APPENDIX D

REPORT OF THE AD HOC WORKING GROUP ON INCIDENTAL MORTALITY ASSOCIATED WITH FISHING (AD HOC WG-IMAF)

CONTENTS

REPORT OF THE AD HOC WORKING GROUP ON INCIDENTAL MORTALITY ASSOCIATED WITH FISHING (AD HOC WG-IMAF)
(Hobart, Australia, 9 to 13 October 2006)

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 2005/06 (SC-CAMLR-XXIV/BG/28). The report contained records of all activities planned 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 intersessional activities and the technical coordinators of national observer programs 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 2005/06 fishing season.

3. The Working Group concluded that most tasks planned for 2005/06 had been successfully implemented. During the intersessional period a number of documents with new data and information were received from Members and international organisations. In addition, much of the information requested intersessionally had been presented to the Working Group in papers submitted to the meeting. In particular, the Working Group noted new information on seabird mitigation activities undertaken by regional fisheries management organisations – IOTC, SEAFO, IATTC and WCPFC (see details in paragraphs 160 to 173). 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 2006/07, compiled by the Co-conveners and the Science Officer, be appended to its report (Table 20).

4. The Working Group especially welcomed to the meeting Mr I. Hay (Australia) and Mr C. Heinecken (South Africa) 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.

5. The Working Group greatly appreciated the participation of a national technical coordinator, Mr Heinecken. His perspective gained from training, briefing and debriefing many CCAMLR scientific observers over several years was invaluable as the Working Group addressed numerous observer-related and data collection issues. In addition to the continued participation of technical coordinators at future meetings, WG-IMAF would also benefit from the participation of South American Members.

Incidental mortality of seabirds and marine mammals
in fisheries in the Convention Area

6. The total extrapolated seabird mortalities during longline fishing for *Dissostichus* spp. outside EEZs in the Convention Area were estimated to be two from Division 58.4.3b. When seabird mortalities reported from EEZs within the Convention Area are included, the total extrapolated seabird mortalities during longline fishing operations in 2005/06 were estimated to be 2 589. This estimate includes 235 birds in Subarea 58.6 and 2 352 birds in Division 58.5.1. For the first time no albatrosses were observed captured in longline fisheries in the Convention Area.

7. Observers reported 33 seabird mortalities, including both albatrosses and petrels, during trawling for finfish in Subarea 48.3. No seabird mortalities were reported during trawling for krill or during pot fishing.

Seabirds in longline fisheries

8. Data were available from all 37 longline cruises conducted within the Convention Area during the 2005/06 season (WG-FSA-06/36 Rev. 2).

9. The Working Group noted that the proportions of hooks observed were similar to those observed for last year for Subarea 48.3 (29% (range 18–39) compared with 31% (range 20–62)); and slightly reduced for Subareas 88.1 and 88.2 (45% (range 20–74) compared with 51% (range 23–100)); Division 58.5.2 (33% (range 31–41) compared with 36% (range 31–41)); and Subareas 58.6 and 58.7 (35% (one vessel) compared with 65% (one vessel)). For other areas the observation rates and ranges increased from last year: Subarea 48.6, 50% compared with 31%; Subarea 58.4, 70% (range 47–100) compared with 56%.

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

11. The total number of observed mortalities was one, a white-chinned petrel in Division 58.4.3b. The total extrapolated mortality for 2005/06 was two birds (Table 2). This compared to 97 birds estimated killed in 2004/05.

12. The total number of seabirds observed caught and released uninjured was 32 (Table 1). 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 97% of seabird captures in 2005/06 (Table 1). As last year, this proportion of seabirds caught on the haul suggests that an increased focus on haul mitigation measures is required (SC-CAMLR-XXIV, Annex 5, paragraph 7.3).

French EEZs in Subarea 58.6 and Division 58.5.1

13. Data were available from 20 cruises in Subarea 58.6 and 27 cruises in Division 58.5.1. The proportion of hooks observed was 25 and 24% respectively (Table 4).

14. In 2005/06 the total reported seabird mortality from observers for Subarea 58.6 and Division 58.5.1 was 57 and 592 birds respectively (Table 4). The corresponding incidental mortality rates were 0.0362 and 0.092 birds/thousand hooks. The extrapolated total seabird mortalities for Subarea 58.6 and Division 58.5.1 were 235 and 2 352 respectively (Tables 5 and 6). All vessels in the French EEZs were autoliners using 50 g/m IWLs in 2005/06, compared with one such vessel in the previous season. Two-thirds of the birds were caught by two vessels in Subarea 58.6, and in Division 58.5.1, 72% of captures were by three vessels. This may indicate that there are individual vessel effects that need to be examined to effectively reduce further seabird captures in these areas.

15. Comparing the 2004/05 and 2005/06 seasons, observed incidental mortality rates decreased to 77 and 57% of the previous seasons' rates respectively in Subarea 58.6 and Division 58.5.1 (Table 7).

16. As for 2005, the Working Group noted that the reports of seabirds being caught injured and uninjured indicate that seabirds are being caught on the haul; this accounted for at least 28% of seabird captures in 2005/06 and 30% in 2004/05 (Table 4) (SC-CAMLR-XXIV, Annex 5, paragraph 7.10). This indicates that a much greater need to focus on haul mitigation measures is required to reduce the remaining seabird by-catch in longline fisheries in the Convention Area.

17. In 2005, the Working Group made recommendations regarding future research and monitoring of the French seabird captures (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraphs 39 to 43). Some of these recommendations were addressed in 2005 and the following remain for 2006. The Working Group recommended that:

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

- a thorough analysis of data be undertaken for the 2003/04 to 2005/06 seasons, similar to that carried out by Delord et al. (2005). Such analyses should include consideration 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 and wind, observer and vessel, and special attention should be given to the circumstances associated with sets and hauls where a large number of birds are caught.

18. The Working Group requested that France supply additional information on the nature of captures (such as where in their body seabirds are hooked), the factors affecting captures (such as line hook-ups or other operational difficulties that may expose the line to bird attacks), and details of mitigation devices used, such as streamer line specifications (e.g. aerial extent, length and spacing of streamers, attachment height, number of streamers, towed device, use across sets and number of streamer lines deployed). This information, in combination with data describing where in their body seabirds are hooked, can indicate how to apply further mitigation or changes in fishing practice to reduce seabird by-catch.

19. The Working Group noted that France continues to reduce its total seabird by-catch by about one half each year. However, the total seabird captures during longline fishing in the French EEZs remains far above that recorded elsewhere in the Convention Area. Seasonal

differences in the fishing patterns between areas may account for the differences in catch rates between the French EEZs and other areas, with no longline fishing conducted outside the EEZs during the summer period, which is considered a high-risk time for seabird captures.

20. The Working Group recommended that all relevant raw data describing by-catch in the French EEZ fisheries (Subarea 58.6 and Division 58.5.1), as submitted from all subareas and divisions within the Convention Area, be submitted to CCAMLR to allow the Working Group to report on total seabird by-catch for the entire Convention Area.

Seabirds in trawl fisheries

21. A total of 33 bird mortalities were recorded in trawl fisheries in the Convention Area. These were all recorded in the icefish fishery in Subarea 48.3. In addition, 89 seabird entanglements with the seabirds released alive were recorded in the same fishery (Table 12).

Subarea 48.3 icefish

22. Data were available from all five trawl cruises conducted within Subarea 48.3 during the 2005/06 season (WG-FSA-06/37 Rev. 1, Table 1). The Working Group noted that there was 100% observer coverage of fishing vessels in this fishery with 78% of tows observed.

23. For 2005/06, 33 bird mortalities (11 black-browed albatross, 20 white-chinned petrels, 1 grey-headed albatross and 1 unknown petrel species) were reported in the Subarea 48.3 icefish fishery from four vessels; in addition 89 birds were released alive, uninjured (Table 12). This compares to 11 bird mortalities (and 14 released alive) in 2005 and 87 bird mortalities (and 132 entanglements) in 2004. The rate of mortality in this subarea in 2006 was 0.07 birds per trawl compared to 0.14, 0.37 and 0.20 in 2005, 2004 and 2003 respectively (Table 14).

24. The Working Group noted that there continued to be a general downward trend in the seabird mortality rate in this fishery (Table 14). However, it is difficult to compare between the level of mortality in 2005 and 2006 as the reduced level of mortality in 2005 was thought to be at least partially due to lower seabird abundance associated with reduced icefish catches (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 204). It was also noted that all recorded seabird mortalities, except one, occurred on the haul.

Division 58.5.2 toothfish/icefish

25. Data were available from all three trawl cruises conducted within Division 58.5.2 during the 2005/06 season (WG-FSA-06/37 Rev. 1, Table 1). The Working Group noted that there was 100% observer coverage of fishing vessels in this fishery with 100% of tows observed.

26. No seabird mortalities were recorded in the trawl fishery in Division 58.5.2. Observer reports from three cruises on board the *Southern Champion* indicated that no bird-scaring devices were deployed but the mitigation measures used were in full compliance with Conservation Measure 25-03.

Krill

27. Data were available from five trawl cruises conducted within Area 48 during the 2005/06 season (Table 1). The Working Group noted that there was not 100% observer coverage of fishing vessels in this fishery and only 15% of tows were observed.

28. The Working Group noted that no seabird mortality was recorded on the *Saga Sea* while fishing with continuous trawls in Subarea 48.1. Similarly, no mortalities were recorded on the *Atlantic Navigator* using either continuous trawl or traditional pelagic trawl methods in Subarea 48.1 (WG-FSA-06/57).

29. There were no recorded incidents of seabird mortality or entanglements in the krill fishery in Area 48, with two cruises in Subarea 48.1 and three cruises in Subarea 48.3, noting that one cruise is incomplete with the vessel still being at sea (WG-FSA-06/37 Rev. 1).

30. In 2005, the Working Group recommended increasing coverage in the krill fishery to 100% of vessels (SC-CAMLR-XXIV, Annex 5, paragraphs 7.55 and 7.56).

31. The Working Group reiterated its advice from 2005 and recommended that the observation of fishing effort in the krill fishery be increased from the current 15% of total effort on a few vessels to 30–50% of effort on 100% of vessels to allow for adequate and representative sampling across all trawl fisheries. This is especially important for the cryptic mortality known to be associated with trawl warp strike (paragraph 75) and for monitoring the ability to use net binding as a mitigation measure for seabirds during net deployment (paragraphs 54 and 59).

Seabirds in pot fisheries

32. During pot fishing in 2005/06, no seabird mortalities were recorded during three cruises targeting *D. eleginoides* in Divisions 58.5.1 and 58.5.2 and Subarea 48.3 (WG-FSA-06/39 Rev. 1).

Marine mammals in longline fisheries

33. There were no reports of incidental mortality of marine mammals in longline gear (WG-FSA-06/36 Rev. 2). This differs from 2004/05, when both pinnipeds (five animals) and cetaceans (two animals) were reported caught (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraphs 196 to 198). In addition, two marine mammals were reported entangled (one Antarctic fur seal in Division 58.5.2, one southern elephant seal in Subareas 88.1/88.2) (WG-FSA-06/38, Table 2).

Marine mammals in trawl fisheries

Krill

34. In 2005/06, and with 15% of total fishing effort observed, one Antarctic fur seal was reported caught and killed (Table 12). The Working Group noted that this level of mortality is greatly reduced from 2004/05, when 96 Antarctic fur seals were observed caught during krill fishing operations in the same area (Area 48) (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 217). The Working Group noted that no marine mammal mortality was reported on the *Saga Sea* while fishing continuous trawls in Subarea 48.1 in 2005/06.

35. Methods deployed to avoid marine mammal capture in 2005/06 were net barriers and a seal exclusion device (WG-FSA-06/37 Rev. 1). The Working Group considered it useful to compare mitigation measures used between years, and the capture rates of associated gear, with a view to identifying potentially effective methods over time.

Finfish

36. In Subarea 48.3, no marine mammal entanglements were recorded with 78% of trawls observed. One leopard seal was caught and killed in the Division 58.5.2 toothfish trawl fishery (compared to one Antarctic fur seal in 2004/05), with 100% observer coverage (Table 14). No mitigation methods were reported.

Marine mammals in pot fisheries

37. There were no reports of incidental mortality of marine mammals in pot fisheries (WG-FSA-06/39 Rev. 1).

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

38. Information from observer reports relating to the implementation of Conservation Measures 25-01, 25-02 and 25-03 in 2005/06 were provided by the Secretariat in WG-FSA-06/38.

Conservation Measure 25-01 ‘Regulation of the use and disposal of plastic packaging bands on fishing vessels’

39. Conservation Measure 25-01 prohibits the use of plastic packaging bands to secure bait boxes. The use of other plastic packaging bands is restricted to those vessels with on-board incineration facilities and all bands must be cut and disposed of using this facility. Information from observer reports indicated 100% compliance with this measure, compared to non-compliance indicated by observer reports on one of 10 vessels in 2005 (WG-FSA-06/38, Table 1).

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

Line weighting

40. For Spanish system vessels there was 100% reported compliance with the line-weighting regime in all subareas and divisions, as for 2005 (WG-FSA-06/38, Table 4). For autoline vessels, all vessels fishing in Subareas 88.1 and 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. For 2005/06, the Working Group noted that only one vessel (*Protegat* in Subarea 48.3), using a variation on the autoline method, used clip-on weights to achieve the sink rate requirements. All other autoline vessels were now using IWLs. The Working Group noted that the *Shinsei Maru No. 3*, using a trot-line system, met the sink rate requirements in Subarea 48.6.

Night setting and offal discharge

41. There was 100% compliance with night setting, and also for offal discharge in all areas where this was required (Subareas 48.3, 48.4, 58.6, 58.7, 88.1 and 88.2) (WG-FSA-06/38, Table 4).

Discard of hooks

42. Observers reported hooks being present in discards on 6 of 36 longline cruises; on three of these this was reported as a rare event. However, the observer reports for the *Globalpesca I* in Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b, the *Protegat* in Subarea 48.3, and the *Punta Ballena* in Subareas 88.1/88.2, indicated that this was a daily occurrence (WG-FSA-06/38, Table 1).

Streamer lines

43. Compliance with streamer line design has increased from 74% (28 of 44 cruises) in 2004/05 to 80% (29 of 36 cruises) this year (WG-FSA-06/38, Table 3), although this is not as high as the 92% (34 of 37 cruises) in 2003. However most of the non-compliant vessels had only minor deviations from the requirement.

44. The cruises where streamer lines did not comply failed on streamer lengths (five cruises), total streamer line length (three cruises, but only one of these deviated by more than 3 m from the required length) and branched streamer spacing (1 cruise). Four vessels failed on one different streamer line specification (*Globalpesca II*, *Insung No. 2* and *Galaecia* in Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b; *Frøyanes* in Subareas 88.1/88.2) and two vessels did not comply on two specifications (*Koryo Maru No. 11* and *Viking Sur*). There was 100% compliance with attachment height.

Haul-scaring devices

45. 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.

46. In Subarea 48.3, four vessels (*Protegat* (78%), *Jacqueline* (46%), *Argos Georgia* (90%) and *Viking Bay* (98%)) did not use haul-scaring devices on all hauls. In Division 58.5.2, two trips by the *Janas* were reported with 100 and 94% compliance with this requirement respectively. In Subarea 58.6 outside the French EEZ and Subarea 58.7 there was 100% compliance (one vessel fished).

Gear debris and garbage

47. The Working Group noted a reported increase in the discharge of gear debris, which occurred on three vessels, one in Subarea 48.3, and two in Divisions 58.4.1, 58.4.2, 58.4.3a and 58.4.3b. This included fishing gear, small sections of line, snoods and plastics. The Working Group noted that this may have additional negative effects on seabirds and marine mammals which could not be quantified at this time. There was 100% compliance with inorganic garbage discharge requirements for longline vessels, though one trawl vessel discharged inorganic discharge. No vessels discharged oil.

Net sonde cables

48. Three observer reports noted that vessel used net sonde cables (*Cabo de Hornos* and *Betanzos* in Subarea 48.3; *Konstruktor Koshkin* in Subarea 48.1). It was unclear whether these were net sonde cables or paravanes, as had been the case in previous years. The Working Group developed a description for incorporation into the scientific observer logbook to clarify the distinction between the two devices and submitted that material directly to the Scientific Observer Data Analyst (paragraph 121).

49. The Working Group reiterated its concern that care was needed to ensure accurate reporting of data by observers because inaccurate reporting may have consequences for reviewing the performance of vessels in fisheries.

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

50. A range of mitigation measures was used on board icefish vessels in Subarea 48.3 and compliance with Conservation Measure 25-03 was generally good. The *Argos Pereira* covered the upper parts of mesh ranging from 135–400 mm with a 'jacket' of 90 mm mesh net. The effectiveness of the panel was not discussed in the observer's report, but it was noted

that this was the only vessel to record no seabird mortalities or entanglements. However, the Working Group recalled that black-browed albatross mortality has been recorded in mesh sizes up to 800 mm (WG-FSA-03/79).

51. Observer reports suggested that the reduced level of seabird mortality recorded during shooting operations was due to improved mitigation measures, including net cleaning, and a combination of weight added to the net and net binding; the latter is described in WG-FSA-05/59 and SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 207. Detailed reporting on net binding was only recorded in two cruise reports from Subarea 48.3. This may have been partly due to the lack of a specific field in the observer logbook to record the use of the method. The Working Group developed recommended changes to the scientific observer logbook to collect these data in future (paragraphs 121 to 124).

Net binding

52. The Working Group noted that the *Insung Ho* used a synthetic netting material to tie slipknots around 150–400 mm sections of the mesh, as opposed to organic sisal string tied to the net as recommended in SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 207. The observer report also indicated that the slipknots frequently opened before the doors were paid away, causing the net to loft on the surface.

53. Net weighting was added to the net to reduce the surface time of the net during shots and hauls on two vessels. The *Cabo de Hornos* reported that 2 x 150 kg chains were stitched along the edges of the codend, and the *Argos Pereira* added two chains of 200 kg each.

54. On the *Cabo de Hornos*, in response to seven mortalities in a single shot in the 100–120 mm mesh, this section of the net was replaced with 150–200 mm mesh. While the effectiveness of this measure was not reported, it was noted that a total of only seven mortalities were recorded on this vessel (i.e. implying all coming from the smaller mesh). Observer reports indicated that two vessels used 'Brady Bafflers' and a third vessel deployed a pair of booms astern of the trawl ramp with net and rope hanging around 2 m seaward. Observers noted that both devices were of little use in preventing net entanglements with seabirds.

55. Similar to reports from last year (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 207) observer data from 2005/06 indicated that streamer lines appeared ineffective 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.

56. The Working Group noted that the *Insung Ho* was non-compliant with the prohibition of offal discharge during shooting and hauling in Subarea 48.3 as prescribed in Conservation Measure 25-03 on 10 occasions (5.9%). Observer reports also indicated a failure to comply with deck lighting restrictions on board three vessels. The Working Group noted that no information on mitigation measures was recorded on the *Sil* (Table 10).

57. The consistency of reporting on the adoption of mitigation measures in the icefish trawl fishery varied considerably. The Working Group recommended changes to the observer logbook to improve the collection of these data (paragraphs 120 to 124).

58. Only a single seabird mortality was recorded during net shooting in the icefish fishery in Subarea 48.3. The Working Group recalled reports of the effective use of net binding to reduce seabird interactions with trawl nets in the *Champsocephalus gunnari* fishery in Subarea 48.3 (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 207; 2004/05 Cruise Reports). Preliminary trials conducted in 2004 and two subsequent seasons of operational experience indicate that binding the net is a highly effective and easily accomplished mitigation measure. There is increasing evidence from observer reports and anecdotal information from fishing companies and technical coordinators (Mr Heinecken and Dr D. Agnew, UK) that in combination with net cleaning and weighting, net binding may be largely responsible for reductions in seabird mortality during shooting operations.

59. The Working Group strongly recommended the use of net binding in the *C. gunnari* fishery in Subarea 48.3, and other pelagic trawl fisheries in the Convention Area, as appropriate. The following guidelines are provided to assist in a uniform uptake of this mitigation measure:

(i) When the net is on the deck, prior to shooting, the application of 3-ply sisal string (which typically has a breaking strength of around 110 kg), or a similar inorganic material, at intervals of approximately 5 m prevents the net from spreading and lofting at the surface. Net binding should be applied to mesh ranging from 120–800 mm. These mesh sizes have been shown to cause the majority of entanglements for white-chinned petrels and black-browed albatrosses, which are the most vulnerable species to this form of mortality in Subarea 48.3.

(ii) When applying the 'string', tie an end to the net to prevent the string from slipping down the net and ensure that it can be removed when the net is hauled.

(iii) Added weights to the codend should be used in conjunction with net binding to increase the sink rate of the net and increase the angle of the net's ascent during hauling, therefore reducing surface net time.

(iv) Net cleaning should be used in conjunction with added weight and net binding to reduce seabird captures during shooting operations.

60. The Working Group recommended that an advisory note be added to Conservation Measure 42-01 to assist in the uptake of this mitigation measure. Accordingly, the Working Group recommended that Conservation Measure 42-01 be revised as follows:

Add the following sentence to 'mitigation' paragraph 7:

Vessels are encouraged to use net binding as a means to reduce seabird interactions. See SC-CAMLR-XXV, Annex 5, Appendix D, paragraph 59 for guidelines for net binding.

61. The Working Group will review the use of net binding to assess the efficacy of this mitigation measure in all pelagic trawl fisheries.

62. The Working Group noted that no information is currently collected about seabird interactions with trawl warp cables. The Working Group strongly recommended that data be collected to assess and evaluate the nature and extent of such interactions. Data collection protocols, revisions to observer logbooks and cruise reports have been developed and will be incorporated by the Secretariat for 2006/07 fisheries (paragraphs 74, 122 and 123).

General

63. The Working Group reflected that the ongoing success in minimising and mitigating by-catch of seabirds in longline fisheries in the Convention Area has resulted from an ongoing and adaptive approach to application of mitigation measures. The success and uptake of this approach has been contingent on the sustained very high level (100%) of observer coverage in the Convention Area.

Incidental mortality of seabirds outside the Convention Area

Longline

New Zealand

64. Dr S. Waugh (New Zealand) noted that in New Zealand fisheries in 2003/04, observers reported the capture of the following seabird species that breed in the Convention Area: black-browed albatross (1), light-mantled albatross (1), grey petrel (3) and white-chinned petrel (4) caught in tuna longline fisheries, white-chinned petrel (31), Cape petrel (1) in autoline fisheries for ling. An additional 37 seabird captures of unidentified species were recorded by observers. Where estimation of total captures was possible, 514 seabirds were estimated in 2003/04 New Zealand longline fisheries.

65. For 2004/05 New Zealand fisheries, observers reported the capture of the following seabird species that breed in the Convention Area: grey petrel (2), white-chinned petrel (3) and southern giant petrel (2) caught in tuna longline fisheries, white-chinned petrel (10), grey petrel (1) and common diving petrel (1) caught in ling autoline fisheries, an additional 160 seabird captures of unidentified species were also reported. Where estimation of total captures was possible, 329 seabirds were estimated in the 2004/05 New Zealand longline fisheries.

Other areas

66. No other Members reported on longline seabird by-catch from outside the Convention Area.

Trawl

New Zealand

67. Dr Waugh reported that for observed trawl fisheries in New Zealand for 2003/04, estimated total captures of seabirds were 338 birds (34% CV) in hoki trawl fisheries and 845 birds (8% CV) in squid trawl fisheries. An additional 190 unidentified seabirds were recorded by observers. For 2004/05 there were 395 birds estimated caught (23% CV) in hoki trawl fisheries and 1 454 birds (7% CV) in squid trawl fisheries, with an additional 77 unidentified seabirds.

South Africa

68. Mr Heinecken reported on WG-FSA-06/41 which provided estimates of the incidental mortality of seabirds in South Africa's deep-water hake trawl fishery. Observations of seabird interactions with gear were made on 331 trawls during 20 trips on 14 vessels between mid-2004 and the end of 2005. Shy and black-browed albatross were killed most frequently and low numbers of white-chinned petrels, Cape gannets and sooty shearwaters were also killed. Mortalities were greater in winter, when more seabirds attended fishing vessels, primarily when offal was being discharged. The total extrapolated annual seabird mortality was approximately 18 000 (95% CI 8 000–31 000), of which 85% were killed on trawl warp cables and 15% entangled in nets. Of the birds killed, approximately 5 000 (95% CI 3 000–12 500) were black-browed albatrosses. Based on satellite-tracking data, these birds are likely to be predominantly Convention Area birds breeding in South Georgia.

69. The Working Group noted that the data collection protocols for warp cable strikes were similar to those used in the Falkland/Malvinas Islands (WG-FSA-04/79) and New Zealand (WG-FSA-05/41), with the exception that due to closely trimmed warp cable splices resulting in few birds being hauled on board, a new data field was added to estimate the number of birds that were observed to be dragged under water and not to surface. A proportion of these events were verified by post-hoc analysis of video recordings. The Working Group recognised that these estimates were based on a small observed sample and viewed the extrapolation with caution. However, the level of estimated seabird mortality remains a serious conservation concern.

70. As reported in previous studies of seabird mortality associated with warp cable strikes, the highest level of mortality was associated with periods of offal discharge (WG-FSA-04/79 and 05/41). Studies suggest that large-winged birds such as albatrosses and giant petrels (WG-FSA-04/79) are more susceptible to having their wings wrap around warp cables and being dragged underwater. It was noted that in July 2006, streamer lines became mandatory in the South Africa hake trawl fishery, as a means to deter seabirds from warp cable collisions. The Working Group encouraged the development of a more effective and operationally simple design of streamer lines that would be supported by the industry and deployed by the crew.

71. Mr Heinecken noted the cryptic nature of seabird warp-strike mortalities, not normally seen unless specific observations of bird contacts with warps are undertaken. The cryptic nature of this mortality and the need for specifically tasked seabird observers to record and

quantify this type of mortality has been noted in recent years (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 211; WG-FSA-04/79 and 05/41). The Working Group re-emphasised the need for effective mitigation of seabird by-catch in trawl fisheries, recommended expanded data collection by dedicated seabird observers to determine the extent of the interaction and noted that restricting offal discharge during trawl operations would significantly reduce the observed by-catch in this fishery.

Development of a trawl warp cable data collection protocol for inside the Convention Area

72. Dr Waugh reported on the development of data collection protocols (WG-FSA-06/62) to record seabird strikes and mortality on trawl warps in the New Zealand squid fishery and on intersessional work (WG-FSA-06/61) to develop a data collection protocol to investigate seabird and warp cable strikes in trawl fisheries in the Convention Area.

73. The levels of seabird mortality of Convention Area seabirds in trawl fisheries in New Zealand and South Africa are a conservation concern. Taken together with the seabird mortalities reported in the *C. gunnari* trawl fishery in Subarea 48.3 this year as well as past years (Table 14), the Working Group reiterated the need to monitor seabird strikes with trawl warp cables in the Convention Area (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraphs 210 to 212).

74. Thus, the Working Group developed forms and a protocol and recommended that they are used in all trawl fisheries in the Convention Area. The objective is to assess the extent of seabird interactions with trawl warp cables in Convention Area fisheries. This would be undertaken in three stages:

(i) document if seabird interactions with trawl warp cables are occurring in the Convention Area fisheries;

(ii) if detected, examine the nature and extent of seabird mortalities, including the vessel type, seabird species concerned and operational factors of the fishery that may contribute to the interactions;

(iii) examine mitigation options to reduce mortality of seabirds in these fisheries.

75. The Working Group recommended that the first stage occur in 2006/07, requiring sampling across a high proportion of vessels and fisheries (paragraphs 22, 25, 27 and 31).

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

76. 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.

77. 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.

78. 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-XXV/BG/27 and in SC-CAMLR-XXII, Annex 5, paragraphs 6.112 to 6.117.

79. 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 2006 (SCIC-06/9), 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-XXV/BG/26) has been used.

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, 88.2	Summer	0.27	0.33	0.87
	Winter	Not applicable, access not possible in winter		

80. 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-XXV/BG/27.

81. The estimated total for the whole Convention Area in 2005/06 indicates a potential incidental mortality of seabirds in the unregulated fishery of 4 583 (95% CI 3 756–12 237) seabirds. The values for this and previous years are summarised in respect of different parts of the Convention Area in Table 17.

82. In comparison with estimates for previous years, calculated in identical fashion, the value for 2005/06 is similar to the values estimated for 2003/04 (SC-CAMLR-XXIII/BG/23)

and 2004/05 (SC-CAMLR-XXIV/BG/27). 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.

83. Based on the data since 1996 (SC-CAMLR-XXIV/BG/27), an estimated total of 185 716 (95% CI 151 187–543 319) seabirds have been killed by these vessels. Of these:

(i) 41 590 (95% CI 33 647–131 451) were albatrosses, including individuals of four species listed as globally threatened using the IUCN threat classification criteria (BirdLife International, 2004);

(ii) 7 359 (95% CI 6 011–20 597) were giant petrels, including one globally threatened species;

(iii) 116 478 (95% CI 94 973–333 776) were white-chinned petrels, a globally threatened species.

84. The Working Group also noted that grey petrels, a winter-breeding species that is another globally threatened species, have comprised between 5 and 11% of the catch in the regulated fishery in Division 58.5.1 over the last three years, and that some of the estimated 454 to 1 478 birds taken in the IUU fishery this year may have been of this species. The Working Group undertook to examine methods of estimating the by-catch of this species by IUU vessels within Division 58.5.1 as an intersessional task with a view to assessing the level of take of grey petrels in future years.

85. 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.

86. 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.

87. Many albatross and petrel species are facing potential extinction as a result of fishing operations. 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.

Research into and experience with mitigation measures

Longline

88. Dr G. Robertson (Australia) presented WG-FSA-06/22 and reported results of an experiment on a chartered Spanish system longline vessel to examine a range of factors that affect the sink rate of longlines to improve seabird deterrent capabilities. This work was proposed in 2005 (WG-FSA-05/12; SC-CAMLR-XXIV, Annex 5, Appendix O, paragraphs 65 to 71) and endorsed by the Scientific Committee (SC-CAMLR-XXIV, paragraph 5.16) and the Commission (CCAMLR-XXIV, paragraph 5.1).

89. The research produced a range of recommendations, including a new line-weighting regime, aimed at improving sink rates to depths beyond where seabirds can access baited hooks. As outlined in WG-FSA-05/12, the next steps are to test the new line-weighting regime operationally in 2007 and its effectiveness as a seabird deterrent. The ongoing research will involve comparing the differences in sink rates between traditional Spanish system weights (bags of rocks) and elliptical steel weights. The objective of this trial is to determine the mass of steel weight that will sink gear at the same rate as the traditional weights (8.5 kg at 40 m) in Conservation Measure 25-02. The elliptical steel weights will be smaller and lighter, easier to handle and less likely to snag on the seabed (and hence result in less gear lost and less 'ghost' fishing).

90. Following final stages of research, the Working Group recommended that a suite of best-practice seabird by-catch mitigation measures for Spanish system longline vessels be developed.

91. The Working Group also noted the recommendation in WG-FSA-06/22 that Spanish system vessels could reduce line tension events that occur during setting and can often lead to seabird mortality events by reducing the number of hooks that become snagged on both the setting table and setting boxes. The use of a marine-grade stainless steel to manufacture a steel apron on the setting table and stainless steel sleeves in all hook boxes was considered to be an important step to ensuring the continued high level of performance of Spanish system vessels.

Shinsei Maru No. 3 bottom-line system

92. Based on the requested information received about the *Shinsei Maru No. 3* bottom-line system on the structure of the gear, the weight of line weights, estimated sink rates, and an accounting of any seabird interactions with the gear (WG-FSA-06/15; SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 81; WG-FSA-05/26), the Working Group determined that the threats to Convention Area seabirds during line-setting operations would be minimal and potentially lower than with the traditional Spanish system. The cruise report noted that no birds were hooked either in line setting or line hauling and a bird-scaring device was used during line hauling.

93. The Working Group noted with interest this gear design and weighting regime and agreed that continued reporting of this methodology would provide valuable information on its performance in relation to seabird by-catch.

94. The Working Group also noted with interest the comparatively high target species catch rates for the *Shinsei Maru No. 3* bottom-line system compared to the traditional Spanish system, although the source of the latter data was not provided in the paper (WG-FSA-06/15).

Integrated weight lines

95. The Working Group noted that previous trials on the sink rate of IWLs had investigated the sink rate of lines with 50 g/m of lead for a range of line diameters (9.0–11.5 mm). But it was noted that at the time of these trials that IWLs were only manufactured by a single company (Fiskevegn). Due to the success of IWLs in reducing seabird mortality and the widespread support for their operational characteristics, several other manufacturers are now producing IWLs.

96. The Working Group agreed that it was critical that IWLs produced by other manufacturers needed to strictly comply with the 50 g/m specification and to ensure that the operational characteristics of IWLs conformed with Conservation Measure 25-02. IWLs that are developed to being greater than 12 mm diameter would need to undergo independent sink rate tests to ensure that they meet the 0.2 m/sec sink rate, as required in Conservation Measure 24-02.

Streamer lines

97. The Working Group noted the recommendation in WG-FSA-06/22 that mechanised streamer line systems could greatly assist in their retrieval and agreed that further research was required into the utility and cost of such systems. Several key characteristics of streamer lines were identified as critical for such trials. These included the length of the mainline, the nature of the tension device (towed object), aerial extent, the material of the mainline and streamers and the attachment position and height.

Streamer lines and integrated weight line

98. Mr E. Melvin (USA) reported on WG-FSA-06/52, which described the results of research comparing the performance of 50 g/m IWLs to unweighted longlines (UWLs) both with and without paired streamer lines (PS) in the 2005 Bering Sea fishery for Pacific cod (*Gadus macrocephalus*). Performance measures included seabird mortality, abundance and behaviour, fish catch rates of target and non-target fish, an assessment of relative sink rates and 2 m access windows, as well as practical matters of relative handling and breaking strength.

99. All mitigation technologies dramatically decreased seabird by-catch rates, while having little to no effect on fish catch rates – target or by-catch species. Mitigation was more effective for surface foraging seabirds (91–100%) than for diving seabirds (79–97%). Shearwater seabird catch rates were significantly less for IWL-PS than for UWL-PS, reducing by-catch rates by 97% compared to no deterrent (UWLs). IWLs and UWL-PS performed

similarly reducing shearwater by-catch rates by 88 and 79% respectively. For surface foragers IWLs, UWL-PS and IWL-PS performed similarly reducing catch by 91, 98 and 100% respectively.

100. The substantial reductions in seabird mortality when using IWLs alone (91% for shearwaters and 88% for surface foragers) occurred despite the lack of a concomitant decrease in seabird attack rate or abundance. The Working Group concluded that attack rates alone are a poor indicator of seabird mortality and consequently a poor measure of success in seabird mitigation research programs. Seabird attack rates on longlines were significantly reduced within 60 m – the aerial extent of streamer lines – when PS were used. Functionally, IWLs reduced the 2 m access window by nearly half compared to UWLs. Sink rates and access windows varied between vessels. This variation was a function of deployment of gear relative to rotation of the propeller and vessel speed.

101. The paper recommended revisions to Conservation Measures 24-02 and 25-02 based on these results. Proposed revisions to Conservation Measure 24-02 included measuring sink rates to a depth of 2 m (in addition to or instead of 10 m or 15 m) and estimating the 2 m access window (seconds to 2 m x speed in m/s) for each set where sink rates are measured. Proposed revisions to Conservation Measure 25-02 included requiring two streamer lines instead of one during line setting and requiring 50 g/m (minimum weighting) IWLs for autoline vessels fishing in the Convention Area.

102. The need for revisions to conservation measures was discussed generally, noting that the number of seabirds taken in the Convention Area, not including the French EEZ, was near zero in 2005/06. However, the Working Group noted that while these findings indicated that the use of two streamer lines and 50 g/m IWLs constituted the best seabird mitigation practice for autoline longline fisheries in Alaska, that the effectiveness of two streamer lines compared to single lines need to be tested in Southern Ocean conditions in a fishery with similar seabird assemblages to those encountered within the Convention Area. This would ideally include a mix of *Thalassarche* and *Diomedea* albatrosses, *Procellaria* petrels and *Puffinus* shearwaters. The Working Group recommended that such tests are conducted.

Sink rates and access windows

103. The Working Group reviewed a data extract from 2005/06 sets with sink rate data for both Spanish gear and autoline vessels to examine sink rates achieved in Convention Area fisheries and to evaluate 2 m access windows relative to the aerial extent of streamer lines. All sink rate data were generated using the 10 m bottle line test – no TDRs were used to measure sink rates in the Convention Area. All autoline sets were made using IWLs, but the Working Group noted one exception. The *Protegat* fishing in Subarea 48.3 was categorised as an autoline vessel by the observer and had IWLs on board, but IWLs were not used and the gear that was set would best be described as Spanish gear (double-line system).

104. The Working Group noted that most sink rates (Figure 1) and streamer line aerial extent estimates (Table 11) greatly exceeded those documented through extensive TDR data collection activities for both IWLs and Spanish system gear. This observation led to questions regarding the methodology by which sink rates and streamer line aerial extent are measured by fishery observers. Estimates of the 2 m access window based on the available

sink rate data yielded a mean of 23 m for IWLs and 20 m for Spanish system gear. Mean streamer line aerial extent was 73 m for IWLs and 84 m for Spanish system gear. The Working Group recommended several observer logbook and cruise report modifications to address these points (paragraphs 118 and 119).

Longline bait

105. Dr T. Micol (France) reported results of a comparison made on board one French vessel on white-chinned petrel responses to treated mackerel baits (spicy) versus untreated baits. The petrels readily consumed all untreated baits. However, birds almost never swallowed treated baits immediately and they sometimes ignored them completely. While preliminary, these results suggest that treated baits could be effective in reducing seabird attacks on longline baits, and consequently reducing seabird capture on baited hooks. The Working Group looks forward to receiving a working paper detailing this research.

Longline hauling

106. Given that 32 birds were observed caught and uninjured during the haul, compared to a single mortality during line setting (WG-FSA-06/36 Rev. 2, Table 2), the Working Group reiterated that priority should be given to reducing the number of birds caught during line hauling (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraphs 11 and 84 to 86). Conservation Measure 25-02, paragraph 8, requires that a device designed to discourage birds from accessing baits during line hauling be used in high-risk areas for seabirds (Subareas 48.3, 58.6 and 58.7 and Divisions 58.5.1 and 58.5.2).

107. The Working Group noted that it was not possible to develop prescribed standards for the refinement of Conservation Measure 25-02 (SC-CAMLR-XXIV, Appendix O, paragraph 84), as the level of detail reported by observers on the design of devices currently used was insufficient to determine the most appropriate device to recommend. The Working Group recommended that the observer logbooks be updated to collect the required information in the 2006/07 season. Recommended changes were provided to the Secretariat (paragraph 120).

Longline hauling mitigation measures

108. A total of 312 birds were reported caught and released alive during line hauling operations in the 2005/06 season in Subareas 48.3, 48.4, 58.6 and 58.7 and Division 58.5.1 (WG-FSA-06/36 Rev. 2, Tables 2 and 6.1). In all the other areas where longline fishing operations occurred no birds were caught while hauling. No haul mitigation measures were reported for Subarea 58.6 and Division 58.5.1 where 280 of the 312 seabirds were caught during hauling.

109. For areas where haul mitigation measures were reported, the catch rates (birds/thousand hooks) for Subareas 48.3 and 48.4, and the South Africa EEZ areas (Subareas 58.6 and 58.7) were 0.003, 0.005 and 0.015 respectively.

110. A comparison of the catch rate by gear type indicates 0.001 birds/thousand hooks for autoline gear and 0.004 birds/thousand hooks for Spanish system gear.

111. Haul mitigation devices were reported in use at the hauling station for 78 to 100% sets (paragraph 22). Three haul mitigation designs were described in the observer reports:

(i) A single boom extending 3–5 m perpendicular from the side of the vessel, approximately 1–2 m aft of the hauling station. From the end of the boom, a single line was suspended with a buoy attached to the end of the line so that it just touched the water surface. With the rolling of the vessel, the buoy swung around in an erratic manner in front of the hauling station. The movement and size of the buoy distracted and scared any birds approaching the 'swing' area of the buoy.

(ii) A single boom extending 3–5 m perpendicular from the side of the vessel, approximately 1–2 m forward of the hauling station. From the boom, multiple sets of paired streamers were attached that reached down to the surface of the water.

(iii) A 'Brickle curtain', consisting of two booms, approximately 6 m in length, that extend out over the water ahead and aft of the hauling station. A rope was extended from the rail to the end of the first boom, across to the end of the second boom and back to the rail on the other side. Long bright orange streamers suspended from this rope at short (approximately) half a metre intervals that hung down into the water. Weights were attached to the ends of the streamers so that they extended below the surface of the water. The overall effect was a curtain of streamers that completely enclosed the line-hauling point. The device reportedly proved to be extremely effective in deterring birds from approaching close to the hauling point. However, a number of disadvantages to this system were noted. The close proximity of the streamers resulted in them getting tangled and hooked on exposed hooks on the line being retrieved. The resultant procedure of having to retrieve the system to unhook the line and then re-deploy it resulted in the crew becoming more and more reluctant to keep it in place. One vessel used three booms and the curtain of streamers extended down the starboard side of the vessel from a point forward of the hauling station to the stern.

112. A fourth system described where no birds were caught was a 'moon pool' where the line was hauled inside the vessel and not exposed on the surface outside the vessel.

113. The Working Group noted that the use of a moon pool poses the optimum mitigation efficacy against catching birds while hauling. From the results where seabirds were caught, the Brickle curtain was the most effective mitigation described. The single boom and suspended buoy was the least effective measure. It also noted that the greatest numbers of birds were caught during the southern summer season (September to April) in Subareas 58.6/58.7 (South African EEZ) where the single boom/buoy technique was used.

114. The Working Group noted that the Brickle curtain is a highly effective haul mitigation device for longline vessels. The Working Group encouraged technical coordinators to instruct observers to collect information on haul mitigation devices used in the Convention Area.

Trawl

115. WG-FSA-06/41 did not report data on mitigation trials; however, the authors reported that a pair of short streamer lines set over the warps in initial trials prevented seabirds from entering the danger zone where warps enter the water. Their use was recommended based on these initial trials and subsequently became a permit requirement starting in the second half of 2006. The authors also suggested that vessels should manage offal discharge to minimise seabird interactions.

General

116. The Working Group noted the need for seabird mitigation research to explore effects on target species and the by-catch of other taxa of new and additional mitigation measures.

Observer data collection

117. The Working Group reviewed data collection needs relative to several areas of seabird interactions and mitigation and proposed additions or changes to logbooks and cruise reports.

Longline

118. A review of sink rate data from the fishery for both Spanish gear and autoline gear (WG-FSA-06/38, Table 6) suggested that additional data would be useful to interpret anomalously high sink rates especially with Spanish longline gear. The Working Group suggested simple additions to the logbook to indicate the placement of bottle test attachment lines relative to added weights, how gear is set relative to the direction of the propeller, and if weight spacing during a bottle line test matches the spacing used typically during fishing.

119. As with sink rate data, aerial extent data on streamer lines varied greatly (Table 11), suggesting that instructions to fishery observers could be improved. Consequently, the cruise report illustration of aerial extent was revised to better match the illustration in Conservation Measure 25-02. Form modifications were developed to allow information to be collected on the distribution of streamers along the aerial extent of the streamer line. Details were provided describing how to better estimate the placement of streamer lines relative to the entry point of the hookline. In addition, specific instructions will be provided to technical coordinators on collecting these data where night-time setting is required.

120. Recognising that for the past two years most seabirds were caught during the haul and unspecified haul mitigation is being used in the Convention Area, data fields were added to the cruise report to improve reporting of haul mitigation being used in the Convention Area.

Trawl

121. To address the extent to which net binding is used during the shot, specific data fields were added to the logbook to indicate when net binding is used, if the most hazardous meshes are bound, and to report the spacing and nature of binding materials being used. In addition, data fields were added to allow observers to better determine if net sonde cables are being used. Changes include a specific illustration to help differentiate between paravanes and net sonde cables.

122. Several papers in recent years have documented the cryptic nature of seabird warp strikes, which can result in high levels of seabird mortality in trawl fisheries outside the Convention Area. The papers included protocols to measure these interactions and described methods to mitigate them (WG-FSA-03/91, 04/79, 04/46, 05/36, 05/41, 05/46, 05/P8, 06/41 and 06/61). The Working Group suggested that a warp-strike interaction protocol be developed for Convention Area trawl fisheries (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraphs 212 and 215). This protocol was developed intersessionally by the Working Group and was incorporated into scientific observer data collection instructions by the Secretariat during the meeting to allow data to be collected beginning in the 2006/07 fishery. The protocol includes collecting behavioural data on four classes of seabirds (albatrosses, giant petrels, white-chinned petrels and other petrels) and data on the abundance of total seabirds in a specified area near a warp, as well as selected operational data designed to explain the nature and extent of warp interactions.

123. The data collected by scientific observers using the protocol will be reviewed by the Working Group in 2007 to assess the threat posed by trawl warp strikes in the Convention Area and to determine if targeted mitigation methods need to be developed.

124. To improve the ability of the Working Group to assess seabird mortality reporting during trawl hauls, the current data collection protocol was augmented to include the extent to which the haul was monitored and to record seabirds found on warp cables.

Research into the status and distribution of seabirds

125. ACAP addresses all Procellariiform seabirds occurring in the Convention Area. ACAP was requested in 2005 to submit summary information detailing the population trends of albatrosses and petrels (SC-CAMLR-XXIV, Annex 5, paragraph 7.37), and this information was provided in WG-FSA-06/40. Summarised assessments of the population status and trends of the ACAP-listed species were provided to the meeting from which it is evident that for populations for which data are available:

(i) population size estimates of high–medium quality are available for 68% of all populations, 32% of populations having either low quality or no estimates of population size;

(ii) population trend information is only available for 40% of all populations of ACAP-listed species. For the populations for which trend data are available, 27% are increasing, 30% are stable and 43% are declining;

(iii) the availability of vital demographic parameters for these populations remains limited, with estimates of adult survival available for only 18% of populations, and immature recruitment/survival available for only 11% of populations;

(iv) overall, the level of information on population status and trends is limited for the *Procellaria* petrel group.

126. The report from ACAP (WG-FSA-06/40) outlined a proposal for the development of Species Conservation Assessments for all ACAP-listed species. These assessments would include a basic description of each species including such information as taxonomy, breeding locations, foraging distribution and overlap with fisheries. These data would include summaries of known threats at each breeding site, current population sizes and population trend data. It was proposed that these Species Assessments would be web-based and housed on the ACAP website, and thereby readily available for consideration by CCAMLR Members. Consideration of this proposal will be progressed at the ACAP Meeting of Parties to be held in New Zealand in November 2006. The Working Group was encouraged by the proposal for Species Conservation Assessments and agreed they would be useful for WG-IMAF's work.

127. Dr Waugh reported on the progress of the ACAP Breeding Sites Working Group. The group is actively collating site data, as well as developing assessments of land-based threats and best-practice island management guidelines.

128. WG-FSA-06/12 reported the results of a comparison in 2002 of census methods for black-browed albatrosses at the Ildefonso archipelago, a major breeding site for this species of albatross. Of the methods tested – ground-truthed air photography, boat-based photography, ground counts, point distance sampling and quadrat sampling – air photography was considered to be the most accurate method for this breeding site. Compared to air photography the other methods underestimated mortality by 9–55%. Air photography yielded a total of 47 000 breeding pairs of black-browed albatrosses at Ildefonso, representing the fourth largest population of this species of albatross in the world.

129. Dr Micol reported on preliminary results of a study that assessed the possible impact of longline fishing on the population dynamics of white-chinned petrels on the Crozet Islands. The breeding population on Crozet archipelago was found to be 35 000–51 000 pairs, an estimate extrapolated from surveys conducted on Possession Island. The comparison of the breeding population of white-chinned petrels on Possession Island between 1983 and 2004 indicated a decline of 41% in 20 years, at an annual rate of decrease of 2.6% per year. Modelling analysis showed that this decline was attributable both to environmental factors and to fisheries. More detailed results, including Kerguelen data, will be submitted to the next meeting of WG-IMAF.

130. The distribution of southern and northern giant petrels foraging from Macquarie Island was examined via satellite telemetry during the 2005/06 breeding season (WG-FSA-06/49). Four adults and two fledglings of each species were tracked and the time spent in CCAMLR areas was assessed for each species. Adult southern giant petrels, tracked during their incubation phase, spent 37% of their time at sea in Division 58.4.1, and 14% in Subarea 88.1. Adult northern giant petrels, tracked during chick rearing, spent less time in CCAMLR waters, only traversing waters in Division 58.4.1. Both southern and northern giant petrel fledglings traversed the Pacific Ocean, travelling east towards the South American

Continental Shelf. Southern giant petrel chicks took a more southerly route, traversing Subareas 88.1 and 88.2 along this course, while the more northerly route taken by the northern giant petrel fledglings did not take them through CCAMLR waters. This new distribution data was welcomed by the Working Group and was incorporated into the assessments of risk for CCAMLR subareas (SC-CAMLR-XXV/BG/26).

Incidental mortality of seabirds in relation to new and exploratory fisheries

Assessment of risk in CCAMLR subareas and divisions

131. 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 increases in seabird incidental mortality.

132. 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.

133. 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-XXV/BG/26).

134. This year additional information from a satellite-tracking study was provided on the at-sea distribution of southern and northern giant petrels that breed on Macquarie Island (WG-FSA-06/49). A CCAMLR observer report from a fishing cruise in Subarea 48.6 provided valuable distributional data on grey petrel, great shearwater, sub-Antarctic skua and southern fulmar from this infrequently visited area (Elcimo Pool, unpublished CCAMLR observer report, *Shinsei Maru No. 3*, 19 December 2005 to 3 April 2006). A record of Buller's albatross from this area was not considered at this stage because of concerns that this subarea was well outside the known distribution of this species. The revised assessments incorporating new information made available at the meeting (with changes/additions underlined) have been issued as SC-CAMLR-XXV/BG/26.

135. The Working Group noted a tabled description of the WG-IMAF risk assessment (WG-FSA-06/33) that represented progress towards full documentation of the process used for defining risk ratings within the Convention Area. This description identified several key data types used in the risk assessment (breeding distributions, and inferred and known foraging ranges of seabird species and their threat status). The process includes precautionary approaches in the face of data gaps, assignment of appropriate mitigation measures through specification of conservation measures, and the use of an expert group with a diversity of expertise in seabird population ecology and mitigation and operational aspects of fisheries.

136. The Working Group discussed whether seabird mortality information should be added to the assessments. It was considered that the current information described adequately the intrinsic risk to seabirds of fishing activities within a prescribed area. This rating would be

valid irrespective of fishing practice and changes in operation that might occur through time. Therefore the assessments provided a baseline against which relative risk and appropriate mitigation response by fisheries could be measured.

137. The Working Group considered that it would useful to develop this paper further, with a view to making the methodology and approaches more accessible to groups outside CCAMLR seeking to undertake similar processes, particularly those with fishery management responsibilities where Convention Area seabirds are taken outside the Convention Area. This would be developed intersessionally by the Working Group. Links to the ACAP Seabird Bycatch Working Group were identified as a key to coordination and dissemination of effective seabird by-catch management into other international regional fora.

New and exploratory longline fisheries operational in 2005/06

138. Of the 39 proposals last year for new and exploratory longline fisheries in seven subareas and divisions, only 22 were actually undertaken (SC-CAMLR-XXV/BG/1 Rev. 2).

139. One white-chinned petrel in Division 58.4.3b was the only reported incidental seabird mortality in new and exploratory fisheries in 2005/06 (paragraph 11). Clearly, the strict adherence 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 by-catch of seabirds.

New and exploratory longline fisheries proposed for 2006/07

140. The assessment of the risk to seabirds posed by new and exploratory longline fisheries in the Convention Area is incorporated into the revised assessment in SC-CAMLR-XXV/BG/26 (an update of SC-CAMLR-XXIV/BG/26) and summarised in Figure 2 and Table 18, and also includes an assessment of recommended levels of observer coverage.

141. Forty-one applications for exploratory longline fisheries, submitted by 12 countries, were received by CCAMLR in 2006. No applications for new longline fisheries were received. The areas for which these proposals were received were:

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

142. 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-XXV/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 2006, is set out in Table 19.

143. 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-XXV/18), Japan (CCAMLR-XXV/19), Namibia (CCAMLR-XXV/21), New Zealand (CCAMLR-XXV/22), Norway (CCAMLR-XXV/23), Russia (CCAMLR-XXV/24), South Africa (CCAMLR-XXV/25), Spain (CCAMLR-XXV/26) and the UK (CCAMLR-XXV/27) 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-XXV/17), Republic of Korea (CCAMLR-XXV/20) and Uruguay (CCAMLR-XXV/28) fall into this category.

144. 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;

(iv) stating an intent to have only one observer on board the vessel in areas where two are required.

145. The Working Group welcomed the improvements in notifications this year and in particular that only three (25%) of the notifications were now assessed in the insufficient information category compared with six (46%) in 2005. Members were requested to take greater care in future submissions to ensure the intent to comply with relevant seabird by-catch measures was clear.

146. 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.

147. In 2005 the Working Group developed a checklist to assist Members when completing their notifications (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 193). The Secretariat used this information in developing a pro forma and checklist to assist Members in fulfilling notification requirements in 2006. The Working Group welcomed CCAMLR-XXV/29 which proposes further improvements to this approach and should improve the information available to the Working Group in future. The Working Group recommended that the one-page summary of notifications should also include a four-part checklist to address Members' intentions to:

(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;

(iv) comply with scientific observer requirements specified in Conservation Measures 41-04, 41-05, 41-06, 41-07, 41-09, 41-10 and 41-11.

148. 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 reiterated its recommendation 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.

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

ACAP

149. Mr W. Papworth provided an update on recent developments within ACAP. The second meeting of the Advisory Committee of ACAP was held in Brasilia, Brazil, from 5 to 8 June 2006. The meeting was preceded by workshops of the Breeding Sites Working Group and the Status and Trends Working Group. Six Parties were represented: Australia, Chile, France, New Zealand, South Africa and the UK. In addition, two Signatory States: Argentina and Brazil; one range State: the USA; and BirdLife International were represented. During proceedings, Argentina announced that its Government had ratified the Agreement; bringing the total number of ACAP Parties to 10. Brazil also notified the meeting that its ratification

process was well advanced and that it expected this would be completed by the second Meeting of the Parties in November this year. A full report of the meeting is available at www.acap.aq/.

150. Items of particular relevance to CCAMLR included:

(i) the review of data relevant to assessments of status and trends of albatross populations by the ACAP Status and Trends Working Group (WG-FSA-06/40);

(ii) development of a database by the Working Group on Breeding Sites for the collection and collation of data on breeding sites of ACAP species, including management activities and threats present at the sites. Analyses are proposed to contribute to the reporting format of the Status and Trends Working Group;

(iii) the establishment of a Seabird Bycatch Working Group (SBWG) to address issues related to fisheries interactions;

(iv) advice from ACAP's Taxonomic Working Group that available data do not warrant the recognition of Gibson's and Antipodean albatrosses or Buller's and Pacific albatrosses at the specific level, and to adopt a subspecific nomenclature for these taxa; and that data suggest shy and white-capped albatrosses are divergent and diagnosable and therefore warrant recognition at the specific level.

151. There was a substantial discussion on the incidental mortality of albatrosses and petrels in fisheries and how to further action that would improve the conservation status of seabirds that breed and forage in the Convention Area. The Working Group agreed that ACAP Parties and CCAMLR Members should be proactive in engaging with RFMOs and in promoting information exchange and strengthening their input into RFMO meetings by including seabird experts on Member State delegations. It was also agreed that a critical role of Parties and Members was to become involved in the development and implementation of seabird resolutions and other measures to reduce by-catch of albatrosses and petrels within RFMO jurisdictions. Further, Parties and Members should take steps beyond the current scope of IPOA-Seabirds and NPOA-Seabirds or similar plans should be developed for fisheries with a known seabird by-catch problem and assessments conducted for all other fisheries operating within their EEZs.

Relationship between CCAMLR and ACAP

152. ACAP's recently established SBWG was still seeking to agree to terms of reference and associated strategy. The Working Group agreed that it would be beneficial if WG-IMAF and SBWG maintained a close cooperative relationship, particularly with respect to technology transfer of best-practice mitigation measures. The work of both groups was seen as complementary. It was noted that many of the WG-IMAF members were also members of SBWG, and it would be useful to consider conducting frequent technical workshops around the WG-IMAF/WG-FSA meeting to ensure the best-practice measures developed by CCAMLR over the last 10 years can be readily transferred to other fisheries where Convention Area birds are currently being impacted by fisheries interactions.

FAO IPOA-Seabirds

153. The Secretariat reported on intersessional advice reporting further substantial progress in the development of the Chilean and Brazilian NPOA-Seabirds. Brazil had informed CCAMLR that in June 2006 it had finalised its NPOA-Seabirds and had begun implementing elements of the plan. The plan's main objective is to reduce seabird by-catch in Brazilian waters and to protect breeding colonies of Procellariiformes. Actions have already been developed to achieve the objective, including research on seabird by-catch and development of new technologies to avoid the by-catch. The Brazilian Government is promoting tests of seabird by-catch mitigation measures and awareness of the fishing sector with fishing practices compatible with seabird conservation.

154. Chile informed the Secretariat that the Chilean Subsecretary of Fisheries had begun the process of public consultations required to adopt the Chilean NPOA-Seabirds.

155. South Africa advised that, unfortunately, there had been not much progress achieved this year on the finalisation of the South African NPOA-Seabirds. The Working Group was also informed that Uruguay was in the early stages of developing a draft NPOA-Seabirds.

156. It was noted that there were now a number of NPOA-Seabirds developed and that the standard of these documents varied considerably. Dr B. Sullivan (UK) informed the meeting that guidelines for a model or best-practice NPOA had been developed by BirdLife International with the intent of strengthening the implementation of IPOA-Seabirds and securing support of national governments and RFMOs for this initiative at FAO. The Working Group supported this initiative and recommended its support by CCAMLR and CCAMLR Members at COFI-27.

Other international organisations and initiatives,
including non-governmental organisations

157. The Working Group was informed that the 4th International Fishers' Forum would be held in Costa Rica in November 2007. The Working Group hoped that the forthcoming meeting would continue the trend of previous meetings and provide outreach to fishers and encouragement to take practical steps to greatly reduce interactions with seabirds.

158. Mr Melvin provided information on a pelagic mitigation workshop that he will hold on 15 October 2006. The meeting had been set up to take advantage of the expertise present at the WG-IMAF meeting to assist in refining an experimental program for pelagic fisheries. The Working Group recalled previous advice to the Scientific Committee that many of the seabirds breeding in the Convention Area were being impacted by pelagic tuna fisheries that operate in the migratory ranges of these seabirds (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 63). Development of mitigation measures for pelagic longline fishers, although not of direct relevance to Convention Area demersal longline fisheries, was therefore still considered a high priority and encouraged the participation at the workshop of all WG-IMAF members.

159. Dr Sullivan updated the Working Group on the implementation of the BirdLife International Albatross Task Force, formerly known as Operation Ocean Task Force (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraph 154), which works at sea and in

onshore workshops to demonstrate the adoption of mitigation measures, and to collect baseline by-catch data, where required. The Task Force currently has three full-time mitigation instructors working in South Africa, two focusing on pelagic longline fisheries and one on the hake trawl fishery. There are also two employees working in pelagic fisheries in Brazil. There are also plans to have two people based in Chile by the end of 2006, and negotiations are under way to have a further four to six people working in South America and southern Africa in 2007/08.

RFMOs, tuna commissions and international governmental organisations and implementation of Resolution 22/XXIII

160. At the Twenty-third Annual Meeting of the Commission, CCAMLR adopted Resolution 22/XXIII seeking international actions to reduce the incidental mortality of seabirds arising from fishing. This resolution followed from great concern that, even though seabird by-catch had been substantially reduced within CCAMLR fisheries through implementation of conservation measures, populations of seabirds that breed and forage within CCAMLR waters continue to be threatened by IUU fishing and in trawl and longline fisheries in waters outside the Convention Area.

161. In particular, the resolution urges Members that are also members of other RFMOs to identify those mitigation measures that would be most effective at reducing or eliminating such mortality and to require such measures to be implemented in the relevant fisheries.

162. Appreciable progress had been made in terms of communication on seabird by-catch issues with RFMOs (SC-CAMLR-XXIV, Annex 5, Appendix O, paragraphs 161 to 168) as reported below.

CCSBT

163. No data were reported to CCAMLR this year. However, Mr B. Baker (Australia) reported CCSBT's ERSWG had met in February this year, but the report from that meeting had not been accepted by the CCSBT Commission as yet. The CCSBT Commission meeting was running concurrently with WG-FSA and it was hoped the report from the meeting would be considered at this time, and hence released for consideration by CCAMLR at the soonest possible time.

IATTC

164. IATTC's Stock Assessment Working Group met in the USA from 15 to 19 May 2006 and recommended that IATTC coordinate with WCPFC, and other tuna RFMOs as appropriate, in its implementation of seabird resolutions and the development of scientific information and reports that support this implementation. This could include practical areas of cooperation on the mitigation of seabird by-catch. Further, it also recommended that IATTC should develop, in coordination with the other RFMOs, a strategy to mitigate by-catches in the different fisheries involved. The program should include standardisation of

data collection (whenever possible), discussion of research programs and activities to be undertaken in each, and a mechanism for the timely sharing of results. This item could be included in the agenda of the upcoming meeting in Kobe, Japan.

165. The IATTC's Bycatch Working Group met in the Republic of Korea on 24 June 2006. It noted the following:

(i) Information indicates that longline fisheries in the IATTC area may have both direct and indirect impacts on some seabird populations. The level of the impact is currently not known.

(ii) Remote-tracking data and at-sea observations highlight the importance of the IATTC area for foraging and breeding of waved and Laysan albatrosses, foraging of black-footed and black-browed albatrosses, and several other albatross species from New Zealand which migrate across the Pacific to forage in the Humboldt Current.

(iii) Observer data from US pelagic longline fisheries indicate by-catch of Laysan and black-footed albatrosses in the Northeast Pacific. No comparable data exist from industrial longline fleets in the central and southeast Pacific.

(iv) Plots of seabird distributions overlaid on pelagic longline effort revealed several areas of potential vulnerability to by-catch.

(v) Seabird by-catch mitigation measures have been developed which have effectively reduced seabird by-catch in longline fisheries, and more gear research is ongoing.

IOTC

166. IOTC's Working Party on Bycatch held its second meeting in the Seychelles on 1 August 2006. Prior to the meeting, IOTC had passed a seabird resolution (Resolution 06-04) in June which, *inter alia*, requires the use of tori lines below 30°S, but with an exemption for vessels targeting swordfish using the 'American longline system' (defined as monofilament line plus light sticks). Originally the resolution included prescribed by-catch limits as a performance indicator, but the deletion of this and the exemption of tori lines for swordfish was the result of lobbying by some industry representatives present at the meeting.

167. IOTC's Working Party on Bycatch discussed the resolution and its implications for the work of IOTC. There was general agreement that the derogation for swordfish in the resolution appeared to be scientifically unsupportable and should be removed. BirdLife International presented a paper to the meeting to support removal of the derogation. During the meeting a paper was developed that recommended the introduction of 20% observer coverage over a limited period of two years to assess the observer coverage rates necessary to characterise by-catch in IOTC fisheries in the longer term. However, agreement on the introduction of such a level of cover was not reached.

ICCAT

168. Dr Sullivan noted that ICCAT's Standing Committee on Research and Statistics (SCRS) accepted a UK proposal this year to conduct an assessment of the impact of incidental catch of seabirds resulting from vessels fishing in the ICCAT area. The assessment is called for in ICCAT's seabird resolutions (02-14). The UK's proposal received support from Brazil, the European Community, South Africa, Uruguay and the USA. ICCAT's Commission will address this SCRS recommendation at its annual meeting in Croatia in November 2006. The Working Group agreed that this news was encouraging and demonstrated increased progress with RFMOs actively addressing seabird by-catch.

SEAFO

169. WG-IMAF was informed that the recently concluded meeting of SEAFO had adopted a conservation measure (05/06) requiring the development within one year of effective mechanisms to collect data and report on seabird interactions to the SEAFO Commission. Further, the conservation measure called for all longline vessels operating south of 30°S to use bird-scaring lines, and for all vessels to set lines at night.

WCPFC

170. Dr Sullivan introduced WG-FSA-06/18 reporting on the Second Meeting of the WCPFC's Ecosystem and Bycatch Specialist Working Group, held in August 2006 in Manila, the Philippines. The meeting was presented with a range of discussion papers on ecological modelling and risk assessment for the WCPFC, distributional data from BirdLife International's *Procellariiform* Tracking Database (WG-FSA-06/19; see next paragraph), and mitigation measures available that could assist WCPFC Parties. The WCPFC working group drafted a resolution responding to an earlier WCPFC resolution 2005-01 that will be considered by the WCPFC Commission meeting in December 2006. The new resolution calls on Commission Members, *inter alia*, to require longline vessels to use at least two mitigation measures, one which must include side setting with a bird curtain, night setting or tori lines and one from a recommended suite of measures when operating south of 30°S and north of 23°N. The recommended mitigation measures include weighted branch lines, blue-dyed bait, line-shooters, bait casters, underwater-setting chutes and offal discharge management procedures.

171. The Working Group strongly encouraged Parties to ensure the participation of appropriately experienced mitigation practitioners to contribute to the December 2006 meeting of WCPFC. Their participation would ensure that the most appropriate mitigation measures are considered for adoption for application within WCPFC. Mitigation practitioners within the Working Group could assist in the provision of the appropriate advice.

172. WG-FSA-06/19 provided distributional data from BirdLife International's *Procellariiform* Tracking Database showing the overlap between a number of albatross and petrel species and the jurisdictional area of WCPFC. The *Procellariiform* Tracking Database includes distribution data for Pacific populations of 14 of the 16 albatross species that breed in the region. The WCPFC Convention Area overlaps with 41% of the global breeding

distribution of the 23 species of albatrosses and petrels for which there are data in the database, making it one of the most important RFMOs for albatrosses. Distribution in the WCPFC area is concentrated south of 30°S (mostly below 35°S) and north of 20°N. Some species spend a significant proportion (>40%) of their time in the high-seas areas. Key high-seas areas include the Tasman Sea and areas north of the Hawaiian Islands. The distribution of seabirds in high-seas areas emphasises the importance of WCPFC in bringing about a collaborative approach to reducing seabird by-catch.

173. WG-FSA-06/30 provided additional information on the distribution of albatrosses and petrels overlapping with the WCPFC Convention Area. This information complemented that in WG-FSA-06/19, and was preliminary to developing a risk assessment for the WCPFC fishery.

General

174. The Working Group was encouraged by the progress made by several RFMOs since the last meeting towards the mitigation of seabird by-catch in their fisheries. It noted with satisfaction the considerable progress made at WCPFC, SEAFO, IOTC and ICCAT, and their strong desire to work cooperatively with CCAMLR. However, it was recognised that for pelagic longline gear types in particular, there is at present no best-practice mitigation strategy that has been rigorously tested and available for widespread uptake by the major RFMOs operating to the north of the CAMLR Convention Area.

175. The Working Group expressed concern that some RFMOs may be considering adopting measures such as bait-casting machines, side-setting and deep-setting line shooters on the basis of information that lacked robust evaluation through controlled experiments on their effectiveness to mitigate seabird by-catch on a wide array of species. Development of proven pelagic mitigation measures and their uptake outside the Convention Area should remain a high priority for CCAMLR.

176. The Working Group also noted the high and persistent seabird by-catch outside the Convention Area of species found in the Convention Area. It recommended to the Scientific Committee that the Commission be represented at the January 2007 tuna RFMOs meeting in Kobe, Japan, and that the Secretariat develop a paper describing the scientific and other processes CCAMLR has followed in developing and implementing effective seabird by-catch mitigation measures. That paper would, *inter alia*, emphasise the requirement for extensive and sustained scientific observer coverage in addition to applied and adaptive mitigation research in any effort to reduce seabird mortality associated with fishing operations.

177. The Working Group noted that the successful uptake and transfer of operational and technical mitigation measures refined in the Convention Area, with the concomitant success in reducing seabird by-catch, to other areas and RFMOs is contingent, in part, upon sufficiently adequate levels of observer coverage in those RFMO fisheries such that the nature and extent of seabird by-catch, as well as the effectiveness of mitigation measures, can be accurately monitored.

Fishery reports

178. The Working Group reviewed the fishery reports developed by WG-FSA (Agenda Items 5.1 and 5.2) and the information relating to the by-catch of seabirds and marine mammals contained within the reports.

179. The Working Group updated the fishery reports based on the information contained in SC-CAMLR-XXIV, Annex 5, Appendix O, and the information contained in WG-FSA-06/36 Rev. 2, 06/37 Rev. 1, 06/38 and 06/39 Rev. 1.

180. The Working Group recommended that this process of updating fishery reports continue and noted that this process provided constructive interaction with WG-FSA and contributed to the streamlining of the work of Scientific Committee's working groups.

Streamlining the work of the Scientific Committee

Streamlining of agenda

181. Ad hoc WG-IMAF noted that streamlining its agenda for this year's meeting was a useful step forward. Based on the experiences at this meeting, the Working Group developed additional recommendations for future agenda improvements, including:

(i) update of the risk assessment only when new information is tabled;

(ii) the continued request for compilation of detailed information on various agenda items by ACAP;

(iii) a focus on the impacts of captures and by-catch of Convention Area seabirds and marine mammals outside the Convention Area;

(iv) improved data submission and data compilation prior to the start of the meeting.

182. The Working Group noted that regular review of its agenda and a move to completing some tasks on a biennial and triennial basis where appropriate would allow further streamlining of the agenda in future.

Interaction with WG-FSA

183. The Working Group noted that the current interactions with WG-FSA allowed the transfer of useful knowledge on fishing technologies and practices, ongoing dialogue on matters of mutual interest and a useful element of peer review during meetings.

184. The Working Group therefore agreed that it could conduct its work most effectively if it retained its linkage with WG-FSA.

185. Ad hoc WG-IMAF noted the proposed restructure of WG-FSA (SC-CAMLR-XXIV, Annex 5, paragraphs 14.1 to 14.9) and noted its support for the proposals, along with the need for ongoing dialogue with respect to future change and the content of the research plans of other working groups.

186. With respect to the development of new seabird and marine mammal mitigation devices, ad hoc WG-IMAF recognised that it was important to also consider the impact of such devices on other taxa (paragraph 116). The Working Group requested that where WG-FSA was aware of such interactions, the matter be raised so as to allow cooperative efforts to resolve them in a timely manner.

Interaction with WG-EMM

187. The Working Group noted the shared areas of interest between WG-IMAF and WG-EMM and encouraged ongoing dialogue between the two groups on matters of joint interest (e.g. marine mammal population status, interactions with fisheries).

Future focus of the work of ad hoc WG-IMAF

188. The Scientific Committee established ad hoc WG-IMALF in 1993. In 2001 it decided that its scope should be expanded to cover fishing other than by longlines and the group was renamed ad hoc WG-IMAF. The Working Group noted the very positive results in 2005/06 with respect to seabird and marine mammal by-catch throughout the Convention Area.

189. The Working Group agreed that despite the continuing reductions in by-catch in the Convention Area, there was a need to remain vigilant with our monitoring of by-catch and the implementation of conservation measures and to continue to strive to minimise seabird and marine mammal by-catch in all Convention Area fisheries.

190. Noting that time delays in responding to changing fishery dynamics and by-catch rates could have serious consequences for the conservation of seabirds and marine mammals, and that a biennial meeting of ad hoc WG-IMAF may mean three-year delays between the recognition of a problem and the development of a solution, the Working Group recommended that annual meetings continue.

191. The Working Group noted the opportunity to focus on the by-catch of Convention Area seabirds and marine mammals outside the Convention Area given CCAMLR's responsibility for these Antarctic marine living resources (Convention Article I) and the positive results being obtained within the Convention Area. To date CCAMLR measures and practices have been held up as a role model outside the Convention Area (paragraph 177) and the mitigation measures adopted within the Convention Area have been, or are in the process of being, adopted by neighbouring RFMOs.

192. As a result of the discussions detailed in paragraphs 188 to 191, ad hoc WG-IMAF reviewed its original terms of reference (SC-CAMLR-XII, paragraph 10.19). The Working

Group discussed proposed revisions to the terms of reference and made additional suggestions for consideration during the intersessional period with a view to ad hoc WG-IMAF recommending revised terms of reference in 2007.

Future research plan

193. The Working Group discussed the development of a medium-term research plan for ad hoc WG-IMAF. The Working Group noted that the current agenda required the meeting to be conducted without the benefit of detailed technical discussion of some items due to time constraints and the need to address all agenda items each year (noting that the move to undertaking some agenda items at multi-year intervals may alleviate this problem to some extent in the future).

194. The Working Group recommended the development of a medium-term research plan as an intersessional task for the group.

195. The Working Group noted that in future it may be possible to conduct short workshops in association with the annual ad hoc WG-IMAF meeting to address critical items in the medium-term research plan. The use of invited experts at such workshops was highlighted by the Working Group as likely being crucial to their success. A series of appropriate workshop subjects could be incorporated into the research plan during the intersessional period.

Duration of the meeting

196. Ad hoc WG-IMAF discussed the time required to conduct its core work and noted that at present it required the allotted five days to conduct its work program.

197. The Working Group noted that the revised terms of reference and results of intersessional work were unlikely to allow a reduction in required time in 2007; however, the Working Group indicated its intention to further review the required duration of the meeting in 2007.

Other business

Australian proposal on extending fishing season in Division 58.5.2 for longline vessels

198. Mr Baker and Mr Hay presented and sought advice from the Working Group on an Australian proposal to further extend the fishing season in Division 58.5.2 for longline vessels from the current 1 September to 30 September (Conservation Measure 41-08, paragraph 3) to 1 September to 30 April. If three seabirds are caught during the season extension by a vessel (between 1 September and 30 April), fishing would cease for that vessel.

199. Mr Baker and Mr Hay noted that Australian vessels have been fishing using longlines in the division since 2003 during the specified season, in compliance with the one-month season extension detailed in Conservation Measure 41-08, paragraph 3, since 2005 and to date have only caught one seabird in the fishery.

200. Further, they noted that the same company has been involved in the fishery throughout that period and has been involved in pioneering the development of IWLs.

201. The Working Group noted that in recent years it had only considered such proposals when a detailed technical document in support of the proposed change had been tabled in advance of the meeting (e.g. WG-FSA-04/73 from Australia proposing to undertake daytime setting subject to line-weighting requirements in Division 58.5.2).

202. The current advice for Division 58.5.2 from WG-IMAF (SC-CAMLR-XXV/BG/26) is that it is a Risk Level 4 area (average-to-high risk; prohibit longline fishing within the breeding season of the main albatross and petrel species (September to April) and ensure strict compliance with Conservation Measure 24-02).

203. Accordingly, the proposal appears to be contrary to the current advice of the Working Group. The proponents of the proposal noted that the implementation of a seabird by-catch limit during the extended season effectively means that a seasonal control is redundant (a duplication of measures).

204. The Working Group recalled its previous detailed deliberations on the extension of the fishing season in Subarea 48.3 in 2002 (SC-CAMLR-XXI, Annex 5, paragraphs 6.30 to 6.46) and 2003 (SC-CAMLR-XXII, Annex 5, paragraphs 6.46 to 6.54). A vessel took up the option of commencing fishing during the last two weeks of April 2003. The vessel commenced fishing on 15 April 2003, killed three seabirds on 20 April 2003 and then ceased fishing until the regular fishing season commenced on 1 May 2003 (SC-CAMLR-XXII, Annex 5, paragraph 6.50). With respect to the current proposal, of particular concern is that current mitigation measures are unlikely to adequately mitigate capture of white-chinned petrels during the summer season in higher-risk areas, that where season extensions are under consideration they should be undertaken in a stepwise manner to allow review of results and appropriate responses, that two observers are needed so that seabird mortality limits can be monitored accurately and that a season extension into the austral spring was preferable as white-chinned petrels are less susceptible to by-catch at this time (Nel et al., 2002).

205. The Working Group noted that a three-seabird limit had previously been introduced as a precautionary measure to extend the fishing season for one month in Division 58.5.2 (Conservation Measure 41-08, paragraph 3). However, this did not automatically mean that this was the appropriate mechanism for mitigating incidental seabird mortality in this fishery over an additional seven-month season extension.

206. The current closed season excludes fishing during the periods when local breeding seabirds (black-browed albatross, light-mantled albatross and southern giant petrel) are most active in this area. White-chinned petrels from Kerguelen are also inferred visitors to the area in the breeding season and the species recognised as being most difficult to mitigate against in longline fisheries. The removal in its entirety of a seasonal restriction in this area will allow fishing in the period assessed as having the greatest risk of seabird by-catch (the breeding season).

207. The Working Group noted that the vessel may catch in excess of three seabirds in a single set during the breeding season, as has been observed in other areas of similar risk where fishing has occurred during the white-chinned petrel breeding season. Further, as longline vessels typically undertake several sets before beginning to haul lines, and typically it is only during hauling that seabird mortalities are detected, the potential for a substantial increase in seabird incidental mortality in Division 58.5.2 exists as a result of this proposal.

208. Dr Micol reported observations from the Kerguelen longline fishery (Division 58.5.1) during the 2005 breeding season. From one night's fishing activity (three sets) a total of 41 white-chinned petrels were observed caught by a single vessel with 20 of those seabirds caught on a single set. This autoline vessel used IWLs (50 g/m), withheld offal during line setting, was fishing in full compliance with Conservation Measure 25-02 and also used additional streamer lines. The fishery in Division 58.5.1 is closed from mid-February to mid-March as an additional by-catch avoidance measure, to avoid periods of the year when white-chinned petrel captures have historically been at highest rates.

209. The Working Group noted that even with the use of measures additional to those under Conservation Measure 25-02, there is potential for a single multiple-capture event of more than three seabirds.

210. The Working Group noted that its preference would be for a closely monitored and stepwise roll-back in the season in Division 58.5.2 rather than a one-step move to fishing throughout the year. The Working Group had previously agreed to recommend extensions to the end of fishing seasons (i.e. September) rather than the early part of the season when birds are chick-rearing and risk of capture is higher due to their restricted foraging ranges and added nutritional requirements related to chick rearing.

211. The Working Group noted that the proposal did not contain information that allowed an assessment of the risks that the additional fishing might entail to seabirds, nor how these might be mitigated. It noted that the proposal would involve fishing in the breeding period for several species of seabirds vulnerable to mortality in longline fishing and thus posed much higher risk of seabird mortalities than current fishing outside the breeding season. The Working Group requested more timely and comprehensive information that would allow detailed and specific analysis of the risk of the proposal and how risks could be mitigated. Such information should include:

- an assessment of the likely outcome in terms of bird mortality, including supporting information for that assessment detailing the likely seabird catch rates and totals;

- what additional measures (if any) and their likely efficacy, could be deployed to mitigate the additional risk of mortality to seabirds.

Line sink rate testing proposal for Subarea 48.6

212. CCAMLR-XXV/32, submitted by Japan, requested dispensation from leaving the Convention Area to conduct longline sink rate tests when fishing at the end of one season and into the subsequent season in Subarea in 48.6. The Working Group reviewed the proposal, and noted that as the same vessel, gear and crew would be involved and that the vessel would

have undertaken regular line sink rate testing during the previous season, the proposal did not pose any additional risk to seabirds provided the standard sink rate, as detailed in Conservation Measure 24-02, is achieved.

Management advice

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

References

BirdLife International. 2004. *Threatened Birds of the World 2004*. CD-ROM. BirdLife International: Cambridge, UK.

Delord, K., N. Gasco, H. Weimerskirch, C. Barbraud and T. Micol. 2005. Seabird mortality in the Patagonian toothfish longline fishery around Crozet and Kerguelen Islands, 2001–2003. *CCAMLR Science*, 12: 53–80.

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Table 1: Observed incidental mortality of seabirds in the longline fisheries for *Dissostichus* spp. in Subareas 48.3, 48.4, 58.6, 58.7, 88.1, 88.2 and Divisions 58.4.1, 58.4.2, 58.4.3 and 58.5.2 during the 2005/06 season, including related mitigation information. Sp – Spanish method; A – 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 observed (thousands)			No. of birds observed caught[1]						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																							
Insung No. 22	1/5–18/6/06	Sp	97	0	97	100	242.1	994.7	24	0	0	0	0	0	0	0	0	0	100		(0)	O	(92)
Jacqueline	1/5–26/8/06	Sp	223	0	223	100	474.0	1760.5	26	0	0	0	0	4	0	0	0	0	100		(0)	O	(96)
Argos Helena	1/5–31/8/06	A	266	0	266	100	735.7	2187.0	33	0	0	0	0	0	0	0	0	0	100		(0)	O	(0)
Koryo Maru No. 11	2/5–22/7/06	Sp	156	0	156	100	338.1	1416.7	23	0	0	0	0	7	0	0	0	0	100		(0)	O	(96)
Polarpesca I	12/5–14/8/06	Sp	247	0	247	100	233.2	1278.9	18	0	0	0	0	1	0	0	0	0	99.6		(0)	O	(98)
Protegat	1/5–27/6/06	A	134	0	134	100	175.4	766.1	22	0	0	0	0	5	0	0	0	0	99		(0)	O	(0)
Punta Ballena	15/5–23/8/06	A	97	0	97	100	166.0	718.8	23	0	0	0	0	0	0	0	0	0	100		(0)	O	(0)
San Aspiring	1/5–27/8/06	A	236	0	236	100	770.5	1957.5	39	0	0	0	0	1	0	0	0	0	100		(0)	O	(0)
Viking Bay	1/5–16/8/06	Sp	216	0	216	100	349.1	1200.5	29	0	0	0	0	3	0	0	0	0	100		(0)	O	(100)
Argos Georgia	1/5–31/8/06	A	305	0	305	100	562.8	1835.7	30	0	0	0	0	0	0	0	0	0	100		(0)	O	(0)
Total						100	4046.9	14116.4	28.7							0	0	0					
Subarea 48.4																							
Argos Helena	7/4–15/4/06	A	30	0	30	100	54.3	113.4	47	0	0	0	0	0	0	0	0	0	100		(0)	O	(0)
San Aspiring	10/4–25/4/06	A	41	0	41	100	81.8	208.9	39	0	0	0	0	1	0	0	0	0	100		(0)	O	(0)
Total						100	136.1	322.3	42							0	0	0					
Subarea 48.6																							
Shinsei Maru No. 3	15/4–17/5/06	A	28	33	61	46	139.3	276.2	50	0	0	0	0	0	0	0	0	0	100	100	(0)	O	(0)
Shinsei Maru No. 3	5/1–29/3/06	A	59	125	184	32	346.2	702.1	49	0	0	0	0	0	0	0	0	0	100	100	(0)	O	(0)
Total						36	485.5	978.3	50							0	0	0					
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b																							
Globalpesca I	22/12–21/2/06	Sp	2	86	88	2	318.5	541.5	58	0	0	0	0	0	0	0	0	0	100	100	(0)	O	(0)
Tronio	15/12–10/3/06	Sp	12	131	143	8	879.4	1848.4	47	0	0	0	0	0	0	0	0	0	100	100	(0)	O	(48)
Globalpesca II	21/12–22/1/06	Sp	0	44	44	0	261.4	422.2	61	0	0	0	0	0	0	0	0	0		100	(0)	O	(0)
Insung No. 2	4/1–4/3/06	Sp	8	104	112	7	683.2	882.5	77	0	0	0	0	0	0	0	0	0	100	100	(0)	O	(0)
Galaecia	2/12–22/2/06	Sp	11	93	104	11	776.7	1305.0	59	0	1	0	0	0	0	0	0.001	0.001	100	100	(0)	O	(81)
Galaecia	5/4–5/7/06	Sp	66	47	113	58	1830.4	1830.4	100	0	0	0	0	0	0	0	0	0	100	100	(0)	O	(0)
Total						16	4749.6	6830.0	70							0	<0.001	<0.001					
Division 58.5.2																							
Janas	25/7–13/9/06	A	92	74	166	55	226.1	744.4	30	0	0	0	0	0	0	0	0	0	100	100	(0)	O	(0)
Janas	7/5–27/6/06	A	64	63	127	50	322.3	923.4	34	0	0	0	0	0	0	0	0	0	100	100	(0)	O	(0)
Total						53	548.4	1667.8	33							0	0	0					
Area 51, Subareas 58.6, 58.7																							
Koryo Maru No. 11	19/2–30/3/06	Sp	68	0	68	100	242.4	676.1	35	0	0	0	0	10	0	0	0	0	100		(0)	O	(100)
Total						100	242.4	676.1	35							0	0	0					

(continued)

Table 1 (continued)

Vessel	Dates of fishing	Method	Sets deployed				No. of hooks observed (thousands)			No. of birds observed caught[1]						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							
Subareas 88.1, 88.2																						
Avro Chieftain	2/12–13/1/06	A	0	38	38	0	115.2	232.8	49	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Punta Ballena	2/1–5/2/06	A	0	81	81	0	109.5	538.9	20	0	0	0	0	0	0	0	0	0		100	(0)	(0)
San Aotea II	16/12–16/2/06	A	0	125	125	0	273.7	672.4	40	0	0	0	0	0	0	0	0	0		100	(0)	(0)
San Aspiring	2/12–15/2/06	A	0	93	93	0	295.2	637.8	46	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Viking Sur	6/1–5/2/06	A	0	90	90	0	316.9	425.8	74	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Antartic II	1/12–6/2/06	A	0	119	119	0	496.8	674.6	73	0	0	0	0	0	0	0	0	0		100	(0)*	(0)*
Argos Georgia	15/1–12/2/06	A	0	88	88	0	147.1	325.2	45	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Argos Helena	11/12–10/2/06	A	4	156	160	3	316.0	729.9	43	0	0	0	0	0	0	0	0	0	100	100	(0)	(0)
Frøyanes	8/12–7/2/06	A	3	186	189	2	342.2	796.4	42	0	0	0	0	0	0	0	0	0	100	100	(0)	(0)
Janas	14/12–8/2/06	A	0	117	117	0	234.5	564.5	41	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Volna	17/12–15/2/06	Sp	0	60	60	0	274.2	590.0	46	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Yantar	17/12–15/2/06	Sp	0	66	66	0	116.6	527.8	22	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Paloma V[2]	5/12–11/3/06	Sp	5	128	133	4	525.0	1256.4	41	0	0	0	0	0	0	0	0	0	100	100	(0)	(0)
Total						1	3562.9	7972.5	45							0	0	0				

[1] Bird ‘caught’ as defined by the Commission at CCAMLR-XXIII, paragraphs 10.30 and 10.31.

[2] *Paloma V* also conducted a small amount of fishing in Divisions 58.4.1 and 58.4.3b during this cruise.

Table 2: Extrapolated incidental mortality of seabirds, for those vessels upon which incidental mortalities of seabirds were observed in Division 58.4.3b during the 2005/06 season.

Vessel	Hooks observed (thousands)	Hooks set (thousands)	Percentage of hooks observed	% Night sets	Extrapolated number of incidental seabird mortalities		
					Night	Day	Total
Galaecia	776.7	1305.0	59	11	0	2	2

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 2006 (- indicates no fishing occurred).

Subarea	Year									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Subarea 48.3										
Extrapolated mortality	5755	640	210*	21	30	27	8	27	13	0
Observed mortality rate	0.23	0.032	0.013*	0.002	0.002	0.0015	0.0003	0.0015	0.0011	0
Subarea 48.4										
Extrapolated mortality	-	-	-	-	-	-	-	-	0	0
Observed mortality rate	-	-	-	-	-	-	-	-	0	0
Subarea 48.6										
Extrapolated mortality	-	-	-	-	-	-	-	0	0	0
Observed mortality rate	-	-	-	-	-	-	-	0	0	0
Subareas 58.6, 58.7										
Extrapolated mortality	834	528	156	516	199	0	7	39	76	0
Observed mortality rate	0.52	0.194	0.034	0.046	0.018	0	0.003	0.025	0.149	0
Subareas 88.1, 88.2										
Extrapolated mortality	-	0	0	0	0	0	0	1	0	0
Observed mortality rate	-	0	0	0	0	0	0	0.0001	0	0
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b										
Extrapolated mortality	-	-	-	-	-	-	-	0	8	2
Observed mortality rate	-	-	-	-	-	-	-	0	<0.001	0.0002
Division 58.5.2										
Extrapolated mortality	-	-	-	-	-	-	0	0	0	0
Observed mortality rate	-	-	-	-	-	-	0	0	0	0
Total seabird mortality	6589	1168	366	537	229	27	15	67	97	2

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

Table 4: Observed incidental mortality of seabirds in the longline fisheries for *Dissostichus* spp. in Subarea 58.6 and Division 58.5.1 within the French EEZ during the 2005/06 season (September–August). A – autoliner; N – night-time setting; D – daytime setting (including nautical dawn and dusk).

Vessel	Dates of fishing	Method	Sets deployed				No. of hooks observed (thousands)			Hooks baited (%)	No. of birds observed caught						Observed seabird mortality (includes injured birds) (birds/thousand hooks)			Streamer line in use %		Offal discharge during haul
			N	D	Total	%N	Obs.	Set	% observed		Dead		Injured		Uninjured							
											N	D	N	D	N	D	N	D	Total	N	D	
Subarea 58.6																						
Ship 3	17/9–3/10/05	A	34	0	34	100	96.7	390.6	24.7	NC	0	0	0	0	1		0	0	0	100	0	0
Ship 7	11/10–13/12/05	A	40	0	40	100	59.7	395.9	15.1	NC	1	0	0	0	0	0	0.0168	0	0.0168	100	0	0
Ship 1	30/10–2/11/05	A	50	0	50	100	74.7	297.5	25.1	NC	3	0	0	0	0	0	0.0401	0	0.0401	100	0	0
Ship 2	14/11–18/11/05	A	30	0	30	100	24.3	119.0	20.4	NC	0	0	0	0	0	0	0	0	0	100	0	0
Ship 11	14/11–25/11/05	A	14	0	14	100	43.0	180.0	23.9	NC	0	0	0	0	0	0	0	0	0	100	0	0
Ship 11	21/12–6/1/06	A	49	0	49	100	91.1	276.0	33.0	81	1	0	0	0	1	0	0.0110	0	0.0110	100	0	0
Ship 7	17/1–18/2/06	A	103	0	103	100	188.5	700.5	26.9	NC	4	0	0	0	22	0	0.0212	0	0.0212	100	0	0
Ship 11	28/1–7/2/06	A	37	0	37	100	53.5	197.0	27.2	NC	2	0	0	0	0	0	0.0374	0	0.0374	100	0	0
Ship 3	2/2–21/2/06	A	43	0	43	100	97.5	405.3	24.1	NC	13	0	0	0	6	0	0.1333	0	0.1333	100	0	0
Ship 1	4/2–25/2/06	A	52	0	52	100	111.2	447.8	24.8	NC	8	0	0	0	7	0	0.0719	0	0.0719	100	0	0
Ship 2	4/2–13/2/06	A	19	0	19	100	41.3	158.4	26.1	NC	0	0	0	0	1	0	0	0	0	100	0	0
Ship 6	5/2–23/2/06	A	45	0	45	100	96.0	393.8	24.4	NC	6	0	2	0	8	0	0.0833	0	0.0833	100	0	0
Ship 5	6/2–25/2/06	A	39	0	39	100	96.1	397.8	24.2	88	3	0	1	0	6	0	0.0416	0	0.0416	100	0	0
Ship 11	16/4–14/5/06	A	92	0	92	100	114.8	461.5	24.9	92	1	0	0	0	1	0	0.0087	0	0.0087	100	0	0
Ship 2	4/5–21/5/06	A	56	0	56	100	80.3	364.7	22.0	NC	0	0	0	0	1	0	0	0	0	100	0	0
Ship 1	22/5–19/6/06	A	76	0	76	100	122.5	527.3	23.2	86	11	0	1	0	0	0	0.0980	0	0.0980	100	0	0
Ship 5	9/6–25/6/06	A	53	0	53	100	96.7	392.4	24.6	NC	0	0	0	0	1	0	0	0	0	100	0	0
Ship 6	17/6–28/6/06	A	43	0	43	100	48.2	193.5	24.9	NC	0	0	0	0	0	0	0	0	0	100	0	0
Ship 3	25/6–28/6/06	A	11	0	11	100	19.0	87.2	21.8	NC	0	0	0	0	0	0	0	0	0	100	0	0
Ship 2	4/8–7/8/06	A	8	0	8	100	19.9	82.6	24.1	90	0	0	0	0	0	0	0	0	0	100	0	0
Total			894			100	1574.9	6468.6	24.3		53		4		55		0.0362		0.0362			

(continued)

Table 4 (continued)

Vessel	Dates of fishing	Method	Sets deployed				No. of hooks observed (thousands)			Hooks baited (%)	No. of birds observed caught						Observed seabird mortality (includes injured birds) (birds/thousand hooks)			Streamer line in use %		Offal discharge during haul
			N	D	Total	%N	Obs.	Set	% observed		Dead		Injured		Uninjured							
											N	D	N	D	N	D	N	D	Total	N	D	
Division 58.5.1																						
Ship 11	1/9–8/11/05	A	184	0	184	100	277.4	1181.0	23.5	NC	9	0	0	0	2	0	0.0324	0	0.0324	100	0	0
Ship 5	2/9–8/11/05	A	194	0	194	100	414.7	1375.2	30.2	NC	5	0	0	0	7	0	0.0121	0	0.0121	100	0	0
Ship 6	6/9–29/11/05	A	226	0	226	100	500.6	2007.0	24.9	NC	25	0	0	0	1	0	0.0499	0	0.0499	100	0	0
Ship 1	9/9–30/10/05	A	151	0	151	100	317.5	1270.5	25.0	NC	35	0	0	0	7	0	0.1102	0	0.1102	100	0	0
Ship 7	15/9–3/10/05	A	170	0	170	100	392.1	1549.1	25.3	NC	66	0	0	0	18	0	0.1683	0	0.1683	100	0	0
Ship 2	17/9–8/11/05	A	143	0	143	100	325.1	1297.0	25.1	NC	7	0	0	0	12	0	0.0215	0	0.0215	100	0	0
Ship 3	7/10–6/12/05	A	121	0	121	100	392.1	1420.7	27.6	NC	126	0	0	0	7	0	0.3213	0	0.3213	100	0	0
Ship 2	7/12–31/1/06	A	155	0	155	100	320.4	1201.0	26.7	93	3	0	0	0	5	0	0.0094	0	0.0094	100	0	0
Ship 5	14/12–30/1/06	A	119	0	119	100	279.8	1141.2	24.5	86	10	0	1	0	27	0	0.0393	0	0.0393	100	0	0
Ship 1	31/12–29/1/06	A	72	0	72	100	167.5	710.3	23.6	NC	4	0	1	0	13	0	0.0299	0	0.0299	100	0	0
Ship 11	10/1–23/1/06	A	34	0	34	100	63.5	234.0	27.1	NC	0	0	0	0	0	0	0	0	0	100	0	0
Ship 3	12/1–30/1/06	A	39	0	39	100	110.7	444.2	24.9	NC	1	0	0	0	0	0	0.0090	0	0.0090	100	0	0
Ship 6	14/1–31/1/06	A	47	0	47	100	104.7	423.0	24.8	98	5	0	0	0	1	0	0.0478	0	0.0478	100	0	0
Ship 5	28/2–7/3/06	A	23	0	23	100	51.3	207.0	24.8	NC	13	0	0	0	4	0	0.2532	0	0.2532	100	0	0
Ship 1	1/3–15/3/06	A	38	0	38	100	90.9	387.0	23.5	NC	36	0	0	0	17	0	0.3961	0	0.3961	100	0	0
Ship 3	1/3–4/4/06	A	65	0	65	100	238.7	952.4	25.1	94	32	0	0	0	1	0	0.1341	0	0.1341	100	0	0
Ship 6	1/3–2/4/06	A	88	0	88	100	192.2	784.5	24.5	NC	14	0	0	0	0	0	0.0728	0	0.0728	100	0	0
Ship 7	1/3–28/3/06	A	63	0	63	100	167.7	729.2	23.0	NC	30	0	0	0	2	0	0.1789	0	0.1789	100	0	0
Ship 2	4/3–29/4/06	A	151	0	151	100	371.0	1526.3	24.3	87	3	0	0	0	5	0	0.0081	0	0.0081	100	0	0
Ship 11	8/3–13/4/06	A	90	0	90	100	125.3	507.6	24.7	91	42	0	0	0	5	0	0.3353	0	0.3353	100	0	0
Ship 5	14/4–4/6/06	A	136	0	136	100	325.0	1344.6	24.2	87	16	0	0	0	28	0	0.0492	0	0.0492	100	0	0
Ship 1	21/4–18/5/06	A	64	0	64	100	156.9	663.0	23.7	89	34	0	11	0	0	0	0.2868	0	0.2868	100	0	0
Ship 7	4/5–2/7/06	A	138	0	138	100	379.0	1490.3	25.4	93	30	0	5	0	27	0	0.0923	0	0.0923	100	0	0
Ship 3	11/5–20/6/06	A	78	0	78	100	264.2	1063.7	24.8	NC	14	0	0	0	4	0	0.0530	0	0.0530	100	0	0
Ship 6	14/5–12/6/06	A	72	0	72	100	159.8	648.0	24.7	NC	7	0	0	0	0	0	0.0438	0	0.0438	100	0	0
Ship 2	9/6–31/7/06	A	80	0	80	100	187.2	743.7	25.2	89	7	0	0	0	9	0	0.0374	0	0.0374	100	0	0
Ship 11	16/6–2/7/06	A	39	0	39	100	58.2	234.0	24.9	NC	0	0	0	0	1	0	0	0	0	100	0	0
Total			2780			100	6433.4	25535.2	25.0		574		18		203		0.0920		0.0920			

NC Not collected

Table 5: Estimated total seabird mortality in Subarea 58.6 and Division 58.5.1 within the French EEZ during the 2005/06 season.

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 3	96.7	390.6	24.7	100	0	0	0
Ship 7	59.7	395.9	15.1	100	7	0	7
Ship 1	74.7	297.5	25.1	100	12	0	12
Ship 2	24.3	119.0	20.4	100	0	0	0
Ship 11	43.0	180.0	23.9	100	0	0	0
Ship 11	91.1	276.0	33.0	100	3	0	3
Ship 7	188.5	700.5	26.9	100	15	0	15
Ship 11	53.5	197.0	27.2	100	7	0	7
Ship 3	97.5	405.3	24.1	100	54	0	54
Ship 1	111.2	447.8	24.8	100	32	0	32
Ship 2	41.3	158.4	26.1	100	0	0	0
Ship 6	96.0	393.8	24.4	100	33	0	33
Ship 5	96.1	397.8	24.2	100	17	0	17
Ship 11	114.8	461.5	24.9	100	4	0	4
Ship 2	80.3	364.7	22.0	100	0	0	0
Ship 1	122.5	527.3	23.2	100	52	0	52
Ship 5	96.7	392.4	24.6	100	0	0	0
Ship 6	48.2	193.5	24.9	100	0	0	0
Ship 3	19.0	87.2	21.8	100	0	0	0
Ship 2	19.9	82.6	24.1	100	0	0	0
	1 574.9	6 468.6	24.3%		235		235
Division 58.5.1							
Ship 11	277.4	1 181.0	23.5	100	38	0	38
Ship 5	414.7	1 375.2	30.2	100	17	0	17
Ship 6	500.6	2 007.0	24.9	100	100	0	100
Ship 1	317.5	1 270.5	25.0	100	140	0	140
Ship 7	392.1	1 549.1	25.3	100	261	0	261
Ship 2	325.1	1 297.0	25.1	100	28	0	28
Ship 3	392.1	1 420.7	27.6	100	457	0	457
Ship 2	320.4	1 201.0	26.7	100	11	0	11
Ship 5	279.8	1 141.2	24.5	100	45	0	45
Ship 1	167.5	710.3	23.6	100	21	0	21
Ship 11	63.5	234.0	27.1	100	0	0	0
Ship 3	110.7	444.2	24.9	100	4	0	4
Ship 6	104.7	423.0	24.8	100	20	0	20
Ship 5	51.3	207.0	24.8	100	52	0	52
Ship 1	90.9	387.0	23.5	100	153	0	153
Ship 3	238.7	952.4	25.1	100	128	0	128
Ship 6	192.2	784.5	24.5	100	57	0	57
Ship 7	167.7	729.2	23.0	100	130	0	130
Ship 2	371.0	1 526.3	24.3	100	12	0	12
Ship 11	125.3	507.6	24.7	100	170	0	170
Ship 5	325.0	1 344.6	24.2	100	66	0	66
Ship 1	156.9	663.0	23.7	100	190	0	190
Ship 7	379.0	1 490.3	25.4	100	138	0	138
Ship 3	264.2	1 063.7	24.8	100	56	0	56
Ship 6	159.8	648.0	24.7	100	28	0	28
Ship 2	187.2	743.7	25.2	100	28	0	28
Ship 11	58.2	234.0	24.9	100	0	0	0
	6 433.4	25 535.2	25.2%		2 352		2 352

Table 6: Total estimated seabird by-catch and by-catch rate (birds/thousand hooks) in longline fisheries in Subarea 58.6 and Division 58.5.1 within the French EEZ in 2005/06.

Subarea/ division		Season 2005/06
Subarea 58.6		
	Estimated by-catch	235
	By-catch rate	0.0362
Division 58.5.1		
	Estimated by-catch	2 352
	By-catch rate	0.0920

Table 7: Total estimated seabird by-catch and by-catch rate (birds/thousand hooks) in longline fisheries in Subarea 58.6 and Division 58.5.1 within the French EEZ from 2000 to 2005.

Subarea/ division	Season					
	2000/01*	2001/02*	2002/03*	2003/04*	2004/05	2005/06
Subarea 58.6						
Estimated by-catch		1 243	720	343	242	235
By-catch rate		0.1672	0.1092	0.0875	0.0490	0.0362
Division 58.5.1						
Estimated by-catch	1 917	10 814	13 926	3 666	4 387	2 352
By-catch rate	0.0920	0.9359	0.5180	0.2054	0.1640	0.0920

* The number of observed hooks has not been collected and the values given are from the total number of hooks set.

Table 8: Species composition of birds killed in longline fisheries in Subarea 58.6 and Division 58.5.1 within the French EEZ during the 2005/06 season (September to August). N – night-time setting; D – daytime setting (including nautical dawn and dusk); PRO – white-chinned petrel; MAH – sub-Antarctic giant petrel; PCI – grey petrel; DAC – Cape petrel; PND – petrel non determined; EC – rockhopper penguin; () – % composition.

Vessel	Dates of fishing	No. of birds killed by group								Species composition (%)											
		Albatross		Petrels		Penguins		Total													
		N	D	N	D	N	D	N	D	WCP		PCI		DAC		MAH		PND		EC	
Subarea 58.6																					
Ship 3	17/9–3/10/05	0	0	0	0	0	0	0	0												
Ship 7	11/10–13/12/05	0	0	0	0	1	0	1	0											1	(100.0)
Ship 1	30/10–2/11/05	0	0	3	0	0	0	3	0	3	(100.0)										
Ship 2	14/11–18/11/05	0	0	0	0	0	0	0	0												
Ship 11	14/11–25/11/05	0	0	0	0	0	0	0	0												
Ship 11	21/12–6/1/06	0	0	1	0	0	0	1	0	1	(100.0)										
Ship 7	17/1–18/2/06	0	0	4	0	0	0	4	0	4	(100.0)										
Ship 11	28/1–7/2/06	0	0	2	0	0	0	2	0	2	(100.0)										
Ship 3	2/2–21/2/06	0	0	13	0	0	0	13	0	13	(100.0)										
Ship 1	4/2–25/2/06	0	0	8	0	0	0	8	0	8	(100.0)										
Ship 2	4/2–13/2/06	0	0	0	0	0	0	0	0												
Ship 6	5/2–23/2/06	0	0	8	0	0	0	8	0	6	(75.0)					2	(25.0)				
Ship 5	6/2–25/2/06	0	0	4	0	0	0	4	0	4	(100.0)										
Ship 11	16/4–14/5/06	0	0	1	0	0	0	1	0			1	(100.0)								
Ship 2	4/5–21/5/06	0	0	0	0	0	0	0	0												
Ship 1	22/5–19/6/06	0	0	12	0	0	0	12	0					11	(91.7)			1	(8.3)		
Ship 5	9/6–25/6/06	0	0	0	0	0	0	0	0												
Ship 6	17/6–28/6/06	0	0	0	0	0	0	0	0												
Ship 3	25/6–28/6/06	0	0	0	0	0	0	0	0												
Ship 2	4/8–7/8/06	0	0	0	0	0	0	0	0												
		0	0	56	0	1	0	57	0	41	(71.9)	1	(1.8)	11	(19.3)	2	(3.5)	1	(1.8)	1	(1.8)

(continued)

Table 8 (continued)

Vessel	Dates of fishing	No. of birds killed by group								Species composition (%)											
		Albatross		Petrels		Penguins		Total													
		N	D	N	D	N	D	N	D	WCP		PCI		DAC		MAH		PND		EC	
Division 58.5.1																					
Ship 11	1/9–8/11/05	0	0	9	0	0	0	9	0	7	(77.8)	2	(22.2)								
Ship 5	2/9–8/11/05	0	0	5	0	0	0	5	0	4	(80.0)	1	(20.0)								
Ship 6	6/9–29/11/05	0	0	25	0	0	0	25	0	21	(84.0)	4	(16.0)								
Ship 1	9/9–30/10/05	0	0	35	0	0	0	35	0	22	(62.9)	13	(37.1)								
Ship 7	15/9–3/10/05	0	0	66	0	0	0	66	0	66	(100.0)										
Ship 2	17/9–8/11/05	0	0	7	0	0	0	7	0	5	(71.4)	2	(28.6)								
Ship 3	7/10–6/12/05	0	0	126	0	0	0	126	0	125	(99.2)	1	(0.8)								
Ship 2	7/12–31/1/06	0	0	3	0	0	0	3	0	3	(100.0)										
Ship 5	14/12–30/1/06	0	0	11	0	0	0	11	0	10	(90.9)					1	(9.1)				
Ship 1	31/12–29/1/06	0	0	5	0	0	0	5	0	4	(80.0)					1	(20.0)				
Ship 11	10/1–23/1/06	0	0	0	0	0	0	0	0												
Ship 3	12/1–30/1/06	0	0	1	0	0	0	1	0	1	(100.0)										
Ship 6	14/1–31/1/06	0	0	5	0	0	0	5	0	5	(100.0)										
Ship 5	28/2–7/3/06	0	0	13	0	0	0	13	0	13	(100.0)										
Ship 1	1/3–15/3/06	0	0	36	0	0	0	36	0	36	(100.0)										
Ship 3	1/3–4/4/06	0	0	32	0	0	0	32	0	32	(100.0)										
Ship 6	1/3–2/4/06	0	0	14	0	0	0	14	0	14	(100.0)										
Ship 7	1/3–28/3/06	0	0	30	0	0	0	30	0	30	(100.0)										
Ship 2	4/3–29/4/06	0	0	3	0	0	0	3	0	3	(100.0)										
Ship 11	8/3–13/4/06	0	0	42	0	0	0	42	0	42	(100.0)										
Ship 5	14/4–4/6/06	0	0	16	0	0	0	16	0							16	(100.0)				
Ship 1	21/4–18/5/06	0	0	45	0	0	0	45	0					34	(75.6)			11	(24.4)		
Ship 7	4/5–2/7/06	0	0	35	0	0	0	35	0			30	(85.7)			5	(14.3)				
Ship 3	11/5–20/6/06	0	0	14	0	0	0	14	0	1	(7.1)	13	(92.9)								
Ship 6	14/5–12/6/06	0	0	7	0	0	0	7	0							7	(100.0)				
Ship 2	9/6–31/7/06	0	0	7	0	0	0	7	0			7	(100.0)								
Ship 11	16/6–2/7/06	0	0	0	0	0	0	0	0												
		0	0	592	0	0	0	592	0	444	(75.0)	73	(12.3)	34	(5.7)	30	(5.1)	11	(1.9)	0	(0.0)
Total (%)		0	0	648	0	1	0	649	0	485	(74.7)	74	(11.4)	45	(6.9)	32	(4.9)	12	(1.8)	1	(0.2)

Table 9: Compliance, as reported by observers, of streamer lines and haul scaring devices with the minimum specifications set out in Conservation Measure 25-02 (2005) during the 2005/06 season. Sp – Spanish method; A – autoliner; Y – yes; N – no; - – no information; 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. of streamers per line	Spacing of streamers per line (m)		Night	Day	
Subarea 48.3											
Insung No. 22	1/5–18/6/06	Sp	Y	Y (7.5)	Y (253)	10	Y (5)	Y (6.5)	100		100
Jacqueline	1/5–26/8/06	Sp	Y	Y (7.6)	Y (158)	9	Y (5)	Y (6.5)	100		46
Argos Helena	1/5–31/8/06	A	Y	Y (7.3)	Y (154)	13	Y (5)	Y (8)	100		MP
Koryo Maru No. 11	2/5–22/7/06	Sp	Y	Y (8)	Y (150)	10	Y (5)	Y (8)	100		100
Polarpesca I	12/5–14/8/06	Sp	Y	Y (8)	Y (150)	7	Y (5)	Y (7)	99.6		100
Protegat	1/5–27/6/06	A	Y	Y (8)	Y (150)	30	Y (5)	Y (6.5)	99		78
Punta Ballena	15/5–23/8/06	A	Y	Y (7)	Y (150)	7	Y (5)	Y (1–7)	100		100
San Aspiring	1/5–27/8/06	A	Y	Y (8)	Y (240)	22	Y (5)	Y (12)	100		100
Viking Bay	1/5–16/8/06	Sp	Y	Y (7)	Y (150)	9	Y (5)	Y (10)	100		98
Argos Georgia	1/5–31/8/06	A	Y	Y (7.6)	Y (155)	7	Y (5)	Y (7)	100		90
Subarea 48.4											
Argos Helena	7/4–15/4/06	A	Y	Y (7.3)	Y (154)	13	Y (5)	Y (1–8)	100		MP
San Aspiring	10/4–25/4/06	A	Y	Y (8)	Y (220)	22	Y (5)	Y (1–8)	100		100
Subarea 48.6											
Shinsei Maru No. 3	15/4–17/5/06	A	N	Y (7.5)	N (146)	6	Y (5)	Y (4.4–6.8)	100	100	100
Shinsei Maru No. 3	5/1–29/3/06	A	Y	Y (10)	Y (164)	6	Y (5)	Y (4.5–7.2)	100	100	100
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b											
Globalpesca I	22/12–21/2/06	Sp	Y	Y (7)	Y (150)	7	Y (5)	Y (1–7)	100	100	0
Tronio	15/12–10/3/06	Sp	Y	Y (10)	Y (167)	12	Y (5)	Y (1–6.5)	100	100	100
Globalpesca II	21/12–22/1/06	Sp	N	Y (7)	Y (150)	6	Y (5)	N (1–6)		100	0
Insung No. 2	4/1–4/3/06	Sp	N	Y (7)	Y (150)	10	Y (5)	N (1–4.5)	100	100	100
Galaecia	2/12–22/2/06	Sp	N	Y (8)	Y (150)	8	Y (5)	N (1.5–5)	100	100	0
Galaecia	5/4–5/7/06	Sp	Y	Y (7)	Y (150)	9	Y (5)	Y (1–6.5)	100	100	0
Division 58.5.2											
Janas	25/7–13/9/06	A	Y	Y (7)	Y (175)	24	Y (5)	Y (1.3–7)	100	100	100
Janas	7/5–27/6/06	A	Y	Y (7)	Y (150)	15	Y (3)	Y (1–7)	100	100	94
Subareas 58.6, 58.7											
Koryo Maru No. 11	19/2–30/3/06	Sp	N	Y (7.7)	Y (161)	12	N (5.7)	N (1.6–4.2)	100		100

(continued)

Table 9 (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. of streamers per line	Spacing of streamers per line (m)		Night	Day	
Subareas 88.1, 88.2											
Avro Chieftain	2/12–13/1/06	A	Y	Y (7.7)	Y (204)	24	Y (3)	Y (1–8.8)		100	MP
Punta Ballena	2/1–5/2/06	A	Y	Y (7)	Y (160)	7	Y (5)	Y (1–7)		100	0
San Aotea II	16/12–16/2/06	A	Y	Y (7)	Y (210)	13	Y (4.5)	Y (1–6.5)		100	0
San Aspiring	2/12–15/2/06	A	Y	Y (8)	Y (220)	20	Y (5)	Y (1–8)		100	0
Viking Sur	6/1–5/2/06	A	N	Y (7)	N (100)	10	Y (5)	N (1–6)		100	0
Antartic II	1/12–6/2/06	A	Y	-	-	-	-	-		100	0
Argos Georgia	15/1–12/2/06	A	Y	Y (7)	Y (155)	7	Y (5)	Y (1–7)		100	0
Argos Helena	11/12–10/2/06	A	Y	Y (8)	Y (150)	13	Y (4)	Y (1–9)	100	100	0
Frøyanes	8/12–7/2/06	A	N	Y (7.2)	N (147)	18	Y (4.5)	Y (1–6.5)	100	100	0
Janas	14/12–8/2/06	A	Y	Y (8)	Y (150)	19	Y (5)	Y (0.5–7.5)		100	0
Volna	17/12–15/2/06	Sp	Y	Y (7)	Y (150)	8	Y (5)	Y (1–6.5)		100	0
Yantar	17/12–15/2/06	Sp	Y	Y (7)	Y (150)	8	Y (5)	Y (1–6.5)		100	0
Paloma V[1]	5/12–11/3/06	Sp	Y	Y (7)	Y (150)	12	Y (5)	Y (1–6.5)		100	0

[1] *Paloma V* also conducted a small amount of fishing in Divisions 58.4.1 and 58.4.3b during this cruise.

Table 10: Summary of scientific observations relating to compliance with Conservation Measure 25-02 (2005), based on data from scientific observers from the 1996/97 to the 2005/06 seasons. Values in parentheses are the percentage of complete observer records. 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
2005/06	100 (100)	10.0	40	100	100 (100)	100	(100)	100	(100)	100	(100)	[7]		100	(100)	0	0
Subarea 48.4																	
2005/06	Auto only	na	na	100	100 (100)	100	(100)	100	(100)	100	(100)	[7]		100	(100)	0	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
2005/06	Auto only	na	na	36[6]	No discharge	50	(100)	100	(100)	50	(100)			100	(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
2005/06	16[9] (100)	7.2	48	16[5]	No discharge	100	(100)	100	(100)	100	(100)			100	(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
2005/06	Auto Only	na	na	53[8]	No discharge	100	(100)	100	(100)	100	(100)	[7]		100	(100)	0	0

(continued)

Table 10 (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 58.6 and 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)	0.149	0
2005/06	100	(100)	9.1	40	100	100 (100)	0	(100)	100	(100)	100	(100)	100	(100)	0	(100)	0	0
Subarea 88.1, 88.2																		
1996/97	Auto only		na	na	50	0 (100)	100	(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)	100	(100)	0	0
1998/99	Auto only		na	na	1[3]	100 (100)	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)	100	(100)	0	0
2000/01	1	(100)	12	40	18[4]	No discharge	100	(100)	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)	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)	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
2005/06	100[9]	(100)	9.2	35	1[4]	No discharge	85	(92)	100	(92)	85	(92)	[7]		100	(92)	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 5 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 11: Aerial extent of streamer lines reported by observers during the 2005/06 season. Sp – Spanish method; A – autoliner.

Vessel name	Dates of fishing	Fishing method	Average setting speed (knots)	Aerial extent of streamer line
Subarea 48.3				
Insung No. 22	1/5–18/6/06	Sp	7.8	25
Jacqueline	1/5–26/8/06	Sp	9.4	50
Argos Helena	1/5–31/8/06	A	7.6	45
Koryo Maru No. 11	2/5–22/7/06	Sp	6.7	20
Polarpesca I	12/5–14/8/06	Sp	6.1	150
Protegat	1/5–27/6/06	A	6.0	40
Punta Ballena	15/5–23/8/06	A	6.3	30
San Aspiring	1/5–27/8/06	A	6.6	100
Viking Bay	1/5–16/8/06	Sp	8.0	60
Argos Georgia	1/5–31/8/06	A	7.1	40
Subarea 48.4				
Argos Helena	7/4–15/4/06	A	6.0	45
San Aspiring	10/4–25/4/06	A	6.0	100
Subarea 48.6				
Shinsei Maru No. 3	15/4–17/5/06	A	7.6	34
Shinsei Maru No. 3	5/1–29/3/06	Auto	7.6	60
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b				
Globalpesca I	22/12–21/2/06	Sp	6.7	45
Tronio	15/12–10/3/06	Sp	8.9	65
Globalpesca II	21/12–22/1/06	Sp	8.2	110
Insung No. 2	4/1–4/3/06	Sp	8.1	145
Galaecia	2/12–22/2/06	Sp	8.2	45
Galaecia	5/4–5/7/06	Sp	7.9	125
Division 58.5.2				
Janas	25/7–13/9/06	A	5.7	51
Janas	7/5–27/6/06	A	5.9	30
Subareas 58.6, 58.7				
Koryo Maru No. 11	19/2–30/3/06	Sp	7.4	52
Subareas 88.1, 88.2				
Avro Chieftain	2/12–13/1/06	A	5.1	50
Punta Ballena	2/1–5/2/06	A	6.0	150
San Aotea II	16/12–16/2/06	A	6.1	59
San Aspiring	2/12–15/2/06	A	6.6	100
Viking Sur	6/1–5/2/06	A	6.9	40
Antartic II	1/12–6/2/06	A	6.8	
Argos Georgia	15/1–12/2/06	A	6.0	40
Argos Helena	11/12–10/2/06	A	7.7	50
Frøyanes	8/12–7/2/06	A	8.0	75
Janas	14/12–8/2/06	A	5.1	100
Volna	17/12–15/2/06	Sp	7.7	120
Yantar	17/12–15/2/06	Sp	7.2	50
Paloma V[1]	5/12–11/3/06	Sp	7.9	75

[1] *Paloma V* also conducted a small amount of fishing in Divisions 58.4.1 and 58.4.3b during this cruise.

Table 12: Observed incidences of seabird and marine mammal entanglements with trawl gear for the 2005/06 season. DIC – *Diomedea chrysostoma*; DIM – *Diomedea melanophrys*; DIX – *Diomedea exulans*; MAI – *Macronectes giganteus*; PDM – *Pterodroma macroptera*; PRO – *Procellaria aequinoctialis*; SEA – *Arctocephalus gazella*; SLP – *Hydrurga leptonyx*; * – data from cruise report.

Vessel	Dates of fishing	Area	Species	Total observed	
				Mortality (dead or injured)	Released alive (uninjured)
Betanzos	22/3–22/4/06	48.3	DIC		1
			DIM		12
			PRO	7	35
Cabo de Hornos	3/2–9/3/06	48.3	DIM	4	1
			PDM	1	1
			PRO	2	
Argos Pereira	25/12–19/1/06	48.3			
Sil	1/1–18/2/06	48.3	DIM	2	
			DIX		1
			MAI		1
*Insung Ho**	3/2–13/2/06	48.3	DIC	1	1
			DIM	5	18
			PRO	11	18
Southern Champion	11/3–31/3/06	58.5.2			
Southern Champion	29/4–23/6/06	58.5.2	SLP	1	
Southern Champion	22/7–16/9/06	58.5.2			
Niitaka Maru	26/6–5/7/06	48.3			
Niitaka Maru	10/7–28/7/06	48.3			
Saga Sea	17/6–11/8/06	48.1			
Konstruktor Koshkin	15/4–26/5/06	48.1	SEA	1	

Table 13: Seabird mortality totals and rates (BPT – birds/trawl) and species composition, recorded by observers in the CAMLR Convention Area trawl fishery during the 2005/06 season. ANI – *Champsocephalus gunnari;* DIC – grey-headed albatross; DIM – black-browed albatross; KRI – *Euphausia superba*; PRO – white-chinned petrel; PTZ – unknown petrel; TOP – *Dissostichus eleginoides*.

Area	Vessel (target species)	Cruise dates	Trawls		BPT	Dead				Total dead	Alive (combined)
			Set	Observed		DIC	DIM	PRO	PTZ		
48.1	*Saga Sea* (KRI)	17/6–11/8/06	550	550	0.00					0	0
	Konstruktor Koshkin (KRI)	15/4–26/5/06	577	289	0.00					0	0
	Total		1127	839	0.00					0	0
48.3	*Betanzos* (ANI)	22/3–22/4/06	70	63	0.11			7		7	48
	Cabo de Hornos (ANI)	3/2–9/3/06	138	101	0.07		4	2	1	7	2
	Argos Pereira (ANI)	25/12–19/1/06	71	35	0.00					0	0
	Sil (ANI)	1/1–18/2/06	137	137	0.01		2			2	2
	Insung Ho (ANI)	3/2–13/2/06	169	121	0.14	1	5	11		17	37
	Total		585	457	0.07	3%	33%	61%	3%	33	89
48.3	*Niitaka Maru* (KRI)	26/6–5/7/06	191	56	0.00					0	0
	Niitaka Maru (KRI)	10/7–28/7/06	204	125	0.00					0	0
	Total		395	181	0.00					0	0
58.5.2	*Southern Champion* (ANI/TOP)	11/3–31/3/06	143	143	0.00					0	0
	Southern Champion (ANI/TOP)	29/4–23/6/06	425	425	0.00					0	0
	Southern Champion (ANI/TOP)	22/7–16/9/06	518	518	0.00					0	0
	Total		1086	1086	0.00					0	0

Table 14: Seabird mortality totals and rates (BPT – birds/trawl) and species composition of by-catch, recorded by observers in the CAMLR Convention Area trawl fisheries over the last six seasons. DAC – Cape petrel; DIC – grey-headed albatross; DIM – black-browed albatross; MAI – southern giant petrel; MAH – northern giant petrel; PRO – white-chinned petrel; PTZ – unknown petrel; PWD – Antarctic prion.

Season	Area	Target species	Trips observed	Trawls		BPT	Dead								Total dead	Alive (combined)
				Set	Observed		DIC	DIM	PRO	MAH	PWD	PTZ	DAC	MAI		
2001	48.1	*E. superba*	2	485	427	0									0	0
	48.3	*C. gunnari*	6	381	350	0.26	5	46	41						92	40
	58.5.2	*D. eleginoides*	7	1441	1387	<0.10									0	0
		C. gunnari														
2002	48.3	*E. superba*	5	992	755	<0.10									0	0
	48.3	*C. gunnari*	5	460	431	0.16		18	49		1				68	52
	58.5.2	*D. eleginoides*	6	904	850	<0.10									0	1
		C. gunnari														
2003	48.3	*E. superba*	6	1928	1073										0	0
	48.3	*C. gunnari*	3	184	182	0.20	1	7	28						36	15
	58.5.2	*D. eleginoides*	8	1311	1309	<0.10		2	2				2		6	11
		C. gunnari				5										
2004	48	*E. superba*	1	334	258	<0.10									0	0
	48.3	*E. superba*	6	1145	829	<0.10									0	0
	48.3	*C. gunnari*	6	247	238	0.37	1	26	59					1	87	132
	58.5.2	*D. eleginoides*	5	1218	1215	<0.10									0	13
		C. gunnari														
2005	48.2	*E. superba*	2	391	285	<0.10							1		1	0
	48.3	*C. gunnari*	7	337	277	<0.14		9	1	1					11	14
	48.3	*E. superba*	5	1451	842	<0.10									0	0
	58.5.2	*D. eleginoides*	6	1303	1301	<0.11		5	3						8	0
		C. gunnari														
2006	48.1	*E. superba*	2	1127	839	0.00									0	0
	48.3	*C. gunnari*	5	585	457	0.07	1	11	20			1			33	89
	48.3	*E. superba*	2	395	181	0.00									0	0
	58.5.2	*D. eleginoides*	3	1086	1086	0.00									0	0
		C. gunnari														

Table 15: Seal mortality totals and rates (SPT – seals/trawl) and species composition, recorded by observers in the CAMLR Convention Area trawl fisheries during the 2005/06 season. ANI – *Champsocephalus gunnari;* KRI – *Euphausia superba*; SEA – Antarctic fur seal; SLP – leopard seal; TOP – *Dissostichus eleginoides*.

Area	Vessel (target species)	Cruise dates	Trawls		SPT	Dead		Total dead	Alive (combined)
			Set	Observed		SLP	SEA		
48.1	*Saga Sea* (KRI)	17/6–11/8/06	550	550	0.00			0	0
	Konstruktor Koshkin (KRI)	15/4–26/5/06	577	289	0.003		1	1	0
	Total		1127	839	0.001			1	0
48.3	*Betanzos* (ANI)	22/3–22/4/06	70	63	0.11			0	0
	Cabo de Hornos (ANI)	3/2–9/3/06	138	101	0.07			0	0
	Argos Pereira (ANI)	25/12–19/1/06	71	35	0.00			0	0
	Sil (ANI)	1/1–18/2/06	137	137	0.01			0	0
	InsungHo (ANI)	3/2–13/2/06	169	121	0.14			0	0
	Total		585	457	0.07			0	0
48.3	*Niitaka Maru* (KRI)	26/6–5/7/06	191	56	0.00			0	0
	Niitaka Maru (KRI)	10/7–28/7/06	204	125	0.00			0	0
	Total		395	181	0.00			0	0
58.5.2	*Southern Champion* (ANI/TOP)	11/3–31/3/06	143	143	0.00			0	0
	Southern Champion (ANI/TOP)	29/4–23/6/06	425	425	0.002	1		1	0
	Southern Champion (ANI/TOP)	22/7–16/9/06	518	518	0.00			0	0
	Total		1086	1086	0.001			1	0

Table 16: Seal mortality totals and rates (SPT – seals/trawl) and species composition of by-catch, recorded by observers in the CAMLR Convention Area trawl fisheries over the last six seasons. SEA – Antarctic fur seal; SES – southern elephant seal; SLP – leopard seal.

Season	Area	Target species	Trips observed	Trawls		SPT	Dead			Total dead	Alive (combined)
				Set	Observed		SLP	SEA	SES		
2001	48.1	*E. superba*	2	485	427	0.00				0	0
	48.3	*C. gunnari*	6	381	350	0.00				0	0
	58.5.2	*D. eleginoides* *C. gunnari*	7	1441	1387	0.001		1		1	2
2002	48.3	*E. superba*	5	992	755	0.00				0	0
	48.3	*C. gunnari*	5	460	431	0.00				0	0
	58.5.2	*D. eleginoides* *C. gunnari*	6	904	850	0.001		1		1	0
2003	48.3	*E. superba*	6	1928	1073	0.03		27		27	15
	48.3	*C. gunnari*	3	184	182	0.00				0	0
	58.5.2	*D. eleginoides* *C. gunnari*	8	1311	1309	0.003		2	2	4	2
2004	48	*E. superba*	1	334	258	0		0		0	0
	48.3	*E. superba*	6	1145	829	0.17		142		142	12
	48.3	*C. gunnari*	6	247	238	0				0	0
	58.5.2	*D. eleginoides* *C. gunnari*	5	1218	1215	0.002		3		3	0
2005	48.2	*E. superba*	2	391	285	0.06		16		16	8
	48.3	*C. gunnari*	7	337	277	0.00		0		0	2
	48.3	*E. superba*	5	1451	842	0.006		5		5	64
	58.5.2	*D. eleginoides* *C. gunnari*	6	1303	1301	0.00				0	1
2006	48.1	*E. superba*	2	1127	839	0.001		1		1	0
	48.3	*C. gunnari*	5	585	457	0.00				0	0
	48.3	*E. superba*	2	395	181	0.00				0	0
	58.5.2	*D. eleginoides* *C. gunnari*	3	1086	1086	0.00	1			1	0

Table 17: Estimated total potential seabird by-catch in unregulated longline fisheries in the Convention Area from 1996 to 2006.

Subarea/ division	Year	Extrapolated potential incidental mortality of seabirds		
		Lower	Median	Upper
48.3	2006	0	0	0
	1996–2005	1 835	3 486	56 766
58.4.2	2006	264	322	861
	1996–2005	707	863	2 305
58.4.3	2006	2 821	3 442	9 191
	1996–2005	1 747	2 131	5 691
58.4.4	2006	0	0	0
	1996–2005	3 886	4 741	12 659
58.5.1	2006	454	554	1 478
	1996–2005	48 327	58 965	157 442
58.5.2	2006	107	130	348
	1996–2005	32 657	39 845	106 391
58.6	2006	102	124	331
	1996–2005	44 927	54 817	146 366
58.7	2006	0	0	0
	1996–2005	12 856	15 686	41 884
88.1	2006	0	0	0
	1996–2005	489	598	1 578
88.2	2006	9	11	28
	1996–2005	0	0	0
Totals	2006	3 756	4 583	12 237
	1996–2005	147 431	181 133	531 082
Total		151 187	185 716	543 319

Table 18: 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 19: Summary of IMAF risk assessment in relation to proposed new and exploratory longline fisheries in 2006/07 (five-point risk scale as defined in SC-CAMLR-XXV/BG/26).

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 Korea (CCAMLR-XXV/20) does not contain sufficient information to be certain that it does not conflict with the IMAF assessment. Proposals from Japan (CCAMLR-XXV/19), New Zealand (CCAMLR-XXV/22) and Norway (CCAMLR-XXV/23) do 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 Korea (CCAMLR-XXV/20) does not contain sufficient information to be certain that it does not conflict with the IMAF assessment. Proposals from Japan (CCAMLR-XXV/19), New Zealand (CCAMLR-XXV/22) and Norway (CCAMLR-XXV/23) do 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 Korea (CCAMLR-XXV/20) and Uruguay (CCAMLR-XXV/28) do not contain sufficient information to be certain that they do not conflict with the IMAF assessment. Proposals from Australia (CCAMLR-XXV/18), Namibia (CCAMLR-XXV/21), New Zealand (CCAMLR-XXV/22) and Spain (CCAMLR-XXV/26) 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 Korea (CCAMLR-XXV/20) and Uruguay (CCAMLR-XXV/28) do not contain sufficient information to be certain that they do not conflict with the IMAF assessment. Proposals from Australia (CCAMLR-XXV/18), Namibia (CCAMLR-XXV/21), New Zealand (CCAMLR-XXV/22) and Spain (CCAMLR-XXV/26) do not conflict with the IMAF assessment.

(continued)

Table 19 (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 to 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.	Proposal from Korea (CCAMLR-XXV/20) does not contain sufficient information to be certain that it does not conflict with the IMAF assessment. Proposals from Japan (CCAMLR-XXV/19) and Spain (CCAMLR-XXV/26) 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 to 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 Korea (CCAMLR-XXV/20) and Uruguay (CCAMLR-XXV/28) do not contain sufficient information to be certain that they do not conflict with the IMAF assessment. Proposals from Australia (CCAMLR-XXV/18), Japan (CCAMLR-XXV/19), Namibia (CCAMLR-XXV/21) and Spain (CCAMLR-XXV/26) 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 Argentina (CCAMLR-XXV/17), Korea (CCAMLR-XXV/20) and Uruguay (CCAMLR-XXV/28) do not contain sufficient information to be certain that they do not conflict with the IMAF assessment. Proposals from New Zealand (CCAMLR-XXV/22), Norway (CCAMLR-XXV/23), Russia (CCAMLR-XXV/24), South Africa (CCAMLR-XXV/25), Spain (CCAMLR-XXV/26), and UK (CCAMLR-XXV/27) do not conflict with the IMAF assessment.

(continued)

Table 19 (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 Argentina (CCAMLR-XXV/17), Korea (CCAMLR-XXV/20) and Uruguay (CCAMLR-XXV/28) do not contain sufficient information to be certain that they do not conflict with the IMAF assessment. Proposals from New Zealand (CCAMLR-XXV/22), Norway (CCAMLR-XXV/23), Russia (CCAMLR-XXV/24), South Africa (CCAMLR-XXV/25), Spain (CCAMLR-XXV/26), and the UK (CCAMLR-XXV/27) 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 Argentina (CCAMLR-XXV/17) and Uruguay (CCAMLR-XXV/28) do not contain sufficient information to be certain that they do not conflict with the IMAF assessment. Proposals from New Zealand (CCAMLR-XXV/22), Norway (CCAMLR-XXV/23), Russia (CCAMLR-XXV/24), Spain (CCAMLR-XXV/26), and the UK (CCAMLR-XXV/27) do not conflict with the IMAF assessment.

Table 20: Intersessional work plan for ad hoc WG-IMAF for 2006/07.

The Secretariat will coordinate the intersessional work of the IMAF group. An interim review of work will be conducted in May 2007 and advised to ad hoc WG-IMAF in advance of WG-EMM/WG-SAM (July 2007). The outcome of the intersessional work will be reviewed in September 2007 and reported as a tabled paper to WG-IMAF in October 2007.

[1] In addition to work coordinated by the Science/Compliance Officer (Secretariat) * SODA: Scientific Observer Data Analyst

	Task/Topic	Paragraphs of WG-FSA report	Members' Assistance[1]	Start/ Completion deadlines	Action
1.	**Planning and coordination of work:**				
1.1	Circulate materials on IMAF matters as contained in reports of current meetings of CCAMLR.	Standing request		Dec 2006	Place all relevant sections of CCAMLR-XXV on IMAF page of CCAMLR website and notify IMAF group members, and technical coordinators and (via them) scientific observers.
1.2	Acknowledge work of technical coordinators and scientific observers.	Standing request		Dec 2006	Commend technical coordinators and all observers for their efforts in the 2005/06 fishing season.
1.3	Review new and exploratory fishery notifications.	Standing request	Mr Smith and Dr Waugh	At submission deadline	Transmit e-copies of notifications and adopted 2006 e-version of Table 19 to Dr Waugh and Mr Smith to prepare initial draft of IMAF table.
1.4	Prepare new and exploratory notification checklist relating to IMAF risk assessment.		Science Officer, Mr Smith	Mar 2007/ Aug 2007	Needs to be distributed to Mr Smith and Dr Waugh for review prior to circulation to Members in time for 2007 notifications of new and exploratory fisheries.
1.5	Prepare agenda for IMAF-07.		Science Officer, Co-Conveners	Feb 2007/ Aug 2007	Science Officer to forward e-version of last year's annotated agenda to Co-Conveners for revision prior to distribution to WG-IMAF for comments on revised structure, final version to be circulated later in year.
1.6	Prepare tables and figure formats for 2007 meeting.	Standing request	SODA*, Co-Conveners, IMAF members	May 2007, comments by mid-June 2007	SODA to forward e-version of all last year's tables and figures and agreed modifications to Co-Conveners for revision prior to distribution to WG-IMAF.

(continued)

Table 20 (continued)

	Task/Topic	Paragraphs of WG-FSA report	Members' Assistance[1]	Start/ Completion deadlines	Action
1.7	Membership of WG-IMAF.	Standing request	Members	Nov 2006/ as required	Request nomination of new members to IMAF, especially technical coordinators from those Members that deploy the greatest number of observers in the Convention Area, Members not currently involved and request all Members to send their representatives to the next IMAF meeting.
1.8	Submission of papers for IMAF-07.		Members, IMAF members, SODA	By 0900 24 Sep 2007	Submit papers specifically relevant to agenda items.
1.9	Allocation of submitted papers to agenda items and assignment of rapporteuring tasks.	Standing request	Co-Conveners	Before meeting	Prepare list, circulate to confirmed attendees and post on website.
2.	**Members' research and development activities:**				
2.1	Request Members provide updated information on national research programs on albatrosses, giant petrels and white-chinned petrels to ACAP in relation to status and trends of populations and foraging range and distribution, genetic profiles and the numbers and nature of by-catch specimens and samples.	Standing request	Members, IMAF members, technical coordinators, nominated scientists	Nov 2006/ Sep 2007	Explicit reminder to IMAF members in March 2007.
2.2	Risk assessment of seabird by-catch in the Convention Area.	Standing request	IMAF members	Nov 2006/ Sep 2007	Further work as appropriate to update SC-CAMLR-XXV/BG/26 for the Scientific Committee. Circulate any new tabled papers relating to seabird at-sea distributions to Co-Conveners and Dr Gales – and to other WG-IMAF members as requested.

(continued)

Table 20 (continued)

	Task/Topic	Paragraphs of WG-FSA report	Members' Assistance[1]	Start/ Completion deadlines	Action
2.3	Further develop draft manuscript describing CCAMLR's risk assessment process.		Drs Waugh and Gales, Mr Baker	Dec 2006/ Feb 2007	Review further developed draft manuscript (WG-FSA-06/33); circulate to IMAF intersessionally and receive comments by February 2007; intent for publication in peer-reviewed journal.
2.4	Request BirdLife International to provide summary data on distribution of Southern Ocean seabirds from its tracking database if accumulation of data warrants. Plan with BirdLife for the three-year review of tracking database.	Standing request	Science Officer, BirdLife International, Co-Conveners	Jul 2007	Request information. Circulate any new information to WG-IMAF. Co-conveners to liaise with BirdLife International with respect to three-year review.
2.5	Information on the development and use of fisheries-related methods of the avoidance of incidental mortality of seabirds. In particular, information is sought on the following: • optimum configuration of line-weighting regimes and equipment; • experiences with IWL, especially the practicality of the gear in conjunction with a line-shooting device; • haul mitigation devices and experiences with their use; • tests of/experiences with streamer lines, especially with respect to paired vs single lines; • trawl haul mitigation and the use of net binding; • determination of appropriate 'access windows' for Convention Area seabirds and fisheries.	Standing request	Members, IMAF members, technical coordinators	Nov 2006/ Sep 2007	Request information, collate responses for IMAF-07, members to submit papers where possible.

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Table 20 (continued)

	Task/Topic	Paragraphs of WG-FSA report	Members' Assistance[1]	Start/ Completion deadlines	Action
2.6	Methods for preventing seal mortality or injury associated with krill trawl fishing.	Standing request	Members as appropriate, scientific observers, IMAF members	As soon as report available	Further testing of and continued reporting on effectiveness of various mitigation methods and devices; report to IMAF-07.
2.7	Continued experimental trials of mitigation measures in French EEZ.	Standing request	France, IMAF scientists	As soon as reports available	Report available results to IMAF-07, in particular details of multiple streamer lines and a repeat of the earlier modified DeLord analysis including all additional available data.
2.8	Information on modifications to standard longline gear.		IMAF	Sep 2007	Provide reports describing in detail hybrid longline methods, how they are deployed and retrieved, via a paper on these matters for IMAF-07.
2.9	Request data acquired from newly developed protocols for: seabird trawl warp strike observation, longline haul, and longline access window (sink rate, vessel speed, and aerial extent of streamer lines).	7.32 (App. D 74)	Drs Waugh and Sullivan and Mr Melvin, IMAF members	Aug 2007	Review data-to-date from new protocols developed at IMAF-06. Data extract in early August to allow paper to be drafted.
3.	**Information from outside the Convention Area:**				
3.1	Information on longline fishing effort in the Southern Ocean outside the Convention Area.	Standing request	Members, non-Contracting Parties, international organisations	Sep 2007	Request information intersessionally from those Members known to be licensing fishing vessels in areas adjacent to the CCAMLR Convention Area (e.g. Argentina, Brazil, Chile, UK, South Africa, Uruguay, New Zealand and Australia); review situation at IMAF-07. Request information from other Parties – Members and non-Contracting Parties (e.g. People's Republic of China, Japan, Republic of Korea)and review at IMAF-07.

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Table 20 (continued)

	Task/Topic	Paragraphs of WG-FSA report	Members' Assistance[1]	Start/ Completion deadlines	Action
3.2	Information on incidental mortality outside the Convention Area of seabirds breeding within the area.	Standing request	Members, IMAF members	Sep 2007	Repeat request to all IMAF members, especially to those relevant to item 3.1 above; review at IMAF-07.
3.3	Reports on use and effectiveness of mitigation measures outside the Convention Area.	Standing request	Members, non-Contracting Parties, international organisations	Sep 2007	Request information on use/implementation of mitigating measures, especially provisions in Conservation Measures 25-02, 24-02 and 25-03, as under item 3.1 above; review responses at IMAF-07.
4.	**Cooperation with international organisations:**				
4.1	Cooperation with ICCAT, IATTC, WCPFC, CCSBT, SEAFO and IOTC on specific issues regarding incidental mortality of seabirds.	Standing request	Co-Conveners, Science Officer	Nov 2006/ Sep 2007	Brief CCAMLR observers on desired feedback on IMAF matters (seabird by-catch levels and mitigating measures).
4.2	Collaboration and interaction with all tuna commissions (ICCAT, IATTC, IOTC, CCSBT, WCPFC, SEAFO) and regional fishery management organisations with responsibility for fisheries in areas where Convention Area seabirds are killed.		Relevant Members, CCAMLR observers	Nov 2006 and at specific meetings	Request information on: (i) annual data on distribution level of longline fishing effort; (ii) existing data on levels and rates of seabird by-catch; (iii) measures currently in use and whether voluntary or mandatory; (iv) nature and coverage of observer program; (v) scientific information supporting proposed or adopted mitigation measures. Support regulations for use of proposed or adopted mitigating measures at least as effective as Conservation Measure 25-02.

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Table 20 (continued)

	Task/Topic	Paragraphs of WG-FSA report	Members' Assistance[1]	Start/ Completion deadlines	Action
4.3	Tuna RFMO Meeting in Japan in Jan 2007.	7.57	Science Officer, Co-Conveners, Members	Dec 2006	Request members to support incidental mortality related initiatives at the meeting as referred to in CCAMLR Resolution 22/XXV.
4.4	Progress with NPOAs in respect of FAO IPOA-Seabirds.	Standing request	Relevant Members, IMAF members	By Sep 2007	Solicit reports to CCAMLR on progress for information and make review.
4.5	Support for ACAP attendance at AC/MOP meetings.	Standing request	Members as appropriate; Australia		Support the work of the Advisory Committee, implementation of its Action Plan, and coordinating activities between CCAMLR and ACAP. Report to IMAF-07.
4.6	IUCN Red List: Seabirds	Standing request	Secretariat	Aug 2007	Obtain from BirdLife International, circulate to IMAF members and table for SC-CAMLR-XXVI, any revisions to the conservation status of albatross, *Macronectes* and *Procellaria* species.
4.7	BirdLife International	Standing request	Science Officer, BirdLife International	Sep 2007	Request information from BirdLife International about its activities of relevance to IMAF, in particular its Seabird Program and 'Albatross Task Force'. BLI submission of updated report on RFMO evaluation to IMAF-07.
4.8	Southern Seabird Solutions	Standing request	New Zealand	Sept 2007	Report on progress to IMAF-07.
5.	**Data acquisition and analysis:**				
5.1	Acquisition from EEZs and elsewhere as appropriate, of seabird incidental mortality data for trawl fisheries.	Standing request	Members	Nov 2006/ Sep 2007	Request Members for appropriate data.

(continued)

Table 20 (continued)

	Task/Topic	Paragraphs of WG-FSA report	Members' Assistance[1]	Start/ Completion deadlines	Action
5.2	Acquisition of original data in CCAMLR format on seabird incidental mortality for French EEZs in Subarea 58.6 for 2000/01 and in Subarea 58.6 and Division 58.5.1 for 2006/07.	7.7 (App. D 17)	France	2001/02 data – as soon as possible, 2006/07 data – Sep 2007	Request France to submit reports and data logbooks prepared by national observers for the current and past fishing seasons, preferably using CCAMLR reporting formats.
5.3	Analysis of 2003/04 to 2005/06 vessel-specific by-catch information.	7.7 (App. D 17)	France	As soon as possible	Request analysis of the 2003/04 to 2005/06 by-catch data to identify factors contributing to high levels of by-catch via a paper for IMAF-07.
5.4	Status report on implementation of IMAF recommendations re: mitigation research programs, observer coverage and implementation of mitigation measures.	Standing request	France, IMAF	Sep 2007	Report to IMAF-07.
5.5	Provision of data by Brazil on by-catch of Convention Area seabirds in Brazilian waters.	Standing request	Brazil	As soon as possible	Report to IMAF-07.
5.6	Estimates of IUU take of seabirds.	Standing request	Secretariat	Before IMAF-07	Prepare 2007 estimates of IUU seabird by-catch.
5.7	Request updated information on distribution, status and trends of albatross and petrel populations from ACAP.	Standing request	Science Officer	Jul 2007	Request information. Submit paper to IMAF-07 by deadline.
6.	**Scientific observer issues:**				
6.1	Preliminary analysis of data from 2006/07 fisheries, including extrapolations for all fisheries (trawl and longline) where incidental mortalities (seabird and marine mammal) occur.	Standing request	SODA	IMAF meeting	Produce draft tables equivalent to Tables 1 to 19 of the FSA-06 report for IMAF-07 as soon as possible.

(continued)

Table 20 (continued)

	Task/Topic	Paragraphs of WG-FSA report	Members' Assistance[1]	Start/ Completion deadlines	Action
6.2	Changes to current seabird and marine mammal data collection included in the scientific observer cruise reports and logbooks for all fisheries.		SODA, IMAF, technical coordinators		IMAF follow through with Secretariat and with technical coordinators to assure that these changes are incorporated into observer forms and into training/briefing protocols used by technical coordinators.
6.3	Vessel operators reminded of exceeding minimum streamer line specifications and haul mitigation requirements in CM 25-02 and other seabird-related CMs.	Standing request	Members, technical coordinators	Nov 2006	Vessel operators advised to exceed standards to prevent compliance failures.
6.4	Review priorities and protocols for observers in the cruise logbooks, cruise reports and the *Scientific Observers Manual* and address identified issues especially to determine if data collections meet data requirements.	Standing request	IMAF	Sept 2007	Intersessional IMAF task group to be established to complete work. Report, as necessary, to IMAF-07.
7.	**Revision of seabird and marine mammal related conservation measures:**				
7.1	Research areas: (i) revaluate streamer line colours; (ii) relationship of line sink rate to values that include both vessel speed and sink rate; (iii) integrated weight line efficacy; (iv) methods for monitoring individual vessel compliance; (v) comparison of steel elliptical weights versus traditional Spanish system weights;	Standing request App. D 89, 102)	IMAF	Sep 2007	Continued research to allow a more informed revision of conservation measures, with the intention of combining related conservation measures if possible.

(continued)

Table 20 (continued)

Task/Topic	Paragraphs of WG-FSA report	Members' Assistance[1]	Start/ Completion deadlines	Action
7.1 (continued)				
(vi) efficacy of 'new' Spanish line-weighting regime as a seabird deterrent;				
(vii) efficacy of paired streamer lines in Southern Ocean conditions;				
(viii) development of best management practice in Spanish system;				
(ix) development of best management practice in autoline gear.				

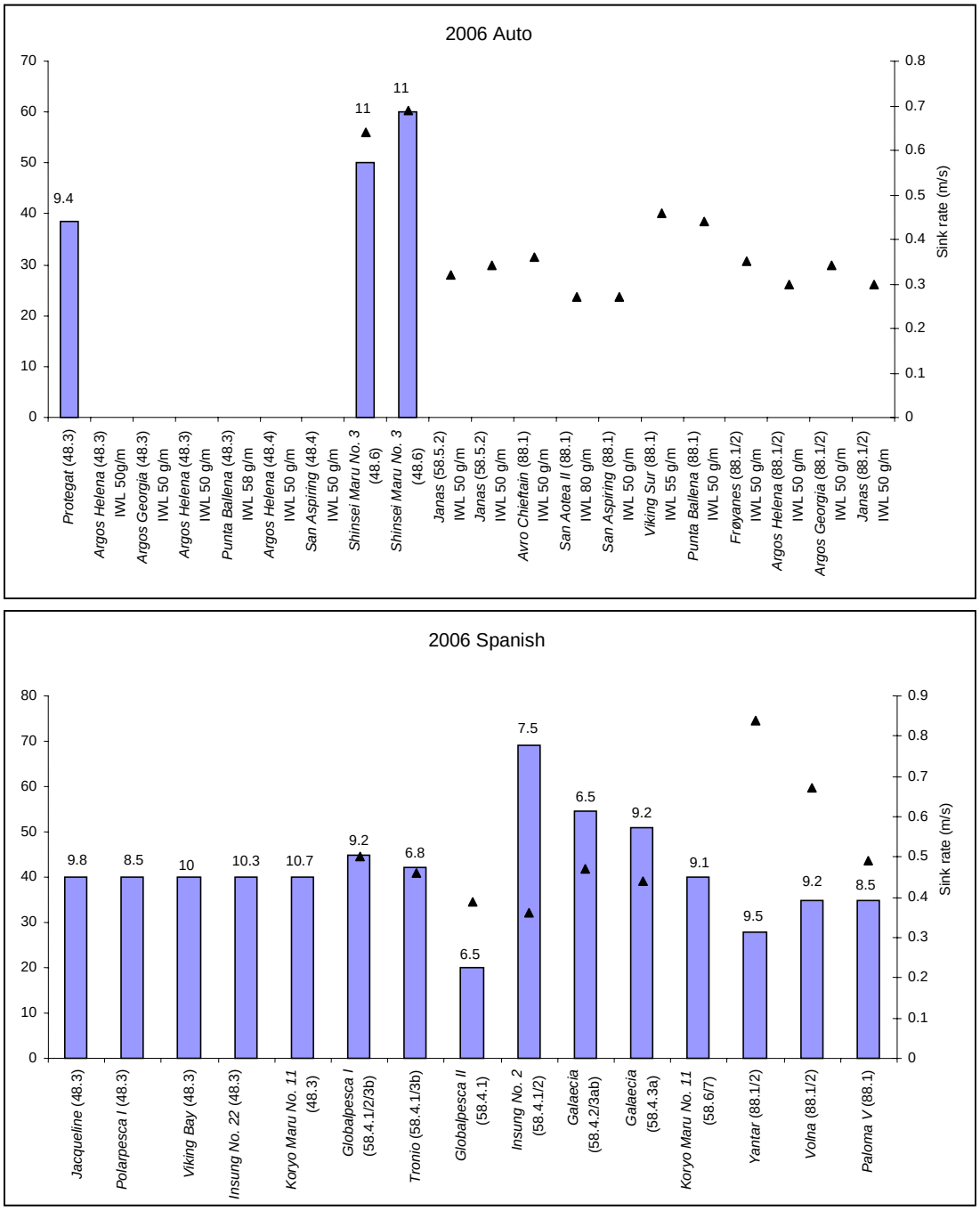

Figure 1: Longline weight spacing (y-axis in metres) and weights used (kilograms) by Spanish and autoline systems during the 2005/06 season. ▲: Sink rate (metres/second); IWL: Integrated Weighted Line (grams/metre).

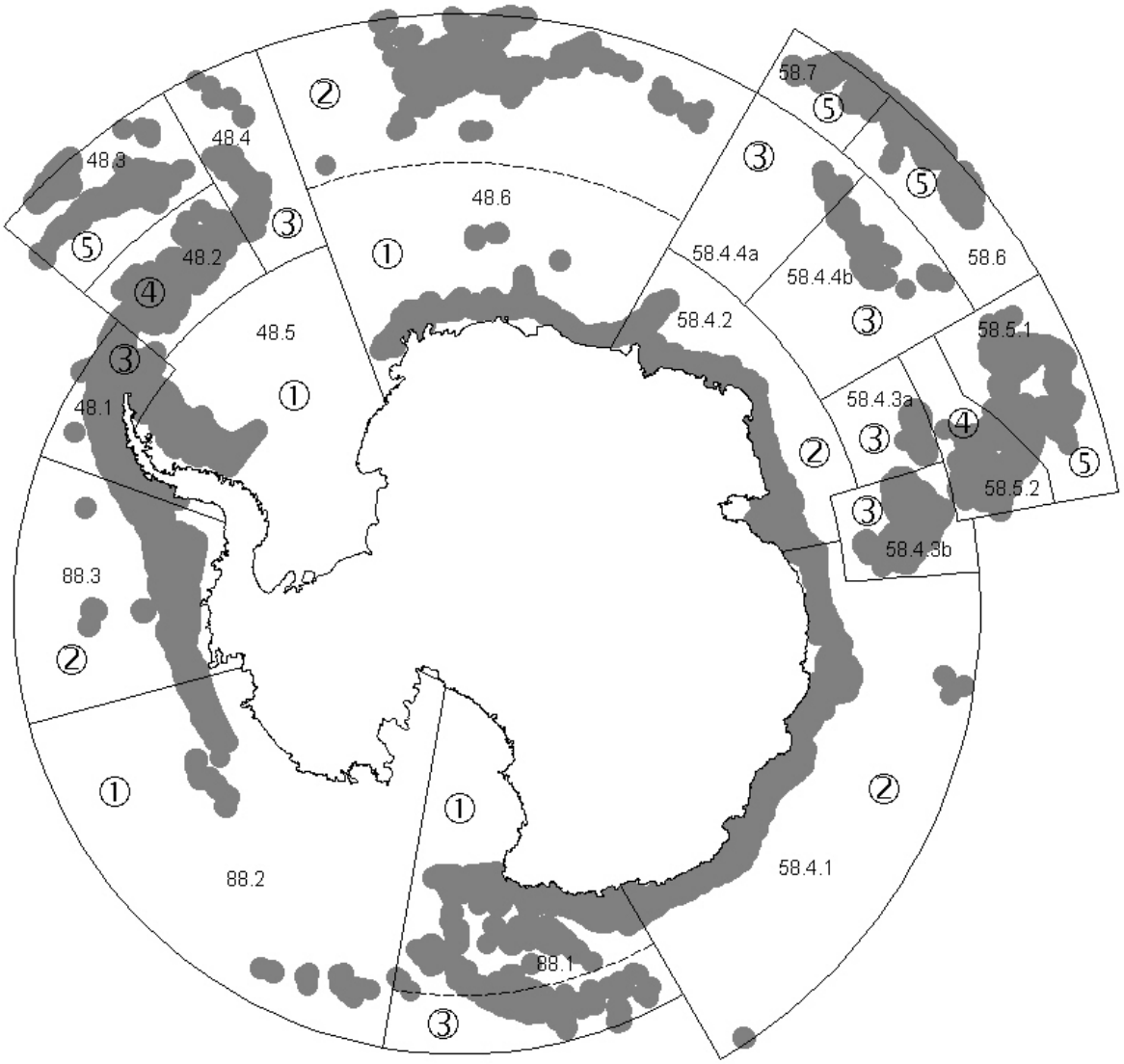

Figure 2: Assessment of the potential risk of interaction between seabirds, especially albatrosses, and longline fisheries within the Convention Area. 1: low, 2: average to low, 3: average, 4: average to high, 5: high. Shaded patches represent seabed areas between 500 and 1 800 m.