REPORT OF THE WORKING GROUP ON INCIDENTAL MORTALITY ASSOCIATED WITH FISHING

(This text was adopted as part of the WG-FSA report and has been extracted here as a separate document)

INCIDENTAL MORTALITY OF MAMMALS AND SEABIRDS ARISING FROM FISHING

Intersessional Work of Ad Hoc WG-IMAF

6.1 The Secretariat reported on the intersessional activities of ad hoc WG-IMAF according to the agreed plan of intersessional activities for 2001/02 (SC-CAMLR-XX, Annex 5, Appendix F). The report contained records of all activities planned and results of their completion (WG-FSA-02/83).

6.2 The Working Group thanked the Science Officer for his work on the coordination of IMAF activities and the technical coordinators for their extensive support. It also thanked the Scientific Observer Data Analyst for his work on the processing and analysis of data submitted to the Secretariat by international and national observers during the course of the 2001/02 fishing season.

6.3 The Working Group concluded that most tasks planned for 2001/02 had been successfully implemented. The list of current intersessional tasks was reviewed and a number of changes were agreed in order to consolidate specific tasks in future plans. The Working Group agreed that the plan of intersessional activities for 2002/03, compiled by the Convener, be appended to its report (Appendix D).

6.4 The membership of ad hoc WG-IMAF was reviewed. The Working Group noted with regret that Mr J. Cooper (South Africa) had resigned from the group due to his changed commitments. The Working Group especially welcomed Ms T. Hewitt (Australia), Dr D. Nel (South Africa), Mr M. McNeill (New Zealand) and Dr Reid who attended the meeting for the first time. In particular, it was noted that, thanks to Mr McNeill's participation, expert advice on operational aspects of fishing vessels had become available to the group. Members were asked to review their representation on ad hoc WG-IMAF intersessionally, to suggest additional members and to facilitate the attendance of their representatives at the meetings.

Incidental Mortality of Seabirds during Regulated Longline Fishing in the Convention Area

2002 Data

6.5 Data were available from 22 longline cruises conducted within the Convention Area during the 2001/02 season (details in WG-FSA-02/11 Rev. 1 and Table 6.1).

6.6 The Working Group noted that the proportion of hooks observed was similar to last year for Subareas 48.3 (22% (range 19–31) compared with 24% (10–81)), 58.6 and 58.7 (37% (range 9–59) compared with 39% (range 6–63)) and 88.1 and 88.2 (42% (range 40–45) compared with 56% (range 37–89)), but with generally greater consistency across vessels. Only for three cruises (*Suidor One* (9%), *Isla Camila* (19%), *Isla Santa Clara* (19%)) was the proportion of hooks observed lower than 20%.

6.7 The Working Group noted that WG-FSA-02/52 indicated that for the purposes of detecting a substantial (order-of-magnitude) change in by-catch rate from the present very low

levels, observation of at least 25% of hooks would be appropriate. Technical coordinators were requested to try to ensure that this minimum level of hook observation is achieved by each vessel.

6.8 As usual, the total observed seabird catch rate was calculated using the total number of hooks observed and the total seabird mortality observed (Table 6.2). The estimated total catch of seabirds by vessel was calculated using the vessels observed catch rate multiplied by the total number of hooks set.

Subarea 48.3

6.9 The total estimated seabird mortality was 27 birds (Table 6.2) compared with 30 birds last year and 21 the year before (Table 6.3). The overall catch rate was 0.0015 birds/thousand hooks compared to 0.002 in the two previous years (Table 6.3). Of the six birds observed killed (all at night), four were southern giant petrels, one was a northern giant petrel and one a Cape petrel (Table 6.4).

South African EEZs in Subareas 58.6 and 58.7

6.10 No seabirds were observed killed in these parts of Subareas 58.6 and 58.7, compared to 199 and 516 birds estimated killed in the two previous years (Table 6.3). It was noted that WG-FSA-02/17, which also reported on the seabird by-catch in this fishery, included observations of two birds killed from fishing in the South African EEZs in these subareas, but that these records relate to fishing outside the Convention Area.

6.11 The effort in this fishery was substantially reduced from 2001, involving only three cruises and 1.67 million hooks set this year compared with 11 cruises and 6.56 million hooks last year.

6.12 There was no indication of the circumstances by which such a major reduction (to zero) of seabird by-catch within this fishery had been achieved. Nevertheless it was clearly a remarkable and encouraging achievement.

Subareas 88.1 and 88.2

6.13 No incidental mortality of seabirds was observed in fishing operations whose level and nature were closely similar to those in previous years. This was the fourth successive year of zero seabird by-catch in the fishery in Subarea 88.1.

French EEZs in Subarea 58.6 and Division 58.5.1

6.14 No data were received for the 2001/02 season. Given the high levels of seabird by-catch reported for these fisheries for 2000 and 2001, it was important that such data for the current season be submitted to the Secretariat as soon as possible, using the CCAMLR data reporting forms and formats.

6.15 Some data had been received for the 1999/2000 and the 2000/01 fishing seasons in respect of these areas but had arrived after the deadline for submission of papers for consideration at this year's meeting. These data would be evaluated by the Secretariat during the intersessional period.

General

6.16 The Working Group noted that the total numbers of birds reported as caught but released alive (42) was greater than the numbers landed dead (six). It noted that some proportion of birds landed alive were likely to have sustained injuries (e.g. broken wing) prejudicial to their subsequent survival. Such birds should be regarded as part of the total of birds killed. It was recommended that appropriate changes be made to the observer logbook to enable birds landed alive but with potentially fatal injuries to be distinguished from those released alive with no or minor injury.

Compliance with Conservation Measure 29/XIX

6.17 Data from observer reports on compliance with this conservation measure in 2001/02 are provided in WG-FSA-02/13 Rev. 1 and summarised in Tables 6.5 and 6.6. Comparison with similar data from previous years is provided in Table 6.7.

Streamer Lines

6.18 Compliance with streamer line design has markedly improved since last year, with observers reporting full compliance of the design of the streamer lines deployed on 19 of the 22 cruises (86%) (WG-FSA-02/13 Rev. 1 and Table 6.5). This compares with 66% overall compliance in 2000/01 and 33% in 1999/2000. The two vessels that did not fully comply failed on total length (*Eva 1*) and height of attachment point (*Koryo Maru No. 11* on one cruise) (Table 6.6).

6.19 All vessels fishing in Subareas 58.6, 58.7, 88.1 and 88.2 used streamer lines on all sets. In Subarea 48.3, 12 vessels undertook some sets without using a streamer line. Of these, four vessels (*Isla Camila, Argos Georgia, Polarpesca 1, Atlantic No. 52*) undertook 10 or more sets without a streamer line (Table 6.1 and WG-FSA-02/13 Rev. 1).

Offal Discharge

6.20 There was 100% compliance with the requirement to either hold offal on board, or to discharge on the opposite side to where the line was hauled (Table 6.5). All but one vessel complied fully with the requirement to not dump offal during setting; the *Viking Bay* was observed dumping offal during four (2%) sets (WG-FSA-02/13 Rev. 1).

Night Setting

6.21 Compliance with night setting has remained high in Subarea 48.3, up from 95% last season to 99% this season (Table 6.5). In Subareas 58.6 and 58.7 compliance was considerably higher than the previous season, up from 78% to 99% (Table 6.5). In Subarea 48.3 observers reported some difficulty in achieving exact compliance with this measure, due to the lack of sufficiently precise tables to define nautical twilight (paragraph 6.48).

6.22 In Subarea 88.1 night setting increased to 33%. However, vessels operating in this area do so under Conservation Measure 235/XX, which contains an exemption from night setting requirements south of 65°S for vessels which demonstrate a consistent minimum line sink rate of 0.3 m/s.

Line Weighting – Spanish System

6.23 In 2000 the Commission accepted WG-IMALF's recommendation for an alternative line-weighting regime for vessels using the Spanish method of longline fishing. Conservation Measure 29/XIX requires vessels to use either 8.5 kg weights spaced at no more than 40 m or 6 kg weights at no more than 20 m. The addition of the option of 8.5 kg weights at no more than 40 m was made because of concern that the existing regime placed practical constraints on fishers.

6.24 This year compliance with line weighting for Spanish longline systems (6 kg every 20 m or 8.5 kg every 40 m) had significantly improved (Table 6.5 and Figure 6.1). Ten (63%) cruises in Subarea 48.3 and 2 (66%) cruises in Subareas 58.6 and 58.7 complied with this line-weighting regime. All vessels met the weight spacing requirement and nine (53%) either met the weighting requirement or were within 95% of the required weight. The median weight and line spacing for Subareas 48.3, 58.6 and 58.7 were 8.6 kg every 40 m and 6.6 kg every 40 m respectively.

6.25 The results from last season strengthen the Working Group's conclusion that the current line-weighting requirements can be complied with. Once again it recommended that vessels unable to meet the line-weighting requirement of Conservation Measure 29/XIX should be prohibited from fishing in the Convention Area.

Line Weighting – Autoline System

6.26 In Subareas 88.1 and 88.2 vessels fishing south of 65°S in daylight were required to use line weights to achieve a consistent minimum line sink rate of 0.3 m/s (Conservation Measure 216/XX). The Working Group noted that both vessels complied with this measure.

Thawed Bait

6.27 Two vessels used frozen bait when setting longlines on more than one occasion; *Isla Santa Clara* (15%) and *Tierra del Fuego* (1%) (WG-FSA-02/13 Rev. 1).

General

6.28 The Working Group noted that if compliance with Conservation Measure 29/XIX is interpreted strictly (i.e. 100% in all elements of the conservation measure), only three vessels (*San Aotea II, Janas* and *Argos Helena*) fully complied with all elements at all times. Eight further vessels were within 95% of the minimum requirements of all elements of Conservation Measure 29/XIX (Table 6.5). The Working Group emphasised that the specifications in the conservation measure are minimum standards, and vessels should be advised to exceed these to prevent compliance failure due to marginal shortcomings.

6.29 The Working Group again recommended that vessels which do not comply with all elements of Conservation Measure 29/XIX should be prohibited from fishing in the Convention Area (SC-CAMLR-XX, paragraph 4.41).

Fishing Seasons

6.30 In 2000 the Scientific Committee advised the Commission that once full compliance with Conservation Measure 29/XIX was achieved, together with negligible levels of seabird by-catch, any relaxation of closed seasons should proceed in a stepwise fashion and the results of this carefully monitored and reported (SC-CAMLR-XIX, paragraph 4.42).

6.31 On the basis of the data for the 2001/02 fishing season in Subarea 48.3, seabird by-catch levels were very low (at levels negligible in terms of the population dynamics of the species concerned) for the third successive season. However, only one vessel (*Argos Helena*) fully complied with Conservation Measure 29/XIX.

6.32 In light of the fact that full compliance by the vessels fishing in Subarea 48.3 is possible in the near future if past trends continue, the Working Group considered options for the future that could allow a season extension with minimal risk to seabirds. A number of factors were taken into account.

6.33 The Working Group recalled the information obtained from the French EEZ in the 1999 and 2000 seasons when, despite reported use of Conservation Measure 29/XVI, 8 491

white-chinned petrels were killed. This indicates that the current conservation measures may not be able to adequately mitigate the capture of this species during the summer season.

6.34 The Working Group also recalled its advice to the Scientific Committee two years ago (SC-CAMLR-XIX, Annex 5, paragraph 7.150) that current indications are that allowing fishing in summer, at night, using streamer lines, proper offal discharge practices and c. 40 m between weights on longlines (existing practice for Spanish system vessels) will still result in unacceptably high mortality of seabirds, and further experimentation into the effectiveness of line-weighting concepts and underwater setting devices with the Spanish system is important. The Working Group proposed and outlined an experiment (WG-FSA-01/29), but funding to undertake this has not been found despite considerable effort (WG-FSA-02/30).

6.35 The Working Group also noted that information from Subareas 58.6 and 58.7 shows that white-chinned petrels are less susceptible to by-catch at the beginning of the breeding season during September when they are incubating eggs, compared to the chick-rearing period between January and April (WG-FSA-01/08, now Nel et al., 2002).

6.36 In the light of these considerations the Working Group proposed that a cautious and stepwise approach be taken in terms of a season extension, in order to minimise risk to seabirds.

6.37 Three options for season extension were considered by the Working Group:

(i) An extension of the season for two weeks in September, once there was full compliance with Conservation Measure 29/XIX, and subject to a limit of three birds per vessel, assuming fishing effort was maintained at current levels. Vessels would be required to carry two observers, so that the limit could be monitored accurately, and either two streamer lines or a single streamer line with a boom-and-bridle system would be required.

(ii) An extension of the season for the last two weeks in April once there was full compliance with Conservation Measure 29/XIX, and subject to a limit of three birds per vessel, assuming fishing effort was maintained at current levels. Vessels would be required to carry two observers, so that the limit could be monitored accurately, and either two streamer lines or a single streamer line with a boom-and-bridle system would be required.

(iii) In the forthcoming season to allow only vessels in Subarea 48.3 that were adjudged to have complied fully with Conservation Measure 29/XIX in 2001/02 to fish during the last two weeks of April to enable a preliminary assessment of seabird by-catch during this period. As part of the access arrangement during this period, the vessel would be required to collect data to allow a more reliable assessment of the risk to seabirds during this period. This would include collection of data on the sink rate of longlines, and observations of seabird behaviour around the vessel. A limit of three birds would be applied to the vessel; two observers would be required so that the limit could be monitored accurately; two streamer lines or a single streamer line with a boom-and-bridle system would be required.

6.38 The Working Group noted that of the two options (i) and (ii) outlined in paragraph 6.37 above, it regarded option (i) as preferable, in terms of leading to an extension to the fishing season at a time of lower potential risk to seabirds.

6.39 These options for extensions to the toothfish fishing season were further discussed. From the perspective of the assessments by WG-FSA, while there might be potential difficulties arising from CPUE overlap, mix of maturity stages and the need to incorporate season (rather than whole year) into the assessments, these did not present real obstacles.

6.40 It was noted that the toothfish fishery in Subarea 48.3 currently reaches the catch limit several weeks before the end of the fishing season.

6.41 Although extending the fishing season so that it more closely approaches the current timing of the meetings of WG-FSA, the Scientific Committee and the Commission, could create difficulties for ensuring that observer reports and fishing data were available in time for consideration at these meetings, it was likely that these issues could be addressed by appropriate changes to administrative and management practice. The Working Group agreed to address the topic of how to manage year-round fisheries for toothfish at its meeting next year.

6.42 It was recollected that one of the original aims of extending the toothfish fishing season was to avoid this fishery being restricted to the winter months when the weather was worst and vessel safety particularly critical.

6.43 However, in view of the experiences of fishing in winter over the last several years, the extent to which this argument still applied was not clear to the Working Group.

6.44 Nevertheless, safe fishing practice might affect the feasibility of option (iii) in paragraph 6.37 because current best practice in this fishery in Subarea 48.3 is for vessels to operate in pairs.

6.45 For all three options, concerns were also raised about the difficulties of ensuring compliance with the proposed bird by-catch limit, both in terms of the potential requirement for near real-time reporting and of the levels of observation needed to achieve accurate monitoring of the seabird by-catch.

6.46 The Working Group re-emphasised the importance of not compromising the status of scientific observers by their close involvement in issues of compliance, especially where these involve decisions as to whether or not a vessel continued fishing (SC-CAMLR-XX, paragraph 4.85).

Research into and Experiences with Longline Mitigation Measures

Night Setting

6.47 The Working Group noted that night setting continued to be one of the most effective methods of mitigating albatross incidental mortality (WG-FSA-02/36). In high-latitude areas of lower risk for seabird by-catch, full compliance with strict line-weighting requirements (e.g. as in Conservation Measure 216/XX) had resulted in some daylight setting without seabird by-catch.

6.48 The Working Group discussed the definition of nautical twilight (paragraph 6.21) and noted the revised tables available in the new observer logbooks. The Working Group encouraged technical coordinators to ensure the new forms are used.

Bait

6.49 No new research on bait relating to mitigating incidental seabird mortality was reported.

Line Weighting

6.50 Significant progress had been made during the intersessional period in exploring the application of longlines with integrated weight (IW) for autoline vessels (WG-FSA-02/22). Longlines with 0 g/m, 25 g/m, 50 g/m, 75 g/m and 100 g/m sank to 15 m depth at 0.11 m/s, 0.23 m/s, 0.27 m/s and 0.32 m/s respectively (the sink rate required under Conservation Measure 216/XX is 0.3 m/s). No adverse effects on fishing operations or on the catch rate of the target fish species (ling, *Genypterus blacodes*) were noted.

6.51 Dr G. Robertson (Australia) and Mr Smith indicated that the New Zealand Ling Longline Working Group, in collaboration with New Zealand Longline Ltd, the Australian Antarctic Division, New Zealand Department of Conservation and New Zealand Ministry of Fisheries, plans to conduct a trial in New Zealand waters in November 2002 of the effectiveness of the 50 g/m IW longline as a method for mitigating incidental seabird catches. The trial will also examine the effects of IW longlines on catch rates of target fish species, as well as operational aspects of fishing. Results of the trial will be presented to the 2003 meeting of CCAMLR. The Working Group welcomed this experiment.

6.52 One of the additional likely benefits of IW lines is that baits reach the ocean floor more quickly than on unweighted lines, and as a result baits are likely to retain their attractiveness for longer, resulting in increased effective fishing time.

6.53 WG-FSA-02/25 reported on the intrinsic sink rates (under controlled conditions) of the types of longlines most commonly used in the world's autoline fisheries. Silver line (mixture of dan line and polypropylene) sank at 0.18–0.21 m/s, whereas polyester line sank at 0.23 m/s. Polyester line set from a typical Norwegian-built autoliner sank at 0.16 m/s, 11% slower than the intrinsic sink rate; the difference is thought to be due to propeller turbulence and sea state. The paper provides a useful background against which future line-weight manipulation can be judged. In terms of new vessel design for autoliners, the direction of the propeller rotation and the side of the vessel from which the line is set are important considerations in relation to optimising longline sink rate.

6.54 Additional progress had been made during 2001/02 in the implementation of a practical line-weighting regime for vessels using the Spanish longline system. The line-weighting regime prescribed in Conservation Measure 29/XIX (8.5 kg weights spaced at no more than 40 m apart) was used during 10 cruises (up from five in 2000/01). No vessels using the Spanish longline system were active in the Convention Area where Conservation Measure 216/XX applies, and no further data have been collected on how the Spanish longline system may perform in relation to the 0.3 m/s line sink rate requirement in this conservation measure.

6.55 Outside the Convention Area, research into the use of line weighting in pelagic longline fisheries was reported in Anderson and McArdle (2002). The research highlighted that the position of weight placement on pelagic longline snoods was an important variable. Considerable variability in sink rate was noted between individual hooks; with unweighted snoods, 10% of hooks were still less than 2 m deep at a distance beyond the areal coverage of the streamer line. Although weighting generally improved hook sink rate, further research was required into both sink characteristics and operational practicality of the method in pelagic longline fisheries.

6.56 The new method of measuring line sink rate (the 'bottle test' described in Conservation Measure 216/XX) had been successfully applied in the longline fisheries in Subareas 88.1 and 88.2 during the 2001/02 season. The method had provided real-time feedback on the actual line sink rate achieved. Observers reported that calculating line sink rate with the 'bottle test' was considerably easier and cheaper than using time depth recorders and had saved considerable time, whilst allowing more data to be collected (two vessels, 345 results in 2001/02 versus three vessels, and ~100 results in 2000/01).

6.57 One problem highlighted by observers was that the 15 m attachment of the 'bottle test' meant that by the time the bottle was pulled under, the distance of the bottle from the vessel made it sometimes invisible for recording the time of sinking. The use of a 10 m attachment was suggested. The Working Group noted that on the basis of previous research, the longline had reached terminal velocity at 10 m depth, and that it would be reasonable to monitor the sink rate at 10 m depth instead of at 15 m.

Line Shooter

6.58 No new research on line shooters relating to mitigating incidental seabird mortality was reported.

Underwater Setting

6.59 No further information on the effectiveness of underwater setting for Spanish or autoline vessels was available.

6.60 Mr Baker reported the results of a trial of an underwater setting device in the Australian domestic pelagic tuna fishery. The concept of setting baits under water was tested as a seabird mitigation measure in Australian conditions during the summer of 2001/02. The objective of the trial was to assess the effectiveness of an underwater line-setting chute under

normal fishing conditions and without any other mitigation measures to mitigate seabird by-catch. The success of the trial was to be measured against the by-catch rate of 0.05 birds/thousand hooks specified in the Australian 'Threat Abatement Plan for the incidental catch (or by-catch) of seabirds during oceanic longline fishing operations' (Environment Australia, 1998).

6.61 A total of 253 observer seadays was completed, with 101 203 hooks (123 sets) observed. Of these, 58 323 hooks (58%) were deployed through the chute, 46 455 (46%) during daylight hours. The total incidental seabird by-catch rate for the period was 1.581 birds/thousand hooks, with 2.777 birds/thousand hooks for day sets and 0.889 birds/thousand hooks for night sets. Flesh-footed shearwaters *(Puffinus carneipes*) made up 97% of the total incidental seabird mortalities with wedge-tailed shearwaters (*P. pacificus*) and great-winged petrels (*Pterodroma macroptera*) making up the remainder.

6.62 Based on the limited data collected, the trial concluded that the chute, used alone, is not an effective seabird by-catch mitigation measure in Australian east coast pelagic fisheries. However, the chute did prove to be capable of setting lines under water by effectively setting baited hooks at a depth of approximately 5 m. The high incidental seabird by-catch rates indicate that the concept of only setting baits under water may not entirely remove the potential for some seabird species to see and attack baited hooks. To reduce or remove the potential for seabird interactions with baited hooks, additional measures may have to be used in conjunction with the concept of setting baited hooks under water. A preliminary report on the trial is available at www.afma.gov.au.

6.63 Ms Rivera reported that the same device was also tested at sea in waters off Hawaii in the pelagic longline fishery. Initial results from that trial indicate some reduction in incidental mortality is likely, and that the chute was operationally practical for this fishery. An additional benefit noted was an increase in the number of baits staying on hooks and a subsequent increase in fishing efficiency. Two key differences from the trial in Australia were that the device was used in conjunction with other mitigation measures (line weighting, offal control) in Hawaii, and a different suite of species with differing vulnerability to being incidentally caught are present in the two study areas. The final report is expected in late 2002.

6.64 Ms Molloy reported initial results of further trials of the capsule underwater setting device, in particular that operational elements of the device were still being refined. This device is quite different from the chute in that it sets baits to 10 m depth. The Working Group requested that results of these trials be reported to it next year and encouraged the further development of the underwater setting capsule.

Offal

6.65 Noting the successful experience of retaining offal on board in Subareas 88.1 and 88.2, the Working Group reiterated its previous advice that all vessels in all areas should use scupper screens to trap processing offal and discarded baits. The Working Group noted that where used, it was important to ensure that scupper screens are clean and functional, made of a material suitable for the saltwater environment, and kept clear to avoid vessel stability hazards. Dual scupper screens on board are recommended to allow scuppers to remain covered whilst dirty screens are cleaned. Spare covers should be on board in the event that one is lost.

6.66 The Working Group also noted that, wherever possible, offal retention, as occurs in the Subarea 88.1 fishery, is preferable. There may be practical difficulties in doing this on some vessels operating in other parts of the Convention Area; however, the Working Group strongly urged Members to ensure such issues were taken into consideration when new vessels were being built.

6.67 Based on detailed observation of processing operations on the *Argos Georgia* in Subarea 48.3 over an 82-day fishing period in 2001/02, the report of the scientific observer indicated that an estimated 15 828 fish heads were discarded with hooks still in them. This level of hook discard in fish heads is consistent with the continued high frequency of hooks found in the albatross colonies on Bird Island, South Georgia (SC-CAMLR-XXI/BG/7). The much greater frequency of hooks/line found in association with wandering albatrosses is consistent with their larger size and hence their ability to swallow entire fish heads. The hooks found in the albatross colonies were of the type used in the regulated toothfish fishery in Subarea 48.3 (SC-CAMLR-XXI/BG/7).

6.68 The Working Group attempted to investigate further the magnitude of this problem, but was unable to do so as observers do not currently report sufficient relevant data. The Working Group recommended that these data be collected in future.

6.69 The Working Group reiterated its previous advice that such potential hazards to albatrosses could be easily avoided by the removal of hooks from the fish heads, fish offal and fish by-catch prior to their discard. The Working Group again proposed that such a recommendation be added to existing conservation measures (SC-CAMLR-XX, Annex 5, paragraph 7.162), but noted that if Conservation Measure 29/XIX is not revised at CCAMLR-XXI, some alternative means of getting this message to the relevant fishers and fisheries should be considered.

6.70 The Working Group commended a scheme reported as operating on at least two vessels (*Polarpesca 1*, *Tierra del Fuego*) from Chile, whereby a bounty was paid for hooks collected by crew from processed fish heads.

Streamer Lines

6.71 The boom-and-bridle system (WG-FSA-01/44 and 01/60) was used by two New Zealand vessels in the fishery in Subareas 88.1 and 88.2 throughout the 2001/02 season. This system allows the skipper to move the position of the streamer line either to the starboard or port so that it is always directly over the longline during setting, irrespective of the wind

direction. With zero seabird by-catch in the fishery in Subareas 88.1 and 88.2, data to support the effectiveness of this design in other circumstances are not readily available. However, Dr Robertson noted, from personal observation on a cruise outside the Convention Area, that this style of streamer line performed better than any other he had previously observed and was probably as effective as paired streamer lines.

6.72 Paired streamer lines have yet to be trialled in the Convention Area. Two studies on the effectiveness of multiple lines have been conducted outside the Convention Area. WG-FSA-02/36 reported on trials of paired/triple streamer lines in Falkland/Malvinas waters. Incidental seabird catch rates for single streamer lines were 0.72 birds/thousand hooks, for paired lines 0.18 birds/thousand hooks and 0.02 birds/thousand hooks for triple streamer lines, although sample sizes were small for some of the trials, and some elements of the streamer lines used were different from the specifications which apply in Conservation Measure 29/XIX. WG-FSA-02/53 reported on trials of paired lines in the Alaska demersal longline fishery and the subsequent revisions to seabird mitigation regulations that will be promulgated in that fishery. Paired streamer lines of specified areal coverage standards were found to reduce seabird incidental catch by 88–100% relative to controls with no deterrents.

6.73 The Working Group noted that given the effectiveness of paired/multiple streamer lines and boom-and-bridle design streamer lines outside the Convention Area, they would likely have considerable benefit if applied within the Convention Area.

6.74 The Working Group also attempted to investigate the effect of the areal coverage of streamer lines on their effectiveness from observer reports. Unfortunately, adequate data are not currently collected by observers to undertake such an analysis. The Working Group recommended that such data be collected to help with designing improvements to the streamer line specification in Conservation Measure 29/XIX.

6.75 Accordingly, the Working Group strongly recommended that fishing within the Convention Area be conducted using either paired streamer lines or boom-and-bridle design streamer lines, especially including trials to test their utility in reducing incidental seabird mortality, so that additional data are available to assist review of the streamer line specification in Conservation Measure 29/XIX.

Research Needs relating to the Spanish Method of Longline Fishing

6.76 Last year, on the basis of WG-FSA-01/29, strong support was given to a proposal to determine the effectiveness of mitigation measures either singly or in combination on vessels using the Spanish longline method (SC-CAMLR-XX, Annex 5, paragraphs 7.187 and 7.188). The research is important, as the Spanish system is the most common gear deployment system in the Convention Area as well as being commonly used in adjacent non-Convention waters frequented by Convention Area albatrosses and petrels. This experiment was strongly endorsed by the Scientific Committee (SC-CAMLR-XX, paragraph 4.63) and the Commission (CCAMLR-XX, paragraph 6.26). WG-FSA-02/30 reported that that the experimental design and project cost projections had been completed, vessel availability

addressed and some 50 organisations approached for funding. A small amount of funding had been offered. However, at this time it was not possible to go ahead with the research, as considerable additional funding was still required.

6.77 The Working Group commended the considerable efforts to raise funds for this research. It reiterated that this experimentation is considered particularly important, and again urged Members to facilitate the financing, planning and undertaking of this study.

Research into and Experiences with Trawl Mitigation Measures

6.78 This topic is discussed, in relation to experiences in the Convention Area, in paragraphs 6.197 and 6.199.

6.79 WG-FSA-02/36 reported on trials on trawlers fishing around the Falkland/Malvinas Islands of a device designed to prevent birds colliding with trawl warps.

Revision of Conservation Measures 29/XIX and 216/XX

6.80 In light of the data and experiences reported above, the Working Group reviewed the relevant elements of Conservation Measures 29/XIX and 216/XX.

6.81 The following minor changes are recommended for Conservation Measure 216/XX:

(i) in paragraph B1(iii): 15 m be changed to 10 m;
(ii) in paragraph B2(v): 15 m be changed to 10 m;
(iii) in paragraph B5: 15 m be changed to 10 m; and
(iv) in paragraph B8: the numerator of the formula be adjusted to 10.

6.82 The review of Conservation Measure 29/XIX concluded that several elements of the measure, relating to line weighting for autoliners, streamer lines and hooks in discards and offal, will need to be reviewed in the near future; however, sufficient data with which to propose all potential improvements are not yet available.

6.83 The Working Group noted that as the incidental mortality of Convention Area seabirds both within and outside the Convention Area continues to be of concern, initiatives should be taken to:

(i) encourage the use of paired/multiple streamer lines, or a boom-and-bridle design streamer line in all Convention Area longline fisheries;

(ii) support experiments to determine the effectiveness of paired/multiple streamer lines, or boom-and-bridle design streamer lines;

(iii) encourage fishers to remove hooks from fish heads, fish offal and whole fish to be discarded in all Convention Area longline fisheries; and

(iv) provide additional data on the numbers of hooks discarded in fish heads, fish offal and whole fish in Convention Area longline fisheries.

6.84 The Working Group noted that in addition to the application of conservation measures to the issue of reducing incidental seabird mortality, the following issues should be taken into consideration when new vessels are built for longline fishing:

(i) Propeller rotation:
The deployment position of longlines in relation to the rotation direction of the propeller can have a major bearing on longline sink rates. Naval architects and engineers involved in vessel construction are encouraged to research the relationship between the rotation direction of the propeller and longline sink rates to identify the optimal position in the vessel from which longlines should be deployed. Computer modelling techniques and flume tank tests of scaled-down versions of vessels might identify such 'sweet spots'.

(ii) Meal plants:
Offal from processed fish discharged into the sea attracts seabirds to fishing vessels. This practice maintains the interest of seabirds in vessels, and exposes them to line setting operations when baited hooks are deployed and to the risk of ingestion of hooks embedded in fish heads, offal and discarded fish. Fish processing plants would greatly reduce this problem while at the same time providing fish meal product for sale. With vessels of suitable size, vessel designers are encouraged to build fish meal plants into new longline vessels to minimise the attractiveness of vessels to seabirds.

(iii) Vessel attachment points for streamer lines:
The greater the areal extent of streamer lines, the more effective they are in deterring seabirds. Areal coverage is improved if streamer lines can be attached to points high on the vessel superstructure. In the case of the boom-and-bridle system, capacity should exist for the components of this system to be fitted to vessels. Vessel designers are encouraged to consider these issues in new vessels, with particular attention given to the location and strength of anchor points of gear on vessels.

(iv) Through-the-hull line setting:
Longlines deployed deep under water (beneath the upwelling effects of the propeller) are likely to reduce contact between baited hooks and seabirds, particularly species that feed by surface seizure. This will have dividends for both seabird conservation and fishing efficiency, since fewer baits will be taken from hooks. Vessel designers are encouraged to incorporate underwater setting in the design and construction of new longline vessels.

(v) Moon pool:
Hauling aboard longlines in a manner that exposes seabirds to baited hooks increases the likelihood of live captures. Through-the-hull line hauling – or the 'moon pool' concept – would eliminate this problem; it would also reduce the contact between seabirds and non-target fish species flicked off longlines, because these species would sink out of reach of birds by the time they are clear of the vessel. Vessel designers are encouraged to adopt moon pool line hauling concepts in the construction of new longline vessels.

(vi) Deck lighting:
Lights that illuminate the water where longlines are deployed provide visual cues for night-feeding seabirds to attack baited hooks. Vessel designers are encouraged to locate lights in positions that minimise illumination astern, while maintaining suitable on-board illumination to ensure crew safety is not compromised.

6.85 The Working Group requested further information from France in relation to their statement last year concerning the design of their five new longline fishing vessels (CCAMLR-XX, paragraph 6.13).

Incidental Mortality of Seabirds during Unregulated Longline Fishing in the Convention Area

General

6.86 As no information is available on seabird by-catch rates 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.

6.87 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.

6.88 This year, a new method of estimating IUU catch of toothfish in Subarea 48.3 was presented in WG-FSA-02/4 and 02/5 (paragraphs 3.17 to 3.22).

6.89 The model described in WG-FSA-02/4 also estimates the numbers of seabirds caught by IUU fishing in Subarea 48.3, presenting mean and confidence limits for estimates rather than the minimum and maximum estimates currently presented in CCAMLR reports. The derivation of IUU seabird by-catch rates used in WG-FSA-02/4 was described in WG-FSA-02/5. Summer rates were calculated using the 1997 observer data up to the end of March, and winter rates were calculated using the data from 15 April (Table 6.8). It has been assumed in the past that, since regulated CCAMLR fishing vessels were operating largely without mitigation measures in 1997, their seabird by-catch rates would be indicative of those of IUU vessels.

6.90 One of the vessels fishing in 1997, the *Isla Isabel*, reported very high by-catch rates on one cruise but caution has previously been expressed about these data since only 10% of hooks were observed (SC-CAMLR-XVI, Annex 5, paragraph 7.55). WG-FSA-02/4 provided calculations with and without these data. The Working Group suggested that all the *Isla Isabel* data should be included, because very high seabird by-catch rates are not unknown in this and other fisheries, but that the seabird by-catch estimates should be included into the main model in WG-FSA-02/4 as weighted rather than unweighted bootstraps. Weighting could, for instance, use both total hooks set and hooks observed to reflect sampling density.

6.91 The Working Group agreed that these papers represented significant advances in the estimation of IUU catches of both seabirds and fish. It would be useful to see if the method could be applied to other CCAMLR areas. However, it was also recognised that there are many more data available from Subarea 48.3 than other CCAMLR areas, and this may limit its wider application.

6.92 The Working Group agreed to develop a simpler way of estimating potential by-catch of seabirds associated with IUU fishing in the Convention Area and a clearer way of presenting the results of this. Dr Agnew agreed to investigate this further intersessionally in collaboration with ad hoc WG-IMAF, the Secretariat and with Members who may hold appropriate data. In addition, the Secretariat was requested to implement the seasonal delimitation suggested in WG-FSA-02/4 and 02/5 for all the estimated seabird by-catch data available to date.

Unregulated Seabird By-catch in 2002

6.93 In view of the fact that:

(i) seabird by-catch rates in the regulated fishery have been reduced substantially since 1997, due to much better compliance with CCAMLR conservation measures, including those relating to closed seasons; and

(ii) it is unreasonable to assume that the unregulated fishery made comparable improvements to the timing and practice of its operations;

the Working Group decided that it should continue to use the seabird by-catch rates from 1997, as was done in previous assessments. The assessment this year, therefore, followed the identical procedure to that used in previous years, except that the calculation was prepared on a fishing season basis, in place of the split-season used in the past. The assessment has been incorporated into a background paper (SC-CAMLR-XXI/BG/23). It should be noted that applying some of the seabird catch rates used in SC-CAMLR-XXI/BG/23 to the whole unregulated fishery may produce a considerable overestimate of seabird by-catch, at least in some areas.

Results

6.94 It was noted that in addition to the change from split-year to fishing season, the review by WG-FSA of data on IUU removals of *Dissostichus* spp. resulted in several changes to historical data. Therefore the estimates of IUU removals of seabirds for all previous years show differences from previously reported values.

6.95 Commensurate with changes in IUU effort since last year, estimates of seabird by-catch have decreased in Subareas 48.3, 58.6 and 58.7 and Division 58.4.4, and increased in Divisions 58.5.1 and 58.5.2. For the first time, IUU catches were potentially taken from Subarea 88.1, producing a low level of assumed estimated seabird by-catch in this area.

6.96 The overall estimated totals for the whole Convention Area indicate a potential seabird by-catch in the unregulated fishery of 39 000–52 000 (lower level) to 70 000–93 000 seabirds (higher level) in 2001/02. These values, in relation to the estimates from previous years, are shown in Figure 6.2.

6.97 As in previous years, it was emphasised that the values in SC-CAMLR-XXI/BG/23 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.

6.98 Nevertheless, even taking this into account, the Working Group endorsed its conclusions of recent years that such levels of mortality continue to be unsustainable for the populations of albatrosses and giant and white-chinned petrels breeding in the Convention Area.

Summary Conclusion

6.99 Ad hoc WG-IMAF once again urgently drew the attention of WG-FSA, the Scientific Committee and the Commission to the numbers of albatrosses and petrels being killed by unregulated vessels fishing in the Convention Area. Since 1996, an estimated total of 278 000 to 700 000 seabirds have been killed by these vessels. Of these:

(i) 74 000 to 144 000 were albatrosses, including individuals of four species listed as globally threatened (Vulnerable) using the IUCN threat classification criteria (BirdLife International, 2000);

(ii) 13 000 to 24 000 were giant petrels, including one globally threatened (Vulnerable) species; and

(iii) 203 000 to 378 000 were white-chinned petrels, a globally threatened (Vulnerable) species.

6.100 These levels of loss of seabirds from the populations of these species and species groups are 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.

6.101 These and several other albatross and petrel species are facing potential extinction as a result of longline fishing. The Working Group again urgently requested the Commission to continue to take action to prevent further seabird mortality by unregulated vessels in the forthcoming fishing season.

Incidental Mortality of Seabirds during Longline Fishing
outside the Convention Area

6.102 The Working Group considered papers reporting on seabird mortality from fisheries conducted outside the CCAMLR Convention Area but which affected birds that breed within it.

6.103 WG-FSA-02/36 reported on by-catch of seabirds in the longline fishery for *D. eleginoides* around the Falkland/Malvinas Islands (Area 41) during 2001/02. A total of 8 066 014 hooks was set in this fishery and a total of 25 dead birds was observed on 860 120 hooks (0.029 birds/thousand hooks[1]). These by-catch rates are much lower than earlier reports for this fishery. Almost all (23) mortalities were black-browed albatrosses, which were likely to have been from the local population. Only two white-chinned petrels were killed. Regression models suggest that by-catch of black-browed albatrosses increased with abundance of birds present during setting. This paper also provided a very useful historic summary of fishery–seabird interactions around the Falkland/Malvinas Islands.

6.104 WG-FSA-02/18 reported on by-catch of seabirds in the longline fishery for *D. eleginoides* around southern Chile (Area 87) from September 2001 to June 2002. Black-browed albatrosses were caught most frequently in this fishery. Sooty shearwaters, Cape petrels and white-chinned petrels were also caught in lesser numbers. The mortalities to the latter two species were likely to be from breeding populations within the Convention Area. Seabird by-catch rates increased markedly during October and November compared to earlier in the year.

6.105 WG-FSA-02/82 reported on by-catch of seabirds in the *D. eleginoides* longline fishery operating in Argentine waters on the Patagonian shelf (Area 41) from 1999 to 2001. A total of 9 696 196 hooks was observed during this period and 710 seabird mortalities (0.07 birds/thousand hooks) were reported. The annual by-catch rate varied between 0.04 and 0.27 birds/thousand hooks. Given a fishing effort of 20 million hooks per annum, the total seabird by-catch for this fishery could range between 800 and 5 400 birds per annum[2]. Black-browed albatrosses (53%) and white-chinned petrels (26%) were caught most frequently, the former from the breeding populations of the Falkland/Malvinas Islands, most or all of the latter from the populations breeding in the Convention Area. Wandering albatrosses, grey-headed albatrosses, southern royal albatrosses, southern giant petrels, Cape petrels, sooty shearwaters and grey petrels were also killed. Many of these birds are likely to have been from breeding populations within the Convention Area.

6.106 In a document submitted to the Secretariat, Uruguay reported that in six toothfish longline fishing voyages in FAO Statistical Areas 47, 51 and 57 during 2001/02, observers did not report any seabird mortality.

6.107 Two white-chinned petrels were killed in toothfish longline fishing operations by South Africa, within its EEZ but outside the Convention Area, during 2001/02 (WG-FSA-02/17).

6.108 WG-FSA-02/43 reviewed spatio–temporal trends of longline fishing effort in the Southern Ocean and implications for seabird by-catch. It described the extent and magnitude of demersal and pelagic longline fisheries (mainly for tuna) in southern waters and the deficiencies in management of some of these fisheries relating to both fishery and seabird by-catch monitoring and regulation. These deficiencies include the poor recording of effort statistics, a lack of adequate at-sea monitoring and an inability to control illegal fishing. The spatial and temporal distributions of effort in the pelagic and demersal fisheries have changed markedly over time. These distributions also differ between fleets (often depending on target

[1] Given as 0.017 birds/thousand hooks in WG-FSA-02/36

[2] Given as 1 500–8 000 birds in WG-FSA-02/82

species) and within a fleet over a season. Changes in the magnitude of effort and the major fleets of influence can have substantial implications for interactions with seabirds. Effort statistics presented in this paper underestimate the true level. However, it is clear that longline effort in southern waters has increased markedly since the late 1960s and early 1970s. The total reported effort from all longline fleets is now well over 250 million hooks per year and has been at this level since the early 1990s. Recent substantial increases in illegal fishing have occurred in both the pelagic and demersal longline fisheries. Estimates of by-catch from IUU fishing for toothfish alone would suggest that current levels of seabird mortality are not sustainable. When combined with the impacts from regulated fisheries, some of which show either inconsistent use of mitigation devices or none at all, the long-term viability of many Southern Ocean species of seabird may be in jeopardy. The Working Group noted the importance of this study in addressing the global impacts of longline fishing on seabirds occurring in the Convention Area.

6.109 The Working Group recommended that responses be sought by the Secretariat on seabird by-catch levels, mitigation measures in use (and whether voluntary or mandatory) and observer programs from all Members and other countries conducting or permitting longline fishing in areas where seabirds from the CCAMLR Convention Area are killed.

Research into the Status and Distribution of Seabirds

6.110 Following last year's request for information summarising national research on seabirds (albatrosses and *Macronectes* and *Procellaria* petrels) vulnerable to longline fisheries interactions, papers were presented by the USA (WG-FSA-02/72) and New Zealand (WG-FSA-02/37), and information submitted during the meeting by Chile and Australia. Reference to research on albatrosses by South Africa is included in WG-FSA-02/16 and research by Chile in WG-FSA-02/18. Of the countries known to be conducting relevant research on these species, no reports were received from the UK and France (both of which provided full reports last year) and Argentina.

6.111 The US report (WG-FSA-02/72) included details of current research into methods to monitor and mitigate seabird by-catch. This was viewed by the Working Group as an additional valuable contribution to its work. All Members are requested to include details of mitigation research in their annual update to the Working Group on the current status of relevant research programs.

6.112 Previously it was noted that the information regarding assessments of population dynamics and foraging ranges was insufficient for comparisons with levels of by-catch and fishing effort. Consequently Members were requested to provide additional details to assist these important assessments (SC-CAMLR-XIX, Annex 5, paragraphs 7.10 and 7.11). New Zealand (WG-FSA-02/37) and Chile were the only Members to provide new information this year.

6.113 All information provided to date was summarised in SC-CAMLR-XXI/BG/22, which updates SC-CAMLR-XX, Annex 5, Tables 49 and 50. All Members were again requested to provide any new or outstanding details of population dynamics studies and foraging ranges. The submission of the population and foraging research information to next year's meeting of WG-IMAF should enable a timely review of the level of information available for each population.

6.114 The most recent assessments of the global status of albatrosses, giant petrels and *Procellaria* petrels are reflected in SC-CAMLR-XXI/BG/22. This summary reflects the revised status of the black-browed albatross from Near-Threatened to Vulnerable (SC-CAMLR-XXI/BG/22). This change was principally based on population declines newly reported for the Falkland/Malvinas Islands where 70% of the world population breeds. The species now meets the IUCN criteria for Vulnerable status, whereby it is inferred that the species has declined in numbers by >30% over the last 30 years (probably owing to mortality caused by longline fisheries), and it is projected that declines will continue into the future.

6.115 To enable revisions to the population status of populations vulnerable to fishery-related mortality in the Convention Area, Members are requested to provide information on the most recent assessment of population size (year and population size estimate, and population trend) for each population, where this information is available. No new compiled datasets were received this year. New information was extracted for specific populations from information provided by Australia (WG-FSA-02/23), Chile (WG-FSA-02/18) and South Africa (WG-FSA-02/23). This information has been incorporated in SC-CAMLR-XXI/BG/22 to update SC-CAMLR-XX, Annex 5, Table 49.

6.116 Information on the breeding population of black-browed albatrosses at Heard Island between 1947 and 2000 (Woehler et al., 2002) was reviewed. Census data were collected on 16 of 53 visits, but all colonies were surveyed on only three occasions, albeit at different stages of the breeding season. Comparisons of the survey data were interpreted in the paper to reflect a trebling of the population since 1947, with approximately 600 pairs in 2000. The Working Group was cautious about the interpretation of the increasing trend given the disparate nature of the data. The Working Group commended the initiation of systematic surveys of the population and recommended the continuation of the monitoring of this population.

6.117 The population dynamics of wandering albatrosses at Marion Island were described with respect to the effects of environmental (ENSO) and anthropogenic (longlining) influences (WG-FSA-02/16). The proportion of first-time breeders was positively correlated with a maximum ENSO index, whereas the annual survival rates of breeding adults was negatively correlated with Japanese longline fishing effort in the Southern Indian Ocean. Survival rates of adult females were lower than those of adult males, although survival rates of juveniles were not gender specific. Overall, adult survival rates were consistent with those recorded at other Indian Ocean sites (Crozet) but differed from Atlantic sites (South Georgia), suggesting common factors operating at ocean-basin scale. The authors recommend the implementation of international conservation initiatives to reduce the impact of longline fishing on wandering albatrosses at Marion Island.

6.118 Of the 12 breeding sites for black-browed albatrosses, three occur in Chile – Diego de Almagro, Ildefonso and Diego Ramirez Islands. Populations at these locations have been censused only once previously. In light of decreases recorded elsewhere, an urgent need

has been long recognised to recensus the Chilean populations and assess their conservation status. WG-FSA-02/23 reported on the results of a census in 2001 of the black-browed albatrosses on Diego de Almagro. Six colonies, and a total of 15 600 albatrosses were recorded for the island. To consolidate our knowledge of the status of albatrosses breeding in Chile, many of which forage in the Convention Area (paragraphs 6.120 and 6.121; SC-CAMLR-XXI/BG/22), the populations at Ildefonso and Diego Ramirez are in urgent need of reassessment.

6.119 The Working Group welcomed the progress report of Chilean research on albatross ecology and conservation (WG-FSA-02/18). Population surveys of black-browed albatrosses at Gonzalo Island have varied between 3 862 and 5 173 pairs, although interannual variation makes assessments of trends premature. Similarly, the high level of interannual variability of grey-headed albatrosses (range of 2 335 to 4 501 pairs between 1980 and 2001), together with their biennial breeding frequency, precludes confident assessment of trends.

6.120 The foraging distributions of black-browed and grey-headed albatrosses during the 2001/02 breeding seasons were reported in WG-FSA-02/18. Black-browed albatrosses prospected shelf waters during incubation and chick brooding stages, foraging in more southerly waters (south of 55°S) when foraging to feed large chicks. Grey-headed albatrosses showed a more extensive pelagic distribution during the breeding season, foraging in increasingly more southerly waters as the season progressed.

6.121 The foraging information was compared with the locations of longline setting operations in the toothfish fishery in southern Chile (WG-FSA-02/18). There was extensive overlap by black-browed albatrosses with fishing operations, whereas overlap by grey-headed albatrosses with the fishery was relatively limited. Both albatross species were foraging in CCAMLR Subareas 48.1 and 88.3 during summer months. Further tracking will be required to assess the risks faced by these populations at sea.

6.122 With the exception of the Chilean satellite-tracking studies, no new research programs focussing on populations relevant to the Convention Area have been started since 1999. Assessments of population size and trends of many populations and species affected by longline fishing remain absent. The most detailed studies are for the *Diomedea* albatrosses, with considerably less known for the *Thalassarche*, *Phoebetria*, *Macronectes* and *Procellaria* respectively. It is disturbing that, of all the species killed on longlines in southern waters, our understanding of the population size, trends and foraging ranges remains most deficient for white-chinned petrels, the species most commonly killed in the Convention Area.

6.123 The summary of foraging ranges of relevant albatross and petrel populations (at different times of year and stages of the breeding cycle), has been updated in SC-CAMLR-XXI/BG/22. Ultimately it is envisaged that these data will be assessed with respect to overlap with fisheries operations, and ultimately, to compare at-sea distributions with data on fishing effort. Incomplete provision and availability of data are preventing further progress. Further information on the CCAMLR areas prospected by the different populations will enable refined estimates of ranges of relevance to regional risk assessments.

6.124 The deficiencies resulting from the lack of relevant research into population dynamics and foraging ecology of most populations still persist, as noted last year (SC-CAMLR-XX, Annex 5, paragraph 7.21). If sufficient information is available next year, the Working Group intends to reassess the status of knowledge at a population level.

6.125 Recognising the importance of validating the species of birds killed, as well as determining their sex, age, and where possible provenance, the observer logbooks were modified in 1996 to require an entry indicating the place of deposition and the scientists responsible for relevant material (SC-CAMLR-XV, Annex 5, paragraph 7.20).

6.126 In view of the importance of trying to identify the population of origin of birds killed on longlines and the substantial progress with the ability to determine provenance via DNA profiles, the Working Group reiterated the requirement to retain specimens wherever possible. The Working Group also requested that Members be asked to supply information regarding the extent and location of their seabird by-catch collections.

International and National Initiatives relating to Incidental Mortality of Seabirds in relation to Longline Fishing

Second International Fishers' Forum (IFF2)

6.127 The Western Pacific Regional Fishery Management Council will host the Second International Fishers' Forum (IFF2) in Honolulu, Hawaii, USA, from 19 to 22 November 2002. In November 2000, New Zealand hosted the First International Fishers' Forum (IFF1) which focused on methods to solve the incidental catch of seabirds by longline fishing gear. IFF2 will build on the efforts made by the participants at IFF1, and will also include discussions on sea turtle biology and behaviour, and on reducing and minimising the harmful effects of interactions between sea turtles and longline gear.

6.128 The mission of the forum is to convene an international meeting of fishers to address possible solutions to incidental by-catch of sea turtles and seabirds by longline fishing gear. The primary objectives are to:

(i) increase the awareness of fishers that incidental longline catch of seabirds and sea turtles may pose a serious problem to these populations and to the continued operations of longline fishing;

(ii) promote the development and use of practical and effective seabird and sea turtle management and mitigation measures by longline fishers;

(iii) foster an exchange and dissemination of information among fishers, scientists, resource managers, and other interested parties on the use of mitigation measures, and the development of coordinated approaches to testing new measures;

(iv) promote the development and implementation of collaborative mitigation research studies by scientists, fishers, resource managers, and other interested parties; and

(v) build on IFF1 to encourage continued progress and new participants.

6.129 Detailed information on IFF2 can be found at www.wpcouncil.org/iff2.htm. Forms are available for registration, travel assistance applications, poster and exhibit registration. The Working Group encouraged CCAMLR Members to promote the active participation of

their longline fishers, scientists, gear technologists, fishery managers and any other interested parties. Effective solutions to seabird (and sea turtle) by-catch problems can best be solved by collaborative and cooperative approaches such as those provided through this international forum.

Agreement on the Conservation of Albatrosses and Petrels (ACAP)

6.130 Since 1999, parties to CMS have been pursuing the development of ACAP (SC-CAMLR-XX, Annex 5, paragraphs 7.195 to 7.198). Progress was noted on ACAP's current status (SC-CAMLR-XXI/BG/20). To date, ACAP has eight signatories (Australia, Brazil, Chile, France, New Zealand, Peru, Spain and the UK) and two (Australia and New Zealand) of the necessary five ratifications required for entry into force.

6.131 In April 2002, Spain became the most recent signatory to ACAP. Spain is the first major fishing nation to recognise the importance of ACAP in the conservation of albatrosses and petrels in the southern hemisphere.

6.132 At the recent CMS Conference of Parties held in Bonn, Germany, two other parties (South Africa and the UK) both confirmed their intention to ratify shortly.

6.133 Australia, in its role as Interim Secretariat, has established a website for ACAP with the aim of keeping all Range States and interested organisations informed of current progress with ACAP and related issues. Further information can be obtained at www.ea.gov.au/biodiversity/international/index/html.

6.134 Australia is optimistic that ACAP will receive the remaining three ratifications required for the agreement to enter into force in 2003 (SC-CAMLR-XXI/BG/20).

FAO's International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds)

6.135 The Working Group noted the Commission's continued request to Members to develop and implement national plans in support of the FAO IPOA-Seabirds (CCAMLR-XX, paragraph 6.27).

6.136 Last year the Working Group requested CCAMLR Members, especially Argentina, Brazil, Chile, European Community, France (in respect of its overseas territories), Namibia, Norway, South Africa, UK (in respect of its overseas territories) and Uruguay to submit reports of their progress towards developing and implementing NPOA-Seabirds to the Working Group at its next meeting (SC-CAMLR-XX, Annex 5, paragraph 7.206).

6.137 The Working Group noted the following new information regarding the status of development on National Plans of Action (NPOA-Seabirds):

(i) New Zealand has spent two years working with a range of interests to develop a national plan of action to reduce albatross and petrel incidental catch in trawl and longline fishing. The NPOA has been consulted on once and submissions

incorporated into a new version. This is currently being finalised for a last consultation. Provided that New Zealand approves the NPOA for consultation, this will occur in late 2002. Upon final approval, the NPOA will then be implemented early in 2003.

(ii) Falkland/Malvinas Islands, South Africa, Taiwan, Australia, Norway and Uruguay (WG-FSA-02/50), and Chile are at various stages of NPOA-Seabirds preparation.

(iii) the European Community is continuing to collect information on the seabird by-catch issue but further progress has apparently not occurred on its Preliminary Draft Proposal for a Community Plan of Action that was submitted to FAO's COFI in 2001.

(iv) Japan indicated it would review comments made by WG-IMAF on its NPOA (SC-CAMLR-XX, Annex 5, paragraphs 7.209 to 7.213) and would then modify and improve the plan if necessary and practicable (CCAMLR-XX, paragraph 6.29). CCAMLR has not yet received a response from Japan to a request on the status and content of its NPOA, and the nature and status of relevant mitigating measures.

6.138 FAO members will be reporting on the implementation status of IPOA-Seabirds at the next COFI biennial meeting in February 2003. The Working Group continued to highlight the need for nations and fishing entities to develop effective NPOAs for fisheries that interact with seabirds from the Convention Area. The Working Group encouraged the CCAMLR Observer to FAO to address this point at the COFI meeting.

Regional Fishery Management Organisations (RFMOs),
Tuna Commissions and International Governmental Organisations

6.139 Last year, the Commission noted the view of the Scientific Committee that the greatest threats confronting the conservation at sea of albatrosses and petrels breeding in the Convention Area are the levels of mortality likely to be associated with IUU longline fishing inside the Convention Area, and with longline fishing for species other than *Dissostichus* in areas adjacent to the Convention Area (CCAMLR-XX, paragraph 6.33). It agreed that there is an urgent need for collaborative work with appropriate regional fisheries organisations. The Commission requested Members to give every assistance to developing appropriate collaboration and data exchange with the relevant tuna commissions and other regional fisheries organisations (SC-CAMLR-XX, paragraphs 4.73 and 4.74).

6.140 In pursuit of this endeavour, the CCAMLR Secretariat provided briefing materials on CCAMLR activities on seabird-related matters to CCAMLR Members attending meetings of the relevant regional fishery management organisations (RFMOs) and tuna commissions, and especially to those nominated to observe on behalf of CCAMLR. CCAMLR observers or, in the absence of nominated observers, Members of CCAMLR to whom information was sent, were requested, individually or collectively as appropriate, to provide feedback on the discussion of seabird by-catch in general, and the responses to the CCAMLR questions in particular, to the CCAMLR Secretariat.

6.141 Intersessionally, the CCAMLR Secretariat provided this seabird-related briefing material directly to appropriate RFMOs (CCSBT, ICCAT, IOTC, IATTC, SPC, FFA and CPPS) and requested the following information:

(i) existing data on levels of seabird by-catch;

(ii) the nature of measures to mitigate seabird by-catch currently in use and whether voluntary or mandatory; and

(iii) the nature and coverage of observer programs and whether these include observation of seabird by-catch and whether the observers are involved in assisting in the correct use of mitigating measures in relation to seabird by-catch.

6.142 The CCAMLR Observer to CCSBT (Australia) attended the meeting of its Working Group on Ecologically Related Species (ERSWG) in November 2001. Seabird-related information was discussed and would be of interest to CCAMLR. A report of the ERSWG meeting will be provided by the CCAMLR Observer once it is available from CCSBT. It was noted that the Republic of Korea is a recent member of CCSBT.

6.143 Although ICCAT has not directly responded to CCAMLR's requests for seabird-related information, the Working Group noted that three draft proposals for resolutions on seabird by-catch were presented at the ICCAT meeting in November 2001 and that this marked the first time that ICCAT had ever circulated draft proposals regarding seabirds. Due to lack of time, these proposals will be reconsidered at the November 2002 meeting. The Working Group encouraged CCAMLR Members that are also members of ICCAT to support the strongest possible resolution for taking action to address the seabird by-catch problem.

6.144 Additionally, the Working Group noted that BirdLife International presented information about its efforts to protect threatened seabirds to ICCAT's Scientific Committee on Research and Statistics at the Committee's meeting in September 2002 in Madrid.

6.145 IOTC had responded that there is no direct evidence from fishermen, observer programs, or experimental longline cruises (Russia, Japan, France and Seychelles) of any seabird by-catch in the fisheries monitored by IOTC, which cover mainly the tropical tunas and, to a lesser extent, the swordfish fishery extending to about 30°S.

6.146 However, fisheries data provided by IOTC (WG-FSA-02/43) does indicate pelagic longline effort by Japan and Taiwan in the Indian Ocean south of 40°S, areas overlapping with the foraging distribution of several albatross species that breed in the Convention Area. Based on knowledge of seabird by-catch associated with longline fisheries in analogous areas, the Working Group believed that, without use of appropriate mitigating measures, seabird by-catch was highly likely in fisheries monitored by IOTC, at least in the southern parts of its area. It urged IOTC and CCAMLR Members who are also members of IOTC to try to ensure that this topic receives serious attention at forthcoming IOTC meetings.

6.147 IATTC indicated that its observer program in the purse seine fishery has never documented the incidental catch of a seabird. IATTC has measures in place calling for the reduction of non-target catches which are not landed, but no impact on seabirds is noted given the lack of observations on seabird incidental catch.

6.148 As advised in the information provided by IATTC, the CCAMLR Secretariat requested information from the USA regarding its observer program of a pelagic longline fishery in the IATTC Convention Area. This information was provided (WG-FSA-02/39). The Working Group commended the example of an RFMO member establishing a voluntary observer program which collects information on seabird by-catch. It encouraged IATTC to establish observer programs in longline fisheries carried out within those parts of its area of responsibility which have risks of substantial associated seabird by-catch, including birds from the CCAMLR Convention Area.

6.149 The Science Officer reported that the response provided by SPC was very helpful. He had been informed in correspondence with members of IMAF that for some countries, however, the data holdings were not comprehensive.

6.150 Mr Smith informed the Working Group that the Standing Committee on Tuna and Billfish receives national reports that include non-target catch information, including seabird by-catch. This offers opportunities for sharing and exchanging relevant information with CCAMLR; the Working Group encouraged CCAMLR to pursue these opportunities.

6.151 To date, the CCAMLR Secretariat has not received responses to its seabird by-catch queries to FFA and CPPS.

6.152 With the entry into force of UNFSA in December 2001, it was noted that it is reasonable to anticipate an improved exchange of information between CCAMLR and other RFMOs on possible interactions between species for which CCAMLR is responsible and fisheries outside the Convention Area. UNFSA Articles 7 ('Compatibility of Conservation Management Measures') and 8 ('Cooperation for Conservation and Management') clearly mandate such improvement. In particular, UNFSA Article 8(6) provides for consultation between RFMOs, and through them with their members, on matters relating to living resources where management action may impact on measures already adopted by, or which are also within the competence of, more than one RFMO.

6.153 To promote this sharing of information, the Working Group requested that when CCAMLR Members submit seabird-related information to RFMOs, a courtesy copy should also be sent to CCAMLR.

6.154 The Working Group acknowledged the continuing importance of RFMOs in addressing seabird by-catch issues, particularly for distant water fleets. It encouraged the CCAMLR observers to these organisations to continue reporting on seabird-related activities and to press for inclusion of this seabird by-catch topic on RFMO agendas. This international collaboration is vital to addressing the identified threat to albatrosses and petrels of longline fishing activity in areas adjacent to the Convention Area.

6.155 The Working Group was pleased to learn that Chile is continuing to pursue submission of a proposal to the Fisheries Working Group of the Asia-Pacific Economic Cooperation (APEC) to address seabird by-catch issues in the longline fisheries. This proposal was initially discussed by several participants at IFF1 in 2000; support was noted from Australia, New Zealand and the USA.

Other International Organisations and Initiatives,
including Non-governmental Organisations

6.156 Ms Molloy reported on the formation of Southern Seabird Solutions – a new alliance of government, fishing industry and environmental groups within New Zealand – created to work cooperatively with other countries on solving the incidental capture of birds. Southern Seabird Solutions members include pelagic and demersal longline skippers, fishing company managers, fishery skills trainers, ecotourism operators, international and national policy experts, environmental campaigners and communication experts. The group had recognised a critical need to accelerate progress on solving the issue within New Zealand.

6.157 The Working Group noted that Southern Seabird Solutions is addressing the by-catch issue of albatrosses and petrels that breed in the Convention Area and commended the group for its efforts. This multi-group initiative could represent a model for the effective implementation of regional efforts to address seabird by-catch. The Working Group commended New Zealand for establishing this innovative group.

6.158 Ms Molloy reported that the International Coalition of Fisheries Associations (ICFA) adopted a resolution at its annual meeting in September 2002 that supports the efforts of Southern Seabird Solutions including the development and adoption of industry driven Codes of Practice that provide practical ways to avoid seabird capture.

6.159 Dr Nel reported that the BirdLife International Seabird Conservation Programme has several ongoing activities of note that relate to albatrosses and petrels that breed in the Convention Area:

(i) regional workshops that focus on sharing technical and practical information on which mitigation methods work best and ways to further reduce seabird by-catch and improve fishing efficiency (a South American workshop recently held in Uruguay and an Asian-focused workshop being planned in Taiwan);

(ii) incentive programs to promote the development of more seabird-friendly fishing methods and raise awareness; and

(iii) participate in the development of various databases for the estimation of global by-catch levels for at-risk seabird species and for GIS satellite-tracking information on Procellariiformes.

National Initiatives

6.160 The USA reported on various aspects of its NPOA implementation (WG-FSA-02/50) which may be of interest to CCAMLR, including:

(i) revisions being made to regulations for Alaskan demersal longline fishers that call for the use of paired streamer lines with a specified areal coverage (paragraphs 6.72 to 6.74); and

(ii) promotion of IPOA-Seabirds implementation and NPOA development through bilateral fisheries meetings, intergovernmental communications with 23 longline nations (and entities) and participation in meetings of RFMOs.

6.161 Last year the Working Group received reports on recent developments in the use of video monitoring and urged Members to report on such developments and any trials undertaken (SC-CAMLR-XX, Annex 5, paragraphs 7.100 to 7.103). The USA reported on two current initiatives (WG-FSA-02/72) to evaluate the effectiveness of video technology to monitor seabird interactions on vessels. One is a collaboration with the International Pacific Halibut Commission (IPHC) to assess the feasibility of: (i) monitoring compliance with regulated use of bird avoidance devices, and (ii) detecting and identifying seabirds that are incidentally taken during longline fishing operations. Preliminary results suggest that it is possible to detect the seabirds coming up on the longlines and to differentiate between certain species groups (albatrosses can be differentiated from fulmars and shearwaters). The second initiative is a collaboration with Archipelago Research of British Columbia in Canada, a company with extensive experience of developing video monitoring applications in commercial fishery venues. The focus of this second project is to evaluate the feasibility of using video technology to detect and identify interactions of seabirds with trawl fishing operations. Results will be reported to WG-IMAF once they are available.

Incidental Mortality of Seabirds in relation to New and Exploratory Fisheries

Assessment of Risk in CCAMLR Subareas and Divisions

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

6.163 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; and
(iii) magnitude of general potential risk of by-catch of albatrosses and petrels.

6.164 Comprehensive assessments on 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 previously combined into a background document for use by the Scientific Committee and the Commission (last year this was SC-CAMLR-XX/BG/11 Rev. 2).

6.165 This year new data on at-sea distribution of albatrosses and petrels from satellite-tracking and other studies was provided in WG-FSA-02/18. This information was used to update the assessment of potential risk of interaction between seabirds and longline fisheries for Subareas 48.1 and 88.3. Other changes were made to the advice provided for conservation measures that should be applied to all statistical areas. These largely reflect operational procedures for high-latitude areas, now accepted by CCAMLR and currently embodied in Conservation Measure 216/XX. These areas have been previously assessed as having a low to average risk of potential interaction between seabirds, especially albatrosses,

and longline fisheries. Relevant subareas and divisions are 48.1, 48.2, 48.4, 48.5, 48.6, 58.4.1, 58.4.2, 58.4.3, 58.4.4, 88.1, 88.2 and 88.3. The revised assessments incorporating new information made available at the meeting (with changes/additions underlined) have been issued as SC-CAMLR-XX/BG/21.

New and Exploratory Longline Fisheries Operational in 2001/02

6.166 Of the 24 proposals last year for new and exploratory longline fisheries in seven subareas and divisions, only two were actually undertaken: by New Zealand in Subareas 88.1 and 88.2.

6.167 No seabird by-catch was reported to have been observed in any of these fisheries. Clearly the strict adherence in Subareas 88.1 and 88.2 to the specific requirements set out in Conservation Measure 216/XX with respect to line-weighting regimes, combined with fishing in areas of average-to-low, and average risk, has proven successful in achieving zero incidental by-catch of seabirds.

New and Exploratory Fisheries Proposed for 2002/03

6.168 The areas for which proposals for new and exploratory longline fisheries were received by CCAMLR in 2002 were:

Subarea 48.6 (north of 60°S)	South Africa
Subarea 48.6	Japan, New Zealand
Division 58.4.2	Australia
Division 58.4.3a	Australia, Japan
Division 58.4.3b	Australia, Japan
Division 58.4.4	Japan, South Africa
Division 58.5.2	Australia
Subarea 58.6	Japan, South Africa
Subarea 88.1	Japan, New Zealand, Russia, South Africa, Spain
Subarea 88.2	Japan, New Zealand, Russia.

6.169 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 paragraphs 6.163 and 6.165, and SC-CAMLR-XX/BG/11 Rev. 2. A summary of risk level, risk assessment, IMAF recommendations relating to fishing season and any inconsistencies between these and the proposals for new and exploratory longline fisheries in 2002, is set out in Table 6.9.

6.170 The only obvious inconsistency needing resolution (highlighted in Table 6.9), was that Russian proposals for Subareas 88.1 and 88.2 did not specify their intent to comply with Conservation Measure 235/XX.

6.171 In previous years, fishing proposals in exploratory fisheries in Subareas 48.6 (south of 60°S), 88.1 and 88.2 have received a derogation in respect of the requirement of Conservation Measure 29/XIX to set longlines at night. This exemption has been given providing that

vessels complied fully with measures specified in Conservation Measure 216/XX, designed to ensure that a line sink rate of at least 0.3 m/s was achieved during daytime fishing operations.

6.172 To date all vessels fishing in the exploratory fisheries in Subareas 88.1 and 88.2 have experienced zero seabird mortalities. The Working Group believed that this result could be attributed largely to strict adherence to this requirement, although there is a need to exercise caution in this interpretation because seabird abundance and risk of incidental mortality is only low (risk level 1), or average to low (risk level 2), in the higher latitudes of Subareas 88.1 and 88.2.

6.173 Last year (SC-CAMLR-XX, Annex 5, paragraph 7.137) the Working Group agreed that this proven protocol could be extended to other vessels fishing experimentally in similar average-to-low risk areas (risk levels 1, 2 or 3). Accordingly, the Working Group recommended that the provisions of Conservation Measure 216/XX could be extended to exploratory fisheries proposed for Divisions 58.4.1, 58.4.3a, 58.4.3b and 58.4.4 in 2002/03. However, to extend this measure to higher-risk areas, such as Subarea 58.6, would be premature at this stage.

6.174 Setting longlines within the Convention Area during daylight hours using currently approved fishing gear still represents a risk for seabirds. In all instances where the provisions of Conservation Measure 216/XX are applied, there remains the need for continued review of performance with respect to incidental mortality of seabirds during fishing operations. The Working Group recommended that any vessel operating under the provisions of this conservation measure, and which catches a total of three seabirds shall revert to night setting in accordance with Conservation Measure 29/XIX. Similar provisions were specified for the 2001/02 season in Conservation Measures 228/XX, 235/XX and 236/XX.

6.175 The Working Group noted that the proposal by Australia to fish in Division 58.4.2 during the breeding season of southern giant petrels may potentially pose a risk to the small populations of this species breeding in the area. The Australian proposal stated an intention to conduct line-weighting trials, and to adopt other mitigation measures such as the use of twin streamer lines and retention of offal. These provisions would exceed the requirements of Conservation Measure 29/XIX, and thus further reduce the potential for catching giant petrels during line setting. However, the potential for giant petrels to be caught during line hauling still remained, and the imposition of a total seabird catch of three seabirds during daylight operations would be an important element for managing incidental mortality in this fishery.

6.176 With respect to the prescription of a seabird by-catch level, the Working Group also noted there did not appear to exist a statement on the precise definition of the status of birds 'caught'. Accurate definition of this needs to be provided, *inter alia,* to assess more accurately in by-catch assessments the numbers of birds killed.

6.177 Agreement may also be needed on the level of observation necessary for accurate determination of the numbers of birds caught, specifically in relation to conservation measures which specify a limit on reaching which fishing should cease. This issue is clearly of relevance to fisheries where exemptions from elements of conservation measures have been made, dependent on prescribed performance criteria, as well as to other aspects of CCAMLR's work.

6.178 One approach would be to accept that full observer coverage (100% of hooks observed) would be required to reliably detect all birds caught. Thus if there was 100% coverage, a by-catch of three birds would be allowed. If observer coverage is less than 100%, we would expect that so long as it is greater or equal to about 25% over the course of a fishery, we could derive a reliable statistical estimate of the number of birds caught by a vessel over a season (paragraph 6.7). However, concern was expressed that levels of observer coverage less than 100% would not be sufficient to ensure a good estimate of birds. Therefore the by-catch limit would be prorated down if observer coverage was less. Taking into account that the by-catch should be set to integer birds, this would imply a limit of three birds for rates of observation of 100%, two birds for rates of 60–100% of hooks and one bird for rates of 25–60% of hooks. Once a cap has been reached at a certain level of coverage, daylight setting operations should cease. Coverage should not be increased to potentially meet a higher bird cap level.

Other Incidental Mortality

Interactions involving Marine Mammals
with Longline Fishing Operations

6.179 There were no reports of marine mammal mortality associated with longline vessels.

6.180 Interactions with marine mammals, in which there was loss of fish, were reported from 73% of vessels fishing in Subarea 48.3 and 30% of vessels in Subareas 58.6/58.7 (WG-FSA-02/13 and summarised in Table 6.10 with comparison to previous years). However, the depth at which interactions with marine mammals occur means that direct observation of fish removal is often very difficult. While the quantification of the interactions is clearly problematic, all vessels operating in Subarea 48.3 provided anecdotal reports of reduced catches and/or damaged fish when large numbers of killer (*Orcinus orca*) and/or sperm (*Physeter catodon*) whales were present at the time of hauling.

6.181 No such interactions were reported for Subarea 88.1, despite sightings of killer whales from the fishing vessels on most cruises.

Interactions involving Marine Mammals and Seabirds
with Trawl and Pot Fishing Operations

6.182 A single penguin was found dead in the net of a Japanese vessel fishing for krill in Subarea 48.2. Two Antarctic fur seals (*Arctocephalus gazella*) were released alive from a Japanese vessel fishing for krill in Subarea 48.3 (from Japan's Report of Member's Activities in 2001/02 as posted on the CCAMLR website).

6.183 The scientific observer recorded no incidental mortality associated with the single vessel (*Kinpo Maru No. 58*) that participated in the pot fishery for crabs in Subarea 48.3.

6.184 In respect of trawl fisheries for *C. gunnari* and *D. eleginoides* in Division 58.5.2 there was only one report of incidental mortality – that of a single southern elephant seal (*Mirounga leonina*) (WG-FSA-02/12).

6.185 In respect of trawl fisheries for *C. gunnari* in Subarea 48.3, there were no reports of marine mammal entanglement or incidental mortality.

6.186 The Working Group recollected that last year, in order to restrict seabird by-catch in this fishery to low levels, pending the collection of data to propose appropriate mitigation measures, the Commission decided that an interim precautionary seabird by-catch limit of 20 birds per vessel trawl fishing for icefish in Subarea 48.3 would be appropriate (CCAMLR-XX, paragraphs 6.38 and 6.39).

6.187 Last year a total of 132 seabird entanglements was reported, of which 92 were fatal, 40 birds being released alive (SC-CAMLR-XX, Annex 5, paragraph 8.5), by the five vessels engaged in this fishery.

6.188 This year, based on data from observer logbooks and supplementary material in the observer reports, a total of 125 seabird entanglements was reported, of which 73 were fatal and 52 birds were released alive (Table 6.11). The birds killed comprised 20 black-browed albatrosses, 52 white-chinned petrels and 1 Antarctic prion (*Pachyptila desolata*); the birds released comprised 13 black-browed albatrosses and 39 white-chinned petrels.

6.189 Two vessels (*In Sung Ho* and *Argos Vigo*) appeared to have reached the by-catch limit; a third vessel (*Robin M. Lee*) closely approached this limit.

6.190 The Working Group noted that the level of seabird mortality in the trawl fisheries for *C. gunnari* in Subarea 48.3 in 2002 was an order of magnitude greater than that in the regulated longline fishery in the same subarea.

6.191 Data from observer reports indicate that 25% of bird deaths in 2002 were recorded during setting; however, the Working Group noted that it was unlikely that birds captured during setting would be retained in the net until hauling.

6.192 There was no significant relationship between total fish catch and bird by-catch ($r = -0.46$, $P < 0.05$). The *Argos Vigo*, which had the equal greatest reported bird by-catch, fished for the shortest period of time and had the lowest fish catch (data from observer reports). The *Zakhar Sorokin* and the *Bonito* fished for a longer period and caught fewer birds than other vessels. Last year (SC-CAMLR-XX, Annex 5, paragraph 8.14) an indication was given that the operational characteristics of the *Zakhar Sorokin* may have contributed to its zero seabird by-catch in 2001; if these characteristics were maintained they may have contributed to its relatively low seabird by-catch in 2002.

6.193 Last year (SC-CAMLR-XX, Annex 5, paragraph 8.20) the Working Group requested that provision be made in the *Scientific Observers Manual* logbook data recording and reporting sheets and instructions to scientific observers, for recording:

(i) the nature and timing of offal discharge (noting that Conservation Measure 173/XVIII prohibits this during shooting and hauling of trawl gear);

(ii) the location, level and direction of deck lighting in use during hauling operations (for which recommendations are made in Conservation Measure 173/XVIII); and

(iii) any other details relevant to entanglement and mortality of seabirds, including video recording as feasible, together with suggestions as to how these could be avoided.

6.194 In addition, the Commission (CCAMLR-XX, paragraph 6.37) recommended that in respect of vessels trawl fishing for icefish in Subarea 48.3 in 2001/02:

(i) new data recording and reporting arrangements be put in place for scientific observers, to ensure that more data are available to investigate and resolve the causes of the problem; and

(ii) mitigating measures be tested with the aim of incorporating appropriate recommendations into Conservation Measure 173/XVIII.

6.195 Offal discharge during setting and hauling was recorded during a small number of hauls on the *Bonito* and *Argos Vigo* (Table 6.19). However, the amount of offal would be expected to be relatively small as the icefish catch was frozen whole. Information about deck lighting was received from three vessels and was consistent with safe vessel operation (Table 6.19). No video material accompanied any of the observer reports.

6.196 There were two scientific observers on board all vessels except the *Robin M. Lee*; however, the only vessel which indicated that there was a dedicated seabird observer was the *Argos Vigo*. The report from the *Argos Vigo* contained detailed information on observations of seabird interaction with nets during setting and hauling and of tests of mitigation measures.

6.197 Tests of mitigation measures conducted on the *Argos Vigo* included cable mitigation measures (consisting of two poles, 4 m in length, suspended from the A-frame, with streamers and bottles attached to produce a visible and audible deterrent). These measures may have reduced potential seabird interactions with trawl cables but they had limited impact on seabird interactions with nets, which generally occurred up to 150 m astern of the vessel. Ensuring that the net was cleaned of enmeshed fish prior to setting apparently made the net less attractive to birds; however, there were indications from other vessels that this made little difference to the level of seabird interactions, although this was not quantified. Scaring devices (fireworks) were also tested. Their deployment was restricted to the period of net hauling due to the limited number available. The average period that the net was at the surface during hauling was 26 minutes; deploying fireworks during this period dispersed feeding aggregations of seabirds for up to 7 minutes, but more often only for 1 minute.

6.198 Much of the mortality of the two main species involved, black-browed albatross and white-chinned petrel, arose as a result of seabirds diving into the net to obtain food and being unable to escape. As reported last year (SC-CAMLR-XX, Annex 5, paragraph 8.11) seabirds were primarily caught in the large mesh at the wings and mouth of the net. There was no reported mortality associated with seabirds colliding with warps; however, observation of seabird interactions with trawl vessels in Subarea 48.3 was primarily directed towards setting and hauling nets, rather than to trawl warp interactions. It is apparent from other studies of seabird interaction with trawl vessels that detection of particular incidents, such as impact with trawl warps, is likely to go unreported unless there is specific observation of warps during the period of fishing (WG-FSA-02/36 and 02/59).

6.199 WG-FSA-02/36 reported the results of a detailed investigation of seabird mortality associated with trawl fishing around the Falkland/Malvinas Islands. All the seabird mortality (mainly of black-browed albatrosses and giant petrels) occurred as a result of collisions with trawl warps, especially when birds became entangled with warp splices. There were no records of seabirds caught in the net; however, the mesh size of the mouth of the net was 120–140 mm compared to a 400 mm mesh width at the mouth of the nets used in the trawl fishery for icefish in Subarea 48.3.

6.200 Last year (SC-CAMLR-XX, Annex 5, paragraph 8.12) the Working Group indicated that high seabird by-catches might be related to specific aspects of vessels or fishing operations. This year's data indicate that all vessels operating in the fishery caught seabirds; of the three that did so in substantial numbers, two were new to the fishery and catch levels of the third (*Argos Vigo*) were similar to last year.

6.201 Mr Williams indicated that the trawl fishery for icefish in Division 58.5.2 did not experience a similar by-catch of seabirds (see also SC-CAMLR-XX, paragraph 4.82). He noted that the vessels operating in this fishery had fish meal plants on board and did not discharge offal, making them much less attractive as a source of food for seabirds. In addition, vessels used bottom trawl gear that is heavier, has a smaller mesh at the mouth and is present at the surface for a much shorter period of time than the midwater trawl gear used in Subarea 48.3.

6.202 It was noted that the use of bottom trawls is currently prohibited in Subarea 48.3 (Conservation Measure 219/XX). It may be appropriate to reconsider whether it is bottom trawling which was intended to be prohibited and whether the use of bottom trawl gear, fished off the bottom, might be permitted, under appropriate conditions.

6.203 It was suggested that the high seabird by-catches in Subarea 48.3 might reflect the much higher densities of breeding seabirds around South Georgia than in other areas where icefish are fished. However, this was not supported by experiences with high densities of seabirds associated with trawling operations elsewhere in the Convention Area and in adjacent areas.

6.204 On the basis of the discussion, the Working Group advised that the by-catch of seabirds associated with the icefish trawl fishery in Subarea 48.3 was likely related to the nature of the fishing gear, especially midwater trawls, being used. It recommended that this be investigated further by continuing the work recommended by the Commission last year (CCAMLR-XX, paragraph 6.37).

6.205 The Working Group recommended investigation into the effect of season and densities of seabirds on incidental mortality rates associated with trawling operations. Technical coordinators were asked to facilitate the collection of these data wherever possible.

6.206 The Working Group noted the comments of the Scientific Committee concerning the potential closure of the icefish fishery during critical periods, as specified for the longline fishery, in relation to reducing the levels of seabird by-catch (SC-CAMLR-XX, paragraph 4.90). It recognised that its evaluation of the problem was not complete. However, it recommended that unless the levels of seabird by-catch in the icefish fishery could be more

effectively mitigated, consideration should be given to restricting the fishing season, at least during the main chick-rearing period of black-browed albatrosses and white-chinned petrels (January–April).

6.207 The Working Group also noted that as most seabirds captured during setting are unlikely to be recorded at hauling (see paragraph 6.191), some birds killed at hauling are not brought onto the vessel and that a proportion of the birds released alive have injuries prejudicial to their survival, it is necessary to define precisely what is meant by the number of birds caught (paragraph 6.176) and to take account of this in any review of the seabird by-catch limit.

6.208 It would also be necessary to make appropriate provision in the *Scientific Observers Manual* logbook data recording and reporting forms, and instructions to scientific observers, for distinguishing birds landed alive but with potentially fatal injuries from those released alive with no or minor injury (paragraph 6.16).

Advice to the Scientific Committee

General

6.209 The plan of intersessional work (Appendix D) summarises requests to Members and others for information of relevance to the work of the Working Group (paragraphs 6.1 to 6.3). Members are particularly invited to review the membership of the Working Group, to suggest additional members and to facilitate attendance of their representatives at meetings (paragraph 6.4).

Incidental Mortality of Seabirds during Regulated Longline Fishing in the Convention Area in 2002

6.210 (i) For Subarea 48.3 the total estimated seabird by-catch in 2002 was only 27 birds at a rate of 0.0015 birds/thousand hooks, very similar to the values of the last two years (paragraph 6.9).

(ii) No observed seabird by-catch was reported from within the South African EEZs in Subareas 58.6 and 58.7, a substantial reduction from the estimated 199 birds last year (paragraph 6.10). The causes of this marked improvement are unknown, although fishing effort was greatly reduced (paragraphs 6.11 and 6.12).

(iii) No incidental mortality of seabirds was observed in Subarea 88.1 for the fourth successive year, due to strict compliance with conservation measures (paragraph 6.13).

6.211 (i) No data were reported from longline fishing within the French EEZs in Subarea 58.6 and Division 58.5.1 in 2002; some data for the 2000 and 2001 seasons, when very high rates of seabird by-catch occurred, had recently been supplied to the Secretariat (paragraphs 6.14 and 6.15).

(ii) Submission to CCAMLR of 2002 data was requested, together with submission of 2003 data in time for analysis and evaluation at WG-IMAF (paragraph 6.14).

Compliance with Conservation Measure 29/XIX

6.212 (i) Overall compliance with this conservation measure this year, compared to last year, was substantially improved in all subareas and divisions and was again complete in Subarea 88.1. Elsewhere, one vessel fully complied with all elements of this measure at all times and eight other vessels were within 95% of the minimum requirements of all elements (paragraph 6.28).

(ii) Streamer lines – compliance with streamer line design was 86% compared with 66% last year (paragraph 6.18). In Subareas 58.6, 58.7, 88.1 and 88.2 all vessels used streamer lines on all sets; in Subarea 48.3 only four of 15 vessels did so.

(iii) Offal discharge – all vessels complied with the requirement either to hold offal on board, or to discharge on the opposite side to where the line was hauled. Only one vessel was observed to discharge offal during setting (paragraph 6.20).

(iv) Night setting – in Subarea 48.3 compliance improved from 95% last season to 99%; in Subareas 58.6 and 58.7 it improved from 78% to 99% (paragraph 6.21).

(v) Line weighting (Spanish system) – appropriate weighting was used in 63% and 66% of cruises in Subareas 48.3 and 58.6/58.7 respectively, compared with 21% and 18% in 2001 and zero in 2000 (paragraph 6.24).

(vi) Line weighting (autoline system) – the requirement to achieve a line sink rate of 0.3 m/s when fishing in daylight in Subareas 88.1 and 88.2 south of 65°S was met by both vessels (paragraph 6.26).

6.213 The Working Group again recommended that vessels which do not comply with all elements of Conservation Measure 29/XIX should be prohibited from fishing in the CCAMLR Convention Area (paragraphs 6.25 and 6.29).

Fishing Seasons

6.214 On the basis of the data for the 2001/02 fishing season in Subarea 48.3, seabird by-catch levels were very low (negligible in terms of the population dynamics of the species concerned), for the third successive season. Full compliance with Conservation Measure 29/XIX was only achieved by one vessel (paragraph 6.31). Recommendations relating to potential future extensions to the fishing season for Subarea 48.3 are provided in paragraphs 6.37 and 6.38 and discussed in paragraphs 6.39 to 6.46. Full compliance by all vessels should readily be achievable next year with small improvements to operational practice.

Research into and Experiences with Mitigating Measures

6.215 (i) Line weighting – significant progress is reported with the development of integrated weights for autoline vessels in achieving the sink rates required under Conservation Measure 216/XX; tests under operational conditions are due in November 2002 (paragraphs 6.50 and 6.51).

(ii) Underwater setting – tests of the chute were successful in the Hawaiian pelagic longline fishery but less so, at least as a sole mitigation measure, in the Australian demersal tuna fishery. Development of the underwater setting capsule continues (paragraphs 6.60 to 6.64).

(iii) Offal discharge – offal retention should be carried out whenever practicable (paragraph 6.66); appropriate scupper screens should be used at all times (paragraph 6.65); hooks should be removed from fish heads, fish offal and fish by-catch prior to their discard (paragraphs 6.67 to 6.69); a bounty scheme for retaining hooks was commended (paragraph 6.70).

(iv) Streamer lines – it is recommended, based on successful experiences outside the Convention Area, that paired streamer lines and boom-and-bridle design streamer lines should be used in the Convention Area (paragraphs 6.71 to 6.75).

(v) General – advice is provided on issues of particular importance for mitigating seabird by-catch, that should be taken into account when new longline vessels are built; information is sought from France on the relevant design specifications of their five new vessels (paragraphs 6.84 and 6.85).

6.216 The key experiment designed to determine the effectiveness of mitigation measures (either singly or in combination) for the Spanish method of longline fishing was developed, costed and submitted, with only limited success, to more than 50 funding organisations. Members were again encouraged to support this important experiment (paragraph 6.34).

Revision of Conservation Measure 216/XX

6.217 Based on its successful use last year, specific advice is provided for a minor revision to the bottle test element of this measure (paragraphs 6.56, 6.57 and 6.81).

Revision of Conservation Measure 29/XIX

6.218 Full proposals for revision of several elements of this measure (those relating to streamer lines, line weighting for autoliners and hooks in offal) are likely to be developed next year; some specific indications are given together with recommendations for data collection (paragraphs 6.68, 6.69, 6.82 and 6.83).

Assessment of Incidental Mortality of Seabirds during
IUU Longline Fishing in the Convention Area

6.219 (i) The estimates of potential seabird by-catch by area for 2002 (SC-CAMLR-XXI/BG/23) were:

Subarea 48.3:	10–20 to 50–70 seabirds;
Subareas 58.6 and 58.7:	5 900–8 000 to 10 800–14 400 seabirds;
Divisions 58.5.1 and 58.5.2:	24 300–32 600 to 43 900–59 100 seabirds;
Division 58.4.4:	8 100–10 900 to 14 700–19 700 seabirds; and
Subarea 88.1:	100–200 seabirds.

(ii) The overall estimated totals for the whole Convention Area (paragraph 6.96) indicate a potential seabird by-catch in the unregulated fishery of 39 000–52 000 (lower level) to 70 000–93 000 birds (higher level) in 2001/02. This is broadly consistent with values from previous years (Figure 6.2; SC-CAMLR-XXI/BG/23).

(iii) Since 1996 the overall total estimated potential seabird by-catch is 278 000–700 000 seabirds, comprising 74 000–144 000 albatrosses, 13 000–24 000 giant petrels and 203 000–378 000 white-chinned petrels (paragraph 6.99).

(iv) The Working Group endorsed its conclusions of recent years that such levels of mortality remain entirely unsustainable for the populations of albatrosses, giant petrels and white-chinned petrels breeding in the Convention Area (paragraph 6.100), many of which are declining at rates where extinction is possible.

(v) The Working Group recommended that the Commission take even more stringent measures to combat IUU fishing in the Convention Area (paragraph 6.101).

Incidental Mortality of Seabirds during Longline Fishing
outside the Convention Area

6.220 (i) Reports were received from Argentina, Chile, Falkland/Malvinas Islands, South Africa and Uruguay on levels of seabird by-catch observed in longline fisheries operating in areas adjacent to the Convention Area (paragraphs 6.103 to 6.107).

(ii) A review of the spatio–temporal trends of longline fishing efforts in the Southern Ocean concluded that a combination of the consistently high effort (250 million hooks per annum) in the regulated fisheries and the substantial increase in IUU fishing, threatens the long-term viability of many Southern Ocean seabird species (paragraph 6.108).

(iii) The Working Group recommended that responses continue to be sought on seabird by-catch levels, mitigation measures in use (and whether voluntary or

mandatory) and observer programs from all Members and other countries conducting or permitting longline fishing in areas where seabirds from the CCAMLR Convention Area are killed (paragraph 6.109).

Research into the Status and Distribution of Seabirds at Risk

6.221 Submitted data on:

(i) size and trends of populations of albatross species and of *Macronectes* and *Procellaria* petrels vulnerable to interactions with longline fisheries;

(ii) the foraging ranges of populations of these species adequate to assess overlap with areas used by longline fisheries; and

(iii) genetic research relevant to determining the origin of birds killed in longline fisheries;

are still insufficient for a comprehensive review of these topics. All Members are requested to submit relevant data to next year's meeting (paragraphs 6.110 and 6.112 to 6.115).

6.222 Important results from submitted information on the above topics are:

(i) potential increases in the population of black-browed albatrosses at Heard Island over the last 50 years (paragraph 6.116);

(ii) survival rates of adult wandering albatrosses breeding at Marion Island were negatively correlated with the Japanese longline fishing effort in the Southern Ocean (paragraph 6.117);

(iii) extensive data from recent research on albatrosses at breeding sites in Chile, establishing baseline population data and showing that birds forage in the Convention Area at certain times of year. Black-browed albatrosses are at particular risk from domestic toothfish longline fisheries (paragraphs 6.118 to 6.121); and

(iv) studies of population size, trends and foraging ranges are still inadequate for many seabird species in the Convention Area threatened by longline fishing mortality, especially white-chinned petrels (paragraph 6.122).

6.223 Members are requested to provide information on the extent and location of their seabird by-catch collections to facilitate the development of collaborative research to investigate the origins of birds killed (paragraphs 6.125 and 6.126).

International and National Initiatives relating to Incidental Mortality of Seabirds in relation to Longline Fishing

6.224 Information was reported on important new international initiatives under the auspices of:

(i) IFF2 – meeting in Hawaii, USA, in November 2002 (paragraphs 6.127 to 6.129);

(ii) ACAP – potential entry into force during 2003 (paragraphs 6.130 to 6.134); and

(iii) FAO-NPOAs – noting rather limited progress in development and even more so in implementation; Members reporting on implementation to COFI in February 2003 are requested also to report to CCAMLR (paragraphs 6.135 to 6.138).

6.225 Recollecting that the greatest threats confronting the conservation at sea of albatrosses and petrels breeding in the Convention Area are the levels of mortality likely to be associated with IUU longline fishing inside the Convention Area and with longline fishing for species other than *Dissostichus* in areas adjacent to the Convention Area (CCAMLR-XX, paragraph 6.33), CCAMLR made a particular effort to contact intersessionally all relevant RFMOs (paragraphs 6.140 and 6.141):

(i) CCSBT – report from November 2001 meeting still not released (paragraph 6.142);

(ii) ICCAT – no direct response but three draft resolutions relating to seabird by-catch may be discussed at the November 2002 meeting; Members encouraged to support strongest possible resolution (paragraphs 6.143 and 6.144);

(iii) IOTC – reported no evidence of seabird by-catch; however the Working Group noted extensive overlap of at-risk seabirds with longline fisheries in the southern part of the IOTC area (paragraphs 6.145 and 6.146); and

(iv) IATTC – no relevant data available; based on a US example, recommended establishment of observer programs in areas where Convention Area birds are likely to be caught (paragraphs 6.147 and 6.148).

6.226 To assist in fulfilling obligations under the newly ratified UNFSA, Members were requested to copy to CCAMLR submissions of relevant data and information to RFMOs (paragraphs 6.152 and 6.153).

6.227 The Working Group encouraged CCAMLR observers to RFMOs to continue reporting on seabird-related activities and to press for inclusion of this seabird by-catch topic on RFMO agendas (paragraph 6.154).

6.228 The Working Group commended recent initiatives addressing by-catch issues of albatrosses and petrels breeding in the Convention Area by New Zealand, USA and BirdLife International (paragraphs 6.156 to 6.161).

Incidental Mortality of Seabirds in relation
to New and Exploratory Fisheries

6.229 (i) Of the 24 exploratory longline fisheries approved for 2001/02, only two, in Subareas 88.1 and 88.2, were operational; no seabird by-catch was reported in either of these fisheries (paragraphs 6.166 and 6.167).

(ii) The assessment of potential risk of interactions between seabirds and longline fisheries for all statistical areas in the Convention Area was reviewed, revised and provided as advice to the Scientific Committee and Commission in SC-CAMLR-XXI/BG/21. There were no changes to this advice in relation to levels of risk of seabird by-catch for any part of the Convention Area. However, the potential for exemptions for daylight setting in areas of lower risk to seabirds has been incorporated into the advice (paragraphs 6.171 to 6.174).

(iii) The 21 proposals by five Members for new and exploratory longline fisheries in eight subareas/divisions of the Convention Area in 2002/03 were addressed, in relation to advice, in SC-CAMLR-XXI/BG/21 and Table 6.9 (paragraphs 6.168 and 6.169).

(iv) The only potential problems apparently needing resolving (Table 6.9 and paragraphs 6.170 and 6.176 to 6.178) are:

(a) to check that Russia intends to comply with Conservation Measure 236/XX in Subareas 88.1 and 88.2;

(b) the need to define the nature and status of birds caught, in relation to the limits on seabird by-catch (paragraph 6.176); and

(c) the potential need to specify appropriate levels of observation to detect accurately low levels of bird by-catch (paragraphs 6.177 and 6.178).

Other Incidental Mortality

6.230 (i) In the Convention Area in 2002, there were no reports of marine mammal mortality in the longline fishery; one southern elephant seal was reported killed by a trawl vessel in Division 58.5.2 (paragraphs 6.179 and 6.184).

(ii) A single penguin was found dead in the net of a krill trawler in Subarea 48.2 (paragraph 6.182).

6.231 No instances of incidental mortality of marine mammals or seabirds had been recorded in the pot fishery for crabs in Subarea 48.3 in 2002 (paragraph 6.183).

6.232 (i) In trawl fishing for icefish in Subarea 48.3, 125 seabirds were entangled, at least 73 fatally, a total an order of magnitude greater than the reported total seabird by-catch mortality for all regulated longline fishing in Subarea 48.3 in 2002 (paragraphs 6.185 to 6.190).

(ii) All vessels engaged in the fishery caught seabirds; detailed observations indicate that seabirds were caught when they became entangled in the large mesh at the mouth of the midwater trawls (paragraphs 6.198 and 6.200).

(iii) Despite vessel-specific differences in levels of seabird by-catch the problem mainly appears to be gear-related and associated with the use of midwater trawls during the period December–March in Subarea 48.3 (paragraphs 6.199, 6.201 and 6.204).

6.233 The Working Group recommended that:

(i) further data be collected to try to define appropriate mitigating measures for the icefish trawl fisheries in Subarea 48.3, continuing the work recommended by the Commission last year (paragraph 6.204);

(ii) unless the levels of seabird by-catch in the icefish fishery can be more effectively mitigated, consideration should be given to restricting the fishing season, at least during the main chick-rearing period of black-browed albatrosses and white-chinned petrels (January–April) (paragraph 6.206);

(iii) it may be appropriate to reconsider whether Conservation Measure 219/XX seeks specifically to prohibit bottom trawling or the use of bottom trawl gear in Subarea 48.3 and whether the use of bottom trawl gear might be permitted under appropriate circumstances (paragraph 6.202); and

(iv) it is necessary to define precisely what is meant by the number of birds caught and to take account of this in any review of the seabird by-catch limit (paragraph 6.207).

Table 6.1: Incidental mortality of seabirds in longline fisheries for *Dissostichus* spp. in Subareas 48.3, 58.6, 58.7, 88.1 and 88.2 during the 2001/02 season. Sp – Spanish method; A – autoliner; N – night setting; D – daytime setting (including nautical dawn and dusk); O – opposite side to hauling.

Vessel	Dates of Fishing	Method	Sets Deployed			No. of Hooks (thousands)				Hooks Baited (%)	No. of Birds Caught						Observed Seabird Mortality (birds/1 000 hooks)			Streamer Line in Use (%)		Offal Discharge during Haul (%)
											Dead		Alive		Total							
			N	D	Total	%N	Obs.	Set	% Observed		N	D	N	D	N	D	N	D	Total	N	D	
Subarea 48.3																						
Eva 1	20/5–28/6/02	Sp	57	3	60	95	133.0	518.2	25	100	0	0	0	0	0	0	0	0	0	93	100	O (97)
Isla Camila	2/5–6/7/02	Sp	142	7	149	95	153.5	792.6	19	100	0	0	0	0	0	0	0	0	0	93	100	O (77)
No. 1 Moresko	1/5–7/7/02	Sp	112	0	112	100	226.1	968.6	23	100	0	0	0	0	0	0	0	0	0	99		O (83)
Isla Santa Clara	1/5–25/7/02	Sp	163	0	163	100	231.1	1156.7	19	100	0	0	4	0	4	0	0	0	0	99		O (87)
Argos Georgia	1/5–31/7/02	Sp	298	0	298	100	211.9	970.0	21	100	0	0	0	0	0	0	0	0	0	96		O (70)
Lyn	1/5–18/7/02	Sp	176	0	176	100	292.1	1346.7	21	100	0	0	0	0	0	0	0	0	0	98		O (87)
Ibsa Quinto	1/5–21/8/02	Sp	166	0	166	100	406.8	1723.4	23	100	0	0	5	0	5	0	0	0	0	88		O (100)
Polarpesca 1	18/5–14/8/02	Sp	204	1	205	99.5	233.7	1020.4	22	100	0	0	4	0	4	0	0	0	0	100	100	O (100)
Isla Alegranza	6/5–9/8/02	Sp	160	0	160	100	370.3	1531.9	24	100	0	0	7	0	7	0	0	0	0	96		O (93)
Viking Bay	1/5–9/8/02	Sp	221	3	224	99	242.8	1152.2	21	100	0	0	4	0	4	0	0	0	0	100	100	O (87)
Koryo Maru No. 11	1/5–2/8/02	Sp	147	0	147	100	299.9	1409.2	21	100	0	0	2	0	2	0	0	0	0	97		O (83)
Atlantic No. 52	26/5–22/8/02	Sp	154	0	154	100	240.4	1137.8	21	100	4	0	2	0	6	0	0.017	0	0.017	82		O (98)
Jacqueline	1/5–218/02	Sp	149	7	156	96	408.4	1713.2	23	100	2	0	3	0	5	0	0.005	0	0.005	100	100	O (86)
Argos Helena	1/5–6/8/02	Sp	191	0	191	100	397.3	1275.1	31	100	0	0	6	0	6	0	0	0	0	100		O (100)
Eva 1	2/7–11/8/02	Sp	75	0	75	100	120.7	564.5	21	98	0	0	0	0	0	0	0	0	0	89		O (96)
Tierra del Fuego	22/5–11/8/02	Sp	134	5	139	96	168.3	740.2	22	100	0	0	0	0	0	0	0	0	0	96	100	O (98)
Total						99	3968.0	17280.5	22		6	0	37	0	43	0	0.0015	0.0	0.0015			
Subareas 58.6 and 58.7																						
Suidor One	13/11–8/12/01	Sp	24	0	24	100	24.0	259.7	9	100	0	0	0	0	0	0	0	0	0	100		O (100)
Koryo Maru 11	8/2–4/4/02	Sp	87	2	89	98	538.3	909.3	59	100	0	0	4	0	4	0	0	0	0	100	100	O (100)
Suidor One	27/4–16/5/02	Sp	18	0	18	100	60.6	143.0	42	100	0	0	1	0	1	0	0	0	0	100		O (100)
Total						99	622.9	1312.0	37		0	0	5	0	5	0	0	0	0			
Subareas 88.1 and 88.2																						
Janas	8/1–21/3/02	A	18	157	175	10	415.0	1034.7	40	94	0	0	0	0	0	0	0	0	0	100	100	(0)
San Aotea II	17/1–19/5/02	A	33	160	193	17	463.0	1031.7	44	88	0	0	0	0	0	0	0	0	0	100	100	(0)
Janas	4/4–2/6/02	A	49	17	66	74	159.7	354.1	45	92	0	0	0	0	0	0	0	0	0	100	100	(0)
Total						33	1037.7	2420.5	43		0	0	0	0	0	0	0	0	0			

Table 6.2: Estimated total seabird mortality by vessel for Subarea 48.3 during the 2001/02 season.

Vessel	Hooks Observed (thousands)	Hooks Set (thousands)	% Hooks Observed	% Night Sets	Estimated Number of Birds Caught Dead		
					Night	Day	Total
Eva 1	133.0	518.2	25	95	0	0	0
Isla Camila	153.5	792.6	19	95	0	0	0
No. 1 Moresko	226.1	968.6	23	100	0	0	0
Isla Santa Clara	231.1	1156.7	19	100	0	0	0
Argos Georgia	211.9	970.0	21	100	0	0	0
Lyn	292.1	1346.7	21	100	0	0	0
Ibsa Quinto	406.8	1723.4	23	100	0	0	0
Polarpesca 1	233.7	1020.4	22	99.5	0	0	0
Isla Alegranza	370.3	1531.9	24	100	0	0	0
Viking Bay	242.8	1152.2	21	99	0	0	0
Koryo Maru No. 11	299.9	1409.2	21	100	0	0	0
Atlantic No. 52	240.4	1137.8	21	100	19	0	19
Jacqueline	408.4	1713.2	23	96	8	0	8
Argos Helena	397.3	1275.1	31	100	0	0	0
Eva 1	120.7	564.5	21	100	0	0	0
Tierra del Fuego	168.3	740.2	22	96	0	0	0
Total					27	0	27

Table 6.3: Total estimated seabird by-catch and by-catch rate (birds/thousand hooks) in longline fisheries in Subareas 48.3, 58.6 and 58.7 from 1997 to 2002.

Subarea	Year					
	1997	1998	1999	2000	2001	2002
48.3						
Estimated by-catch	5 755	640	210*	21	30	27
By-catch rate	0.23	0.032	0.013*	0.002	0.002	0.0015
58.6, 58.7						
Estimated by-catch	834	528	156	516	199	0
By-catch rate	0.52	0.194	0.034	0.046	0.018	0

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

Table 6.4: Species composition of birds killed in longline fisheries in Subareas 48.3 during the 2001/02 season. N – night setting; D – daylight setting (including nautical dawn and dusk); MAI – southern giant petrel; PRO – white-chinned petrel; DAC – Cape petrel; MAH – giant petrel; ( ) – % composition.

Vessel	Dates of Fishing	No. Birds Killed by Group						Species Composition (%)			
		Albatross		Petrels		Total					
		N	D	N	D	N	D	MAI	PRO	DAC	MAH
Eva 1	20/5–28/6/02	0	0	0	0	0	0				
Isla Camila	2/5–6/7/02	0	0	0	0	0	0				
No. 1 Moresko	1/5–7/7/02	0	0	0	0	0	0				
Isla Santa Clara	1/5–25/7/02	0	0	0	0	0	0				
Argos Georgia	1/5–31/7/02	0	0	0	0	0	0				
Lyn	1/5–18/7/02	0	0	0	0	0	0				
Ibsa Quinto	1/5–21/8/02	0	0	0	0	0	0				
Polarpesca 1	18/5–14/8/02	0	0	0	0	0	0				
Isla Alegranza	6/5–9/8/02	0	0	0	0	0	0				
Viking Bay	1/5–9/8/02	0	0	0	0	0	0				
Koryo Maru No. 11	1/5–2/8/02	0	0	0	0	0	0				
Atlantic No. 52	26/5–22/8/02	0	0	4	0	4	0	2 (50)		1 (25)	1 (25)
Jacqueline	1/5–218/02	0	0	2	0	2	0	2 (100)			
Argos Helena	1/5–6/8/02	0	0	0	0	0	0				
Eva 1	2/7–11/8/02	0	0	0	0	0	0				
Tierra del Fuego	22/5–11/8/02	0	0	0	0	0	0				
Total %		0	0	6	0	6	0	4 (66)		1 (17)	1 (17)

Table 6.5: Vessel compliance (%) with Conservation Measure 29/XIX during the 2001/02 season based on data from scientific observers. Those vessels that reached 95% of the minimum requirement of all elements of the conservation measure are in bold. Values for night setting and streamer line setting are absolute proportions for all sets by each vessel. Values for offal discharge and streamer line design are averages across all cruises by each vessel; line weighting is expressed as a percentage of the minimum requirement (6 kg every 20 m or 8.5 kg every 40 m). CHL – Chile; ESP – Spain; GBR – United Kingdom; KOR – Republic of Korea; NZL – New Zealand; RUS – Russia; URY – Uruguay; ZAF – South Africa.

Area/Vessel	Number of Cruises	Night Setting	Offal Discharge	Line Weighting		Streamer Line	
				Distance	Weight	Setting	Design
Subarea 48.3							
Eva 1 (RUS)	2	98	100	100	90	91	0
Isla Camila (CHL)	1	95	100	100	100	93	100
***No. 1 Moresko* (KOR)**	**1**	**100**	**100**	**100**	**99**	**99**	**100**
***Isla Santa Clara* (CHL)**	**1**	**100**	**100**	**100**	**100**	**99**	**100**
***Argos Georgia* (GBR)**	**1**	**100**	**100**	**100**	**100**	**96**	**100**
***Lyn* (GBR)**	**1**	**100**	**100**	**100**	**100**	**98**	**100**
Ibsa Quinto (ESP)	1	100	100	100	96	88	100
***Polarpesca 1* (CHL)**	**1**	**99.5**	**100**	**100**	**100**	**100**	**100**
Isla Alegranza (URY)	1	100	100	100	92	96	100
Viking Bay (ESP)	1	99	100	100	76	100	100
Koryo Maru No. 11 (ZAF)	1	100	100	100	100	97	0
Atlantic No. 52 (URY)	1	100	100	100	65	82	100
***Jacqueline* (GBR)**	**1**	**96**	**100**	**100**	**100**	**100**	**100**
***Argos Helena* (GBR)**	**1**	**100**	**100**	**100**	**100**	**100**	**100**
***Tierra del Fuego* (CHL)**	**1**	**100**	**100**	**100**	**100**	**96**	**100**
Subareas 58.6 and 58.7							
Suidor One (ZAF)	2	100	100	100	71	100	100
***Koryo Maru No. 11* (ZAF)**	**1**	**98**	**100**	**100**	**100**	**100**	**100**
Subareas 88.1 and 88.2							
Janas* (NZL)	**2**	**28**	**100**	**Autoline**		**100**	**100**
San Aotea II* (NZL)	**1**	**17**	**100**	**Autoline**		**100**	**100**

* Conservation Measure 216/XX allows fishing in Subarea 88.1 during daylight periods if the vessel can demonstrate a minimum sink rate of 0.3 m/s.

Table 6.6: Compliance, as reported by scientific observers, of streamer lines with the minimum specifications set out in Conservation Measure 29/XIX during the 2001/02 season. Y: yes; N: no; -: no information; A: autoliner; Sp: Spanish; CHL – Chile; ESP – Spain; GBR – United Kingdom; KOR – Republic of Korea; NZL – New Zealand; RUS – Russia; URY – Uruguay; ZAF – South Africa.

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 (%)	
				Attachment, Height above Water (m)	Total Length (m)	No. Streamers per Line	Spacing of Streamers per Line (m)		Night	Day
Subarea 48.3										
Eva 1 (RUS)	20/5–28/6/02	Sp	N	Y (7)	N (125)	Y (5)	Y (5)	-	93	100
Isla Camila (CHL)	2/5–6/7/02	Sp	Y	Y (5.5)	Y (150)	Y (5)	Y (5)	Y (3–1.5)	93	100
No. 1 Moresko (KOR)	1/5–7/7/02	Sp	Y	Y (6)	Y (165)	Y (5)	Y (5)	Y (4–2)	99	
Isla Santa Clara (CHL)	1/5–25/7/02	Sp	Y	Y (5)	Y (150)	Y (5)	Y (5)	Y (3.5–1.5)	99	
Argos Georgia (GBR)	1/5–31/7/02	Sp	Y	Y (6.3)	Y (150)	Y (30)	Y (5)	Y (3.5–1.5)	96	
Lyn (GBR)	1/5–18/7/02	Sp	Y	Y (10)	Y (155)	Y (7)	Y (5)	Y (3)	98	
Ibsa Quinto (ESP)	1/5–21/8/02	Sp	Y	Y (8)	Y (162)	Y (6)	Y (5)	-	88	
Polarpesca 1 (CHL)	18/5–14/8/02	Sp	Y	Y (5.7)	Y (150)	Y (5)	Y (5)	Y (3.7–1.4)	100	100
Isla Alegranza (URY)	6/5–9/8/02	Sp	Y	Y (6.5)	Y (163)	Y (5)	Y (5)	-	96	
Viking Bay (ESP)	1/5–9/8/02	Sp	Y	Y (8)	Y (162)	Y (5)	Y (5)	Y (3.8–1.4)	100	100
Koryo Maru No. 11 (ZAF)	1/5–2/8/02	Sp	N	N (4)	Y (155)	Y (10)	Y (5)	Y (5–2.5)	97	
Atlantic No. 52 (URY)	26/5–22/8/02	Sp	Y	Y (5)	Y (154)	Y (10)	Y (5)	Y (3.5–1.3)	82	
Jacqueline (GBR)	1/5–22/8/02	Sp	Y	Y (7)	Y (150)	Y (5)	Y (5)	Y (3.9–2)	100	100
Argos Helena (GBR)	1/5–6/8/02	Sp	Y	Y (5)	Y (150)	Y (5)	Y (5)	Y(3.5–1.5)	100	
Tierra del Fuego (CHL)	15/5–19/8/02	Sp	Y	Y (5)	Y (153)	Y (30)	Y (5)	Y (5–1)	89	
Eva 1 (RUS)	30/6–31/8/02	Sp	N	Y (6.9)	N (110)	Y (7)	Y (5)	Y (4–1.2)	96	100
Subareas 58.6 and 58.7										
Suidor One (ZAF)	13/11–8/12/01	Sp	Y	Y (4.5)	Y (150)	Y (5)	Y (5)	Y(3.5–1.2)	100	
Koryo Maru No. 11 (ZAF)	8/2–4/4/02	Sp	Y	Y (6)	Y (155)	Y (5)	Y (5)	Y(5.5–3.5)	100	100
Suidor One (ZAF)	27/4–16/5/02	Sp	Y	Y (5.3)	Y (160)	Y (7)	Y (5)	Y(3.0–.4)	100	
Subarea 88.1										
Janas (NZL)	8/1–21/3/02	A	Y	Y (6)	Y (170)	Y (21)	Y (5)	Y (5–1.5)	100	100
San Aotea II (NZL)	17/1–19/5/02	A	Y	Y (4.5)	Y (155)	Y (12)	Y (4)	Y (9–1.6)	100	100
Janas (NZL)	4/4–2/6/02	A	Y	Y (6)	Y (200)	Y (21)	Y (25)	Y (3.8–1)	100	100

Table 6.7: Summary of compliance with Conservation Measure 29/XIX, based on data from scientific observers from 1996/97 to 2001/02 season. Values in parentheses are % of observer records that were complete. na – not applicable.

Subarea/ Time	Line Weighting (Spanish System Only)			Night Setting (% Night)	Offal Discharge (%) Opposite Haul	Streamer Line Compliance (%)								Total Catch Rate (birds/1 000 hooks)	
	Compliance %	Median Weight (kg)	Median Spacing (m)			Overall	Attached Height	Total Length	No. Streamers	Distance Apart				Night	Day
Subarea 48.3															
1996/97	0 (91)	5	45	81	0 (91)	6 (94)	47 (83)	24 (94)	76 (94)	100 (78)				0.18	0.93
1997/98	0 (100)	6	42.5	90	31 (100)	13 (100)	64 (93)	33 (100)	100 (93)	100 (93)				0.03	0.04
1998/99	5 (100)	6	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	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
Division 58.4.4															
1999/00	0 (100)	5	45	50	0 (100)	0 (100)	100 (100)	0 (100)	Y (100)	100 (100)				0	0
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
Subarea 88.1															
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

[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 and 216/XX allowed vessels to undertake daytime setting south of 65°S in Subarea 88.1 if they could demonstrate a sink rate of 0.3 m/s.

Table 6.8: Bird by-catch (death rate) calculated from 1997 data from the *Dissostichus* spp. fishery in Subarea 48.3, assuming a summer end date of 1 April, used to bootstrap the model in WG-FSA-02/04 (taken from WG-FSA-02/05, Table 5).

Season	Vessel Name	Cruise ID	Hooks Set (thousand)	Hooks Observed (thousand)	Number of Birds Dead	Death Rate (n/1 000 hooks)
Summer	*Argos Helena*	9	303.49	91.91	142	1.545
Summer	*Cisne Verde*	6	99.84	10.244	4	0.390
	Elqui	7	183.6	73.2	36	0.492
	Isla Camila	17	322.72	58.055	43	0.741
	Isla Isabel	11	186.56	21.648	252	11.641
Winter	*Argos Helena*	9	949.35	189.3	14	0.074
	Cisne Verde	6	366.34	89.329	4	0.045
	Cisne Verde	8	951.88	411.41		0.000
	Elqui	7	324	152	15	0.099
	Elqui	29	695.42	639.17		0.000
	Elqui	10	456.94	326.08		0.000
	Ercilla	14	512.35	316.91	24	0.076
	Ercilla	15	343.98	157.94		0.000
	Ercilla	16	243.74	152.42		0.000
	Ibsa Quinto	25	1178.1	353.05	34	0.096
	In Sung 66	28	1345.8	328.26		0.000
	Isla Camila	18	489.29	93.45	9	0.096
	Isla Camila	19	459.84	44.268		0.000
	Isla Isabel	12	537.1	289.8	4	0.014
	Isla Isabel	13	431.21	199.7		0.000
	Jacqueline	20	380.93	19.84	10	0.504
	Jacqueline	21	683.03	41.71	6	0.144
	Koryo Maru No. 11	39	820.4	820.4	1	0.001
	Pescarosa Primero	26	288.52	236.04	2	0.008
	Pescarosa Primero	27	163.2	137.73		0.000

Table 6.9: Summary of IMAF risk level and assessment in relation to proposed new and exploratory longline fisheries in 2002/03. Risk scales are as follows: 1 – Low; 2 – Average-to-Low; 3 – Average; 4 – Average-to-High; 5 – High. Text in bold indicates issues needing resolution.

Area	Risk Scale	IMAF Risk Assessment	Notes
48.6 north of 60°S	2	Average-to-low risk – southern part of area (south of c. 55°S) of low risk; no obvious need for restriction of longline fishing season. Ensure strict compliance with Conservation Measure 29/XIX as a seabird by-catch precautionary measure. Fishing during daytime only permitted under the provisions currently prescribed under Conservation Measure 216/XX. In addition, vessels that catch a total of three (3) birds shall revert to night setting.	• South Africa (CCAMLR-XXI/6) proposes to fish during a season to be established at CCAMLR-XXI. State their acceptance of IMAF assessments and intent to comply with Conservation Measure 29/XIX. Proposal does not conflict with advice provided.
48.6	2	Average-to-low risk – southern part of area (south of c.55°S) of low risk; no obvious need for restriction of longline fishing season. Ensure strict compliance with Conservation Measure 29/XIX as a seabird by-catch precautionary measure. Fishing during daytime only permitted under the provisions currently prescribed under Conservation Measure 216/XX. In addition, vessels that catch a total of three (3) birds shall revert to night setting.	• Japan (CCAMLR-XXI/9) proposes to fish during a season to be established at CCAMLR-XXI. Intend to comply with Conservation Measure 29/XIX noting that 'some variation to application of paragraph 3 within Subareas 88.1 and 88.2 has been allowed by the Commission.' Proposal does not conflict with advice provided by IMAF, subject to acceptance of provisions of Conservation Measure 216/XX. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX). • New Zealand (CCAMLR-XXI/8) proposes to fish north of 60°S from 1 March 2003 to 31 August 2003, and south of 60°S from 15 February 2003 to 15 October 2003. Two scientific observers, 24-hour observer coverage proposed. Intend to comply fully with Conservation Measure 29/XIX north of 60°S. For fishing south of 60°S, a variation to Conservation Measure 29/XIX is sought consistent with the approaches approved by CCAMLR in Conservation Measures 216/XX (line-weighting trials) and 229/XX (three-bird limit for daylight setting). Proposal does not conflict with advice provided.

(continued)

Table 6.9 (continued)

Area	Risk Scale	IMAF Risk Assessment	Notes
58.4.2	2	Average-to-low risk. Ensure strict compliance with Conservation Measure 29/XIX. Prohibit longline fishing during the breeding season of giant petrels (October to March). Fishing at other times only permitted under the provisions currently prescribed under Conservation Measure 216/XX. In addition, vessels that catch a total of three (3) birds shall revert to night setting.	• Australia (CCAMLR-XXI/12) proposes to fish from 1 January to 31 March 2003. Intend to 'comply with or exceed Conservation Measure 29/XIX', specifically through offal retention and use of twin streamer lines. Seek exemption to night-setting requirements through achieving a sink rate of at least 0.3 m/s to a depth of 15 m as specified in Conservation Measure 216/XX. Proposal does not conflict with advice provided. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX).
58.4.3a	3	Average risk. Ensure strict compliance with Conservation Measure 29/XIX. Prohibit longline fishing during the breeding season of albatrosses, giant petrels and white-chinned petrels (September to April). Fishing at other times only permitted under the provisions currently prescribed under Conservation Measure 216/XX. In addition, vessels that catch a total of three (3) birds shall revert to night setting.	• Japan (CCAMLR-XXI/9) proposes to fish during a season to be established at CCAMLR-XXI. Intend to comply with Conservation Measure 29/XIX noting that 'some variation to application of paragraph 3 within Subareas 88.1 and 88.2 has been allowed by the Commission.' Proposal does not conflict with advice provided by IMAF, subject to acceptance of provisions of Conservation Measure 216/XX. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX). • Australia (CCAMLR-XXI/11) proposes to fish from 1 May to 31 August 2003. Intend to 'comply with or exceed Conservation Measure 29/XIX', specifically through offal retention, use of twin streamer lines, and achieving a sink rate of at least 0.3m/s to a depth of 15 m as specified in Conservation Measure 216/XX. Proposal does not conflict with advice provided.
58.4.3b	3	Average risk. Ensure strict compliance with Conservation Measure 29/XIX. Prohibit longline fishing during the breeding season of albatrosses, giant petrels and white-chinned petrels (September to April). Fishing at other times only permitted under the provisions currently prescribed under Conservation Measure 216/XX. In addition, vessels that catch a total of three (3) birds shall revert to night setting.	• Japan (CCAMLR-XXI/9) proposes to fish during a season to be established at CCAMLR-XXI. Intend to comply with Conservation Measure 29/XIX noting that 'some variation to application of paragraph 3 within Subareas 88.1 and 88.2 has been allowed by the Commission.' Proposal does not conflict with advice provided by IMAF, subject to acceptance of provisions of Conservation Measure 216/XX. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX).

(continued)

Table 6.9 (continued)

Area	Risk Scale	IMAF Risk Assessment	Notes
58.4.4	3	Average risk. Ensure strict compliance with Conservation Measure 29/XIX. Prohibit longline fishing during the breeding season of albatrosses and petrels (September to April). Fishing at other times only permitted under the provisions currently prescribed under Conservation Measure 216/XX. In addition, vessels that catch a total of three (3) birds shall revert to night setting.	• Japan (CCAMLR-XXI/9) proposes to fish during a season to be established at CCAMLR-XXI. Intend to comply with Conservation Measure 29/XIX noting that 'some variation to application of paragraph 3 within Subareas 88.1 and 88.2 has been allowed by the Commission.' Proposal does not conflict with advice provided by IMAF, subject to acceptance of provisions of Conservation Measure 216/XX. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX). • South Africa (CCAMLR-XXI/6) proposes to fish during a season to be established at CCAMLR-XXI. State their acceptance of IMAF assessments and intent to comply with Conservation Measure 29/XIX. Proposal does not conflict with advice provided. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (e.g. Conservation Measures 235/XX and 236/XX).
58.5.2	4	Average-to-high risk. Prohibit longline fishing within the breeding season of the main albatross and petrel species (September to April). Ensure strict compliance with Conservation Measure 29/XIX.	• Australia (CCAMLR-XXI/11) proposes to fish from 1 May to 31 August 2003. Intend to 'comply with or exceed Conservation Measure 29/XIX', specifically through offal retention, use of twin streamer lines, and achieving a sink rate of at least 0.3 m/s to a depth of 15 m as specified in Conservation Measure 216/XX. Proposal does not conflict with advice provided.
58.6	5	High risk. Prohibit longline fishing during the main albatross and petrel breeding season (September to April); ensure strict compliance with Conservation Measure 29/XIX.	• Japan (CCAMLR-XXI/9) proposes to fish during a season to be established at CCAMLR-XXI. Intend to comply with Conservation Measure 29/XIX noting that 'some variation to application of paragraph 3 within Subareas 88.1 and 88.2 has been allowed by the Commission.' Proposal does not conflict with advice provided. • South Africa (CCAMLR-XXI/6) proposes to fish during a season to be established at CCAMLR-XXI. State their acceptance of IMAF assessments and intent to comply with Conservation Measure 29/XIX. Proposal does not conflict with advice provided.

(continued)

Table 6.9 (continued)

Area	Risk Scale	IMAF Risk Assessment	Notes
88.1	3	Average risk overall. Average risk in northern sector (*D. eleginoides* fishery), average-to-low risk in southern sector (*D. mawsoni* fishery). Longline fishing season limits of uncertain advantage. Ensure strict compliance with Conservation Measure 29/XIX as a seabird by-catch precautionary measure. Fishing during daytime only permitted under the provisions currently prescribed under Conservation Measure 216/XX. In addition, vessels that catch a total of three (3) birds shall revert to night setting.	• Japan (CCAMLR-XXI/9) proposes to fish during a season to be established at CCAMLR-XXI. Intend to comply with Conservation Measure 29/XIX noting that 'some variation to application of paragraph 3 within Subareas 88.1 and 88.2 has been allowed by the Commission.' Proposal does not conflict with advice provided by IMAF, subject to acceptance of provisions of Conservation Measure 216/XX. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX). • New Zealand (CCAMLR-XXI/7) proposes to fish from 1 December 2002 to 31 August 2003. State their intent to comply with Conservation Measures 29/XIX and 10/XIX. Intend to comply fully with Conservation Measure 29/XIX north of 65°S. For fishing south of 65°S, a variation to Conservation Measure 29/XIX is sought to allow daytime setting consistent with the approaches approved by CCAMLR in Conservation Measures 235/XX and 236/XX (three-bird limit for daylight setting). New Zealand also proposes that all vessels fishing are subject to Conservation Measure 216/XX (line-weighting trials). New Zealand also proposes fishing be prohibited within 10 n miles of 23 significant seabird and marine mammal breeding sites, and within 10 n miles of the Antarctic coastline on a precautionary basis. Proposal does not conflict with advice provided by IMAF, but IMAF has no data to assess the utility of the 10 n miles exclusion zones. • Russia (CCAMLR-XXI/16) proposes to fish from 1 December 2002 to 31 August 2003. State their intent to comply with Conservation Measure 29/XIX. **Compliance with Conservation Measure 235/XX (three-bird limit for daylight setting) uncertain.** Proposal does not conflict with advice provided by IMAF, subject to acceptance of provisions of Conservation Measure 216/XX. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX).

(continued)

Table 6.9 (continued)

Area	Risk Scale	IMAF Risk Assessment	Notes
88.1 (continued)			• South Africa (CCAMLR-XXI/6) proposes to fish during a season to be established at CCAMLR-XXI. State their acceptance of IMAF assessments and note some relaxation of daytime setting has been accepted by CCAMLR in Conservation Measure 235/XX. State intent to comply with Conservation Measure 29/XIX. Proposal does not conflict with advice provided by IMAF, subject to acceptance of provisions of Conservation Measure 216/XX. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX). • Spain (CCAMLR-XXI/6) proposes to fish from 1 December 2002 to 31 August 2003, subject to changes imposed by CCAMLR. State their acceptance of all conservation measures developed for this fishery, and in particular Conservation Measures 29/XIX, 216/XX (line weighting trials) and 235/XX (three-bird limit for daylight setting). Proposal does not conflict with advice provided.
88.2		Low risk. No obvious need for restriction of longline fishing season. Ensure strict compliance with Conservation Measure 29/XIX as a seabird by-catch precautionary measure. Fishing during daytime only permitted under the provisions currently prescribed under Conservation Measure 216/XX. In addition, vessels that catch a total of three (3) birds shall revert to night setting.	• Japan (CCAMLR-XXI/9) proposes to fish during a season to be established at CCAMLR-XXI. Intend to comply with Conservation Measure 29/XIX noting that 'some variation to application of paragraph 3 within Subareas 88.1 and 88.2 has been allowed by the Commission.' Proposal does not conflict with advice provided by IMAF, subject to acceptance of provisions of Conservation Measure 216/XX. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX). • New Zealand (CCAMLR-XXI/7) proposes to fish from 1 December 2002 to 31 August 2003. State their intent to comply with Conservation Measures 29/XIX and 210/XIX. Intend to comply fully with Conservation Measure 29/XIX north of 65°S. For fishing south of 65°S, a variation to Conservation Measure 29/XIX is sought to allow daytime setting consistent with the approach approved by CCAMLR in Conservation Measure 236/XX (3-bird limit for daylight setting). New Zealand also proposes that all vessels fishing are subject to Conservation Measure 216/XX (line-weighting trials).

(continued)

Table 6.9 (continued)

Area	Risk Scale	IMAF Risk Assessment	Notes
88.2 (continued)			New Zealand also proposes fishing be prohibited within 10 n miles of the Antarctic coastline on a precautionary basis. Proposal does not conflict with advice provided by IMAF, but IMAF has no data to assess the utility of the 10 n miles exclusion zones. • Russia (CCAMLR-XXI/16) proposes to fish from 1 December 2002 to 31 August 2003. State their intent to comply with Conservation Measure 29/XIX. **Compliance with Conservation Measure 236/XX (three-bird limit for daylight setting) uncertain.** Proposal does not conflict with advice provided by IMAF, subject to acceptance of provisions of Conservation Measure 216/XX. A maximum limit of three birds caught should be applied to daylight setting as required for fishing in other lower risk areas (Conservation Measures 235/XX and 236/XX).

Table 6.10: Interactions between marine mammals and longline vessels fishing for toothfish, taken from WG-FSA-02/12 Rev. 1 and reports of scientific observers.

Subarea	Year	Cruises where Interaction Occurred	Killer Whale	Sperm Whale	Fur Seal	Unknown
Subarea 48.3	1999	13 of 17	12	1	5	0
	2000	9 of 26	6	3	3	1
	2001	11 of 15	5	4	4	0
Subareas 58.6/58.7	1999	9 of 12	6	4	0	3
	2000	9 of 11	7	6	0	2
	2001	1 of 3	1	0	0	0

Table 6.11: Details of the number of seabirds captured in trawl fisheries in Subarea 48.3, taken from WG-FSA-02/12 Rev. 1 and reports of scientific observers. DIM – black-browed albatross, PRO – white-chinned petrel, PAC – Antarctic prion; nr – not recorded.

Vessel	Dates	Days Fishing	No. of Trawls	% Trawls Ob-served	Birds Dead	DIM	PRO	PAC	Birds Re-leased	DIM	PRO
Zakhar Sorokin	20/12–05/02	48	185	94	7	3	4		nr		
In Sung Ho	31/12–18/02	37	87	100	21	3	17	1	18	1	17
Robin M. Lee	23/12–15/02	32	85	94	19	4	15		25	7	18
Bonito	15/12–09/02	40	68	100	5	2	3		1	1	
Argos Vigo	15/12–16/02	29	60	100	21	8*	13*		8	4	4
Total					73	20	52	1	52	13	39

* Includes two birds observed killed but not brought on board

Table 6.12: Nature and timing of offal discharge (proportion of total sets/hauls) and status of deck lighting of vessels involved in trawl fisheries for icefish in Subarea 48.3, taken from reports of scientific observers.

Vessel	Offal Discharged Setting/Hauling	Deck Lighting
Zakhar Sorokin	0 / 0	No information
In Sung Ho	No information	Details provided
Robin M. Lee	0 / 0	Details provided
Bonito	9% / 7%	Details provided
Argos Vigo	7% / 0	No information

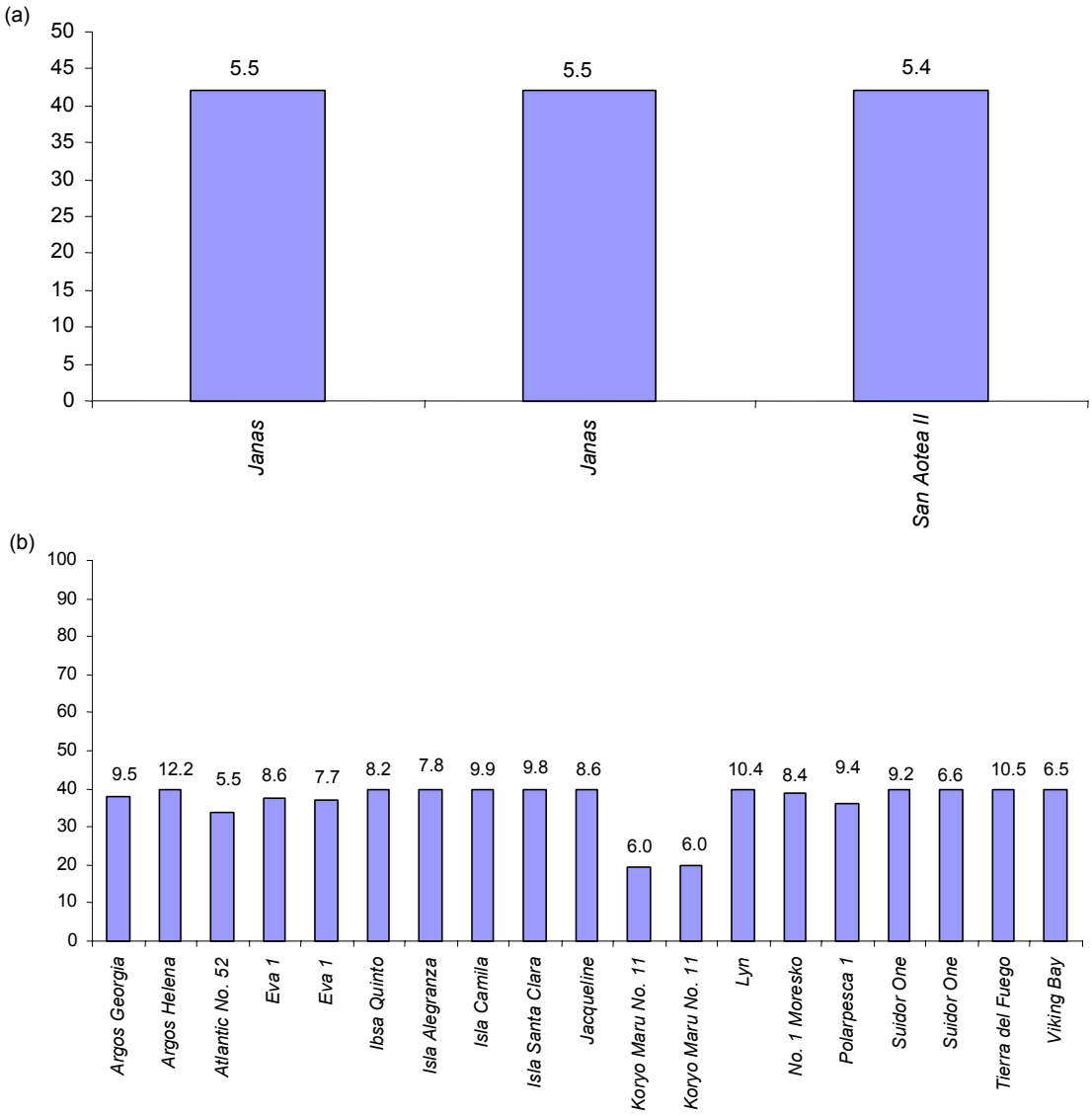

Figure 6.1: Longline weight spacing (y-axis in metres) and weights used (kilograms) by (a) auto and (b) Spanish systems during the 2002 season.

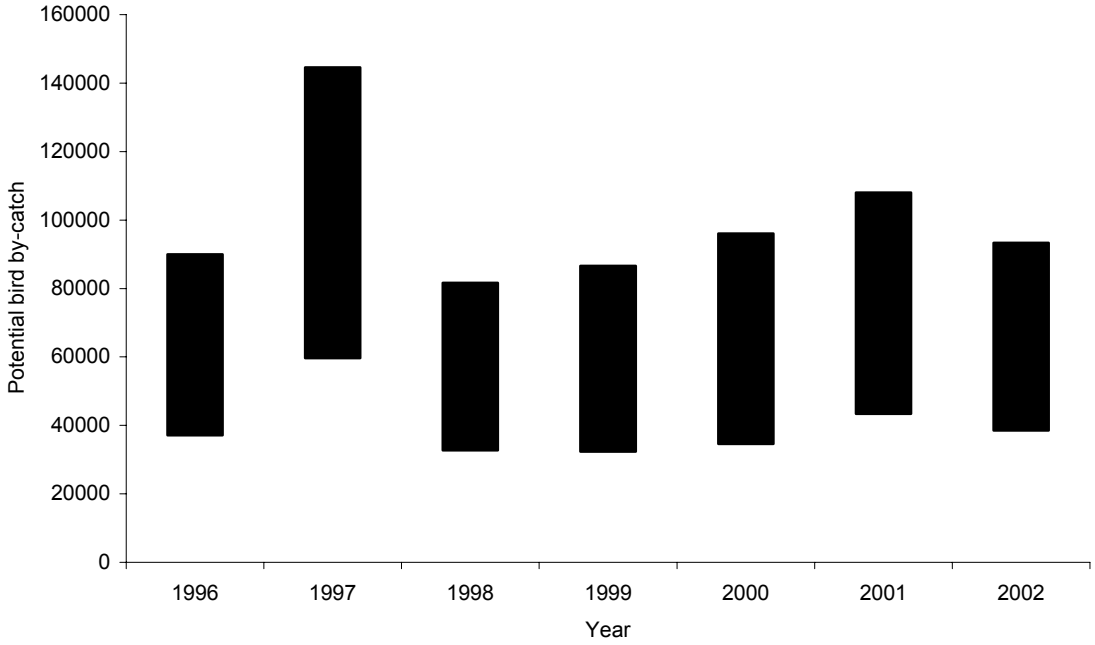

Figure 6.2: The range of estimated potential by-catch of birds in IUU longline fisheries in the Convention Area from 1996 to 2002. The solid bars represent the range from the lower limit of the lower estimate to the upper limit of the upper estimate (see paragraph 6.96).