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 ARISING FROM LONGLINE FISHING

IMALF Intersessional Activities

7.1 The Secretariat reported on the intersessional activities of ad hoc WG-IMALF (WG-FSA-99/7). The IMALF group worked in accordance with the plan of intersessional activities developed immediately after the completion of CCAMLR-XVII (November 1998) by the Secretariat in consultation with Prof. Croxall (Convener), Mr Baker (Deputy Convener) and other members of ad hoc WG-IMALF. As in previous years, the intersessional work of the IMALF group was coordinated by the Secretariat's Science Officer.

7.2 The report of intersessional activities of ad hoc WG-IMALF contained records of all activities planned and their results. It was considered item by item to evaluate outcomes and to decide which tasks were complete, which needed continuing or repeating, and which were in essence annual standing requests. Major items of future work would be considered later under that agenda item (paragraphs 9.14 and 9.15). The remaining tasks which needed intersessional work would appear in the plan of intersessional activities for 1999/2000 (Appendix D).

7.3 The Working Group noted the extensive work accomplished intersessionally by ad hoc WG-IMALF, details of which were presented in a number of WG-FSA papers. The Working Group thanked the Science Officer for his work on the coordination of IMALF activities. 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 1998/99 fishing season.

7.4 The membership of ad hoc WG-IMALF was reviewed. The need for continuing membership of Ms K. Maguire (Australia), Dr M. Imber (New Zealand) and Ms J. Dalziell (New Zealand) was questioned. Mr T. Reid (Australia) was recommended as an additional member. The Science Officer and Convener would take up these suggestions with the members involved. WG-FSA noted that some CCAMLR Member countries which are involved in longline fishing and/or seabird research in the Convention Area (e.g. Norway, Ukraine, Uruguay and USA) are not represented in ad hoc WG-IMALF. Members were asked to review their representation in ad hoc WG-IMALF intersessionally and to facilitate attendance of as many of their members as possible at the meeting. In respect of the latter, attendance by representatives from France would be particularly appreciated.

7.5 The Working Group welcomed the appearance of the book *Identification of Seabirds of the Southern Ocean. A Guide for Scientific Observers aboard Fishing Vessels* by D. Onley and S. Bartle, published by CCAMLR and the National Museum of New Zealand in 1999. This book is intended as a guide for use by fisheries observers when aboard fishing vessels south of 40°S. The main purpose is to identify any birds that come on deck (live or dead) rather than to identify birds in flight. The Working Group offered some comments to help in any future revision.

(i) For effective use (e.g. on deck) it would be helpful for the pages to lie flat when open (e.g. using ring binding), and for the plates to be waterproof.

(ii) In the appropriate section of the book observers should be requested to supply any relevant information on why they thought birds were caught on particular sets/hauls.

(iii) The taxonomy and nomenclatures of albatrosses, particularly in the wandering albatross group, is inconsistent with the most recent comprehensive treatment (Robertson and Gales, 1998). This will create unnecessary confusion. It was noted that the Oversight Committee had suggested that authors adhere to the nomenclature, especially vernacular, used by Robertson and Gales (1998).

(iv) Since bills were being used predominantly for identifying species, it would have been helpful if all species were shown on one page so that observers could look them up quickly, once they had become familiar with the different species.

(v) Not all very young black-browed albatrosses have a pale eye, rendering *Diomedea melanophrys* and *Diomedea impavida* very difficult to distinguish at this age (and, in Australia at least, a large proportion of the birds are of this age).

(vi) Most photographs of the spectacled petrel show bills to have pale tips.

(vii) The book does not illustrate any species of penguin, despite at least gentoo and king penguins being caught by longliners with some regularity. On the other hand, southern fulmars and Antarctic petrels are shown, despite not having been caught by fishing vessels.

(viii) Because there is an expectation that the birds will be identified in the hand, measurements may be invaluable in deciding the identity of some birds. However, in this book the measurements given seem to only be a small subsample of those already published, and only a few measurements are given.

(ix) The section on breeding, populations, distribution and behaviour may be of somewhat restricted generality. Comments to improve this were provided to the authors a year ago, but only one has been incorporated in the text. Examples of misleading text are the statements that shy albatrosses are sometimes caught by southern bluefin tuna longliners and by trawl gear south and east of New Zealand (it is the species most commonly caught by domestic southern bluefin tuna longliners in southeast Australia), and that short-tailed shearwaters sometimes feed around trawlers and are caught by drift nets in the North Pacific (they are very common around, and sometimes caught by, longliners around Australia).

7.6 With respect to comments in paragraph 7.5(iii), the Secretariat advised that the species nomenclature used in the guide is same as used in the *CCAMLR Scientific Observers Manual*. The preface to the guide states that it was written taking into account, in particular, the requirements of the CCAMLR Scheme of International Scientific Observation. The list of seabird species appended to the guide also contains references to their CCAMLR codes. Therefore, any future changes to the guide will require similar changes to the *CCAMLR Scientific Observers Manual*.

Research into Status of Seabirds at Risk

7.7 In response to the request for information on current national research programs into the status of seabird species vulnerable to fisheries interactions (albatrosses, giant petrels, *Procellaria* petrels) (SC-CAMLR-XVII, Annex 5, paragraph 7.8), summary papers had been presented by Australia (WG-FSA-99/61), France (WG-FSA-99/27), New Zealand (WG-FSA-99/49), South Africa (WG-FSA-99/34) and the UK (WG-FSA-99/17).

7.8 The Working Group was unaware of any relevant current research additional to that reported in the above papers, given that WG-FSA-99/61 and 99/17 included collaborative projects involving Chile.

7.9 The information in the above papers was further summarised in Table 45. This indicates regions and sites at which research on populations and foraging ecology is currently in progress and also those regions/sites of importance for target species at which no current research is being undertaken. While it is encouraging that significant research programs have been initiated during the 1990s for a range of species at a number of sites, notable deficiencies remain. Some of these are indicated in paragraphs 7.10 to 7.15.

7.10 The populations of many regions (e.g. Falkland/Malvinas Islands, South Georgia, Crozet Islands) comprise sub-populations at numerous geographically distinct sites or islands; demographic monitoring and foraging range information is usually derived from studies at only one island/site. Recent studies of a number of species indicate that birds from different islands within a region may segregate at sea. This may result in differential interactions with fishing activities and so be reflected in differing population trends. Where possible, multisite studies within breeding regions are preferable.

7.11 Within the *Diomedea* albatrosses, researchers have indicated current research on both population monitoring and foraging ecology for all species at most sites. However, the adequacy of many of these programs for confident assessments of population trends and foraging distributions is not always clear from the available information. Summaries provided elsewhere (Gales, 1998; Croxall, 1998) indicate that some of the demographic programs have limited time series data and so may be of limited use at present. Many of the foraging range/ecology studies are limited to information from only a few adult birds at restricted times during the breeding season; results cannot necessarily be extended to other seasons or age groups.

7.12 For the *Thalassarche* albatrosses, the extent and utility of information is similarly restricted; for some important populations there are still no research or monitoring programs in place. Priority populations for targeted research and/or monitoring would include grey-headed albatrosses and Indian yellow-nosed albatrosses in the western Indian Ocean sector, as well as foraging ecology studies for both Salvin's and white-capped albatrosses. Notable also is the absence of recent population assessments for the critically endangered Chatham Island albatross.

7.13 Even less information is available for the two species of *Phoebetria* albatrosses. The need for population monitoring and foraging ecology studies at western Indian Ocean sites for both species, as well as for South Georgia and New Zealand populations of light-mantled albatrosses, remains a priority.

7.14 Both species of giant petrels are impacted by longline fishing, yet information on population trends remains inadequate for most populations. Recent satellite-tracking studies of giant petrels at South Georgia (WG-FSA-99/38 and 99/39) showed both species and sex-specific foraging segregation, these results highlighting the need for similar studies at other important breeding sites.

7.15 For white-chinned and grey petrels, population assessments remain inadequate. Population trends are unknown for all sites across the range of both species. Recent satellite-tracking studies of white-chinned petrels (WG-FSA-99/20 and 99/47), the commonest species in the by-catch of longliners in many sectors, show their extended foraging ranges overlap with longline fisheries from Antarctic to sub-tropical waters. Information on population trends and foraging distribution of both species at all important sites is urgently required.

7.16 Assessments of the genetic profiles of albatrosses from various sites are currently being undertaken in laboratories of a number of countries including Australia, New Zealand, South Africa, UK and the USA. The application of these results in determination of the provenance of birds killed in longline fisheries will assist in identifying the populations most at risk. To accelerate this process, cooperation and coordination in the dissemination of the population specific profiles is essential. Members were requested to table information on the current status of these research programs for next year's meeting of WG-FSA.

7.17 In order to determine more accurately the status and potential utility to CCAMLR of the research programs summarised in Table 45, further investigation and refinement of information is required. Dr Gales undertook to coordinate this intersessionally.

7.18 Members were requested to update the information summarised in Table 45 by means of appropriate reports to future meetings of the Working Group.

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

1998 Data

7.19 Last year, for Subareas 58.6 and 58.7, four of the observer logbooks were incomplete. An attempt was made intersessionally to get the missing information required to calculate the seabird catch rates and numbers of hooks observed; however, this information was not collected and could not be calculated from the available data. Table 46 summarises all available information on seabird catch rates and the numbers of birds observed for these areas. This updates the relevant parts of SC-CAMLR-XVII, Annex 5, Table 35 and necessitates recalculation of estimates of overall seabird by-catch and of the species composition of the catch.

7.20 The revised observed species composition for birds killed in the longline fishery for Subareas 58.6 and 58.7 during the 1997/98 season is given in Table 47. White-chinned petrels (91%) were the most common of all birds killed; no incidental mortality of albatrosses was recorded.

7.21 The estimated total incidental catch of seabirds for each vessel (Table 48) was calculated using the catch rate (birds/thousand hooks) for each vessel multiplied by the total number of hooks set by that vessel during the fishing season. For the four vessels where catch rates could not be calculated, the overall catch rate was used. The overall catch rate was calculated from the total number of hooks observed and the total observed seabird mortality. The catch rates for Subareas 58.6 and 58.7 was 0.15 and 0.54 birds/thousand hooks for night and day setting respectively (Table 46) and 0.19 birds/thousand hooks overall. The night rate was about 31% of the level of the previous season (0.49 birds/thousand hooks); however, the day rate was similar to that of the previous season (0.58 birds/thousand hooks). The estimated total of 528 birds killed was 63% of the 1997 total (834 birds); the overall catch rate in 1998 was 39% of that in 1997.

7.22 WG-FSA-99/28 used data collected by CCAMLR international scientific observers in 1997 and 1998 to examine potential relationships between seabird incidental mortality rates on longline vessels fishing for *D. eleginoides* and the nature and use of mitigating measures, as well as with environmental variables such as time of day, time of year.

7.23 Out of the 3 283 longline sets analysed, only 311 caught birds (9.4%). Data conformed most closely to a Delta distribution (many zero values and lognormal distribution of non-zero values) and were analysed using two GLMs, a binomial model for presence/absence of seabird catches and a Gamma model for the magnitude of non-zero catches. Sparsity of data precluded analysis of seabirds at a taxon level more detailed than albatrosses and petrels combined. Other analytical difficulties, particularly in using GLMs, related to the large number of potentially important factors, the lack of overlap between factors and the fact that fishing has purposely avoided making catches of seabirds. There were, for instance, only three records in the entire dataset where none of the mitigation measures has been used.

7.24 The only factors consistently significant were time of year (very few birds caught after April) and use of streamer lines, but the effects of most other factors could not be fully analysed with the present data. Even vessels using streamer lines and setting at night were found to catch albatrosses occasionally (Figure 29), although in all such cases the line weightings used were less than those specified by Conservation Measure 29/XVI.

7.25 Vessel-specific effects were not considered in this analysis. The shortening of the season between 1997 and 1998 significantly reduced the data available, such that only two vessels fished in March and April in both years, and both changed a number of their operating parameters in this time.

7.26 The Working Group concurred with the conclusion in WG-FSA-99/28 that given the difficulties of analysing this dataset, especially the problem of very low numbers of sets not using mitigation measures and sets catching birds, experimental approaches to identifying effective mitigation measures may be preferable to post hoc analysis of observer data.

7.27 It was noted, however, that the data distributions used in the models may not be entirely realistic. In particular, there is a need to cater for the assumption that with mitigation measures in use there is an expectation that the more likely by-catch may still be zero birds. Newly available analytical software may assist in improving the analysis described in WG-FSA-99/28, and it was recommended that this be investigated intersessionally.

7.28 In general, however, it was recognised that analysis of the existing observer data is unlikely to provide clear-cut answers with respect to the efficacy of mitigation measures. As observed seabird by-catch rates decrease, this will be increasingly true. Further improvements to, and assessments of, mitigation measures will need testing using carefully designed experiments.

1999 Data

7.29 A total of 32 cruises was conducted within the Convention Area during the 1998/99 season, with scientific observers (international and national) aboard all vessels. Twenty-one cruises were undertaken in Subarea 48.3 by 12 vessels, nine cruises were undertaken in Subareas 58.6 and 58.7 by three vessels and two cruises were undertaken by two vessels in Subarea 88.1. A detailed list of the observations conducted and the type of data submitted to the Secretariat is contained in Table 49.

7.30 The timeliness of logbook and cruise report submissions to the Secretariat greatly improved this season, with all of the logbooks being received before the start of the meeting. The quality of the logbooks submitted this year has been much improved on previous years. All of the logbooks have been submitted using the CCAMLR logbook forms, although some forms were outdated and lacked some information (e.g. numbers of hooks observed). Positive feedback was received from the observers, through their technical coordinators, on the use of the electronic observers logbook. Submission of data using this method should be encouraged.

7.31 The Working Group expressed concern that the proportion of hooks being observed to provide overall estimates of seabird mortality was still rather low (WG-FSA-99/18 and 99/26). A desirable level of observation would be about 40 to 50% (SC-CAMLR-XVII, Annex 5, paragraphs 3.60 and 7.124 to 7.130); levels below 20% may introduce potentially serious errors into estimates.

7.32 Average values (percentages with ranges in parenthesis) over the last three years, for Subareas 48.3 and 58.6/58.7 have been as follows:

1997: 48.3 – 34 (5–100); 58.6/58.7 – 60 (15–100);
1998: 48.3 – 24 (1–57); 58.6/58.7 – 43 (14–100); and
1999: 48.3 – 25 (10–91); 58.6/58.7 – 34 (13–62).

7.33 The Working Group agreed that the level of sampling effort required to estimate seabird mortality should be investigated using existing data and simulation models. This work, which should be undertaken by WG-IMALF in the intersessional period, should consider the resolution and accuracy of estimates of seabird by-catch rates under various levels of observed by-catch rates.

7.34 The seabird catch rates for Subareas 48.3, 58.6, 58.7 and 88.1 were calculated from the combined numbers of hooks observed and the total seabird mortality observed (Table 50). No incidental mortality was observed for Subarea 88.1. The estimated total catch of seabirds by vessel was calculated using the vessel's catch rate multiplied by the total number of hooks set. For those vessels where data for calculating catch rates were unavailable, the overall catch rate for that area was used.

7.35 The data compiled and analyses undertaken by the Secretariat with respect to Subarea 48.3 included the results from the line-weighting experiment by the *Argos Helena* (WG-FSA-99/5). It was agreed that it was inappropriate to include these data in the estimation of by-catch and calculation of by-catch rates. However, there was insufficient time at the meeting to undertake the necessary recalculations in respect of Tables 16 and 50 to 52. Therefore it was agreed to highlight (and footnote as appropriate) these data in the above tables and to ensure that data from such experiments were excluded from the main calculations in future.

Subarea 48.3

7.36 For Subarea 48.3, the total catch rate of birds killed during daytime setting periods (0.08 birds/thousand hooks) was higher than that for night setting (0.01 birds/thousand hooks). However, this includes 88 birds killed in daytime during the line-weighting experiment on the *Argos Helena* (WG-FSA-99/5). If these data are excluded, the overall daytime catch rate would be 0.03 birds/thousand hooks and the combined overall value 0.01 birds/thousand hooks. The total estimated seabird mortality in Subarea 48.3 for 1999 was 306 birds (Table 51), a 48% decrease on the previous season, or 210 birds (a 65% decrease) if the *Argos Helena* line-weighting experiment is excluded.

7.37 The most commonly observed species killed in Subarea 48.3 (Table 52) was black-browed albatross, comprising 66% of the total seabird mortality, followed by white-chinned petrel (27%) and grey-headed albatross (3%). If *Argos Helena* data are excluded, the values are: black-browed albatross 81%, white-chinned petrel 7%, grey-headed albatross 5%.

7.38 The Working Group commended the continued reduction in the number of seabirds killed in this subarea and the maintenance of the previous year's very low by-catch rate. It noted, however, that further reductions could be achieved by:

(i) reconfigurations of offal discharge arrangements on the three vessels still discharging on the same side as the haul;

(ii) eliminating daytime setting; and

(iii) using line-weighting regimes that comply with Conservation Measure 29/XVI.

Division 58.5.1

7.39 CCAMLR-XVIII/BG/19 reported that during 1 481 longline sets by two Ukrainian vessels, 151 seabirds were killed, comprising 149 white-chinned petrels, 1 black-browed albatross and 1 light-mantled albatross.

7.40 The Working Group regretted that the full data from this fishery – and similar data from fishing within the French EEZ in Subarea 58.6 – had not been submitted to the Secretariat for analysis and evaluation at the meeting. It urged France to submit data in timely fashion to future meetings.

Subareas 58.6 and 58.7

7.41 For Subareas 58.6 and 58.7, no incidental mortality was observed during daylight setting (12% of total); the catch rate for night setting was 0.05 birds/thousand hooks. An estimated total of 156 birds were killed (Table 53), 30% of the value in 1998.

7.42 In Subareas 58.6 and 58.7, white-chinned petrels were the most common observed species killed, comprising 67% of the total seabird mortality (Table 52), followed by giant petrel (17%), gentoo penguin (8%) and grey petrel (6%).

7.43 Further analysis of the seabird by-catch in the longline fishery around the Prince Edward Islands (Subarea 58.7) in the 1998/99 season was provided in WG-FSA-99/42 Rev. 1. The 11 sanctioned fishing trips contributed a fishing effort of 5.1 million hooks, 19% more than the number of hooks set in 1997/98. Only 79 seabirds (15% of the total killed in 1997/98) were observed killed. Average seabird by-catch rate by sanctioned vessels was 0.016 birds/thousand hooks, compared with 0.289 in 1996/97 and 0.117 in 1997/98. Comparisons between years for the same vessel, using the same gear design and at the same time of year, show marked decreases in seabird by-catch rate during 1998/99.

7.44 Five bird species were reported killed: white-chinned petrels predominated (79%), followed by giant petrels *Macronectes* spp. (13%) and grey petrels (6%). The last is a concern as only one grey petrel had been killed prior to this year. Birds were caught on only 3.1% of lines set (n = 1 187). Bird by-catch was primarily linked to daytime sets, with most birds caught in the late afternoon or shortly after dusk. Use of an underwater setting device (a Mustad funnel) significantly reduced bird by-catch to very low levels (0.002 birds/thousand hooks), but it was not tested during the period when seabird by-catch typically peaks (mid- to late summer). An average of 4.5 live birds were caught per 100 hauls; although these were released alive, the higher catch rate of Spanish double-line gear is cause for concern.

7.45 WG-FSA-99/42 Rev. 1 suggested that the substantial reduction in seabird by-catch rates reported for 1998/99 was due to:

(i) continued application of mitigation measures (use of streamer lines, setting lines at night or in conjunction with an underwater setting device);

(ii) increasing experience by both crews and observers;

(iii) switch in fishing to waters more distant from the Prince Edward Islands; and

(iv) reduction in the amount of offal released from vessels.

The change in fishing area may have been especially important during the high-risk late summer period; it was recommended that fishing within 200 km of the islands from January to March should be prohibited.

7.46 The Working Group commended the efforts of South Africa in achieving continued improvement in the performance of the fishery within its EEZ in terms of reduction of seabird by-catch. It noted, however, that:

(i) there was evidence that a proportion of seabird by-catch went unobserved, at least on some vessels;

(ii) the biggest reductions in by-catch were achieved by the change in fishing area and by the use of underwater setting; and

(iii) further reduction would likely be achieved by elimination of daytime setting and by line-weighting regimes that complied with Conservation Measure 29/XVI.

It endorsed the recommendation that fishing within 200 km of the Prince Edward Islands should be prohibited from January to March inclusive.

General

7.47 The Working Group noted that over the last three years, comparing 1999 with 1997 (Table 54), seabird by-catch and by-catch rate in the regulated fishery have been reduced by 96.4% and 95.7% respectively in Subarea 48.3 and by 81.3% and 94.2% respectively in Subareas 58.6 and 58.7. This has been achieved by a combination of improved used of mitigating measures in compliance with Conservation Measure 29/XVI and by delaying the start of fishing until after the end of the breeding season of most albatross and petrel species.

Compliance with Conservation Measure 29/XVI

7.48 This section summarises information on the extent of compliance with the main elements of Conservation Measure 29/XVI in 1998/99. Table 16 provides a comparison between 1996/97, 1997/98 and 1998/99, together with an indication of the proportion of logbooks that provided data on each of the elements of Conservation Measure 29/XVI (see also WG-FSA-99/12). Based on available data, in 1998 two autoline vessels (*San Aotea II* and *Janus*), operating in Subarea 88.1, complied with all aspects of Conservation Measure 29/XVI, subject to the variation to allow daytime setting granted under Conservation Measure 169/XVII (see paragraph 7.85). For the remainder of the vessels, either insufficient data were provided to assess full compliance or not all elements of the conservation measure were complied with.

7.49 Line weighting: Data for each vessel and cruise are shown separately for Spanish system and autoline vessels in Figures 30 and 31. This year one vessel (*Illa de Rua*) complied with the line-weighting regime that applies to vessels using the Spanish system (6 kg every 20 m) on two of three cruises. One other vessel (*Koryo Maru 11*) used a line-weighting regime very close to the requirement (5 kg every 20 m) on two of five cruises. Overall (i.e. for all areas combined), the median weight and distance between weights for each of the last three years (1996/97, 1997/98 and 1998/99) for all vessels using the Spanish system was 5 kg at 45 m, 6 kg at 45 m and 7 kg at 44 m respectively. The average weight (kg) per metre of mainline for the three years was 0.111, 0.133 and 0.150 respectively. This indicates a substantial increase in overall weight added to lines in 1998/99, but is still well below the level specified by Conservation Measure 29/XVI.

7.50 Offal discharge: In Subareas 58.6, 58.7 and 88.1 there was 100% compliance with the requirement either to hold offal on board during the haul, or to discharge on the opposite side of the vessel to hauling. In Subarea 48.3, 71% of the vessels discharged offal on the opposite side to hauling. This was a substantial improvement on 1998 when only 31% of vessels complied in this regard. In Subarea 88.1 vessels achieved compliance through having a fish meal plant operating to process offal.

7.51 Night setting: Night setting was successfully completed for 80% of sets in Subarea 48.3 and 84% in Subareas 58.6 and 58.7. If the daytime sets made during mitigation measure experimentation by the *Argos Helena* in Subarea 48.3 and *Eldfisk* in Subareas 58.6 and 58.7 are removed, the percentage of night sets for the two subareas would be 86% and 98% respectively, compared with values for 1998 of 90% and 93% respectively.

7.52 Streamer lines: Vessel and cruise-specific data are summarised in Tables 16 and 17. Both vessels fishing in Subarea 88.1 used streamer lines that complied with Conservation Measure 29/XVI. However, no vessels fishing in Subareas 48.3, 58.6 and 58.7 used streamer lines that met all aspects of the CCAMLR design. The length of streamer lines was the element with lowest compliance; only 10% of vessels in Subareas 58.6 and 58.7 and 26% in Subarea 48.3 had lines that were at least 150 m long. This situation has not improved over the last three seasons. Adequate streamer line length is very important because it is a crucial element in the amount of protection afforded by the streamer line. Compliance with attachment height is generally good, showing consistent improvement for vessels fishing in Subarea 48.3. The number and spacing of streamers is generally close to 100% (Table 17). Thirteen observers (compared to eight last year) noted that spare streamer line material was on board. However, two observers (none last year) indicated that spare material was absent.

7.53 Thawed bait: As with the previous two years, reporting on compliance with use of thawed bait was incomplete. It appears from the logbooks that at least one vessel (*Ibsa Quinto*) used frozen bait on more than one set.

7.54 Overall, levels of compliance with elements Conservation Measure 29/XVI are steadily improving, particularly with respect to night setting and offal discharge. Compliance with line weighting and overall use of streamer lines is still far from satisfactory.

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

7.55 The Working Group estimated the levels of seabird by-catch that might be associated with the unregulated longline fisheries in the Convention Area in 1998/99.

7.56 An estimate of total seabird by-catch for any fishery requires information on seabird by-catch rates from a sample of the particular fishery and an estimate of the total number of hooks deployed by the fishery. For unregulated fisheries, information is not available either for seabird catch rate or for total hooks set. To estimate these parameters, catch rates of seabirds and *Dissostichus* spp. from the regulated fishery and estimates of total fish catches from the unregulated fishery are required.

Unregulated Seabird By-catch

7.57 As no information is available on seabird by-catch rates from the unregulated fishery, estimates have been made using both the average catch rate for all cruises from the appropriate period of the regulated fishery 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 are under no obligation to set at night, to use streamer lines or to use any other mitigation measure. Therefore catch rates, on average, are likely to be considerably higher than in the regulated fishery. For Subarea 48.3, the worst-case catch rate was nearly four times the average value and applies only to a single cruise in the regulated fishery. Using this catch rate to estimate the seabird catch rate of the whole unregulated fishery may produce a considerable overestimate.

7.58 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 this assessment last year. The assessment this year, therefore, followed the identical procedure to that used last year (SC-CAMLR-XVII, Annex 5, paragraphs 7.75 to 7.81) except that assessments this year also needed to be made for Subarea 48.3 and Division 58.4.4.

7.59 No seabird by-catch data are available for Division 58.4.4. The IMALF risk assessment for this division is level 3 (average) compared with level 5 (high) for Subareas 58.6 and 58.7, which lie immediately to the north. Seabird by-catch rates for Division 58.4.4 were therefore set at 60% of those pertaining to Subareas 58.6 and 58.7.

Unregulated Effort

7.60 To estimate the number of hooks deployed by the unregulated fishery, it is assumed that the fish catch rate in the regulated and unregulated fisheries is the same. Estimates of fish catch rate from the regulated fishery and estimated total catch from the unregulated fishery can then be used to obtain an estimate for the total number of hooks using the following formula:

$$\text{Effort}(U) = \text{Catch}(U)/\text{CPUE}(R),$$

where U = unregulated and R = regulated.

Catch rates for Divisions 58.4.4 and 58.5.2 were assumed to be identical to those for Division 58.5.1.

7.61 The fishing year was divided into two seasons, a summer season (S: September to April) and a winter season (W: May to August), corresponding to periods with substantially different bird by-catch rates. There is no empirical basis on which to split the unregulated catch into summer and winter components. Three alternative splits (80:20, 70:30 and 60:40) were used.

7.62 The seabird by-catch rates used were:

Subarea 48.3 –
summer: mean 2.608 birds/thousand hooks; maximum 9.31 birds/thousand hooks;
winter: mean 0.07 birds/thousand hooks; maximum 0.51 birds/thousand hooks.

Subareas 58.6, 58.7, Divisions 58.5.1 and 58.5.2 –
summer: mean 1.049 birds/thousand hooks; maximum 1.88 birds/thousand hooks;
winter: mean 0.017 birds/thousand hooks; maximum 0.07 birds/thousand hooks.

Division 58.4.4 –
summer: mean 0.629 birds/thousand hooks; maximum 1.128 birds/thousand hooks;
winter: mean 0.010 birds/thousand hooks; maximum 0.042 birds/thousand hooks.

Results

7.63 The results of these estimations are shown in Tables 55 and 56.

7.64 For Subarea 48.3, depending on the proportionate split of catches into summer and winter, estimates of the seabird by-catch in the unregulated fishery range from a lower level (based on the mean by-catch rate of regulated vessels) of 3 200 to 4 300 birds in summer (and 30 to 60 in winter) to a potentially higher level (based on the maximum by-catch rate of regulated vessels) of 11 500 to 15 400 birds in summer (and 200 to 400 in winter).

7.65 For Subareas 58.6 and 58.7 combined, depending on the proportionate split of catches into summer and winter, estimates of the seabird by-catch in the unregulated fishery range from a lower level (based on the mean by-catch rate of regulated vessels) of 12 000 to 16 000 birds in summer (and 70 to 140 in winter) to a potentially higher level (based on the maximum by-catch rate of regulated vessels) of 23 500 to 31 500 birds in summer (and 300 to 600 in winter).

7.66 It should be noted that Subarea 58.7, mainly due to low levels of fishing and catch rates of fish, makes rather little contribution to this year's total.

7.67 For Divisions 58.5.1 and 58.5.2, depending on the proportionate split of catches into summer and winter, estimates of the seabird by-catch in the unregulated fishery range from a lower level (based on the mean by-catch rate of regulated vessels) of 100 to 130 birds in summer (and 10 to 25 in winter) to a potentially higher level (based on the maximum by-catch rate of regulated vessels) of 3 650 to 4 900 birds in summer (and 75 to 150 in winter).

7.68 For Division 58.4.4, depending on the proportionate split of catches into summer and winter, estimates of the seabird by-catch in the unregulated fishery range from a lower level (based on the mean by-catch rate of regulated vessels) of 3 000 to 4 000 birds in summer (and 15 to 30 in winter) to a potentially higher level (based on the maximum by-catch rate of regulated vessels) of 5 000 to 7 000 birds in summer (and 30 to 130 in winter).

7.69 The overall estimated totals for the whole Convention Area (Table 56) indicate a potential seabird by-catch in the unregulated fishery of 18 000 to 25 000 (lower level) to 44 000 to 59 000 birds (higher level) in 1998/99.

7.70 This compares with totals of 17 000–27 000 (lower level) to 66 000–107 000 (higher level) in 1996/97 and 43 000–54 000 (lower level) to 76 000–101 000 (higher level) in 1997/98. Any suggestion of a decrease in 1998/99 should be viewed with caution, given the uncertainties and assumptions involved in these calculations.

7.71 The composition of the estimated potential seabird by-catch based on data from 1997 is set out in Table 57. This indicates a potential by-catch of 21 000 to 46 500 albatrosses, 3 600 to 7 200 giant petrels and 57 000 to 138 000 white-chinned petrels in the unregulated fishery in the Convention Area over the last three years.

7.72 As in the last two years, it was emphasised that the values in Tables 55 to 57 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.

7.73 Nevertheless, even taking this into account, the Working Group endorsed its conclusion of last year that such levels of mortality are entirely unsustainable for the populations of albatrosses and giant and white-chinned petrels breeding in the Convention Area.

Summary Conclusion

7.74 IMALF 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. In the last three years, an estimated 170 000 to 250 000 seabirds have been killed by these vessels. Of these, 21 000 to 46 500 were albatrosses, including individuals of four species listed as globally threatened (vulnerable) using the IUCN threat classification criteria. These and several other albatross and petrel species are facing potential extinction as a result of longline fishing. The Working Group urgently requests the Commission to take action to prevent further seabird mortality by unregulated vessels in the forthcoming fishing season.

Incidental Mortality of Seabirds in relation to New and Exploratory Fisheries

Assessments of Risk in CCAMLR Subareas and Divisions

7.75 In previous years concerns were raised relating to the numerous proposals for new fisheries and the potential for these new and exploratory fisheries to lead to substantial increases in seabird incidental mortality (SC-CAMLR-XVI, Annex 5, paragraph 7.118; SC-CAMLR-XVII, Annex 5, paragraph 7.98).

7.76 In order to address these concerns, the Working Group prepared 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.

7.77 The assessments made in 1997 and 1998 for new and exploratory fisheries proposed in those years are set out in SC-CAMLR-XVI, Annex 5, paragraph 7.126 and SC-CAMLR-XVII, Annex 5, paragraph 7.116. Similar assessments of two areas with established longline fisheries (Subarea 48.3 and Division 58.5.1) were undertaken in 1997 (SC-CAMLR-XVI, Annex 5, paragraph 7.127).

7.78 The Working Group again noted that the need for such assessments would be largely unnecessary if all vessels were to adhere to all elements of Conservation Measure 29/XVI. It is considered that these measures, if fully employed, and if appropriate line-weighting regimes could be devised for autoliners, should permit longline fishing activities to be carried out in any season and area with negligible seabird by-catch.

7.79 This year new data on breeding distribution and population sizes of albatrosses and petrels were provided in WG-FSA-99/59, and on at-sea distribution from satellite-tracking studies in WG-FSA-99/19, 99/20, 99/21, 99/25, 99/36, 99/38, 99/39 and 99/47.

7.80 The areas for which proposals for new and exploratory fisheries were received by CCAMLR in 1999 were:

Subarea 48.6	(South Africa, European Community)
Division 58.4.1	(Australia – trawl)
Division 58.4.2	(Australia – trawl)
Division 58.4.3	(Australia – trawl, France, European Community)
Division 58.4.4	(Chile, South Africa, Uruguay, France, European Community)
Division 58.5.1	(Chile, France)
Division 58.5.2	(France)
Subarea 58.6	(Chile, France, South Africa, European Community)
Subarea 58.7	(France)
Subarea 88.1	(Chile, European Community, New Zealand)
Subarea 88.2	(Chile, European Community).

7.81 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 paragraph 7.76 and adopted in previous years. Two areas, Division 58.4.2 and Subarea 88.2 were fully assessed for the first time. Full details of these two new assessments are provided in paragraph 7.84, together with summaries for the other areas.

7.82 The full texts of all assessments were combined into a background document for use by the Scientific Committee and Commission (SC-CAMLR-XVIII/BG/23). It was agreed that this document should in future be tabled annually for the Scientific Committee.

7.83 A summary of risk level, risk assessment, IMALF recommendations relating to fishing season and any inconsistencies between these and the proposals for new and exploratory fisheries in 1999 is set out in Table 58. The assessment conclusion, advice and full comments on the proposals are set out below.

7.84 (i) Subarea 48.6:

Assessment: moderately well-known area in terms of visiting species. Its very large area, however, suggests interaction potential is probably underestimated. The northern part of the area (north of c. 55°S) contains extensive potential fishing grounds and is also the area in which most seabirds potentially at risk occur.

Advice: 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; apply Conservation Measure 29/XVI as a seabird by-catch precautionary measure.

It was noted that South Africa (CCAMLR-XVIII/9) and the European Community (CCAMLR-XVIII/21) propose to fish from 1 March to 31 August north of 60°S and from 15 February to 15 October south of 60°S and to comply fully with all elements of Conservation Measure 29/XVI. This does not conflict with the above advice.

(ii) Division 58.4.1:

Assessment: although no breeding populations are within the area, this is a potentially important foraging area for five albatross species (two threatened, one near-threatened), southern giant petrel, northern giant petrel, white-chinned petrel and short-tailed shearwater from important breeding areas for the species concerned.

Advice: average risk; prohibit longline fishing during the breeding season of albatrosses, giant petrels and white-chinned petrels (September–April); apply all elements of Conservation Measure 29/XVI.

It was noted that Australia (CCAMLR-XVIII/12) is proposing a trawl fishery in this area, and that longline fishing is not currently proposed.

It was also noted that much of the risk to seabirds in this area arises in the region of the BANZARE Rise in the west of the region, adjacent to Division 58.4.3.

(iii) Division 58.4.2 (new assessment)

Breeding species in this area: southern giant petrel.

Breeding species known to visit this area: wandering albatross, light-mantled albatross and white-chinned petrel from Crozet Islands.

Breeding species inferred to visit this area: black-browed albatross, light-mantled albatross, grey-headed albatross, northern giant petrel, white-chinned petrel and grey petrel.

Other species: short-tailed shearwater, sooty shearwater.

Assessment: this is an important foraging area for four albatross species (two threatened), southern giant petrel and white-chinned petrel.

Advice: average-to-low risk; prohibit longline fishing during the breeding season of giant petrels (October to April); maintain all elements of Conservation Measure 29/XVI.

It was noted that Australia (CCAMLR-XVIII/11) is proposing a trawl fishery in this area, and that longline fishing is not currently proposed.

(iv) Division 58.4.3:

Assessment: although no breeding populations are within the area, this is a potentially important foraging area for four albatross species (two threatened, one near-threatened), southern giant petrel and white-chinned petrel from important breeding areas for the species concerned.

Advice: average risk; prohibit longline fishing during the breeding season of albatrosses, giant petrels and white-chinned petrels (1 September to 30 April); maintain all elements of Conservation Measure 29/XVI.

It was noted that:

(a) France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season and to comply fully with all elements of Conservation Measure 29/XVI. This fishing season substantially conflicts with the IMALF advice;

(b) the European Community (CCAMLR-XVIII/21) intends to fish from 15 April to 31 August and to comply fully with all elements of Conservation Measure 29/XVI. This will overlap the recommended season closure by two weeks; and

(c) the proposal by Australia (CCAMLR-XVIII/12) is for a trawl fishery.

(v) Division 58.4.4:

Assessment: although no breeding populations are within the area, this is a potentially important foraging area for four albatross species (three threatened, one near-threatened), southern giant petrel, white-chinned petrel and grey petrel from very important breeding areas for the species concerned.

Advice: average risk; prohibit longline fishing during the main breeding season of albatrosses and petrels (1 September to 30 April); maintain all elements of Conservation Measure 29/XVI.

It was noted that:

(a) France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season and to comply fully with all elements of Conservation Measure 29/XVI. This fishing season substantially conflicts with the IMALF advice;

(b) Chile (CCAMLR-XVIII/13), South Africa (CCAMLR-XVIII/9), Uruguay (CCAMLR-XVIII/14) and the European Community (CCAMLR-XVIII/21) propose to fish from 15 April to 31 August. This will overlap the recommended season closure by two weeks; and

(c) Chile (CCAMLR-XVIII/13) states its intent to comply with streamer-line requirements under Conservation Measure 29/XVI, but makes no specific reference to the other provisions of this conservation measure. However, it is understood that Chile intends to conform fully with all elements of Conservation Measure 29/XVI. South Africa, Uruguay and the European Community intend to comply fully with all elements of Conservation Measure 29/XVI.

(vi) Division 58.5.1:

Assessment: important foraging area for six albatross species (four threatened, one near-threatened), southern giant petrel, white-chinned petrel and grey petrel, for several of which Kerguelen is a very important breeding site. Most albatross and petrel species breeding at Heard and McDonald Islands will also forage in this area, as will birds of many of the species breeding at Crozet.

Advice: high risk; prohibit longline fishing during the main albatross and petrel breeding season (i.e. 1 September to 30 April); ensure strict compliance with Conservation Measure 29/XVI.

It was noted that:

(a) France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season and to comply fully with all elements of Conservation Measure 29/XVI. This fishing season substantially conflicts with the IMALF advice;

(b) Chile (CCAMLR-XVIII/13) states that it would comply with conservation measures that were in force concerning fishing seasons in relevant subareas and divisions. However, there was no fishing season conservation measure for Division 58.5.1 in force in 1998/99. Given the high-risk category of the division, it is recommended that the fishing season be restricted to 1 May to 31 August; and

(c) Chile (CCAMLR-XVIII/13) states its intent to comply with streamer-line requirements under Conservation Measure 29/XVI, but makes no specific reference to the other provisions of this conservation measure. However, it is understood that Chile intends to conform fully with all elements of Conservation Measure 29/XVI.

(vii) Division 58.5.2:

Assessment: important foraging area for six albatross species (four threatened, one near-threatened and including one of the only two albatross species which are critically endangered – Amsterdam albatross) and for both species of giant petrel and white-chinned petrels from globally important breeding sites at Kerguelen, Heard and Amsterdam Islands.

Advice: 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/XVI.

It was noted that:

(a) France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season and to comply fully with all elements of Conservation Measure 29/XVI. This fishing season substantially conflicts with the IMALF advice; and

(b) longline fishing is currently prohibited within the EEZ around Heard and McDonald Islands.

(viii) Subarea 58.6:

Assessment: known and potential interactions with seven species of albatross (five threatened, one near-threatened), for many of which Crozet is one of the most important world breeding sites, as it is for giant, white-chinned and grey petrels. Also substantial potential for fishery interactions with albatrosses and petrels from the Prince Edward Islands and albatrosses from a variety of other breeding sites in their non-breeding season. Even outside the French EEZ (within which commercial longline fishing is presently prohibited), this is one of the highest risk areas in the Southern Ocean.

Advice: high risk; prohibit longline fishing during the main albatross and petrel breeding season (i.e. 1 September to 30 April); ensure strict compliance with Conservation Measure 29/XVI.

It was noted that:

(a) France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season and to comply fully with all elements of Conservation Measure 29/XVI. This fishing season substantially conflicts with the IMALF advice;

(b) South Africa (CCAMLR-XVIII/8), Chile (CCAMLR-XVIII/13) and the European Community (CCAMLR-XVIII/21) propose to fish from 15 April to 31 August. This will overlap the recommended season closure by two weeks; and

(c) Chile (CCAMLR-XVIII/13) states its intent to comply with streamer-line requirements under Conservation Measure 29/XVI, but makes no specific reference to the other provisions of this conservation measure. However, it is understood that Chile intends to conform fully with all elements of Conservation Measure 29/XVI. South Africa and the European Community intend to comply full with all elements of Conservation Measure 29/XVI.

(ix) Subarea 58.7:

Assessment: known and potential interactions with five species of albatross (four threatened), for most of which the Prince Edward Islands is one of the most important world breeding sites, as it is for giant petrels. Also substantial potential for fishery interactions with albatrosses and petrels from the Crozet Islands and albatrosses from various other breeding sites in their non-breeding season. This small area is one of the highest risk areas in the Southern Ocean. It should be noted that within South Africa's EEZ, commercial longline fishing is currently permitted all year.

Advice: high risk; prohibit longline fishing during the main albatross and petrel breeding season (1 September to 30 April); ensure strict compliance with Conservation Measure 29/XVI.

It was noted that France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season and to comply fully with all elements of Conservation Measure 29/XVI. This fishing season substantially conflicts with the IMALF advice.

(x) Subarea 88.1:

Assessment: the northern part of this area lies within the foraging range of three albatross species (two threatened) and is probably used by other albatrosses and petrels to a greater extent than the limited available data indicate. The southern part of this subarea has potentially fewer seabirds at risk.

Advice: 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; the provisions of Conservation Measure 29/XVI should be strictly adhered to.

It was noted that:

(a) Chile (CCAMLR-XVIII/13), the European Community (CCAMLR-XVIII/21) and New Zealand (CCAMLR-XVIII/10) propose to fish from 15 December to 31 August;

(b) Chile (CCAMLR-XVIII/13) states its intent to comply with streamer-line requirements under Conservation Measure 29/XVI, but makes no specific reference to the other provisions of this conservation measure. However, it is understood that Chile intends to conform fully with all elements of Conservation Measure 29/XVI. The European Community intends to comply fully with all elements of Conservation Measure 29/XVI; and

(c) New Zealand (CCAMLR-XVIII/10) proposes a continuation of the variation to Conservation Measure 29/XVI as provided for by Conservation Measure 169/XVII, to allow line-weighting experiments to continue south of 65°S in Subarea 88.1 (see paragraphs 7.85 to 7.91 for further discussion).

(xi) Subarea 88.2 (new assessment):

Breeding species in this area: none.

Breeding species known to visit this area: light-mantled albatross from Macquarie Island.

Breeding species inferred to visit this area: light-mantled albatross from Auckland, Campbell and Antipodes Islands; Antipodean albatross from Antipodes Island; grey-headed albatross and Campbell albatross from Campbell Island; wandering albatross, black-browed albatross and grey-headed albatross from Macquarie Island, grey petrel and white-chinned petrel from New Zealand populations.

Other species: sooty shearwater.

Assessment: although there are few observational data from this area, the northern part of this area lies within the suspected foraging range of six albatross species (four threatened) and is probably used by other albatrosses and petrels to a greater extent than the limited available data indicate. The southern part of this subarea has potentially fewer seabirds at risk.

Advice: low risk. No obvious need for restriction of longline fishing season; apply Conservation Measure 29/XVI as a seabird by-catch precautionary measure.

It is noted that:

(a) the European Community (CCAMLR-XVIII/21) states that it will comply with Conservation Measure 29/XVI, including only setting gear at night; and

(b) Chile (CCAMLR-XVIII/13) states its intent to comply with streamer-line requirements under Conservation Measure 29/XVI, but makes no specific reference to the other provisions of this conservation measure. However, it is understood that Chile intends to conform fully with all elements of Conservation Measure 29/XVI.

New Zealand Proposal in respect of Subarea 88.1

7.85 The Working Group noted New Zealand's request for a continuation of the variation to Conservation Measure 29/XVI, as provided for last year by Conservation Measure 169/XVII, to allow line-weighting experiments to continue south of 65°S in Subarea 88.1 (CCAMLR-XVIII/10). Conservation Measure 169/XVII allowed vessels to set lines during the daytime south of 65°S in Subarea 88.1 if vessels weighted their lines and achieved a minimum sink rate of 0.3 m/s for all parts of the longline. This variation was sought because during austral summer (December to March) there are no periods of darkness at these latitudes.

7.86 In 1998 the Working Group noted that line weighting has the best potential as an alternative mitigation measure, and noted the need to urgently gain information on longline sink rates and seabird interactions for both autoliners and vessels using the Spanish system. The Working Group also noted in 1998 that while manual addition and removal of weights will probably be the best means of achieving the target sink rates in the short term, more efficient and safer ways of weighting longlines need to be developed.

7.87 New Zealand reported that no seabird mortalities were recorded either during the experimental line-weighting program or when fishing north of 65°S and complying in full with Conservation Measure 29/XVI. Time–depth recorders were used to monitor sink rate and the minimum sink rate of 0.3 m/s was consistently achieved.

7.88 The Working Group supported the variation in 1998 on the grounds that this would assist in the development of line weighting for all areas of CCAMLR. In considering New Zealand's request to continue line sink rate experimentation, the Working Group noted that the southern part of Subarea 88.1 was assessed as average to low risk for seabirds. This limits the usefulness of extrapolation of the results of the line-weighting experiment to other higher risk areas.

7.89 However, continuation of the experiment will build on last year's data. It should also provide the opportunity to experiment with ways to integrate weighting into the mainline.

7.90 The Working Group therefore supported the New Zealand proposal to continue the variation to Conservation Measure 29/XVI and encouraged New Zealand to investigate ways of more safely and efficiently weighting longlines. The Working Group suggested that a condition might be attached to this variation requiring vessels to determine what weighting regime would be required to achieve an integrated weighting system.

7.91 The Working Group also requested that New Zealand report to the next meeting of WG-FSA on the nature and effectiveness of its line-weighting regimes for minimising seabird mortality within the New Zealand EEZ during the 1998/99 and 1999/2000 seasons.

7.92 CCAMLR-XVIII/10 indicated that New Zealand vessels operating within Subarea 88.1 in 1999/2000, where possible, will be required to operate fishmeal plants for processing offal and by-catch. If a vessel experiences operational problems with their meal plant, they will retain offal and by-catch on board for disposal in port on their return to New Zealand. This provision will apply to the whole of Subarea 88.1.

7.93 The Working Group noted that this constituted an excellent example of good operational practice and encouraged widespread emulation of this practice.

New and Exploratory Fisheries Operational in 1998/99

7.94 Table 59 provides information on the performance of new and exploratory fisheries undertaken in 1998/99. It was noted that little or no fishing was carried out in Subarea 48.6 and Divisions 58.4.1, 58.4.3 and 58.4.4.

7.95 Comprehensive reports on seabird interactions with longline fishing in Subareas 58.6, 58.7 and 88.1 have been provided by South Africa and New Zealand (WG-FSA-99/42 and 99/35). Information contained in these reports was used in assessments of new and exploratory fisheries in 1999/2000, where relevant. The seabird by-catch data and the effectiveness of mitigation measures employed in these new and exploratory fisheries are discussed in paragraphs 7.29 to 7.54 and 7.116.

Incidental Mortality of Seabirds during Longline Fishing outside the Convention Area

7.96 WG-FSA-99/18 reviewed seabird by-catch in the Australian Fishing Zone (AFZ) over the decade to 1997. Most of the birds killed in the tuna longline fishery were albatrosses. Analyses of the trends of seabird catch rates in the AFZ by Japanese longliners over 10 years show an apparent fall from the 1988 by-catch figure of 0.4 birds/thousand hooks to levels of between 0.1 to 0.2 birds/thousand hooks. Based on current fishing levels, these recent rates equate to between 1 000 and 3 500 birds being killed each year. Although the initial fall in the by-catch rate was achieved rapidly, the rate has plateaued or risen slightly since, indicating that there may have been changes to fishing practices or equipment which are detrimental to efforts to minimise seabird by-catch and/or adoption of mitigation methods has been slow. The paper emphasises that large amounts of data are necessary to gain clear insights into the suite of species impacted by a fishery, and the effect of different fishing gear, environmental variables, and the mitigation measures employed.

7.97 WG-FSA-99/73 reported on seabird interactions with longline fisheries in the AFZ in 1998. There was no fishing in 1998 by Japanese longline fishing vessels. Fishing in the AFZ by domestic pelagic longliners is logically treated as two fleets: a heterogenous local-style fleet and a homogenous Japanese-style fleet. The increase in local-style pelagic effort during the 1990s was sustained this year, with over 9 million hooks being set, a 22% rise over the number of hooks set during 1997. Of these, 13 700 (0.1%) were observed. Over 770 000 hooks, of which c. 50 000 (6.5%) were observed, were set in the AFZ by Australian-owned Japanese-style vessels. This number has been fairly constant throughout the 1990s.

7.98 In the local-style pelagic fishery, all observations were made around Tasmania in summer, most observed hooks were set at night, and the observed by-catch rate was 0.58 birds/thousand hooks. Shy albatrosses were the most commonly caught species of seabird. By-catch rates were influenced by moon phase. The importance of measures additional to bird lines (such as weights) was emphasised.

7.99 The observed by-catch rate in the Australian-owned Japanese-style fishery was 0.4 birds/thousand hooks. Most observed hooks were set during the day. The species caught were mainly black-browed and wandering albatrosses. Bird lines were found to reduce the observed by-catch rate, but only if they were of good quality. Thawed bait and fewer birds around the vessel were observed to result in lower by-catch rates.

7.100 Measured by-catch rates of birds by both parts of the fleet are high (in the order of 0.4 to 0.6 birds/thousand hooks during 1998), and this suggests that both of these fleets continue to catch a substantial number of seabirds in the AFZ. Because of the small percentage of hooks observed, estimates of the total numbers of seabirds caught would be premature. Approximately 43 000 hooks were observed set by domestic demersal longline fishing vessels. No birds were observed to be caught by these hooks.

7.101 New data on foraging ranges outside the Convention Area of seabird species breeding within the Convention Area are provided for:

(i) white-chinned petrel in WG-FSA-99/20 and 99/47, showing substantial overlap with longline fisheries in coastal South America and with southern bluefin tuna fisheries in the Indian Ocean;

(ii) northern and southern giant petrels in WG-FSA-99/38 and 99/39, showing substantial overlap with longline fisheries in coastal South America; and

(iii) grey-headed albatross in WG-FSA-99/25, showing substantial overlap with southern bluefin tuna fisheries in the Indian Ocean.

7.102 The Working Group regretted the absence of other data from Members on incidental mortality of seabirds, especially for regions adjacent to the Convention Area, such as New Zealand, South Africa, southern South America and the Falkland/Malvinas Islands.

7.103 Members were reminded that such information is likely to include data on incidental mortality of seabirds which breed in the Convention Area and were requested to provide relevant data for next year's meeting.

Research into and Experience with Mitigating Measures

7.104 The FAO review of incidental catch of seabirds by longline fisheries, including a review of, and technical guideline for, mitigation (WG-FSA-99/23), is to be published shortly. This is an authoritative source reference, the main conclusions of which have been taken forward into the FAO International Plan of Action on the Reduction of Incidental Catch of Seabirds in Longline Fishing (FAO IPOA–Seabirds) (WG-FSA-99/6, Appendix 1).

7.105 WG-FSA-99/26 reviewed factors affecting the number and the mortality of seabirds attending longliners and trawlers fishing in the Kerguelen area during 1994 and 1997, based on on-board observations by dedicated observers. The total numbers of seabirds attending vessels varied mainly according to the year, cloud cover and presence of offal from longliners. The dumping of offal increased the numbers of birds attending the vessel. The activity of the vessels also affected the numbers attending, birds being more abundant during line setting and during trawl hauling. The white-chinned petrel was the most abundant ship-following seabird, followed by black-browed albatross and giant and cape petrels. The number of white-chinned petrels, black-browed and grey-headed albatrosses attending fishing vessels increased through the season, whereas the converse was true for giant and cape petrels.

7.106 Four species of birds were caught by fishing gear (mainly by longliners), the order of frequency being white-chinned petrels, black-browed, grey-headed and wandering albatrosses. Taking into account the number of birds from each species attending longliners and known to be potential by-catch, white-chinned petrel and grey-headed albatross were caught in much greater proportion than the number of potential by-catch present, whereas black-browed albatrosses were caught in lower proportions. Giant petrels were abundant around longliners, but not observed caught.

7.107 WG-FSA-99/26 reported that, for longline vessels, most birds were killed when the lines were set during the day or at other times when the deployment of the streamer lines was incorrect, at an overall rate of 0.47 birds/thousand hooks. Only one albatross was caught when the lines were set during the night. White-chinned petrels represented 92% of all birds killed by longliners. The number of birds caught varied significantly between months and between years. The type of bait used also affected the catch rate. The catch rate was related to the number of birds attending the longliner only for black-browed albatrosses. Most birds killed by trawlers were caught by the netsonde cable. Night setting is the most efficient method to reduce mortality of albatrosses. Additional methods need developing to reduce the mortality of species active at night, especially the white-chinned petrel, whose populations in the Indian Ocean are threatened by longline fisheries.

7.108 Observer effects on reported by-catch rates were evident from experiences reported in WG-FSA-99/26. For one vessel, the by-catch rate recorded while the observer was undertaking other fishery monitoring tasks was five times lower (0.05 birds/thousand hooks) than that recorded during dedicated observations of the line haul (0.25 birds/thousand hooks). These observations reinforce the need for caution when interpreting by-catch rate data, as comparisons between vessels and studies may be affected by differences in the quality of the reported data.

7.109 The Working Group reviewed new information relating to methods for mitigating seabird by-catch in longline fisheries, with special emphasis on those aspects and topics covered by Conservation Measure 29/XVI.

Offal Discharge

7.110 The Working Group commended the fact that available reports on vessels operating in the longline fisheries in Subareas 58.6 and 58.7 in 1998 (Table 50) indicate that all vessels

discharge offal on the opposite side to the haul, as specified in Conservation Measure 29/XVI. The advantages of this, in respect of reducing seabird by-catch, were clearly indicated from last year's data (SC-CAMLR-XVII, Annex 5, paragraph 7.140) In Subarea 48.3, however, three vessels (*Isla Sofía*, *Isla Camila* and *Jacqueline*) are still operating with offal discharge on the same side as the haul, in contravention of the conservation measure. The fact that, unlike last year, high seabird by-catch rates are not associated with these vessels, probably reflects that they were fishing at a time when very few birds were available to be caught. The Working Group noted that the engineer's diagram of the waste-pipe reconfiguration of the *Koryo Maru 11* had been provided to the Secretariat, as requested last year (SC-CAMLR-XVII, Annex 5, paragraph 7.144). It was hoped that the vessels above could use this as a basis for reconfiguration.

Line Weighting

7.111 Three papers provided new insights on mitigation. WG-FSA-99/5 reported the results of line-weighting experiments on the *Argos Helena* in Subarea 48.3 in February 1999. Many commercial vessels using the Spanish longline system attach weights every 40 m, rather than the 20 m interval specified in Conservation Measure 29/XVI. The experiment was therefore designed to examine the effect on seabird mortality of increasing line weighting from 4.25 kg at 40 m intervals to 8.5 kg (double) and 12.75 kg (treble) at 40 m intervals. Doubling the weight reduced the bird mortality from 3.98 birds/thousand hooks to <1/thousand hooks. There was no significant reduction in mortality with a line weighting of 12.75 kg per 40 m, compared to 8.5 kg per 40 m.

7.112 WG-FSA-99/5 noted that bird catch rates with twice and three times the normal weighting regime were similar to those found during daytime setting around South Georgia in the 1998 winter fishery. Many more birds are present around South Georgia in the February period than in winter. The fact that such low catch rates are achievable, even when fishing during the day at a time of year when certain species, especially black-browed albatrosses, are most vulnerable, suggests that it may be possible to develop a viable year-round fishing regime with an acceptably low threat to seabirds through the use of effective line weighting.

7.113 The Working Group was surprised that with line weightings of 8.5 kg at 40 m intervals, which should equate to sink rates of about 1 m/s (WG-FSA-95/58) (cf. Conservation Measure 29/XVI which specifies 6 kg at 20 m, giving a sink rate of about 0.9 m/s), the line still did not sink sufficiently fast to avoid catching any birds.

7.114 An important observation in WG-FSA-99/5 was that the distance of 40 m between the weights meant that the fishing line could loop up to the surface, increasing the danger of birds being caught on hooks. The effect of buoyancy of birds already caught on the line was particularly important in this regard. Observations from the stern indicated that this was still a problem even with the use of three times the normal weight, and emphasised the importance of the 20 m interval specified in Conservation Measure 29/XVI. WG-FSA-99/5 also reported on the effect of environmental conditions and seabird behaviour on the vulnerability of seabirds to hooking and the effectiveness of mitigation methods. Strong winds in particular reduced the effectiveness of the streamer line by blowing it away from the fishing line. The use of multiple streamer lines under these circumstances was suggested as a possible solution to this problem.

7.115 The Working Group recognised that this experiment was a useful contribution to the understanding of the importance of line weighting in the mitigation of seabird mortality, and the practicalities of increasing line weighting above that currently in general use in the fishery. It also provided a helpful example of the use of GLMs in the analysis of data on factors affecting seabird mortality. Further experimentation on longline-weighting regimes with the Spanish method is necessary before advice on the refinement of the relevant part of Conservation Measure 29/XVI can be provided.

7.116 WG-FSA-99/35 reported the results of line-weighting trials on autoline vessels in Subarea 88.1. For two vessels, 5 kg weights every 60 m sank longlines at 0.36 m/s (setting at 4.5 to 5 knots) and 5 kg weights at 65 m sank lines at 0.4 m/s (setting at 5.5 to 6 knots). Setting speed has a substantial effect on line sink rate. No seabirds were observed caught in Subarea 88.1 with these weighting regimes and sink rates. Although the numbers of seabirds around the vessel were high at times, few were of species known to be vulnerable to capture on longlines. WG-FSA-99/37 provides similar information as WG-FSA-99/35 in poster form but also notes that weights at larger spacings (5 kg every 400 m) have no effect on sink rate.

7.117 WG-FSA-99/62 reported the results of meetings with Norwegian autoline gear makers Mustad and Fiskevegn. Conclusions were that marine, autoline and rope engineers have much to offer in efforts to reduce seabird deaths in autoline longline fishing globally and have been under-utilised in efforts thus far. It was also concluded Mustad and Fiskevegn are unlikely to respond to requests to modify autoline gear (e.g. make heavier magazine carriers to support heavier ropes) and rope composition (to increase specific gravities) until client demand makes it economically viable to do so. An increase in client demand is most likely to come with the imposition of fishing licence conditions which require faster sinking longlines.

7.118 The Working Group noted that four of five autoline vessels fishing in the Convention Area in 1998/99 used weights on their longlines. In addition, the spacings between weights on autoline vessels have varied over the last three years, from median values of 4 kg at 200 m (average 0.014 kg/m) in 1997, to 9 kg at 640 m (average 0.015 kg/m) in 1998, to 5 kg at 100 m (average 0.022 kg/m) in 1999.

Line Setter

7.119 No response from Mustad was received to the Secretariat's request for further information (SC-CAMLR-XVII, Annex 5, paragraph 7.155).

Streamer Line

7.120 No new specific or experimental information on design or use had been received this year. Several reports had testified to reduction in seabird by-catch achieved using streamer lines, the importance of constructing and using them correctly (e.g. WG-FSA-99/26) and to certain circumstances in which they were of reduced effectiveness (e.g. WG-FSA-99/5), together with suggestions to help rectify this.

Underwater Setting

7.121 WG-FSA-99/5 referred to potential tests of the effectiveness of an underwater setting tube on the Spanish system vessel *Argos Helena*. The trial was aborted due to poor tube design.

7.122 In Subareas 58.6 and 58.7, the autoliner *Eldfisk* used a Mustad underwater setting funnel, designed to set line at 2 m depth (WG-FSA-99/42 Rev. 1). It set 487 longlines (1.4 million hooks) during three cruises. Of these, 203 sets (41.0% of hooks) used the Mustad funnel (11.6% of total fishing effort). Fifteen birds were killed (13 white-chinned and 2 grey petrels); only one (a white-chinned petrel) was caught on a set made using the funnel. Seabird by-catch using the funnel (0.002 birds/thousand hooks) was markedly less than when not using the funnel (0.017), and the difference is significant despite the small sample size (X^2 = 5.95, df = 1, $P < 0.05$). This underestimates the efficacy of the funnel, because it does not take into account the much greater proportion of hooks set during the day using the funnel (97.0%) compared with night sets (11.1%). Given the known higher by-catch rate during day sets, the null model of an equal likelihood of mortalities occurring with and without the funnel is conservative. The sample size of night sets using the funnel was too small to be compared with night sets not using the funnel, but the only bird killed while using the funnel was caught during the day.

7.123 The line jumped out of the funnel during 22 of 203 sets (11%). With increasing experience this happened less frequently (16%, 13%, 3% on successive trips). This did not result in any birds being caught in this study, but could be a problem during day sets in areas/times with a high risk of seabird by-catch. There is also a problem with increased rates of bait loss as a result of the use of the funnel. This needs to be addressed by the funnel manufacturer.

7.124 The Working Group commended the work, and strongly encouraged further use and development of this system.

General

7.125 Consideration needs to be given to the use of coloured fishing gear as a possible aid to reducing seabird by-catch. It is possible that proper use of appropriate mitigation measures might result in reduction in the by-catch of albatrosses to acceptable levels, but that catch rates of white-chinned petrels will remain unacceptably high due to the reduced effectiveness of night setting with this species. One approach with this species might be to dye, either dark blue or black, hook lines, snood lines, hooks and bait in an attempt to make gear less visible to white-chinned petrels foraging, whether in daylight or in darkness.

7.126 Members expressed a desire to achieve better feedback from the fishing industry on operational issues and fishing strategy procedures that may influence the successful use of mitigation measures. Of particular concern was to learn more from the industry about practical implications of the line-weighting regimes promoted in Conservation Measure 29/XVI and similar regimes being suggested for autoliners.

7.127 Members, especially technical coordinators of national scientific observation programs, were requested to provide relevant information in advance of next year's meeting of WG-FSA.

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

7.128 WG-FSA-99/6 reviewed most of the current international initiatives relating to the elimination of seabird by-catch in longline fisheries. In addition to summarising progress on issues discussed in paragraphs 7.132 to 7.140, it noted that:

(i) the United Nations adopted a resolution at its 53rd Session (in 1998) noting its concern with loss of seabirds and urging states to reduce fishery by-catches;

(ii) workshops addressing seabird by-catch issues in longline fisheries are planned to be held in 2000:

(a) in Canada under the auspices of the Circumpolar Seabird Working Group of the Intergovernmental Committee on Conservation of Arctic Flora and Fauna;

(b) in Hawaii, USA, in May as part of the Second International Conference on Albatrosses and Petrels;

(c) in South Africa, with support from the Global Environmental Facility and BirdLife South Africa; and

(iii) the BirdLife International Seabird Conservation Programme, working through national partnership in 80 countries, intends to commence a global campaign addressing seabird by-catch issues, including persuading and facilitating the major longlining nations to prepare effective plans of action under the FAO IPOA (see paragraphs 7.129 to 7.131).

FAO International Plan of Action on the Reduction of Incidental Catch of Seabirds in Longline Fisheries (IPOA–Seabirds)

7.129 SC-CAMLR-XVIII/BG/14 reported that at the 23rd session of the FAO Committee on Fisheries (COFI; Rome, 15 to 19 February 1999) the IPOA–Seabirds was adopted and forwarded to the FAO Council, which endorsed it in June 1999.

7.130 Members of COFI are requested to report to its next meeting (in 2001) their progress in relation to IPOA–Seabirds in conducting assessments followed by adopting National Plans of Action (NPOAs) if warranted.

7.131 The Working Group recognised the importance of prompt preparation of detailed NPOA–Seabirds by relevant Member States, especially those with most experience in longline fisheries and seabird by-catch issues. It encouraged all Members of the Commission

involved in longline fishing, especially those operating within the Convention Area, to develop appropriate NPOAs and to report on progress to the next meeting of ad hoc WG-IMALF.

Convention on Migratory Species

7.132 The Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention) provides a framework for countries to work together towards the conservation of migratory species throughout their range. At the 5th Conference of Parties to the Convention, held in 1997, all southern hemisphere species of albatrosses were listed on either Appendix I or II of the CMS. Listing on Appendix II obliges range states to endeavour to conclude regional agreements that facilitate cooperative conservation and management actions.

7.133 Since this listing, the Group of Temperate Southern Hemisphere Countries on the Environment (known as the Valdivia Group) have been endeavouring to develop an agreement in cooperation with other southern hemisphere albatross range states. Members of the Valdivia Group are Argentina, Australia, Brazil, Chile, New Zealand, South Africa and Uruguay. An ad hoc Valdivia Working Group on Albatrosses was formed to progress development of a regional agreement. In June 1999, Australia hosted the inaugural meeting of the working group which was attended by all member countries of the Valdivia Group. The group identified key elements for a framework of regional cooperation on the conservation of all southern hemisphere albatross species.

7.134 This meeting also agreed to explore the preparation of a program promoting exchange of experts, technicians and personnel responsible for developing and implementing different techniques for mitigating fishing impacts on albatross species. It was recognised that a number of organisations, such as CCAMLR and FAO, had recommended conservation measures pertinent to albatross conservation and Member countries agreed to exchange information regarding their implementation of CCAMLR and other measures.

7.135 The Working Group commended these approaches and encouraged the Valdivia Group to progress their initiatives and to contribute fully to other relevant undertakings, especially with respect to the FAO IPOA–Seabirds and to planned seabird by-catch workshops (paragraphs 7.144 to 7.149).

7.136 The Working Group was informed (WG-FSA-99/6) that South Africa is nominating seven members of the genera *Macronectes* and *Procellaria* (including the white-chinned petrel) to Appendix II of the Bonn Convention; this will be considered at the 6th Conference of Parties in November 1999.

Australian Threat Abatement Plan

7.137 The objective of the Australian Threat Abatement Plan, officially released on 2 August 1998, is to reduce seabird by-catch in all fishing areas, seasons and fisheries to below 0.05 birds/thousand hooks, based on current fishing levels. This represents a reduction of up

to 90% of seabird by-catch within the AFZ, and should be achievable within the five-year life of the plan. The ultimate aim of the threat abatement process is to achieve a zero by-catch of seabirds, especially threatened albatross and petrel species, in longline fisheries.

7.138 WG-FSA-99/53 reported on implementation of first-year actions. Critical actions under this plan include: regulation of fishing practices, implementation of an observer program to identify seabird by-catch rates throughout the AFZ, testing and refinement of underwater setting devices, further experimentation of line-weighting regimes, development of seabird collection kits, and development of a communication program to enhance industry understanding and adoption of new regulations and other measures contained in the plan.

7.139 A working group has been established to identify indicative 'best-practice' mitigation measures that may be appropriate in the sub-Antarctic fisheries, should demersal longlining be considered in the future in these areas.

7.140 A video has been produced, providing information on the correct use of mitigating measures to reduce seabird by-catch in pelagic tuna fisheries.

Commission for the Conservation of Southern Bluefin Tuna (CCSBT)

7.141 No information was available this year to the Working Group from this Commission or from its Ecologically Related Species Working Group (ERSWG). It was understood that the ERSWG had not met in 1999.

Indian Ocean Tuna Commission (IOTC)

7.142 SC-CAMLR-XVIII/BG/32 indicated that the inaugural meeting of the IOTC Scientific Committee acknowledged the importance of considering non-target, associated and dependent species (NTADs) in research and management measures. However, specific seabird mitigation measures were not considered.

7.143 The Working Group encouraged the IOTC to review the nature and extent of seabird by-catch in tuna longline fisheries within its area of jurisdiction and to require vessels to adopt appropriate mitigating measures.

International Fishers Forum

7.144 The Working Group noted New Zealand's intention to host an international forum for fishers, focused on solving the incidental capture of seabirds in demersal and pelagic longline fisheries, during the fourth quarter of 2000 (SC-CAMLR-XVIII/BG/16).

7.145 The forum will be an opportunity for fishers, gear technologists and researchers to meet, and hear first hand about mitigation measures used in longline fisheries around the world, and to learn about new measures currently under development.

7.146 The Working Group agreed that this exchange of information and ideas would result in a more coordinated response to this issue and hopefully accelerate progress in solving the problem. In addition, countries participating would be in a more informed position to prepare their NPOAs in relation to the FAO IPOA–Seabirds initiative (paragraphs 7.129 to 7.131; SC-CAMLR-XVIII/BG/4).

7.147 A second objective for the forum will be the use of modelling tools to predict the impact of fisheries on seabird species. Seabird modelling experts will report on projects undertaken to date and will address questions posed by the workshop participants.

7.148 Dr Robertson indicated that he had been holding discussions relating to the need for a focused workshop on seabird mortality in the autoline fishery. He felt this might advantageously be associated with the International Fishers Forum. The autoline workshop will attempt to bring together marine architects, autoline gear makers and rope manufacturers with the objective of encouraging engineers from these disciplines to manufacture longline vessels configured to deploy longlines that do not catch birds. A second objective will be to derive engineering modifications to existing vessels that would, through structural change, facilitate the deployment of fast-sinking longlines.

7.149 The Working Group supported the International Fishers Forum and associated autoline workshop, and encouraged Member countries longlining in the Convention Area to participate.

Strategic and Policy Issues

Regulated Fishing

7.150 The Working Group noted the Commission's endorsement of the strategic advice of the Scientific Committee concerning policies and practices believed essential to addressing and resolving the issue of seabird by-catch in longline fisheries (CCAMLR-XVII, paragraph 6.31), specifically that:

(i) sustained development of underwater setting offers the most likely medium- to long-term solution to the problem;

(ii) work to develop line-weighting regimes to ensure sink rates that will preclude seabirds accessing bait offers the best short-term solution, as well as the likelihood of permitting exemption from several other mitigating measures currently in use in the Convention Area; and

(iii) in the meantime, improved compliance with the existing suite of mitigation measures in Conservation Measure 29/XVI is essential.

7.151 The Working Group noted with appreciation the increased efforts, especially by New Zealand and South Africa, to use and develop underwater setting. It also commended the recent work, especially by Australia, New Zealand and the UK, directed at improving knowledge of appropriate line-weighting regimes. The results of work to date reinforce the view, suggested last year, that appropriate line weighting could lead to a relaxation of certain elements of existing conservation measures regulating longline fishing in the Convention Area.

7.152 The Working Group regretted, however, that compliance with Conservation Measure 29/XVI, especially in the critical area of line weighting, had not improved greatly since last year. In effect, no vessel engaged in longline fishing (using the Spanish method) in the Convention Area had operated in compliance with Conservation Measure 29/XVI in the 1998/99 fishing season. Only two vessels (and only on four of eight cruises) had complied with the line-weighting specifications of Conservation Measure 29/XVI.

7.153 The Working Group recollected the instruction of the Commission last year (CCAMLR-XVII, paragraph 6.24) that vessels discharging offal during the haul on the same side as the line hauling site should not be allowed to fish in the Convention Area.

7.154 The Working Group wished to extend this principle to recommend that vessels which had proven unable or unwilling to comply with all the provisions of Conservation Measure 29/XVI should not be allowed to fish in the Convention Area.

IUU Fishing

7.155 The Working Group noted the endorsement by the Scientific Committee (SC-CAMLR-XVII, paragraphs 4.49 and 4.50) and Commission (CCAMLR-XVII, paragraph 6.22) of its advice and concerns last year (SC-CAMLR-XVII, Annex 5, paragraphs 7.93 to 7.95) that levels of IUU fishing are generating levels of seabird by-catch about two orders of magnitude greater than in the regulated fishery and unsustainable for the albatross, giant petrel and white-chinned petrel populations concerned. It noted that the Commission viewed this with the greatest concern and was proposing a wide range of measures to address the problem of unregulated and illegal fishing (CCAMLR-XVII, paragraphs 5.16 to 5.69).

7.156 The Working Group reiterated its view that, within the Convention Area, IUU longline fishing now poses the principal survival threat for most, if not all, the species and populations of at-risk seabirds.

7.157 The Working Group recognised the difficulty of simultaneously trying to enhance the effectiveness of the regulated fishery and to diminish the attractiveness of the IUU fishery. It noted the impact of IUU fishing on seabirds could be reduced by increasing the benefit to fishers of using vessels or fishing practices which were configured and/or operated in ways to reduce the probability of seabird by-catch (e.g. underwater setting, integrated weighted autolines).

7.158 It also recollected the views expressed by some Members in previous years (e.g. CCAMLR-XVII, paragraph 9.10; SC-CAMLR-XVII, paragraphs 4.45 and 9.25) that:

(i) extending the regulated fishing season could achieve a reduction in levels of IUU fishing; and

(ii) the current closed season (September to April inclusive) may be promoting IUU fishing at the time of year when risk of seabird by-catch is greatest (i.e. during the breeding season of albatrosses and petrels).

7.159 However, other members felt that there was insufficient information on the operations of IUU fishing to have any confidence that extending the fishing season for regulated vessels would reduce the impact of IUU fishing.

Mitigating Measures and Fishing Seasons

7.160 The Working Group agreed that relaxation of current fishing season restrictions could only be recommended when there is compliance with all the main elements of Conservation Measure 29/XVI.

7.161 The key mitigation measures (excluding underwater setting) relevant to permitting year-round fishing by regulated vessels are, in approximate order of priority:

(i) appropriate line-weighting regime;
(ii) night-time setting;
(iii) correct use of streamer lines; and
(iv) minimisation of problems associated with offal discharge.

7.162 Compliance with night setting is currently about 80%. Offal discharge practice has steadily improved in recent years. Use of streamer lines, as specified by Conservation Measure 29/XVI, needs considerable improvement. Compliance with line weighting, potentially the most crucial element of Conservation Measure 29/XVI, is still very inadequate.

7.163 Ad hoc WG-IMALF proposed that vessels able to demonstrate that they have consistently (i.e. in every cruise) achieved full compliance with each element of Conservation Measure 29/XVI in the 1999/2000 fishing season should, in the following year, be allowed to fish at any time of year. Such compliance would be carefully verified, particularly with respect to line-weighting requirements, by WG-IMALF and WG-FSA, on the basis of all available data and the report of the scientific observer. WG-IMALF noted that an appropriate line-weighting regime for autoline vessels will need to be determined. From the results reported in WG-FSA-99/35 it is recommended that this should not be less than the achievement of a minimum sink rate of at least 0.3 m/s on every set, with a goal of achieving a sink rate of 0.4 m/s.

7.164 The Working Group endorsed this approach in principle. It felt, however, that it might be premature to advise adoption of this procedure at the present meeting.

7.165 The Working Group also recognised the existing risk that vessels, having complied consistently and fully with all elements of Conservation Measure 29/XVI in one year, could relax their compliance while fishing year round in the next year. This could lead to high levels of seabird by-catch during the austral summer.

7.166 To minimise this risk, the Working Group proposed that:

(i) to the extent feasible, there should be in-port inspections of vessels in order to ensure that they are configured, and have all fishing and related gear necessary, to be able to comply in full with Conservation Measure 29/XVI; and

(ii) longline fishing should cease if a significant level of bird by-catch occurs (cf. the Scientific Committee recommendation, in SC-CAMLR-XVII, paragraphs 4.67 and 4.68, with respect to the New Zealand proposal for fishing in Subarea 48.1 in 1998/99). Advice on appropriate levels of seabird by-catch, on an area-specific basis would be provided by WG-IMALF to WG-FSA.

7.167 An essential complement to the recommendations in paragraphs 7.162 and 7.163 is rapid further progress in defining the optimum (minimum) line-weighting regime that will eliminate (or reduce to a very low level) seabird by-catch for both autoliners and vessels using the Spanish system. Doing this will require dedicated experiments.

7.168 The Working Group recommended that such experiments be strongly encouraged. As an incentive to attract the cooperation of fishers and fishery managers, such experiments, which should be conducted in accordance with a strictly specified experimental design, could be undertaken under CCAMLR Conservation Measure 64/XII, being eligible for an appropriate catch level (i.e. more than 50 tonnes) under the CCAMLR research exemption provisions. Any such experiments will need to be conducted before the commercial fishery has exhausted the catch limit and would require notification at least six months in advance of the starting date of the research.

7.169 An appropriate experimental design could be rapidly devised by WG-IMALF in consultation with WG-FSA, in particular taking account of the design and experience reported in WG-FSA-99/5. For the Spanish system, the main research priorities are to quantify, for different seabird species, the area in which baits are available to seabirds and for this to be expressed in terms of longline sink rates and line-weighting regimes, together with data relating to other factors that affect longline sink rate and bird behaviour, such as wind strength and direction and setting speed. The main measures of effectiveness would be bird mortality and rates of bird attacks on bait. Cruises of up to three weeks duration and considerable flexibility in fishing to allow for experimental manipulations, would be required. Cruises would take place at times of high bird numbers, with appropriate limits on bird by-catch, so that the effectiveness of line-weighting regimes can be properly tested.

7.170 For the autoline system, in addition to the research requirements outlined for the Spanish system, a method of incorporating weighting into the fishing line is a high priority. This would eliminate safety risks, increase ease of use and, with appropriate sink rates, achieve compliance with CCAMLR conservation measures.

Advice to the Scientific Committee

7.171 The Scientific Committee was requested to note the following recommendations/advice.

7.172 General:

(i) The Working Group welcomed the appearance of the book *Identification of Seabirds of the Southern Ocean. A Guide for Scientific Observers aboard Fishing Vessels* published by CCAMLR and the National Museum of New Zealand in 1999; some comments are offered to help in any future revision (paragraph 7.5).

(ii) There had been a comprehensive response to the request for information on research programs into the population status and foraging ecology of seabird species at risk from longline fishing in the Convention Area (paragraph 7.7). Interim advice on important gaps was provided; intersessional investigation and refinement of information is required to determine more accurately the potential utility to CCAMLR of data from these research programs (paragraphs 7.9 to 7.18).

(iii) The sampling effort required to estimate accurately seabird by-catch rates is to be investigated intersessionally (paragraph 7.33).

7.173 Data on incidental mortality of seabirds during regulated longline fishing in the Convention Area:

1998:

(i) Revision of data and results for Subareas 58.6 and 58.7 (Tables 46 to 48) gave new by-catch totals and rates that were 63% and 39% of the 1997 values (paragraph 7.21).

(ii) Results of intersessional analysis of all scientific observer data from 1997 and 1998 confirmed the importance of time of year (very few birds caught after April) and use of streamer lines in reducing seabird by-catch but the effects of most other factors (including line weighting) could not be fully analysed with the existing data (paragraphs 7.22 to 7.25).

(iii) The Working Group concluded that further improvements to, and assessments of, mitigation measures will need testing using carefully designed experiments (rather than continuing analysis of general scientific observer data) (paragraph 7.28).

1999:

(iv) Timely data submissions ensured excellent availability of data for scrutinising at the meeting (paragraph 7.30).

(v) For Subarea 48.3, the seabird by-catch (210 birds) was reduced by 65% and the by-catch rate (0.01 birds/thousand hooks) by 67%, compared with 1998. However, there was scope for further reductions through improving offal discharge, daytime setting and line weighting (paragraphs 7.36 to 7.38).

(vi) For Division 58.5.1, no data were received, but at least 151 seabirds were killed. France was asked to submit data in timely fashion to future meetings (paragraphs 7.39 and 7.40).

(vii) For Subareas 58.6 and 58.7, seabird by-catch (156 birds) was reduced by 70% and by-catch rates (0.03 birds/thousand hooks) by 85%, compared with 1998 (paragraphs 7.41 to 7.44). The biggest reductions in by-catch were achieved by the change in fishing area and by the use of underwater setting. The Working Group recommended that fishing within 200 km of the Prince Edward Islands should be prohibited from January to March inclusive (paragraphs 7.45 and 7.46).

(viii) For Subarea 88.1, there was no seabird by-catch (paragraph 7.34).

General:

(ix) In comparing seabird by-catch and by-catch rate in the regulated fishery over the last three years (Table 54), these have been reduced by 96.4% and 95.7% respectively in Subarea 48.3, and by 81.3% and 94.2% respectively in Subareas 58.6 and 58.7 from 1997 to 1999. This has been achieved by a combination of improved used of mitigating measures in compliance with Conservation Measure 29/XVI and by delaying the start of fishing until after the end of the breeding season of most albatross and petrel species (paragraph 7.47).

7.174 Compliance with Conservation Measure 29/XVI:

(i) Overall, levels of compliance with elements of Conservation Measure 29/XVI are steadily improving, particularly with respect to night setting and offal discharge. Compliance with line weighting and overall use of streamer lines is still far from satisfactory. Two autoline vessels, operating in Subarea 88.1, complied with all aspects of Conservation Measure 29/XVI (subject to the variation to allow daytime setting granted under Conservation Measure 169/XVII). For the remainder of the vessels, either insufficient data were provided to assess full compliance or not all elements of the conservation measure were complied with (paragraph 7.48 and Table 16).

(ii) Line weighting: one vessel complied with the line-weighting regime that applies to vessels using the Spanish system (6 kg every 20 m) on two of three cruises; one other vessel used a line-weighting regime very close to the requirement (5 kg every 20 m) on two of five cruises. The average weight (kg) per metre of mainline for 1997, 1998 and 1999 was 0.102 (5 kg at 45 m), 0.096 (6 kg at 45 m) and 0.142 (7 kg at 44 m) respectively. This indicates a substantial increase in overall weight added to lines in 1998/99, but still well below the level specified by Conservation Measure 29/XVI (paragraph 7.49).

(iii) Offal discharge: in Subareas 58.6, 58.7 and 88.1 there was 100% compliance with the requirement either to hold offal on board during the haul, or to discharge on the opposite side of the vessel to hauling. In Subarea 48.3, 71% of the vessels discharged offal on the opposite side to hauling, compared with only 31% in 1998. In Subarea 88.1, vessels achieved compliance through having a fish meal plant operating to process offal (paragraph 7.50).

(iv) Night setting: night setting was successfully completed for 80% of sets in Subarea 48.3 and 84% in Subareas 58.6 and 58.7. Excluding daytime sets made during mitigation measure experimentation by the *Argos Helena* in Subarea 48.3 and *Eldfisk* in Subareas 58.6 and 58.7, values are 86% and 98% respectively, compared with 90% and 93% for 1998 (paragraph 7.51).

(v) Streamer lines: both vessels fishing in Subarea 88.1 used streamer lines that complied with Conservation Measure 29/XVI. No vessels fishing in Subareas 48.3, 58.6 and 58.7 used streamer lines that met all aspects of the CCAMLR design. The length of streamer lines was the element with lowest compliance; only 10% of vessels in Subareas 58.6 and 58.7 and 26% in Subarea 48.3 had lines that were at least 150 m long. Compliance with attachment height and number and spacing of streamers is generally close to 100% (paragraph 7.52, Tables 16 and 17).

7.175 Assessment of incidental mortality of seabirds during unregulated longline fishing in the Convention Area:

(i) The estimates of potential seabird by-catch by area for 1999 (paragraphs 7.64 to 7.68, Tables 55 and 56) were:

Subarea 48.3:	3 230–4 360 to 11 700–15 800 seabirds;
Subareas 58.6 and 58.7:	12 070–16 140 to 23 800–32 100 seabirds;
Divisions 58.5.1 and 58.5.2:	110–155 to 3 725–5 050 seabirds; and
Division 58.4.4:	3 015–4 030 to 5 030–7 130 seabirds.

(ii) The overall estimated totals for the whole Convention Area (paragraph 7.69 and Table 56) indicate a potential seabird by-catch in the unregulated fishery of 18 000–25 000 (lower level) to 44 000–59 000 birds (higher level) in 1998/99. This compares with totals of 17 000–27 000 (lower level) to 66 000–107 000 (higher level) in 1996/97 and 43 000–54 000 (lower level) to 76 000–101 000 (higher level) in 1997/98. Any suggestion of a decrease in 1998/99 should be viewed with caution, given the uncertainties and assumptions involved in these calculations.

(iii) The species composition of the estimated potential seabird by-catch (Table 57) indicates a potential by-catch of 21 000 to 46 500 albatrosses, 3 600 to 7 200 giant petrels and 57 000 to 138 000 white-chinned petrels in the unregulated fishery in Convention Area over the last three years.

(iv) The Working Group endorsed its conclusion of last year that such levels of mortality are entirely unsustainable for the populations of albatrosses, giant petrels and white-chinned petrels breeding in the Convention Area (paragraph 7.73).

(v) The Scientific Committee was asked to recommend that the Commission take the most stringent measures possible to combat unregulated fishing in the Convention Area.

7.176 Incidental mortality of seabirds in relation to new and exploratory fisheries:

(i) Of those new and exploratory fisheries approved for 1998 which were operational in 1998/99, that in Subarea 88.1 (New Zealand) caught no seabirds (paragraph 7.34). Those in Subareas 58.6 and 58.7 (South Africa) had low levels of seabird by-catch and are reviewed in detail in paragraphs 7.41 to 7.47.

(ii) The full texts of assessments of risk of by-catch of seabirds in all statistical subdivisions of the Convention Area (except Subarea 48.5) were compiled into a background document for the use of the Scientific Committee and Commission (paragraph 7.82; SC-CAMLR-XVIII/BG/23).

(iii) All proposals this year for new and exploratory fisheries were reassessed in terms of risk of by-catch of species and groups of seabirds at risk (paragraph 7.84 and Table 58). In respect of this year's proposals, potential conflict between proposed fishing seasons and advice on seasons closed to fishing to protect seabirds was:

(a) minor for Divisions 58.4.3 (European Community), 58.4.4 (Chile, European Community, South Africa and Uruguay), Subareas 58.6 (Chile, European Community, South Africa) and 58.7 (South Africa);

(b) substantial for Divisions 58.4.3 (France), 58.4.4 (France), 58.5.1 (France), Subareas 58.6 (France) and 58.7 (France); and

(c) uncertain for Division 58.5.1 (Chile).

(iv) Detailed advice was provided in respect of the New Zealand request for a continuation of the variation from Conservation Measure 29/XVI for exploratory fishing in Subarea 88.1 (paragraphs 7.85 to 7.93). Otherwise it was recommended that Conservation Measure 29/XVI should be retained for longline fisheries in all parts of the Convention Area.

7.177 Incidental mortality of seabirds during longline fishing outside the Convention Area:

(i) Information on seabird by-catch outside the Convention Area, submitted by Australia, continues to indicate that substantial by-catch occurs of species and populations breeding within the Convention Area (paragraphs 7.96 to 7.100).

(ii) The Working Group received no data from other Members, especially for regions adjacent to the Convention Area, such as New Zealand, South Africa, southern South America and the Falkland/Malvinas Islands; appropriate Members were requested to provide relevant data for next year's meeting (paragraphs 7.102 and 7.103).

7.178 Research into, and experience with, mitigating measures:

(i) Offal discharge: vessels still operating with offal discharge on the same side as the haul, in contravention of the Conservation Measure 29/XVI, should undertake waste-pipe reconfiguration using information from the *Koryo Maru 11* (paragraph 7.110).

(ii) Line weighting: experiments into line-weighting regimes using the Spanish system vessels in Subarea 48.3 in February (paragraphs 7.111 to 7.115) and autoline vessels in Subarea 88.1 in January and February (paragraph 7.116) showed reductions in bird by-catch rates from 3.98 birds/thousand hooks to <1 bird/thousand hooks (in Subarea 48.3) and zero by-catch (in Subarea 88.1). These results have potentially important implications for longline fishing practices in the Convention Area.

(iii) The experiment using a Mustad underwater setting funnel in Subareas 58.6 and 58.7 between August 1998 and June 1999, showed that seabird by-catch using the funnel (0.002 birds/thousand hooks) was significantly less than when not using the funnel (0.017 birds/thousand hooks) (paragraph 7.122). Further use and development of this system was strongly encouraged (paragraph 7.124).

(iv) Technical coordinators of national scientific observation programs were requested to provide relevant information on operational issues and fishing strategy procedures that may influence the successful use of mitigation measures, especially line-weighting regimes, for next year's meeting of WG-FSA (paragraphs 7.126 and 7.127).

7.179 International and national initiatives:

(i) Initiatives relating to reducing seabird by-catch in longline fisheries by FAO, CMS, Australia and New Zealand (paragraphs 7.128 to 7.149).

(ii) Adoption by FAO of its IPOA–Seabirds in 1999 and its request for FAO member States to produce NPOAs and report on them to FAO in 2001. Longlining Members of the Commission are encouraged to develop their own NPOA–Seabirds and to report on progress (paragraphs 7.129 to 7.131).

(iii) An initiative by the Valdivia Group to assist conservation of southern hemisphere albatrosses (paragraph 7.133).

(iv) Progress with implementation of the Australian Threat Abatement Plan (paragraphs 7.137 to 7.140).

(v) The intention of New Zealand to host an International Fishers Forum in 2000 to improve the development of mitigation measures and encouragement to Members to participate (paragraphs 7.144 to 7.149).

7.180 Strategic and policy issues:

(i) The recommendation that vessels which had proven unable or unwilling to comply with all the provisions of Conservation Measure 29/XVI should not be allowed to fish in the Convention Area (paragraphs 7.152 to 7.154).

(ii) Within the Convention Area, IUU longline fishing now poses the principal survival threat for most, if not all, the species and populations of at-risk seabirds (paragraph 7.156).

(iii) The impact of IUU fishing on seabirds could be reduced by increasing the benefit to fishers of using vessels or fishing practices which were configured and/or operated in ways to reduce the probability of seabird by-catch (e.g. underwater setting, integrated weighted autolines) (paragraph 7.157).

(iv) Relaxation of current fishing season restrictions could only be recommended when there is compliance with all the main elements of Conservation Measure 29/XVI (paragraph 7.160).

(v) Vessels able to demonstrate that they have consistently (i.e. in every cruise) achieved full compliance with each element of Conservation Measure 29/XVI in a fishing season should, in the following year, be allowed to fish at any time of year (paragraphs 7.163 to 7.166). In respect of this:

(a) compliance would need careful verification, particularly with respect to line weighting, by ad hoc WG-IMALF and WG-FSA, on the basis of all available data and the report of the scientific observer;

(b) appropriate line-weighting regimes for autoline vessels need determining.

(c) to the extent feasible, there should be in-port inspections of vessels in order to ensure that they are configured, and have all fishing and related gear necessary, to be able to comply in full with Conservation Measure 29/XVI; and

(d) longline fishing should cease if a significant level of bird by-catch occurs (cf. the Scientific Committee recommendation in SC-CAMLR-XVII, paragraphs 4.67 and 4.68, with respect to the New Zealand proposal for fishing in Subarea 48.1 in 1998/99). Advice on appropriate levels of seabird by-catch, on an area-specific basis, would be provided by ad hoc WG-IMALF to WG-FSA.

Given these considerations, the Working Group felt that it might be premature to advise adoption of this procedure at the present meeting (paragraph 7.164).

(vi) The need for rapid further progress in conducting experiments to define the optimum (minimum) line-weighting regime that will eliminate (or reduce to a

very low level) seabird by-catch for both autoliners and vessels using the Spanish system. As an incentive to attract the cooperation of fishers and fishery managers, such experiments, which should be conducted in accordance with a strictly specified experimental design, could be undertaken under CCAMLR Conservation Measure 64/XII (paragraphs 7.167 and 7.168).

Table 16: Summary of compliance with Conservation Measure 29/XVI, based on data from scientific observers, for 1996/97, 1997/98 and 1998/99. Values in parentheses are % of observer records that were complete.

Subarea/ Time	Line Weighting (Spanish System Only)			Night Setting	Offal Discharge	Streamer Line Compliance (%)					Total Catch Rate (Birds/1 000 Hooks)	
	Compliance %	Median Weight (kg)	Median Spacing (m)	(% Night)	(%) Opposite Haul	Overall	Attached Height	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]
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
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

[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.

Table 17: Compliance with streamer line minimum specifications, as reported by scientific observers, in accordance with the specifications of Conservation Measure 29/XVI. Nationality: CHL – Chile, ESP – Spain, GBR – United Kingdom, KOR – Republic of Korea, NZL – New Zealand, URY – Uruguay, ZAF – South Africa; Fishing method: A – autoliner, Sp – Spanish system; Y – yes, N – no, - no information.

Vessel Name (Nationality)	Dates of Trip	Fishing Method	Compliance with CCAMLR Specifications	Compliance with Details of Streamer Line Specifications								Spare Streamers on Board
				Attachment Height above Water (m)		Total Length (m)		No. Streamers per Line		Spacing of Streamers per Line (m)		Length of Streamers (m)	
Subarea 48.3													
Argos Helena (GBR)	10/4–30/7/99	Sp	N	Y	(4.5)	N	(120)	Y	(35)	Y	(2)	-	-
Ibsa Quinto (ESP)	10/4–4/6/99	Sp	N	Y	(5)	Y	(150)	N	(4)	Y	(5)	-	-
Ibsa Quinto (ESP)	8/6–21/7/99	Sp	Y	Y	(5)	Y	(150)	-		Y	(1)	-	N
Illa de Rua (URY)	8/4–28/6/99	Sp	N	Y	(4.8)	N	(100)	Y	(5)	Y	(5)	-	Y
Illa de Rua (URY)	1/7–17/7/99	Sp	N	N	(4)	N	(125)	Y	(8)	Y	(5)	-	Y
Isla Camila (CHL)	11/4–22/6/99	Sp	N	Y	(7)	N	(60)	Y	(25)	Y	(2)	-	-
Isla Camila (CHL)	15/6–18/7/99	Sp	N	N	(3)	Y	(150)	Y	(5)	Y	(5)	-	-
Isla Gorriti (URY)	8/5–12/6/99	A	N	N	(3)	Y	(155)	Y	(6)	Y	(5)	-	Y
Isla Gorriti (URY)	12/6–18/7/99	A	N	Y	(4.5)	N	(35)	Y	(5)	-		Y (5)	-
Isla Sofía (CHL)	31/3–25/6/99	Sp	N	Y	(5.5)	N	(85)	Y	(19)	Y	(4.5)	-	-
Isla Sofía (CHL)	28/6–22/7/99	Sp	N	Y	(6.4)	N	(78.5)	Y	(21)	Y	(3.3)	Y (3)	-
Jacqueline (GBR)	11/4–21/7/99	Sp	N	Y	(5.5)	N	(75)	Y	(30)	Y	(2)	N (0.5)	-
Koryo Maru 11 (ZAF)	10/4–27/6/99	Sp	Y	Y	(4.5)	Y	(150)	-		Y	(5)	-	Y
Koryo Maru 11 (ZAF)	30/6–4/8/99	Sp	N	Y	(5)	N	(120)	Y	(5)	Y	(5)	-	-
Lyn (GBR)	9/4–14/6/99	Sp	N	Y	(4.5)	N	(80)	Y	(26)	N	(6)	Y (6)	Y
Lyn (GBR)	17/6–20/7/99	Sp	N	Y	(4.5)	N	(80)	Y	(25)	Y	(2.3)	-	N
Magallanes III (CHL)	14/5–21/8/99	Sp	N	Y	(5)	N	(25)	Y	(5)	Y	(4)	-	-
No. 1 Moresko (KOR)	11/4–22/7/99	Sp	N	Y	(6)	N	(51)	N	(4)	Y	(25)	-	Y
Tierra del Fuego (CHL)	11/4–23/6/99	Sp	N	Y	(7.5)	N	(45)	-		-		-	-
Tierra del Fuego (CHL)	17/6–25/7/99	Sp	N	N	(3)	N	(75)	Y	(11)	Y	(1.8)	-	-
Subareas 58.6 and 58.7													
Arctic Fox (ZAF)	21/9–14/11/98	A	Y	Y	(12)	Y	(150)	-		-		-	-
Arctic Fox (ZAF)	24/11/98–1/1/99	A	N	Y	(4.5)	N	(125)	Y	(10)	Y	(2.5)	-	-
Arctic Fox (ZAF)	31/3–29/5/99	A	N	Y	(4.5)	N	(125)	Y	(10)	Y	(2.5)	Y (3.5)	Y
Arctic Fox (ZAF)	8/6–23/7/99	A	N	Y	(4.5)	N	(100)	Y	(7)	Y	(5)	-	-
Eldfisk (ZAF)	2/10–1/11/98	A	N	-		N	(120)	Y	(7)	Y	(4)	-	Y
Eldfisk (ZAF)	1/5–23/6/99	A	N	Y	(5.5)	N	(100)	Y	(8)	Y	(5)	-	Y

continued

Table 17 continued

Vessel Name (Nationality)	Dates of Trip	Fishing Method	Compliance with CCAMLR Specifications	Compliance with Details of Streamer Line Specifications								Spare Streamers On Board
				Attachment Height above Water (m)		Total Length (m)		No. Streamers per Line		Spacing of Streamers per Line (m)		Length of Streamers (m)
Koryo Maru 11 (ZAF)	3/11–28/12/98	Sp	N	Y	(4.5)	N	(45)	Y	(10)	Y	(3)	-	Y
Koryo Maru 11 (ZAF)	5/1–5/2/99	Sp	N	Y	(4.5)	N	(45)	Y	(10)	Y	(3)	-	Y
Koryo Maru 11 (ZAF)	6/2–24/3/99	Sp	N	Y	(8)	N	(100)	Y	(12)	Y	(3)	N (0.2)	Y
Subarea 88.1													
Janas (NZL)	23/12/98–5/3/99	A	Y	Y	(8)	Y	(200)	Y	(5)	Y	(1.8)	-	Y
San Aotea II (NZL)	22/12/98–3/3/99	A	Y	Y	(5)	Y	(200)	Y	(10)	Y	(5)	-	-

Table 45: Summary of seabirds at risk from longline fisheries in the Convention Area indicating the populations where population monitoring (PM) and foraging ecology (FE) studies are currently being undertaken (information extracted from documents cited in paragraph 7.7; also Gales, 1998; Marchant and Higgins, 1990).

Species	Species Status[1]	Study Location	Annual Pairs	Year Commenced	Objectives	
					PM	FE
Wandering albatross	Vulnerable	South Georgia	2 178	1972	√	√
Diomedea exulans		Crozet	1 734	1960	√	√
		Kerguelen	1 455	1973	√	√
		Macquarie	10	1994	√	
				1998		√
		Marion	1 794	1979	√	√
		Prince Edward	1 277			
Gibson's albatross	Vulnerable	Auckland	65	1991	√	√
Diomedea gibsoni		Adams	5 762			
Antipodean albatross	Vulnerable	Antipodes	5 148	1994	√	√
Diomedea antipodensis						
Amsterdam albatross	Critically Endangered	Amsterdam	13	1983	√	√
Diomedea amsterdamensis						
Southern royal albatross	Vulnerable	Campbell	7 800	1995	√	√
Diomedea epomophora						
Northern royal albatross	Endangered	Chatham	5 200	1990s	√	√
Diomedea sanfordi		Taiaroa	18	1950s	√	√
				1993		√
Grey-headed albatross	Vulnerable	South Georgia	54 218	1976	√	√
Thalassarche chrysostoma		Diego Ramirez	10 000	1999	√	√
		Macquarie	84	1994	√	
				1999		√
		Campbell	6 400	1995	√	√
		Marion	6 217	1984	√	√
		Prince Edward	1 500			
		Kerguelen	7 900			
Black-browed albatross	Near Threatened	South Georgia	96 252	1976	√	√
Thalassarche melanophris		Falklands/Malvinas	550 000	1990	√	
				1998		√
		Diego Ramirez	32 000	1999	√	√
		Kerguelen	3 115	1978	√	√
		Macquarie	38	1994	√	
				1999		√
		Antipodes	100	1995	√	
		Heard, McDonald	750			
		Crozet	980			
Campbell albatross	Vulnerable	Campbell	26 000	1995	√	√
Thalassarche impavida						
Indian yellow-nosed albatross	Vulnerable	Amsterdam	25 000	1978	√	√
Thalassarche carteri		Prince Edward	7 000			
		Crozet	4 430			

continued

Table 45 continued

Species	Species Status[1]	Study Location	Annual Pairs	Year Commenced	Objectives PM	Objectives FE
Buller's albatross	Vulnerable	Snares	8 460	1992	√	√
Thalassarche bulleri		Solander	4 000–5 000	1992	√	√
Chatham albatross	Critically	Chatham	4 000	1998		√
Thalassarche eremita	Endangered					
Salvin's albatross	Vulnerable	Bounty	76 000	1998	√	
Thalassarche salvini		Snares	650			
White-capped albatross	Vulnerable	Antipodes	75	1995	√	
Thalassarche steadi		Disappointment	72 000			
		Adams	100			
		Auckland	3 000			
Light-mantled albatross	Data	Macquarie	1 100	1993	√	
Phoebetria palpebrata	deficient			1998		√
		Crozet	2 151	1970	√	√
		South Georgia	6 500			
		Marion	201			
		Kerguelen	3 000–5 000			
		Heard, McDonald	500-700			
		Auckland	5 000			
		Campbell	>1 500			
		Antipodes	<1 000			
Sooty albatross	Vulnerable	Crozet	2 298	1970	√	√
Phoebetria fusca		Amsterdam	300-400	1992	√	√
		Tristan da Cunha	2 750			
		Gough	5 000–10 000			
		Prince Edward	700			
		Marion	2 055			
Southern giant petrel	(Vulnerable)	South Georgia	5 000	1980	√	
Macronectes giganteus				1998		√
		Macquarie	2 300	1994	√	
		Crozet	1 017	1979	√	
		Marion		1984	√	√
		Adélie Land	9–11	1952	√	
		South Sandwich	800			
		Gough				
		Prince Edward	3 000			
		Kerguelen	3–5			
		Heard	2 350			
		South Orkney	8 755			
		South Shetland	7 185			
		Enderby Land	no estimate			
		Frazier	250			
		Antarctic Peninsula	1 125			
		Falklands/Malvinas	5 000			
Northern giant petrel	(Near	South Georgia	3 000	1980	√	
Macronectes halli	Threatened)		1 280	1998		√
		Macquarie	1 313	1994	√	
		Crozet		1979	√	
		Marion	500	1984	√	√
		Prince Edward				

continued

Table 45 continued

Species	Species Status[1]	Study Location	Annual Pairs	Year Commenced	Objectives	
					PM	FE
Northern giant petrel continued		Kerguelen	1 450–1 800			
		Auckland	no estimate			
		Campbell	230+			
		Antipodes	320			
		Chatham	no estimate			
White-chinned petrel *Procellaria aequinoctialis*	(Vulnerable)	South Georgia	2 000 000	1995–98	√	√
		Crozet	10 000s	1970	√	√
		Prince Edward	10 000s	1996	√	√
		Falklands/Malvinas	1 000–5 000			
		Kerguelen	100 000s			
		Auckland, Campbell, Antipodes	10 000–50 000			
Grey petrel *Procellaria cinerea*	(Vulnerable)	Gough	100 000s			
		Tristan da Cunha	1 000s			
		Prince Edward	1 000s			
		Crozet	1 000s			
		Kerguelen	1 000s			
		Campbell	10 000s			
		Antipodes	10 000s			

[1] As classified using IUCN criteria for threatened species (see Croxall and Gales, 1998).

Table 46: Incidental mortality of seabirds in the longline fisheries for *D eleginoides* in Subareas 58.6 and 58.7 during the 1997/98 season. Fishing method: A – autoliner, Sp – Spanish; Offal discharge at haul: O – opposite side to hauling, S – same side as hauling; D – day setting (including nautical dawn and dusk); N – night setting.

Vessel Name	Dates of Fishing	Fishing Method	Sets Deployed				No. of Hooks (1 000s)			Hooks Baited (%)	No. of Birds Observed						Observed Seabird Mortality (Birds/1 000 hooks)			Streamer Line in Use (%)		Offal Discharge at Haul (Position)
											Dead		Alive		Total							
			N	D	Total	%N	Observed	Set	% Observed		N	D	N	D	N	D	N	D	Total	N	D	
Aquatic Pioneer	15/1/97–9/1/98	A	105	0	105	100	129.8	296.2	43	80	1	0	0	0	1	0	0.01	0	0.01	72		-
Aquatic Pioneer	1/2–12/3/98	A	76	0	76	100	-	315.8	-	81	8	0	1	0	9	0	-	-	-	90		O
Aquatic Pioneer	1/4–14/598	A	95	0	95	100	-	341.6	-	78	1	0	0	0	1	0	-	-	-	100		O
Aquatic Pioneer	23/6–26/7/98	A	151	6	157	96	-	348.6	-	68	0	2	0	0	0	2	-	-	-	98	83	O
Eldfisk	3/3–17/4/98	A	240	0	240	100	164	884	18	85	8	0	1	0	9	0	0.05	0	0.05	85		O
Eldfisk	9/1–12/2/98	A	164	0	164	100	136.1	496.1	27	82	18	0	0	0	18	0	0.13	0	0.13	0		O
Eldfisk	19/8–14/9/98	A	69	69	138	50	58.2	395.2	14	63	0	0	0	0	0	0	0	0	0	100	98	O
*Koryo Maru 11**	19/11/97–15/1/98	Sp	-	-	101	-	451.7	533	84	100	27		27		54		-	-	0.06	-	-	S
Koryo Maru 11	3/2–10/3/98	Sp	57	13	70	81	434.1	434.1	100	100	104	55	11	2	115	57	0.29	0.68	0.37	0	0	O
Koryo Maru 11	28/7–31/8/98	Sp	48	0	48	100	40.4	269.4	15	100	1	0	3	0	4	0	0.02	0	0.02	100		O
Total						92%	4 314.0										0.15	0.54	0.19			

* Data obtained from observer cruise report (logbook data incomplete).

Table 47: Species composition of birds killed in longline fisheries in Subareas 58.6 and 58.7 during the 1997/98 season. D – daylight setting (including nautical dawn and dusk), N – night setting; MAH – northern giant petrel, MAI – southern giant petrel, PRO – white-chinned petrel, PTZ – unidentified petrels.

Vessel Name	Dates of Fishing	No. Birds Killed by Group						Species Composition (%)			
		Albatross		Petrels/ Fulmars		Total					
		N	D	N	D	N	D	MAI	PRO	MAH	PTZ
Aquatic Pioneer	15/1/97–9/1/98	0	0	1	0	1	0			1	
Aquatic Pioneer	1/2–12/3/98	0	0	8	0	8	0		8		
Aquatic Pioneer	1/4–14/5/98	0	0	1	0	1	0		1		
Aquatic Pioneer	23/6–26/7/98	0	0	0	2	0	2	2			
Eldfisk	9/1–12/2/98	0	0	18	0	18	0		18		
Eldfisk	3/3–17/4/98	0	0	8	0	8	0		8		
Eldfisk	19/8–14/9/98	0	0	0	0	0	0				
Koryo Maru 11	3/2–10/3/98	0	0	104	55	104	55		142		17
*Koryo Maru 11**	19/11/97–15/1/98	0	0		27		27		27		
Koryo Maru 11	28/7–31/8/98	0	0	1	0	1	0				1
Total %		0	0	141	27 57	141	27 57	2 (1)	204 (91)	1 (<1)	18 (8)

* Data obtained from observer cruise report (logbook data incomplete).

Table 48: Estimated seabird mortality by vessel for Subareas 58.6 and 58.7 during the 1997/98 season.

Vessel Name	Hooks Observed (1 000s)	Hooks Set (1 000s)	% Night Sets	Estimated Seabird Mortality during Line Setting		
				Night	Day	Total
Aquatic Pioneer	129.8	296.2	100	3	0	3
*Aquatic Pioneer**		315.8	100	47	0	47
*Aquatic Pioneer**		341.6	100	51	0	51
*Aquatic Pioneer**		348.6	96	50	8	58
Eldfisk	58.2	395.2	50	0	0	0
Eldfisk	136.1	496.1	100	64	0	64
Eldfisk	164.0	884.0	100	44	0	44
Koryo Maru 11	40.4	269.4	100	5	0	5
Koryo Maru 11	434.1	434.1	81	102	56	158
Koryo Maru 11	451.7	533.0	92	73	23	97
Total	1 414.3	4 314.0	92	441	87	528

* Estimates are based on the total observed catch rates.

Table 49: Summary of observations on fisheries conducted in the 1998/99 season by designated CCAMLR scientific observers.

Flag State	Vessel	Fishing Method	Observer	Subarea/ Fishery	Period of Observation	Report / Date Submitted	Data Reported
Chile	*Isla Camila*	LLS Spanish	P. Boyle Great Britain	48.3 *D. eleginoides*	15/6–18/7/99	Scientific Observer Logbook 31/8/99 Cruise Report 13/9/99	Cruise, vessel, and IMALF details
Chile	*Isla Camila*	LLS Spanish	N. Mynard Great Britain	48.3 *D. eleginoides*	11/4–22/6/99	Scientific Observer Logbook 3/8/99 Cruise Report 3/8/99	Cruise, vessel, and IMALF details
Chile	*Isla Sofía*	LLS Spanish	D. Owen Great Britain	48.3 *D. eleginoides*	28/6–22/7/99	Scientific Observer Logbook 30/8/99 Cruise Report 2/9/99	Cruise, vessel, and IMALF details
Chile	*Isla Sofía*	LLS Spanish	M. Murphy Great Britain	48.3 *D. eleginoides*	31/3–25/6/99	Scientific Observer Logbook 3/8/99 Cruise Report 3/8/99	Cruise, vessel, and IMALF details
Chile	*Magallanes III*	LLS Spanish	H. Brachetta Argentina	48.3 *D. eleginoides*	14/5–21/8/99	Scientific Observer Logbook 17/9/99 Cruise Report 11/10/99	Cruise, vessel, and IMALF details
Chile	*Tierra del Fuego*	LLS Spanish	J. Taylor Great Britain	48.3 *D. eleginoides*	17/6–25/7/99	Scientific Observer Logbook 30/8/99 Cruise Report 2/9/99	Cruise, vessel, and IMALF details
Chile	*Tierra del Fuego*	LLS Spanish	N. Ansell Great Britain	48.3 *D. eleginoides*	11/4–23/6/99	Scientific Observer Logbook 10/8/99 Cruise Report 17/8/99	Cruise, vessel, and IMALF details
Great Britain	*Argos Helena*	LLS Spanish	A. Black Great Britain	48.3 *D. eleginoides*	2/1–16/2/99	Scientific Observer Logbook 31/3/99 Cruise report submitted as FSA paper	Cruise, vessel, and IMALF details
Great Britain	*Argos Helena*	LLS Spanish	Y. Marin Uruguay	48.3 *D. eleginoides*	10/4–30/7/99	Scientific Observer Logbook 1/9/99 Cruise Report 25/8/99	Cruise report, limited IMALF
Great Britain	*Jacqueline*	LLS Spanish	M. Purves South Africa	48.3 *D. eleginoides*	11/4–21/7/99	Scientific Observer Logbook 30/8/99 Cruise Report 6/9/99	Cruise, vessel, and IMALF details
Great Britain	*Lyn*	LLS Spanish	C. Cardenas Chile	48.3 *D. eleginoides*	17/6–20/7/99	Scientific Observer Logbook 30/8/99 Cruise Report 6/9/99	Cruise, vessel, and IMALF details
Great Britain	*Lyn*	LLS Spanish	P. Casas-Cordero Chile	48.3 *D. eleginoides*	9/4–14/6/99	Scientific Observer Logbook 30/8/99 Cruise Report 6/9/99	Cruise, vessel, and IMALF details
New Zealand	*Janas*	LLS Auto	F. Stoffberg South Africa	88.1 *Dissostichus* spp.	23/12/98–5/3/99	Scientific Observer Logbook 14/4/99 Cruise Report 26/3/99	Cruise, vessel, and IMALF details
New Zealand	*San Aotea II*	LLS Auto	B. Watkins South Africa	88.1 *Dissostichus* spp.	22/12/98–3/3/99	Scientific Observer Logbook 14/4/99 Cruise Report 21/5/99	Cruise, vessel, and IMALF details

continued

Table 49 continued

Flag State	Vessel	Fishing Method	Observer	Subarea/ Fishery	Period of Observation	Report / Date Submitted	Data Reported
Republic of Korea	*No. 1 Moresko*	LLS Spanish	A. Williams Great Britain	48.3 *D. eleginoides*	11/4–22/7/99	Scientific Observer Logbook 30/8/99 Cruise Report 2/9/99	Cruise, vessel, and IMALF details
South Africa	*Koryo Maru 11*	LLS Auto	G. Fulton Great Britain	48.3 *D. eleginoides*	10/4–27/6/99	Scientific Observer Logbook 10/8/99 Cruise Report 13/9/99	Cruise, vessel, and IMALF details
South Africa	*Koryo Maru 11*	LLS Auto	D. Byrom Great Britain	48.3 *D. eleginoides*	30/6–4/8/99	Scientific Observer Logbook 30/8/99 Cruise Report 2/9/99	Cruise, vessel, and IMALF details
Panama	*Eldfisk*	LLS Auto	Watkins/Wium South Africa	58.6 , 58.7 *D. eleginoides*	2/10–1/11/98	Scientific Observer Logbook 21/4/99 Cruise Report 16/3/99	Cruise, vessel, and IMALF details
South Africa	*Arctic Fox*	LLS Auto	B. Fairhead South Africa	58.6, 58.7 *D. eleginoides*	24/11/98–11/1/99	Scientific Observer Logbook 21/4/99 Cruise Report 28/1/99	Cruise, vessel, and IMALF details
South Africa	*Eldfisk*	LLS Auto	Watkins/Pienaar South Africa	58.6, 58.7 *D. eleginoides*	1/5–23/6/99	Scientific Observer Logbook 23/7/99 Cruise Report 23/7/99	Cruise, vessel, and IMALF details
South Africa	*Koryo Maru 11*	LLS Auto	J. Wium South Africa	58.6, 58.7 *D. eleginoides*	6/2–24/3/99	Scientific Observer Logbook 21/5/99 Cruise Report 23/7/99	Cruise, vessel, and IMALF details
South Africa	*Arctic Fox*	LLS Auto	H. Crous South Africa	58.6, 58.7 *D. eleginoides*	8/6–23/7/99	Scientific Observer Logbook 6/9/99 Cruise Report 6/9/99	Cruise, vessel, and IMALF details
South Africa	*Arctic Fox*	LLS Auto	F. Stoffberg South Africa	58.7 *D. eleginoides*	21/9–14/11/98	Scientific Observer Logbook 21/4/99 Cruise Report 11/10/99	Cruise, vessel, and IMALF details
South Africa	*Arctic Fox*	LLS Auto	B. Fairhead South Africa	58.7 *D. eleginoides*	31/3–29/5/99	Scientific Observer Logbook 23/7/99 Cruise Report 23/7/99	Cruise, vessel, and IMALF details
South Africa	*Koryo Maru 11*	LLS Auto	M. Davies South Africa	58.7 *D. eleginoides*	5/1–5/2/99	Scientific Observer Logbook 21/5/99 Cruise Report 22/2/99	Cruise, vessel, and IMALF details
South Africa	*Koryo Maru 11*	LLS Auto	M. Davies Great Britain	58.7 *D. eleginoides*	3/11–28/12/98	Scientific Observer Logbook 21/4/99 Cruise Report 22/2/99	Cruise, vessel, and IMALF details
Spain	*Ibsa Quinto*	LLS Spanish	M. Endicott Great Britain	48.3 *D. eleginoides*	8/6–21/7/99	Scientific Observer Logbook 30/8/99 Cruise Report 2/9/99	Cruise, vessel, and IMALF details
Spain	*Ibsa Quinto*	LLS Spanish	L. Fearnehough Great Britain	48.3 *D. eleginoides*	10/4–4/6/99	Scientific Observer Logbook 9/7/99 Cruise Report 9/7/99	Cruise, vessel, and IMALF details
Uruguay	*Illa de Rua*	LLS Spanish	P. Ghey Great Britain	48.3 *D. eleginoides*	8/4–28/6/99	Scientific Observer Logbook 10/8/99 Cruise Report 20/8/99	Cruise, vessel, and IMALF details

Table 49 continued

Flag State	Vessel	Fishing Method	Observer	Subarea/ Fishery	Period of Observation	Report / Date Submitted	Data Reported
Uruguay	*Illa de Rua*	LLS Spanish	P . Wright Great Britain	48.3 *D. eleginoides*	1/7–17/7/99	Scientific Observer Logbook 30/8/99 Cruise Report 2/9/99	Cruise, vessel, and IMALF details
Uruguay	*Isla Gorriti*	LLS Auto	P. Boyle Great Britain	48.3 *D. eleginoides*	8/5–12/6/99	Scientific Observer Logbook 31/8/99 Cruise Report 13/9/99	Cruise, vessel, and IMALF details
Uruguay	*Illa de Rua*	LLS Auto	G. Bruce Great Britain	48.3 *D. eleginoides*	12/6–17/7/99	Scientific Observer Logbook 31/8/99 Cruise Report 13/9/99	Cruise, vessel, and IMALF details
Russia	*Zakhar Sorokin*	Trawl	A. King Great Britain	48.3 *C. gunnari*	13/2–13/3/99	Scientific Observer Logbook 24/4/99 Cruise Report 24/4/99	Cruise, vessel, and IMALF details
Australia	*Austral Leader*	Trawl	J. Hunter Australia	58.5.2 *D. eleginoides C. gunnari*	20/8–24/9/98	Scientific Observer Logbook 13/11/98 Cruise Report 25/3/99	Cruise, vessel, and IMALF details
Australia	*Southern Champion*	Trawl	M. Scott Australia	58.5.2 *D. eleginoides C. gunnari*	27/9–11/11/98	Scientific Observer Logbook 18/12/98 Cruise Report 24/3/99	Cruise, vessel, and IMALF details
Australia	*Southern Champion*	Trawl	M. Tucker Australia	58.5.2 *D. eleginoides C. gunnari*	19/11/98–6/1/99	Scientific Observer Logbook 22/2/99 Cruise Report 25/3/99	Cruise, vessel, and IMALF details
Australia	*Southern Champion*	Trawl	J. Parkinson Australia	58.5.2 *D. eleginoides C. gunnari*	13/1–3/3/99	Scientific Observer Logbook 27/4/99 Cruise Report 15/4/99	Cruise, vessel, and IMALF details
Australia	*Southern Champion*	Trawl	I. Brown Australia	58.5.2 *D. eleginoides C. gunnari*	10/3–29/4/99	Scientific Observer Logbook 19/5/99 Cruise Report 23/8/99	Cruise, vessel, and IMALF details
Australia	*Austral Leader*	Trawl	C. Heinecken South Africa	58.4.1, 58.4.3, 58.5.2 *D. eleginoides*	14/3–13/5/99	Scientific Observer Logbook 1/6/99 Cruise Report 23/7/99	Cruise, vessel, and IMALF details
Australia	*Southern Champion*	Trawl	H. Sturmann Australia	58.5.2 *D. eleginoides C. gunnari*	8/5–14/7/99	Scientific Observer Logbook 19/7/99 Cruise Report 23/8/99	Cruise, vessel, and IMALF details
Great Britain	*Argos Helena*	Pot	M. Purves South Africa	48.4 *Paralomis* spp.	31/8–23/9/99	Scientific Observer Logbook 11/10/99 Cruise Report 11/10/99	Cruise, vessel, and IMALF details

Table 50: Incidental mortality of seabirds in the longline fisheries for *D. eleginoides* in Subareas 48.3, 58.6, 58.7 and 88.1 during the 1998/99 season. Sp – Spanish method, Auto – autoliner, N – night-time setting, D – daytime setting (including nautical dawn and dusk), O – opposite side to hauling, S – same side as hauling, * – the average seabird catch rate was used due to lack of observed hooks. The highlighted row indicates data from the UK line-weighting experiment.

Vessel Name	Dates of Fishing	Fishing Method	Sets Deployed				No. of Hooks (1 000s)			Hooks Baited (%)	No. of Birds Caught						Observed Seabird Mortality (Birds/1 000 hooks)			Streamer Line in Use (%)		Offal Discharge at Haul
											Dead		Alive		Total							
			N	D	Total	%N	Ob-served	Set	% Ob-served		N	D	N	D	N	D	N	D	Total	N	D	
Subarea 48.3																						
Argos Helena	1/2–16/2/99	Sp	0	24	24	0	81.6	89.1	91	100		88		11		99	0	1.08	1.08		91	O
Argos Helena	16/4–29/5/99	Sp	173	1	174	99	191	1259	15	100	1	0	13	0	14	0	0.005	0	0.005	83	0	O
Ibsa Quinto	13/7–3/9/98	Sp	29	0	29	100	50.9	249.1	20	100	0	0	1	0	1	0	0	0	0	100		O
Ibsa Quinto	15/4–28/5/99	Sp	38	0	38	100	131.8	339.0	38	100	5	0	8	0	13	0	0.04	0	0.04	89		O
Illa de Rua	15/4–21/6/99	Sp	114	6	120	95	207.5	1102.8	18	100	52	2	11	0	16	2	0.03	0.22	0.03	99	100	O
Illa de Rua	6/7–17/7/99	Sp	18	0	18	100	39.6	176.3	22	100	0	0	0	0	0	0	0	0	0	77		S
Isla Camila	18/4–11/6/99	Sp	88	8	96	91	433.6	749.8	57	100	30	0	16	1	46	1	0.08	0	0.07	77	87	S
Isla Camila	17/6–17/7/99	Sp	41	7	48	85	67.5	451.2	14	100	1	0	2	0	3	0	0.02	0	0.01	100	100	S
Isla Gorriti	17/5–10/6/99	Auto	39	12	51	76	48.5	463.0	10	88	0	0	0	0	0	0	0	0	0	97	100	O
Isla Gorriti	13/6–17/7/99	Auto	42	28	70	60	236.7	643.2	36	90	0	0	2	2	2	2	0	0	0	0	17	O
Isla Sofía	15/4–20/6/99	Sp	86	17	103	83	117.0	772.6	15	92	6	0	2	0	8	0	0.06	0	0.05	100	100	S
Isla Sofía	2/7–16/7/99	Sp	26	4	30	86	47.4	245.0	19	100	0	0	0	0	0	0	0	0	0	84	75	S
Jacqueline	15/4–17/7/99	Sp	77	2	79	97	354.5	971.5	36	100	1	0	30	0	31	0	0.003	0	0.003	94	100	S
Koryo Maru 11	22/4–21/6/99	Sp	57	3	60	95	134.0	761.0	17	100	0	0	0	0	0	0	0	0	0	100	100	O
Koryo Maru 11	6/7–17/7/99	Sp	10	0	10	100	26.1	145.2	18	100	0	0	0	0	0	0	0	0	0	100		O
Lyn	15/4–7/6/99	Sp	74	13	87	85	101.9	795.5	12	100	1	4	0	1	1	5	0.01	0.19	0.04	100	100	O
Lyn	27/6–15/7/99	Sp	30	4	34	88	66.0	277.0	23	100	0	0	0	1	0	1	0	0	0	0	0	O
Magallanes III	23/5–14/7/99	Sp	53	26	79	67	275.3	736.8	37	100	0	1	1	5	1	6	0	0.01	0.004	100	100	O
No. 1 Moresko	15/4–16/7/99	Sp	85	45	130	65	360.7	1074.4	33	100	0	0	2	1	2	1	0	0	0	84	91	O
*Tierra del Fuego**	15/4–11/6/99	Sp	102	6	108	94		732.0		100	20	0	7	2	9	2	0.01	0.08	0.07	97	100	O
Tierra del Fuego	19/6–17/7/99	Sp	73	15	88	82	104.8	354.5	29	100	0	0	1	0	1	0	0	0	0	87	86	O
Total						83	3076.4	12388	25								0.01	0.08	0.07			
Subarea 58.6, 58.7																						
Arctic Fox	27/9–6/11/98	Auto	128	3	131	97	390.4	914.4	42	87	14	0	0	0	14	0	0.04	0	0.04	0	0	O
Arctic Fox	30/11/98–4/1/99	Auto	82	1	83	98	159.5	479.7	33	84	1	0	0	0	1	0	0.01	0	0.01	100	100	O
Arctic Fox	6/4–22/5/99	Auto	122	4	126	96	190.7	726.2	26	83	3	0	0	0	3	0	0.02	0	0.02	99	100	O
Arctic Fox	14/6–15/7/99	Auto	131	7	138	94	259.3	415.1	62	82	5	0	1	0	6	0	0.02	0	0.02	95	100	O
Eldfisk	7/10–6/11/98	Auto	76	86	162	46	67.4	500.0	13	82	7	0	0	0	7	0	0.19	0	0.10	100	100	O
Eldfisk	7/5–8/6/99	Auto	128	54	182	70	102.8	507.3	20	83	2	0	0	0	2	0	0.03	0	0.02	100	100	O
Koryo Maru 11	8/11–20/12/98	Sp	50	0	50	100	166.4	383.5	43	100	15		5		20		0.09	0	0.09	98		O
Koryo Maru 11	10/1–31/1/99	Sp	38	4	42	90	105.0	194.3	54	100	0	0	3		3	1	0	0	0	100	100	O
Koryo Maru 11	10/2–17/3/99	Sp	64	0	64	100	73.3	367.4	19	100	1		5		6		0.01	0	0.01	100		O
Total						88	1514.8	4487.9	34								0.05	0	0.03			

continued

Table 50 continued

Vessel Name	Dates of Fishing	Fishing Method	Sets deployed				No. of Hooks (1 000s)			Hooks Baited (%)	No. of Birds Caught						Observed Seabird Mortality (Birds/1 000 hooks)			Streamer Line in Use (%)		Offal Discharge at Haul
											Dead		Alive		Total							
			N	D	Total	%N	Ob-served	Set	% Ob-served		N	D	N	D	N	D	N	D	Total	N	D	
Subarea 88.1																						
Janus	6/1–26/2/99	Auto	2	126	128	1	234.9	725.3	32	80	0	0	0	0	0	0	0	0	0	100	95	S
San Aotea II	30/12/98–22/2/99	Auto	0	126	126	0	205.8	687.0	29	83	0	0	0	0	0	0	0	0	0	100		S
Total						0.5	440.7	1412.3	31								0	0	0			

Table 51: Estimated seabird mortality by vessel for Subarea 48.3 during the 1998/99 season. The highlighted row indicates data from the UK line-weighting experiment.

Vessel Name	Hooks Observed (1 000s)	Hooks Set (1 000s)	% Night Sets	Estimated Number of Birds Caught Dead		
				Night	Day	Total
Argos Helena	81.6	89.1	0	0	96	96
Argos Helena	191	1 259	15	6	0	6
Ibsa Quinto	50.9	249.1	100	0	0	0
Ibsa Quinto	131.8	339	100	14	0	14
Illa de Rua	39.6	176.3	100	0	0	0
Illa de Rua	207.5	1 102.8	95	31	12	43
Isla Camila	67.5	451.2	85	8	0	8
Isla Camila	433.6	749.8	91	55	0	55
Isla Gorriti	48.5	463	76	0	0	0
Isla Gorriti	236.7	643.2	60	0	0	0
Isla Sofía	47.4	245	86	0	0	0
Isla Sofía	117	772.6	83	38	0	38
Jacqueline	354.5	971.5	97	3	0	3
Koryo Maru 11	26.1	145.2	100	0	0	0
Koryo Maru 11	134	761	95	0	0	0
Lyn	66	277	88	0	0	0
Lyn	101.9	795.5	85	7	23	30
Magallanes III	275.3	736.8	67	0	2	2
No. 1 Moresko	360.7	1 074.4	65	0	0	0
Tierra del Fuego	104.8	354.5	82	0	0	0
*Tierra del Fuego**		732	94	7	4	11
Total	3 076.4	12 388	79	169	137	306

* Estimates are based on the total observed catch rates.

Table 52: Species composition of birds killed in longline fisheries in Subareas 48.3, 58.6 and 58.7 during the 1998/99 season. N – night setting, D – daylight setting (including nautical dawn and dusk), DIM – black-browed albatross, DIC – grey-headed albatross, MAI – southern giant petrel, PCI – grey petrel, PRO – white-chinned petrel, DAC – cape petrel, OCO – Wilson's storm petrel, PYP – Gentoo penguin, ( ) – % composition. The highlighted row indicates data from the UK line-weighting experiment.

Vessel Name	Dates of Fishing	No. Birds Killed by Group						Species Composition (%)															
		Albatross		Petrels/Fulmars		Total		DIM		DIC		MAI		PRO		OCO		DAC		PYP		PCI	
		N	D	N	D	N	D																
Subarea 48.3																							
Argos Helena	1/2–16/2/99	0	51	0	37	0	88	50	(57)	1	(1)	1	(1)	36	(41)								
Argos Helena	16/4–29/5/99	1	0	0	0	1	0	1	(100)														
Ibsa Quinto	13/7–3/9/98	0	0	0	0	0	0																
Ibsa Quinto	15/4–28/5/99	2	0	3	0	5	0	2	(40)					2	(40)					1	(20)		
Illa de Rua	15/4–21/6/99	3	2	2	0	5	2	3	(43)	2	(29)			1	(14)	1	(14)						
Illa de Rua	6/7–17/7/99	0	0	0	0	0	0																
Isla Camila	18/4–11/6/99	30	0	0	0	30	0	3	(100)														
Isla Camila	17/6–17/7/99	0	0	1	0	1	0											1	(100)				
Isla Gorriti	17/5–10/6/99	0	0	0	0	0	0																
Isla Gorriti	13/6–17/7/99	0	0	0	0	0	0																
Isla Sofía	15/4–20/6/99	6	0	0	0	6	0	6	(100)														
Isla Sofía	2/7–16/7/99	0	0	0	0	0	0																
Jacqueline	15/4–17/7/99	0	0	1	0	1	0							1	(100)								
Koryo Maru 11	22/4–21/6/99	0	0	0	0	0	0																
Koryo Maru 11	6/7–17/7/99	0	0	0	0	0	0																
Lyn	15/4–7/6/99	1	3	1	0	2	3	4	(80)			1	(20)										
Lyn	27/6–15/7/99	0	0	0	0	0	0																
Magallanes III	23/5–14/7/99	0	1	0	0	0	1			1	(100)												
No. 1 Moresko	15/4–16/7/99	0	0	0	0	0	0																
Tierra del Fuego	15/4–11/6/99	2	0	0	0	2	0	2	(100)														
Tierra del Fuego	19/6–17/7/99	0	0	0	0	0	0																
Total %								98	(66)	4	(3)	2	(1)	40	(27)	1	(1)	1	(1)	1	(1)		
Subareas 58.6, 58.7																							
Arctic Fox	27/9–6/11/98	0	0	14	0	14	0					6	(43)	8	(57)								
Arctic Fox	6/4–22/5/99	0	0	3	0	3	0					1	(33)	1	(33)							1	(33)
Arctic Fox	14/6–15/7/99	1	0	4	0	5	0			1	(20)									4	(80)		
Arctic Fox	30/1198–4/1/99	0	0	1	0	1	0					1	(100)										
Eldfisk	7/10–6/11/98	0	0	7	0	7	0							7	(100)								
Eldfisk	7/5–8/6/99	0	0	2	0	2	0															2	(100)
Koryo Maru 11	8/11–20/12/98	0	0	15	0	15	0							15	(100)								
Koryo Maru 11	10/1–31/1/99	0	0	0	0	0	0																
Koryo Maru 11	10/2–17/3/99	0	0	1	0	1	0							1	(100)								
Total %										1	(2)	8	(17)	32	(67)					4	(8)	3	(6)

Table 53: Estimated seabird mortality by vessel for Subareas 58.6 and 58.7 during the 1998/99 season.

Vessel Name	Hooks Observed (1 000s)	Hooks Set (1 000s)	% Night Sets	Estimated Number of Birds Caught Dead		
				Night	Day	Total
Arctic Fox	159.5	479.7	98	5	0	5
Arctic Fox	190.7	726.2	96	14	0	14
Arctic Fox	259.3	415.1	94	8	0	8
Arctic Fox	390.4	914.4	97	35	0	35
Eldfisk	67.4	500.0	46	44	0	44
Eldfisk	102.8	507.3	70	11	0	11
Koryo Maru 11	73.3	367.4	100	5	0	5
Koryo Maru 11	105.0	194.3	90	0	0	0
Koryo Maru 11	166.4	383.5	100	35	0	35
Total	1 514.8	4 487.9	87.89	156	0	156

Table 54: Total estimated seabird by-catch and by-catch rate (birds/1 000 hooks) in longline fisheries in Subareas 48.3, 58.6 and 58.7, 1997 to 1999.

Subarea	Year		
	1997	1998	1999
48.3			
Estimated by-catch	5 755	640	210*
By-catch rate	0.23	0.03	0.01*
58.6, 58.7			
Estimated by-catch	834	528	156
By-catch rate	0.52	0.19	0.03

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

Table 55: Estimate of seabird by-catch in the unregulated *Dissostichus* spp. fishery in Subareas 48.3, 58.6 and 58.7 and Divisions 58.4.4, 58.5.1 and 58.5.2 in 1998/99. S – summer, W – winter.

Subarea/ Division	Total Unregulated Catch (tonnes)	Split S:W		Unregulated Catch (tonnes)		*Dissostichus* spp. Regulated By-catch Rate (kg/hooks)	Unregulated Effort (1 000 hooks)		Seabird By-catch Rate (birds/1 000 hooks)				Estimated Total Unregulated Seabird By-catch			
									Mean		Max		Mean		Max	
		S	W	S	W		S	W	S	W	S	W	S	W	S	W
48.3	640	80	20	512	128	0.31	1 652	413	2.608	0.07	9.31	0.51	4 307	29	15 377	211
	640	70	30	448	192	0.31	1 445	619	2.608	0.07	9.31	0.51	3 769	43	13 454	316
	640	60	40	384	256	0.31	1 239	826	2.608	0.07	9.31	0.51	3 231	58	11 532	421
58.6	1 728	80	20	1 382	346	0.09	15 360	3 840	1.049	0.017	1.88	0.07	16 113	65	28 877	269
	1 728	70	30	1 210	518	0.09	13 440	5 760	1.049	0.017	1.88	0.07	14 099	98	25 267	403
	1 728	60	40	1 037	691	0.09	11 520	7 680	1.049	0.017	1.88	0.07	12 084	131	21 658	538
58.7	140	80	20	112	28	0.10	1 120	280	0.049	0.017	1.88	0.07	55	5	2 106	20
	140	70	30	98	42	0.10	980	420	0.049	0.017	1.88	0.07	48	7	1 842	29
	140	60	40	84	56	0.10	840	560	0.049	0.017	1.88	0.07	41	10	1 579	39
58.4.4	1 845	80	20	1 476	369	0.24	6 150	1 538	0.629	0.01	1.128	0.042	3 868	15	6 937	65
	1 845	70	30	1 292	554	0.24	5 381	2 306	0.629	0.01	1.128	0.042	3 385	23	6 070	97
	1 845	60	40	1 107	738	0.24	4 613	3 075	0.629	0.01	1.128	0.042	2 901	31	5 203	129
58.5.1	620	80	20	496	124	0.24	2 067	517	0.049	0.017	1.88	0.07	101	9	3 885	36
	620	70	30	434	186	0.24	1 808	775	0.049	0.017	1.88	0.07	89	13	3 400	54
	620	60	40	372	248	0.24	1 550	1 033	0.049	0.017	1.88	0.07	76	18	2 914	72
58.5.2	160	80	20	128	32	0.24	533	133	0.049	0.017	1.88	0.07	26	2	1 003	9
	160	70	30	112	48	0.24	467	200	0.049	0.017	1.88	0.07	23	3	877	14
	160	60	40	96	64	0.24	400	267	0.049	0.017	1.88	0.07	20	5	752	19

Table 56: Estimates of potential seabird by-catch in unregulated longline fishing in the Convention Area in 1998/99.

Subarea/ Division	Potential By-catch Level	Summer	Winter	Total[1]
48.3	Lower	3 200–4 300	30–60	3 200–4 400
	Higher	11 500–15 400	210–420	11 700–15 800
58.6	Lower	12 100–16100	65–130	12 200–16 200
	Higher	21 650–28 900	270–540	21 900–29 400
58.7	Lower	40–55	5–10	50–60
	Higher	1 600–2 100	20–40	1 600–2 100
58.4.4	Lower	2 900–3 900	15–30	2 900–3 900
	Higher	5 200–6 900	65–130	5 300–7 000
58.5.1	Lower	80–100	10–20	100
	Higher	2 900–3 900	40–70	2 900–4 000
58.5.2	Lower	20–30	2–5	20–30
	Higher	750–1 000	10–20	800–1 000
Total	Lower	18 300–24 500*	100–300[1]	18 000–25 000[2]
	Higher	43 600–58 200*	600–1 200[1]	44 000–59 000[2]

[1] Rounded to nearest hundred birds
[2] Rounded to nearest thousand birds

Table 57: Composition of estimated potential by-catch in unregulated longline fisheries in the Convention Area from 1997 to 1999.

Area/Year	Estimated Total Potential Seabird By-catch[1] (lower level above, higher level below)	Composition of Potential Seabird By-catch[2]		
		Albatrosses	Giant Petrels	White-chinned Petrels
Subarea 48.3[3]				
1996/97	-	-	-	-
1997/98	-	-	-	-
1998/99	3 000–4 000 12 000–16 000	1 505 6 020	70 280	1 680 6 720
Subareas 58.6, 58.7[4]				
1996/97	17 000–27 000 66 000–107 000	4 840 19 030	880 3 460	13 860 54 495
1997/98	9 000–11 000 15 000–20 000	2 200 3 850	400 700	6 300 11 025
1998/99	12 000–16 000 23 500–31 500	3 080 6 050	560 1 100	8 820 17 325
Divisions 58.5.1, 58.5.2[4]				
1996/97	-	-	-	-
1997/98	34 000–45 000 61 000–81 000	8 690 15 620	1 580 2 840	24 885 44 730
1998/99	c. 100 4 000–5 000	c. 22 990	c. 4 180	c. 63 2 835
Division 58.4.4[4]				
1996/97	-			
1997/98	-			
1998/99	3 000–4 000 5 000–7 000	770 1 320	140 240	2 205 3 780
Total				
1996/97	17 000–27 000 66 000–107 000	4 840 19 030	880 3 460	13 860 54 495
1997/98	43 000–54 000 76 000–101 000	10 890 19 470	1 980 3 540	30 185 55 755
1998/99	18 000–24 000 44 000–59 000	5 377 8 892	774 1 800	12 768 30 660
Overall Total	78 000–105 000 186 000–265 000	21 107 47 392	3 634 7 342	56 813 140 910

[1] Rounded to nearest thousand birds.
[2] Based on averages for lower (above) and higher (below) level values.
[3] Based on 43% albatrosses, 2% giant petrels, 48% white-chinned petrels (7% unidentified petrels) (see SC-CAMLR-XVI, Annex 5, Table 44).
[4] Based on 22% albatrosses, 4% giant petrels, 6% white-chinned petrels (10% unidentified petrels) (see SC-CAMLR-XVI, Annex 5, Table 42).

Table 58: Summary of IMALF risk level and assessment in relation to proposed new and exploratory fisheries in 1999/2000.

Subarea/ Division	Risk Level	IMALF Risk Assessment	Reference	Notes
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. Apply Conservation Measure 29/XVI as a seabird by-catch precautionary measure.	SC-CAMLR-XVII, Annex 5, 7.116(i)	• South Africa (CCAMLR-XVIII/9) and the European Community (CCAMLR-XVIII/21) propose to fish from 1 March to 31 August north of 30°S; and from 15 February to 15 October south of 30°S, complying with Conservation Measure 29/XVI. • This does not conflict with the IMALF advice. • Conservation Measure 162/XVII applied in 1998/99.
58.4.1	3	Average risk. Prohibit longline fishing during the breeding season of albatrosses, giant petrels and white-chinned petrels (1 September to 30 April). Maintain all elements of Conservation Measure 29/XVI.	SC-CAMLR-XVII, Annex 5, 7.116(ii)	• Australia (CCAMLR-XVIII/12) is proposing a trawl fishery in this area; longlining is not currently proposed.
58.4.2	2	Average-to-low risk. Prohibit longline fishing during the breeding season of giant petrels (1 October to 31 March). Maintain all elements of Conservation Measure 29/XVI.	7.84(iii)	• Australia (CCAMLR-XVIII/11) is proposing a trawl fishery in this area; longlining is not currently proposed.
58.4.3	3	Average risk. Prohibit longline fishing during the breeding season of albatrosses, giant petrels and white-chinned petrels (1 September to 30 April). Maintain all elements of Conservation Measure 29/XVI.	SC-CAMLR-XVII, Annex 5, 7.116(iii)	• France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season, complying with Conservation Measure 29/XVI. This season substantially conflicts with the IMALF advice. • The European Community (CCAMLR-XVIII/21) intends to fish between 15 April to 31 August, complying with Conservation Measure 29/XVI. This season will overlap the recommended season closure by two weeks. • Conservation Measure 163/XVII applied in 1998/99.

continued

Table 58 continued

Subarea/ Division	Risk Level	IMALF Risk Assessment	Reference	Notes
58.4.4	3	Average risk. Prohibit longline fishing during the main breeding season of albatrosses and petrels (1 September to 30 April) Maintain all elements of Conservation Measure 29/XVI.	SC-CAMLR-XVII, Annex 5, 7.116(iv)	• France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season, complying with Conservation Measure 29/XVI. This season substantially conflicts with the IMALF advice. • Chile (CCAMLR-XVIII/13), South Africa (CCAMLR-XVIII/9), Uruguay (CCAMLR-XVIII/14) and the European Community (CCAMLR-XVIII/21) propose to fish from 15 April to 31 August, complying with Conservation Measure 29/XVI. This season will overlap the recommended season closure by two weeks. • Conservation Measure 164/XVII applied in 1998/99.
58.5.1	5	High risk. Prohibit longline fishing during the main albatross and petrel breeding season (i.e. 1 September to 30 April). Ensure strict compliance with Conservation Measure 29/XVI.	SC-CAMLR-XVII, Annex 5, 7.116(v)	• France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season, complying with Conservation Measure 29/XVI. This season substantially conflicts with the IMALF advice. • Chile (CCAMLR-XVIII/13) stated that it would comply with conservation measures that were in force concerning fishing seasons in relevant subareas and divisions. • I t is understood that Chile intends to comply fully with Conservation Measure 29/XVI. • No conservation measures applied to this area in 1998/99.
58.5.2	4	Average-to-high risk. Prohibit longline fishing within the breeding season of the main albatross and petrel species (1 September to 30 April). Ensure strict compliance with Conservation Measure 29/XVI.	SC-CAMLR-XVII, Annex 5, 7.116(vi)	• France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/00 season, complying with Conservation Measure 29/XVI. This season substantially conflicts with the IMALF advice. • Longline fishing is currently prohibited within the EEZ around Heard/McDonald Islands. • No conservation measures applied to this area in 1998/99.

continued

Table 58 continued

Subarea/ Division	Risk Level	IMALF Risk Assessment	Reference	Notes
58.6	5	High risk. Prohibit longline fishing during the main albatross and petrel breeding season (i.e. 1 September to 30 April). Ensure strict compliance with Conservation Measure 29/XVI.	SC-CAMLR-XVII, Annex 5, 7.116(vii)	• France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season, complying with Conservation Measure 29/XVI. This season substantially conflicts with the IMALF advice. • South Africa (CCAMLR-XVIII/8), Chile (CCAMLR-XVIII/13) and the European Community (CCAMLR-XVIII/21) propose to fish from 15 April to 31 August, complying with Conservation Measure 29/XVI. This season will overlap the recommended season closure by two weeks. • Conservation Measure 168/XVII applied in 1998/99.
58.7	5	High risk. Prohibit longline fishing during the main albatross and petrel breeding season (i.e. 1 September to 30 April). Ensure strict compliance with Conservation Measure 29/XVI.	SC-CAMLR-XVII, Annex 5, 7.116(viii)	• France (CCAMLR-XVIII/20) proposes to fish the whole of the 1999/2000 season, complying with Conservation Measure 29/XVI. This season substantially conflicts with the IMALF advice. • Conservation Measure 160/XVII applied in 1998/99.
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; the provisions of Conservation Measure 29/XVI should be strictly adhered to.	SC-CAMLR-XVII, Annex 5, 7.116(ix)	• Chile (CCAMLR-XVIII/13), the European Community (CCAMLR-XVIII/21) and New Zealand (CCAMLR-XVIII/10) propose to fish from 15 December to 31 August. • This does not conflict with the IMALF advice. • Chile and the European Community intend to comply fully with Conservation Measure 29/XVI. • New Zealand (CCAMLR-XVIII/10) proposes a continuation of the variation to Conservation Measure 29/XVI as provided for by Conservation Measure 169/XVII, to allow line-weighting experiments to continue south of 65°S in Subarea 88.1 (see paragraphs 7.85 to 7.91 for further discussion). • Conservation Measure 169/XVII applied in 1998/99.

continued

Table 58 continued

Subarea/ Division	Risk Level	IMALF Risk Assessment	Reference	Notes
88.2	1	Low risk. No obvious need for restriction of longline fishing season. Apply Conservation Measure 29/XVI as a seabird by-catch precautionary measure.	7.84(xi)	• The European Community (CCAMLR-XVIII/21) will comply with Conservation Measure 29/XVI, including only setting gear at night. • It is understood that Chile intends to comply fully with Conservation Measure 29/XVI. • No conservation measures applied to this area in 1998/99.

Table 59: Results from new and exploratory longline fisheries proposed in 1998/99.

Subarea/Division	Country	Catch (tonnes)	Report on Seabird By-catch
48.6	South Africa	0	
58.4.3	France	No fishing	
58.4.4	South Africa Spain Uruguay France	No fishing No fishing No fishing No fishing	
58.6	South Africa	201 in EEZ	WG-FSA-99/42
58.7	South Africa	180 in EEZ	WG-FSA-99/42
88.1	New Zealand	298	WG-FSA-99/35

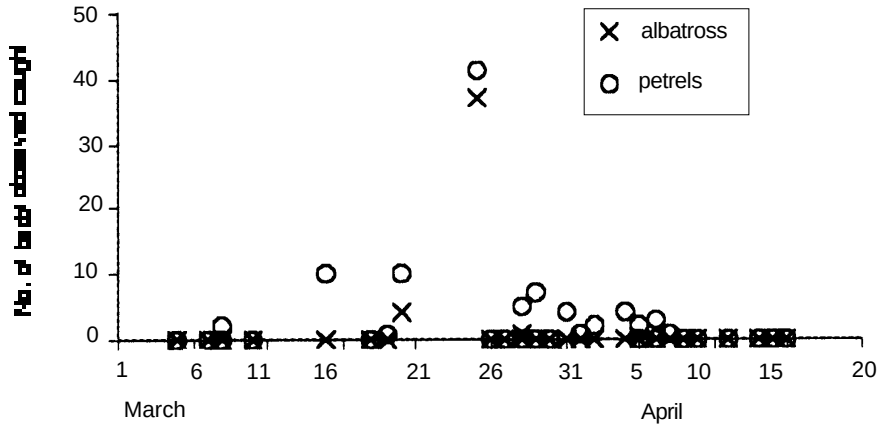

Figure 29: Catches of seabirds in March and April 1997 on longline sets where streamer lines were used, offal was not discharged and setting was at night with no moon. Line weighting was 0.1 to 0.19 kg/m (greater line weightings were not available in 1997).

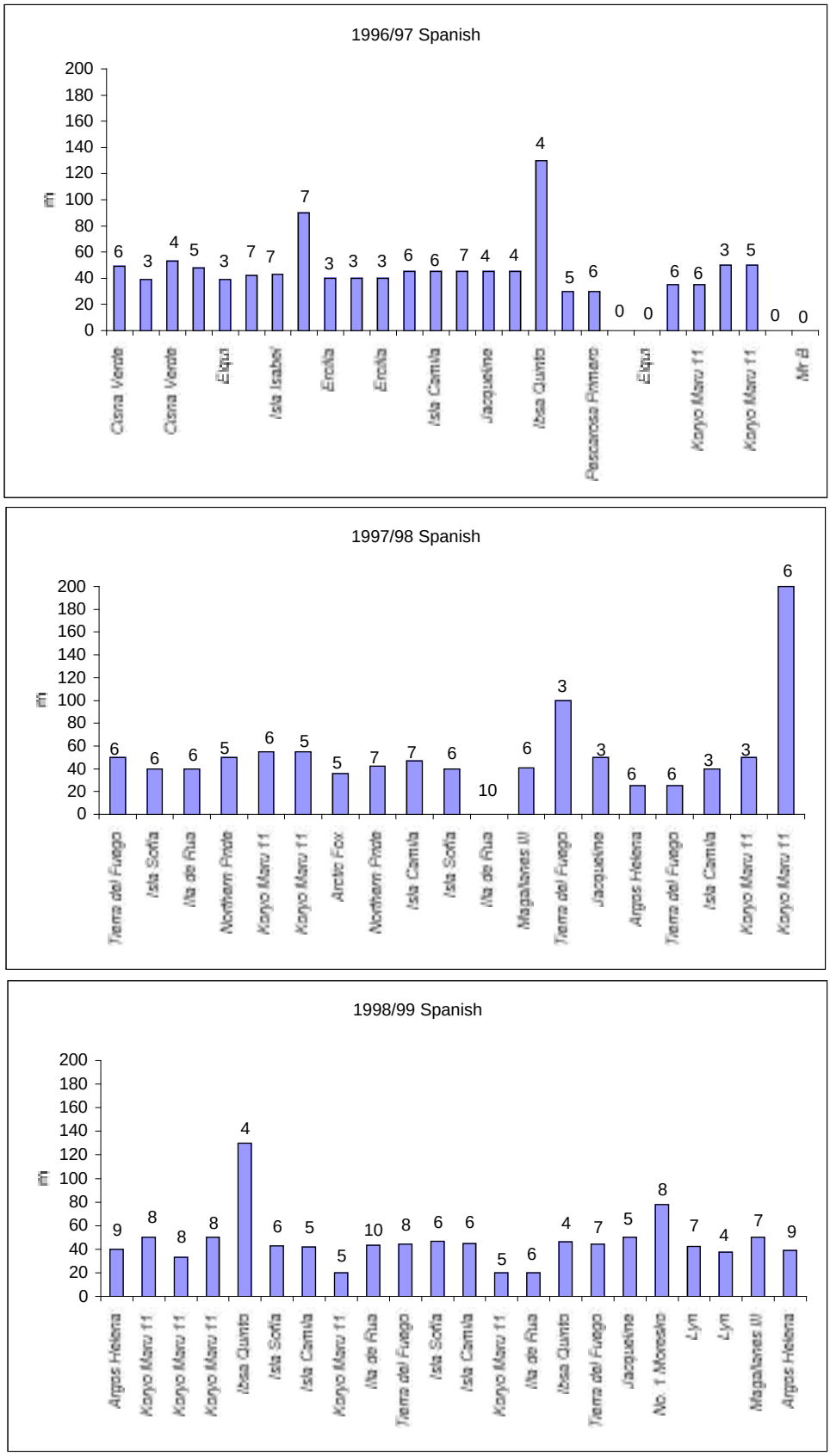

Figure 30: Mass of weights (kg) and weight spacings (m) used by vessels using the Spanish method in 1996/97, 1997/98 and 1998/99.

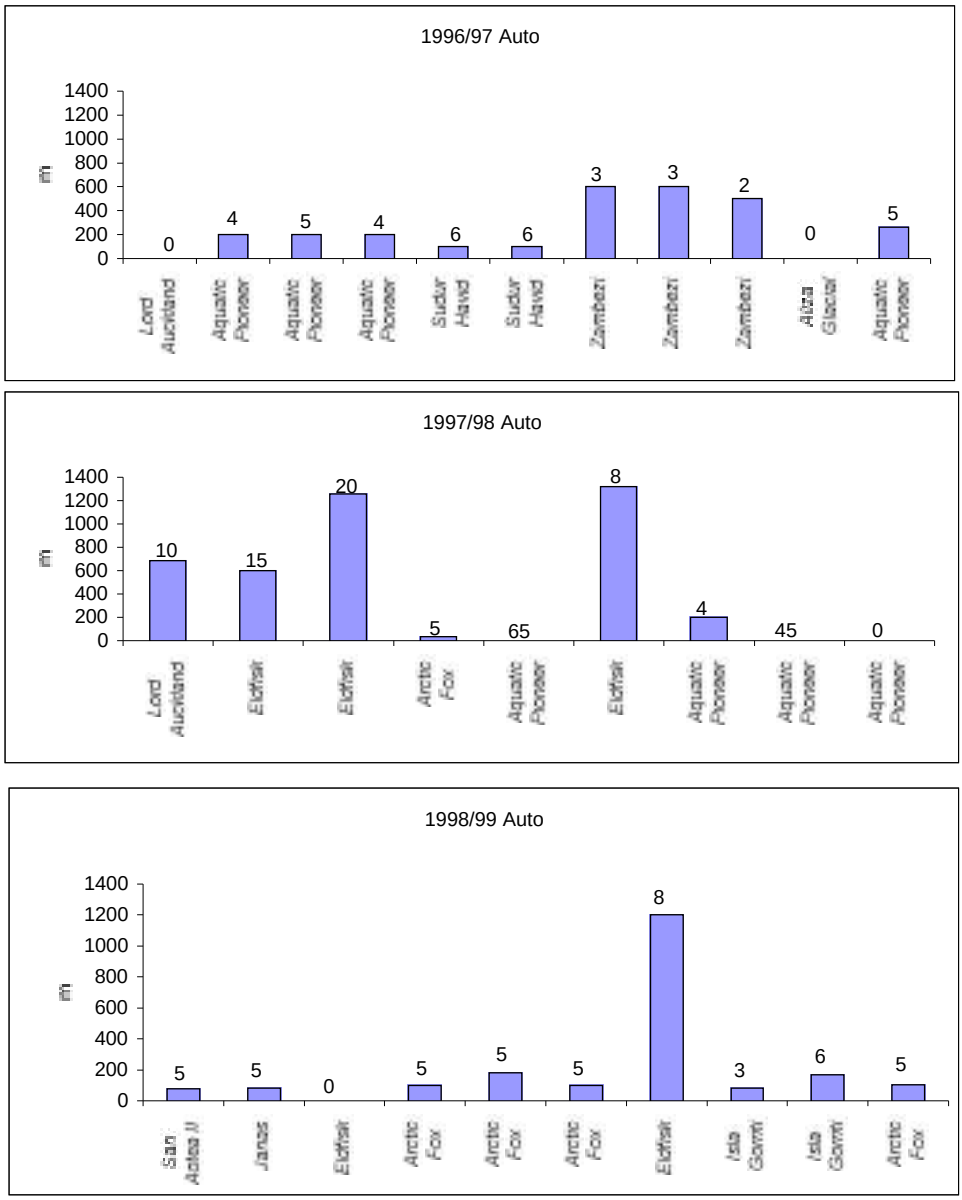

Figure 31: Mass of weights (kg) and weight spacings (m) used by autoline vessels in 1996/97, 1997/98 and 1998/99.