ASSESSMENT OF INCIDENTAL MORTALITY

INCIDENTAL MORTALITY IN LONGLINE FISHERIES

9.1 The Chairman introduced this item by noting that, in response to the growing concerns about this topic and the increasing volume of material being presented for discussion at the Scientific Committee, it was decided last year to convene an *ad hoc* Working Group to review the situation. The terms of reference for this Working Group, set out in SC-CAMLR-XII, paragraph 10.19, were to:

(i) review and analyse the data submitted in accordance with CCAMLR requirements on incidental mortality associated with longline fishing;

(ii) review the efficacy of mitigating measures currently in use in the Convention Area, and consider improvements to them, taking into account experience both inside and outside the Convention Area;

(iii) review data on the level and significance of incidental mortality arising from longline fishing to marine animals found within the Convention Area;

(iv) prepare a summary of the above for the consideration of the Scientific Committee;

(v) provide the Scientific Committee with advice for improvements to:

(a) the reporting requirements currently in use in the Convention Area; and

(b) the measures in use to avoid incidental mortality in longline fisheries within the Convention Area.

9.2 The meeting of WG-IMALF was held in Hobart, Tasmania, on 21 and 22 October 1994, under the convenership of Dr Moreno. The report of the meeting is attached at Annex 8.

9.3 The Convener noted that the meeting had been very well attended, with 32 participants from 12 Member countries. Forty papers were presented for consideration.

9.4 The Scientific Committee recorded its thanks to the Working Group for undertaking such an onerous task in such a short time. It welcomed the tabling of papers by Members such as Brazil and Uruguay, which were unable to send representatives to the meeting; it also appreciated the presence of representatives of fisheries authorities and organisations at the meeting.

Level of Incidental Mortality Arising
from Longline Fisheries and its Significance
for Marine Animals within the Convention Area

9.5 The Scientific Committee noted the review of reports of incidental mortality of seabirds arising from longline fishing in Subarea 48.3 since the start of the fishery there in 1986/87 (Annex 8, paragraphs 3.2 and 3.3).

9.6 The Scientific Committee recollected that, because of the very incomplete reporting of data on incidental mortality and the lack of information on the effectiveness of mitigation measures (SC-CAMLR-XII, paragraph 10.31), it had recommended last year to the Commission that scientific observers be placed on a high proportion of longline vessels fishing in the Convention Area (SC-CAMLR-XII, paragraph 10.32).

9.7 In response, the Commission had incorporated in Conservation Measure 69/XII, regulating the *D. eleginoides* fishery in Subarea 48.3 in 1993/94, the requirement that a scientific observer (appointed in accordance with the CCAMLR Scheme of International Scientific Observation) be aboard each vessel authorised to fish in the subarea.

9.8 The reports of the scientific observers from three of the four vessels which were authorised to fish in Subarea 48.3 were available for review by WG-IMALF.

9.9 Dr Shust regretted that because fishing by Ukraine/Bulgaria on the *RK-1* had only ceased on 15 September, there had been insufficient time to prepare and transmit the observer's report to CCAMLR. It would be submitted as soon as possible.

9.10 The Scientific Committee welcomed this information and the Secretariat was requested to ensure that the report was available for review by the appropriate working and *ad hoc* groups of the Scientific Committee.

9.11 The Scientific Committee endorsed the conclusions of the WG-IMALF review (Annex 8, paragraph 3.11) of the observer reports, specifically that:

(i) the use of scientific observers had provided CCAMLR with the first adequate sets of quantitative data on incidental mortality of seabirds in the Convention Area and the first evidence of any kind of interactions involving cetaceans;

(ii) the observers had produced excellent results, often under very difficult conditions, and had also managed to achieve and maintain good relations with the fishing masters and crew, without which such useful data could not have been collected;

(iii) catch rates of seabirds were broadly similar to those reported for longline fisheries elsewhere (see Annex 8, Table 2 and paragraph 3.41). The current level of annual mortality of seabirds from longline fishing in Subarea 48.3 is likely to be in the order of a few hundred birds (over half of which, however, will be albatrosses). The levels of mortality, at least in some previous years when fishing effort was greater and few, if any, mitigating measures were used, could easily have been five or more times higher. Even current levels of mortality are likely to be having detrimental effects on some local albatross populations;

(iv) setting lines only at night would reduce very significantly the catch of albatrosses. It will probably, however, result in larger numbers of white-chinned petrels being killed; further work on measures to prevent incidental mortality of petrels will be required;

(v) streamer lines were shown to be highly effective in reducing seabird mortality. Some modification of the existing CCAMLR specification, to cater for the different types of longline fishing in the Convention Area, would be appropriate;

(vi) discharge of offal during setting should continue to be prohibited; discharge during line hauling should be conducted on the opposite side of the vessel to hauling operations; and

(vii) attention should be given to the problem of cetacean interactions.

9.12 Members commented on certain aspects of the WG-IMALF review of the observers' reports, specifically that:

(i) because all catch rates of birds were based on observations during the hauling of lines, they will be substantial underestimates. This is due to the number of birds that are hooked and killed but not retained on the hooks; this proportion is about 30% in studies conducted outside the Convention Area; and

(ii) the use of Mustad autoliners results in a proportion (perhaps 30%) of hooks not being baited. Thus the true number of hooks 'available' to catch birds is substantially

lower than the numbers given in Table 2 of Annex 8, resulting in an underestimate of the real rate of catching birds.

9.13 The Scientific Committee noted the review of relevant data for Subarea 48.4 and Division 58.5.1 (Kerguelen). It noted that seabird mortality rates in the latter area (Annex 8, paragraphs 3.14 to 3.16) are broadly similar to those reported from Subarea 48.3.

9.14 It also noted the conclusion of WG-IMALF that, provided that the *D. eleginoides* fishery on the Kerguelen shelf is maintained at its current level and the enforcement of measures to reduce incidental mortality is maintained, there should be very limited impact from this source on local seabird populations.

9.15 The Scientific Committee noted with concern that in Subarea 48.3 there had been a very substantial increase in the numbers and proportions of albatrosses at their breeding colonies showing evidence of having interacted with local longline fisheries. These data could indicate mortality to albatrosses additional to those recorded from observations of hauled birds and from estimates of further mortality during setting.

9.16 The Scientific Committee welcomed the review of incidental mortality of seabirds which breed in the Convention Area, in longline fisheries for tuna outside the Convention Area (Annex 8, paragraphs 3.22 to 3.30). This review summarised many of the data presented to the Scientific Committee in recent years.

9.17 Dr D. Robertson (New Zealand) drew attention to the existence of recent data from New Zealand which could supplement Table 2 of Annex 8. These data are also from the southern bluefin tuna longline fishery. In 1993 the data were from vessels either using streamer lines or fishing at night. In 1994 the data were from vessels required by regulation to use streamer lines whether or not fishing took place at night. The observed incidental catch rates for 1993 and 1994 (0.18 and 0.14 birds/1 000 hooks respectively) are both considerably higher than the rate recorded in Annex 8, Table 2 for 1992 in the New Zealand region.

9.18 Potential problems arising from existing and developing longline fisheries for *D. eleginoides* in southern Chile, the Patagonian shelf, the Falklands/Malvinas Islands and oceanic banks adjacent to the Convention Area were highlighted in Annex 8, paragraph 3.31.

9.19 The Scientific Committee noted the Working Group conclusions that the problem of incidental mortality of seabirds from the Convention Area clearly occurs in all three oceans bordering the Convention Area (Annex 8, paragraph 3.34).

9.20 The review of evidence of the effects of longline fishing outside the Convention Area on seabird populations in the Convention Area (Annex 8, paragraphs 3.35 to 3.40) was noted. This review also summarises many of the papers presented at recent meetings of the Scientific Committee.

9.21 The Scientific Committee welcomed the overall summary of many of the preceding studies and data in Annex 8, Tables 2 and 3. It agreed to include Table 2 in the report of the Scientific Committee (with some minor changes to aid clarity) and to incorporate the New Zealand data referred to in paragraph 9.17 (Table 8).

9.22 Dr M. de Poorter (ASOC) drew the meeting's attention to document CCAMLR-XIII/BG/14 (also Annex 8, paragraph 3.16) which reports an average of one to two birds killed per longline setting in the Ukraine fishery in the Kerguelen EEZ, and SC-CAMLR-XIII/BG/12 which mentions a total of 875 sets for this fishery in 1993/94. Combined, this gives an estimated total of 875 to 1 750 birds killed in this fishery in the Kerguelen EEZ in 1993/94.

9.23 Prof. Duhamel drew attention to the fact that the estimate provided in CCAMLR-XIII/BG/14 was not based on data of the same type as those analysed by WG-IMALF.

9.24 The Scientific Committee noted the clear indications in Annex 8, Table 3 that, of species breeding in the Convention Area, albatrosses and white-chinned petrels are particularly at risk from longline fishing.

Table 8: Catch rates of seabirds in various longline fisheries from data collected by observers both inside and outside the CCAMLR Convention Area. Rough estimates of total mortality are extrapolated from estimates of total effort. These estimates may involve substantial extrapolation, and hence may be subject to considerable uncertainty.

Region	Fishery	Season	Estimated Number of Hooks Observed	Number of Birds Observed Caught	Observed Incidental Catch Rate of Seabirds (No. per 1 000 hooks)	Estimated Total Effort in Fishery (Millions of hooks)	Annual Implied Total Seabird Mortality	Reference
South Atlantic off Brazil	Tuna	1990	18 597	71	3.82	-	2 650[1]	WG-IMALF-94/4
South Atlantic off Brazil and Uruguay	Tuna	1994	55 624	280	5.03	-	-	WG-IMALF-94/17
Australia, SW of Tasmania	Tuna (Japanese)	1987	108 662	45	0.41	107.9[4]	44 000	WG-IMALF-94/6
New Zealand (north)	Tuna (domestic)	1994	11 200	6	0.27	-	-	WG-IMALF-94/10
New Zealand (w/o mitigation)	Tuna (Japanese)	1988-91	1 269 000	304	0.24	10.4	2 500	SC-CAMLR-XII-BG/14
New Zealand (streamer lines + night-setting)	Tuna (Japanese)	1992	1 032 000	16	0.016	9.0	144[2]	SC-CAMLR-XII-BG/14
New Zealand	Tuna (Japanese)	1993	1 226 000	215	0.18	4.8	839	D. Robertson pers. comm.
New Zealand	Tuna (Japanese)	1994	708 000	98	0.14	0.9	128	D. Robertson pers. comm.
Fisheries in CCAMLR Convention Area								
South Georgia (Subarea 48.3)	*D. eleginoides*	1991	9 000	6	0.67	5.2290	3 000	WG-IMALF-94/5
" (single vessel)	"	1994	239 200	75	0.31	0.2392	75	SC-CAMLR-XIII-BG/9 Rev 1.
"	"	1994	25 860	5	0.19	0.2504	55	WG-IMALF-94/14
"	"	1994	206 720	98	0.47	0.2914[3]	138	WG-IMALF-94/15[5]
Kerguelen (Division 58.5.1)	"	1994	174 000	38	0.22	-	-	WG-IMALF-94/12

[1] Estimate calculated as birds per fishing day. Number of fishing days is an estimate only.

[2] Reported to be higher in 1993

[3] C. Moreno, pers. comm.

[4] All hooks south of 30°S

[5] Including data from experimental hauls set during the day

9.25 The Scientific Committee noted in particular the Working Group's conclusions that:

(i) although considerable uncertainty exists concerning the estimates of implied total seabird mortality, it is known that substantial numbers of seabirds are killed each year;

(ii) except for the very high catch rates of seabirds in the tuna fisheries off Brazil and Uruguay (where it is unlikely that any mitigating measures are in use), catch rates are broadly similar across fisheries despite the considerable differences in the near-surface longline gear employed in fisheries for tuna and the bottom lines used in the fisheries for *D. eleginoides*;

(iii) the results from the Japanese tuna fishery in New Zealand waters (and also from similar Australian work) show that a substantial reduction in catch rates of seabirds can be achieved by setting longlines at night and by using bird-scaring streamer lines; and

(iv) the greater part of seabird incidental mortality relating to birds breeding within the Convention Area arises from fisheries outside the Convention Area. However, catch rates of seabirds in longline fisheries within the Convention Area are comparable with those outside. Therefore, future expansion in any of these fisheries has the potential to lead to substantial incidental mortality unless the use of mitigation measures is continued and improved.

Data Reporting on Incidental Mortality Arising
from Longline Fishing in the Convention Area

9.26 The Scientific Committee noted the deficiencies in data reporting identified by WG-IMALF (Annex 8, paragraph 4.2) and endorsed the comments that:

(i) there is a need greatly to improve the collection of data and information on incidental mortality;

(ii) reliable data will only be obtained from scientific observers;

(iii) it would be essential to have observers on all longline vessels fishing in the Convention Area; and

(iv) the range and nature of the tasks of the scientific observer (collecting both bird and fish data) are such that some prioritisation of tasks will be necessary. Even so, some tasks are unlikely to be within the ability of a single observer.

9.27 The Scientific Committee therefore endorsed the WG-IMALF recommendations that:

(i) whenever logistically possible, two scientific observers should be present on each vessel. In this context, the Scientific Committee noted that one particularly helpful way of giving effect to this might be to share the duties between an international scientific observer and a scientific observer provided by the Member operating the vessel, as had been done successfully in 1992/93 and 1993/94 with the BF *Friosur V* in Subareas 48.4 and 48.3;

(ii) priority tasks for scientific observers in relation to recording appropriate data on incidental mortality (Annex 8, paragraph 4.4) include:

(a) observation of both setting and hauling of lines and recording of appropriate details of fishing equipment, fishing techniques and the type and nature of the deployment of mitigating measures;

(b) retention of all specimens of birds caught, or, if impossible, retaining at least the head, leg and samples suitable for subsequent DNA analysis, together with any bands or other identifying markers;

(c) training in seabird identification;

(d) assisting with education and dissemination of information to fishermen on the problem of incidental mortality and its solutions. It was recognised that to carry out this task the observer would need to be equipped with appropriate documentation.

9.28 Accordingly the Scientific Committee recommended that:

(i) the pilot edition of the *Scientific Observers Manual* be updated to include the following research priorities, relevant to incidental mortality, which could be addressed by scientific observers:

- monitoring total incidental bird mortality by species, sex and age;
- monitoring bird mortality per unit of fishing effort and relative vulnerability of different species;
- collecting bird bands and reporting other study markings;
- evaluating the efficacy of mitigation measures; and
- investigating the practicalities of implementing different mitigation methods;

(ii) in addition, a new appendix to the *Scientific Observers Manual* be prepared by the Secretariat to provide guidance to observers placed on longline vessels for the purposes of recording information relating to incidental mortality;

(iii) reporting data on incidental mortality on form C2 be continued; and

(iv) the Secretariat create data sheets in book format based on information set out in Annex 8, Appendix D for reporting observations conducted on board longline vessels by scientific observers designated under the CCAMLR Scheme of International Scientific Observation.

9.29 The Scientific Committee recognised that producing new data formats will not be possible in time for the 1994/95 fishing season. Development of these data formats would probably require close liaison with (and between) WG-IMALF and WG-FSA, as would evaluating priorities for the collection of data on fish and incidental mortality separately and together. The Scientific Committee therefore recommended that the list of data required be circulated among Members (Annex 8, Appendix D) in order to help standardise the collection of information by scientific observers in 1994/95.

9.30 In helping to provide material for observers to assist fishing vessels reduce incidental mortality, the Scientific Committee commended the collaboration between Australia and Japan which had resulted in the production in 1994 of a book in Japanese entitled *Catching Fish not Birds: a Guide to Improving Longline Fishing Efficiency*. The Scientific Committee recommended that CCAMLR should consider requesting permission to revise the English language version of this text

(WG-IMALF-94/20) to ensure its applicability to longline fishing for *D. eleginoides* in the Convention Area and then arrange its wide circulation in all languages of the Commission, and, if possible, in languages of nations currently undertaking longline fishing in the Convention Area.

Measures for Reducing and/or Eliminating Incidental Mortality Associated with Longline Fishing

9.31 The Scientific Committee welcomed the review by WG-IMALF of relevant information from Members working in the Convention Area (Annex 8, paragraphs 5.1 to 5.3), derived from experience of the scientific observers on vessels in Subarea 48.3 and from research in conjunction with the longline fishery around Kerguelen.

9.32 It noted the apparent efficacy of the method currently in use around Kerguelen, and also the comments of WG-IMALF that such a method would not be applicable to the types of longline fishing for *D. eleginoides* currently in use elsewhere in the Convention Area.

9.33 The Scientific Committee also welcomed the review of relevant experiences and observations from similar, but much more extensive, work outside the Convention Area (Annex 8, paragraphs 5.4 to 5.20).

9.34 It noted that the work referred to in Annex 8, paragraphs 9.29 and 9.30 indicated very clearly the need for some small, but potentially very important, modifications to the existing Conservation Measure (29/XII). The Scientific Committee also noted that while these modifications should very substantially reduce the number of albatrosses caught, they may increase mortality of petrels.

9.35 In general, however, the Scientific Committee observed that while improvements to such mitigating measures were desirable, only through more fundamental modifications to longline fishing techniques would lasting solutions to the problem be achieved. Examples of such modifications are the development by Australia and Japan of bait-casting machines and the development by Norway of methods for setting longlines under water.

9.36 In conclusion, the Scientific Committee recommended that scientific observers be placed on all longline vessels fishing in the Convention Area and that this requirement be incorporated into the appropriate conservation measures.

9.37 The Scientific Committee also recommended that Conservation Measure 29/XII be revised to:

(i) ensure that the setting of longlines takes place only at night (i.e., between the times of nautical twilight);

(ii) allow slightly greater flexibility in the design and deployment of streamer lines;

(iii) request that every effort should be made to ensure that birds captured during longlining are released alive and that, wherever possible, hooks are removed without jeopardising the birds' lives; and

(iv) ensure that the prohibition on dumping trash and/or offal during longline operations is maintained, with the addition of wording indicating that where this was impossible, any discharge should take place as far away as possible from the area of the vessel where longlines are being set or hauled.

9.38 In the revision of Conservation Measure 29/XII, existing provisions for rapid sinking of baited hooks and for the night-time use of the minimum ship's lights necessary for safety, be retained.

9.39 As regards deploying streamer lines effectively and helping to devise improvements to them, the Scientific Committee noted that WG-IMALF-94/19 provides a very clear statement of the principles involved in the construction and use of streamer lines. It recommended that this document be translated into all Commission languages and, if possible, into the languages of other Members currently fishing in the Convention Area, and circulated to Members with a request to make it widely available amongst the longline fishing fleets, including all the vessels operating in the Convention Area. All scientific observers should also be in possession of a copy of the document.

9.40 The Scientific Committee noted that the future development of improved methods to mitigate seabird mortality may require an experimental approach, augmenting and complementing data being collected by scientific observers aboard commercial vessels. Members were encouraged to undertake such work and to report the results to the Scientific Committee for review.

9.41 Lic. Marschoff noted that using longlines in an experimental program (as suggested in Annex 8, paragraphs 5.24 and 6.2) will result in some degree of interference with fishing activities. For example, during 1993/94 this potential problem was solved by the designation of a Special Area for Protection and Scientific Study.

9.42 The Scientific Committee noted that several papers tabled at WG-IMALF had drawn attention to the potentially important problem posed by interactions between longlines and cetaceans and that WG-IMALF had recommended that the Scientific Committee investigate how these interactions could be reduced.

9.43 The Scientific Committee recommended that a useful first step would be for the Secretariat to consult with the IWC, seeking its advice on this topic, information on relevant research into cetacean-fishery interactions and, particularly, details of research investigating techniques whereby such interactions can be reduced or eliminated.

9.44 Dr D. Torres (Chile) noted that FAO also had interests, and potentially relevant information, in this field; the Secretariat was asked to seek similar advice from this organisation.

9.45 The Scientific Committee recognised that however successful it is in reducing and/or eliminating incidental mortality of seabirds in longline fisheries in the Convention Area, there remains the substantial problem of the impact of incidental mortality on seabirds in areas outside the Convention Area (paragraphs 9.18 and 9.19). This is a problem CCAMLR cannot solve in isolation.

9.46 The Scientific Committee commended Japan for the initiatives already taken by its fishing organisations and authorities to reduce this problem; it encouraged Japan and other fishing Members to extend these practices as widely as possible and to continue devising improved solutions to the problem.

9.47 Accordingly, the Scientific Committee endorsed the recommendation of WG-IMALF that CCAMLR should exchange, with appropriate fisheries management authorities and international organisations, information on the state of Antarctic seabird populations affected by longline fisheries, incidental catches in these fisheries, and relevant data on fishing effort as well as CCAMLR experiences with mitigating techniques and with the formulation of conservation measures.

9.48 This exchange of information should involve all the international fishery organisations covering waters adjacent to the Convention Area as listed in Annex 8, Appendix E.

9.49 In this context, CCAMLR's attention was drawn to recent international efforts in formulating guidelines for responsible fishing, aimed at the sustainable use of the world's fisheries resources. In May 1992 a meeting on responsible fisheries was held in Cancun, Mexico, and in the same year the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, agreed on the need to develop specific guidelines for responsible fishing and entrusted FAO with the development of a Code of Conduct for that purpose. A Technical Consultation on this subject was

held in April 1994 and discussions will continue during the FAO Committee on Fisheries in March 1995. The work of CCAMLR on the regulation of fisheries is of high relevance to these international efforts and should be made known to FAO. It should also be noted that the UN Conference on Straddling Stocks and Highly Migratory Fish Stocks will continue, and hopefully be finalised, in 1995. Again, certain regulatory measures enacted by CCAMLR concerning high seas fishery and incidental catches of seabirds may be of considerable interest to that conference as an example of how some aspects of this problem are currently being tackled.

9.50 The Scientific Committee noted that WG-IMALF had identified a number of areas where further work was needed (Annex 8, paragraph 6.1), and proposed various actions in respect of some of these (Annex 8, paragraph 6.2).

9.51 Many of these initiatives have been addressed earlier in this report. However, the Scientific Committee also recommended that:

(i) Members maintain or increase monitoring of seabird populations at risk from incidental mortality. The main species involved are albatrosses, for which quite extensive programs are in progress or under development, and to a lesser extent white-chinned petrels, for which there are currently no population monitoring programs; and

(ii) WG-IMALF and WG-FSA should consider, as a matter of priority, the development of mechanisms facilitating the processing of specimens collected by scientific observers.

9.52 The Scientific Committee discussed how best to carry forward the work of WG-IMALF, particularly in the light of the heavy burden on the Secretariat of meetings already planned to be held in Hobart prior to the next meeting of the Scientific Committee.

9.53 It was agreed that a full meeting of WG-IMALF should not take place in 1995. In the intersessional period, the undertaking of initiatives identified above should be handled by an *ad hoc* subgroup instituted by the Scientific Committee and coordinated by Dr Moreno.

9.54 This subgroup will report on progress to the 1995 meeting of WG-FSA, for which the topic of incidental mortality in longline fisheries will receive attention as a special agenda item. Every effort should be made to ensure that scientists experienced in studies of incidental mortality can attend WG-FSA, at least when this subject is being discussed.

ADVICE TO THE COMMISSION

9.55 The Commission should note the conclusions of the Scientific Committee following its review of the reports of scientific observers on board longline fishing vessels in Subarea 48.3 under the terms of Conservation Measure 69/XII (paragraphs 9.11 and 9.12).

9.56 The Commission should also note the conclusions of the Scientific Committee on which species breeding in the Convention Area are principally at risk from longline fishing (paragraph 9.24), on catch rates of seabirds in tuna and *D. eleginoides* longline fisheries, on the success achieved by appropriate measures seeking to mitigate this incidental mortality and, finally, the conclusion that the greater part of seabird incidental mortality relating to birds breeding in the Convention Area arises from fisheries outside the Convention Area (paragraph 9.25).

9.57 Japanese scientists, at the time of the adoption of the report, reserved their position on the conclusions described above, since they had not analysed the papers and data submitted to WG-IMALF.

9.58 The Scientific Committee has made a series of recommendations:

(i) concerning improving the collection of data on incidental mortality (paragraph 9.27);

(ii) for related changes to the *Scientific Observers Manual* (paragraph 9.28); and

(iii) for publications assisting scientific observers in explaining the problems of, and solutions to, incidental mortality of seabirds in longline fisheries (paragraph 9.30).

9.59 The Scientific Committee, after reviewing numerous papers tabled on the topic of measures for mitigating incidental mortality in longline fisheries, recommended that:

(i) scientific observers be placed on all longline vessels fishing in the Convention Area and that this requirement be incorporated into the appropriate conservation measures (paragraph 9.36);

(ii) Conservation Measure 29/XII be slightly revised, along the lines specified in paragraphs 9.37 and 9.38; and

(iii) CCAMLR should make widely available to longline fishing vessels and observers a publication explaining how to construct, set and use streamer lines correctly (paragraph 9.39).

9.60 In seeking to reduce interactions between cetaceans and longline fishing in the Convention Area, the Scientific Committee recommended that the Commission consult with the IWC and FAO for advice (paragraphs 9.43 and 9.44).

9.61 In order to help reduce the mortality outside the Convention Area of seabirds breeding within the Convention Area, the Scientific Committee recommended that the Commission exchange information with all international fisheries organisations covering waters adjacent to the Convention Area and also with FAO and the UN (paragraphs 9.47 to 9.48).

9.62 The Scientific Committee agreed that WG-IMALF need not meet in 1995. It established an *ad hoc* subgroup, coordinated by Dr Moreno, to ensure progress is made with the agreed intersessional tasks and to report to the 1995 meeting of WG-FSA (paragraphs 9.53 and 9.54).

9.63 Dr de Poorter expressed the view that it would be helpful to the Commission's deliberations if, in addition to the total number of birds accidentally killed in the past season, the Commission was informed of the effects of bird mortality that would be achieved by the different actions it might consider taking. This could include an estimate of the decrease of total mortality and the potential increase in petrel mortality resulting from adopting the mitigative measures identified by WG-IMALF, as well as the effects on bird mortality in the event of closure of the fishery.

9.64 Dr de Poorter further stated that it would be useful to specify a time frame for an in-depth review of the effectiveness of additional mitigative action.

9.65 Dr Holt noted that WG-IMALF had reviewed information concerning the incidence of bird, especially albatross, mortality in the *D. eleginoides* longline fishery. He suggested that the Commission might wish to consider these impacts when determining an appropriate catch level for this fishery. In fact, consideration of these impacts may include setting a catch level at the lowest or lower end of the range of levels being considered.

9.66 Dr Moreno stated that it was inappropriate to relate the problems of incidental mortality to the process of determining TAC levels. This statement is based on the fact that most incidental mortality of seabirds occurs outside the Convention Area, and the existence of mitigating measures which are currently being used to decrease the rate of mortality within the Convention Area. He was

convinced that the most important issue is to educate fishermen in order to achieve longterm success in applying mitigating measures in all fisheries.

9.67 Dr de la Mare agreed that it was inappropriate to make a direct connection between TACs and the level of bird mortality. However, he considered that there was a need to provide information to the Commission on the likely consequences, for example in terms of estimates of bird mortality, of management measures directed towards the fishery. This would be particularly appropriate where a range of alternative measures was proposed so that the Commission might take bird mortality into account when considering the alternatives. The measures considered may be not only TACs, but other regulations possibly involving fishing areas and seasons.

9.68 Dr Robertson noted that in addressing the issues of incidental mortality of seabirds, the Scientific Committee has so far been careful to propose mitigating measures which will not have an impact on the TACs of target species.

9.69 Lic. Marschoff indicated that gathering information on incidental mortality would become useless if it did not result in adequate conservation measures being adopted; these measures might well include the setting of TACs based on by-catch considerations, as has been done in the past by the Commission.

9.70 Mr Miller emphasised that in addressing incidental mortality, CCAMLR was, to a large extent, inheriting a problem whereby far greater mortality was occurring outside than inside the Convention Area. Consequently, CCAMLR has a strong duty to inform other organisations and nations fishing outside the Convention Area of the magnitude of the problem of incidental mortality of seabirds across the Convention's boundaries. Therefore, the Commission should be proactive in promoting awareness not only of its activities in respect of the above, but also in enhancing efforts aimed at addressing incidental mortality of species found in the Convention Area on a global basis.

INCIDENTAL MORTALITY IN TRAWL FISHERIES

9.71 The Commission adopted Conservation Measure 30/X in 1991 which prohibited the use of net monitor cables in the Convention Area from the beginning of the 1994/95 fishing season.

9.72 Mr Z. Cielniaszek (Poland) informed the Scientific Committee that Poland intended to operate one vessel in the 1994/95 season and asked the Scientific Committee to support its request to the Commission to defer the introduction of the conservation measure for one season. Poland maintained that the ship it planned to use was old, and since this would be its last season of operation

it would be uneconomic to replace the net monitor with one which does not use a cable. Poland would continue, however, to deploy the cables in accordance with the procedure set out in Annex 6 of CCAMLR-X. This has resulted in no cases of bird or mammal mortality being observed, a situation reflected in the report of Poland (CCAMLR-XIII/BG/7).

9.73 The Scientific Committee noted, however, that no other reports had been presented on incidental mortality caused by net monitor cables in trawl fisheries within the Convention Area.

9.74 The Scientific Committee recalled that such mortality in New Zealand trawl fisheries went unreported until scientific observers had been placed on board fishing vessels (SC-CAMLR-X/BG/4).

9.75 In the absence of relevant data from the Convention Area, the Scientific Committee could not assess the probability of incidental mortality of seabirds occurring. It was therefore unable to comment on the proposal from a scientific point of view, although it noted that the net monitor cable arrangement used by Poland was unlikely to cause substantial mortality of albatrosses. The Scientific Committee was, however, concerned at the prospect of creating exemptions from conservation measures and recommended that if an exemption were to be granted then this should be conditional on a scientific observer being placed on board.

9.76 The Scientific Committee noted that Ukraine proposed to undertake trawling on the Ob and Lena Banks using vessels equipped with net monitor cables (see paragraphs 2.74 to 2.76).

9.77 Japan reported in CCAMLR-XIII/BG/23 that two penguins, two unidentified seabirds and two Antarctic fur seals were caught and brought on board krill fishing vessels. Most of them, except for two unidentified birds, were caught alive and released immediately. Coordinates and dates provided show the birds were taken in the region of the South Shetland Islands in March to May and the fur seals were taken in June near South Georgia. This is the first report of incidental catches of marine mammals and birds in active trawl fishing gear in the Convention Area.

MARINE DEBRIS

9.78 Members' reports on the assessment and avoidance of incidental mortality and impacts of marine debris on biota in the Convention Area have been received from Australia, Brazil, Japan, Russia, Poland, South Africa, UK and USA (CCAMLR-XIII/BG/6, 24, 23, 28, 7, 5, 20 and 15). Reports dealing with mortality and loss of longline equipment are discussed in paragraphs 9.5 to 9.25.

9.79 Dr Croxall presented SC-CAMLR-XIII/BG/3 which reports that surveys of Antarctic fur seals entangled in man-made marine debris were carried out for the fourth consecutive winter and sixth consecutive summer at Bird Island, South Georgia. In the 1993 winter the number of entangled seals was only 39% of the record 1992 total, but still five times the numbers in 1990 and 1991. Nearly all animals were juveniles, half had severe injuries and the proportion of females (40%) was the highest yet reported. The proportion of animals entangled in packaging bands was the lowest ever (24%) and less than one-half that in 1992. Fishing net fragments and especially string and bags were common entangling materials. In the 1993/94 summer the number of seals entangled (23) was the lowest ever and a 70% reduction on the previous year, thereby reversing the upward trend since 1990. For the first time more animals were entangled in net fragments (35%) than in packaging bands (30%), the decrease in the latter mirroring the records of the preceding winter. However, 68% of animals affected were female (previous highest 40%); combined with the highest proportion of adults and of severe injury yet reported, grounds still remain for concern.

9.80 Dr Croxall introduced SC-CAMLR-XIII/BG/4 which reported the first observations of oiled albatrosses at South Georgia. He noted that as with the oiled penguins reported in 1993, also from South Georgia (SC-CAMLR-XII, paragraph 10.29), evidence suggests that at least one of the birds became contaminated locally.

9.81 Paper SC-CAMLR-XIII/BG/4 also recorded the ingestion of plastics by albatrosses and giant petrels and reported a six-fold increase over the previous year of the incidence of fishing line and hooks associated with, regurgitated by and impaled in seabirds (see Annex 8, paragraphs 3.18 to 3.21). Paper CCAMLR-XIII/BG/5 reported the occurrence of a tuna longline hook close by a wandering albatross nest at Marion Island.

9.82 The Scientific Committee noted with concern the apparent increase in the number and variety of environmental threats to birds and seals.