ANNEX 9

DEBATE ON OBSERVER COVERAGE IN THE KRILL FISHERY BY THE SCIENTIFIC COMMITTEE
(taken from Scientific Committee reports)

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From SC-CAMLR-XXIII (2004)

2.5 WG-EMM recommended that international scientific observers continue to be placed on as many krill vessels as possible. Some participants considered that a high level of observation would be required to acquire the information necessary to determine sampling protocols, and that this ought to apply equally to all krill fisheries (Annex 4, paragraphs 3.29 and 3.30).

From SC-CAMLR-XXIV (2005)

2.7 The Scientific Committee considered the issue of compulsory deployment of CCAMLR scientific observers on all krill fishing vessels in the Convention Area, which was raised by WG-EMM and WG-FSA (Annex 4, paragraphs 3.45 and 3.55; Annex 5, paragraph 11.3(iii)).

2.8 The Scientific Committee noted that WG-EMM agreed, in principle, that there is an urgent need for CCAMLR scientific observers on all krill fishing vessels (Annex 4, paragraph 3.45) to maximise spatial and seasonal observer coverage of the fishery and to adequately understand current developments in the krill fishery, especially given the recent changes in catching and processing technology (Annex 4, paragraphs 3.45 and 3.46). However, consensus on this issue has not been reached (Annex 4, paragraphs 3.46 and 3.55).

2.9 The Scientific Committee also noted the recommendation by WG-FSA that CCAMLR scientific observers be deployed on all krill fishing vessels (Annex 5, paragraph 11.3(iii)).

2.10 The Scientific Committee noted that data from observers on board fishing vessels in the Convention Area are used:

(i) to provide accurate catch rates used in standardising CPUE, the effect of this is most evident in the improved data following the introduction of 100% coverage of observers in the *D. eleginoides* fishery in Subarea 48.3;

(ii) to provide length frequencies for use in determining the interaction of the fishery with the caught species, the utility of this is demonstrated in the implementation of integrated assessments for *Dissostichus* spp. in Subareas 48.3 and 88.1 that help understand the changes in the stock structure during the development of the fishery;

(iii) to provide information on the differences between vessels which need to be estimated for use in standardising time series of CPUE as well as for inclusion of different integrated assessments;

(iv) to provide catch and length information as above to help determine the overlap between fisheries and predators at small scales.

The Scientific Committee agreed that these purposes are important in the assessment work being undertaken to provide advice to the Commission.

2.11 Dr Shin indicated that, while seeing the scientific merits of the observer-collected data, he does not share the same view on the magnitude of improvements the observer-collected data will bring to the assessment of the krill fishery as in other fisheries. He further noted that the krill fishery is a commercial venture and there may be constraints in having the fishery provide scientific data.

2.12 Dr Holt suggested that, from the scientific point of view, there were no doubts as to the appropriateness of deploying international scientific observers on all krill fishing vessels. However, it has not been possible to resolve this question for some years due to reasons which have little to do with scientific aspects of the matter. For example, the question of protecting the confidentiality of fishery information represents an obstacle for some countries. Dr Holt suggested that this issue be referred to the Commission for consideration since it would be difficult for the Scientific Committee to eliminate these obstacles.

2.13 Dr M. Naganobu (Japan) expressed his disagreement with compulsory deployment of international scientific observers on all krill fishing vessels, for the following reasons:

(i) Japan has signed a number of international agreements, in accordance with which foreign scientific observers already collect scientific data on Japanese vessels, and these agreements are sufficiently effective;

(ii) compliance with the requirement of compulsory 100% international scientific observer coverage of all krill fishing vessels may have significant financial implications;

(iii) there are problems arising from the need to respect the fishing companies' rights to protect the confidentiality of fishing information;

(iv) currently, the total catch of krill is at a stable level. It is significantly lower than the precautionary catch and there is therefore no urgent need to increase the amount of data being collected.

2.14 Profs J. Beddington (UK) and Croxall expressed surprise at the nature and content of some of the contributions to this discussion, and noted that:

(i) the WG-EMM report indicated that apparently all Members, except Japan, had agreed in principle that the deployment of scientific observers should be required on all krill vessels (Annex 4, paragraph 3.46); the reservation by Japan appeared solely to relate to commercial confidentiality, a matter which should be referred to the Commission for discussion;

(ii) the WG-FSA report indicated consensus amongst all Members that observer coverage should be required on all vessels participating in the Convention Area krill fishery (Annex 5, paragraph 11.3 and Appendix S, paragraph 31);

(iii) reservations now being expressed by Members, including by the same individuals who were present at the working group meetings, involve a combination of new objections, most of which relate to matters outside the competence of the Scientific Committee and old objections, which have been extensively debated in previous years.

2.15 However, Profs Beddington and Croxall did recognise that while there appeared to be consensus on the scientific merits of increased levels of observation on vessels fishing for krill in the Convention Area, there may be valid concerns about how this should be implemented in order best to achieve the desired scientific objectives.

2.16 To address any such concerns, the UK proposed a scientific study whereby, in the first year feasible, each vessel participating in the krill fishery in the Convention Area should have a scientific observer on board to carry out the tasks already requested or required by the Scientific Committee. For this single-year pilot study, protocols should be developed and the results analysed and evaluated by an appropriate group established by the relevant working groups of the Scientific Committee. This group would then recommend to the Scientific Committee, levels of observer coverage appropriate for each specified task and for the observer program for the krill fishery overall.

2.17 Dr V. Siegel (European Community) supported the UK proposal which could prove to be an acceptable option to speed up the process of improving scientific data collection in the krill fishery. He noted that CCAMLR should not be complacent just because the catch of krill has stabilised in recent years, as the fishery enters a new stage associated with the adoption of a new fishing technology. The Scientific Committee will therefore need to have sufficient information available to it to be able to provide appropriate management advice. He also noted that the majority of objections to the 100% coverage by CCAMLR scientific observers of the krill fishery (issues of confidentiality, finance etc.) do not fall within the Scientific Committee's terms of reference and should be considered by the Commission.

2.18 Mr L. Pshenichnov (Ukraine) noted that an acceptable option would be a requirement of conservation measures to deploy at least national scientific observers on all krill fishing vessels, provided that they would collect data in accordance with the CCAMLR Scheme of International Scientific Observation.

2.19 Dr Shin observed that a unanimous recommendation of 100% observer coverage on all krill fishing vessels was not likely, and did not see the utility of attempting to forward such a recommendation under the current circumstance. He further observed that krill catch varied little from year to year over a decade at a low level, while the catch limit has risen by four times in the major fishing ground. With regard to seal by-catch, solutions are being found, and the problem is far more tractable now. To his delegation's view, it is more pressing to ensure observer-collected data are analysed and the results are delivered in time, and it will be more useful to articulate where the more critical data needs are and to discuss the means to improve the situation. He further noted that krill fishing occurs over protracted periods and across large distances, and hence placing observers on such fishing platforms would incur a much greater challenge in logistics and cost.

2.20 Dr A. Constable (Australia) noted that it would be useful to introduce a process which would allow the CCAMLR Secretariat to accredit and coordinate scientific observers' activities on all krill fishing vessels.

2.21 The Scientific Committee agreed that deployment of international observers on all krill fishing vessels would allow collection of useful scientific information required to develop management advice for the krill fishery, based on the ecosystem approach.

2.22 At the same time, the Scientific Committee was unable to reach consensus as to the urgency of including this requirement in the CCAMLR Scheme of International Scientific Observation, as its appropriateness in terms of balance between scientific usefulness and costs was not clear to some participants.

2.23 The Scientific Committee has also found that the majority of problems which could become an obstacle to the introduction of compulsory scientific observer coverage of all fishing vessels (issues of costs, and confidentiality of data collected on board fishing vessels) do not fall within the Scientific Committee's responsibility and should be decided by the Commission.

2.24 The majority of Members of the Scientific Committee agreed to support the proposal put forward by the UK and to conduct an experiment during the first year feasible in organising the work of scientific observers on all krill fishing vessels during this season (paragraph 2.16).

Advice for the Commission

2.32 The Scientific Committee recommended that:

(iii) the deployment of international scientific observers on krill fishing vessels would allow collection of useful scientific information required to develop management advice for the krill fishery, based on the ecosystem approach, be noted (paragraph 2.21);

(iv) the remaining problems hindering the introduction of the system of compulsory deployment of scientific observers on all krill fishing vessels cannot be resolved by the Scientific Committee as they are included in the Commission's responsibilities (paragraph 2.23).

2.33 The Scientific Committee noted that most Members supported a proposal to conduct, in the first appropriate season, an experiment in the organisation of the work of CCAMLR scientific observers on all krill fishing vessels during this fishing season, in order to assess the scientific usefulness and effectiveness of the introduction of a system of compulsory deployment of scientific observers on all krill fishing vessels (paragraph 2.24).

From SC-CAMLR-XXV (2006)

2.14 The Scientific Committee noted that both WG-EMM (Annex 4, paragraph 3.80) and WG-FSA (Annex 5, paragraph 10.3) recommended increased observer coverage across the krill fleet. It also recalled its discussion last year on the deployment of observers on krill vessels (SC-CAMLR-XXIV, paragraphs 2.7 to 2.24), including specific comments indicating the points of disagreement on compulsory deployment of observers on krill fishing vessels.

2.15 The Scientific Committee noted that three main issues are of high priority in the krill fishery at present:

(i) understanding the differences in selectivity between the various krill fishing gear configurations (paragraph 2.9);

(ii) determining the level of by-catch of fish larvae in the krill fishery (paragraph 2.12);

(iii) determining the level of warp strikes by seabirds and incidental mortality of seals (paragraphs 5.31 and 5.32).

2.16 In considering these three issues, the Scientific Committee agreed that there may be differences in by-catch of fish larvae and incidental mortality of seabirds and seals between different trawl methods and gear configurations in this fishery. It therefore agreed that observations from all Members were important for addressing these issues.

2.17 Some Members, however, were of the view that the issues of by-catch of larval fish and the incidental mortality of seabirds and mammals do not outweigh the importance of more direct krill-related observations. They also noted that, at present, the effect of by-catch of larval fish on the dynamics of those stocks has not been assessed and that it would be desirable for the working groups to make this assessment using existing data before focussing on further monitoring of by-catch of larval fish in the krill fishery. Dr M. Naganobu (Japan) noted that Japan has provided information from the scientific observation on krill vessels including the by-catch of larval fish for over 10 years. He further noted that the interaction with seabirds and mammals in the krill fishery is only modest or coming under control.

2.18 Most Members agreed that, as proposed last year (SC-CAMLR-XXIV, paragraph 2.16), a scientific study should be undertaken such that each vessel in the krill fishery should carry an observer at the same time in the same areas to enable a valid comparison of the different methods and that this study could be used to help determine the level of observer coverage that would be required in the future. It was noted from Table 1 that such a study might be undertaken in Subarea 48.2 during March–May when most Members fished in that area.

2.19 Some Members indicated that such an experiment is still unlikely to result in sufficient coverage of the features intended to be monitored, as the level of krill fishery is currently very low. Hence the justification of the cost that will incur is not sufficiently strong. They also noted that, should such a study proceed, the manner in which the study would be funded would need to be considered (for example, see the comments in CCAMLR-XXIV, paragraph 9.7).

Advice to the Commission

2.22 The Scientific Committee recommended that:

(ii) the deployment of scientific observers on krill fishing vessels should be a high priority to investigate the by-catch of larval fish in the krill fishery (paragraphs 4.7 to 4.10);

From SC-CAMLR-XXVI (2007)

3.6 The Scientific Committee endorsed WG-SAM's advice which identified a need for high-quality length-frequency data from the fishery from several years in advance of implementing an integrated assessment, and recommended that the fishery start providing length-frequency data now, given that the coverage by research surveys is not likely to be sufficient for all regions (Annex 7, paragraph 3.13).

3.7 The Scientific Committee based its deliberations on the following two strategic objectives for scientific observations of the krill fishery:

(i) to understand the overall behaviour and impact of the fishery
(ii) to undertake routine monitoring of the fishery to inform population and ecosystem models.

3.8 The rationale behind this two-stage approach is that fisheries monitoring effort does not necessarily have to have indefinite maximum coverage if a reduced observation effort is sufficient to fulfil management requirements. There is, however, an expectation that there will be a long-term need for systematic data collection from the fishery.

3.9 The Scientific Committee agreed that it will only be possible to design the spatial and temporal level of observer coverage required for objective (ii) once objective (i) has been completed. A full investigation of (i) would require systematic spatial and temporal coverage by scientific observers across SSMUs, seasons, vessels and fishing methods.

3.10 The Scientific Committee agreed that there are a number of ways to collect the required scientific data from the krill fishery. For example, for both first and second stages the most comprehensive coverage, and the most rapid way to achieve objective (i), could be either of the following alternatives:

- 100% coverage by international scientific observers
- 100% coverage by international scientific and/or national observers.

3.11 The Scientific Committee noted that reduced levels of observational effort could delay the achievement of objective (i) in paragraph 3.7, and may also introduce bias into the data if the observational effort is not reduced appropriately. This reduced effort could include:

(i) systematic but <100% coverage by observers;

(ii) different levels of coverage for different fleets, for example, 100% coverage for new vessels with unknown characteristics and a lesser level of coverage on established vessels for which data are already available;

(iii) random systematic allocation of observers plus regular quality checks, and systematic coverage by scientific observers until the fishery is established to fulfil suitable data for management requirements.

3.12 It was clarified that:

(i) 'systematic coverage' means coverage that ensures data collection across all areas, seasons, vessels and fishing methods, which leads to the provision of consistent high-quality data for assessments in multi-vessel, multi-nation fisheries (Annex 7, paragraph 4.16);

(ii) to obtain the required information, either international or national scientific observers would be acceptable, provided the data and reports are consistent with the CCAMLR Scheme of International Scientific Observation and are of a sufficiently high quality to be of use for the proposed analyses;

(iii) levels of initial observation coverage to understand the overall behaviour and impact of the krill fishery might be higher than that of the eventual long-term observation coverage.

3.13 The Scientific Committee encouraged interested Parties to submit plans to achieve systematic and consistent collection of the required scientific data from the fishery to the next WG-EMM, WG-SAM and ad hoc WG-IMAF meetings for scrutiny. These plans would include those that proposed 100% observer coverage and those that could demonstrate adequate data collection using lower levels of coverage. This work is essential in order that Members can agree on the level of coverage that enables collection of the data necessary to achieve the stated objectives.

3.14 The Scientific Committee agreed that the working groups should carry out an assessment of the consequences to the data collection effort of the different approaches suggested, and recommend the required level of observer coverage to the Scientific Committee in 2008.

3.15 The Scientific Committee acknowledged that each of the options for obtaining the priority data required would have consequential issues of implementation and the timescale of delivery. Risks associated with reduced coverage need to be thoroughly addressed by relevant experts before agreeing on an observer coverage plan.

3.16 The Scientific Committee further urged Members and Contracting Parties fishing for krill to send their experts to WG-EMM and WG-SAM to be fully engaged in the process.

Table 1: Recommendations from the Scientific Committee on scientific observer coverage in the krill fishery.

Recommendations from the Scientific Committee		Implementation by the Commission	
Year	Detail	Year	Detail
	Scientific observations		
2000	Recommended the placement of national and, or, international scientific observers, following the protocols outlined in the *Scientific Observers Manual* (SC-CAMLR-XIX, paragraph 3.14)		
2001	Re-iterated need for detailed data (SC-CAMLR-XX, paragraphs 3.7 to 3.9)	2001	Endorsed the approach (CCAMLR-XX, paragraph 4.14)
2002	Noted the inconsistency in the data requirements for krill fisheries (SC-CAMLR-XXI, paragraphs 4.19 and 4.23)	2002	Noted the inconsistency and the compelling needs for detailed data (CCAMLR-XXI, paragraphs 4.27 and 4.28)
2002	Recognised the importance of data collected regularly by scientific observers (SC-CAMLR-XXI, paragraphs 4.19 and 4.22)		
2003	Implement standard electronic logbooks on krill vessels (SC-CAMLR-XXII, paragraph 2.1)		
2004	Re-iterated need for placement of scientific observers on board krill fishing vessels (SC-CAMLR-XXIII, paragraph 2.5)	2004	Noted the need (CCAMLR-XXIII, paragraph 4.5)
2005	Re-iterated need for placement of scientific observers on board krill fishing vessels (SC-CAMLR-XXIV, paragraphs 2.7 to 2.10)		
2005	Advised the Commission that the majority of the obstacles to the placement of scientific observers on board krill fishing vessels did not fall within the Scientific Committee's responsibilities (SC-CAMLR-XXIV, paragraphs 2.21 to 2.24)	2005	Noted the advice (CCAMLR-XXIV, paragraphs 9.3 and 9.8)
2005	Advised on new requirements for detailed data and coverage by scientific observers (SC-CAMLR-XXIV, paragraph 4.11)	2005	Noted the need (CCAMLR-XXIV, paragraphs 4.24 and 4.32)
2006	Re-iterated need for scientific observations, with focus on gear selectivity, by-catch of larval fish and IMAF (SC-CAMLR-XXV, paragraphs 2.15, 2.22 and 4.20)	2006	Noted the need (CCAMLR-XXV, paragraphs 4.27 to 4.30 and 10.1 to 10.11)
2007	Re-iterated need for the systematic observer coverage in krill fisheries (SC-CAMLR-XXVI, paragraphs 3.13 to 3.16)	2007	Endorsed the approach (CCAMLR-XXVI, paragraph 4.35). Implemented requirement for observers in the fishery in Division 58.4.2 (note: fishery is inactive) (CCAMLR-XXVI, paragraph 4.49; Conservation Measure 51-03)