ANNEX 9

REPORT OF THE AD HOC TECHNICAL GROUP
FOR AT-SEA OPERATIONS
(Bergen, Norway, 4 and 5 July 2009)

CONTENTS

REPORT OF THE AD HOC TECHNICAL GROUP FOR AT-SEA OPERATIONS

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INTRODUCTION

Opening of the meeting

1.1 The second meeting of ad hoc TASO was held in Bergen, Norway, on 4 and 5 July 2009. The meeting was co-convened by Mr C. Heinecken (South Africa) and Dr D. Welsford (Australia).

1.2 The Co-conveners welcomed participants (Appendix A) and thanked Mr S. Iversen and the Institute of Marine Research (Norway) for hosting the meeting.

1.3 The Technical Group noted that the Scientific Committee had endorsed the group's terms of reference which had been developed at its first meeting (SC-CAMLR-XXVII, paragraph 6.7):

> To provide advice to the Scientific Committee, its working groups and SCIC on:
>
> (i) the practical implementation of the acquisition of data requested to be collected at sea;
>
> (ii) the feasibility of obtaining the data specified, given stated priorities and the general requirements placed on observers, and potential opportunities for optimising the collection of data;
>
> (iii) systems required to ensure the data collected are of consistently high quality;
>
> (iv) any technical and logistical issues related to at-sea implementation of conservation measures, or proposed conservation measures, in the Convention Area.

1.4 The Technical Group recognised that it was the role of other Working Groups to specify data requirements, including the specific data required and the frequency of data collection, and to provide the rationale for these requirements. The Technical Group's role is limited to advising on whether or not these requirements can be met, or to provide advice on how these requirements could be achieved. It was also noted that, in view of the specific expertise gathered in the group, it may be in a position to alert other working groups to changes in fisheries and observer workloads that have implications for data collection and data quality requirements (SC-CAMLR-XXVII/BG/6, paragraph 4.3).

Adoption of the agenda and conduct of the meeting

1.5 The provisional agenda was revised and adopted (Appendix B).

1.6 Documents submitted to the meeting are listed in Appendix C.

1.7 The report was prepared by Dr D. Agnew (UK), Messrs E. Appleyard (Scientific Observer Data Analyst) and J. Clark (UK), Drs A. Constable (Australia) and S. Hanchet (New Zealand), Messrs Heinecken (Co-convener) and N. Gasco (France), Drs C. Jones (USA), S. Kawaguchi (Australia) and B. Krafft (Norway), Mr F. McEachan (Australia), Drs D. Middleton (New Zealand), D. Ramm (Data Manager), K. Reid (Science Officer), G. Watters (USA) and Welsford (Co-convener).

1.8 In preparing its report, the Technical Group agreed to highlight text that provides advice on future work to the Scientific Committee without repeating it in full in Item 5.

DESIGN AND OPERATION OF FISHING VESSELS AND GEARS USED IN THE CAMLR CONVENTION AREA

Krill trawling methods

2.1 TASO-09/5 described in detail the three main types of fishing for krill – conventional trawling, continuous trawling and pumping system to clear the codend.

2.2 TASO-09/11 described trawl systems, discharges and systems for obtaining green weight of krill on board the three Norwegian krill fishing vessels, *Saga Sea*, *Juvel* and *Thorshøvdi*.

2.3 The *Saga Sea* employs, and the *Thorshøvdi* will employ, twin trawl systems capable of concurrently towing at different depth layers. If there is any stratification in krill length-frequency composition, then composition in each net may differ. It was clarified that samplings for scientific observations are being done before they were mixed in the holding tanks. The Technical Group noted that being able to match up relative quantity from the different nets and being able to verify acoustic scatterings with the catch would greatly contribute to the understanding of krill aggregation structures.

2.4 The Technical Group noted the importance of information on mesh size and panel configuration due to their effects on catch efficiency.

2.5 CPUE reporting in the haul-by-haul catch and effort data (C1 data) for the continuous trawling method considerably improved in last 12 months, now allowing catch for every two-hour interval with position information.

2.6 Materials presented at last year's and this year's meetings of ad hoc TASO greatly helped to understand at-sea operations of this fishery in fine detail. The Technical Group thanked members who contributed information to understand the operational nature of this fishery.

2.7 The Technical Group recommended cataloguing details of vessel gear types as a reference for the *Scientific Observers Manual*. The group further noted the need for equivalent information from other operators to make the information comprehensive.

2.8 The Technical Group further recommended that the general terms in use for all trawl types operating in the Antarctic krill fishery, summarised in Annex 1 of TASO-09/5, be put

on the CCAMLR website to help Commissioners understand the nature of this fishery (paragraph 2.25). In addition, definitions from WG-FSA-08/60, reviewing the autoline system, should be included.

IUU gillnetting methods

2.9 The Scientific Committee has requested information on the configuration of gillnets being used in IUU activities in the CAMLR Convention Area, including the types and quantities of species caught in these nets. An important question to address is whether total catch of IUU gillnetting can be estimated based on sightings of IUU nets.

2.10 TASO-09/10 presented information on the retrieval of an abandoned gillnet by an Australian vessel patrolling BANZARE Bank (Division 58.4.3b), and the toothfish and by-catch found when a number of sections of the gillnet was retrieved. A total of 8 km of net was retrieved from the 16 nets which comprised an estimated total of 130 km of net. The catch of toothfish and by-catch were documented. Complete retrieval was not possible because of weather and snagging of the nets, as well as unfamiliarity with the configuration of the net. All remaining buoys were cut from the nets in an attempt to prevent the remaining net from ghost fishing. The retrieval process is documented in the paper to allow the experience to be used by others in retrieving IUU gillnets. The observed catch was directly prorated to the whole length of net, indicating that at least 29 tonnes of toothfish would have been caught by the sets. However, these figures are likely to be underestimates of total mortality in gillnets, due to the evidence of large numbers of fish eaten by isopods in the net. Other catch included grenadiers, skates, lithodid crabs, jellyfish, featherstars and squid.

2.11 The configuration of the retrieved gillnet is documented in Appendix D.

2.12 The Technical Group thanked Australia for its efforts in recovering the gillnet and for documenting its characteristics and catch. It is the first observation of its kind in the CAMLR Convention Area and will contribute greatly to the discussions in WG-FSA and the Scientific Committee on the impacts of gillnetting in the Southern Ocean.

2.13 Mr Heinecken presented results of a survey of gillnet operations to provide background on possible gillnet operations in the Southern Ocean. The results are presented in Appendix E, including a discussion on the configurations of gillnets, the manner of deployments and the types of considerations that might be given by vessels in using gillnets as opposed to longlines.

2.14 The Technical Group thanked Mr Heinecken for undertaking this survey as this provides useful information for considering possible gillnet operations in the Southern Ocean.

2.15 The Technical Group noted that:

(i) reports from European fisheries indicate that deep-water gillnet operations are known to lose large quantities of gear each year, which is likely to be the case for IUU gillnet operations in the Convention Area. These reports indicated that lost gear results in ghost fishing;

(ii) consumption of caught fish by isopods and other scavengers and predators before retrieval would result in the observed catch being less than the total mortality;

(iii) the length of net that could be deployed per day by a vessel may be around 36 km;

(iv) gillnetting operations are likely to be similar to longline operations, although IUU gillnetters may not be concerned about loss of fish to depredation from long soak times because they are not reliant on bait which deteriorates over short period;

(v) the similarities between gears, described in Appendices D and E, suggest the widespread capability of using deep-sea gillnets.

2.16 On the basis of the understanding of normal commercial gillnet operations, the Technical Group agreed that gillnets could be deployed by longline vessels. Gillnetting does not need bait, so a vessel can carry more fuel on board and is less dependent on managing soak times to ensure the greatest recovery of fish caught with bait. As a result, the use of gillnets could extend a voyage of a longline vessel. Although gillnet operations seem similar to longline operations, it was unclear whether the behaviour of vessels would be the same for these two types of operation.

2.17 The Technical Group noted that the recovery of gillnet sections caught by longliners was the first indication that IUU gillnetting was taking place in the Convention Area. The Technical Group requested that the Secretariat document the time series of observations of gillnet recoveries from observer reports and other data.

2.18 The Technical Group noted that gillnet guides are visibly present on gillnet vessels which can be used to differentiate these vessels from longliners (Appendix E, Figure 2). The Technical Group recommended that explicit observations of gillnet guides should be recorded if an IUU vessel is sighted.

2.19 The Technical Group recommended that WG-FSA consider the information here in determining its advice on IUU gillnetting. It recommended that TASO-09/10 be forwarded to WG-FSA for consideration in the calculations of IUU gillnet catch.

Documenting gear types

2.20 WG-IMAF requested that ad hoc TASO consider the development of a protocol for observers to photograph fishing gear as a basis for developing a photo library of fishing gear types used in the Convention Area (SC-CAMLR-XXVII, paragraph 5.28(i)(d)), and to assist with determining the prevalence of lost gear that may impact on seabirds and mammals.

2.21 The Technical Group recalled that this request was based on the report to WG-IMAF on marine debris reported to CCAMLR (WG-FSA-08/9) and agreed a reference library of photographs of fishing gear used within the Convention Area would be feasible.

2.22 The Technical Group recommended that a practical means to obtain these photographs would be for the Secretariat to send out a circular to Members' technical coordinators requesting them to supply a detailed list of gear to observers and task them to record photographs of each item on the list.

2.23 The Technical Group noted that programs collecting debris mostly record the material component of debris found, while vessels look at the function of different gear. A detailed reference library, listing gear material and function, would cross this gap.

2.24 The Technical Group also recommended that observers be instructed to take photographs of gear or materials that may not be on a working gear list but could conceivably be lost overboard and contribute to marine debris. This would include, *inter alia*:

- hooks
- snoods
- rope materials (anchor rope, mainline, bottomline and connectors)
- net used to hold stones on longlines
- trawl net
- plastic crates
- box strapping bands.

2.25 The Technical Group requested that the Secretariat develop a reference library drawing on presentations and papers to ad hoc TASO and working groups of gear, including diagrams indicating the design and nomenclature for the different types of gear used in the different fisheries, and that a detailed list describing all gear used in the Convention Area be included in the *Scientific Observers Manual* and on the website (paragraph 3.17). As a starting point, this library should include the material and photographs provided during the meeting.

2.26 The Technical Group agreed that that these details with photographs be made available in HTML format to facilitate searching and identifying gear items by all users, and that this process could complement the FIRMS fact sheets on fishing gear and fish species which have been prepared by FAO, and which the Secretariat will review and further develop in due course.

DATA COLLECTION PRIORITIES ACROSS CCAMLR FISHERIES

Methods of estimating green-weight removals in krill trawl fisheries

3.1 TASO-09/6 provided details of the procedures used by krill vessels in Subarea 48.3 to estimate green weight of krill, this included product-specific conversion factors that were regularly measured on board the vessel, as well as fixed conversion factors supplied by the Flag State. This analysis suggests that, for krill fisheries in Subarea 48.3, the uncertainty in catch arising from uncertainty in the use of conversion factors may not be as large as suggested in WG-EMM-08/46.

3.2 Dr M. Kiyota (Japan) informed the Technical Group that the operator of the *Fukuei Maru* (formerly the *Niitaka Maru*) considered that the use of a fixed conversion factor was the most appropriate means of estimating green weight. Estimation of catch from measurements

from the fish ponds were problematic because there were three product-specific fish ponds. In one pond, catches were often mixed from consecutive hauls. The fish ponds also often held relatively little krill and access to the fish ponds for the purposes of sampling krill to calculate volume-to-mass conversions may be problematic.

3.3 The Technical Group noted that when green weight of krill was estimated without the use of conversion factors, this was achieved by visual codend mass estimation as well as from measurement of the depth of the krill in the fish pond.

3.4 The Technical Group noted that many vessels estimate the volume of krill in the fish pond and used a scaling factor to produce an estimate of weight of krill. However, no details of such volume-to-mass scaling was available.

3.5 The Technical Group agreed that the current protocol for observers to estimate conversion factors, involving taking a subsample of 500 kg of krill through processing on board a vessel, is unworkable and that a different approach to gaining a better understanding of actual green weight of krill caught is required.

3.6 The UK agreed to implement a trial procedure involving the collection of volume-to-mass data for krill samples from the krill fishery and to report on this to ad hoc TASO and WG-EMM next year.

3.7 The Technical Group suggested that WG-EMM take note of:

(i) the findings of TASO-09/6, noting that further analysis of the implications of using variable and fixed conversion factors should be evaluated;

(ii) the plans for future implementation of an accurate, repeatable volume-to-mass conversion for krill where volumetric measures are used.

Taxonomic resolution of invertebrate by-catch

3.8 Conservation Measure 22-07 requires that longline by-catch be monitored for VME indicator taxa. The 2008/09 fishing season was the first season during which this monitoring was required, and work presented in TASO-09/8 evaluated the ability of observers to record information related to VMEs and classify VME indicator taxa at sea. The evaluation was conducted by comparing classifications made by observers (who were untrained with respect to invertebrate taxonomy) with those made by trained taxonomists. The observers worked on four New Zealand and one South African longliners fishing in the Ross Sea. The observers collected benthic invertebrate by-catch specimens and classified them on the basis of the Benthic Invertebrate Classification Guide. The specimens were returned to New Zealand and subsequently reclassified by taxonomists.

3.9 The results in TASO-09/8 demonstrated that the observers were generally able to provide very good classifications of VME indicator taxa. Misclassifications were largely taxa-specific, and most inaccuracies were due to classifying stylasterids as stony corals. Other inaccuracies included mis-classifications of gorgonians as stony corals, hydroids as

gorgonians, and ascidians as sponges. There were also some difficulties classifying organisms that were found attached to other organisms. Regardless of these mis-classifications, over 60% of 708 specimens were correctly classified.

3.10 Despite some mis-classifications, the Technical Group agreed that the results of the work were encouraging because the observers very rarely classified non-VME taxa as VME indicator taxa, and thus there appears to be little risk that 'false positives' could cause more VME Risk Areas than should have been.

3.11 The Technical Group noted a number of conclusions from TASO-09/8:

Observer training –

(i) Update the Benthic Invertebrate Classification Guide to include better photos, clearer descriptions of organisms, and more detail to help separate confusing taxa (e.g. stlyasterids and stony corals).

(ii) Use previously collected organisms to provide hands-on identification training and testing opportunities prior to deployment on a fishing trip.

Data recording procedures –

(iii) Record longline segments that do not catch VME indicator taxa as zeros.

(iv) Record the identification of everything retained in aggregate samples.

(v) Record the total weight of animals retained in all sample buckets (and translate volumetric measurements to kg).

(vi) Use consistent segment numbering when recording data (e.g. do not use number 1 to identify the first sampled segment if data collection is started in middle of a haul).

(vii) If Conservation Measure 22-07 is revised, avoid using the term 'trigger' for both the >5 and >10 VME-indicator-unit thresholds.

3.12 The Technical Group thanked New Zealand for conducting the work and agreed it usefully demonstrated that observers can collect significant information on the by-catch of VME taxa and other benthic organisms. It was noted that the new sampling required of Conservation Measure 22-07 (as well as work conducted as part of the Year-of-the-Skate) had caused the observers to collect less biological information on toothfish and other by-catch species (e.g. macrourids). Nevertheless, the new data were considered to be a substantial improvement over that previously held in the CCAMLR database, which have been shown to be of limited use for describing and quantifying by-catch of benthic invertebrates (CCAMLR-XXVII/26).

3.13 The Technical Group recommended that TASO-09/8 and the discussion here be tabled to the VME Workshop and that the workshop should use the information in the paper to re-evaluate, among other issues, which invertebrate taxa should be monitored in the future.

The Technical Group requested that WG-FSA consider how data on invertebrate by-catch can be used to facilitate precautionary approaches to by-catch mitigation of benthic invertebrates not considered in discussions on conserving VMEs.

Revision of the *Scientific Observers Manual*

3.14 The Secretariat presented the proposed changes to the *Scientific Observers Manual* (TASO-09/4). These changes reflect the current advice from the Scientific Committee and its working groups. The revision contains general updates of material which had become out of date, with a track-change version provided in Appendix 1 of the paper. In addition, two proposals were also presented to the Technical Group for its consideration:

(i) a revised method for recording krill feeding observations
(ii) an updated revised fish sampling protocol for krill fisheries.

3.15 The Technical Group thanked the Secretariat for preparing the draft review of the manual.

3.16 The Technical Group noted that the current proposal for the fish sampling protocol would require observers to take a total of six 50 kg samples and keep only one. It was felt that this was unnecessarily time-consuming. The Technical Group proposed an alternative approach, which would be to collect one 50 kg random sample and ask the crew to retain all of the remaining large fish from the haul.

3.17 The Technical Group made the following recommendations for the *Scientific Observers Manual*:

(i) inclusion of photographic maturity stage guide for toothfish
(ii) add a reference to the Benthic Invertebrate Classification Guide
(iii) include a section of gear identification, as discussed in paragraph 2.25
(iv) include a mechanism to help prioritise the data collection requirements of observers.

3.18 The Technical Group noted that the section in the manual relating to the collection of fish scales for ageing purposes may no longer be needed, and recommended that WG-FSA consider removing this section from the manual.

3.19 The Technical Group also noted that the updates to the *Scientific Observers Manual* would benefit from review by observers. It therefore recommended that technical coordinators provide the proposed changes to their observers and submit comments to the Secretariat in time for the manual to be updated for WG-FSA (no later than 15 September 2009).

3.20 It was identified that there is a need for specific advice from the working groups on the minimum observer data collection requirements needed for them to carry out their work. The Technical Group proposed that a list of observer priorities be included in the Fishery Reports, and requested WG-FSA and WG-IMAF to consider implementing this over time.

3.21 The Technical Group also recommended that the sections of this report dealing with the revision of the *Scientific Observers Manual* and other observer matters be circulated to Members for information.

Data collection workloads

3.22 Dr Hanchet presented information on the New Zealand training program and instructions to their international and national observers (TASO-09/9).

3.23 The Technical Group noted that in situations where both national and international observers are on board vessels, it is important that their respective responsibilities are well understood. The primary responsibility of an international observer must be to collect CCAMLR data, while the national observers will often have additional tasks specified by their national program.

3.24 The Technical Group also noted New Zealand's efforts to streamline and improve the quality of data collected by observers; this included the development of new tools such as waterproof touch-screen laptops, otolith label scanners and an improved VME taxa identification guide (TASO-09/9).

3.25 The Technical Group noted that WG-SAM raised concern over the possible delay in the submission of observer data and its impact on assessments. Two issues that contribute to this and their solutions were discussed:

(i) Observers are sometimes delayed between the end of the trip and their return to their home port. In this case, observer coordinators should examine ways of acquiring observer datasets electronically prior to vessels returning to port. Most vessels now have satellite broadband, which should be capable of transmitting observer datasets which are usually no more than 2–3 Mb in size.

(ii) Technical coordinators may not be submitting data to the Secretariat within the one-month deadline. This matter should be brought to the attention of SCIC, and technical coordinators should be reminded of their responsibilities in adhering to the data submission deadlines.

OBSERVER RECRUITMENT AND TRAINING

4.1 The Scientific Committee established ad hoc TASO as a group that reports to the Scientific Committee on discussion of issues in relation to the Scheme of International Scientific Observation. The terms of reference for TASO include providing advice on systems required to ensure the data collected are of consistently high quality. SC-CAMLR-XXVII, paragraph 6.8, requested that the long-term work program for TASO include ensuring an equivalent level of training and accreditation for observers across the Convention Area.

4.2 TASO-09/9 provided a description of New Zealand scientific observation in the CAMLR Convention Area, including recruitment and training of observers, observer quality management and Antarctic specific training and task prioritisation.

4.3 The Technical Group noted the comprehensive nature of the New Zealand scientific observer recruitment, training and performance management program, and its emphasis on measures in place to improve at-sea observation through iterative feedback and continuous improvement. In discussion, generic lists of required observer competencies, and the areas that must be covered in training, were developed.

4.4 The Technical Group also noted that observers are usually recruited with the following basic competencies:

(i) an ability to communicate clearly (spoken and written) in one of the four CCAMLR languages;

(ii) a good level of numerical literacy;

(iii) use of computers;

(iv) personal qualities required to undertake the role of an observer in a conscientious and professional manner.

4.5 The Technical Group agreed that the training of observers should include, *inter alia*, the following areas:

(i) health and safety, including first-aid and survival-at-sea certification;

(ii) the sampling and data collection procedures specified in the *Scientific Observers Manual*;

(iii) familiarisation with target and by-catch species in the CAMLR Convention Area;

(iv) the CCAMLR process, data needs and conservation measures;

(v) vessel operations and layout;

(vi) use of sampling equipment;

(vii) use of on-board electronic communications;

(viii) sensitivity to the host vessel culture;

(ix) the observer Code of Conduct, data rules and commercial confidentiality concerns;

(x) experience in domestic fisheries and initial supervision by more experienced observers.

4.6 The Technical Group noted that inexperienced observers may need to be accompanied by experienced observers on their first voyage in order to ensure the quality of observer data does not suffer for that voyage.

Accreditation

4.7 The Technical Group noted that similar standards should apply to all observers working in CCAMLR waters. The Technical Group recalled that a key task set for it by the Scientific Committee when it was established was to develop a minimum standard for observer programs to facilitate accreditation.

4.8 The Technical Group noted that information had been provided in its 2008 and 2009 meetings on the training and performance monitoring systems in place in the observer programs of a number of Members, but that comprehensive and comparable information on programs of all Members who deploy observers was not available.

4.9 It was also noted that WCPFC had recently agreed that all programs participating in its Regional Observer Programme should be accredited (WCPFC5-2008/16). To make progress towards accreditation, WCPFC had introduced interim standards in a number of areas (observer guides and manuals, training, code of conduct, safety, national coordinators, briefing and debriefing, equipment and materials, communication, measuring performance, dispute settlement), noting that, in respect of training, programs should be linked to the Commission's decisions, available for review, and with materials provided to the Secretariat.

4.10 The Technical Group reiterated that a benchmark for the accreditation of observers must be established (SC-CAMLR-XXVII/BG/6, paragraph 4.6). The Technical Group recommended that the Scientific Committee consider how this should be achieved, which could include:

(i) the creation of a CCAMLR training manual, in addition to the existing *Scientific Observers Manual*. Such a training manual would include the appropriate options for delivering training as well as exercises that could be used;

(ii) the establishment of a process for all observers to be accredited through assessment via a common testing process (e.g. a standard final exam) and the provision of an individual capability statement.

4.11 The Technical Group further recommended that observer accreditation should be subject to ongoing review through a performance and quality management procedure based on the observer's data as submitted to the CCAMLR Secretariat.

4.12 The Technical Group recommended that its Co-conveners, in conjunction with observer coordinators and the Secretariat, prepare a paper for the Scientific Committee outlining a framework for a possible accreditation scheme.

4.13 The Technical Group also recommended that all programs providing observers under the CCAMLR Scheme of International Scientific Observation should, where they have not done so already, be requested to provide summaries of their recruitment, training, quality review, and performance monitoring processes. The headings in TASO-09/9 should be considered to provide a pro-forma framework for the provision of this information. These summaries, together with giving access to the source material, would provide the information required for the Technical Group and the Scientific Committee to conduct a comparative review of training and quality management procedures in all CCAMLR observer programs, for the purpose of establishing minimum accreditation standards.

FUTURE WORK

5.1 The Technical Group agreed that the most important aspect of the work of the group was to provide advice to the Scientific Committee on the practical implementation of the recommendations of the Scientific Committee and the conservation measures of the Commission; noting that the Scientific Committee meeting last year had spent considerable time discussing practical difficulties in implementing the recommendations of WG-EMM.

5.2 The Technical Group agreed that a priority for its future work should be to advise on the development of an accreditation scheme for observers in order to bring a common standard to CCAMLR scientific observers as discussed in Item 4.

5.3 The Technical Group noted that discussion of the future work requirements and the format of future meetings were intrinsically linked. At this year's meeting there was no representation from vessel operators and only a limited number of technical coordinators. The Technical Group recognised that alternative mechanisms may need to be found to allow greater engagement from industry, technical coordinators and those with direct experience of at-sea operations in the Convention Area. It also noted that holding a meeting on the weekend in between two working group meetings made it difficult for participants to prepare adequately for the meetings.

5.4 The Technical Group noted that this was only its second meeting and that it was possible that industry representatives had yet to recognise the value of their engagement in the group.

5.5 The Technical Group considered that a potential mechanism to facilitate greater engagement in the work of the group might include enhanced intersessional correspondence.

5.6 The Technical Group asked the Scientific Committee to consider the issue of how to facilitate ad hoc TASO's work with respect to the Scientific Committee's overall work priorities.

5.7 The Technical Group's future work is summarised in the following paragraphs:

Krill trawling methods – paragraphs 2.7 and 2.8
IUU gillnetting methods – paragraphs 2.17 to 2.19
Documenting gear types – paragraphs 2.22 and 2.24 to 2.26
Estimating green weight of krill catches – paragraphs 3.5 to 3.7
Taxonomic resolution of invertebrate by-catch – paragraph 3.13
Estimating fish by-catch in krill trawls – paragraph 3.16
Revision of the *Scientific Observers Manual* – paragraphs 3.17 to 3.21
Observer recruitment and training – paragraphs 4.5 and 4.10 to 4.13.

ADOPTION OF THE REPORT AND CLOSE OF THE MEETING

6.1 The report of the second meeting of ad hoc TASO was adopted.

6.2 In closing the meeting, the Co-conveners thanked the participants for their expert contributions to the work of ad hoc TASO, and the rapporteurs for preparing the report. The

Co-conveners also thanked the CCAMLR technical coordinators and scientific observers for their dedicated work throughout the fishing seasons. The Co-conveners thanked Mr Iversen and IMR for providing excellent facilities and meeting arrangements, and the Secretariat for their support.

6.3 Dr Watters, on behalf of the participants, thanked the Co-conveners for their leadership.

APPENDIX A

LIST OF PARTICIPANTS

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(Bergen, Norway, 4 and 5 July 2009)

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APPENDIX B

AGENDA

Ad Hoc Technical Group for At-Sea Operations
(Bergen, Norway, 4 and 5 July 2009)

1. Introduction
   - 1.1 Opening of the meeting
   - 1.2 Adoption of the agenda and conduct of the meeting

2. Design and operation of fishing vessels and gears used in the CAMLR Convention Area
   - 2.1 Krill trawling methods
   - 2.2 IUU gillnetting methods
   - 2.3 Documenting gear types

3. Data collection priorities across CCAMLR fisheries
   - 3.1 Trawl fisheries – methods for estimating green-weight removals in krill trawl fisheries
   - 3.2 Longline fisheries – taxonomic resolution of invertebrate by-catch
   - 3.3 Revision of the *Scientific Observer Manual*
   - 3.4 Data Collection Workloads and Managing Priorities

4. Observer recruitment and training

5. Future work
   - 5.1 Long-term work plan
   - 5.2 Format of future meetings

6. Adoption of report and close of meeting.

APPENDIX C

LIST OF DOCUMENTS

Ad Hoc Technical Group for At-Sea Operations
(Bergen, Norway, 4 and 5 July 2009)

TASO-09/1	Draft Agenda for the Ad Hoc Technical Group on At-Sea Operations (TASO)
TASO-09/2	List of Participants
TASO-09/3	List of Documents
TASO-09/4	Proposed changes to the *Scientific Observers Manual* Secretariat
TASO-09/5	A descriptive review of the trawl systems used in the Antarctic krill fishery M. Davis, J. Moir Clark and T. Peatman (UK)
TASO-09/6	Conversion factors and green weight calculation in the Antarctic krill fishery T. Peatman and J. Moir Clark (UK)
TASO-09/7	Implementation of CCAMLR observer program on krill fisheries S. Kawaguchi (Australia)
TASO-09/8	Evaluation of VME taxa monitoring by observers from five vessels in the Ross Sea region Antarctic toothfish longline fisheries during the 2008/09 season S.J. Parker, S. Mormede, D.M. Tracey and M. Carter (New Zealand)
TASO-09/9	A brief description of New Zealand scientific observer efforts in the CCAMLR Area N. Smith and D. Bilton (New Zealand)
TASO-09/10	Report on the abandoned gillnet retrieval operation conducted by Australia in CCAMLR Statistical Division 58.4.3b (BANZARE Bank) D. Snowdon, J. Hamill, F. McEachan and D. Welsford (Australia)
TASO-09/11	Technical information about the Norwegian krill fishing vessels S.A. Iversen (Norway)

APPENDIX D

CONFIGURATION OF ABANDONED GILLNET RETRIEVED BY AUSTRALIA ON BANZARE BANK (DIVISION 58.4.3b) IN 2009
(from TASO-09/10)

The sets retrieved had a typical configuration of:

(i) approximately 3–5 n miles in length, consisting of 50 m sections of net;

(ii) two square floats, four windy buoys and a strobe light at each end of the set. One end of a set contained a radio beacon;

(iii) the downline was green 20 mm four-strand rope weighted below the surface with rocks pursed in mesh bags (approximately four per downline) and the line was weighted on the bottom using large chain links (typically 3 links, each weighing approximately 20 kg);

(iv) the net recovered comprised panels of 90 x 90 mm square mesh, 1 mm monofilament gillnet;

(v) an estimated vertical net spread from 0–10 m above the sea floor;

(vi) the ground rope was 25 mm, four-strand rope that was weighted with integrated lead beading;

(vii) the headline was 20 mm floating rope that had no buoys attached.

The following figure provides a diagram of the net components.

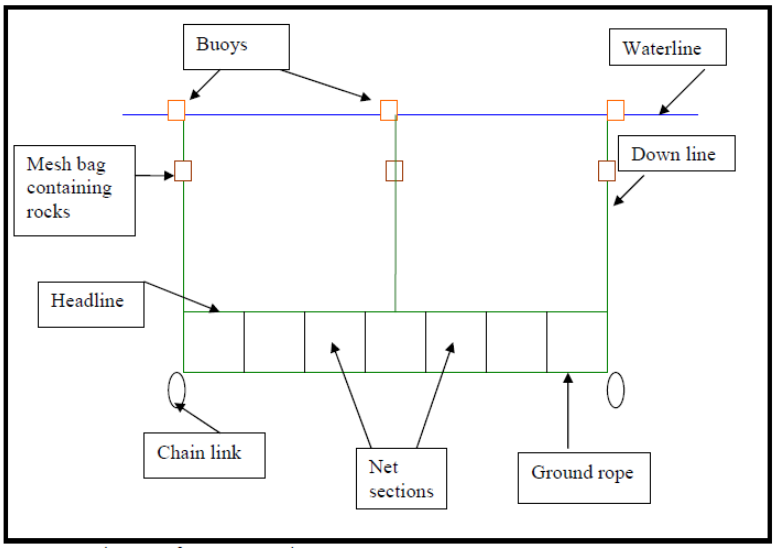

Diagram of net construction.

Chain links to weight gillnet.

APPENDIX E

SURVEY OF GILLNET OPERATIONS

In 2008, the Scientific Committee requested that Members provide information on the use of gillnets used by IUU vessels in the Convention Area (SC-CAMLR-XXVII, paragraphs 6.13 to 6.15).

2. Gillnets have traditionally been used to target a number of different shark species in South-East Asia, around Japan, the Caribbean and West Africa as well as in the North-East Atlantic where the deep-sea gillnet fishery is conducted in depths between 200 and 1 200 m, with the main target species being anglerfish (*Lophius* spp.) and deep-water sharks.

3. In February 2006, the European Community banned the use of fixed nets below depths of 200 m in ICES Divisions VIa, b and VIIb, c, j, k and Subarea XII. A similar prohibition has been introduced by NEAFC in its Regulatory Area. These prohibitions were introduced because of concerns about the length of nets used, soak times, discards and ghost fishing by lost and discarded nets. However, at the time, ICES recognised that there was limited data available on deep-water gillnet fisheries and approved a limited observer program to monitor the angler fishery in ICES Subarea VI.

4. Following the prohibition of gillnetting in the north Atlantic, a number of vessels commenced fishing in the southern Indian Ocean (FAO Area 51) for deep-water sharks.

5. From CCAMLR observer-reported data it appears that deep-water gillnets first appeared in CCAMLR waters at roughly the same stage as when this fishing method was banned from some of the fishing grounds in the North-East Atlantic. It is possible that the surplus of fishing gear not being used in these fisheries, together with the sudden availability of crew members with experience in handling this type of gear, caused a shift to the IUU fleet operating in the Southern Ocean.

6. A background paper was submitted to CCAMLR in 2007, CCAMLR-XXVI/BG/33, which provided a photographic record of IUU vessels targeting *Dissostichus* spp. with gillnets. Although this document depicts details on the type of gear used to operate gillnets, it does not provide detail on the actual gear specifications and actual effort in the form of exactly how many nets are set and worked in a day or are deployed at any one time.

7. The objective for discussion is to compare details of the gear specifications reported by the observers from the two trips approved by ICES (in ICES Subarea VI), together with gear details received from vessels currently targeting deep-water sharks in the southern Indian Ocean – FAO Area 51 (Table 1), and the assumption that IUU vessels are likely to use comparable gear and have similar capability to deploy and handle this gear. From this comparison it may be possible to obtain an estimate of the daily fishing effort by IUU vessels with respect to the specifications of the gear used and the daily capabilities for setting and hauling gear.

POSSIBLE ADVANTAGES OF USING GILLNETS IN PLACE OF LONGLINES

8. A major advantage of operating with deep-water gillnets in place of longlines is that a vessel would not have to carry large volumes of bait. This would conceivably increase the fuel carrying capacity of the vessels by at least 70 tonnes. Savings on bait costs would further lower operating costs. Additional advantages would be that without being limited by their bait supplies, and with the possibility to carry extra fuel, the vessels would be able stay out on the fishing grounds for longer periods without having to be refuelled or tranship bait, resulting in fewer constraints on their operations. Lower catch rates that would normally be uneconomical for a vessel using conventional fishing means may still be profitable for a vessel deploying gillnets.

9. The possibility also exists that a vessel may be able to alternate between using longlines and gillnets during a trip.

OPERATING GILLNETS

10. Nets are hauled using an extended stainless steel winch drum (Figure 1). This replaces the heavier cast iron winch drum used to haul rope or the top line of a longline. It appears that the drums can be exchanged in a relatively short time. This indicates that a vessel could switch from longline to using nets with little effort. The possibility exists that the net winch can also be used to haul a top rope of a longline.

11. A stainless steel guide (Figure 2) is used in place of a roller and gathers the net as it comes over side and allows the net to be hauled around the drum. This is a characteristic item of equipment that can be used to identify vessels that are using gillnets. The guide protrudes over the side and is folded inboard when not in use.

12. The net is deployed from the stern the same as a longline. A chute or channel guides the net from the hauling point to where it is stored ready for deploying.

13. Gear terms and specifications:

- A bottom-set gillnet can be defined as a wall of netting with a weighted groundline holding it on the seabed and kept vertical by a floatline.
- Alternative terms – bottom-set nets, gillnets, entangling nets, trammel nets.
- Net panel (skein) of net – variable length, depths, mesh sizes and materials obtainable from net manufacturers.
- Fleet – number of net panels connected together. Single working unit that is set and hauled.
- Floatline (top rope) – attached to the top row of meshes and connects net panels into a continuous fleet.

- Weightline (groundline) – weighted rope attached to the bottom row of meshes connecting fixed number of net panels of a fleet in conjunction with the float line.

- Terminal anchor and buoys – weights/anchor and marker buoys attached to the end of each fleet. Similar or the same as those used to mark the ends of a longline.

Table 1: Comparison of reported gillnet specifications used in ICES Subarea VI and FAO Area 51.

Item	ICES Subarea VI	FAO Area 51
Net panel (length x depth)	50 m x 3.6 m	112 m x 40 m
No. panels per fleet		150 to 180
Length of single fleets deployed	7.1–12.4 km	8.33–9.26 km reported by vessel *16.80–20.16 km (calculated from no. of net panels/fleet)*
Reported number of set fleets in the water at any one time	9–14	2–3
Net mesh length	280 mm	160–180 mm
Mesh material	0.6 mm monofilament nylon	0.7 mm (green) monofilament nylon
Floatline/top line		20 mm (green) polysteel 4–strand rope
Groundline (weight line)		20–25 mm (green) polysteel rope with core of lead beads in each strand
Weights		Three links (estimated 40–50 mm) stud-link chain
No. of fleets worked per day	3.5 fleets	2–3 fleets on rotational basis/set and hauled
Soak time	46–119 hours	48–96 hours
Estimated gear lost	No gear reported lost	200 m/6 months

Figure 1: Drum or net roller used to haul in the gillnet.

Figure 2: Guide to haul a gillnet over the side inboard.

Figure 3: Chain links used to anchor the net.