ANNEX 7

WORKING GROUP FOR THE CCAMLR ECOSYSTEM MONITORING PROGRAM
REPORT ON INTERSESSIONAL ACTIVITIES IN 1987/88

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The Working Group for the CEMP (WG-CEMP) did not meet during the intersessional period. However, work continued by correspondence and within the Secretariat particularly on those tasks identified by the Scientific Committee at its last meeting (SC-CAMLR-VI, paragraph 7.39). The following provides a summary of progress made.

PUBLICATION OF THE STANDARD METHODS

2. These were published in English in a booklet entitled 'Standard Methods for Monitoring Parameters of Predatory Species'. Included were methods for eight parameters for penguin species and two parameters for fur seals. Translation into other languages is being undertaken. Assistance from scientists from appropriate countries has been sought to ensure accurate translation of the scientific concepts.

SUMMARY OF MEMBERS' CEMP ACTIVITIES

3. At the time of preparing this report, the Secretariat had received reports to the Commission of activities from eleven Members (SC-CAMLR-VI, paragraph 7.39(i)). Details of these were extracted from the reports and appended (Appendix 1).

4. It is pleasing to note the number of national monitoring programs which have been established and the research being undertaken in support of, or related to the CEMP. Details of these programs are included in the papers submitted for discussion at the meeting of the Scientific Committee. A list of these papers is given at Appendix 2.

5. Australia, Brazil, Japan, United Kingdom and USA indicated that they were undertaking studies within the Convention Area which could be considered as contributing to the predator monitoring program. None stated explicitly which parameters and species were being monitored.

6. All eleven Members indicated they were undertaking studies of environmental parameters and of prey which may contribute to the program.

PROPOSALS FOR DATA REPORTING FORMATS FOR EXISTING APPROVED PREDATOR MONITORING OPERATIONS

7. Data formats and relevant instructions for the submission of data on penguins were drafted and comments sought from the Chairman of the SCAR Subcommittee on Bird Biology. Additional comments were also obtained from the Subcommittee itself at its meeting in August 1988.

8. Subsequently, the data formats were revised considerably in conjunction with the CCAMLR Data Manager as requested in paragraph 7.34 of SC-CAMLR-VI. These are set out on forms which will be circulated in draft form at the meeting of the Scientific Committee. They will allow for the presentation of summary data including statistical parameters in a manner which is easy to transfer to the CCAMLR data centre.

9. Forms for the collection of field data have been drafted concurrently. The use of these forms is optional however, as several scientists have developed other methods for recording their data in the field. The forms have been produced to assist in recording data in a systematic manner that will ensure all necessary information is obtained and that it can be easily transferred onto the data reporting forms.

PROPOSALS FOR THE REGISTRATION AND PROTECTION OF APPROVED LAND BASED MONITORING SITES

10. It was considered that the protection of land based sites required the Scientific Committee to identify and register the site and then for the Commission to protect the site by means of a conservation measure. Accordingly, two papers have been prepared, SC-CAMLR-VII/3 ‘Registration of Monitoring Sites’ and CCAMLR-VII/6 ‘Registration and Protection of Monitoring Sites’ for consideration of the Scientific Committee and the Commission respectively. A draft conservation measure is included for the consideration of the Commission.

PROGRESS A SENSITIVITY ANALYSIS ON ESTIMATES OF PREDATOR PARAMETERS DERIVED FROM EXISTING DATA

11. A summary of published data which may be of use in a sensitivity analysis has been prepared by the Secretariat. This data summary refers to all the parameters identified for

monitoring of Adélie penguins. Discussions were held with Dr G. Kirkwood and Dr K. Sainsbury, CSIRO Division of Fisheries, Hobart and the Secretariat in an attempt to define the tasks and to identify a suitable person to be employed to undertake the analysis. It became clear that the task needed to be defined in more details and should be the subject of further consideration by the Working Group for the CEMP.

PROGRESS TOWARDS STANDARDISATION OF SAMPLING DESIGN FOR PREY MONITORING

12. This requirement was set out in paragraph 7.39(vi) of SC-CAMLR-VI. It reiterates the requirement identified in paragraph 7.37 which also requires Members to provide Dr Everson with information relevant to the design of surveys to estimate krill abundance and to provide net haul samples of krill on spatial and temporal scales consistent with the predator monitoring operations in the integrated study areas. As requested, Dr Everson has sought information (SC-CIRC 88/1) from Members who had not already provided information. A Summary of the very limited number of responses is presented separately (SC-CAMLR-VII/5, 'CCAMLR Ecosystem Monitoring Program, Monitoring Prey'). The spatial scales over which prey surveys should be conducted to link with monitoring of the predator variables were discussed. Standard Methods A5, A7, A8, C1 and C2 determine variables which may be linked to prey using a radial transect method as proposed earlier.

13. Simulation studies were suggested as a means of providing guidance for the setting up of surveys.

Dr Everson concludes that:

(i) Theoretically it is feasible to monitor krill in support of the predator studies agreed by CEMP.

(ii) Proposed survey methods have been outlined (Everson 1988) which should be tested by simulation studies and also in the field.

(iii) More information is needed on the depth distribution and degree of aggregation of krill with respect to time of day, position and physical variables.

GENERAL COMMENTS

14. (i) Members are required to follow the standard methods which have been established if they are to be considered to be participating the CEMP. To date, no Member has indicated that they are in fact doing this, however, it is clear that activity related to the monitoring program has begun and will increase.

(ii) Several Members appear to be conducting monitoring related programs on penguins in the vicinity of King George Island. The degree to which they are co-operating was not identified. However, it would seem that close co-operation between scientists from Member countries will become important and that co-ordination of such programs will be required. The need for regional co-ordination has been discussed in previous meetings.

(iii) The elaboration of methods for monitoring of prey even if they are interim and the initiation of a prey monitoring program is essential for the interpretation of data on predator variables and is thus of high priority. Further discussion may be needed to define the requirements and then the methods for use in each of the integrated study areas as requested in paragraph 7.38 of SC-CAMLR-VI.

(iv) The linkage between the abundance and variability of prey and the variables being monitored for the predators has been discussed briefly in previous meetings of WG-CEMP. Now that standardised methods have or are being developed and as the Monitoring Program progresses this aspect needs further and detailed discussions.

CONCLUSION

15. This report sets out progress made during the intersessional period. It is clear from several of the issues where progress could not be made that further detailed discussions need to be held within the WG-CEMP. Particularly important issues include the requirements for sensitivity analysis and the development of detailed methods for monitoring prey. In order to address these issues and to maintain momentum in developing the program, a meeting the WG-CEMP should be held in 1989.

REFERENCE

EVERSON, I., 1988. Prey Monitoring Surveys. SC-CAMLR-VI/BG/8: 1–10.

APPENDIX 1

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: Argentina

Scientific objective(s) of program(s):

1. Elephant seals: population size, marking, milk and blood samples

2. Weddell seal: CEMP parameters

3. Adelie: arrival weight, first incubation shift, annual trends in population size, demography (Method A), fledging weight;
   Chinstrap: annual trends in population size, breeding success (Method B)

4. Adelie: breeding success (Method B), diet
   Antarctic fur seal: population size

Location(s) of program(s):

1. Jubany Base, King George (S. Shetlands)
2. Orcadas Base, S. Orkneys
3. Jubany Base, King George (S. Shetlands)
4. Orcadas Base, S. Orkneys

Time span for program(s):

1–2. Not specified
3. Summer 1987/88
4. Summer 1987/88

Facilities, gears and equipment used:

1–4. Not specified

Is another country involved in the program(s)?

1–4. Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

1–4. Not specified

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: Australia

Scientific objective(s) of program(s):

1. Breeding biology of crabeater seals
   - to increase knowledge of the biology of crabeater seals during their breeding season

2. Assessment of the breeding population of crabeater seals in the Prydz Bay region
   - to record the distribution and estimate the abundance of breeding crabeater seals, through observations and detailed census
   - to investigate the presence of seals in relation to ice type and amount, proximity to the continental shelf and presence of zooplankton

3. Emperor and Adelie penguins
   - to investigate the diet, metabolic rate and foraging range of Emperor and Adelie penguins, in order to understand their role as predators in the marine ecosystem

4. Origin of krill-based ecosystem
   - to identify the time of origin of the krill based ecosystem
   - to make comments on the taxonomy of the *Euphausiacea*, and possibly to contribute to the question of their origin and evolution

Location(s) of program(s):

1.–2. MacRobertson Land coast (approximately Cape Darnley to Mawson and offshore)
3. Magnetic Island, near Davis, and Auster and Taylor rookeries, near Mawson
4. Prydz Bay

Time span for program(s):

1–2. October–November 1987 (field work)
3. November 1987–September 1988 (field work)
4. October 1987 (field work)

Facilities, gears and equipment used:

1–2. R/V *Nella Dan*
3. Land based
4. M/V *Lady Franklin*

Is another country involved in the program(s)?

1–4. Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

1. K.R. Kerry, Antarctic Division, Hobart
   P. Shaughnessy, CSIRO, Canberra
2. K.R. Kerry, Antarctic Division, Hobart
3. H. Burton, Antarctic Division, Hobart
4. P.G. Quilty, Antarctic Division, Hobart

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: Brazil

Scientific objective(s) of program(s):

Marine and Continental birds of Antarctic and sub-Antarctic regions (including Adelie and Chinstrap penguins)
- weight dynamics
- arrival and fledging weights
- breeding success
- Man's impact

Location(s) of program(s):

S. Shetlands (Elephant Is)

Time span for program(s):

Long-term project
November 1987–April 1988 (same in 1988/89–1990/91)

Facilities, gears and equipment used:

Research vessels
Land based

Is another country involved in the program(s)?

Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

Not specified

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: Chile

Scientific objective(s) of program(s):

1. Ecological studies of Antarctic fur seal

2. Trophic studies of tetrapod's community, collection of stomachs of 45 birds (no species)

Location(s) of program(s):

1–2. Cape Shirreff, Livingston Island (S. Shetlands)

Time span for program(s):

1–2. December 1987 – February 1988

Facilities, gears and equipment used:

1–2. Land based

Is another country involved in the program(s)?

1–2. Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

1–2. Not specified

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: France

Scientific objective(s) of program(s):

1. Reproduction biology of species of petrels

2. Investigation of predator-prey relationships among birds and mammals in Crozet Is.

3. Study of changes in the population of 8 species of birds and of the Weddell seal

Location(s) of program(s):

1. Kerguelen Is (58.5.1)
2. Crozet Is (58.6)
3. Adelie Land (58.4.1)

Time span for program(s):

1–3. Not specified

Facilities, gears and equipment used:

1–2. Not specified

Is another country involved in the program(s)?

1–2. Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

1–2. Not specified

3. Drs P. Jouventin and D. Robineau

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: Federal Republic of Germany

Scientific objective(s) of program(s):

Monitoring of krill abundance by net hauls along 14 transects including all SIBEX transects

Location(s) of program(s):

Elephant Island to Adelie Island (Antarctic Peninsula)

Time span for program(s):

October to December 1987
Ongoing program since 1983 on standard transects

Facilities, gears and equipment used:

R/V *Polarstern*

Is another country involved in the program(s)?

National program

Name of chief investigator/contact point who can be contacted about the program(s):

Dr Volker Siegel, Institut für Seefischerei, Bundesforschungsanstalt für Fischerei, Palmaille 9, D–2000 Hamburg 50, FRG

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: Japan

Scientific objective(s) of program(s):

1. Adelie penguin census, feeding behaviour, populations census, diving depth and water temperature (direct CEMP)

2. Minke whale survey: Density/patchiness and school size, reproductive rates, age at sexual maturity, cohort strength, stomach contents, blubber thickness

3. Krill survey: target strength, biological samples, oceanographic samples

Location(s) of program(s):

1. Syowa Station
2. Not specified
3. Scotia Sea

Time span for program(s):

1. December 1987
2. Not specified
3. 28 October 1987 – 16 March 1988

Facilities, gears and equipment used:

1. TD recorders, land based

2. Sighting and sampling, vessel

3. R/V *Kayo Maru*, echo sounders and echo integrators

Is another country involved in the program(s)?

1–3. Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

1. Dr N. Saito, National Institute of Polar Research, 9–10 Kaga 1 chome, Itabashi-ku, Tokyo 173

2. Not specified

3. Dr Y. Shimadzu, Research Co-ordination Section, Japan Fisheries Agency, 2–1, 1-chome, Kasumigaseki, Chiyoda-ku, Tokyo 100.

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: New Zealand

Scientific objective(s) of program(s):

1. Adelie: foraging

2. Adelie: tracking during feeding in the sea

3. Aerial survey of penguin colonies

Location(s) of program(s):

1. Cape Bird
2. McMurdo Sound
3. Ross Sea

Time span for program(s):

1–3. Not specified

Facilities, gears and equipment used:

1–2. Land based
3. Aircraft C-130

Is another country involved in the program(s)?

1–3. Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

1–3. Not specified

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: South Africa

Scientific objective(s) of program(s):

1. The relationship between the population dynamics of selected seasonal species and their prey (Macaroni penguin)

2. Breeding success, diet and breeding behaviour of seabirds (in particular, Macaroni penguin) (can be considered of relevance to CEMP)

Location(s) of program(s):

Prince Edward Is and SANAE Station

Time span for program(s):

Not specified

Facilities, gears and equipment used:

Not specified

Is another country involved in the program(s)?

Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

Not specified

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: UK

Scientific objective(s) of program(s):

1. Penguin demography and deferred sexual maturity

2. Antarctic fur seal - reproductive success

3. Spatial and temporal variability in the key interactions of the ecosystem (food <— krill <— predators)

4. Monitoring of the breeding population size (Signy Is) of selected penguin colonies (direct CEMP)

Location(s) of program(s):

1–3. Signy (S. Orkneys)
4. Bird Is (S. Georgia), Signy Is (S. Orkneys)

Time span for program(s):

1–4. Not specified

Facilities, gears and equipment used:

1–4. Land based

Is another country involved in the program(s)?

1–4. Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

1–4. Drs J.P. Croxall and I.L. Boyd

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: USA

Scientific objective(s) of program(s):

1. Fish stock assessment survey
   Krill assessment survey/calibration experiments
2. Marine mammal and bird monitoring
3. Seabird ecology and behaviour
4. Seabird ecology
5. Physiological ecology and energetics of Adelie penguins
6. Population biology and energetics of krill

Location(s) of program(s):

1. S. Georgia, Bransfield Strait, off Elephant Is
2. Seal Island, South Shetland Islands, Palmer Station, Anvers Island
3. Admiralty Bay, King George Island
4. Weddell Sea
5. Palmer Station
6. Bellingshausen Sea

Time span for program(s):

1. November 1987 – February 1988
2. December 1987 – February 1988
3. September 1987 – February 1988
4. June – August 1988
5. December 1987 – January 1988
6. December 1987 – March 1988

Facilities, gears and equipment used:

1–6. Not specified

Is another country involved in the program(s)?

1. Co-operation with Poland
2. Chile
3–6. Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

1. Dr K. Sherman
2. J. Bengtson
3. W. Trivelpiece
4. D. Ainley
5. M. Chapell
6. R. Ross, L. Quetin

CEMP RESEARCH ACTIVITIES IN 1987/88 SEASON

Country: USSR

Scientific objective(s) of program(s):

1. Integrated studies of spatial and temporal distribution of krill and factors affecting krill concentration (direct CEMP)

2. Structure and functions of the pelagic community of the Scotia Sea

3. Oceanographic trawl and integrated hydroacoustic surveys

4. Spatial and temporal distribution of krill and environment factors affecting

Note: Inventory of data collected and preliminary results

1–3. Grid Map of sampling stations
Chlorophyll concentration data
Krill density distribution data
Water temperature data
Silicon concentration data (surface waters)
Water circulation data
Primary production (surface waters)
Krill biological samples
Phyto- and zooplankton samples

Location(s) of program(s):

1–3. Scotia Sea and adjacent waters from 52°–53°S to the ice-edge, including:
S. Georgia Is
S. Orkney Is
S. Shetland Is
4. Kosmonavtov and Sodruzhestro Seas south of 60°S to the ice edge between 30° and 90°E

Time span for program(s):

1–3. January – April 1988
4. Not specified

Facilities, gears and equipment used:

1–3. R/V *Evrika*
Isaacs-Kidd Trawl for krill sampling

4. Bottom and pelagic trawl samples and oceanographic stations

Is another country involved in the program(s)?

1–4. Not specified

Name of chief investigator/contact point who can be contacted about the program(s):

1–4. VNIRO Research Institute, 17a V. Krasnoselskaya Street, Moscow, USSR

APPENDIX 2

LIST OF BACKGROUND PAPERS RELEVANT TO CEMP AND PRESENTED FOR CONSIDERATION AT THE SEVENTH MEETING OF THE SCIENTIFIC COMMITTEE

SC-CAMLR/VII/BG/3	BIRD ISLAND MONITORING PROGRAM J.P. Croxall et al. (UK)
SC-CAMLR/VII/BG/4	BIRK ISLAND. SOUTH GEORGIA. ENVIRONMENTAL ASSESSMENT W.N. Bonner and J.P. Croxall (UK)
SC-CAMLR/VII/BG/7	SURVEY DESIGN TO ESTIMATE KRILL ABUNDANCE DURING FIBEX I. Everson et al. (UK)
SC-CAMLR/VII/BG/9	REPORT TO THE SCIENTIFIC COMMITTEE OF CCAMLR ON THE MEETING OF THE STEERING COMMITTEE FOR THE JOINT CCAMLR/IWC WORKSHOP ON THE FEEDING ECOLOGY OF SOUTHERN BALEEN WHALES D.G.M. Miller and Y. Shimadzu CCAMLR Representatives
SC-CAMLR/VII/BG/15	PRELIMINARY RESULTS OF RESEARCH ACTIVITIES OF RV *EVRIKA* IN THE SCOTIA SEA IN JANUARY–MARCH 1988 L.I. Maklygin et al. (USSR)
SC-CAMLR/VII/BG/17	UNITED STATES SEABIRD RESEARCH UNDERTAKEN AS PART OF THE CCAMLR ECOSYSTEM MONITORING PROGRAM, 1987–1988 W.R. Frazer et al. (USA)
SC-CAMLR/VII/BG/18	PRELIMINARY REPORT OF THE 1987–1988 NMFS ANTARCTIC MARINE LIVING RESOURCES PROGRAM. MARINE MAMMAL AND BIRD FIELD RESEARCH J.B. Bengtson (USA)
SC-CAMLR/VII/BG/19	PHYSICAL OCEANOGRAPHIC SETTING OF THE *SIEDLECKI* JANUARY 1987, SOUTH SHETLAND ISLAND DATA SET A.L. Gordon (USA)
SC-CAMLR/VII/BG/20	PATTERNS AND PROCESSES IN THE DISTRIBUTION AND DYNAMICS OF ANTARCTIC KRILL S.A. Levin, A. Morin and T.H. Powell (USA)

SC-CAMLR/VII/BG/21	JOINT POLISH/AMERICAN HYDROACOUSTIC SURVEY OF ELEPHANT ISLAND AND THE VICINITY OF KING GEORGE ISLAND, 1988 M.C. Macaulay (USA)
SC-CAMLR/VII/BG/22	STATISTICAL PROBLEMS IN KRILL STOCK HYDROACOUSTIC ASSESSMENTS M.C. Macaulay (USA)
SC-CAMLR/VII/BG/31	FORAGING ENERGETICS OF GREY HEADED ALBATROSSES DIOMEDEA CHRYSOSTOMA AT BIRD ISLAND, SOUTH GEORGIA D.P. Costa (USA) and P.A. Prince (UK)
SC-CAMLR/VII/BG/32	AUSTRALIAN RESEARCH ON ANTARCTIC BIRD AND SEAL DIETS R. Williams (Australia)
SC-CAMLR/VII/BG/33	THE POPULATION OF *MIROUNGA LEONINA*, AT STRANGER POINT (25 DE MAYO – KING GEORGE I.) D.F. Vergani, Z.B. Stanganelli (Argentina)
SC-CAMLR/VII/BG/34	ELEPHANT SEAL, *MIROUNGA LEONINA*, STOCK IDENTIFICATION USING DNA FINGERPRINTS D.F. Vergani, C.A. Aguirre and R.V. Rivers Pomar (Argentina)
SC-CAMLR/VII/BG/35	IS THE UNUSUAL PRESENCE OF CALIDRIS FUSCICOLLIS IN ANTARCTICA AN INDICATOR OF ENVIRONMENTAL CHANGE? D.F. Vergani, C.A. Aguirre and D. Montali (Argentina)
SC-CAMLR/VII/BG/40	HYDROACOUSTIC SURVEYS OF THE DISTRIBUTION AND ABUNDANCE OF KRILL: PRYDZ BAY REGION – FIBEX, ADBEX II AND SIBEX II I.R. Higginbottom, K.R. Kerry and S.E. Wayte (Australia)