

**SUMMARY OF MEMBERS' RESEARCH ACTIVITIES
RELATED TO ECOSYSTEM MONITORING**

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CONTENTS

Tables 1 – 4 set out programs in progress or envisaged for monitoring or directed research to assess the utility of potential monitoring parameters. The categories under which the different national responses are given are those identified as the most important at the Meeting of the Working Group for the CCAMLR Ecosystem Monitoring Program (Annex 6). The categories are given at Annex 6, Table 2 (predators), Table 6 (environment), Figure 2 (prey) and Table 3 (research programs on predators). Future monitoring and research studies on prey and on the environment were similar to those identified in Table 1 and so have not been reproduced in Tables 2 – 4.

Table 5 provides information on the dates and areas of operation for research cruises and shore based activities.

Table 1: Monitoring Programs for the Current Season (1986/87)

Species and Parameters*	Arg	Aust	Brazil	Chile	France	FRG	GDR	Japan	Korea	NZ	Poland	S.Afr	USSR	UK	USA
1. Predators															
Antarctic fur seal															
Foraging/attendance cycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AP
Pup growth and weaning weight	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crabeater seal															
Reproductive rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AP
Age at sexual maturity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AP
Cohort strength	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AP
Body condition	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AP
Penguins**															
Arrival weight	-	-	-	AP(a)	X(a)	-	-	-	-	X(a)	-	X(m)	-	-	-
Population size	-	PB(a)	-	AP(a)	X(a)	-	-	X(a)	-	X(a)	-	X(m)	-	-	-
Survival	-	PB(a)	-	-	-	-	-	-	-	X(a)	-	X(m)	-	-	-
Incubation shift duration	-	-	-	-	X(a)	-	-	-	-	X(a)	-	X(m)	-	-	-
Brooding success	-	PB(a)	-	-	X(a)	-	-	-	-	X(a)	-	X(m)	-	-	AP(a,c)
Foraging trips	-	-	-	AP(a)	-	-	-	-	-	X(a)	-	X(m)	-	-	AP(a)
Fledging weights	-	PB(a)	-	-	X(a)	-	-	-	-	X(a)	-	X(m)	-	-	AP(a,c)
Adult weight at fledging	-	-	-	-	X(a)	-	-	-	-	X(a)	-	X(m)	-	-	AP(a,c)
Macaroni weight before moult	-	-	-	-	-	-	-	-	-	-	-	X(m)	-	-	-
Minke whale															
Reproductive rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Age at sexual maturity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cohort strength	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Prey															
Krill															
- Population variables	-	-	AP	AP	-	-	-	-	SG	-	?	X	AP,PB,X	-	AP
- Relation to predators	-	PB	-	AP	-	-	-	-	SG	-	AP	X	-	-	AP
- Association with fishery	-	-	-	-	-	-	-	-	SG	-	?	-	-	-	-
- Advection	-	-	-	AP	-	-	-	-	SG	-	?	X(m)	-	-	AP
Early Life History Stages of Fish	-	PB	AP	-	X	-	SG	-	-	-	SG,AP	-	PB,X	SG	AP,SG
Pleuragramma antarcticum	-	PB	-	-	-	-	-	-	-	-	SG,AP	-	PB,X	-	-

Table 1 (continued)

Species and Parameters*	Arg	Aust	Brazil	Chile	France	FRG	GDR	Japan	Korea	NZ	Poland	S.Afr	USSR	UK	USA
3. Environment															
Water															
Movement	-	PB	AP	AP	-	-	-	X	SG	SG	-	AP	AP,PB,X	-	AP
Physical/ chemical properties	-	PB	AP	AP	X	-	-	X	SG	-	AP	X	-	SG	AP
Primary production	-	PB	AP	AP	-	-	-	X	SG	-	AP	X	-	-	AP
Secondary production	-	-	-	-	-	-	P	X	SG	P	AP	X	-	-	AP
Ice***															
Sea ice edge	-	PB(F,S)	-	AP	-	-	-	-	-	-	-	X	AP,X	-	-
Percent cover	-	PB(F,S)	-	AP	-	-	-	-	-	-	-	X	-	-	-
Floe size	-	PB(F)	-	AP	-	-	-	-	-	-	-	X	-	-	-
Snow cover	-	PB(F)	-	-	-	-	-	-	-	-	-	-	-	-	-

* Areas
 AP -- Antarctic Peninsula
 PB -- Prydz Bay
 SG -- South Georgia
 X -- Other Area

*** Method of Observation: S -- Satellite
 F -- Field

** Penguin Species
 a -- Adelie
 c -- Chinstrap
 m -- Macaroni

Analysis of existing data

Table 2: Monitoring Programs Proposed for Future Seasons

Species and Parameters*	Arg	Aust	Brazil	Chile	France	FRG	DDR	Japan	Korea	NZ	Poland	S.Afr	USSR	UK	USA
Predators															
Antarctic fur seal															
Foraging/attendance cycles	-	-	-	AP	-	-	-	-	-	-	-	-	-	SG	-
Pup growth and weaning weight	-	-	-	AP	-	-	-	-	-	-	-	-	-	SG	-
Crabeater seal															
Reproductive rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Age at sexual maturity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cohort strength	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Body condition	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Penguin**															
Arrival weight	X(a)	-	AP(a)	AP(a,c)	X(a)	-	-	-	-	-	-	-	-	SG(m)	-
Population size	X(a)	PB(a)	AP(a)	AP(a,c)	X(a)	-	-	-	-	X(a)	-	-	-	SG(m)	-
Survival	X(a)	PB(a)	-	AP(a,c)	-	-	-	-	-	X(a)	-	-	-	-	-
Incubation shift duration	-	-	-	-	X(a)	-	-	-	-	X(a)	-	-	-	?	-
Brooding success	X(a)	PB(a)	-	-	X(a)	-	-	-	-	X(a)	-	-	-	SG(m)	-
Foraging trips	-	-	AP(a)	-	-	-	-	-	-	X(a)	-	-	-	?	-
Fledging weights	-	PB(a)	-	AP(a,c)	X(a)	-	-	-	-	X(a)	-	-	-	SG(m)	-
Adult weight at fledging	-	-	-	-	X(a)	-	-	-	-	X(a)	-	-	-	SG(m)	-
Macaroni weight before moult	-	-	-	-	-	-	-	-	-	-	-	-	-	SG(m)	-
Minke whale															
Reproductive rate	-	-	-	-	-	-	-	-	PB,X	-	-	-	-	-	-
Age at sexual maturity	-	-	-	-	-	-	-	-	PB,X	-	-	-	-	-	-
Cohort strength	-	-	-	-	-	-	-	-	PB,X	-	-	-	-	-	-

* Areas:
 AP -- Antarctic Peninsula
 PB -- Prydz Bay
 SG -- South Georgia
 X -- Other Area

** Penguin Species:
 a -- Adelie
 c -- Chinstrap
 m -- Macaroni

Analysis of existing data

Table 3: Research Program for the Current Season (1986/87)

Species and Parameters*	Arg	Aust	Brazil	Chile	France	FRG	GDR	Japan	Korea	NZ	Poland	S.Afr	USSR	UK	USA
Predators															
Antarctic fur seal															
Indices of body condition	-	-	-	AP										SG	-
Juvenile tooth size	-	-	-	AP	-	-	-	-	-	-	-	-	-	?	-
Fine structure of teeth	-	-	-	-	-	-	-	-	-	-	-	-	-	?	AP
Crabeater seal															
Collection of material for further analysis of demographic variables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AP
Instantaneous growth rates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Juvenile tooth size	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indices of body condition	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AP
Feeding areas and behaviour using satellite technology	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AP
Antarctic petrel															
Growth rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fledging success	-	?	AP	-	-	-	-	-	-	-	-	-	-	-	-
Diet	-	PB	AP	-	-	-	-	-	-	-	-	-	-	-	-
Penguins**															
Feeding areas (using satellite technology)	-	-	-	-	-	-	-	-	-	-	-	X(m)	-	-	-
Behaviour (“ “ “)	-	-	-	-	-	-	-	-	-	-	-	X(m)	-	-	-
Frequency (“ “ “)	-	-	-	AP(a)	-	-	-	-	-	-	-	X(m)	-	-	-
Meal size	-	PB(a)	AP	AP(a,c)	X(a)	-	-	-	X(a)	-	-	X(m)	-	SG	AP
Minke whale															
Surveys of abundance using sightings (as by IDCR)	-	-	-	-	-	-	-	X ¹	-	-	-	-	-	-	-
Diving behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Analysis of existing data															
- Stomach contents	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Blubber thickness	-	-	-	-	-	-	-	PB	-	-	-	-	-	-	-
- Density and patchiness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- School size	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Areas:
 AP -- Antarctic Peninsula
 PB -- Prydz Bay
 SG -- South Georgia
 X -- Other Area

** Penguin Species:
 a -- Adelle
 c -- Chinstrap
 m -- Macaroni

¹ IDCR (International Decade of Cetacean Research) Cruise Area II (0 – 60 W), 3 vessels from Japan

Table 4: Research Programs Proposed for Future Seasons

Species and Parameters*	Arg	Aust	Brazil	Chile	France	FRG	GDR	Japan	Korea	NZ	Poland	S.Afr	USSR	UK	USA
Predators															
Antarctic fur seal															
Indices of body condition	-	-	-	AP										SG	
Juvenile tooth size	-	-	-	AP	-	-	-	-	-	-	-	-	-	?	-
Fine structure of teeth	-	-	-	-	-	-	-	-	-	-	-	-	-	?	-
Crabeater seal															
Collection of material for further analysis of demographic variables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Instantaneous growth rates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Juvenile tooth size	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indices of body condition	-	PB	-	-	-	-	-	-	-	-	-	-	-	-	-
Feeding areas and behaviour using satellite technology	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antarctic petrel															
Growth rate	-	PB	-	-	-	-	-	-	-	-	-	-	-	-	-
Fledging success	-	PB	AP	-	-	-	-	-	-	-	-	-	-	-	-
Diet	-	PB	-	-	-	-	-	-	-	-	-	X	-	-	-
Penguins**															
Feeding areas (using satellite technology)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Behaviour (“ “ “)	-	PB	-	-	-	-	-	-	-	-	-	-	-	-	-
Frequency (“ “ “)	-	PB	-	-	-	-	-	-	-	-	-	-	-	-	-
Meal size	-	PB	AP	AP(a,c)	X(a)	-	-	-	-	X(a)	-	-	-	-	SG
Minke whale															
Surveys of abundance using sightings (as by IDCR)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diving behaviour	-	-	-	-	-	-	-	PB,X	-	-	-	X	-	-	-
Analysis of existing data															
- Stomach contents	-	-	-	-	-	-	-	PB,X	-	-	-	-	-	-	-
- Blubber thickness	-	-	-	-	-	-	-	PB,X	-	-	-	-	-	-	-
- Density and patchiness	-	-	-	-	-	-	-	PB,X	-	-	-	-	-	-	-
- School size	-	-	-	-	-	-	-	PB,X	-	-	-	-	-	-	-

* Areas:
 AP -- Antarctic Peninsula
 PB -- Prydz Bay
 SG -- South Georgia
 X -- Other Area

** Penguin Species:
 a -- Adelie
 c -- Chinstrap
 m -- Macaroni

Table 5: Dates and Areas of Operation for Research Cruises and Shore-based Activities

Member	Ship/Station/Region	Proposed Time	Species/Notes
Argentina	Jubany Station, Orcadas Station	Oct–Feb 87/88	Adelie penguin
Australia	M/V <i>Nella Dan</i>	Jan–Feb 87	Fish, krill, hydrology
		Oct–Nov 87	Crabeater seal
	Davis Station	Oct–March 87	Adelie penguin
	Scullen Monolith	Dec–Jan 86/87	Antarctic petrel
Brazil	R/V <i>Barao de Teffe</i>	Dec–March 86/87	
	Comandante Ferraz		Adelie penguin
	Elephant, Nelson, King George Islands		
Chile	King George Island	On-going	Adelie penguin
EEC	No programs		
France	Dumont D'urville, Kerguelen	On-going	Adelie penguin, Macaroni penguin
FRG	R/V <i>Polar Stern</i>	Oct–Dec 87	Krill, hydrology
Japan	Syowa Station, 3 vessels	Oct–Dec 86	Adelie penguin, IDCR cruise 0°–60°W
New Zealand	Ross Sea region	Oct–Dec, on-going	Adelie penguin
Poland/USA	R/V <i>Prof. Siedlecki</i>	Dec 86	Early life history stages of fish (ANI, SSI, NOG*) distribution, abundance, growth rate and diet
South Africa	Marion Island	On-going	Macaroni penguin
	Western Lazarev Sea	1987/88	Krill, fish, predators
UK	HMS <i>John Biscoe</i>	Jan 87	Early life history stages of fish (ANI, SSI, NOG*) distribution, abundance, growth rate and diet
USA	R/V <i>Polar Duke</i>	Nov 86	Crabeater seal
	USCGC <i>Glacier</i>	Dec–Jan 86/87	Antarctic fur seal, Crabeater seal
USA/Poland	R/V <i>Prof. Siedlecki</i>	Jan–Feb 87	Antarctic fur seal, Chinstrap penguin
USA	Elephant Island	Dec–Feb 86/87	Antarctic fur seal
	James Ross Island	Jan 87	Crabeater seal
	Palmer Station	Dec–Jan 86/87	Adelie penguin
	Admiralty Bay	Dec–Feb 86/87	Adelie penguin, Chinstrap penguin
	South Shetland Islands	Dec–Feb 86/87	Antarctic fur seal

* FAO Species Codes: ANI - *Champscephalus gunnari*, SSI - *Chaenocephalus aceratus*, NOG - *Notothenia gibberifrons*