

**REPORT OF THE CONSULTATION ON CO-ORDINATION  
OF FISH STOCK ASSESSMENT SURVEYS**

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An informal consultation was held among members of the Scientific Committee to co-ordinate fish stock assessment surveys and to ensure that the methodology, timing and location of the surveys are appropriate to the requirements of fish stock assessments.

2. Fish stock assessment surveys are planned by seven countries in support of the CCAMLR research program. Joint operations will be conducted in the Kerguelen area (58.5) by France and the USSR. In the South Georgia area (48.3), three fish stock assessment surveys will be conducted: one by Spain, another in a joint effort by Poland and the USA, and a third by the German Democratic Republic. In the South Orkney Islands area (48.2), the USSR and Spain will each conduct a survey. A survey will be conducted by Spain in both the South Shetland Islands area (48.1) and the South Sandwich Islands area (48.4). Australia will survey fish stocks in the Prydz Bay area (58.4).

3. All the surveys in the Atlantic sector will be conducted using commercial-sized bottom trawls of 32–36m headline fitted with 80 mm mesh (as measured by CCAMLR Regulation on Mesh Size Measurement). The survey indices of abundance will be based on the ‘swept area’ method on the Polish/USA and Spanish surveys. Sampling for most surveys will be stratified randomly by depth. The USSR surveys will be conducted on a transect pattern (including hydrology, phytoplankton, and zooplankton investigations) from shoal to deep water across-the-shelf.

4. Mesh selectivity experiments will be conducted in the South Georgia area during the Spanish and joint Polish/USA cruises. These surveys will use different mesh sizes of 80 through 90, 100, and up to 120 mm. A standard method with fine-meshed liners placed on the cod end will be used to retain fish which have escaped through the various mesh sizes. These data will be used to estimate selectivity factors, mean length of fish at 50% selectivity level and to determine the mesh sizes offering optimal escapement for immature fish stages. An introduction to the methodology for conducting mesh selectivity experiments is given in Appendix 1 of this annex and in the document SC-CAMLR-V/BG/41. In addition to the South Georgia surveys described above, Spain will conduct mesh selectivity experiments in the South Shetland and South Orkney Islands areas.

5. Preliminary recruitment-index experiments leading towards a standard strategy for future CCAMLR recruitment surveys will be conducted in the South Georgia area during United Kingdom studies of early life stages of fish, and during joint Polish/USA surveys.

Surveys of juveniles will also be conducted by the German Democratic Republic in this area. In addition, the USSR is currently undertaking a long-term program investigating the distribution and abundance of juvenile fish in various areas of the Antarctic. The details for 1986/87 were not available during the 1986 sessions of the Scientific Committee. The survey strategy for the initial experiment is given in Tables 1–3. It is recognised that further consultations will be required prior to the establishment of standard recruitment index methods based on the results of the preliminary experiments to be conducted by the United Kingdom, Poland and the USA. Results of juvenile icefish (Channichthyidae) distribution and abundance surveys were presented in a document presented for the Fish Stock Assessment Working Group Meeting (Fish WG/1986/Doc.10). The analysis of ichthyoplankton data from SIBEX cruises will proceed during two BIOMASS Workshops to be held in Cambridge in October 1986 and 1987.

6. During the survey operations in 1986/87, collections will be made of ichthyoplankton by Brazil, France, Poland, USSR, United Kingdom and USA.

7. The timing of fish stock assessment surveys will allow for sequential sampling for fish stock assessment purposes in the South Georgia area from November to December (see Table 2). The South Orkney Islands will be surveyed October by Poland and during the first half of January by Spain; the USSR survey in this area will be conducted within the January to March period depending on the extent of the pack ice.

8. The following three tables provide information on fish stock assessment surveys planned in 1986/87:

Table 1. National Fish Survey Activities in Support of the CCAMLR Scientific Program Planned for the 1986/87 Season.

Table 2. Timing of Fish Stock Assessment Surveys to be Undertaken in 1986/87 by Area.

Table 3. Summary of Planned Fish Survey Operations in 1986/87.

9. Survey details for the Spanish and Polish/USA operations for the 1986/87 season are given in Appendices 2 and 3, of Document SC-CAMLR-V/5.

TABLE 1: NATIONAL FISH SURVEY ACTIVITIES IN SUPPORT OF THE CCAMLR SCIENTIFIC PROGRAM PLANNED FOR THE 1986/87 SEASON

Country	Area	Dates	Type of Activity
Argentina*	Bransfield Strait	Jan–Feb	Provision plans for scientific fishing
Australia	Prydz Bay	Feb–Mar	Scientific sampling with small-scale trawls
Belgium	Information not available		
Brazil*	South Shetland Is.	Dec/Mar	Abundance and distribution, ichthyoplankton
Chile*	Gerlache Strait	Summer	Scientific sampling for fish ecology studies
France	Kerguelen	Nov–Apr/Jul–Aug	Joint French/Soviet research on stock assessment; biomass surveys ichthyoplankton; it is unknown at this time whether or not it will be possible to undertake mesh selectivity studies this season
GDR*	South Georgia (maybe S. Orkney I.)	Nov–Dec	Commercial trawling and scientific research
FRG	No activities planned in 1986/87		
India	Indian Ocean Sector	Summer	Provisional plans for scientific sampling in transit to study area
Japan	No activities planned in 1986/87		
Rep. of Korea	No activities planned in 1986/87		
New Zealand	Ross Sea	Summer	Notothernid physiology
Norway	No activities planned in 1986/87		
Poland*	South Georgia Bransfield Strait	Nov–Dec Dec–Jan	Joint Polish/USA stock assessment; abundance and distribution studies; mesh selectivity research; ichthyoplankton surveys

TABLE 1 continued

Country	Area	Dates	Type of Activity
Spain*	S. Georgia, Orkney, Sandwich, Shetland Islands	Nov–Feb	Biomass trawl surveys by species; mesh selectivity studies; 1 research vessel, 1 commercial vessel
South Africa	No activities planned in 1986/87		
USSR*	Kerguelen Other areas	Nov–Apr/Jul–Aug will be available	stock assessment; abundance and distribution studies, ichthyoplankton studies; joint USSR/French research (see above) (information on activities in other areas will be available)
UK*	South Georgia	Dec/Jan	Scientific research on early life stages of fish; distribution and abundance, interactions with principal prey species, vertical distribution.
USA*	South Georgia	Nov–Dec	Joint Polish/USA scientific research (see above)
Uruguay	No activities planned in 1986/87		

\* suggest that an *ad hoc* group co-ordinate the effort in relation to trawling locations, methods, and formats for transmitting results and data to the Secretariat.

TABLE 2 : TIMING OF FISH STOCK ASSESSMENT SURVEYS TO BE UNDERTAKEN IN 1986/87

Region	Country	Fish Stock Surveys	Ichthyoplankton Surveys
South Georgia	GDR	Nov–Dec	
	Poland/USA	24 Nov–26 Dec	Dec
	Spain	19 Nov–11 Dec	
	UK		Jan
South Sandwich Islands	Spain	13 Nov–10 Feb	
South Orkney Islands	Poland	Oct	
	GDR	Nov–Dec	
	Spain	23 Dec–8 Jan	
	USSR	Jan–Mar	Jan–Mar
South Shetland Islands	Spain	10–31 Jan	
Prydz Bay	Australia	Feb–Mar	
Kerguelen Islands	France	Nov–Apr/Jul–Aug	Nov–Apr/Jul–Aug
	USSR	Nov–Apr/Jul–Aug	

TABLE 3 : SUMMARY OF PLANNED FISH SURVEY OPERATIONS IN 1986/87

Country:	Argentina	Australia	Belgium	Brazil	Chile	France	GDR	FRG	India	Japan
Ships:	Irizar	Nella Dan	no activities planned		[shore station]	Fiolent		planned	no activities	no activities planned
Ship call sign:		OZKC								
Dates:	Jan/Feb 87	Feb/Mar 87		Dec 86/Mar 87	Jan/Feb	Nov/Apr Jul/Aug	Nov/Dec			
Operating area:	Bransfield Str.	Prydz Bay		Bransfield Str. King George Is	South Bay, Anvers Island	Kerguelen	South Georgia (maybe S.Orkney)			
Dist. offshore:		< 150 n.m.				12–120 n.m.	> 12 n.m.			
On/off shelf:		on shelf		on shelf						
Sampling program:				abundance and distribution	ecology of Nototheniidae	transects with oceanographic and biological stations	commercial and scientific trawls		provisional plans for scientific sampling in transit to operations area	
Sample types:	fish abundance	bottom trawls midwater trawls		ichthyoplankton and mature fish surveys		biomass surveys ichthyoplankton	bottom trawls, midwater trawl			
Gear types:	Otter, bongo, blackie, Isaac-kidd	3m beam trawl small otter trawl IYGPT				bongo net standard trawl				
Transect types:		N-S transects from shelf edge to coast @ 2 degree interval				8 transects perpendicular to the coastline				
Mesh selectivity?:	no	no				no	no			
Larvae/juveniles?:	yes	yes: RMT & IYGPT		yes		yes	yes			
Krill research?:	yes	yes				no	no			
Other aspects:		CTD profiles and phytoplankton								
General comments:	transect details are not yet defined	cruise will not be assessment <i>per se</i> because gear is too small, but data are applicable				this work will be undertaken jointly with Soviet scientists				

TABLE 3 continued

Country:	Korea	New Zealand	Norway	Poland	South Africa	Spain	Uruguay	USSR	United Kingdom	USA
Ships:	no activities planned	no activities planned	no activities planned	Siedlecki	no activities planned		no activities planned			Siedlecki
Ship call sign:										
Dates:				Oct/Jan		Nov/Feb		Nov/Apr Jul/Aug	Dec/Jan	Nov/Dec
Operating area:				South Georgia Shag Rocks Bransfield Str.		S. Shetland Orkney, Georgia Sandwich, Shag to 500 m isobat		South Georgia Kerguelen other areas	South Georgia	South Georgia Shag Rocks Bransfield Str.
On/off shelf:				on shelf		on shelf				on shelf
Sampling program:				stock assessment		transects and strat. random bottom trawls		stock assessment	early life stages	stock assessment
Sample types:				abundance and distribution, ichthyoplankton		sex/age comp., biomass, length bottom trawl semi- pelagic trawl		abundance and distribution ichthyoplankton	distr. and abund. interactions with prey, vert. distr.	abund. & distr. ichthyoplankton bottom trawls
Gear types:										
Transect types:										see cruise plan
Mesh selectivity?:				yes		yes		yes		yes
Larvae/juveniles?:				yes		no		yes		yes
Krill research?:				yes		no		yes		yes
Other aspects:						hydrography meteorology biol. samples of catch				
General comments:				Nov/Dec studies are joint with USA		an observer and sampling scheme will also be put on commerc. vessel in same area		Kerguelen studies are joint with France		joint with Poland



## **METHODS FOR NET SELECTIVITY STUDIES ON FISH**

The following methods are based on those described by Dr J. Zaucha (Doc. SC-CAMLR-V/BG/29).

2. Standard techniques using a fine-meshed liner should be used. Due to the rough nature of fishing grounds and consequent danger of damage, the liner should only be attached in the upper part of the codend and reach down to the middle of the codend side walls. The same type of fine-meshed netting insert should be placed inside the bottom part of the codend (Fig.1). In this configuration, fish in the codend can only escape through the meshes of the upper part of the trawl to the fine-meshed liner.

3. Selectivity studies should be conducted under the same conditions as those of commercial operations. The basic net design should be identical to that which is in current commercial use on the fishing grounds. Any additional strengthening to protect the codend must not affect the overall functioning of the net. Double-layer codends, without a chafer, are not recommended for these investigations. The codend ought to be strengthened only by the use of cross ropes, up to 5 of which may be splitting straps, attached to the codend. These should be no less than 1 m apart except for the last four cross ropes which should be not less than 50 cm apart. No more than one tension line should be fastened to the upper side of the codend. All floats should be fastened to the side lacings. Since heavy splitting straps lying on the fine-meshed liner might affect selectivity results, the codend ought to be used with the splitting straps open during trawling. Only after hauling the codend on board to empty the codend and liner should both ends of the straps be shackled together.

4. Analysis should be concentrated on those tows which fulfil the following basic requirements: (1) estimated total catch of the tow should be greater than 500 kg of fish (very large catches should also be excluded), (2) the investigated species should constitute at least 20% of the total weight of the catch.

5. The lengths of fish from representative samples from the codend and codend liner should be measured. The following standard calculations should then be made for each species to obtain the selectivity parameters and ogives for the codend under test with respect to each fish species: (1) mean length of fish for 50% selectivity level, (2) selectivity interval (in cm) between the mean length of fish for selectivity levels of 75 and 25%, (3) selectivity factor  $F_x = l_{50} / A$ , where:  $L_{50}$  = fish length at a 50% selectivity level and A = mean mesh size in the codend.

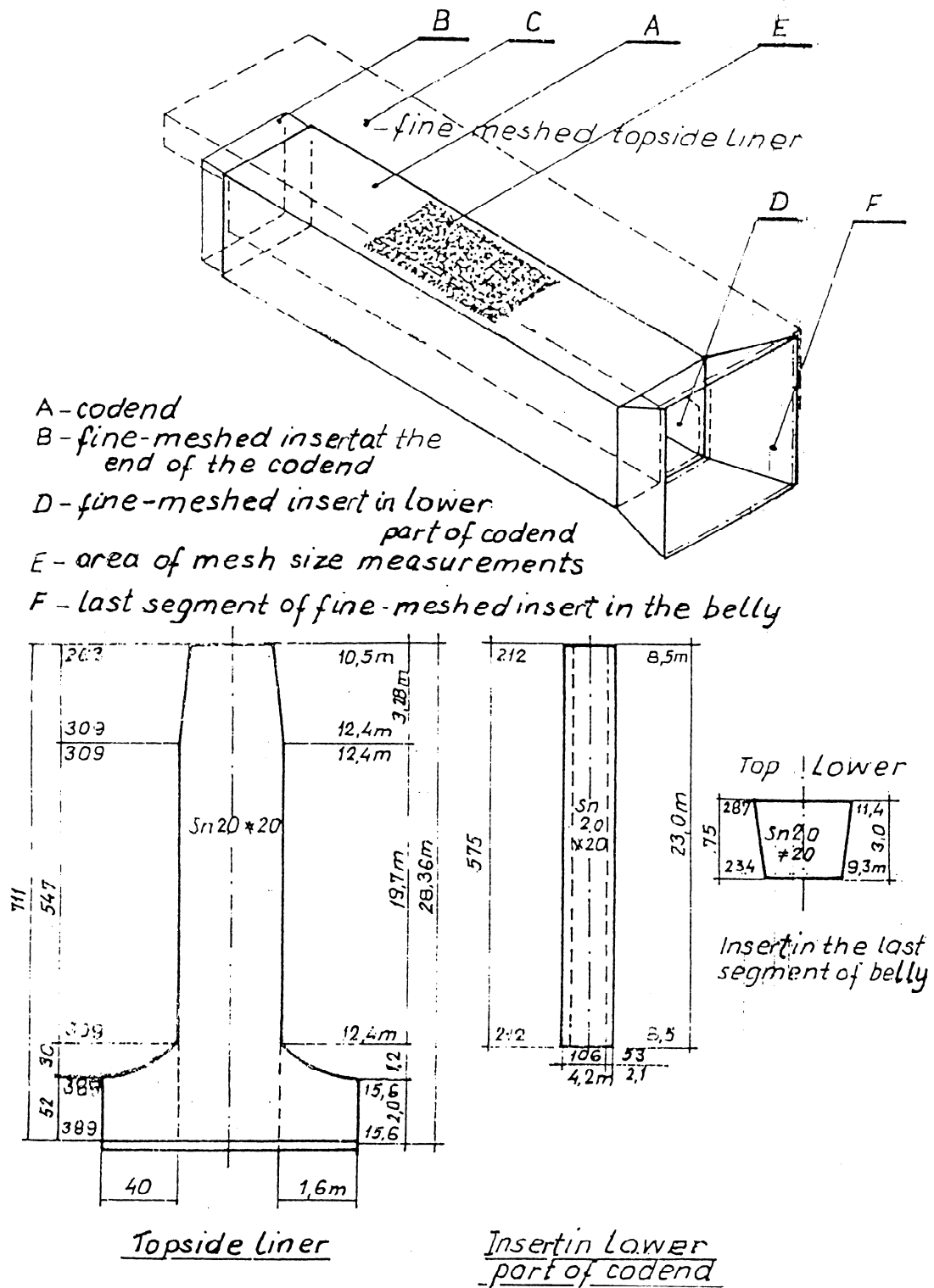


Figure 1: Plan of Tape Codend with Fine-meshed Topside Liner and Fine-meshed Insert in Lower Part of Codend.