

FISH STOCK ASSESSMENT

7.1 At its 1983 meeting, the Scientific Committee had agreed that the starting point for discussions on fish stock assessment at this meeting should be the report of the second meeting of the BIOMASS Working Party on Antarctic Fish Biology, published as BIOMASS Report Series 12. Members had been invited to submit comments on this report.

7.2 During the inter-sessional period, Dr K.-H. Kock (Federal Republic of Germany), Dr Guy Duhamel (France), and Dr J.-C. Hureau (France) under the auspices of the BIOMASS Working Group on Fish Ecology had prepared a comprehensive and updated resources review, summarising all the available data on Antarctic fish stocks and examining the present status of exploited stocks. This report was available to the Scientific Committee as SC-CAMLR-III/BG/2. The SCAR observer, in presenting the fish resources review, explained that BIOMASS is a scientific program under the responsibility of the SCAR/SCOR/ACMRR/ IABO Group of Specialists on Southern Ocean Ecosystems and their Living Resources.

7.3 On behalf of the Scientific Committee, the Chairman expressed his thanks to SCAR, to the BIOMASS Working Party on Fish Ecology and to the authors for carrying out this valuable work.

7.4 In response to the Scientific Committee's request, comments from Japanese scientists on the original BIOMASS report were presented in SC-CAMLR-III/6. Also presented was SC-CAMLR-III/5, which commented on the status of fish stocks largely in the light of the new BIOMASS report (SC-CAMLR-III/BG/2).

7.5 Further information pertaining to Polish fishing operations off South Georgia was given in SC-CAMLR-III/BG/11. In this paper, besides data which were already published, new data on Polish commercial catches were presented, as well as a preliminary assessment of the exploited fish stock biomass off South Georgia.

7.6 Each of the papers SC-CAMLR-III/2, SC-CAMLR-III/5 and SC-CAMLR-III/11 includes data which indicate evidence of possible overfishing for a number of fish stocks. Following initial presentations of the results in these papers, the Scientific Committee agreed that detailed discussions would best be carried out in a working group. Accordingly, it agreed to establish an *Ad Hoc* Working Group on Fish Stock Assessment, convened by Dr R. Hennemuth (USA), to meet on an opportunistic basis during the current session and report its findings back to the Scientific Committee for consideration.

7.7 The terms of reference for this *ad hoc* Working Group were

- to identify those fish stocks which appeared to be heavily fished, and for which conservation action might be necessary; and
- to indicate the options for conservation measures in respect of these stocks.

7.8 The report of the *Ad Hoc* Working Group is given in Annex 8. The report was accepted in its entirety by the Scientific Committee. A small working group had been set up to define the data needs for a proposed meeting on fish stock assessment in the intersessional period. This is discussed in paragraph 7.51 below.

Identification of Fish Stocks in Need of Conservation Measures

7.9 In identifying those stocks of fish for which conservation measures may be necessary, the Working Group had examined three areas: South Georgia, other South Atlantic grounds within the Convention Area and Kerguelen.

(a) South Georgia

7.10 For the species caught around South Georgia, the following were identified in light of the available data as being heavily fished and in need of conservation measures:

Notothenia rossii marmorata

Notothenia gibberifrons

Champscephalus gunnari

Dissostichus eleginoides

7.11 Of these, the *Nototheniidae*, particularly *N. rossii*, were felt by the Working Group to have been most greatly affected by fishing, and the various species of icefish were considered to be less seriously depleted. For *N. rossii*, all available evidence was consistent with indicating that this stock is very severely affected by fishing, and that the present biomass is less than 10% of the initial biomass when the fishery started. Data submitted were insufficient to assess the relationship between the present biomass and the initial biomass for other species.

7.12 Some concern was expressed over the stocks of *Pseudochaenichthys georgianus*. It was noted, however, that this species is taken primarily as a by-catch and catches have been fairly small. The available data were felt to be insufficient for a clear assessment.

(b) Other South Atlantic Grounds in the Convention Area

7.13 For stocks in other South Atlantic grounds, the Working Group found that there were insufficient data to make an assessment of the state of the stocks.

(c) Kerguelen

7.14 For the species caught around Kerguelen, the Working Group identified the following as being in need of conservation measures:

Notothenia rossii

Champscephalus gunnari

7.15 The Working Group agreed that the status of this stock of *N. rossii* was probably very similar to that of the same species around South Georgia.

7.16 Substantial catches of *C. gunnari* have also been taken around Kerguelen. The Working Group felt that there was probably less reason for serious concern about the status of this stock than for any other Antarctic stock from which significant catches have been taken.

7.17 The Scientific Committee endorsed these findings of the Working Group with respect to each of the areas.

Existing Management Measures

7.18 At South Georgia and Kerguelen, some management measures have already been applied by individual countries.

7.19 For the Soviet fisheries in the CCAMLR area, outside of the EEZ around Kerguelen, a regulation setting minimum mesh sizes of 120 mm for *N. rossii* and *D. eleginoides* and

80 mm for other species, as well as corresponding minimum fish sizes for each species and sector, have been in force since 1980 (see SC-CAMLR-III/13).

(a) South Georgia

7.20 In addition, Soviet vessels have refrained from fishing within 12 miles of South Georgia, since the beginning of the fishery.

(b) Kerguelen

7.21 Around Kerguelen, French authorities have set a number of controls. In 1978, an EEZ was created, and no fishing was permitted in the first 14 months.

7.22 After that period, the following measures were adopted:

- fishing within the 12-mile zone is forbidden;
- fishing licences are issued by French authorities;
- fishing grounds are closed completely or partially during some periods of the year;
- a minimum mesh size of 70 mm was set in 1980;
- logbooks must be submitted to French authorities;
- planning of each fishing season;
- limited number of authorised trawlers;
- quota on total catches and days of fishing;
- fishery observers appointed by the French authorities on trawlers;
- control of unloading of catches;
- presence of a fisheries patrol vessel.

7.23 From 1984, the regulations will include a TAC for *N. rossii* and *C. gunnari*, and closed seasons during the spawning seasons of the two species and a minimum size limit for *C. gunnari*.

Management Options

South Georgia

7.24 The Scientific Committee welcomed the initiatives taken by the Soviet authorities with respect to their fishing operations in this area.

7.25 It was noted that minimum mesh sizes and fish size limits had only been in force since 1980. Thus, although it was to be expected that these should have some beneficial effect, it was too early for any such effects to become apparent.

7.26 The Committee recommended that this measure should be continued and applied to all fishing fleets in the area.

7.27 However, the Committee endorsed the Working Group's views that, by itself, mesh or size regulation was unlikely to be fully effective in restoring depleted stocks.

7.28 The Committee also recommended that the area within 12 miles of South Georgia should be closed to all fishing fleets.

7.29 It noted, however, that while such a closure should give protection to juvenile fish, the refraining from fishing by Soviet vessels within 12 miles of South Georgia since the beginning of the fishery has not been fully effective in halting the decline of the stocks.

7.30 In view of the above, the Committee agreed to recommend that some further management measures are essential, given the depleted state of the identified stocks around South Georgia, particularly *N. rossii*.

7.31 The majority of members identified the following range of possible management measures that might be taken, in addition to those already recommended above:

- (a) Closure of the total fishery around South Georgia for a period;
- (b) Imposition of an appropriate global TAC, with associated by-catch provisions;
- (c) Imposition of appropriate individual species TACs.

7.32 However, the delegations of Poland, GDR and USSR did not agree to the measures identified in paragraph 7.31 (a,b,c), because they felt that there is not sufficient scientific evidence proving necessity of application of such measures at the present.

7.33 Further discussion of the latter two measures is given in paragraphs 36–38 of Annex 8.

7.34 With respect to the first of these options, Dr Robertson (NZ) made the following specific proposal, supported by Dr Kerry (Australia) and others:

that Area 48.3 be closed to all commercial trawling for fish in the 1984–85 season, and that the closure be reviewed at the 1985 CCAMLR meeting.

7.35 In support of this proposal, Dr Robertson (NZ) alluded to the urgent need for management, particularly for *N. rossii*, and the insufficiency of the currently available data to specify a detailed management program. In his view, imposition of the proposed management measure would minimise the risk of further depletion of the stocks that could occur if no action were taken until a detailed plan could be agreed. A number of other representatives indicated their support for these views.

7.36 Dr Lubimova (USSR) stated that this proposal was unacceptable. The results obtained by the Working Group which are based on insufficient evidence do not justify the proposal made by Dr Robertson (NZ).

7.37 Citing similar reasons, Dr Ranke (GDR) and Dr Slosarczyk (Poland) also stated their opposition to this proposal.

7.38 Dr Hureau (France) observed that a similar closure had been imposed by French authorities at Kerguelen. After a period of 14 months' closure it had been possible to allow fishing to continue under appropriate management regulations.

7.39 Other members believed that it would be more appropriate just to include this proposal as one of the range of options to be considered by the Commission.

7.40 The Committee noted that an extremely useful management measure imposed by the French authorities around Kerguelen was closing specific areas at certain times of the year to protect spawning fish. Unfortunately, spawning grounds for fish around South Georgia have not yet been identified, thus ruling out an option of this type.

7.41 The Committee agreed that a research vessel survey in the spawning season (May) would be very useful.

Kerguelen

7.42 As noted earlier, a wide range of management measures have been imposed on this fishery by French authorities, including individual species TACs to apply from 1984.

7.43 The Scientific Committee agreed that in principle these measures should ensure restoration of the depleted stocks in this area to levels around that of maximum net productivity, as envisioned in Article 11 of the Convention.

7.44 Thus it did not believe further conservation measures for these stocks were necessary at present.

Other South Atlantic Stocks in the Convention Area

7.45 The Scientific Committee noted the conclusions of the Working Group that there were insufficient data for these stocks to allow an assessment to be carried out. Thus no advice can be given for these stocks.

7.46 In these circumstances, it was agreed that the range of management options possible for these stocks covered the full range discussed by the Working Group.

7.47 The Scientific Committee strongly recommended that all available historical data on these stocks be collated and that additional new research data be collected.

Additional Research Needed

7.48 While much new data was available to the *Ad Hoc* Working Group, and these greatly assisted the deliberations, the Scientific Committee noted there are insufficient data available to specify a detailed management program.

7.49 As detailed in Annex 8, the Working Group identified a number of desirable lines of further study:

- analysis of detailed catch and effort data;
- simulation modelling of age and length composition;
- estimation of recruitment trends.

7.50 The Scientific Committee agreed that to carry out these additional analyses, it would be useful to hold an inter-sessional meeting of the *Ad Hoc* Working Group on Fish Stock Assessment.

7.51 It was agreed, however, that for this meeting it was essential that detailed catch and effort data be available, as well as additional biological data. The form of the detailed data required are set out in Appendix 6 of Annex 6 and Appendix III of Annex 8.

7.52 With respect to the timing and venue of the meeting, the Committee agreed that these would largely be dictated by the amount of time it would take to prepare the required data and by the availability of suitable computer equipment and stock assessment software.

7.53 It was felt that it would be preferable to hold the meeting of the *Ad Hoc* Working Group on Fish Stock Assessment in Hobart, prior to the next session of the Scientific Committee.

7.54 The Scientific Committee agreed that the intersession meeting of the *Ad Hoc* Working Group on Fish Stock Assessment should have the following terms of reference:

1. To assess the status of fish stocks in the Convention Area, including South Georgia, other areas in the South Atlantic within the Convention Area, and Kerguelen.
2. To advise on the management measures needed to achieve the Commission's objectives taking account of any requests made to the Scientific Committee by the Commission.
3. To identify further research studies and data collections which would be required for improved fish stock assessment.
4. To submit a report to the Scientific Committee which would *inter alia* assist the Committee in considering any management measure that might appear necessary.

7.55 Reference was made to the necessity of giving due consideration to the relationship between the Antarctic Ecosystem and associated or dependent marine ecosystems in waters adjacent to the Convention Area, when further analysing conservation and management measures.