

FISH RESOURCES

FISHERY STATUS AND TRENDS

3.1 In the Atlantic sector commercial fishing for finfish was prohibited in Subareas 48.1 and 48.2 (Conservation Measures 41/X and 42/X).

3.2 In Subarea 48.3 (South Georgia) the total catch of all species in 1991/92 was 50 678 tonnes, which compares to 82 423 tonnes in 1990/91, the difference being largely due to a drop in myctophid landings. However, all expected catch returns have not yet been received.

3.3 The fishery for *Champsocephalus gunnari* was closed for the 1991/92 season (Conservation Measure 33/X). The fishing season for *Dissostichus eleginoides* was shorter than in previous seasons, mainly because of entry into the fishery of the Chilean fleet. This fishery was subject to a TAC of 3 500 tonnes (Conservation Measure 35/X). The total catch reported for this species was 3 703 tonnes, including 133 tonnes taken in research catches. The total catch of *Electrona carlsbergi* was 46 960 tonnes, well below the TAC of 245 000 tonnes (Conservation Measure 38/X). Directed fisheries on *Notothenia rossii*, *Patagonotothen guntheri*, *Notothenia gibberifrons*, *Chaenocephalus aceratus*, *Pseudochaenichthys georgianus* and *Notothenia squamifrons* were prohibited in 1991/92 under Conservation Measures 3/IV and 34/X. A summary of catches of all species from 1970 onwards is presented in Table 3 of Annex 5.

3.4 In the Indian Ocean sector, the only commercial fishing reported was from Division 58.5.1 (Kerguelen). The total catch consisted of 44 tonnes of *C. gunnari* and 7 492 tonnes of *D. eleginoides*. Fishing for *N. squamifrons* in Division 58.4.4 (Ob and Lena Banks) was prohibited under Conservation Measure 43/X.

REPORT OF THE WORKING GROUP ON FISH STOCK ASSESSMENT

3.5 The acting chairman of the Working Group on Fish Stock Assessment (WG-FSA), Dr Kock presented the report of the meeting which had been held at the CCAMLR Secretariat Offices in Hobart from 13 to 22 October, 1992.

3.6 The Report of the Working Group is attached in Annex 5.

3.7 WG-FSA reported there were no scientists present at the meeting who were familiar with the contents of some of the papers which presented assessments. WG-FSA attempted to take these

papers fully into account in its work, but in some cases, the Working Group was unable to evaluate them because some technical details of the analyses were insufficiently reported. In these cases, WG-FSA has referred the papers back to the authors for clarification and re-submission to a future meeting.

3.8 In reviewing the report, the Scientific Committee thanked WG-FSA for the considerable work which had gone into the report. The Committee particularly thanked the acting chairman for running the Working Group meeting when the Convener (Dr Everson) was unfortunately unable to attend.

CCAMLR Scheme of International Scientific Observation
(Annex 5, paragraphs 4.1 to 4.5)

3.9 The Scientific Committee endorsed the comments of WG-FSA. The Scientific Committee agreed that all vessels conducting any form of fishing should be covered under the Scientific Observation Scheme, but the highest priority for the placement of Scientific Observers was on commercial fishing vessels.

Review of Draft CCAMLR Scientific Observers Manual
(Annex 5, paragraphs 4.6 to 4.9)

3.10 The Scientific Committee endorsed the comments made by WG-FSA. The Scientific Committee expressed its appreciation for the considerable effort put into producing the manual by the Secretariat, and to many Members of the Scientific Committee and Working Groups for their contributions.

Data Requirements Endorsed by the Commission in 1991
(Annex 5, paragraphs 5.1 and 5.2)

3.11 Requests for various data from WG-FSA in 1991 (SC-CAMLR-X, Annex 6, Appendix E) were endorsed by the Scientific Committee and Commission. Data submitted to the Secretariat in response to this request are listed in Annex 5, Appendix D. Although some of the data requested by the Working Group had been submitted, there is a substantial amount of data still required (Annex 5, Appendix D).

Catch and Effort Statistics (Annex 5, paragraphs 5.3 to 5.7)

3.12 The Scientific Committee noted that STATLANT A and B data are still not being submitted to the Secretariat by the due date (September 30), and many of these data were still not submitted in time for the meeting of WG-FSA. This year, the necessary data could be compiled from the returns under the reporting requirements adopted under the various conservation measures in force. However, the STATLANT data cover any fisheries not subject to specific reporting requirements, and so their timely submission is essential. The Data Manager suggested that moving the due date for submission forward to 31 August would allow the Secretariat to determine which data are missing well ahead of the meeting of WG-FSA. Given this extra time the Secretariat would be able to seek these data from Members so that they would be available in time for WG-FSA.

3.13 The Scientific Committee requested the Data Manager to consult with Members in the intersessional period to determine if such a scheme could be arranged, and to report the results and recommendations from this review to the next meeting of WG-FSA for further consideration.

General Advice on the Management of Fish Stocks (Annex 5, paragraphs 6.237 to 6.245)

3.14 WG-FSA discussed the potential utility of effort controls as a means of controlling fishing mortality. These were seen as likely to be useful in controlling the rate of expansion of fishing effort on stocks for which new fisheries have recently begun and for which insufficient information was available for setting a TAC.

3.15 Effort controls may be particularly valuable in ensuring that the fishing season does not become excessively foreshortened. Some of the estimation methods in use by WG-FSA may become unreliable if the fishing season is very short. In such cases increasing effort will lead to increasing uncertainty about the status of the stocks.

3.16 The Scientific Committee endorsed these comments, but also noted WG-FSA's comments that the implementation of effort controls has a number of practical difficulties which will require consideration by the Commission.

Considerations of Ecosystem Management

Interactions with WG-Krill (Annex 5, paragraphs 7.1 to 7.7)

3.17 The Scientific Committee endorsed the comments of WG-FSA. The Scientific Committee reiterated the conclusion of WG-Krill-91/25 that there is still an urgent requirement for more detailed monitoring of the krill fishery to properly assess the magnitude of the fish by-catch problem, and to determine the locations and times of year when young fish are at greatest risk. The Scientific Committee also emphasised the need to ensure that future information should be submitted in accordance with the formats set out in the Draft Scientific Observers Manual along with full details of the sampling procedures employed according to the agreed guidelines (see SC-CAMLR-IX, Annex 5, Appendix F).

3.18 It was suggested that the Commission may need to consider measures which reduce the by-catch of fish in krill trawls.

Interactions with WG-CEMP (Annex 5, paragraphs 7.8 to 7.15)

3.19 The Scientific Committee endorsed the comments of WG-FSA on these matters.
Research Surveys

Workshop on the Design of Bottom Trawl Surveys

3.20 The Report of the Workshop on the Design of Bottom Trawl surveys is given in Annex 5, Appendix H. The Scientific Committee endorsed the comments and recommendations of WG-FSA, and thanked the Bundesforschungsanstalt für Fischerei (Federal Research Centre for Fisheries), Germany, for hosting the Workshop. The Scientific Committee agreed that the 'Draft Manual for Bottom Trawl Surveys' should be circulated by the Secretariat to all Members in the intersessional period for comment. A new draft will be prepared for final approval next year.

Recent and Proposed Surveys

3.21 The Scientific Committee noted that a Russian survey on *D. eleginoides* was carried out in the Shag Rocks/South Georgia area from May to July 1992 using two commercial longliners. The catch taken during the survey made up approximately 6% of the TAC set by the Commission for the

1991/92 season which had been exhausted in March 1992. It was noted that no provisions have been made to take these catches into account when considering a TAC for 1992/93.

3.22 A plan detailing the survey design and the objectives of this research cruise was not submitted to CCAMLR six months in advance as requested by the Commission in 1986 (CCAMLR-V, paragraph 60). As a result the research plan was not subject to scrutiny by the Scientific Committee and the Working Group. WG-FSA was unable to assess if the research plan set out in COMM CIRC 92/23 was directed to specific questions and gaps in knowledge addressed by the Working Group at its last meeting.

3.23 Fine-scale haul-by-haul data and length composition data from the research cruise were submitted to CCAMLR. Preliminary analyses of biological characteristics (age, reproduction) were provided in WG-FSA-92/13, 14 and 15. However, the Scientific Committee noted that the submission of biological data did not follow the guidelines and standards set out by WG-FSA earlier (SC-CAMLR-IX, Annex 5, paragraphs 249 to 254). It was noted that biological sample size was small compared with the approximate 20 000 fish taken.

3.24 The Scientific Committee noted the conclusion of WG-FSA that the information provided so far from these surveys contributed little to improve the assessments carried out by the Working Group during this year's meeting. The Scientific Committee reiterates earlier statements and the Commission's decision from 1986 that research plans should be submitted six months in advance to allow careful review of research proposals to ascertain that they address specific requests by the Scientific Committee and Working Groups (see also Scientific Research Exemption section following).

3.25 A bottom trawl survey was undertaken by the *Falklands Protector* in January 1992 with scientists from the UK, Germany and Poland participating.

DATA REQUIREMENTS

3.26 The Scientific Committee endorsed the list of data requirements specified by WG-FSA set out in Annex 5, Appendix D.

SCIENTIFIC RESEARCH EXEMPTION

3.27 The Scientific Committee noted the concerns expressed by various Members (CCAMLR-XI/9) in connection with the Russian research cruise on *D. eleginoides* in Subarea 48.3 during 1992.

3.28 This particular cruise commenced after closure of the fishery in accordance with Conservation Measure 35/X; the TAC of 3 500 tonnes set by this measure was exceeded as a consequence of catches during the cruise. The catch comprised approximately 6% of the TAC and had not been taken into account in the formulation of the TAC (Annex 5, paragraph 8.17).

3.29 While re-endorsing the need for research exemption provisions (CCAMLR-V, paragraphs 59 and 60), the Scientific Committee noted that there is still some uncertainty attached to their effective implementation.

3.30 The Scientific Committee consequently agreed that in the interest of reducing such confusion, some attempt should be made to clarify the scientific research exemption provisions as they currently stand.

3.31 As a first step, the Scientific Committee recommended that the status of scientific research exemption provisions as set out in CCAMLR-V, paragraph 60 should be such that they are formalised either as a Commission resolution or as a full conservation measure.

3.32 The Scientific Committee reiterates its concern that many vessels (including research vessels) are capable of taking large catches which may have a detrimental impact on the objective function of specific conservation measures (SC-CAMLR-VIII, paragraph 3.10).

3.33 The Scientific Committee drew the Commission's attention to apparent inconsistencies in interpretation of the exemption provisions as applied to research vessels and commercial or fishery support vessels engaged in scientific research (CCAMLR-V, paragraph 60(c); CCAMLR-VIII, paragraph 51 - see Annex 6). Definition of the latter is further confused by the stipulated requirement to register permanent research vessels that may engage in fishing for research purposes (CCAMLR-V, paragraph 60(a) and (b)), and by the fact that it is unclear whether it is only these vessels to which the additional requirements are to be applied.

3.34 For the reasons stipulated in paragraph 3.32 above, the Scientific Committee recommended that the scientific exemption review procedure described below should be applied to all vessels planning to undertake research on species, or in areas, subject to conservation measures. This application procedure shall only be invoked when research catch levels are anticipated to be

substantial. “Substantial” should be viewed as equivalent to the lowest commercial catch level of the species taken in any year in the area or subarea concerned, or 100 tonnes, whichever is the least. This qualification is necessary to ensure that research activities likely to result in inconsequential catches are not included in the exemption review process set out in the following paragraphs.

3.35 In the context of applying research exemption provisions to all vessels, the Scientific Committee sought further clarification by the Commission on the definition of “research vessels” as applied in the Registry of Permanent Research Vessels (CCAMLR-V, paragraph 60(a) and (b) - reproduced in Annex 6 of this report). The Scientific Committee emphasised the desirability of obtaining the details of all vessels subject to the scientific research exemption provisions as set out in subparagraph 60(b) of CCAMLR-V (Annex 6).

3.36 The Scientific Committee recommended that any Member intending to undertake research at the fishing level stipulated above and in accordance with subparagraph (c) of CCAMLR-V, paragraph 60 should submit a research plan to the Secretariat. Such plans should then be reviewed by the appropriate Working Group and advice on their scientific merits be provided to the Scientific Committee. To allow this process sufficient time to occur, submission of plans should be submitted to the Secretariat at least 30 days in advance of the appropriate Working Group’s planned next meeting or three months in advance of the annual Scientific Committee meeting whichever is the earlier.

3.37 It was felt, however, that the current statement and level of detail for submitted research plans (CCAMLR-V, paragraph 60(d)) should be viewed as little more than interim requirements. The Scientific Committee therefore tasked its Working Groups to develop guidelines and standardised formats for such plans. The standardisation of formats will provide for comparable review and evaluation of submitted research plans.

3.38 Having evaluated the submitted research plans, the Scientific Committee will formulate advice to the Commission on their scientific merits. Due account will be taken of the advice offered by the appropriate Working Groups in this regard.

3.39 The Scientific Committee again endorses the principle (CCAMLR-VIII, paragraph 51) that catches of all species taken during scientific research as outlined above should be considered as part of any prevailing TACs.

3.40 During the review, evaluation and acceptance of research plans, a catch reporting procedure equivalent to the finest-scale reporting provisions for commercial fisheries on the same species or in the same area, should be instituted. The implementation of catch reporting procedures

should occur when the appropriate Working Group or Scientific Committee are of the opinion that catches will comprise a discernible proportion of any prevailing TAC on the species, or in the area, concerned.

3.41 Submission of catch data in accordance with the above should reach the Secretariat within 180 days of the completion of the research.

3.42 Failure to submit required catch data should be viewed as a failure to fulfil the research exemption provisions.

NEW FISHERIES

3.43 Two notifications of new fisheries in Subarea 48.4 were received by CCAMLR; one from the USA (CCAMLR-XI/5) and one from Chile (CCAMLR-XI/7). Dr Holt reported that the US intention was to take *D. eleginoides* in fish pots which are used to capture bait for the crab fishery. However, during the initial trip of the US crab vessel in Subarea 48.3, few fish were captured and use of fish pots was discontinued (WG-FSA-92/29). It is believed unlikely that further attempts to catch *D. eleginoides* using fish pots will be made by this vessel in Subarea 48.4.

3.44 Dr C. Moreno (Chile) presented plans of a Chilean fishing company to conduct exploratory fishing operations for *D. eleginoides* using longlines in waters off the South Sandwich Islands (Subarea 48.4) during the 1992/93 fishing season (CCAMLR-XI/7). The proposed fishing activity will be undertaken during a 40-day period aboard the Chilean vessel *Friosur V*. The vessel will take a maximum of 240 tonnes of *D. eleginoides*. Dr Moreno extended an invitation for one scientist to participate as an invited observer on board the vessel.

3.45 The Scientific Committee supported the application to conduct the exploratory fishery, noting that the minimum effort possible was being applied (i.e., use of one vessel conducting only one trip of 40 days) and a maximum of 240 tonnes would be taken. The Scientific Committee agreed that the list of data to be collected should include information on the amount and composition of by-catch in the fishery. It was agreed that the participation of scientific observers aboard the vessel was essential.

EXPLORATORY FISHERIES

3.46 The Scientific Committee noted that the exploratory crab fishery had provided a useful example of the sequence of the steps that should be taken in association with a new fishery. It was felt that the advance notification of the start of the fishery, the provision of information about fishing operations and catches, and the plans to convene a workshop had been helpful in the Scientific Committee's evaluation of this exploratory fishery.

3.47 It was recalled that the provisions of Conservation Measure 31/X requiring notification of entry into a fishery and provision of information about the fishery ceased to apply at the conclusion of the Commission's annual meeting following initial notification from at least one Member. Members agreed that although there was an expectation that the provision of this type of information would continue once the fishery entered into an exploratory phase, a formal requirement no longer applied.

3.48 Some Members suggested that it would be desirable to formalise this process to ensure that any future new fisheries that may occur undergo similar assessments during their exploratory phase. Other Members believed that the need for such formal measures was less apparent.

3.49 The Scientific Committee agreed that as a general principle, the orderly development of new and exploratory fisheries was fundamental. Commercial catches should not be allowed to expand faster than the Scientific Committee is able to consider the implications of such expansion.

3.50 WG-FSA had discussed the various types of precautionary measures that could be implemented to promote the orderly development of new and exploratory fisheries (Annex 5, paragraphs 6.237 to 6.245). In this regard, it had recommended that when insufficient data were available with which to calculate a TAC, consideration should be given to imposing limits on fishing effort .

3.51 The Scientific Committee agreed that the topic of exploratory fisheries was one which merited further discussion at the 1993 meetings of the Scientific Committee and its Working Groups. Members were encouraged to develop and submit papers outlining possible approaches to this issue for consideration during the forthcoming year.

3.52 It was noted that the issues outlined above highlight the question of what management measures and research requirements are most appropriate when a fishery is operating under substantial uncertainty concerning the types and availability of data required for undertaking the desired single- or multi-species assessments.

3.53 It is the Scientific Committee's view that a precautionary approach is especially appropriate under circumstances of uncertainty, and the guidance of the Commission is solicited in advising the Scientific Committee of the types of analyses and management options that would be most useful to the Commission.

ASSESSMENTS AND MANAGEMENT ADVICE

3.54 Assessment summaries for the various fish stocks assessed by WG-FSA are presented in Appendix I of Annex 5.

Statistical Area 48 (South Atlantic)

Subarea 48.3 (South Georgia)

Notothenia rossii, *Patagonotothen guntheri*
and *Notothenia squamifrons* (Subarea 48.3)
(Annex 5, paragraphs 6.32 to 6.34, 6.83 to 6.88 and 6.89 to 6.91)

3.55 The Scientific Committee endorsed the advice of WG-FSA and recommended that all conservation measures for these species should remain in force.

Champtocephalus gunnari (Subarea 48.3)
(Annex 5, paragraphs 6.36 to 6.82)

3.56 The Scientific Committee endorsed the comments of WG-FSA. The Scientific Committee noted that a new survey carried out in 1992 by the UK confirmed that a dramatic drop in biomass in this stock occurred between 1989/90 and 1990/91. In view of this, the Scientific Committee agreed that the conservative management adopted by the Commission in 1991/92 was the most appropriate. Fish in 1990/91 were found to be in poor condition, with a lower than usual proportion in pre-spawning condition, which was probably the result of poor feeding due to a low abundance of krill in the area.

3.57 The 1992 survey indicates that there was a modest increase in the abundance of the stock, and that the fish have improved in condition.

3.58 The Scientific Committee agreed that the results from VPA analyses and stock projections from the VPA were unreliable and should not be used for assessing the current status of the stock.

3.59 WG-FSA used the age distributions and abundance estimates from the recent survey to calculate stock projections and a range of possible TACs. The Scientific Committee noted that these projections assumed that future recruitment to the stock would be similar to those estimated to occur before the recent decline in biomass. However, the observations of fish in poor condition which may have led to increased mortality and poor spawning performance means that this assumption may not be justified. The Scientific Committee considered that TACs calculated from these projections should be treated with caution. The lower 95% confidence interval of the projected catch using $F_{0.1}$ indicates a TAC of 15 200 tonnes.

3.60 The Scientific Committee noted that re-opening the fishery for *C. gunnari* would lead to a by-catch of other species, and that only limited data (from Polish catches) on the by-catch in earlier fishing on *C. gunnari* were available. These data indicate that with bottom trawling, the catch of *C. gunnari* would need to be limited by the by-catch consideration, to six-times the MSY calculated for *N. gibberifrons*. This results in a TAC of 8 800 tonnes.

3.61 Analyses undertaken in 1990 showed that the by-catch of *N. gibberifrons* in pelagic trawls for *C. gunnari* is potentially of the order of 3 to 16%. This leads to a range for a possible TAC for *C. gunnari* of 9 200 to 15 200 tonnes, if MSY for *N. gibberifrons* is not to be exceeded.

Management Advice

3.62 In light of the uncertainty surrounding the current status of the stock the Scientific Committee recommended that a conservative approach to management is appropriate in the immediate future.

3.63 Some Members, taking into account the uncertainty about current levels of recruitment, the modest increase in abundance even after two years with negligible catches, and the likelihood that a fishery this coming season would rely heavily on two year old fish, considered that the current conservation measure prohibiting directed fishing on *C. gunnari* in Subarea 48.3 should be continued for at least one more year. Further monitoring of the stock should be carried out to observe its rate of recovery.

3.64 Other Members considered that re-opening the fishery with a low TAC would be possible.

3.65 Dr Shust considered that a TAC of 12 000 tonnes, which is at the middle of the range given above, would be appropriate.

3.66 Some Members considered that a TAC of this magnitude could result in the by-catch of one or more of *N. gibberifrons* or *C. aceratus* or *P. georgianus* exceeding the MSY for these species, even if the fishery was to be restricted to pelagic trawls (Annex 5, paragraph 6.72). It was emphasised that *P. georgianus* may be particularly vulnerable to pelagic trawls because it is believed to undertake vertical migrations within the water column.

3.67 Dr Shust said that a higher by-catch of *N. gibberifrons* could be acceptable because of the likely continued improvement in the stock (Annex 5, paragraph 6.95).

3.68 If the fishery is re-opened, the Scientific Committee recommended that the following measures be applied:

- (i) bottom trawling to be prohibited;
- (ii) a TAC set at 9 200 tonnes;
- (iii) an effort and biological reporting system similar to that specified in Conservation Measure 37/X be instituted which should also include information on the proportion of by-catch species;
- (iv) the fishing season to be closed from 1 April to the end of the following Commission meeting to protect the spawning stock; and
- (v) the mesh regulations to be maintained (Conservation Measure 19/IX).

Notothenia gibberifrons, *Chaenocephalus aceratus*
and *Pseudochaenichthys georgianus* (Subarea 48.3)
(Annex 5, paragraphs 6.92 to 6.101)

3.69 The Scientific Committee endorsed the recommendations of WG-FSA.

Management Advice

3.70 Stocks of *N. gibberifrons* and *C. aceratus* have apparently recovered to a high proportion of their initial levels. *P. georgianus* may not have recovered to the same extent. A

re-opening of the fishery on these species might be considered. However, all three species have been taken in quantity only by bottom trawling in the commercial fishery. None of these species can be taken without a significant by-catch of other species.

3.71 The Scientific Committee recommended that a directed fishery on these three species should remain prohibited because the potential yields could be entirely taken as by-catch in the *C. gunnari* fishery.

Electrona carlsbergi (Subarea 48.3)
(Annex 5, paragraphs 6.102 to 6.107)

3.72 The Scientific Committee endorsed the advice from WG-FSA on this species.

Management Advice

3.73 The Scientific Committee has difficulty in providing advice based on data and assessments which are no longer current. The fishery in 1991/92 was subject to Conservation Measure 38/X.

3.74 On the basis of the known biological characteristics of the stock, the current level of fishing on *E. carlsbergi* in Subarea 48.3 may be sustainable. However, the fishery is now based on a stock for which the age structure and biomass are unknown. Substantial by-catches of other myctophids are also taken, for which few biological data are available. Thus, the Scientific Committee was unable to advise on an appropriate TAC for the current fishery. The Scientific Committee reiterated the need for further surveys to estimate current biomass (SC-CAMLR-X, Annex 6, paragraph 7.149).

Dissostichus eleginoides (Subarea 48.3)
(Annex 5, paragraphs 6.108 to 6.176)

3.75 The Scientific Committee endorsed the advice and recommendations of WG-FSA for this stock.

3.76 WG-FSA undertook a substantial review of the state of biological knowledge of this species as part of the assessment. This review is summarised in Annex 5, paragraphs 6.118 to 6.140. and Annex 5, Appendix G.

3.77 The Scientific Committee endorsed the list of data requirements and future research needs given in Annex 5, paragraph 6.176.

3.78 The Scientific Committee noted with appreciation the submission of haul-by-haul data from the fishery. This detailed data has allowed considerable refinement of the estimates of stock abundance using a range of methods. Last year, the range of estimates of stock abundance was 8 000 to 610 000 tonnes. The improvements in data has allowed this range to be refined to 8 000 to 160 000 tonnes. Further fine-scale data collection should allow a steady improvement in assessments, particularly if experiments on hook selection factors could be carried out by ensuring that different hook types were fished on the same grounds at the same time.

Management Advice

3.79 In spite of the improvements in estimates of abundance, considerable uncertainty still remains about the size of this stock and its sustainable yield. Given the wide range of possible TACs the Scientific Committee considered that a conservative approach should be taken in setting a TAC. The Scientific Committee considered that a stock biomass in excess of 45 000 tonnes is unlikely. Accordingly, the Scientific Committee recommended a TAC in the range 750 to 5370 tonnes. Given that the most recent TAC is near the middle of this range, the Scientific Committee agreed that a TAC similar to that set in 1991/92, under Conservation Measure 35/X, would be appropriate. It was also agreed that it is desirable to avoid large year to year variations in TAC when possible. The Scientific Committee recommended that Conservation Measure 35/X, with an appropriate alteration dependent on the setting of a new TAC, should be retained for the 1992/93 season.

3.80 The Scientific Committee noted that the TAC in 1991 was reached after four months. It was agreed that further expansion of the number of vessels taking part in the fishery would not be appropriate, as this would lead to even earlier closure of the fishing season, which could introduce extra complications into the CPUE and other fine-scale data, with consequent deleterious effects on assessments.

Subarea 48.2 (South Orkney Islands)

Champscephalus gunnari (Subarea 48.2)
(Annex 5, paragraphs 6.181 to 6.199)

3.81 Dr Shust queried the assumption used in one set of biomass projections, carried out for this stock by WG-FSA, that the recruitment to the stock was assumed to be zero for a number of years. He considered that the validity of this assumption was doubtful and use of it would lead to a substantial underestimate of current stock abundance and to a TAC which would be too low.

3.82 The acting chairman of WG-FSA explained that the samples collected during research surveys contained very few young fish. He further explained that WG-FSA had used three different scenarios relating to recruitment in order to evaluate the likely range for the current status of the stock. Mr Balguerías concurred, noting that data from both the former USSR fishery and the results of trawl surveys carried out by Spain indicate that one strong cohort supported the fishery over a number of years.

3.83 With this clarification, the Scientific Committee endorsed the advice and recommendations of WG-FSA on this species.

Management Advice

3.84 The Scientific Committee noted the large number of assumptions and uncertainties associated with both the projections and the maximum yield calculations for this stock. The Scientific Committee agreed that a conservative approach would be appropriate for managing this stock. The Scientific Committee recommended that the fishery for *C. gunnari* in Subarea 48.2 remains closed until a survey is conducted and a more accurate estimate of the status of the stock has been obtained.

Notothenia gibberifrons, *Chaenocephalus aceratus*,
Pseudochaenichthys georgianus, *Chionodraco rastrispinosus*
and *Notothenia kempfi* (Subarea 48.2) (Annex 5, 6.200 to 6.202)

3.85 The Scientific Committee endorsed the advice from WG-FSA on these species. In light of the Scientific Committee's recommendation for continued closure of the *C. gunnari* fishery, the re-opening of a mixed species fishery in Subarea 48.2 was not considered.

Subarea 48.1 (Antarctic Peninsula)
(Annex 5, paragraphs 6.203 to 6.206)

3.86 The finfish fishery in the Antarctic Peninsula subarea has been closed during the 1991/92 season (Conservation Measure 41/X). The Scientific Committee expressed concern about the reported catch of 50 tonnes of *E. carlsbergi* taken in Subarea 48.1. The Scientific Committee endorsed the comments of WG-FSA on this subarea.

Management Advice

3.87 Pending further information on the fish stocks in the area, the Scientific Committee recommended that conservation measures in force should be maintained (Conservation Measure 41/X) until a research survey is carried out to enable the status of the fish stocks in Subarea 48.1 to be re-assessed.

Statistical Area 58 (Indian Ocean)

Division 58.5.1 (Kerguelen)

Dissostichus eleginoides (Division 58.5.1)
(Annex 5, paragraphs 6.208 to 6.214)

3.88 The catch in 1991/92 of this species increased markedly over previous years to 7 492 tonnes. This is the highest catch of this species ever recorded in this area. The average annual catch between 1984/85 and 1990/91 was 2 210 tonnes, and the previous largest catch was 6 677 tonnes in 1984/85 when the trawling grounds on the western shelf area were first exploited. 6 787 tonnes of the 1991/92 catch was taken mostly on the trawling grounds in the northern part of the plateau, which were discovered in the 1990/91 season. The exploratory longline fishery was conducted in the western part of the plateau (at 400 to 600 m) by two vessels to assess the effects of this type of fishery on *D. eleginoides*, the efficiency of the regulations imposed and the measures to minimise incidental mortality of seabirds. 705 tonnes of fish were caught by this method.

3.89 Dr G. Duhamel (France) agreed with the conclusions reached by WG-FSA with respect to its analyses and recommendation for the trawling grounds for *D. eleginoides* to the west of Kerguelen. However, he considered that more careful analysis of the CPUE data was required, particularly to take into account catch location. He considered that it was not valid to extrapolate the advice from the western trawling ground to the new trawling ground to the north of Kerguelen.

Management Advice

3.90 The Scientific Committee is concerned at the rapid expansion of the fishery for *D. eleginoides* in Division 58.5.1. The Scientific Committee recommended a catch at a similar level to 1991/92 (1 100 tonnes) should be set for the western trawling grounds. The Scientific Committee also recommended that a catch level be established for the northern trawling grounds substantially below the catch taken in the 1991/92 season.

Notothenia rossii (Division 58.5.1)
(Annex 5, paragraphs 6.215 to 6.216)

3.91 The Scientific Committee endorsed the recommendations of WG-FSA. The Scientific Committee recommended that existing measures prohibiting directed fishing should be retained.

Notothenia squamifrons (Division 58.5.1)
(Annex 5 paragraphs 6.217 and 6.218)

3.92 The Scientific Committee endorsed the recommendations of WG-FSA.

Chamsocephalus gunnari (Division 58.5.1)
(Annex 5 paragraphs 6.219 and 6.220)

3.93 The Scientific Committee endorsed the advice of WG-FSA without comment.

Division 58.4.4 (Ob and Lena Banks)

Notothenia squamifrons (Division 58.4.4)
(Annex 5, paragraphs 6.222 to 231)

3.94 The Scientific Committee endorsed the recommendations of WG-FSA.

3.95 Dr Yakovlev stated that Ukraine was intending to conduct surveys to estimate the biomass of the stocks on these banks in the coming year. An *ad hoc* group was set up to review the Ukrainian cruise design before the end of this Commission meeting.

Management Advice

3.96 The results calculated by WG-FSA indicate a stock in 1990 of about 6 000 tonnes on Lena Bank and 3 500 tonnes on Ob Bank. As the species is relatively slow growing, the stock size is likely to have changed little since 1990. Although it appears that the stock could sustain a fishery of a few hundred tonnes, the Scientific Committee recommended that a survey to determine age structure and stock size at both Ob and Lena Banks should be undertaken, and a revised assessment carried out before considering re-opening the fishery.

Pleuragramma antarcticum (Division 58.4.2)
(Annex 5, paragraphs 6.232 to 6.236)

3.97 The Scientific Committee endorsed the comments of WG-FSA on this species. The Scientific Committee recommended that no fishery should be undertaken on *P. antarcticum* in the CEMP Integrated Study Regions (ISRs).