NEW AND EXPLORATORY FISHERIES

9.1 Three conservation measures on new fisheries were in force during 1998/99, but only in respect of one of these (Conservation Measure 162/XVII) was fishing carried out. Seven conservation measures relating to exploratory fisheries were in force during 1998/99, but only in respect of four of these (Conservation Measures 151/XVII, 166/XVII, 167/XVII and 169/XVII) was fishing carried out.

9.2 For those new and exploratory fisheries where fishing occurred in 1998/99, in all but one case, the numbers of days fished and the catches reported were very small. The exception was the exploratory fishery for *Dissostichus* spp. in Subarea 88.1, conducted under Conservation Measure 169/XVI, where two vessels fished for a total of 76 days in 38 fine-scale rectangles taking 298 tonnes of *D. mawsoni*.

9.3 The Scientific Committee noted that all data for each active new or exploratory fishery in 1998/99 required under Conservation Measure 65/XII had been submitted to the Secretariat by the due date. A summary of background information is given in Annex 5. Table 21 (Annex 5) indicates that in all but a few cases, either no fishing, or at most a very small amount of fishing, had actually been carried out for the new or exploratory fisheries that had been notified. WG-FSA had noted that increasing amounts of time had been spent each year developing advice on precautionary limits for such fisheries. Particular concern was expressed that WG-FSA had received virtually no new information on *Dissostichus* spp. stocks in a number of subareas and divisions. This was in spite of the fact that new or exploratory fisheries had been notified for these areas, in some cases over the previous four fishing seasons. The concern is further heightened by the fact that substantial amounts of IUU fishing are believed to have occurred in these areas.

9.4 Before discussing the individual notifications, especially in relation to fisheries for *Dissostichus* spp., WG-FSA had noted that the distinction between new and exploratory fisheries was somewhat blurred. In view of this similarity between new and exploratory fisheries, the notifications under the two categories had been discussed together.

9.5 The following notifications had been received at the Secretariat by 28 July 1999, the due date for their consideration during the current year:

- new longline fishery for *D. eleginoides* in Subarea 48.6 and Division 58.4.4, notified by South Africa (CCAMLR-XVIII/9);
- new trawl fishery in Division 58.4.2, notified by Australia (CCAMLR-XVIII/11);
- new longline fishery in Division 58.4.4 outside the South African EEZ, notified by Uruguay (CCAMLR-XVIII/14);
- exploratory trawl fishery in Divisions 58.4.3 and 58.4.1, notified by Australia (CCAMLR-XVIII/12);
- exploratory longline fishery for *Dissostichus* spp. for Subareas 58.6, 88.1 and 88.2, and Divisions 58.4.4 and 58.5.1 outside the EEZs of South Africa and France, notified by Chile (CCAMLR-XVIII/13);
- exploratory longline fishery for *Dissostichus* spp. in Subarea 88.1, notified by New Zealand (CCAMLR-XVIII/10); and
- exploratory longline fishery for *D. eleginoides* in Subarea 58.6 outside the EEZs of South Africa and France, notified by South Africa (CCAMLR-XVIII/8).

9.6 In addition, the existence of one notification had been made known to the Secretariat by

the due date although the full submission had not arrived until later. This was the new and exploratory longline fisheries for *D. eleginoides* in Subareas 58.6 and 58.7 and Divisions 58.4.3, 58.4.4, 58.5.1 and 58.5.2 outside the EEZs of South Africa, Australia and France, that was notified by France (CCAMLR-XVIII/20).

9.7 The European Community had submitted a notification (CCAMLR-XVIII/21) on behalf of Portugal for new and exploratory fishing for *Dissostichus* spp. in Subareas 48.6, 58.6, 88.1, 88.2 and Divisions 58.4.3 and 58.4.4 outside the Australian, French and South African EEZs. This had only been received by the Secretariat on 1 October 1999 (Annex 5, paragraphs 4.20 to 4.23).

9.8 The UK had submitted a notification of research vessel activity when the total catch is expected to be >50 tonnes (WG-FSA-99/41). Since this related to a study using a new method in an existing fishery, the Scientific Committee considered this under Agenda Item 8, Scientific Research Exemption.

9.9 The Scientific Committee noted that Conservation Measures 31/X (new fisheries) and 65/XII (exploratory fisheries) clearly specify the type of information that should be provided as part of the notification. Apart from the proposed new fishery in Division 58.4.2 and the proposed exploratory trawl fisheries in Divisions 58.4.1 and 58.4.3, the information provided in the notifications submitted for 1999/2000 was seriously deficient in terms of the requirements set out in paragraph 3 of Conservation Measure 31/X and paragraph 2 of Conservation Measure 65/XII. The Scientific Committee noted that this had seriously jeopardised the ability of WG-FSA to provide advice on the likely consequences to the target and by-catch species, should the notified fisheries commence.

Calculation of Precautionary Catch Levels

9.10 WG-FSA used the same procedure for the calculation of precautionary catch levels as it had used at its 1998 meeting (SC-CAMLR-XVII, Annex 5, paragraph 9.37) and compared the results with a refined version that had been developed at the meeting. The refinement involved the use of an adjustment based on relative areas of seabed which may be classified as recruitment areas.

9.11 A further refinement was to adjust the mean recruitment further by scaling it by the relative levels of CPUE recorded for different areas compared to CPUE in Subarea 48.3. This was thought to reduce the level of uncertainty associated with the estimates. In the absence of CPUE data for areas notified for new or exploratory fisheries, the assessments were undertaken using the relative CPUE from adjacent areas. This meant using CPUE data from Subarea 88.1 for Subarea 88.2, and CPUE data from Division 58.4.4 for Division 58.4.3.

9.12 For assessments for the trawl fishery in Division 58.4.2 and the fisheries proposed for Divisions 58.4.1 and 58.4.3, WG-FSA had prorated the estimated recruitment from that observed at Heard and McDonald Islands.

9.13 WG-FSA drew the attention of the Scientific Committee to the results of a trawl survey on BANZARE Bank in Divisions 58.4.1 and 58.4.3 in which only very low abundances of *Dissostichus* spp. had been found.

9.14 New biological information, detailed in Annex 5, paragraphs 4.41 to 4.55, was available for a few localities and was incorporated into the assessments. The results of the GYM projections are set out in Annex 5, Table 27.

9.15 In reviewing the results of the GYM calculations, WG-FSA had agreed that in a number of cases the calculated yield levels were far in excess of any possible precautionary catch levels

appropriate for those subareas or divisions. WG-FSA had noted that the calculations had used agreed methods incorporating assumptions that it had believed to be the most appropriate given the available information. The instances of clearly inappropriate calculated yields were therefore taken to indicate that the methods and assumptions themselves must be flawed. Having spent a significant amount of time on the analyses and checking the results, WG-FSA decided that it could not recommend precautionary catch levels using the calculated yields in Annex 5, Table 27 for new and exploratory fisheries.

9.16 The procedure had originally been developed by WG-FSA in an attempt to investigate the possible effects of IUU catches. WG-FSA agreed that it was no longer appropriate to use these methods for estimating precautionary yield levels for new and exploratory fisheries for *Dissostichus* spp.

9.17 WG-FSA had agreed that the only methods that were likely to result in reliable estimates of precautionary catch levels were those that were based on estimates of recruitment to the fishery obtained for the actual area subject to notification of a new or exploratory fishery. If such recruitment estimates were available, together with estimates of seabed area over which the recruits are found and catch rate data for any fishing carried out in the area, the assessments based on them would be similar in nature to those carried out in Subarea 48.3 and Division 58.5.2.

9.18 WG-FSA had stressed the importance of full compliance with Conservation Measure 65/XII, which explicitly requires submission of data in accordance with a data collection plan developed by the Scientific Committee for that area and the submission of a research and fisheries operation plan by the Member making the notification. It was agreed that submission of a research plan considered acceptable by the Scientific Committee should be a prerequisite to the commencement of any future new or exploratory fishery (paragraph 7.23).

9.19 Due to its other assessment tasks, WG-FSA did not have sufficient time to develop a generic science plan for new and exploratory fisheries, but had provided outline requirements in Annex 5, paragraphs 4.67 to 4.71. In this context, it had repeated its recommendation of last year that research surveys to estimate biomass should be included in the very early stages of the development of new and exploratory fisheries for *Dissostichus* spp. (SC-CAMLR-XVII, Annex 5, paragraph 4.76).

9.20 The Scientific Committee considered how to incorporate this research activity into the development plans for new and exploratory fisheries. It was accepted that two approaches were needed:

(i) research surveys to estimate standing stock and recruitment; and
(ii) a sampling design to be implemented during commercial fishing operations.

9.21 The requirements of research surveys have been considered in detail in the past and the Scientific Committee accepted that further comment was unnecessary at this stage.

9.22 There was considerable discussion about suitable sampling designs and how they might be implemented during commercial fishing. The Scientific Committee took as an example the recent prospecting survey by Chile to Subareas 48.1, 48.2 and 88.3 (SC-CAMLR-XVI, paragraphs 9.31 to 9.37). Two considerations were paramount:

(i) a desire to obtain objective data from normal commercial operations; and
(ii) a need to obtain information over as large an area as possible.

9.23 In discussing the matter the following key points arose:

(i) the research and fishing plan should be an integral part of the notification;

(ii) the plans should be reviewed annually;

(iii) the reasons behind the plan should be made clear to commercial operators;

(iv) the plan should not be so complex as to jeopardise efficient commercial fishing operations; and

(v) the sampling design should take full account of all by-catch species.

9.24 The Scientific Committee considered it a high priority to develop these ideas further and Dr Constable agreed to convene an informal group to consider the matter. The group was also requested to consider precautionary catch limits for the current season. The discussions of the subgroup are reflected below.

Fisheries-based Research Plan

9.25 The Scientific Committee noted the advice of WG-FSA that new and exploratory fisheries should be accompanied by research activities (Annex 5, paragraphs 4.62 to 4.71). In the past, this has been recommended to be in the form of fisheries-independent surveys of recruitment of young *Dissostichus* spp. The Scientific Committee agreed that fishing vessels undertaking new or exploratory fisheries are likely to be the only vessels able to undertake research in some of the proposed areas until large surveys can be coordinated amongst several institutions. Surveys of *Dissostichus* spp. have been undertaken in the past as part of the early stages in some fisheries, e.g. longline fishing for *D. eleginoides* in Subarea 48.4, crab fishing in Subarea 48.3, and trawl fishing in Division 58.4.3. These surveys required sampling across the wider area of interest in order to provide, at least, estimates of the average density in the area.

9.26 Research plans should be submitted for each area for which a new or exploratory fishery is intended. The Scientific Committee agreed that research plans were necessary for the new and exploratory fisheries proposed this year. This is because few data are available for undertaking assessments in the areas for which fishing has been proposed. Assessments are urgently required to identify the appropriate catch levels for these developing fisheries. The Scientific Committee agreed that the proposal suggested by WG-FSA (Annex 5, paragraphs 4.67 to 4.71) provides a suitable basis for developing such a plan. It has been proposed that, for the coming year, fishing vessels undertake research activities during the period they are prospecting in the new or exploratory fishing grounds.

9.27 The components of the fisheries-based research activity proposed for this year include:

(i) the identification of small-scale research units (SSRUs) for assessing the relative density of *Dissostichus* spp. using CPUE;

(ii) measures to ensure:

(a) sufficient shots are undertaken in each area to provide the statistical power for detecting differences in *Dissostichus* spp. density that will influence management advice on catch limits in each area;

(b) the effort is distributed over the whole area in order to ensure the CPUE is most likely to reflect the average density of fish in the SSRU; and

(c) minimum characteristics of each haul needed for maintaining a minimum standard sampling methodology.

9.28 The Scientific Committee noted that the research activity would be desirable in successive years in order to provide all of the information necessary to characterise the distribution of the stocks in the different statistical and biological units.

9.29 The Scientific Committee recommended to extend to all areas for new and exploratory fisheries the delineation of SSRUs provided by WG-FSA for Subareas 58.6 and 58.7 and Division 58.4.4 (Annex 5, paragraph 4.68).

9.30 In specifying research areas, the Scientific Committee recognised that terminology concerning areas is becoming confusing. The following definitions are given:

Subarea	A CCAMLR statistical subarea for which catches are reported. Catches are not reported for subareas when these are divided into divisions.
Division	Some subareas have been divided into divisions. Such divisions are CCAMLR statistical divisions for which catches are reported.
Fine-scale rectangles	These are areas defined in conservation measures for catch reporting and, in some measures, to limit the level of catch in localised areas, thereby reducing the potential for localised depletion. Such rectangles are defined as 0.5° latitude by 1° longitude (approximately 30 x 30 n miles).
SSRUs	These are newly defined this year for the purposes of a fishery-based research plan for new and exploratory fisheries such that the area is equivalent to a survey stratum and that research hauls be placed, preferably at random, throughout the unit. Such units are much greater in size than fine-scale rectangles but smaller than statistical subareas or divisions. They are in the order of 100 to 300 n miles in their dimensions.

9.31 The details of each SSRU are given in Table 6 and shown in Figure 1.

9.32 The Scientific Committee considered that the research proposal for a new trawl fishery in Division 58.4.2 was appropriate for that fishery (CCAMLR-XVIII/11). This proposal requires some flexibility in the placement of the research operation, but the approach is consistent with the dimensions of the SSRUs described above.

9.33 The Scientific Committee recognised that a common sampling methodology is required for all research units to ensure a common distribution and density of samples in the different fishing grounds, including the application of these requirements to both longline and trawl fisheries. As a result, it should be possible to obtain a coherent set of data that will enable analyses of the distribution and some aspects of the dynamics of these stocks.

9.34 The Scientific Committee discussed whether to determine the data requirements for individual SSRUs as a whole or whether requirements should be applied to each vessel when in the area. The Scientific Committee agreed that each vessel should have a minimum requirement per research unit and that such a minimum requirement should facilitate the detection of broad differences between areas irrespective of the number of vessels undertaking the fisheries-based research.

9.35 The Scientific Committee used the analysis of WG-FSA (Annex 5, paragraph 4.69, Figure 3 and Table 29) to determine the number of hauls required per research unit. This analysis was based on the 1992 haul-by-haul data from Subarea 48.3, the earliest year when haul-by-haul data were available. The Scientific Committee noted that small differences will be difficult to detect in the early stages of this plan. It agreed that 20 research hauls per research unit will be needed by each vessel operating in the unit. This will enable comparisons of the relative densities between units and with Subarea 48.3. This level of sampling should be able to detect differences between areas which are greater than 20%. The Scientific Committee noted that little progress would be made in the assessment of relative abundance and other aspects of the biology and ecology of *Dissostichus* spp. in these units if there were less than 20 research

hauls undertaken in a research unit.

9.36 For the 1999/2000 season, the Scientific Committee considered that all research hauls should be separated from each other by a minimum of 10 n miles. Such a separation should be measured from haul centres. This should ensure that the research hauls provide a wide coverage across the research unit and enable the best opportunity for estimating the average CPUE across the unit. In order to standardise the hauls, the Scientific Committee agreed that a haul should comprise at least 3 500 hooks at a station and that the soak time (time from the end of the set to the beginning of the haul) should be no less than six hours.

9.37 The Scientific Committee agreed that all vessels in new and exploratory fisheries must have scientific observers present, subject to the requirements of the Commission, during these activities and that all the information specified in the *Scientific Observers Manual* should be collected during the research hauls, as well as during the commercial activities in these research units. The Scientific Committee also agreed that the following information should be collected:

(i) effort: in the case of longlines this will include the positions and depths of the beginning and end points of every line set in a haul, total number of hooks in the haul and the soak time from the end of the set to the beginning of hauling. In the case of trawling, it will include the location and depth of the beginning and end points in the haul, the length of the tow (including deviations from a straight line) and the characteristics of the net;

(ii) catch: estimate of the total green weight and number of all fish species in the catch. For longlines, green weight should be estimated from individually weighing all fish in the research catch. In trawl fisheries, catch weights up to about 1 tonne should be measured by weighing directly a number of bins of fish and prorating by the total number of bins. For catches over 1 tonne, estimates by the master or from factory production records should be used;

(iii) bait: the type of bait used on longlines;

(iv) conditions: the sea and cloud conditions during deployment;

(v) biological information: all fish in a haul up to 100 fish to be measured and biological characteristics to be obtained in accordance with the *Scientific Observers Manual* (in particular length, weight, sex and maturity). Otoliths and scales should be sampled in a way that ensures representative sampling from all lengths of fish in the catch. A method for randomly sampling the fish should be applied when only a subsample of fish from the catch is taken for these measurements; and

(vi) by-catch: all by-catch should be recorded (number and mass by species), including estimates of by-catch released or lost prior to landing.

9.38 The Scientific Committee agreed that this research plan could be undertaken during commercial activities, such that research hauls could be interspersed with commercial hauls. This agreement was based on the understanding that haul-by-haul data from observers would be made available from all commercial and research hauls in these fisheries to CCAMLR. Also, the Scientific Committee noted that a haul would only qualify as a research haul if it satisfies all the criteria described above concerning the haul characteristics, distance from other research hauls and the amount of biological information available from the haul.

9.39 The Scientific Committee agreed that results from the research plan are a prerequisite for beginning assessments of the status of stocks in areas of new and exploratory fisheries. The Scientific Committee agreed that the research plan should be a necessary component of activities by vessels undertaking new or exploratory fisheries in the SSRUs. The Scientific Committee

noted that the simplest application of the research plan would be to have it undertaken in a SSRU prior to beginning commercial prospecting in that unit. It also noted that some prospecting may reveal that few *Dissostichus* spp. are available in some research units. In such cases, the research plan may be unnecessary in determining that insufficient fish are present to support a fishery.

9.40 The Scientific Committee agreed that an alternative approach may be to enable some prospecting prior to requiring the research plan to be undertaken. In this case, the Scientific Committee agreed that prospecting to the level of 10 tonnes of *Dissostichus* spp. catch or 10 hauls in a SSRU, whichever is triggered first, could be an appropriate limit to initial prospecting prior to requiring the research plan to be undertaken in that unit. If a vessel wished to continue prospecting in the research unit, then it should be required to undertake the research plan prior to leaving the area. This is important to ensure that the data from all shots are comparable without being confounded by time.

9.41 If a vessel leaves a research area and subsequently returns, catch or hauls achieved in previous periods still contribute to triggering the research plan. The research plan would need to be completed in accordance with paragraph 9.40.

9.42 The Scientific Committee agreed that no exemptions from conservation measures need to be applied to this research plan. Thus, the Scientific Committee agreed that Conservation Measure 29/XVI should be complied with and that any catch of the research hauls should be counted toward catch limits. It was noted that some of the SSRUs overlap with EEZs. In these areas, the undertaking of the research operation will require the cooperation of the relevant authorities.

9.43 The Scientific Committee considered that the research plan described here is the first step to developing a fisheries-based research plan that will assist with assessments in the future. Currently, there are few research programs planned for the coming fishing season that can be used in assessments next year. The Scientific Committee agreed that the plan will need to be reviewed next year in order to ensure that fisheries-based research can continue to be used in the assessment process.

Catch Limits

9.44 Four main options for establishing precautionary catch levels were considered by the Scientific Committee:

(i) use this year's assessments by WG-FSA as a guide to setting precautionary catch levels, particularly for *D. eleginoides* (Table 7);

(ii) recommend that the catch levels adopted by the Commission last year should remain until more information is available (Table 7);

(iii) identify a maximum catch for each statistical area that would enable the conduct of the fisheries-based research plan in the SSRUs in that area; or

(iv) recommend zero catches until fisheries-independent research is undertaken to provide sufficient data for an assessment.

9.45 The Scientific Committee noted that the lower catch levels provided in the assessments of yield by WG-FSA this year do not raise concern. In contrast, the greater catch levels do raise concern, particularly for areas with continental shelves and for Division 58.4.3 where a trawl survey on BANZARE Bank in that area did not find many *Dissostichus* spp. (Annex 5, Table 27). The Scientific Committee also noted that the catch levels in the respective areas for

new and exploratory fisheries need to be precautionary until sufficient information is available to provide an assessment. This is consistent with the intent of the conservation measures on new and exploratory fisheries. If catches are too great in the early stages of a fishery, then the status of the stock may be jeopardised if the stock is only small, and the long-termsustainability of the fishery will be diminished.

9.46 Given the uncertainty, the Scientific Committee considered that the assessments from last year may be a better starting point. However, these were based on many of the same assumptions as this year's assessments. The Scientific Committee noted that the discount factors applied in the past (0.45 for *D. eleginoides* and 0.3 for *D. mawsoni*) may not have been appropriate for all areas. CPUE estimates for some of the new and exploratory fisheries areas are lower than these levels (Annex 5, Table 27).

9.47 The Scientific Committee noted that the longline fishery for *Dissostichus* spp. in Subarea 48.4 began with a fixed low level of catch that enabled prospecting and research, allowed the vessel to try to recover costs, but recognised the potential low abundance of *Dissostichus* spp. in that area. This was used as the basis for the third option. The Scientific Committee agreed that a maximum catch per statistical area would be better than a catch limit per vessel because of the potential for a large number of vessels to undertake prospecting in the same areas, notably Division 58.4.4. Alternatively, the Commission may wish to restrict the number of vessels entering areas of new and exploratory fisheries.

9.48 In addition, the Scientific Committee noted that it may be possible to introduce a minimum CPUE rate that needs to be achieved in order to enable continued prospecting in a small-scale or fine-scale area. Such a scheme was applied in Subarea 48.4 during the initial development of the longline fishery described above. The Scientific Committee agreed that such a measure could help protect local stocks if the catch levels set for an area are too high.

9.49 The Scientific Committee noted that spreading of effort using fine-scale area limitations is going to be a very important component of measures for new and exploratory fisheries this year. The Scientific Committee agreed that the fine-scale rectangle limitation of 100 tonnes should remain as a means of protecting local stocks from depletion in new and exploratory fisheries.

9.50 The Scientific Committee considered that new fisheries proposed for Divisions 58.5.1 and 58.5.2 outside of the EEZs were unlikely to be viable as a result of the very small amount of fishable grounds in those areas (Annex 5, Table 27).

9.51 The Scientific Committee examined the proposal for the trawl fishery for Division 58.4.2. It agreed that the proposed catch limits of 500 tonnes per species were a concern. However, for the coming year and given the information presented in the proposal, the Scientific Committee could not provide additional advice on alternative values. This level of catch per species was considered acceptable for the coming season for the following main reasons:

(i) the area to be explored is very large (over 1 000 n miles of coastline);

(ii) midwater trawling will protect the rich and diverse benthic communities and allow significant refuge for the target species;

(iii) a total catch limit of 1 500 tonnes means not all nominated species will have catch levels of 500 tonnes; and

(iv) previous annual catches of some of the species of similar or greater magnitude have not appeared to have any deleterious effect on the stocks.

9.52 The Scientific Committee agreed that, in order to spread fishing effort for *D. mawsoni* in

the proposed trawl fishery, the catch of this species be subdivided between three smaller units of Division 58.4.2 according to 10° longitude sections identified for the longline fisheries above and that the catch of this species should be restricted to 150 tonnes in each unit.

Future Work

9.53 The Scientific Committee requested that WG-FSA undertake the following tasks at its next meeting:

(i) review the efficacy of the fisheries-based research plans, including an examination of the relationships between data from the commercial operations and the outcomes of the research operations to ensure the integrity of research data obtained in this way;

(ii) assess and compare the relative densities of *Dissostichus* spp. between areas and compare with Subarea 48.3;

(iii) compare biological characteristics of these stocks between areas;

(iv) provide advice on catch levels for 2000/2001; and

(v) revise, as required, the fishery-based research plan.

9.54 The Scientific Committee requested that data arising from the fishery-based research activities be submitted at least one month prior to the meeting of WG-FSA. It also requested that the convener of WG-FSA liaise with Members to begin analyses of these data prior to the meeting of the working group, perhaps in the subgroup on assessments.

9.55 The Scientific Committee considered that it will be important for WG-FSA to give due consideration in 2000 to the results arising from this fishery in Division 58.4.2 and the research to be undertaken in the course of the fishery in order to determine appropriate catch levels in the future. The Scientific Committee recommended that the Secretariat contact Ukraine to request that they submit data from their historical fisheries in Division 58.4.2. These data should be made available to CCAMLR in the near future to better understand the dynamics of fish stocks in the area.