

MANAGEMENT UNDER CONDITIONS OF UNCERTAINTY
ABOUT STOCK SIZE AND SUSTAINABLE YIELD

Resumption of Fishing

6.1 At last year's meeting, the Commission recognised that no clear policies or measures exist to manage fisheries which have been closed but are under consideration for reopening (CCAMLR-XIV, paragraph 8.26). The Commission requested the Scientific Committee to provide advice on this matter. Dr Holt introduced SC-CAMLR-XV/BG/11 which outlined some suggested procedures to apply to the resumption of a closed fishery.

6.2 WG-FSA advised the Scientific Committee of its deliberations on the matters raised in SC-CAMLR-XV/BG/11, over the definition of a resumed fishery, under what conditions a fishery might be reopened, and whether the existing conservation measures for new (Conservation Measure 31/X) or exploratory (Conservation Measure 65/XII) fisheries could be used instead. WG-FSA recognised that fisheries may lapse for a variety of reasons (including both economic and sustainability factors), and resumption may therefore need to be considered case by case.

6.3 WG-FSA agreed that information and procedures similar to those required for the initiation of a new fishery (Conservation Measure 31/X) and/or for the execution of an exploratory fishery (Conservation Measure 65/XII) should be required during the resumption of a closed fishery. For example, guidelines for a Data Collection Plan and a Research and Fishery Operation Plan, which are required for new and exploratory fisheries, should be considered.

6.4 However, WG-FSA recognised that the requirement for a survey prior to the resumption of a fishery might also be best considered case by case. For example, the Commission requires a survey be completed before closed areas (Subareas 48.1 – Conservation Measure 72/XII and 48.2 – Conservation Measure 73/XII) are reopened for fishing and has required a survey be conducted before directed fishing on a depleted species is resumed (Conservation Measure 97/XIV). However, the Commission does not require a survey before the initiation of a new fishery and may not require a survey before reopening a fishery which had closed for reasons other than stock depletion.

6.5 In all cases, WG-FSA considered it highly desirable for prior notification of the intention to resume a fishery to be provided so that an assessment of the status of the stock can be made and management advice given to the Scientific Committee and Commission. To this end, WG-FSA recommended that the Commission maintain a register of lapsed fisheries.

6.6 The Scientific Committee recognised that one of the key issues in resuming a fishery which has not been exploited for some time is uncertainty over the current status of the stocks. There are two basic cases. The first is where a fishery has been closed as a result of the Commission adopting a specific conservation measure due to an assessment that the stock has been overfished (e.g. *N. rossii* in Subarea 48.3). The second basic case is where fishing activity has ceased for other reasons, for example due to lack of commercial viability. An example of such a case is the fishery for the myctophid *E. carlsbergi* in Subarea 48.3.

6.7 The Scientific Committee considered that reopening a fishery which has been closed by a conservation measure requires an up-to-date stock assessment by the Scientific Committee and its working groups to develop management advice on whether the stock has sufficiently recovered, and to recommend an appropriate TAC. In most cases, a reassessment will require recent information on stock abundance from a scientific survey. Scheduling a reassessment will require prior notice of intent to reopen a fishery so that the required scientific and assessment work can be done. The Scientific Committee noted that its current procedure of seeking information from Members about future fishing plans during its annual meeting has proved unreliable. Therefore the Scientific Committee considers that a formal notification procedure would be more reliable.

6.8 In the case where a fishery has lapsed rather than been closed by a conservation measure, the Commission's recent practice in the instance of the myctophid fishery was to adopt a precautionary TAC based on a method of assessment which takes uncertainty into account in such a way that the assessment remains applicable for an indefinite time. When fisheries appear to have lapsed, the Scientific Committee should, wherever possible, attempt to calculate precautionary catch limits which could then remain in force in case a fishery recommences. Once a fishery has recommenced, normal assessments can be resumed as further information on the status of the stocks is acquired. The Scientific Committee recognised that to ensure that new information becomes available to revise the assessments, it should develop data plans and improved assessment methods as required when it is notified that the fishery is to be resumed.

6.9 A special case is exemplified by *C. gunnari*, where a long-term management strategy is under development. In the case of this species, the status of the stock in Subarea 48.3 is uncertain, and the available information indicates that it can fluctuate in abundance over a large range in an apparently unpredictable manner. One possibility that may be considered in the long-term management strategy is that when it appears that the stock is increasing, a low TAC can be set based on information such as the low end of the range of previous TACs or stock sizes. Such an arrangement, in conjunction with an appropriate survey and other elements of an experimental fishery regime, could allow a fishery to proceed when strong year classes enter the stock. As in the first case, a notification of intent to resume exploitation is necessary so that survey and other data

collection requirements can be coordinated and reviewed by the Scientific Committee and its working groups.

6.10 A further special case is where an early exploratory fishery lapsed and no assessment has ever been completed. An example of such a case is some exploratory fishing for *P. antarcticum* which was carried out in Division 58.4.2 during the 1970s. Resumption of such a fishery could be regulated as if it were either a new fishery or an exploratory fishery. Similarly, for the case of the recent exploratory fishery for crabs in Subarea 48.3, an assessment has not yet been undertaken and so some form of exploratory fisheries measure could be retained so as to be in force should there be an interest in resuming the fishery.

Stock Identity

6.11 An important factor which needs to be taken into account in the further development of management under uncertainty is uncertain stock identity in *D. eleginoides* over its wide area of distribution which probably continues across statistical boundaries inside and outside the Convention Area. A related problem is whether existing statistical boundaries might lead to *D. eleginoides* and *D. mawsoni* being taken in a mixed species fishery. Thus, studies on stock identity, species overlap, fish movement and dispersal have a high priority, particularly in light of the increase in the geographical spread of fishing. If uncertainty in stock identity cannot be overcome by further direct research in the near future, the properties of the assessment methods with respect to uncertain stock identity will require further study.

Feedback Management for *Dissostichus eleginoides*

6.12 Another area requiring further development is the identification of suitable feedback methods to apply to the *D. eleginoides* fisheries. The current assessment method is based on estimating the absolute abundance of young fish by means of trawl surveys. However, the abundance of the total stock cannot be directly estimated in this way, and currently there is no reliable method available for monitoring trends in the total stock. WG-FSA is exploring the properties of methods which may be useful for this purpose, including standardised indices based on CPUE, monitoring changes in the length distribution of the catches and continuing direct monitoring of recruitment. The next step is to develop a strategic model which will allow the properties of these methods to be examined for their possible inclusion in a feedback management system. This work will have a substantial overlap with the strategic modelling approaches currently under development for managing krill fisheries and for

the development of a long-term management strategy for *C. gunnari*. Uncertainty over stock identity can be incorporated into the population components of the strategic models.