

MANAGEMENT UNDER UNCERTAINTY ABOUT STOCK SIZE AND SUSTAINABLE YIELD

10.1 The Scientific Committee recalled the Commission's request for work to continue on the development and implementation of methods for estimating TACs under conditions of uncertainty about stock sizes and sustainable yields (see CCAMLR-XII, paragraph 4.26). The Scientific Committee agreed that both WG-Krill and WG-FSA have made significant, practical advances in this regard; uncertainty has been incorporated into a number of stock assessments.

10.2 With respect to krill, the Scientific Committee reiterated its conclusion made in 1993 (see SC-CAMLR-XII, paragraph 3.97) and noted that the principles of management under uncertainty continue to be incorporated in the assessment and management of this stock.

10.3 With respect to fish, the Scientific Committee noted that WG-FSA has made significant progress in dealing with uncertainty in the assessments of various fish stocks. In particular, the Scientific Committee recognised that uncertainty had been considered during the assessments of *C. gunnari* (Subarea 48.3), *E. carlsbergi* (Subarea 48.3), *C. gunnari* (Division 58.5.2), and *D. eleginoides* (Division 58.5.2) (Annex 4, paragraphs 4.65 to 4.70, 4.78 to 4.83, 4.150 to 4.159, 4.161 to 4.164).

10.4 The Scientific Committee agreed that more work needs to be done on accounting for uncertainty in the assessment and management of fish stocks. There is scope for incorporating additional methods for dealing with uncertainty into the current assessment models. For instance, an estimate of the variability in pre-exploitation biomass could be taken into account for *C. gunnari* in Division 58.5.2 (Annex 4, paragraph 4.158).

10.5 The Scientific Committee noted that a longterm management strategy for *C. gunnari* in Subarea 48.3 (Annex 4, paragraphs 4.78 and 4.79; paragraph 2.34 of this report) will have to deal with uncertainty in many population dynamics parameters. In particular, it should take account of the potential for occasional, large increases in natural mortality of this stock (Annex 4, paragraphs 4.71 to 4.77).

10.6 The approach adopted by CCAMLR is a sensible strategy for coping with unpredicted changes in the ecosystem. It was noted that the observation system implemented in Subarea 48.3 (Annex 4, paragraph 3.7) could be a useful mechanism for collecting data on large-scale changes in the Antarctic marine ecosystem.

10.7 The Scientific Committee reiterated its view that ‘under conditions of increasingly poor data availability, management measures would most appropriately start to follow options from a choice of precautionary low catch levels’ (SC-CAMLR-XII, paragraph 3.98). In this context, it was noted that the techniques and models currently used to incorporate uncertainty in the stock assessments operate in such a way that estimated yields and catch limits usually decrease as uncertainty in model parameters increases (Annex 4, paragraph 4.164).

10.8 The Scientific Committee agreed that the topic of management under uncertainty should remain as a separate agenda item for its 1995 meeting.