

CHAIRPERSON'S INTRODUCTION

A.D.M. Smith

*CSIRO Division of Fisheries
GPO Box 1538
Hobart Tas 7001*

Why discuss ecosystem modelling in a workshop on population dynamics and fishery management? The short answer is that ecologists, who have almost always played a key role in fisheries assessment, have long recognized that fish populations do not exist in a vacuum. Since the early part of this century, fishery biologists have acknowledged, at the very least, the importance of year class fluctuations in fish stocks and have pondered their causes (Hjort 1914).

Interest in the wider ecological and environmental dimension for fisheries management has not diminished – let me cite two recent Australian examples. The very first recommendation of the Fisheries Working Group on Ecologically Sustainable Development states (Anon. 1991):

“that Australian fisheries management be undertaken within an ecosystem management framework”.

This recommendation is made, even though it is recognized that current knowledge and understanding is deficient.

The second example concerns the gemfish fishery off New South Wales. There seems little doubt that the stock has experienced a dramatic decline in recruitment in recent years (Allen 1992), but it is not at all clear that this decline is due to reduction in the size of the spawning stock (Rowling 1992). This has prompted recent interest in finding possible environmental correlates of the collapse.

The main critique of the ecosystem approach has tended to come from scientists involved in the practical aspects of fisheries assessment. The less radical claim of these scientists is that taking account of environmental and ecosystem effects is not irrelevant, just impractical. However the more radical voices have claimed that the approach is largely irrelevant for practical fisheries assessment and management.

Let me quote briefly from two papers which spell out some of this critique. They were both presented at a symposium to review ten years of progress in the Benguela Ecology Programme (BEP) along the south west coast of Africa. This was and is a major multidisciplinary programme to study physical, chemical, biological and ecological processes in the Benguela upwelling system, in relation to the assessment and management of the very productive marine fisheries resources in that region.

The first paper comes from a group at the University of Cape Town who were closely involved in the Benguela Programme (Butterworth *et al.* 1992). On page 990 they state:

“The BEP workshop ... has served to emphasize the impossibility of taking (biological) multispecies effects into quantitative account in scientific recommendations for the management of the Benguela resources, either now or in the immediate future.”

On page 1002 of the same article, they also note that:

"The attempted identification of environmental causes of recruitment fluctuations has had little success worldwide, let alone in South Africa ... Even if environmental causal factors could be identified, it is extremely unlikely that they themselves will be either predictable or controllable so that the variability will remain endemic."

The second paper is by Ray Hilborn who needs no introduction in this forum. In a paper which surveys current and future trends in fisheries stock assessment and management, he states (Hilborn, 1992, page 979) that:

"The role of multispecies analysis in stock assessment is a hotly debated topic among stock assessment scientists, but in practice little if any use of multispecies models affects current fisheries management."

He goes on to say that:

"Clearly, scientists doing stock assessments generally believe that the agencies they work for do not have the fiscal resources to collect the data required to use multispecies interactions in stock assessments, and that generally the expected benefits would be small. There is enough difficulty collecting data on single species and estimating single-species abundance for anyone to reconsider moving beyond single-species assessments."

With the Chair having taken the "devil's advocate" position, we now have four speakers who will hopefully go some way to convincing you that multispecies or ecosystem approaches are both feasible and useful, not only in fisheries assessment (Nic Bax and Tony Koslow), but also for the much broader set of problems associated with marine environmental management (Des Lord and Tony Smith).

References

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