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Report of Mid-Term Meeting of ICNAF Assessment Subcommittee

Rome, 29-30 September 1965

A meeting of the subcommittee was held in the India Room of FAO, Rome, on September 29th and 30th. Those present included J. A. Gulland (Chairman), L. M. Dickie, F. McCracken, K. S. Ketchen, W. MacKenzie (Canada), S. Horsted (Denmark), A. Meyer (Germany), R. Monteiro (Portugal), B. B. Parrish, D. J. Garrod (United Kingdom), A. Posgay (USA), S. J. Holt, L. Boerema, A. Ben Tuvia, M. Ruivo (FAO), and L. R. Day (ICNAF).

Greenland Cod

The subcommittee reviewed the progress in carrying out the recommendation of Panel 1 to examine the desirability of further protection of small cod at West Greenland. Most countries represented reported that work was proceeding in the processing and tabulation of the relevant data; in particular the extensive Danish tagging data was now on punched cards. It was agreed that the analysis of these data would require a meeting of a small working group of those particularly concerned. Invitations for a meeting of such a group were received from Portugal and Denmark; it was considered that travelling expenses for most of the group would be less for a meeting at Copenhagen and it was therefore agreed that the first meeting of the group should be held in Copenhagen, probably in February 1966. Of those present Gulland, Garrod (UK), Horsted (Denmark), Meyer (Germany) and Monteiro (Portugal) expressed their willingness to join in the work of the group, and it was also recommended that Dr Hansen (Denmark) and possibly Dr Schumacher (Germany), and representatives of France, Faroes, Iceland and USSR should be invited to join the group, or at least submit all available data.

Concerning the form of presentation of data, it was agreed that length data should be in the form of total numbers caught by gears, by subareas, by months, with an annual summary. The UK would summarize all age/length key material already submitted to ICNAF and countries should send to Lowestoft as soon as possible any age/length material not previously submitted to ICNAF; the summaries would be in the form of keys for each subarea each quarter, and these should be circulated to participants before the meeting.

Economic Criteria in Fishery Management

Mr Parrish reported on the meeting on this subject held in Rome on 27/28th September, which drew attention to the widespread economic consequences in many sections of the industry of any regulation aimed at controlling effort. It was reaffirmed that economic ideas were very important in the subcommittee's and the Commission's work. After some discussion it was suggested that a useful first step would be to arrange, during the 1966 meeting, for a small number of economists to address the R and S Committee (preferably during the week of the Commission's meeting). A group consisting of the Executive Secretary, Ruivo (FAO) and MacKenzie promised to arrange this.

Greenland Salmon

It was agreed to postpone detailed discussion of this problem until after the meeting of the Salmon and Trout Committee of ICES. While it was most important that all the bodies concerned should have up to date information both on the development of the Greenland fishery, and on the scientific work, it was

suggested that it might be preferable to concentrate the fuller scientific discussion at only one meeting each year, which all interested scientists should attend.

### Stock and Recruitment

The Committee had no formal business to transact under this item of the agenda but the Chairman introduced a general discussion of the subject to draw attention to recent developments in this field and to create an awareness of the implications of such relationships in the assessment work, quite apart from the biological interest of understanding the mechanisms determining year-class strength.

The present state of our knowledge of these relationships in north Atlantic and some Pacific stocks was briefly reviewed by members; arising from this the group was able to conclude that there is no longer any justification for indiscriminate assumption that recruitment is independent of stock size, though at the present moment there is no indisputable evidence of the form of the relationship except that in those stocks for which evidence is available there are signs of a variety of types of stock/recruit relationships, from virtual independence of recruits, except at very low stock levels, through to sharply 'domed' relationships where maximum recruitment may only be obtained over a relatively narrow band of stock sizes.

At the same time it was noted that stock depletion must inevitably follow a time series, with or without much chance of a recovery of stock size, which creates a difficulty in distinguishing a true stock/recruit relationship from possibly undetected long term trends in the environment. In point of fact a stock/recruit relationship cannot be operative except through some density/dependent interrelationship; it must necessarily involve environmental factors. This drew attention to the need to understand the basic biological mechanism controlling such relationships, in addition to the purely empirical correlation approaches which have been the more widely used up to the present. This in turn led to a discussion of the planning and objectives of larval survey work and some of the intrinsic difficulties of this approach.

Though the discussions were necessarily of a very general nature, the Committee was impressed by the need to adjust the accepted standpoint in considering stock/recruitment in relation to stock assessment. It was seen that it is no longer adequate to assume that assessment on a 'per recruit' basis will be adequate in all circumstances, and that there is a real possibility that the effects predicted by this method may seriously underestimate the magnitude of actual changes. This is especially important in the current level of exploitation of some north Atlantic stocks where there is evidence that the stock/recruit relation may be fluctuating in the left-hand, ascending limb of a dome-shaped stock/recruit relation.

It was agreed that much further work was required, and two aspects in particular were supported. Firstly all available sets of data of pairs of values of stock and recruitment should be examined to see whether any consistent pattern emerges when many stocks are considered, even when the data for any one stock is not convincing. These data could be considered at the 1966 R and S meeting of ICNAF, and the meeting therefore recommended that ICNAF scientists should bring to the 1966 meeting all the data they have available. Secondly there is the need for a detailed consideration of the underlying factors which would be best done as part of a symposium (see below).

### Food Chains

Following an introductory talk by Dr Dickie, the problems involved in feeding, predation and the energy flow through the whole system were discussed. Clearly the production of fish flesh, and hence the catch, must be related to the production of lower trophic levels, and as the ICNAF fisheries depart more and

more from the simple single species fisheries such considerations will become more important. Dr Ruivo (FAO) reported the progress on the FAO/ICNAF/ICES Trophic Level Symposium, and the subcommittee reaffirmed its interest in this symposium, but emphasized the particular relevance to its work of studies on fish production, rather than productive studies in general. It was also thought that the general problems of stock and recruitment would come within the frame of reference of the symposium, and this inclusion would be welcomed. However, there was the danger that an incomplete discussion of stock and recruitment would jeopardize the fuller discussion of the problem at some other meeting. The subcommittee therefore recommended that the attention of the organizers of the symposium should be drawn to the importance of the stock/recruitment, with the suggestion that it should be included as a major topic. Alternatively, if time did not permit this, then stock/recruitment questions should be specifically excluded, and should be discussed at some other meeting.