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Final Report of the Greenland Cod Working Group

At the 1965 Meeting of ICNAF, Panel 1 recommended:

- (i) that the Research and Statistics Committee examine the desirability of further protection of small cod at West Greenland, and in particular in this connection, the effects of a closure of Store Hellefiske Bank to trawling, and
- (ii) that facilities be provided, if required, for a meeting of a small working party of experts to examine the matter.

Some of the scientists concerned had preliminary discussions at Halifax, and at the mid-term meeting of the Assessment Subcommittee in Rome in September 1965. The main meeting of the working group was held in Copenhagen from 21-25 February 1966, and the report of this meeting is given in ICNAF Res.Doc.66/18. The group could not conclude all the studies and calculations considered necessary, and these were continued by individual members of the working group. The results of the work are given in reports by Horsted and Gulland (Res.Doc.66/72 and 66/56). The Group met finally in Madrid on 30 May 1966, when it considered the above documents and other information on the Greenland fishery.

The group was in agreement with the general conclusions reached in the two separate reports prepared since the Copenhagen meeting, and considered that the good agreement on the effect of closure reached by two different methods gave added confidence to the conclusions reached. The detailed assessments are given in the reports, but the general conclusions of the group are as follows:

- (a) Small cod at West Greenland are growing so rapidly that in the absence of fishing and with a 20% natural mortality the total weight of a year-class would increase four times between 2 and 5 years old. Between 5 and 9 years there is little change in the total weight of a year-class. With the present intensity of fishing the total catch would increase if the small cod were protected until around 4 years old.
- (b) Small fish less than 4 years old, though present in all subdivisions of West Greenland are relatively more abundant in Div.1B. Because of the nature of the statistical and other material it was not possible to consider different grounds within 1B separately.
- (c) The precise quantitative gain from measures to protect small fish depends on the proportion of the catch which is discarded (discards in this sense also include fish used only for fish meal), about which the group did not have as much information as is desirable. It appears that probably at least 20% by numbers and possibly more of the fish caught by trawlers are discarded; some fish are possibly also discarded by liners, but very much less than by trawlers, and some of them may survive.
- (d) Closure of 1B to trawling would tend to increase the total landings from West Greenland, but it is likely that fishing by liners in 1B will increase due both to increased stocks and to less physical interference between trawlers and liners.
- (e) Total landings would also be increased if Div.1B were closed to liners, or particularly to both liners and trawlers.
- (f) The use of larger meshes by trawlers would also increase landings. All types of gear would probably benefit from meshes up to 150 mm, but for meshes larger than 150 mm trawl landings are likely to decrease, though the total landings may still increase.

- (g) The greatest benefit would come from closing 1B and using larger meshes. At a probable discard rate by trawlers of 20% in numbers, and an exploitation rate ( $E = 0.7$ ) the long-term gains from alternative conservation measures are as follows, as percentages of present landings per recruit:

<u>Conservation measure</u>	<u>Long-term gain %</u>		
	<u>Trawl</u>	<u>Line</u>	<u>Total</u>
150 mm mesh	5	9	7
Closure of 1B to trawlers	4	5	4
Closure of 1B to all gears	7	6	7
150 mm mesh and closure to all gears	11	14	12

In assessing the effect of a given mesh size it must be emphasized that the calculations have been made in terms of the selectivity of a manila codend without chafers. The same effect would be produced by a smaller codend mesh of more selective material, or a larger codend mesh if chafers are used.

While it is not the group's responsibility to suggest any date of introduction of any conservation measure, it should be mentioned that at present the two strongest year-classes in the fishery (1960 and 1961) are larger than 50 cm, while the year-classes of 1962 and 1963, which are in the selective range of meshes between 100 and 150mm are weak. Thus, in present conditions, introduction of a larger mesh size would cause little immediate loss to the landings.

The group considers that there is a great need for further data on the West Greenland cod fishery, specifically as follows:

- (i) data on quantities and sizes of fish discarded or used for fish meal;
- (ii) data on the present effective mesh size used by trawlers at Greenland and on the types of chafer used, if any;
- (iii) data on the hook size in use by liners, and the selectivity of hooks;
- (iv) data on size composition of all landings and catches, particularly for those fleets for which there is at present little material submitted for the Sampling Yearbook;
- (v) data on the possible redistribution of ships at present fishing in 1B.

While the individual members of the group should continue their studies of the West Greenland cod stocks, it is not thought that any formal meeting of the group within the next year or two would produce assessments differing to any significant amount from those presented here and in the three more detailed reports. Therefore, it is suggested that the group should not be needed to meet again for perhaps 5 years, unless the Commission has further specific problems to consider, or unless substantial conservation measures, such as closure of Div. 1B, are brought into force.