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Greenland Salmon Research Programme, 1970, 'Adolf Jensen'

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Two members of staff from the Freshwater Fisheries Laboratory, Pitlochry (D.A.F.S.) joined the 'Adolf Jensen' in 1970 to take part in a series of cruises during which the possibilities of long lining as a means of catching salmon for tagging at Greenland were further investigated. This programme extended from mid-September to mid-November and included a ten-day period when the 'Adolf Jensen' and the Canadian research vessel 'A.T. Cameron' carried out tests to compare the relative merits of drift net and long line fishing.

This programme was seriously curtailed by bad weather, and mechanical troubles so that, during a period of virtually two months, it proved possible to fish on only fourteen occasions, eleven times with long lines and three times with drift nets. This illustrates the problems inherent in carrying out research work in this area, but it should be emphasised that this disappointing situation prevailed despite the best efforts of our Danish colleagues to overcome the difficulties which arose.

The 'Adolf Jensen' joined the 'A.T. Cameron' at Holsteinsborg on 13th September and comparative fishing tests were carried out on, and to the south of Store Hellefiske Banke, during the following ten days, the 'A.T. Cameron' fishing a fleet of 120 drift nets while the 'Adolf Jensen' fished long lines nearby. Mainly because of bad weather, joint fishing was only possible on five occasions, during which the 'A.T. Cameron' caught 129 salmon, of which 55 (43.5%) were tagged. The long lines fished by the 'Adolf Jensen' were not nearly so productive, as a total of 4320 hooks fished during this period produced only 23 salmon (5.3/1000 hooks), of which 14 (60.8%) were tagged.

Following the completion of the joint fishing programme the 'Adolf Jensen' returned to Godthåb and left again on 7th October, sailing south to fish off Frederikshåb where commercial drift-netters had been reporting good catches during late September. Between then and 17th October, when she returned to Godthåb, it only proved possible to fish long lines four times and drift nets once, mainly because of bad weather. During this trip about 700 hooks were lost due to icebergs and bad weather, and only one salmon, taken by long line, was caught.

Mechanical troubles on board and delays in the delivery of spare parts prevented the 'Adolf Jensen' from leaving Godthåb again until 5th November, when she sailed north, fishing drift nets, without success, off Kangamiut, on the night of 6th November. Thereafter, bad weather forced her to remain at Holsteinsborg until 10th November, when she fished drift nets in the afternoon on Store Hellefiske Banke, again without success, and completed her programme by fishing long lines in the same area on 11th and 12th November, when seven salmon were caught and tagged.

During the course of this programme, no salmon were caught in drift nets and a total of 7360 hooks fished, produced only 31 salmon (4.2/1000 hooks), of which 21 (67.8%) were tagged and released. Further details of these long-line catches are given in Table 1.

Hooking rates were consistently lower in 1970 than in 1969. They were particularly low during the second cruise in south Greenland but, even during the first and third cruises, while fishing the same general area as in 1969, they were only about half as good, averaging 5.4 salmon/1000 hooks in this area in 1970, compared with 9.1 salmon/1000 hooks in 1969. This result was particularly disappointing because, during the relatively few occasions on which long lining eventually proved possible, the average number of hooks shot was increased from 420 in 1969 to 670 in 1970, and the latter figure could have been even higher but for the loss of some gear in South Greenland.

Techniques for handling the fish were exactly the same as in 1969; all live fish were anaesthetised before examination. The hook was left in position in 57% of the tagged fish in 1970, compared with 49% in 1969. The proportion of the catch which was tagged (67.8%) was almost identical with that achieved last year (66.2%).

In view of the very small size of the sample, the other information collected from the catch is of little value for comparison with previous results but, for the sake of completeness, the following points are recorded.

(a) The average fork length of the 31 salmon caught was 71.5 cm. and the length range 59 to 97 cm.

(b) The 10 salmon which were not tagged, were weighed. These ranged from 2.3 to 6.7 kg. in weight and averaged 3.4 kg.

(c) The sex ratio among the 10 fish examined internally was 2.3 females to 1 male.

(d) The stomachs of these fish were also examined. Apart from one or two sprats (bait) in each of six stomachs; seven were empty, two contained amphipods and only one contained fish (sand eels).

(e) The age composition of this small sample is given in Table 2.

The average length of these line-caught fish was 71.5 cm., compared with an average length of 65.0 cm. for the 255 salmon taken by the 'Tornak' in gill nets in the Godthåb area during 1970. A similar difference was noted in 1969 when the 65 salmon caught by the 'Adolf Jensen' on long lines averaged 76.4 cm. in length, as compared with average lengths of 65.5 cm. for the 146 salmon caught by the 'Tornak' in the Godthåb area and 67.0 cm. for 620 salmon caught by the 'A.T. Cameron' with drift nets in the Labrador Sea and off West Greenland.

A comparison of the sea age distribution in these samples and in a large stratified sample taken from the Danish commercial drift netter 'Polarlaks' during 1969, given in Table 3, reveals a distinct difference between the age composition of the salmon caught in nets and that of those caught on lines. The age composition of the small catch taken by the 'Adolf Jensen' in 1970 (Table 2) shows a similarly high proportion of older fish. These results suggest that one or both of these methods may be selective for fish of a particular size and that further consideration may have to be given to establishing the true composition of the Greenland stock.

Nets might seem to be the gear most likely to be selective. However, if the age distribution in these net catches does reflect the true age composition in the stock, indicating that long lines are selective for older and larger fish at this period of the year in Greenland, this could account for the relative lack of success of the long lines fished by the 'Adolf Jensen', since most of the fish present would only have spent one winter in the sea. Since large numbers of smaller one-sea-winter fish can be caught off the Faroes in the spring using identical long-lining gear, it is difficult to see how such a phenomenon could be explained other than as a difference in the behaviour of fish of different sea age.

It still seems likely that long-line caught fish are in relatively better condition for tagging than are drift-net caught fish, even if the latter are removed from the nets soon after striking them. However, as a means of providing fish for tagging in experiments at Greenland involving the release of large numbers of tagged fish, long lines now seem of very doubtful value as it seems likely that they will provide many fewer fish for tagging than drift nets, for the same expenditure of time and effort.

Recaptures of two of the 43 long-line caught salmon tagged at Greenland during 1969 have been reported. One was recaptured locally at Ikertoq (within 40 n.m. of the tagging site) fourteen days later and the other was caught by rod and line on the River Wye (England) during April.

Table 1

Date		Position	Wind Conditions	Surface Water Temp. (°C)	Number of Hooks	No. Caught	No. Tagged	Salmon No./1000 Hooks Caught	Salmon No./1000 Hooks Tagged	Percentage Tagged
First Cruise - Joint Fishing										
September	16	29 n.m. NW of Holsteinsborg	0	3.5	960	1	0	1.0	0.0	0.0
	17	39 n.m. WSW of Holsteinsborg	N 2	2.9	960	4	4	4.2	4.2	100.0
	18	43 n.m. WSW of Holsteinsborg	SE 3-4	2.8	960	13	8	13.5	8.3	61.5
	19	46 n.m. WSW of Holsteinsborg	NE 5-7	2.5	960	4	2	4.2	2.1	50.0
	23	15 n.m. W of Fiskemesteren's Havn	NW 3	2.0	480	1	0	2.1	0.0	0.0
					4320	23	14	5.3	3.2	60.8
Second Cruise - Frederikshåb Area										
October	9	12 n.m. WSW of Frederikshåb	E 1-2	1.1	400	1	0	2.5	0.0	0.0
	10	8 n.m. WSW of Arsuk	NW 5	-	480		Line lost due to bad weather			
	13	8 n.m. WSW of Arsuk	NW 3-4	-	480	0	0	0.0	0.0	0.0
	14	15 n.m. SSW of Arsuk	NW 6	0.9	480	0	0	0.0	0.0	0.0
					1840	1	0	0.5	0.0	0.0
Third Cruise - Holsteinsborg Area										
November	11	47 n.m. NNW of Holsteinsborg	ESE 3	0.8	480	6	6	12.5	12.5	100.0
	12	48 n.m. NW of Holsteinsborg	ENE 2	0.6	720	1	1	1.4	1.4	100.0
					1200	7	7	5.8	5.8	100.0
		Overall, Sept. 16 to November 12			7360	31	21	4.2	2.9	67.8

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Table 2

Numbers of Fish

Smolt Age	Sea Age 1+	Sea Age 2+	Total	Percentage in Sample
2	14	6	20	64.5
3	5	2	7	22.6
4	2	-	2	6.4
?	2	-	2	6.4
	23	8	31	
Percentage in Sample	74.1	25.8		

Table 3

Vessel	Method	No. in Sample	Percentage Sea Age Composition: 1 Sea Winter	2 Sea Winters	3 Sea Winters	Previous Spawners
'Adolf Jensen'	Long line	65	60.0	33.8	1.5	4.6
'Tornak'	Gill net	146	93.1	5.5	0.0	1.5
'A.T. Cameron'	Drift net	620	96.1	3.2	0.0	0.6
'Polarlaks'	Drift net	2728[a]	89.4	9.6	0.0	0.8

a Scale samples taken from 370 fish