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Cod Trap Selectivity Studies in 1960

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Continuing a series of experiments to determine the selectivity of the Cod Trap as used by Quebec fishermen, we were able in 1960 to sample 6,577 fish for this purpose.

The experimental trap was situated at La Tabatière, Québec, and the same arrangement as used previously (Boulanger, 1960) was retained to study the effect of a 4.5-inch mesh (114 mm) except that the fishing back was made of single twine No. 54 nylon, Primolite treated. All the other parts including the secondary 3-inch back were of treated cotton twine, No. 18 for the leader, the vees, the sides and the bottom and No. 9 for the auxiliary back.

The fish sampled were rather small in size and the daily catches poor, which is representative of the general conditions of the trap fishery in this area during 1960.

Fishing was carried on from the 20th of June to the 29th of July and Table I is a tally of the numbers in the catches each day. Column "A" shows the quantity of fish released by the 4.5-inch mesh, column "D" gives the quantity of fish retained by the same mesh, while columns "B" and "C" are subdivisions of column "D", showing respectively the amount of fish gilled and not gilled within the confines of the trap enclosed by the 4.5-inch back. Column "E" is the population sampled or, which is the same, the quantity of fish retained by the 3-inch mesh.

As can be seen from this table 85.3% of the total population has been released by the 4.5-inch mesh; 14.7% of it has been retained of which fish only 4.4% were gilled or entangled in the twine.

The high percentage of release is understandable from the size composition of the catch (Fig. 1), most of the fish being under the 21-inch size limit accepted by most fish producers, and it shows that the 4.5-inch mesh was very effective in sampling the right size of fish for the market. Furthermore, a study of Table II will show that, with reference to the market length of 21 inches situated around the 52-cm group (20.3 inches), the 4.5-inch back retained only 468 fish under 21 inches and released only 48 fish over this size limit.

In other words, 7.12% of the total population was retained while it should have been released and 0.73% was released when it should have been retained. The selectivity of the 4.5-inch nylon back as used in 1960 is therefore quite sharp and this mesh size is not far from being the right one for this gear.

Table III gives the data necessary to trace the ogive of Figure 2 and no attempt has been made to smooth the curve. The 50% selection point is found from this graph to be at about 48 cm which gives for a 114-mm (4.5-inch) mesh a selectivity factor of 4.3 .

This value is in good agreement with results obtained during previous experiments. It should be noted that nylon seems to have no particular effect of its own on the selectivity factor for a gear of this kind, this factor being the same as the one we obtained for cotton. This is probably due to the fact that the Cod Trap is a stationary gear and this finding will be controlled in further experiments.

Altogether this work is by no means complete and when instrumentation permits great care and attention will be paid to the study of the escapement process both when the trap is standing still and when it is dried up.

Although there is a good presumption that selectivity takes place through the back of the gear at the moment of drying up, we have no direct evidence of it and there still exists the possibility that the selectivity might take place before as well as during the drying up process and that other parts of the gear are involved.

Direct observation of the escapement process is time consuming and almost impossible to perform properly without instrumentation. The latter will be procured in due time to throw more light on the problem and until then, the selectivity factor given in this paper as well as in the previous ones should be used with caution.

Departure from usual ICNAF procedure

In 1960 the meshes were measured in dried and used condition with a rigid ruler, between knot centres and no pressure was exerted in the process.

Reference

Boulanger, J.-M. 1960. Cod Trap Selectivity, Document No. 44, Serial No. 768 (D.C. 8), Annual Meeting - May/June 1960 -, International Commission for the Northwest Atlantic Fisheries, Bergen.

Table I.

Date	A Number of fish released	Number of fish retained B Not meshed	C meshed	D Total	E Total caught
June					
20	150	118	24	142	292
21	0	23	0	23	23
22	171	44	21	65	236
23	505	130	72	202	707
24	113	20	10	30	143
27	14	35	13	48	62
28	0	20	8	28	28
July					
1	78	2	7	9	87
4	88	18	7	25	113
5	246	116	40	156	402
6	158	46	11	57	215
7	109	16	0	16	125
11	576	17	35	52	628
12	605	1	1	2	607
13	178	1	2	3	181
14	99	0	0	0	99
15	135	5	0	5	140
18	251	13	8	21	272
19	292	7	0	7	299
20	848	0	11	11	859
23	660	30	19	49	709
26	136	11	0	11	147
27	153	3	3	6	159
29	44	0	0	0	44
Total	5,609	676	292	968	6,577
%	85.28	10.28	4.44	14.72	100.0

Table II.

Size groups cms	Size groups inches	Number of fish retained below size limit	Number of fish released above size limit
31	12.1	1	
34	13.3	1	
37	14.4	1	
40	15.6	14	
43	16.8	37	
46	17.9	101	
49	19.1	161	
→ 52	20.3	152	
55	21.4		35
58	22.6		6
61	23.8		5
64	25.0		0
67	26.1		1
			1
Total/6,577 fish		468	48
% of total caught T - 50% - - - - - - → T - com.		7.12	0.73

Table III.

Size groups (cm)	A Number of fish retained	B Total number caught	A/B
25	0	66	0.00
28	0	584	0.00
31	1	1,440	0.00
34	1	1,492	0.00
37	1	867	0.00
40	14	508	0.03
43	37	368	0.10
46	101	286	0.35
49	161	266	0.61
52	152	187	0.81
55	164	170	0.96
58	129	134	0.96
61	91	91	1.00
64	56	57	0.98
67	30	31	0.97
70	13	13	1.00
73	9	9	1.00
76	3	3	1.00
79	4	4	1.00
82	0	0	0.00
85	0	0	0.00
88	0	0	0.00
91	1	1	1.00

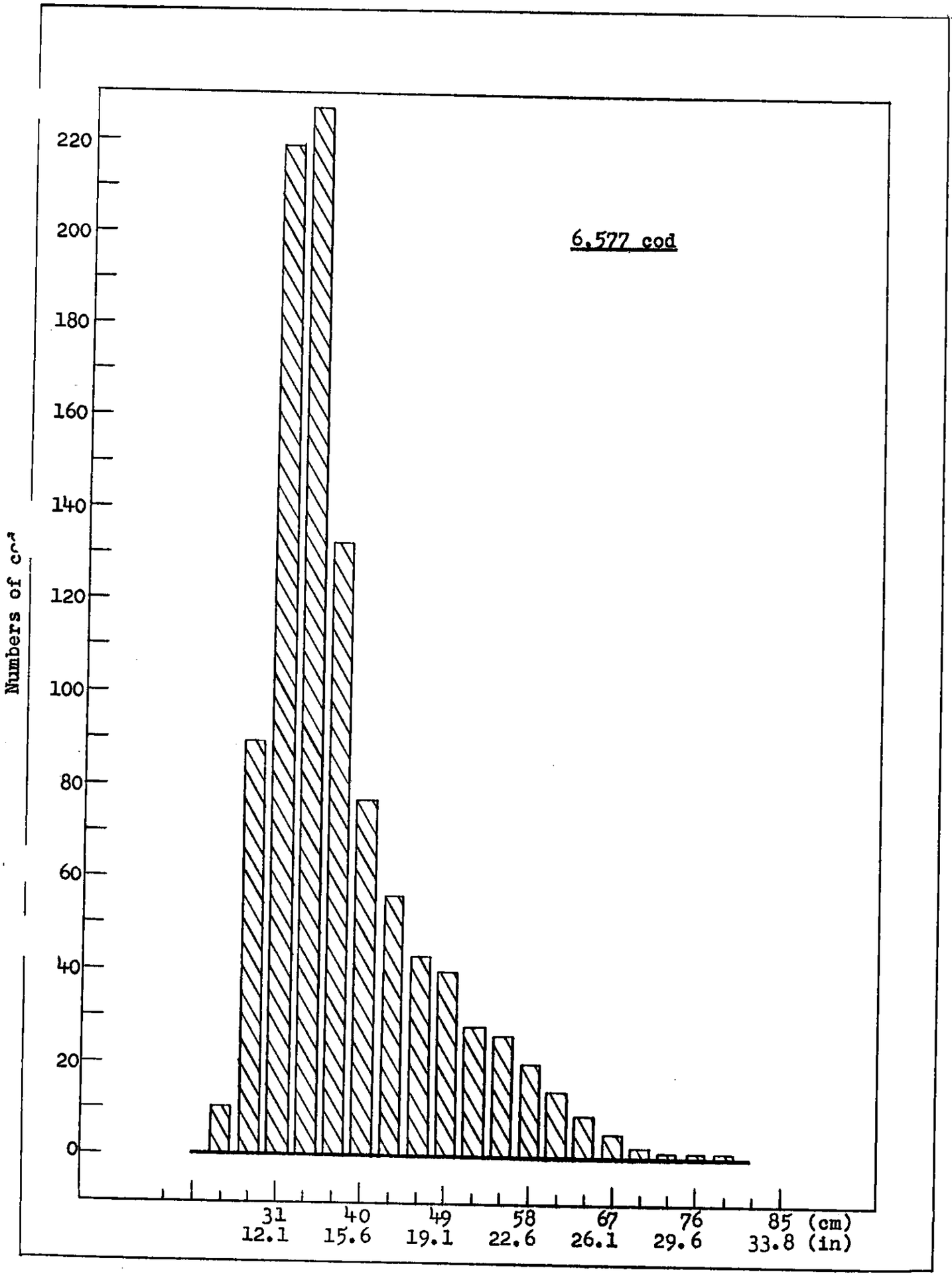

Figure 1. Size composition of cod caught at La Tabatière, P.Q., in experimental trap fitted with 3-inch mesh secondary back in 1960.

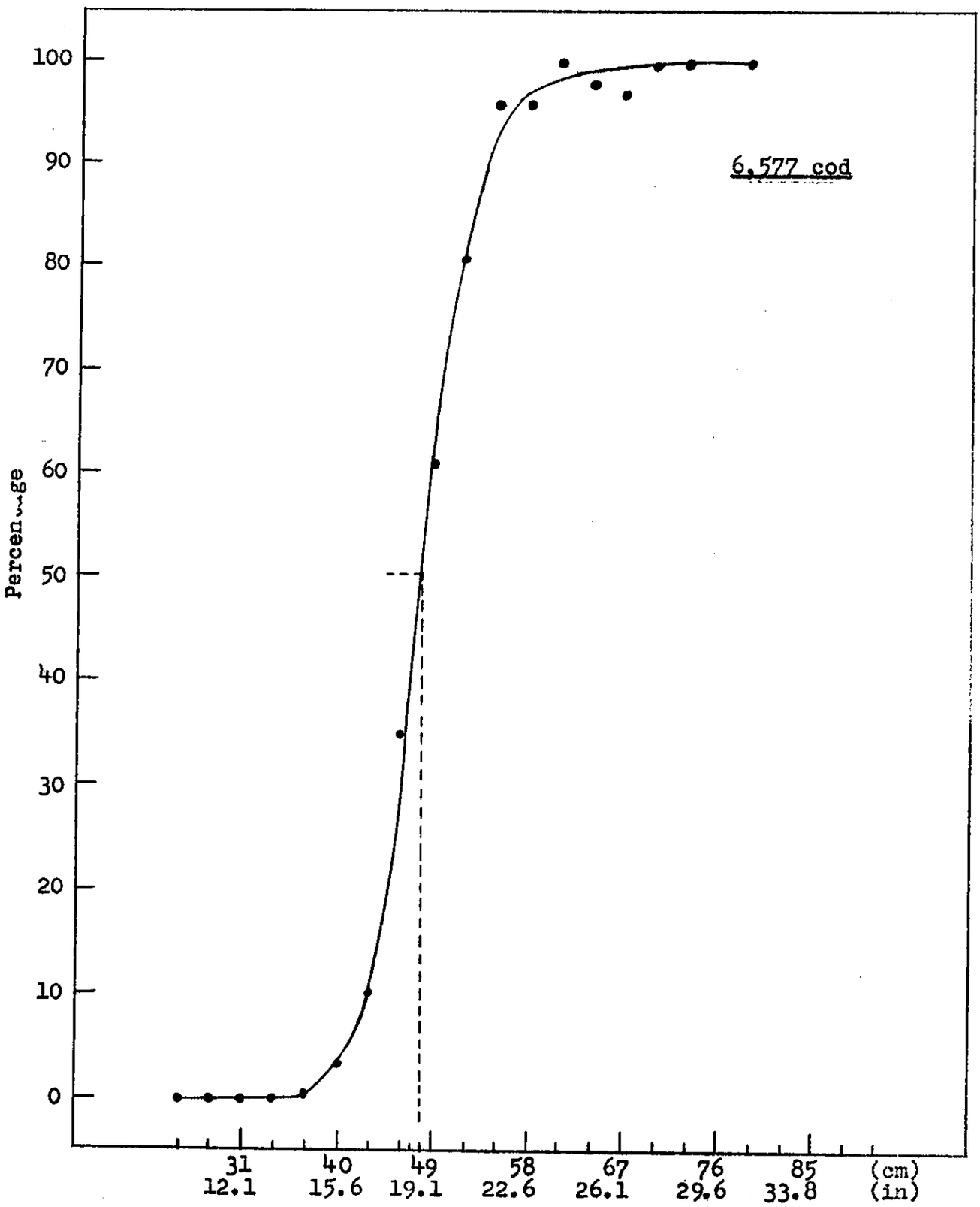

Figure 2. Selection curve for 4.5-inch (114 mm) nylon back cod trap at La Tabatière, P.Q., in 1960 (No. 54 medium, single-twine nylon).