

C.M. 1962

 International Council
 for the Exploration
 of the Sea

Comparative Fishing Committee

No. 62 F

Whiting Mesh selection experiments in Irish waters

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The first reliable figures, apart from one tow in January 1961, were obtained in September 1961 in Galway Bay, when catches during $\frac{1}{2}$ -hour, $1\frac{1}{2}$ -hour and 3-hour tows using cod-ends of different gauge meshes were analysed. Since then, a small mesh cover has been used as a routine part of operations in February, March and July 1962. Cod-ends supplied as being of 70, 65, 60 and 50 mm. gauge mesh are carried on the research vessel, the meshes of these cod-ends being possibly slightly less than that specified by the manufacturers. All cod-ends are fitted with plastic rings, as are the aft ends of the courlene trawls used, thus facilitating the quick interchange of cod-ends. In earlier experiments the small meshed covers were sewn to the foremost section of the cod-end, but latterly to the 'neck' of the trawl slightly in front of the rings. The mesh size of the cover was about 6 mm. in July 1962 and about 10 mm. in earlier experiments. No consistent differences in results were noticed between these two covers.

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Where the catch of whiting in the cod-end is too large for examination in toto, it is randomly sampled and related to the total catch on a weighted basis, this technique being applied to whiting only, in the case of cod-ends, but to whiting and all other species present in covers.

Table I gives 50% release points obtained; Tables II and III show factors influencing the form and position of the selection curve. Only length groups near year-class modes have sufficient numbers of individuals to give consistent results, and whilst data from one cruise very often agree well inter se, results from different cruises can appear to be extremely variable. In the case of the upper end of the curve, i.e. 50%-100%, the length of tow was found to be important, the retention points for a given percentage lying at much greater lengths in the case of the half-hour tows than with those of three-hours. At the lower end of the curve this was not found to apply (Table II).

The dominant species in the cod-end were noted, and it was observed that curves for tows containing many Nephrops, in July 1962, tended to retain slightly higher percentages of whiting than those where Nephrops were few (Table III). Much more pronounced was the effect of large numbers of Squalus acanthias in the cod-end, in increasing the percentage of whiting retained.

In addition to small species of fish, not otherwise easily obtained, 0-group whiting during July at lengths of from 6 to 10 cms. have been fairly effectively sampled, together with cod and haddock of similar size which have not been obtained in numbers by any other means.

Plotting lengths of fish against percentages retained, points are obtained to which the curve can be fitted by eye. In Table I the 50% release points have been taken from the curves. In Tables II and III the percentages are shown

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 Nephrops
 and
 Squalus
 acanthias

together with the total number of individuals of each length group.

Summary

In 1961 and 1962 the research vessel L.T. Cú Feasa performed a series of experiments using courlene cod-ends of 50, 60 and 70 mm. gauges mesh with a small mesh cover. Mesh selection data for half-hour to three-hour tows have been obtained and the effects of duration, haul and dominant species within the catch upon the escapement of whiting have been observed. The useful role of the cod-end cover for obtaining very young whiting (3-4 months) is also mentioned.

Table 1. Summary of hauls showing 50% release points, and Selection Factors

Mesh (mm.)	Date	Dominant species	Duration (hrs.)	50% Release Point (cm.)	Selection Factor
70	6. 1. 61	Whiting	3	28.9	4.1
	15. 9. 61	"	$\frac{1}{2}$	31.0	4.4
	14. 9. 61	"	3	28.5	4.1
					4.2 mean
60	15. 9. 61	"	$1\frac{1}{2}$	19.8	3.3
	5. 3. 62	Whiting, etc.	$\frac{1}{2}$	21.8	3.6
	9. 3. 62	Whiting	$\frac{1}{2}$	21.1	3.5
	9. 3. 62	"	$\frac{1}{2}$	18.4	3.1
					3.4 mean
50	15. 9. 61	"	$\frac{1}{2}$	19.1	3.8
	15. 9. 61	"	3	19.0	3.8
	1. 2. 62	Dabs, <u>Nephrops</u>	3	16.6	3.3
	1. 2. 62	Cod, Coalfish	3	16.6	3.3
	17. 7. 62	Various	$\frac{1}{2}$	17.6	3.5
	17. 7. 62	Whiting, <u>Nephrops</u>	$\frac{1}{2}$	16.8	3.4
	17. 7. 62	Mixed large fish	$\frac{1}{2}$	18.2	3.6
	18. 7. 62	<u>Nephrops</u> , Whiting	1	18.2	3.6
					3.5 mean

Table 2. Effect of duration of haul on selection curve
(Galway Bay, September 1961)

Length (cm.)	With 50 mm. cod end				With 70 mm. cod end			
	Total No. of fish	% Retained		Total No. of fish	Total No. of fish	% Retained		Total No. of fish
		$\frac{1}{2}$ hr.	3 hrs.			$\frac{1}{2}$ hr.	3 hrs.	
11	77	0	0	7	4	0	0	6
12	86	3.5	33.3	30	18	11.1	0	16
13	88	3.4	0	42	18	11.1	5.0	20
14	99	6.6	14.3	70	16	25.0	0	45
15	93	12.9	22.1	86	47	6.4	0	81
16	148	27.0	23.8	122	24	0	4.0	101
17	170	35.3	45.1	173	39	7.7	1.1	95
18	134	41.1	25.3	154	21	23.8	2.7	110
19	63	50.8	62.9	141	24	0	1.7	59
20	26	53.9	38.5	26	9	11.2	0	13
21	5	60.0	0	2	-	-	100	1
22	6	100	96.4	60	-	-	14.3	7
23	20	70.0	96.1	111	10	60.0	5.9	17
24	39	89.7	97.3	330	47	14.9	13.4	67
25	87	73.6	98.8	364	77	13.0	26.4	110
26	86	83.9	99.3	705	103	19.4	25.0	156
27	81	85.2	100	477	103	27.2	42.9	119
28	60	76.7	99.1	442	100	29.0	46.0	78
29	27	85.2	100	185	89	20.2	58.0	76
30	18	66.7	96.9	140	25	52.0	60.4	48
31	3	100	97.3	80	20	60.4	76.0	25
32			100	39	9	55.6	82.4	17
33			100	29	6	33.3	100	5
34			-	-	2	100	100	3
35			-	-			100	2
36			-	-			100	6
37			100	10			100	1
38			-	-			100	2
39			100	10			-	-
40			-	-			-	-

Table 3. The effect of other species present on selection
 (a) Nephrops, July 1962, tows with 50 mm. cod-end

Date of haul	<u>Nephrops</u> abundant						<u>Nephrops</u> few			
	17. 7. 62		17. 7. 62		18. 7. 62		17. 7. 62		17. 7. 62	
Duration	½ hr.		1 hr.		1 hr.		½ hr.		½ hr.	
Length (cm)	%	Total Nos.	%	Total Nos.	%	Total Nos.	%	Total Nos.	%	Total Nos.
15	-	-	-	-	0	1				
16	65.6	3	0	1	0	8	25.0	12	0	1
17	51.3	19	66.7	6	41.6	77	50.0	44	33.3	3
18	68.7	61	63.2	19	42.5	130	54.5	132	50.0	16
19	80.3	137	87.9	58	62.8	250	69.4	183	58.7	29
20	73.8	103	82.2	79	75.5	324	69.1	149	73.8	42
21	94.1	85	92.3	65	80.0	160	74.4	86	70.0	50
22	88.2	68	91.9	37	88.0	158	89.4	47	77.8	54
23	85.0	40	89.7	29	95.3	106	87.5	24	89.4	38
24	95.0	20	100	7	95.2	62	85.8	7	100	15
25	76.0	13	100	6	95.2	42			57.1	7
26	85.0	7	100	5	100	35			0	1

(b) Squalus acanthias, July 1962, tows with 70 mm. cod-end

Date of haul	<u>Squalus</u> abundant				<u>Squalus</u> few			
	16. 7. 62		18. 7. 62		16. 7. 62		18. 7. 62	
Duration	½ hr.		1 hr.		1 hr.		½ hr.	
Length (cm)	%	Total Nos.	%	Total Nos.	%	Total Nos.	%	Total Nos.
18	0	10	5	20	0	9	0	6
19	10	20	18.4	49	0	14	6.7	15
20	18.2	33	27.4	73	1.3	75	5.1	39
21	24.4	45	29.1	79	5.4	204	5.9	34
22	21.3	47	31.3	67	3.9	182	4.0	25
23	19.0	42	38.6	57	11.0	109	13.6	22
24	21.7	23	30.0	40	0	37	7.7	13
25	42.9	14	41.2	17	-	-	0	9