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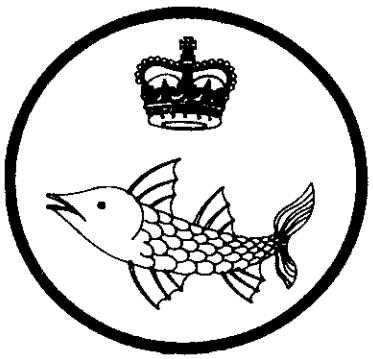
DIRECTORATE OF FISHERIES RESEARCH



FISHERIES NOTICE

Number 66

CARDIGAN BAY SCALLOP SURVEY, SEPTEMBER 1980

LOWESTOFT
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CARDIGAN BAY SCALLOP SURVEY, SEPTEMBER 1980

by A. Franklin and P. M. Connor

INTRODUCTION

A fishery for scallops (Pecten maximus) developed in Cardigan Bay in the spring of 1980. By early summer, over 70 vessels were working the grounds and fears were expressed regarding possible overfishing of the stocks in the area. A survey was undertaken of the scallop beds at the beginning of September using the Ministry of Agriculture, Fisheries and Food, Research Vessel CLIONE to collect the basic biological information needed to allow a preliminary assessment to be made of the potential of the Cardigan Bay stocks and the possible long-term management requirements.

METHOD

A grid of 67 sampling stations was worked from west of Strumble Head to off Aberystwyth (Figure 1). Both Newhaven and French dredges were tried on the grounds; the former appeared to be better suited for the rough ground encountered and these were used exclusively after the initial trials. Stations were positioned for convenience along selected purple Decca lanes; at each station, four standard commercial (0.8 m) Newhaven dredges were towed on a beam. The duration of each haul was 15 min (on the bottom) at a towing speed of approximately 3 knots, with the tide wherever possible. One dredge had a fine-mesh belly and back to retain small scallops. All scallops caught were measured and aged and notes were made of the gonad condition.

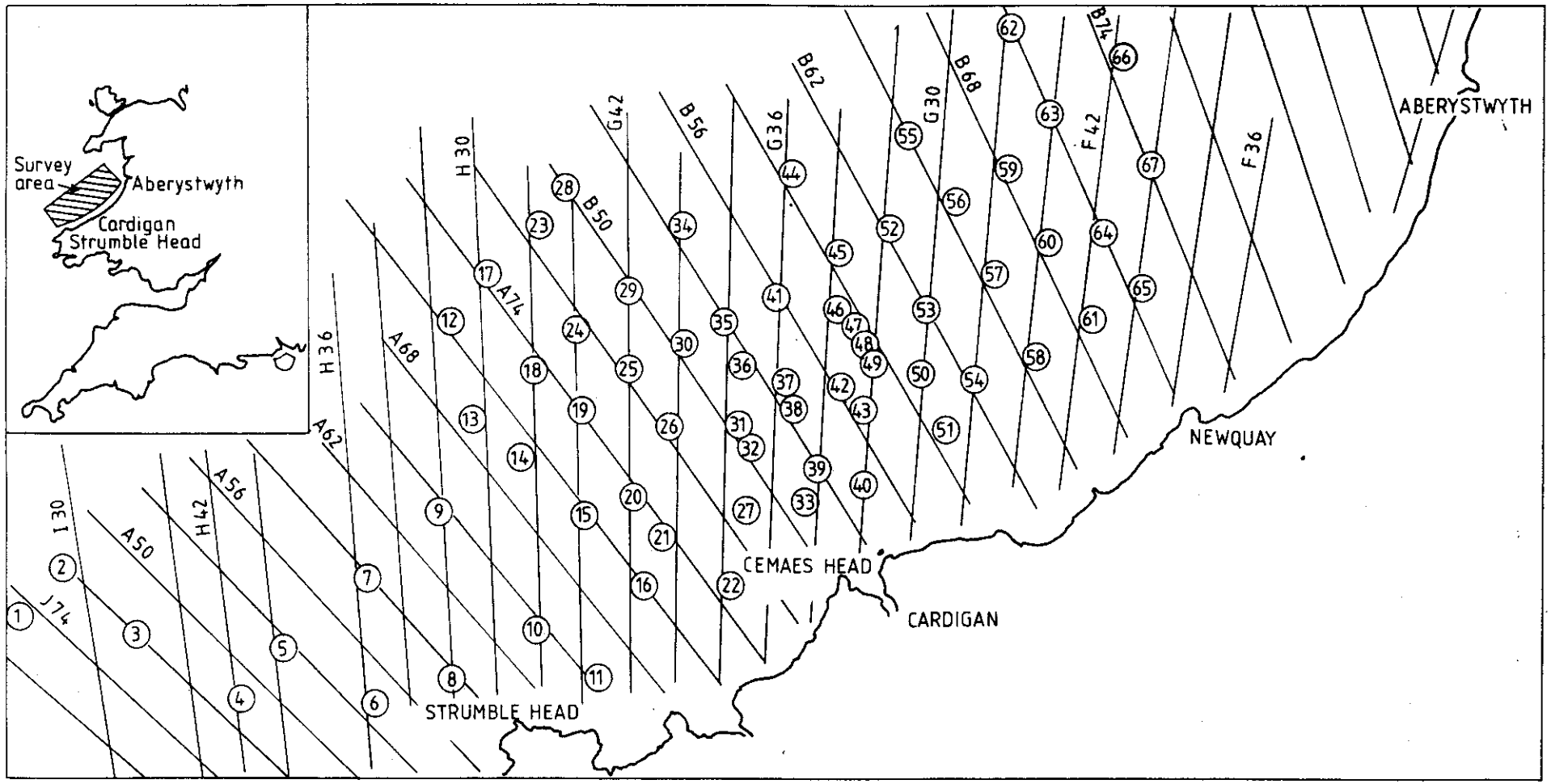

Figure 1 Survey area and positions of individual stations.

Table 1 Catch details for each survey station (one 15 min haul with four Newhaven dredges, unless otherwise indicated)

Station number	Decca position (SW British chain)		Depth	Number of scallops caught		Size (length) of scallops caught			
	Green	Purple		Total	Maximum in one dredge	Below 4 inches	4-5 inches	5-6 inches	Above 6 inches
1	I 33.0	J 73.5	93 m	0	0	-	-	-	-
2	I 30.8	J 77.0	94 m	0	0	-	-	-	-
3	H46.0	J 76.9	95 m	0	0	-	-	-	-
4	H41.2	J 78.8	64 m	0	0	-	-	-	-
5	H39.3	A52.8	64 m	0	0	-	-	-	-
6	H35.8	A53.7	53 m	0	0	-	-	-	-
7	H35.3	A59.0	58 m	0	0	-	-	-	-
8	H32.0	A58.6	51 m	0	0	-	-	-	-
9*	H32.3	A64.2	58 m	1	1	-	-	1	-
10	G46.2	A64.2	46 m	0	0	-	-	-	-
11	G43.4	A65.2	33 m	7	4	-	-	5	2
12*	H31.4	A71.2	60 m	10	8	-	2	8	-
13*	H30.6	A69.1	55 m	7	6	-	-	7	-
14	G46.4	A70.0	50 m	5	4	-	-	5	-
15	G43.9	A70.7	50 m	13	7	-	3	10	-
16	G41.6	A70.9	43 m	23	11	1	9	12	1
17	G47.7	A74.5	60 m	1	1	-	-	1	-
18	G46.0	A73.4	50 m	22	11	1	3	17	1
19	G43.8	A74.2	50 m	15	7	-	1	12	2
20	G41.9	A73.3	45 m	1	1	-	-	1	-
21	G40.5	A73.5	41 m	8	4	-	3	5	-
22	G37.9	A75.0	41 m	0	0	-	-	-	-
23	G45.4	A78.5	58 m	3	1	-	-	3	-
24	G44.1	A76.2	52 m	26	10	1	3	19	3
25	G42.0	A77.4	50 m	9	4	-	1	6	2
26	G40.2	A77.3	47 m	16	5	1	6	8	1
27†	G37.0	A78.4	44 m	44	15	-	12	30	2
28	G44.6	B50.0	62 m	2	1	-	-	1	1
29	G42.0	A79.8	52 m	33	11	-	5	25	3
30	G39.8	B50.4	47 m	18	8	-	-	18	-
31	G37.4	B50.5	42 m	55	18	6	19	30	-
32	G36.8	B50.5	44 m	5	3	1	1	2	1
33	G34.8	B51.6	35 m	65	21	-	52	13	-
34	G40.0	B53.4	49 m	3	2	-	-	3	-
35	G38.2	B52.8	43 m	13	6	-	1	8	4
36	G37.2	B52.7	48 m	50	20	1	9	37	3
37	G35.7	B53.5	43 m	21	10	-	9	12	-
38	G35.1	B53.3	40 m	28	13	2	8	18	-
39	G34.0	B52.9	37 m	8	4	-	3	5	-
40	G32.4	B54.4	18 m	10	4	-	4	6	-
41	G36.0	B55.9	42 m	19	9	-	1	16	2
42+	G33.5	B56.2	38 m	30	30	-	3	26	1
43	G32.4	B56.5	36 m	51	17	3	10	31	7
44	G35.6	B60.0	40 m	6	4	-	2	3	1
45	G33.7	B59.8	40 m	16	7	-	1	13	2
46	G33.7	B57.8	42 m	16	7	-	3	12	1
47	G32.8	B58.3	37 m	43(+1)	13	-	3	33	7
48	G32.5	B58.4	36 m	64	28	-	3	54	7
49	G32.1	B58.5	36 m	51	19	-	13	35	3
50	G30.2	B60.4	30 m	58	23	-	10	45	3
51*	F46.9	B59.5	27 m	5	5	-	-	4	1
52	G31.8	B62.2	36 m	11	6	-	-	5	6

Table 1 (continued)

Station number	Decca position (SW British chain)		Depth	Number of scallops caught		Size (length) of scallops caught			
	Green	Purple		Total	Maximum in one dredge	Below 4 inches	4-5 inches	5-6 inches	Above 6 inches
53	G30.2	B61.8	35 m	40(+1)	14	1	4	30	5
54	F46.0	B62.1	31 m	0	0	-	-	-	-
55	G31.5	B65.0	33 m	0	0	-	-	-	-
56	F47.7	B65.3	33 m	28	12	-	2	20	6
57	F45.8	B65.3	31 m	0	0	-	-	-	-
58	F43.8	B65.4	26 m	0	0	-	-	-	-
59*	F45.7	B68.3	33 m	10	10	-	1	7	2
60	F43.9	B68.7	28 m	0	0	-	-	-	-
61*	F41.8	B68.8	26 m	0	0	-	-	-	-
62	F46.0	B71.2	31 m	0	0	-	-	-	-
63	F44.2	B70.6	32 m	12	6	-	3	7	2
64	F41.5	B70.9	20 m	0	0	-	-	-	-
65	F39.9	B71.5	22 m	0	0	-	-	-	-
66	F41.8	B74.3	25 m	0	0	-	-	-	-
67	F39.9	B74.3	21 m	0	0	-	-	-	-
					Total	18	213	669	82

\+ 10 min tow with a single French dredge.
* Some dredges turned over and not fishing the whole tow.
\+ 10 min tow.
(+1) 1 scallop smashed.

RESULTS

Catch details are summarised in Table 1. The main scallop bed appeared to lie between Cemaes Head and Newquay, extending from two to ten miles offshore. Catches within this area per 15 min tow ranged approximately from 10 to 70 scallops. The maximum catch for any one dredge is given to enable more relevant comparisons to be made between stations when some dredges were not fishing properly, e.g. if turned over. This figure is also important because of the considerable variation in catches between individual dredges, due to their toothbars being set at different tensions, to ensure that at least one would fish efficiently when different bottom types were encountered during the survey. In commercial fishing the tension would, of course, be adjusted to obtain the best catch for any one particular area.

The catchability of scallops varies throughout the year and commercial experience elsewhere seems to be that catch-rates drop after spawning. As many of the scallops caught during the survey had spawned, it is possible that higher catch-rates could be obtained at other times of the year. The maximum haul for a single Newhaven dredge in this survey was 28 scallops at station 48.

The scallops in Cardigan Bay were generally large, as indicated in Table 1. The majority had a length (the largest dimension, i.e. the maximum measurement parallel to the hinge) exceeding 5 inches (127 mm) and $\sim$ 10% exceeded 6 inches (152 mm). In many English fisheries, scallops with a length greater than 4 inches (102 mm) have generally been commercially acceptable. The extremely fast growth rate characteristics of the Cardigan Bay scallops would result in this acceptable size being attained in less than four years.

The age-groups of all the scallops caught during the survey are shown in Figure 2. Older scallops were still fairly abundant in the fishery as would be expected in a stock which was essentially unexploited until this year. Around 50% were six years or older and significant numbers of scallops up to nine years old were taken. The stock was, however, dominated by survivors of the 1975 year-class (5 year olds). Unfortunately, this obviously successful settlement was apparently not repeated in later years, very few scallops under four years old being taken, even with fine-mesh gear. Indications from this preliminary survey, therefore, are that the high stock levels present on the beds early in 1980 will not be maintained.

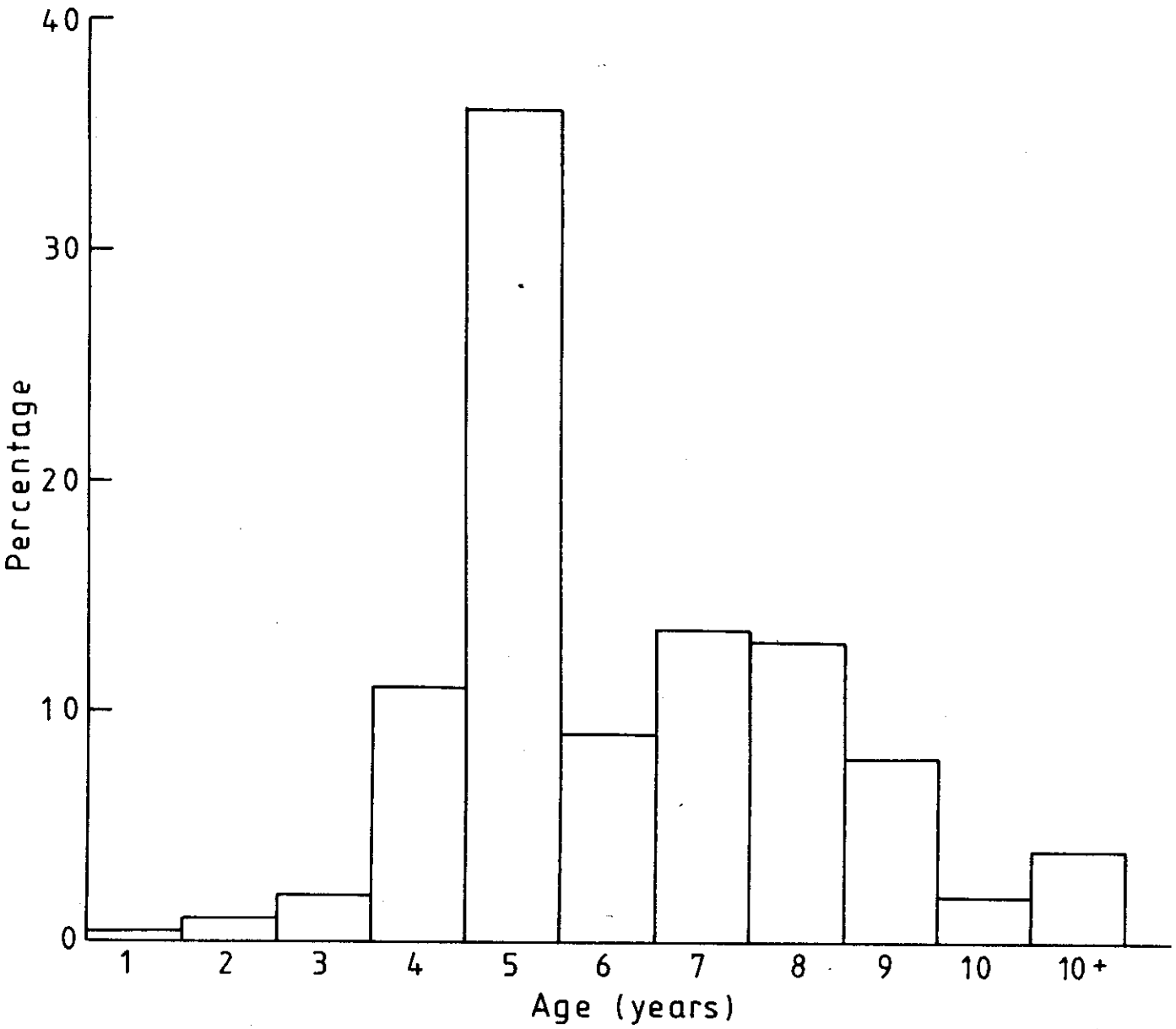

Figure 2 Age-groups of all scallops caught.

The results of the assessment of gonad condition of all scallops caught are summarised in Figure 3. The gonads from the scallops were divided into the standard seven stages, from stage 1 (juvenile) through stages 2-6 (increased development and fullness) to stage 7 (spent). The gonad condition was found to vary considerably from one part of the survey area to another, and even within individual stations. At some stations 100% of the scallops were spent, whilst at others up to 70% had well-developed gonads. It was noted that a greater proportion of spent scallops were present in areas of higher catch-rates.

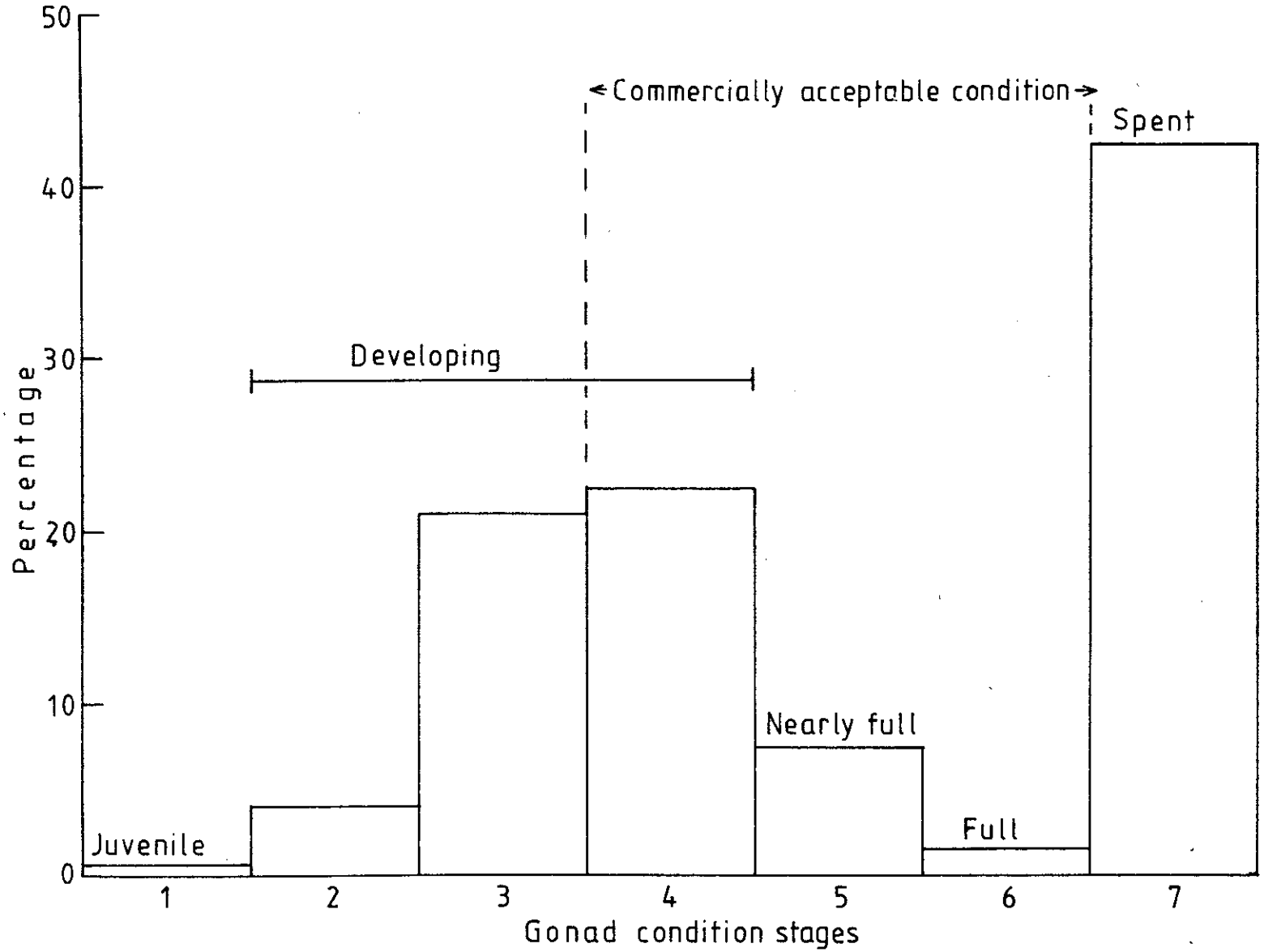

Figure 3 Gonad condition of all scallops caught.

Overall, about one third of the scallops had gonads in stages 4, 5 or 6 at which the scallops are considered to be commercially acceptable.

Local variations in the spawning cycle appear to be a feature of scallop beds off south-west Britain, in contrast, for example, to the eastern English Channel where spawning occurs within a short, definite season. Such variations make it more difficult to assess the benefits likely to result from close season regulations aimed at restricting fishing when scallops are in the spent condition and have a lower market value.

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