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**THE HERRING FISHERIES ON THE
SOUTH AND SOUTH - WEST COASTS
1970/71.**

by

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SOUTH COAST

Introduction

The 1970/71 winter herring fishery off the south coast, based mainly at the ports of Dunmore East and Cobh, began in the week ending 14 November, 1970, and ended on the 4th February, 1971. Eighty boats, seven more than in the 1969/70 season, took part in the fishery and landed a total of 110,816 crans. The total landing, which was an increase of 13,880 crans on the quantity for the previous season, was the highest yet recorded. During the season landings were made on 63 days out of a possible 74. The weather, which prior to Christmas had been reasonably favourable, deteriorated during January and brought fishing to a standstill on a number of occasions. This factor, together with the disappearance of the shoals in early February, closed the fishing season earlier than in the previous four seasons. All herrings landed were auctioned at either Dunmore East or Cobh and the following were the monthly landings in crans at each port:-

Month	Dunmore East	Cobh	Others	Total 1970/71	Total 1969/70	Total 1968/69
October	-	-	-	-	169	232
November	9,585	4,741	-	14,326	8,978	1,356
December	49,841	13,427	-	63,268	34,826	16,221
January	28,528	2,426	-	30,954	36,824	41,204
February	470	1,798	-	2,268	16,139	11,768
Total 1970/71	88,424	22,392	-	110,816	96,936	70,781
1969/70	61,807	35,129	-	96,936		
1968/69	41,071	29,199	511	70,781		

The value of all herring landed amounted to £770,703 which was an increase of £226,033 on the figure for the 1969/70 season. The demand throughout the season was generally very good, except for a period immediately before and after Christmas when marketing problems caused the restriction of fishing on a number of occasions and the fleet

were obliged to fish on a quota system. The average price paid per cran was £6.95 (£6.71 per cran at Dunmore East and £7.85 per cran at Cobh) which represented an increase of £1.35 on the average for 1969/70. The total landings, the value and the average price for the last five seasons were as follows:-

Season	Total landing (Crans)	Value (£).	Average Price (£)
1970/71	110,816	770,703	6.95
1969/70	96,936	544,670	5.60
1968/69	70,781	353,905	5.00
1967/68	63,343	253,372	4.00
1966/67	47,560	235,422	4.95

Disposal of Catch:

In the past the largest part of the landed catch has been exported to the continent, in cured or rough packed form by luggers. However, during 1970/71, the trend away from this method continued and considerable amounts of herrings were frozen or cured in more sophisticated forms before being exported. More herrings were also exported to countries other than Holland and the Federal Republic of Germany, which have traditionally taken most of the catch during the last decade; the influx of buyers from Scandinavian countries helped to create a demand and maintain prices throughout the season. However, the lack of local shore processing facilities contributed to the market restrictions that have already been mentioned. As usual the amount of herrings consumed on the home market accounted for only a small fraction of the total catch. No herrings from the fishery were used for reduction to fishmeal or for trout or mink feeding throughout the season. The following are approximate figures (in crans) for the disposal of the catch in 1970/71:-

Disposal of Catch

	Ireland	Britain	Holland	W. Germany	Belgium	Norway	Sweden	France	Israel	Total
Fresh (whole)	700	7,300	1,000	-	600	-	-	-	-	9600
Rough packed (whole)	-	8,000	63,300	7,100	2,700	1,000	100	600	2,600	84,800
Rough packed (gutted)	-	-	-	600	-	-	-	-	-	600
Rough packed (headed)	-	-	-	-	-	1,500	-	-	-	1500
Cured, spiced and sugared (whole)	-	-	-	-	-	500	-	-	-	500
Cured, spiced and sugared (headed)	-	-	-	200	-	-	600	-	-	800
Frozen (whole)	-	-	5,600	5,700	600	-	-	500	-	12400
Frozen (fillets)	-	-	-	200	-	-	-	-	-	200
Others	-	-	-	400	-	-	-	-	-	400
Total	700	15,300	69,900	14,000	3,900	3,000	700	1,100	2,000	110800

Location and extent of fishery:

As already indicated the season opened during the week ending 14 November 1970, when scattered shoals were located off the Daunt Lightship. In the following week light catches were made over the area extending from the Daunt Rock to Hook Head. Towards the end of November fishing was confined to Baginbun Bay, where good catches continued to be made until this particular group of herrings had spawned. For the

greater part of December, the fleet was divided into two sections, viz. those fishing the area from west of Mine Head to Cork Harbour and landing at Cobh, and those fishing from S.S.E. of Hook Head to Tramore and landing at Dunmore East. After Christmas and during the greater part of January no shoals were located off the Daunt Rock or in Ballycotton Bay and the fleet working from Cobh joined the boats working from Dunmore East. During this period a number of boats returned to Castletownbere and located shoals in Bantry Bay. During January good catches were taken from S.E. of Hook Head to Tramore and towards the end of the month in Baginbun Bay (1.0-1.5 miles off Slade Head and off the Keragh Rocks) where spawning occurred at the end of the month. There was further fishing off Ballycotton and the Daunt Rock in early February but the shoals appeared to be light and scattered and the season ended abruptly.

Landings per type of gear, catch per effort and effort.

The majority of herrings caught were again taken by boats using paired midwater gear, and the number of pairs engaged in this type of fishing was twenty nine (29) compared with twenty three (23) pairs during the 1969/70 season. On a number of occasions throughout the season three or four boats combined in midwater fishing with varying degrees of success, two boats using the midwater gear and the other boat or boats "scouting" for fish. One notable feature about the landings was the decline in the catches made by boats using bottom trawls which, with the exception of the post Christmas period, caught only small amounts of herring. Bottom trawling which became the dominant method of catching herrings in this fishery in the mid-sixties (after the decline of the ring nets) now produces only about 13.5% of the total catch (compared with 68.3% in 1965/66). Some of the reasons for this decline are:

1. The successful catches made by boats using midwater gear have attracted more fishermen to this particular method of fishing;
2. The large fleet using midwater gear by night scatters the shoals and this is to the detriment of the bottom trawlers and
3. a change in the behaviour pattern of the spawning herrings has been noted, whereby they do not remain in the vicinity of the spawning grounds for as long as they did in previous years.

The landings for each type of gear for the last three seasons were as follows:-

Type of gear	1970/71	1969/70	1968/69
Paired midwater trawls	95,877	71,046	42,511
Single midwater trawls	-	200	432
Bottom trawls	14,939	25,690	27,688
Drift nets	-	-	150
Total:	110,816	96,936	70,781

The importance of catch per landing or catch per effort (c.p.e.) lies in the fact that when it is compared over a number of years, it gives an indication of the size of the stock available and how it is reacting to fishing, provided that the fleet during this period of comparison remains at a fairly constant level of efficiency. However, the fleets, both at Dunmore East and Cobh, have in a very short time increased considerably in catching capacity and in efficiency and, in addition, the type of fishing has also changed, as mentioned earlier. Thus accurate comparisons of catch per effort have been rendered difficult. The imposition of quotas has also meant that boats are working below their maximum level of efficiency for periods each season. The average catch per landing per type of gear, excluding those days on which quotas were in operation, for the last five seasons were as follows:-

Season	Bottom Trawl D. East (A)	Pair Midwater D. East (B)	Pair Midwater Cobh (C)	Pair Midwater Total (D)
1970/71	37.3 crans	111.9 crans	103.2 crans	109.2 crans
1969/70	35.5 "	94.1 "	138.3 "	111.8 "
1968/69	54.4 "	85.4 "	127.6 "	109.6 "
1967/68	49.2 "	99.0 "	-	99.0 "
1966/67	35.0 "	92.3 "	-	92.3 "

If the catch per effort of all midwater boats (D) are taken it would seem that the total stock has remained fairly constant during the last three seasons. However, the amounts of fish available to boats fishing from Cobh (C) decreased considerably, while the amounts available to boats fishing off Dunmore (B) has increased. A further breakdown of the

c.p.e. figures per month for 1970/71 was as follows:-

	Bottom Trawls (D. East)	Pair Midwater (D. East)	Pair Midwater (Cobh)
November	17.8 crans	67.7 crans	66.8 crans
December	47.5 "	160.7 "	131.6 "
January	31.6 "	83.5 "	173.3 "
February	-	59.6 "	95.8 "

The figures from Dunmore East show that availability was rather low in all months except December when undoubtedly large shoals were present in the area. The figures for Cobh reveal the same picture, but the January figure is over exaggerated because of heavy landings made on the 1st of the month by boats which had been fishing off Cobh. It would, therefore, appear that over the whole season the quantity of herring present was not higher than in previous years, in spite of the very heavy catches made during December, and that there was no rise in catch per effort in spite of the increased catching power of the fleet in general.

On the other hand, the effort to which the stock has been subjected has again risen dramatically. If we assume that the whole catch during the last five years had been taken by paired midwater boats, we can by using their catch per effort figures estimate the theoretical number of landings (the equivalent to one night's fishings per pair) required to take the whole catch.

Season	Total Catch (Crans)	C.P.E. (pair midwater) Crans	Effort (nights fished per pair)
1960/71	110,816	109.2	1,015
1969/72	96,936	111.8	867
1968/73	70,781	109.6	646
1967/74	63,643	99.0	643
1966/75	47,560	92.3	515

The total effort can now be seen to have doubled during the last five seasons, while the catch per effort has in the last three seasons remained constant. This would indicate that the fishery is now at its peak and further increases in effort are not likely to result in an increased catch.

Scientific investigations.

Sampling of herrings landed at Dunmore East and Cobh was continued throughout the season. A total of 2,511 were examined for length, sex, maturity and age. The average vertebral counts, the number of herrings per kilogramme and the average fat content were also noted.

Length and age

The dominant age groups present in the samples were three, four and five-year old fish which together constituted 90.9% of the total. When the percentage age distributions are related to the average catch per effort it is possible to compare the average strength of the age classes within the stock. The following table shows this for the last five seasons - the age groups being expressed as number of crans in the average landing of a pair of midwater trawlers:-

Age in years. (Crans per paired midwater trawler landing)											
Season	2	3	4	5	6	7	8	9	10	10+	Total
1966/67	7.3	21.2	34.2	6.1	8.9	3.6	2.5	5.7	0.9	1.7	92.1
1967/68	9.0	41.7	12.2	19.8	4.6	4.2	2.1	3.2	1.1	1.2	99.1
1968/69	6.2	39.6	26.1	8.1	20.3	2.8	2.2	0.8	1.3	2.3	109.7
1969/70	5.6	52.4	22.6	13.3	7.2	6.7	2.0	0.7	0.5	0.7	111.7
1970/71	0.8	39.7	38.3	12.9	8.4	4.5	2.5	0.9	0.5	0.6	109.1

Recruitment of three-year old fish was again satisfactory although very few fast growing two-year old fish were present. This latter fact is one of the reasons why the quality of the herrings landed was so good during the season. Because of the persistently good recruitments during the last four seasons, the total stock has been able to withstand the increased effort to which it has been subjected during this time. However, the fact that the total stock is so dependent on each year's recruits means that the position already noted in last year's report has not altered, i.e. a failure in recruitment at the present level of fishing intensity could lead to a reduced catch per effort. One other feature is that mortality this year appears at first glance to be lower than for some time, indicating that the total catch taken from the stock would be lower during 1970/71. The fact that the Dutch fleet did not fish in the area to any great extent during 1970 undoubtedly influenced the lower

mortality rate but indications are that this was only a temporary drop in effort. The reason for the drop in the Dutch effort in the area to the south of Ireland was because of an unexpected improvement in the fishery in the North Sea. However, conservation measures now in operation in the North Sea will probably lead to a renewed increase in effort off our South coast.

A comparison between the age distributions of herrings landed at Dunmore East and Cobh shows that the percentage amount of three-year olds in the Cobh samples was considerably lower than in Dunmore East. This fact, which is attributed to a difference in the recruitment mechanism in the two areas, explains why the Cobh herrings are a bigger "run" of fish than in Dunmore East. The average size of three-year herrings at Cobh continues to be bigger than those at Dunmore East. During the last seven seasons the average size of herrings per age group has increased considerably. This phenomenon has also been noticed in a number of other fisheries and no proper explanation has yet been forthcoming. It does, however, explain why the herrings landed are bigger now than previously but it is not, as is commonly thought, because there are more older herrings in the catches. The following are comparisons of mean lengths (cm) for three, five and eight-year old herrings for the last seven seasons, indicating the increases in mean lengths:-

Age	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71
3 years	25.5	25.7	26.4	26.4	26.9	26.6	26.6
5 years	29.1	29.0	29.2	29.2	29.0	29.2	29.5
8 years	30.0	30.2	30.5	30.6	30.7	30.9	30.9

Maturities.

As has been the case in the last few seasons, fish appear to wait until they are in an advanced state of maturity before approaching the spawning grounds. This means that very few hard clean herrings (stage V) are now taken throughout the season as compared with three or four seasons ago when considerable quantities of this type of herring were taken in the area the south of Hook Head to Mine Head. During 1970/71 the majority of fish taken were stage VI ("mazy") while considerable amounts of "spents" (stage VII) appeared in the catches on occasions after Christmas. It has

been mentioned in earlier reports that successive groups of herrings spawn at different times during the season. This pattern was again maintained during 1970/71. One distinct early spawning took place in Baginbun Bay at the end of November and there was continuous spawning all during January on a small scale both in Baginbun Bay and south of Dunmore East. The season ended after a further spawning in early February. The maturity stages of the fish examined before this last spawning occurred indicated that fishing could have continued well into February. At this time, however, continuous bad weather interrupted the fishing to a great extent and by the time it had improved a large section of the fleet had returned home and the season came to a premature end. For a period before and after Christmas very large shoals were reported in Baginbun bay and off Hook Head. It is thought that this may have been caused by the coincidental arrival of two or more spawning groups on to the grounds at the same time.

Fat Content and numbers of fish per Kilogramme.

The introduction of a new method of estimating fat contents meant that daily estimates of this increasingly important factor were available throughout the season. Compared with previous seasons, the average fat contents throughout 1970/71 were high, presumably because of good feeding available throughout the summer months. However, variations were present, particularly after Christmas, as individual groups of herrings spawned and became spent. Estimates of fat content were based on fillets in all cases.

The bigger than average size of herrings throughout the season, as already mentioned, also meant that the average number of fish per kilogramme was somewhat lower than usual. The average fat content (%) and the average number of fish per kilogramme are shown below, the ranges being given in brackets.

Month	Fat Content (%)		Numbers per kg.	
	Dunmore East	Cobh	Dunmore East	Cobh
November	15.9 (12.0-20.0)	-	4.9 (4.4-5.3)	-
December	11.9 (10.0-15.0)	15.5 (14.0-17.0)	4.9 (4.3-5.6)	4.4 (4.3-4.5)
January	8.5 (6.0-10.5)	-	4.8 (4.4-5.6)	-
February	-	7.3 (6.5-8.5)	-	4.5 (4.4-4.6)

Once again the co-operation of all skippers and buyers and of the employees of the South and East Coast Fishermen's Association in supplying information throughout the season is greatly appreciated.

SOUTH-WEST COAST (SEPTEMBER and OCTOBER, 1970)

Introduction

The autumn herring fishery off the south-west coast, centred at Castletownbere, Baltimore and Dingle, began in the week ending 5th September and ended on 31st October. During this period a total of 5,807 crans were landed, valued at approximately £38,000. Landings at each port were as follows:-

Castletownbere	4,808 crans
Baltimore	1,641 "
Dingle	158 "

Eight Castletownbere, two Wexford and two Dingle boats, using paired midwater trawls and three boats from Union Hall and Schull, using bottom trawls, took part in the fishery at various times throughout this period. Midwater gear accounted for approximately 95% of the landings.

The weather throughout the period was very poor and restricted fishing on a number of occasions. Throughout most of September shoals were located around Dursey Island. At the end of the month, however, and in the early part of October, fishing was carried out off the Stags of Baltimore and off Gerhies in Bantry Bay. For the remainder of October shoals were located in Bantry Bay only.

The quality of herrings landed was considerably better than in previous years. Few small immature fish were present and the numbers per kilogramme varied from 4.2 to 5.7. Most of the fish were either filling (stage IV) or "mazy" (stage VI). "Mazy" and spent fish did not appear in any quantity in the catches until the middle of October, although some stage VI fish were landed at Baltimore at the end of September.

Approximately 60% of the herrings landed were frozen before being exported to Holland. Smaller quantities were either rough-packed at Castletownbere or exported fresh to Britain.

Details of the landings have been collected from this area since midwater fishing started in 1967. The following table shows the total catch (September to November) taken by paired midwater trawls, the number of nights fished (effort) and the average catch per night fishing for pair:-

<u>Year</u>	<u>Total Catch (crans)</u>	<u>Effort</u>	<u>Catch per effort (crans)</u>
1967	2,238	54	41.4
1968	2,141	44	48.7
1969	3,010	29	103.8
1970	4,179	47	88.9

It can be seen that the average catch per effort is, with the exception of 1969, considerably lower than that obtained for either the south or north-west coast winter fisheries. It must, therefore, be concluded that the total stock or stocks belong to small local populations. It can also be seen that the higher catch rate in 1969 coincided with the year of lowest effort, when, for most of the period, only one pair of boats took part in the fishery.

Scientific investigations.

Sampling of the catches was continued in 1970. The mixture of different races in the area, however, makes an accurate assessment of this fishery very difficult. Spawning beds are found in two main areas, viz. around the Stags of Baltimore, and off Gerhies, in Bantry Bay. While autumn spawning herrings only seem to frequent the Baltimore spawning area, both autumn and winter/spring spawners are taken on the Bantry Bay spawning ground. To add further to the confusion, considerable numbers of small immature recruits to an adult winter spawning fishery are also found on occasions frequenting Bantry Bay.

Age.

The age distribution was dominated by three and four-year-old fish, which together constituted 67.7% of the total number of fish examined. It is interesting to note that the three year-old fish (55.4% in 1970) were typical autumn spawning fish, with an average vertebral count of 56.49. However, in 1969 the three year-old fish (28.6%) had a vertebral count of 56.81, which is very similar to that obtained for similar fish from

Dunmore East and Cobh. The percentage age distribution and the average size (cm.) per age group for 1969 and 1970 are shown below.

		<u>Age in Years</u>									
		2	3	4	5	6	7	8	9	10	10+
1969	Length (cm)	24.7	26.7	28.3	19.3	30.3	30.3	31.0	31.4	32.8	31.3
	%	15.8	28.7	12.7	20.3	5.6	12.4	2.8	0.8	0.3	0.6
1970	Length (cm)	23.7	27.2	28.4	29.5	29.8	30.7	30.9	31.4	31.3	31.8
	%	4.9	55.4	12.3	5.3	4.1	7.2	6.4	2.7	0.3	1.4

The co-operation of the Castletownbere Fishermen's Association in providing the use of their premises is gratefully appreciated.