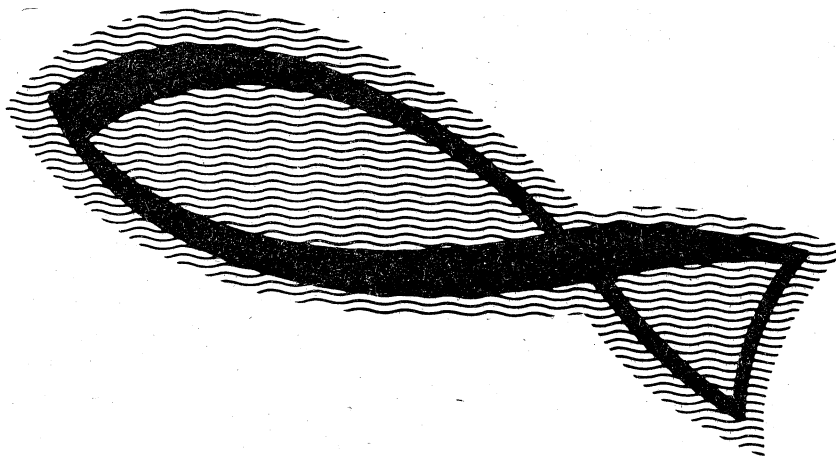




**Fishery Leaflet
Number 72
1975**

**an roinn
talmhaíochta
agus iascaigh**

**Herring investigations on the
North West and West coasts
1974-75**



by

J. Molloy and T. D. Kennedy.

**DEPARTMENT OF AGRICULTURE AND FISHERIES
FISHERIES DIVISION
DUBLIN.1.**

Herring Investigations on the Northwest and West Coasts

1974/1975

by

J. Molloy

and

T. D. Kennedy

ABSTRACT

The main herring fisheries off the Donegal, Mayo and Galway coasts during 1974/75 are reviewed. Landings in all areas decreased considerably and it is thought that this was due mainly to the very poor weather. Recruitment of young fish to the adult fishery was about average off Donegal and slightly better off Galway. The relationship between these herrings to one another and also to those herrings exploited off the Scottish coast is discussed.

Introduction: While the main herring fishery off the north-west coasts covered the period October 1974 to February 1975, quantities of herring were also landed during the period March - September 1974. The section of the report covering the north-west coast is then divided into two sections, that concerned with the period March to September 1974 (the off season) and that with the period October 1974 to February 1975 (the main season). A further section deals with the fishery off the west coast. Reports on investigations of previous seasons have been published by Kennedy 1969-1974.

I North west coast (March to September 1974)

The total amount of herrings landed along the north west coast during the March to September period and the landed value is shown below. These herrings were landed (mainly) by boats fishing from Killybegs although small amounts were also landed at Burtonport. They were taken mainly by boats who were using bottom trawls and as such could be considered a by-catch in a mixed fishery. These boats fish for most of their time in Donegal Bay but may in fact extend their fishing activity to range from Tory Island off the north Donegal coast to Eagle Island off the north west Mayo coast. As can be seen there was a considerable decrease in the amount of herring landed in the area and although the decrease may have been partly due to long periods of bad weather, the general impression among fishermen was that herrings were considerably scarcer than in previous years.

The landing figures for 1974 with the comparable figures for preceding years were as follows:-

| | For human consumption | | For fishmeal | |
|------|-----------------------|---------|--------------|--------|
| | Crans | £ | Crans | £ |
| 1974 | 7,736 | 101,600 | 923 | 2,906 |
| 1973 | 17,018 | 255,825 | 925 | 3,181 |
| 1972 | 18,490 | 150,433 | 1,020 | 2,210 |
| 1971 | 14,919 | 119,840 | - | - |
| 1970 | 13,371 | 62,130 | 6,393 | 13,188 |
| 1969 | 7,610 | 37,524 | 248 | - |

Scientific Investigations: Herring research was continued on the north-west coast from March to September 1974 and samples were examined from the catches landed at Killybegs and Burtonport. A total of 500 fish was examined for age, length, sex maturities and vertebral counts. A further 4,000 fish were measured and the lengths subsequently converted to age using an age/length key. The percentage fat content of fillets and the number of herrings per kilogramme were also estimated for each sample.

Age: The herrings landed during this period were mainly three, four and five year old fish. There was no indication of a strong 1971 year class entering the fishery as recruiting three year olds. The 1963 year class which had dominated the fishery since 1966 has now disappeared from the catches. The monthly age distribution is shown in table 1.

Maturities. The maturities of the herrings throughout the period were similar to those obtained in previous years. Up to the end of June the majority of fish were recovering spents (stage VIII). From July onwards the gonads began to mature and fill (stage III) and they advanced through stages III and IV (filling) to reach stage VI (full) in September. The maturities indicated that spawning would commence in late September and would continue throughout the month of October. During the sampling period small quantities of immature fish (stage II) appeared in the catches

in May and August. The percentage maturity distribution per month is shown in Table 2.

Vertebral counts. The vertebral count, together with the maturity stages, are both used as characteristics in defining and identifying races of herring. The counts throughout the summer months suggested that some winter spawning herrings were present in the catches. Usually the Summer herrings are composed completely of autumn spawning herring.

Fat content and number per Kilogramme. During the months April, May and early June, the fish examined were classified mainly as stage VIII (recovering spents). At this time the fat content remained fairly low (4% - 8%). As the fish began to feed and develop in June the fat content increased rapidly and reached a maximum of 16% in early July. The numbers of herrings per kilogramme was highest in May (5.8 - 6.0) when fish were still recovering spents. However as time progressed the number decreased to 4.8 - 5.2 in August as the fish became full. The average percentage fat content and numbers per kilogramme per month is shown in table 3.

North West Coast (October 1974 - February 1975)

Landings and prices The main herring fishery commenced in October 1974 and continued until early February 1975. A total of 35,243 crans valued at £604,733 was landed at Killybegs during this period. This was a decrease of 47% on the figure for the previous year and was the lowest total landing since the 1969/70 season. The landings at Burtonport increased slightly due to some good fishing in February 1975. A serious factor affecting the landings this year was the prolonged periods of very bad weather which completely prevented fishing at times and at other times restricted the fishing activities to the inner parts of Donegal Bay. Because of this very little fishing was carried out off the Stags of Broadhaven where the heaviest catches are usually made. Because of the substantial drop in landings and resulting income and the steep increases in running costs both fishermen and processors had a very difficult and disappointing season. A tragic side of the season was the loss of the Burtonport trawler with all its crew and this together with several serious accidents aboard vessels highlighted the difficulties and constant danger to the fishing fleet.

With fish in short supply a keen demand led to good prices and the average price was slightly higher than in the previous season. The monthly landings in crans, the value and the average price per cran are shown below.

Landings per month

| Month | Killybegs | | | Burtonport | | | Totals | | |
|-------------|-----------|------------|--------------|------------|------------|--------------|--------|------------|--------------|
| | Crans | Value £ | Av. Price | Crans | Value £ | Av. Price | Crans | Value £ | Av. Price |
| Oct. | 1515 | 21992 | 14.52 | 947 | 11415 | 12.05 | 2462 | 33407 | 13.57 |
| Nov. | 6469 | 113012 | 17.47 | 511 | 7392 | 14.47 | 6980 | 120404 | 17.25 |
| Dec. | 18283 | 301851 | 16.84 | - | - | - | 18283 | 307851 | 16.84 |
| Jan. | 7464 | 131721 | 17.65 | - | - | - | 7464 | 131721 | 17.65 |
| Feb. | 1512 | 30157 | 19.95 | 2355 | 47500 | 20.17 | 3867 | 77657 | 20.08 |
| Other areas | - | - | - | - | - | - | 215 | 3946 | 18.35 |
| Total | 35243 | 604733 | 17.16 | 3813 | 66307 | 17.39 | 39271 | 674986 | 17.19 |

The total landings and value for Killybegs and Burtonport for the last seven seasons are also shown below.

Total landings and value (Killybegs and Burtonport) 1968/69-1974/75

| Season | Killybegs | | | Burtonport and Others | | | Total Value | Av. Price |
|---------|-----------|-----------|-------|-----------------------|--------|-------|-------------|-----------|
| 1974/75 | 35,243 | 604,733 | 17.16 | 3,813 | 66,307 | 17.39 | 674,986 | 17.19 |
| 1973/74 | 66,401 | 1,077,024 | 16.22 | 2,214 | 42,036 | 18.99 | 1,119,060 | 16.31 |
| 1972/73 | 72,848 | 578,629 | 7.94 | 4,727 | 45,026 | 9.53 | 623,655 | 8.03 |
| 1971/72 | 64,285 | 328,879 | 5.12 | 6,773 | 50,582 | 7.47 | 379,461 | 5.34 |
| 1970/71 | 46,259 | 245,121 | 5.30 | 2,004 | 11,242 | 5.50 | 256,363 | 5.30 |
| 1969/70 | 25,493 | 111,433 | 4.37 | 8,510 | 35,742 | 4.20 | 147,175 | 4.32 |
| 1968/69 | 33,503 | 117,261 | 3.50 | 9,341 | 37,364 | 4.00 | 154,625 | 3.60 |

Gear During the season nineteen pairs of midwater trawlers and one pair using ring nets took part in the fishery. In addition two new stern trawlers that in fact used paired midwater trawls, took part. The numbers partaking in the fishery in previous years were:-

| | Paired midwater Trawlers | Ringnetters |
|---------|-----------------------------|-------------|
| 1973/74 | 14 pairs | 3 boats |
| 1972/73 | 15 | 2 |
| 1971/72 | 11 | 2 |
| 1970/71 | 9 | 1 |

Catches per effort and Effort. Normally at the start of the herring season boats "pair" off and remain in pairs for mid water trawling for the duration of the season. The catch/effort is the average quantity of herring caught per pair per nights fishing and effort is the total numbers of landings by pair trawlers for the complete season. During 1974/75 however there was considerable changing of partners throughout the season and several boats left the Donegal fishery to fish herring off the Galway coast. Consequently the catch per effort and effort figures are even more unreliable than usual. The following table shows the catch per effort and effort figures based on the Killybegs midwater fleet from 1968/69-1974/75. The figures for 1974/75 do not include the landings made by the stern trawlers and are based only on the landings by those pairs that remained together for the whole season.

| Season | Catch (crans) (midwater trawls) | Effort (No of fishing nights) | Catch per effort (crans per landing) |
|---------|------------------------------------|-------------------------------------|--|
| 1968/69 | 30899 | 192 | 161 |
| 1969/70 | 18348 | 206 | 89 |
| 1970/71 | 38846 | 261 | 149 |
| 1971/72 | 48836 | 258 | 189 |
| 1972/73 | 61562 | 355 | 174 |
| 1973/74 | 52837 | 375 | 141 |
| 1974/75 | 18878 | 259 | 73 |

The figures for the 1974/75 catch per effort are so low that it is possible that they are not a valid index of stock abundance. Because of adverse weather conditions the fishing fleet was to a large extent confined to areas close inshore and did not fish those areas (e.g. Stags of Broadhaven) where in recent years large quantities of herring were taken. Taking into consideration catches in recent years it is unlikely that the total stock would decrease so suddenly in a single season. A very low catch per effort figure was also recorded for the 1969/70 season when fishing was also affected by unusually severe weather. Under these circumstances, when considerable fluctuations are present in catch per effort data, the resultant mortality figures will be highly variable and for the purpose of stock assessment it is better to take an average of the values obtained from a number of seasons.

Scientific investigations Sampling was continued during the main season on herrings landed on the north west coast. Herrings were examined for length, sex, maturity and racial characteristics. Fat content and the numbers of herrings per kilogramme were also noted.

Age and recruitment. The age distribution during the main season was similar to that of the preceding summer, being dominated by 3, 4 and 5 year old fish. No further influx of three year old fish took place during the main season so that recruitment appears to have been about average. It now seems likely that recruitment to this fishery is subject to very wide yearly fluctuations and that the influx of enormous year classes, e.g 1963 year class, only occurs about once in every eight years. When it occurs, the total stock suddenly increases very quickly and remains high until this particular year class has decreased because of fishing and natural mortality. The age distributions of the autumn component for the last eight seasons is shown in table 4.

Fat Content and number per kilogramme. As explained in Kennedy (1970) the fat content is related to the development of the gonads. In November the fat content of spent fish was 9% and full fish 14%. After spawning was completed and as the fish continued to utilise its fat reserves, the fat content gradually decreased and reached a minimum figure of 6% during January and February. There were occasional landings during the winter of herring which contained full fish and the fat content of these fish varied from 14% in December to 9% in February. The average fat content (based

on fillets) and the number of fish per kilogramme are shown in table 3.

II West Coast

The herring fishery which has developed in recent years on the West Coast continued in 1974/75 with the main fishing taking place in January and February. During the period December to March landings were very disappointing and a total of approximately 15,000 crans was landed. This was a decrease of 8634 cran on the 1973/74 figures. The average price also decreased so that the total value of the fishery dropped by over £183,000. As on the northwest coast bad weather prevented fishing for long periods. Although herring were located over a wide area extending from Galway Bay to Achill Head, it was generally felt that shoals were less abundant than in previous years. Forty-eight boats, using paired midwater trawls took part in the fishery during the season. The monthly landings, the average price and the total value are shown below.

Monthly landings of herrings at Galway and Rossaveal.

| Season | Oct | Nov | Dec | Jan | Feb | Mar | Apr | Total Cran | Value | Av. Price |
|---------|------|------|------|------|------|------|------|------------|--------|-----------|
| 1969/70 | | | | | | | | 1417 | 7120 | 5.02 |
| 1970/71 | | 2000 | 5000 | 850 | 1250 | | | 9100 | 30670 | 3.36 |
| 1971/72 | | 1307 | 4817 | 3417 | 3390 | 6640 | | 19571 | 96376 | 4.92 |
| 1972/73 | | | 1204 | 45 | 6703 | 8434 | 2965 | 19351 | 223119 | 11.53 |
| 1973/74 | 2703 | 2453 | 2742 | 170 | 8159 | 3895 | 217 | 23811 | 426069 | 17.89 |
| 1974/75 | 5087 | 790 | 1178 | 1514 | 5848 | 760 | - | 15177 | 242575 | 15.98 |

A keen demand for herring enabled all catches to be cleared without difficulty and as a result no herrings were reduced to fishmeal. As on the northwest coast most of the catches were exported to continental countries as frozen fillets although smaller quantities were rough packed, spiced or marinated, or exported fresh.

Gear and Catch Effort. During the season a maximum of twenty-four pairs of boats using mid-water trawls took part in the fishery. However with no regular fishing because of weather conditions many of the boats made only occasional landings. While the quantity of herrings landed by midwater boats was down considerably on last years figure the catch effort figure for the season of 80 crans was similar to the figure for 1973/74.

| | Catch (crans) (Midwater trawls) | Effort (No. of fishing nights) | Catch per effort (crans per landing) |
|---------|------------------------------------|-----------------------------------|---|
| 1973/74 | 19,000 | 202 | 94 |
| 1974/75 | 15,177 | 190 | 80 |

In spite of the large numbers of boats attending the fishery the total effort figure however decreased and was an indication of how seriously the poor weather interfered with the fishery.

Scientific Investigations Scientific examination of the herrings landed at Galway was conducted during 1974/75, using the same methods as on the northwest coast. A total of 600 fish was aged and a further 1500 measured and subsequently converted to age.

Age and recruitment. The percentage age distribution for each season since 1970/71 is shown below.

| Season | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10 + |
|---------|-----|------|------|------|------|-----|------|------|------|------|------|
| 1974/75 | - | 1.9 | 41.5 | 19.4 | 10.7 | 2.6 | 4.9 | 4.5 | 8.1 | 0.3 | 6.1 |
| 1973/74 | 0.2 | 20.7 | 25.3 | 10.2 | 3.6 | 5.3 | 5.6 | 7.3 | 3.1 | 18.5 | 0.2 |
| 1972/73 | - | 0.7 | 5.3 | 4.4 | 7.2 | 6.5 | 7.9 | 3.5 | 61.4 | 2.8 | 0.3 |
| 1971/72 | - | 2.6 | 1.3 | 5.4 | 6.1 | 6.4 | 4.5 | 66.8 | 4.1 | 0.3 | 2.5 |
| 1970/71 | - | 0.4 | 3.5 | 6.1 | 6.7 | 3.5 | 66.5 | 8.2 | 3.1 | 0.3 | |

As can be seen the age distribution was dominated by three year old fish (i.e fish who were born in the autumn of 1971).

The number of young fish which entered into the stocks at Galway seems to have been considerably higher than that which entered the Donegal fishery.

Length and vertebral counts. A comparison between the average lengths and vertebral counts per age class of fish from the Galway coast and from Donegal Bay is shown below.

Comparison between average lengths and average vertebral counts (1974/75)

| Age | Galway | | | Donegal | | |
|-----|--------|---------|-----|---------|---------|-----|
| | X.l. | X.V.C. | No. | Xl. | X.V.C. | No. |
| 3 | 26.15 | (56.49) | 128 | 26.40 | (56.68) | 70 |
| 4 | 27.90 | (56.50) | 60 | 27.85 | (56.50) | 28 |
| 5 | 28.68 | (56.42) | 33 | 28.63 | (56.51) | 89 |
| 6 | 29.81 | (56.75) | 8 | 29.39 | (56.37) | 32 |
| 7 | 29.93 | (56.60) | 15 | 30.02 | (56.56) | 23 |
| 8 | 30.25 | (56.36) | 14 | 30.09 | (56.58) | 36 |

Both the average lengths and vertebral counts are very similar for each area. In previous reports it was suggested that the Galway herrings were much bigger per age group than those from Donegal. However, this difference seems to have disappeared and the similarities of these characters for the herrings from both areas would suggest a possible link between the two fisheries.

Fat content and numbers of fish per kilogramme. The fat content for the main season ranged from 6% - 7% and the numbers of herrings per kilogramme averaged 6.4. This was slightly higher than the figure for the Donegal herrings and was caused by the higher proportion of young herrings in the samples from Galway.

Stock Investigations

It has been well established in recent years that the fisheries off the Donegal and North Mayo coast exploits two separate races of herrings which are on occasions mixed throughout the catches. Of these two races the one that spawns in the autumn is by far the more abundant in the catches and usually constitutes approximately 80% of the total landings. The other less abundant race is one that spawns in late winter or early Spring and seems to be more plentiful in the catches from the northerly parts of the coast. The herrings that are taken from Galway Bay are also an autumn spawning stock and although there have been differences between these and the Donegal herrings it is not yet established whether they form a separate population or whether a separation of the main stock only occurs during winter as different groups inhabit different winter quarters.

The herring fisheries that are conducted off the west and north western coasts of

Scotland (e.g. The Minches, Off St Kilda, Stanton Bank, Rhonda, Hebrides and Shetland) also exploit herrings that spawn in the autumn and a small amount of winter spawning herring. Certain similarities and certain differences are also found between these herrings and those from Donegal, but again it has not yet been established whether they mix or whether they do in fact constitute separate races. It is very important to establish the relationship between these different fisheries because any programme aimed at stock conservation must be based on adequate scientific knowledge of the stocks in question, and their migrations.

Recently the Scottish authorities have become alarmed at the very rapid increases that have taken place in the catches in the fisheries from around their coast. These increases have been caused mainly by (1) the introduction into the areas around Hebrides and Shetland of fleets of purse-seiners from the Faroes, Norway and Iceland, (2) by a rise in the Dutch catch from west of Shetland and (3) by a rise in the Scottish catch mainly from the Minches. The catch statistics from these fisheries and also from our own Donegal fishery are reported each year to the International Council for the Exploration of the Sea, and are subsequently grouped as having been taken from area VIA. The scientific working group which was established to advise on what annual catch should be taken from this area were faced with the difficulty of separating the fisheries into different stocks. This has not proved possible and rather than let fishing continue to increase without any restrictions, it was decided to treat the whole of area VIA as if it contained only one autumn spawning stock. The working group which met in February 1974 suggested that the total catch from this area should be limited to about 210,000 tons for 1975. The North East Atlantic Fisheries Commission later accepted their figure and Ireland was allocated a share of this total of 20,000 tons. The latest working group which met in March 1975 concluded that because of a series of below average recruitments and a very high fishing rate the stock size would decrease rapidly. The group accordingly recommended that if the total allowable catch for 1975 was all taken, the total catch taken in 1976 should not exceed 66,000 tons.

In previous reports it has consistently been pointed out that the Donegal herrings had as yet shown no signs of being affected by the present fishing rate. This

conclusion was based on the fact that there had been no decrease in catch per effort and no increase in the mortality rates. At the moment it is difficult to determine whether the poor results from the 1974/75 season were caused by a low stock abundance off Donegal (as a direct result of over-fishing in some other part of VIA) or by a much lower fishing intensity because of poor weather.

The lower boundary of VIA runs across the middle of Donegal Bay and up to now all herrings landed at Killybegs were reported as being taken in area VIA. In recent years considerable quantities of these catches would have been taken from the Stags of Broadhaven and should in fact be reported as having come from area VIIB. From now on it is important that the origin of all landings be known and the catches allocated to their proper areas. In the event of quotas being imposed on both areas, the amounts allocated will be based on the catches in recent years.

Conclusions

- (1) The decrease in landings off both the north and northwest coasts was due mainly to the adverse weather conditions throughout 1974/75, combined with a decline in stock abundance.
- (2) Recruitment to the adult stock was about average off Donegal and above average at Galway.
- (3) Considerable work is necessary to determine the exact relationship between the herrings that are taken off the Donegal, Galway and Scottish coasts.

Acknowledgements

The author acknowledges with thanks the assistance of skippers and others who supplied data for this paper.

References.

- Kennedy, T.D. (1974) Herring Investigations on the north west and west coasts
1973-74

Table 1. % Monthly Age distribution (Autumn Spawners)

| Year Class | 1972 | 1971 | 1970 | 1969 | 1968 | 1967 | 1966 | 1965 | 1964 | | |
|------------|------|------------|------------|----------------------|----------|----------|----------|----------|----------|-----------|-------------------|
| Age | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | |
| (Years) | | | | | | | | | | | |
| May | | 25.3 10 | 16.7 19 | 32.7 4 | 3.3 3 | 4.0 1 | 0.7 2 | 5.3 1 | 2.0 1 | 10.0 6 | Donegal Galway |
| June | 7 | 28 31 | 32 15 | 16 8 | 5 4 | 2 4 | 5 5 | 2 4 | - 1 | 9 21 | Donegal Galway |
| July | | 18.2 | 22.2 | 25.3 | 7.1 | 4.0 | 1.0 | 5.1 | 1.0 | 16.1 | Donegal |
| Aug. | 2.7 | 58.6 | 20.0 | 8.0 | 2.7 | 2.7 | 1.3 | 1.3 | - | 2.7 | Donegal |
| Sept | | | | No samples available | | | | | | | |
| Oct | 1.9 | 49.3 | 18.7 | 10.0 | 1.4 | 2.4 | 2.9 | 7.2 | 0.5 | 5.7 | Galway |
| Nov | 5.3 | 22.3 | 21.8 | 12.9 | 7.0 | 5.3 | 5.9 | 4.7 | 1.2 | 13.6 | Donegal |
| Dec | 8 | 12 | 20 | 20 | 8 | 5 | 9 | 10 | - | 8 | Donegal |

1975

| Year Class | 1972 | 1971 | 1970 | 1969 | 1968 | 1967 | 1966 | 1965 | 1964 | | |
|------------|------|------|------|------|------|------|------|------|------|------|---------|
| Age | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | 10+ | |
| Jan 75 | 1.2 | 10.7 | 21.4 | 23.8 | 7.1 | 9.5 | 10.7 | 3.6 | - | 11.9 | Donegal |
| | 10.0 | 38.0 | 10.0 | 6.0 | 4.0 | - | 4.0 | 10.0 | | 18.0 | Galway |
| Feb 75 | 2.0 | 11.1 | 23.2 | 27.3 | 6.1 | 1.0 | 8.1 | 5.1 | - | 16.1 | Donegal |
| | 2.0 | 25.0 | 21.0 | 12.0 | 5.0 | 10.0 | 8.0 | 10.0 | - | 7.0 | Galway |

Table 2. Percentage maturity distribution per month (Autumn-Spawners)

| Maturity Stage | May | June | July | Aug | Sep | Oct | Nov | Dec | Jan | Feb |
|----------------------------|-----|------|------|------|-----|-----|------|------|------|------|
| II (immature) | 15 | 1.0 | | 6.0 | | | 4.7 | 4.0 | 1.2 | 2.0 |
| III)) (filling) | | 24 | 50.5 | 30.0 | | | | | | |
| IV) | | 3 | 15.2 | 26.0 | | | | | | |
| V (full) | | | 13.1 | 33.4 | | | | 7.0 | | |
| VII (spent) | 45 | 1 | | | | | 95.3 | 89.0 | 98.8 | 98.0 |
| VIII (Recovering Spent) | 40 | 70 | 21.2 | 4.6 | | | | | | |

Table 3. Percentage fat content and number per kilogramme per month.

| Month | Area | Condition | % Fat content | Number per Kilogramme |
|-------|---|--|----------------------------------|----------------------------------|
| May | Tory Donegal Bay Galway Bay- North Sound | Spents and R spents " " " " | 8.0 6.0 9.0 | 6.9 5.8 5.8 |
| June | Tory Donegal Bay Galway North Sound | R Spent & filling " " " " | 13.0 16.0 15.0 | 4.8 5.5 5.3 |
| July | Stags of Broadhaven | " " | 15.0 | 4.8 |
| Aug. | Stags of Broadhaven | full and filling | 14.5 | 5.2 |
| Oct. | Galway Bay " " | full and filling | 13.0 9.0 | 4.8 5.8 |
| Nov. | Glen Head-Malinbeg Stags of Broadhaven | full Spents | 14.0 9.0 | 5.5 5.7 |
| Dec. | Donegal Bay | Spents | 8.0 | 5.7 |
| Jan. | Rosbeg " Galway North Slyne Head Stags of Broadhaven | Full Spents " Spents | 9.0 6.0 6.0 6.0 | 5.0 6.5 6.1 |
| Feb. | North of Slyne Head Tory " Stags of Broadhaven | Spents Full Spents Spents | 7.0 9.0 7.0 6.0 | 6.3 4.4 5.6 6.3 |

Table 4. % Age distributions (Autumn Spawners) October - February

Age in years

| W Rings | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 9+ |
|---------|-----|------|------|------|------|------|------|------|------|------|
| Years | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ |
| 1974/75 | 4.4 | 15.5 | 21.6 | 19.7 | 7.1 | 5.1 | 7.9 | 5.7 | 1.3 | 11.7 |
| 1973/74 | 3.9 | 32.4 | 15.0 | 8.5 | 4.6 | 6.9 | 5.1 | 2.3 | 20.8 | 0.5 |
| 1972/73 | 1.6 | 16.6 | 13.4 | 4.8 | 8.9 | 6.8 | 1.8 | 14.6 | 1.2 | 0.4 |
| 1971/72 | 2.5 | 15.4 | 6.5 | 12.1 | 11.4 | 3.7 | 43.5 | 2.4 | 0.5 | 2.2 |
| 1970/71 | 0.5 | 9.5 | 12.3 | 10.7 | 4.1 | 55.6 | 4.0 | 2.1 | 0.4 | 0.9 |
| 1969/70 | 0.9 | 11.1 | 11.3 | 2.9 | 59.1 | 6.6 | 3.1 | 1.6 | 0.6 | 2.8 |
| 1968/69 | 0.8 | 12.5 | 3.7 | 71.8 | 4.1 | 2.0 | 1.1 | 1.0 | 2.1 | 0.9 |
| 1967/68 | 1.3 | 1.7 | 80.6 | 5.7 | 4.3 | 2.5 | 1.1 | 1.8 | 0.6 | 0.4 |