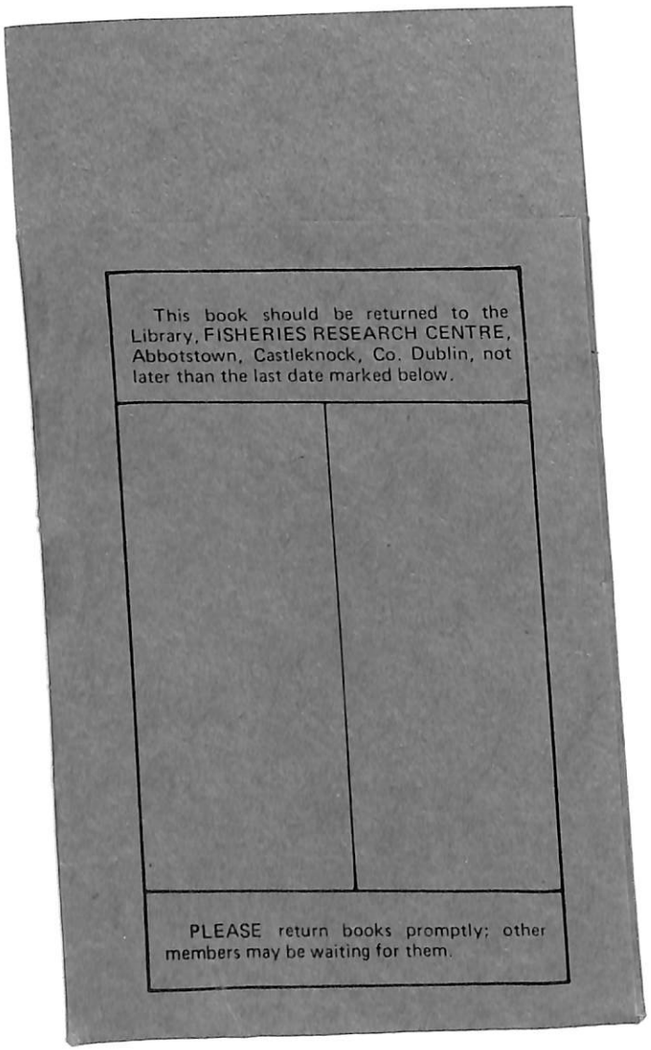
FISHERIES ANNUAL REPORT

OF THE MINISTER FOR FISHERIES AND FORESTRY FOR 1982



FISHERIES

REPORT FOR

1982

AN ROINN IASCAIGH AGUS FORAOISEACHTA
(Department of Fisheries and Forestry)

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FOREWORD

This Report gives an account of the work of my Department in relation to fisheries during the year 1982. It also gives a statistical account of the fisheries in the State and a summary of the activities of the European Economic Community during 1982 as they affect the Irish fishing industry.

PADDY O'TOOLE

Minister for Fisheries and Forestry
30 March 1984

PART I

SEA FISHERIES

LANDINGS OF SEA FISH

In 1982 the total value of all sea-fish (excluding salmon) landings by Irish registered vessels amounted to IR£47.0 m an increase of IR£8.4 m or 21.7% on 1981, of which amount IR£43.8 m relates to landings at Irish ports.

The total volume of sea-fish (excluding salmon) landings amounted to 206,000 tonnes of which 195,000 tonnes were landed at Irish ports.

The weights and values of annual landings of sea-fish (excluding salmon) at Irish ports by Irish registered vessels since 1973 are set out in the following table.

TABLE 1

Year	Tonnes	IR£'000
1982	194,842	43,809
1981	176,577	35,444
1980	134,886	28,866
1979	85,697	24,905
1978	93,689	22,669
1977	82,488	18,689
1976	80,663	12,864
1975	76,262	9,135
1974	84,651	8,736
1973	85,703	7,464

The leading ten fishing ports of 1982 in order of value of fish landed were Killybegs, Castletownbere, Rathmullen, Rossaveel, Howth, Greencastle, Skerries, Dunmore East, Clogherhead and Galway.

DEMERSAL FISHERY

In 1982 the total landings of demersal fish amounted to 34,917 tonnes. Landings of haddock showed the largest increase in volume of all demersal species increasing by 2,309 tonnes or 101%. Whiting was the species caught in the greatest quantity and was followed by cod, haddock, saithe and ray/skate in that order. The total value of

the demersal fish catch increased by 17% from IR£11.9 m in 1981 to IR£13.9 m in 1982. Cod was the first in terms of cash earnings followed by whiting, haddock, plaice and sole in that order. These five varieties contributed 68% of the total value of the demersal catch. The overall average price of all demersal fish in 1982 was IR£398 compared with IR£333 per tonne in 1981. The total quantity, value and average value per tonne of landings of demersal fish for each year since 1973 is shown in the following table.

TABLE 2

Year	Quantity Tonnes	Value IR£000	Average Value Per tonne IR£
1982	34,916	13,908	398
1981	35,916	11,948	333
1980	27,231	8,398	308
1979	21,100	7,721	366
1978	17,900	5,862	327
1977	18,900	5,709	302
1976	23,800	4,652	195
1975	20,000	2,881	144
1974	19,500	2,527	129
1973	20,400	2,374	117

PELAGIC FISHERY

The total pelagic catch of 144,206 tonnes was 15,809 tonnes or 12% higher than the figure for 1981. The total value of the catch was IR£18 m representing an increase of IR£2.7 m or 18%.

Herrings

Landings of herrings amounted to 29,734 tonnes valued at IR£5.2m compared with 29,611 tonnes valued at IR£5.0m in 1981. The average price was IR£176 compared with IR£170.00 per tonne in 1981.

Exports of fresh, chilled or frozen herrings in 1982 amounted to 8,881 tonnes valued at IR£3,419,000 as compared with 12,065 tonnes valued at IR£4,571,000 in 1981. The quantity exported in salted or smoked forms was 9,607 tonnes valued at IR£5,082,000, as compared with 9,918 tonnes valued at IR£4,684,000 in 1981. A further 745 tonnes valued at IR£833,000 was exported in prepared or preserved form. The total herring exports of 19,233 tonnes valued at IR£9,341,000 represented a decrease of 15% in quantity and 7% in value.

The Netherlands proved to be the biggest market for herring having purchased 6,756 tonnes valued at IR£2,759,862. Germany was next having purchased 4,011 tonnes valued at IR£2,801,511 followed by France, Northern Ireland and Great Britain.

The following table shows the total quantity, value and average value per tonne of herring landings for each year since 1973.

TABLE 3

Year	Quantity Tonnes	Value IR£'000	Average Value per tonne IR£
1982	29,700	5,233	176
1981	29,600	5,046	170
1980	36,800	9,395	255
1979	27,400	7,863	287
1978	27,700	8,171	295
1977	23,100	6,033	261
1976	22,000	3,133	142
1975	28,800	3,232	112
1974	39,600	3,950	100
1973	38,900	2,802	72

Sprats

Landings of sprats decreased from 4,984 tonnes in 1981 to 4,109 tonnes in 1982 a decrease of 18% while the value of the catch decreased from IR£313,000 in 1981 to IR£302,000 in 1982 a decrease of 3%.

The following table shows the total quantity, value and average value per tonne of sprats for each year since 1973.

TABLE 4

Year	Quantity Tonnes	Value IR£'000	Average Value per tonne IR£
1982	4,109	302	74
1981	4,984	313	63
1980	9,350	705	75
1979	1,892	128	68
1978	9,119	342	38
1977	6,055	199	33
1976	8,576	218	25
1975	3,516	59	17
1974	7,314	139	19
1973	7,642	133	17

Mackerel

Landings of mackerel amounted to 110,363 tonnes valued at IR£12,456,000 as compared with 93,802 tonnes valued at IR£9,893,000 in 1981.

Landings from the South-West coast mackerel fishery which was mainly exploited by boats fishing from Castletownbere amounted to nearly 24,000 tonnes. This was a considerable increase on the figure for 1981, the most substantial landings being made during January and February. The value of the landings amounted to IR£2.6m.

The chief landing places for mackerel outside of Castletownbere were Killybegs and Rathmullen.

The following table shows the quantity, value and average value per tonne of mackerel landings since 1973.

TABLE 5

Year	Quantity Tonnes	Value IR£'000	Average Value per tonne IR£
1982	110,363	12,456	113
1981	93,802	9,893	105
1980	50,791	4,226	83
1979	24,217	1,792	74
1978	27,507	1,720	63
1977	22,695	1,748	77
1976	14,394	877	61
1975	13,354	584	44
1974	8,525	365	43
1973	8,314	381	46

SHELLFISH

The value of shellfish catch at IR£11.9m showed an increase of IR£3.7m on the value of the 1981 catch. Landings of Dublin Bay Prawns increased from 3,604 tonnes in 1981 to 5,147 tonnes in 1982 with a consequent increase in value from IR£3.3m to IR£4.7m.

The value of shellfish landings over the past ten years is given in the following table.

TABLE 6

Year	IR£'000
1982	11,909
1981	8,243
1980	6,143
1979	7,334
1978	6,526
1977	4,936
1976	3,886
1975	2,374
1974	1,754
1973	1,773

EXPORTS

At IR£73m exports of fish and fish products including both sea and fresh water preparations (see Part II of this Report) established a new record. The comparative figure for 1981 was IR£54.5m. Details of exports are given in Appendix No. 4.

PERSONNEL AND VESSELS

In 1982 there were 3,000 vessels in operation as compared with 3,095 in 1981. The decrease in numbers occurred mainly in the smaller

vessel categories with a drop of 60 vessels in the *10 G.R.T. and under* category and a drop of 30 in the *18' keel and under* category. Decreases of 6 and 21 vessels also occurred in the *51-74 G.R.T.* and the *11-15 G.R.T.* categories respectively. There was, however, an increase in the *over 100 G.R.T.* category with 7 more vessels in the fleet in 1982 than in 1981. There was an increase of 17 vessels in the *16-25 G.R.T.* category.

The decline, which began in 1980, in the number of fishermen engaged in the industry continued throughout 1982. Decreases occurred both in the number of full time fishermen — 3,405 in 1982 as compared with 3,464 in 1981, and in the number of part time fishermen which dropped from 5,276 in 1981 to 5,101 in 1982. These decreases were due to a reduction in (a) the number of vessels operating during the year, and (b) a reduction of crew members by vessel owners to offset increasing overhead costs arising mainly from escalating fuel oil prices.

MARICULTURE

It is only in the past twenty years that marine fish farming, or mariculture, has become a reality, and it has developed most rapidly since the mid-1970's. Here in Ireland, considerable growth has occurred in this sector of the fishing industry in recent years, with the main emphasis on oyster and mussel culture. However, with the continuing progress of marine fish farming activities, coupled with on-going development in methods of cultivation, other species of shellfish, including clams, escallops and abalones, are now being reared artifically in the sea, thus ensuring a healthy base for our infant marine fish farming industry.

With the upsurge of interest in marine fish farming, a completely new system of licensing fish farming activities was called for, and this was provided for under Section 54 of the Fisheries Act, 1980. However certain legal difficulties arose with regard to the implementation of Section 54, but these are being cleared up by the Department, in consultation with the Attorney General's Office, with a view to having the matter rectified as soon as possible. As a result, no marine shellfish farming enterprises were licensed in 1982.

E.E.C. grants continued to be available towards the cost of mariculture projects. The operation of the B.I.M. Mariculture Grants Scheme, which covered both pilot and commercial scale projects, continued during the year.

Technical and engineering advice and assistance continued to be given to various private operators of shellfish and salmonid rearing installations. A number of exhibitions and seminars on fish farming were staged during 1982.

Mariculture has a key role to play in the economy, as most of the production of our marine fish farms is exported.

AN BORD IASCAIGH MHARA

The Board received a grant from the Fisheries Vote for the year ending 31 December 1982 of IR£8.48m for administration and current and capital development. Repayable advances totalling IR£5.74m were also made to the Board from the Central Fund, mainly for the provision of boats and gear.

The scheme of loans, grants and leasing arrangements for the acquisition of sea fishing boats and gear continued in 1982. During the year, six new vessels, ranging in size from 64ft to 90ft, with a total value of IR£7,805,041, joined the fleet. All of these vessels were built in Irish yards. Twenty four new vessels under 50ft and valued at IR£1,682,292, all Irish built, also joined the fleet during the year. Fourteen vessels in this class were on order with Irish builders at the end of 1982.

The serious situation regarding loan repayments is a continuing cause for concern to the Board and has placed a severe strain on their capacity to re-invest in the fleet. Arrears at 31st December, 1982 amounted to IR£3,051,471. The Board is conscious of the difficulties being experienced by the fleet at the present time and is heartened by the fact that in every port and in every size and price range of vessel there are borrowers who are meeting their full commitments.

The Board implemented a considerably stepped-up programme of market investigation and development work abroad, with particular emphasis on West African and Middle Eastern markets. Close liaison was maintained with the exporting industry in improving marketing arrangements for the very substantial catch of mackerel, and in channelling exports of the wide range of other fish products, including farmed fish, to the most remunerative markets, mainly in Europe.

Further progress was made towards meeting the broad based training and educational needs of the industry, particularly of the catching sector. The principal areas of progress were advanced training in heavy engine maintenance, electronics and gear technology at the National Fishery Training Centre in Greencastle and abroad, port courses, mobile training unit in-service courses, and career guidance seminars and workshops.

The Board initiated its involvement in the sphere of development co-operation services through participation in a seven-week in-plant training programme for fisheries personnel from development countries, which was organised in conjunction with DEVCO and the Institute of Public Administration. Five senior governmental executives from Nigeria, Egypt, Tanzania and Malaysia took part.

The Board's Annual Report on its activities in 1982 is published separately.

FISHERIES AND OCEANOGRAPHIC RESEARCH VESSEL

No decision to proceed with the allocation of a contract for the construction of a Research Vessel on the basis of the tenders received had been taken by the end of the year.

SEA FISHERIES PROTECTION

Protection of the exclusive fishery limits during 1982 was maintained by regular patrols of Naval Service Vessels and aerial surveillance by the Air Corps. Prosecutions were instituted against the skippers of 36 foreign vessels and 11 Irish vessels who were arrested during the year for various infringements of the Fisheries Acts, including illegal fishing, illegally attempting to fish, illegal entry and having illegal nets on board. Of these, twenty-eight skippers (all foreign) were convicted and fined a total of IR£819,870, three prosecutions were unsuccessful due to lack of sufficient evidence, and the remaining cases were still sub-judice at the end of the year.

The co-operation of the Naval Service, the Air Corps and the Garda Síochána, which was readily available in the prosecution of offences and general enforcement of fisheries protection measures, is gratefully acknowledged.

EUROPEAN ECONOMIC COMMUNITY

Common Fisheries Policy

Negotiations on the Common Fisheries Policy continued during the year under review.

Discussions continued on the fixing of total allowable catches (TACs) and quota allocations to Member States and on the regulation of the conditions governing fishing and access arrangements for coastal zones.

As regards markets policy, it was noted that Regulation 3796/81 on the common organisation of the market in fishery products entered into force on 1st June 1982, although implementing regulations enabling some elements of the market organisation to function effectively had not been adopted. For the majority of Member States, including Ireland, the application from 1st June 1982 of revised intervention arrangements with divergent levels of financial compensation and special processing premiums for withdrawn fish posed severe operational difficulties for the fish producers' organisations. The Council accordingly decided to suspend those provisions until 31st December 1982 and to maintain existing arrangements in the interim period.

The following regulations , agreed to in principle were adopted:

— a regulation establishing certain supervisory measures for fishing activities by fishing vessels of Member States;

— a regulation suspending certain provisions of Regulation (EEC) No. 3796/81 of 29th December 1981 on the common organisation of the market in fishery products;

— a regulation adjusting community tariff quotas for herring, and

— an implementing regulation arising from Regulation (EEC) No. 3796/81 on the extension of certain rules adopted by producers' organisations.

At the Council meeting on 25-26 October, the Commission presented an Outline of Suggested Solutions, which incorporated amendments in the areas of access, total allowable catches and quotas, and agreements with third countries. Nine Member States said they could agree to the revised proposals, provided there was unanimous agreement. Following the rejection of further concessions which it was seeking, Denmark found the proposals to be unacceptable.

At the final Council meeting of the year, the position of Denmark remained unchanged and it became increasingly obvious that agreement would not be possible before the end of 1982.

The Commission called on Member States to adopt national measures in the areas of access, technical measures for conservation and total allowable catches and quotas, as set down in the Commission's proposals. Ireland drew up national measures in accordance with the Commission's guidelines, which became effective on 1st January 1983.

With regard to the ban on herring fishing in the Celtic Sea, the Commission brought forward a proposal based on new scientific advice which offered a total allowable catch of 8,100 tonnes of herring for the Celtic Sea and Bantry Bay areas between 1st October 1982 and 31st March 1983. This was the first time since 1977 that the Celtic Sea was opened for general herring fishing.

The December Council approved a proposal allocating 30 million ECUs for the continuation of interim common measures for restructuring the inshore fishing industry.

European Agricultural Guidance and Guarantee fund (FEOGA)

Guarantee Section

The prices for the 1982 marketing year came into effect on 1st January 1982.

The following table shows approximate price increases for the quality grades of most interest to Irish fishermen.

Species covered by Community Price support arrangements	Guide Price (Per cent)	Intervention Price* (Per cent)
Cod	9.0	13.3
Saithe	8.0	12.3
Haddock	7.0	10.9
Herring	2.0	6.1
Plaice	0.0/3.0	3.8/6.9
Mackerel	0.0	15.2
Hake	9.9	14.3
Whiting	7.0	9.1

*The increases include adjustments in the value of the green pound which effectively increases all Irish fish support prices by 3.8 per cent.

EEC subvention for withdrawals in 1982 amounted to IR£1.4m in respect of 14,939.5 tonnes of fish which failed to meet the minimum intervention price and was withdrawn from the market by the two fish producers organisations in Ireland.

Export Refunds

Export refunds were available during 1982 for exports to specific third country destinations of a range of fishery products such as frozen whole mackerel, frozen mackerel fillets, dried and salted coalfish, and mackerel dried, salted or in brine.

Refunds were claimed by Irish exporters principally for frozen mackerel products, exported to Nigerian markets. The following refund rates per tonne applied during the year:

— frozen whole mackerel: IR£32.54 from January 1982, and IR£29.58 from August 1982

— mackerel fillets: IR£21.24 from January 1982, and IR£21.42 from August 1982.

Total export refund payments to Irish mackerel exporters during the year came to IR£1,847,535.

Guidance Section

On 28th May 1982 the Commission decided to grant aid, from this section, projects involving the construction and modernisation of inshore fishing vessels and the construction of aquaculture establishments, as part of an interim common measure for restructuring the Community inshore fishing industry. The grants awarded to Ireland amounted to IR£3.025m, which represents approximately 18% of the total FEOGA aid allocated for division between the Member States.

In project terms, the aid related to the construction of 30 new fishing vessels, modernisation of 3 existing vessels and 5 aquaculture projects.

In the course of the year, grant assistance totalling IR£1.172m was also made available from the fund for the improvement of processing and market structures in fisheries.

RESEARCH AND DEVELOPMENT

Pelagic Fisheries

Stocks of herring, mackerel and sprat in Irish waters were investigated and assessed by means of catch sampling and research cruises. Chartered commercial fishing boats were used in surveys of the abundance and distribution of larval (i.e. recently hatched) and juvenile (young adult) herring.

Herring

Changes in the distribution of the south coast herring fisheries since the early 1970s, increased knowledge about the drift of herring larvae and further evidence concerning recruitment to the Celtic Sea herring stock made it advisable to enlarge the Celtic Sea assessment and management area to include the coastal waters westwards to Kerry Head. The size of the spawning stock in this enlarged area was calculated at 40,000 tonnes at 1 October 1982. The scientific advice was that if catches were kept to a modest level (5,000-6,000 tonnes) then the slow re-building of the Celtic Sea spawning stock would be maintained, but that a continuation of the recent annual catches (17,000 tonnes) would lead to a rapid reversal of the stock increases.

For reasons similar to the Celtic Sea considerations, the herring off the northwest coast (the southern part of Division VIa) were assessed together with those off the west coast (VIIb), and not with the rest of VIa as heretofore. The spawning stock in this Galway-Donegal area was calculated to be 77,000 tonnes in 1982 — a reduction from the 95,000 tonnes in 1980 because of reduced recruitment.

In the Irish Sea, the spawning stock of Manx herring fell steadily throughout the 1970s but the evidence now suggests that this decline may have halted and a recovery may have commenced. The continuation of such recovery as may exist will depend on good recruitment levels and a very moderate catch. The spawning strength of the other herring stock exploited by the Irish Sea fishery, i.e. the Mourne stock, has been increasing slowly from its minimum level in 1977, but careful management is called for if this increase is to be maintained. It would be particularly undesirable if the fishery were to be concentrated selectively on either one of these two Irish Sea herring stocks.

Mackerel

The research programme on mackerel showed that this stock continues to be heavily over-exploited, both by our own fleet and by vessels of other countries. The warnings given in the 1981 Annual Report about the danger of a collapse of the fishery must be repeated here. Furthermore, although the exploitation of young fish could be very significantly reduced by the closure of a "box" off south-west England, the beneficial effects of such a management measure would take some years to work their way into the stock before they would be reflected in increased Total Allowable Catches.

Fat Content

Fat content of herring, mackerel and sprat was estimated continuously throughout the year on behalf of exporters and others in the trade. The acquisition of a newly-developed system enabled the Fisheries Research Centre to provide an improved analytical service to the industry.

DEMERSAL FISHERIES

Landings of cod, whiting, haddock and plaice were sampled throughout the year as described in earlier Annual Reports. Levels of discarding of unavoidably captured young fish were investigated at sea by Department scientists in order to improve the assessments of the state of the various stocks. The twice-yearly surveys of the abundance of juvenile plaice in the Irish Sea were continued in 1982.

In general, the stocks of these species (except for black sole) are being exploited above the optimum level, and (as stated in the 1981 Annual Report) a reduction in exploitation would boost the catch rate.

The spawning stock of Irish Sea cod rose in 1982 as the two good year-classes of cod born in 1978 and 1979 matured. As these become fished out, however, the spawning stock is calculated to return to the average level of the 1970s over the next three years.

Recruitment to the Irish Sea plaice stock has fallen steadily since 1978, and although the spawning stock has been recovering from its lowest level in 1977, it is still below the average of the 1964-1982 period.

SHELLFISH

Nephrops

Further experiments on Nephrops trawl design were carried out by the Department's Fisheries Research Centre in 1982, this time with

the rear-end of the trawl divided into upper and lower components of different mesh size with the objective of avoiding large by-catches of juvenile whiting. The interim results were promising.

A survey of the abundance of Nephrops larvae in the Irish Sea was made jointly with the Fisheries Laboratory of the UK Ministry of Agriculture, Fisheries and Food in order to estimate the size of the spawning stock of Nephrops. The results indicated this to be in the range of 5,000-8,000 tonnes of females. Uncertainties about the sex ratio prevents the calculation of an overall spawning stock size at this juncture. It must be noted that commercial catches of Nephrops consist overwhelmingly of males, because breeding females have a generally low availability to capture by the trawl.

MARINE POLLUTION AND ENVIRONMENTAL QUALITY

Monitoring and Control of Pollution

A major survey of the seabed South of Cork in an area used for the licensed disposal of industrial organic waste was carried out during 1982. A preliminary survey had been made in 1978 and the purpose of the 1982 investigation was to collect information on seabed organisms and sediments in order to assess the effects of the dumping operation.

The Department continued to provide scientific advice to Local Authorities and the Department of the Environment on discharge licence applications under the Local Government (Water Pollution) Act, 1977. Scientific advice also continued to be provided to the Department of Transport on licences issued under the Dumping at Sea Act, 1981, in respect of sewage sludge, industrial wastes and dredge spoil, and on licences issued under the Foreshore Act. In addition, information was also provided to the Joint Monitoring Programme of the Oslo and Paris Commissions, as well as to the ICES Monitoring Programme, concerning levels of persistent toxic substances in fish and shellfish. The quality of fish and shellfish continued to be well within established limits.

Six shellfish-growing areas were investigated with regard to EEC Directive 79/923 on the quality required of Shellfish waters viz. — Mornington, Co. Louth, Wexford Harbour, Carrigtwohill, Co. Cork, Tralee Bay, Co. Kerry, Clarinbridge, Co. Galway and Mulroy Bay, Co. Donegal. In addition, brief investigations of polluted estuaries, including those of the Rivers Boyne, Liffey, Suir and Shannon, were carried out. Water and shellfish were analysed for trace metal content.

Exceptional Marine Blooms

Blooms of microscopic algae were generally much less intense in 1982 than in the previous year and no kills were caused in fish farms.

Problems of net fouling occurred, however, in the salmon drift net fishery on the South coast off Youghal and Ballycotton in the same way as in 1981.

The Department's Fisheries Research Centre attempted to develop countermeasures against the toxic effects of plankton blooms on farmed salmonids in cages. A research project incorporating an experimental aeration system was set up in Dunmanus Bay in cooperation with a local fish farmer, but although results were encouraging, the relatively low level of bloom intensity did not allow the system to be fully tested.

MARICULTURE

Scallop research in Mulroy Bay, Co. Donegal, indicated that the settlement of scallop in the North Water was poor, compared with moderate levels in both 1980 and 1981 and the intense settlement of 1979. On-the-spot technical advice concerning the handling and packing of scallop spat for sale was provided to local co-operatives. On-growing trials were conducted in Mulroy Bay, Valentia Harbour (Co. Kerry) and Berehaven (Co. Cork). Interactions between scallop and their predators were again studied in order to improve the survival of young scallop both in intensive culture and on the seabed. Control of fouling organisms was also investigated, and it was found that the mortality of scallop spat resulting from fouling by mussel byssus threads could be significantly reduced by placing a dog-whelk (Nucella) in each level of a stack of on-growing trays. The dog-whelk preys preferentially on the mussels.

The possibility of rebuilding the scallop population of Streamstown Bay, Co. Galway by reseeding was investigated by the Department's scientists from the Fisheries Research Centre, but the abundance of green crabs (Carcinus) was such that a reseeding programme would be impractical without a major predator control operation.

The provision of technical advice on the cultivation of oysters and mussels continued in 1982, and surveys were carried out in Lough Foyle and Lough Swilly to assess their potential for mussel cultivation.

Oyster landings have been falling in recent years because of consistently poor spatfalls since the warm summer of 1976 and the spatfall of 1982 continued this pattern. Mussel shell cultch was laid in Tralee Bay, Galway Bay and Clew Bay.

FISH PATHOLOGY UNIT

The Unit continued to provide a disease diagnostic and advisory service to the aquaculture industry and to carry out research into the

causes and control of important diseases of wild and cultured fish, to fulfil its statutory functions of controlling the spread of fish diseases within the country.

Importation of live fish and eggs

Salmon and trout ova from a number of countries such as Norway, Scotland, Denmark and the Isle of Man were imported under licence granted by the Department to facilitate the development of fish farming in this country. For the first time an import licence was granted for the importation of 30,000 live salmon parr from Norway to a farm in Donegal. Strict conditions were applied to this importation to minimise the disease risk. The fish originated in a disease free hatchery near Bergen in Norway. They were flown to Dublin and transported by road to Donegal, and were then quarantined before being transferred to sea cages in Mulroy Bay for on-growing. The importation of these fish was supervised at all stages by the staff of the Unit who also monitored the health of the fish while in quarantine.

During the year, licences were issued for the importation of about 130,000 goldfish, mainly for the pet trade. A proportion of these fish were examined at the Unit for the presence of disease.

Diseases of farmed fish

Most of the fish farms in the country were visited by the Unit staff during the year and their health status monitored. Investigations of disease outbreaks were also carried out and advice given on treatment and control. The following is a resume of the main disease problems encountered during the year:

Bacterial diseases

Unlike last year, furunculosis was not a major problem on fish farms in 1982. However vibriosis, a disease of salmon and trout in seawater, caused significant losses at some marine farms. Prompt antibiotic treatment in these cases helped reduce losses. Myxobacterial gill disease continues to cause losses, mainly in young salmon fry, and is difficult to treat.

Viral diseases

Infectious Pancreatic Necrosis (IPN) is the only virus disease which causes significant losses in farmed fish in Ireland. Only one outbreak of disease was diagnosed in 1982, as against two the previous year. Several thousand mortalities in young rainbow trout occurred in this outbreak. The disease in this case was brought on by the stress of transporting these fish.

Parasitic Diseases

Parasitic diseases are the cause of significant losses on fish farms in

the country and a number of such diseases were diagnosed in 1982. Proliferative Kidney Disease (PKD) caused fewer losses in 1982 than in previous years, but the disease was detected at a low level at one farm where it had not been seen previously.

Trichodinasis, a parasitic disease of the skin and gills of fish, caused significant losses in 1982. At one farm studied in detail, losses of about 20% occurred in rainbow trout and salmon in the sea. The severity of the disease was probably due to unusually high water temperatures.

Non-infectious diseases

Cataracts leading to blindness in young salmon, which occurred at two hatcheries in 1981, was again observed in 1982. In this case it was seen in salmon smolts being reared in cages in the sea. Because of the importance of sight in the feeding habits of salmon, severely blind fish experienced a marked retardation of growth, although mortalities were low. Feed analysis again suggested a nutritional cause, specifically a high calcium and low zinc content in the diet.

Diseases of wild fish

A survey of disease in wild flatfish was again carried out in 1982. In general, disease levels were much less than the previous year, although the conditions seen were similar i.e. lymphocystis (a virus disease), ulcers and fin rot.

Ulcerative Dermal Necrosis

Small numbers of diseased salmon were reported on the eastern, southern and western coasts. Numbers increased slightly mid-year on the east coast. In the Ballina region, large number of spawning salmon with UDN were observed. During December the disease was common in the Waterville Rivers and the River Lee system. Normal post-spawning losses were reported in the Donegal Rivers.

Research

Research activities of the Fish Pathology Unit focussed this year on the following diseases:

Infectious Pancreatic Necrosis

The epidemiology of this disease came under close scrutiny and serological identification of the virus responsible commenced. Identification results will be reported in 1983. In addition, a major survey was also begun to establish the prevalence of the disease on fish farms throughout the country. This survey is expected to continue into 1983.

Vibrio Anguillarum

The causes of vibriosis also came under examination during the course of the year.

FOREIGN RESEARCH VESSEL CRUISES

Scientific staff of the Fisheries Research Centre worked on board the Norwegian purse seiner "Havdroen" with Norwegian scientists tagging mackerel off the south-west and south coasts, and on the English research vessel "Clione" surveying Nephrops larvae and adults in the Irish Sea. The latter was a joint investigation between the Fisheries Research Centre and Fisheries Laboratory, Lowestoft, UK.

ENGINEERING

FISHERY HARBOUR WORKS

Designated Fishery Harbour Centres

At Killybegs Fishery Harbour Centre, expenditure of IR£764,037 was incurred on development works during the year. An extensive dredging programme was completed to provide adequate depth in the harbour generally and additional depths in specified areas to meet the needs of the bigger boats now using the port. Work was completed on the auction hall and port offices, while tenders for the civil engineering works on the syncrolift were received.

At Castletownbere Fishery Harbour Centre, expenditure on development works during the year was IR£429,691. A 38KV electricity supply was extended to the area to provide an adequate power supply for the industrial expansion envisaged in the harbour development scheme. By the end of the year, work was almost complete on an effluent disposal plant to serve Dinish Island.

At Rossaveel Fishery Harbour Centre, expenditure of IR£84,696 was incurred on development works during the year. Work was completed on the repair of the old pier, and temporary toilets and car parking facilities were provided. A new high mast lighting system was installed on the new pier. An engineering survey of the land south of the causeway was carried out and progress was made on the formulation of an overall development plan for the harbour.

At Howth Harbour IR£2,239,659 was spent during 1982 on development work. The West Pier was widened over its entire length and work on the entrance to the fishery harbour basin was completed. The new trawler pier was surfaced, ducts were laid for electricity and other services, and a protective wall was constructed. The slopes on the eastern-side of the new pier and the slopes of the yacht breakwater were rock armoured.

Other Harbours, Ports and Landing Places

Fishery harbour improvement works, grant-aided by the Department of Fisheries and Forestry, were completed during the year at Aughris, Co. Sligo, Ballaghaline (Doolin), Co. Clare, Dromatoor, Co. Kerry and Ballycrovane, Co. Cork. Fishery harbour works in non-Gaeltacht areas were in progress at the end of the year at Portevlin, Co. Donegal, Killala and Kilcummin, Co. Mayo, Liscannor and Seafield, Co. Clare, Caherciveen, Co. Kerry and Oilean na gCaorach, Co. Cork. In addition, a Hydraulic Model Investigation of Clogherhead Harbour was carried out at University College Cork.

Improvement works, which were recommended by the Department of Fisheries and Forestry and financed by Roinn na Gaeltachta, were completed during the year at Bunbeg, Co. Donegal. Works were in progress at the end of the year at Magheraroarty and Ballyness, Co. Donegal and at Kilronan, Inishmore and Cora Point, Inishmean, Co. Galway.

TECHNOLOGY

Fish Quality Control

During the year, landings were supervised by Fish Quality Officers to ensure compliance with the Departments Handling, Storage and Transport Regulations and with the EEC common marketing standards for fresh or chilled fish. These standards, which relate to size and freshness categorisation, are laid down by EEC Council Regulations Nos. 103/76 and 3166/82. All fish offered for sale for human consumption within the community must comply with the provisions of these Regulations.

Arrangements were initiated to obtain specialist analytic services from University College Cork in order to develop the technical information available to the Department regarding the quality of molluscan shellfish bearing waters and the effectiveness of various depuration and processing procedures in dealing with shellfish taken from contaminated areas. These services are likely to be available early in 1983.

INTERNATIONAL AND OTHER CONFERENCES

During 1982 the Department participated in the following conferences, committees, working groups etc:

Abroad

Statutory Meeting of the International Council for the Exploration of the Sea (ICES) (Copenhagen) and the following ICES working groups and advisory committees:

Marine Chemistry Working Group (Copenhagen)

Workshop on Trace Metals in Seawater (Nantes)
Working Group on Marine Sediments in relation to Pollution (Lowestoft)
Working Group on Marine Pollution Baseline and Monitoring Studies in the North Atlantic (Gothenburg)
Working Group on Pathology and Diseases of Marine Organisms (Ijmuiden)
Working Group on Introduction and Transfers of Marine Organisms (La Coruna)
Nephrops Working Group (Brest)
Roundfish Working Group (Copenhagen)
Herring Assessment Working Group for the Area South of 62°N (Copenhagen)
Irish Sea and Bristol Channel Working Group (Copenhagen)
Mackerel Working Group (Copenhagen)
Advisory Committee on Fisheries Management (Copenhagen)
Advisory Committee on Marine Pollution (Copenhagen)
Ad hoc Working Group on Fishing Area Boundaries (Copenhagen)
Statistics Committee Liaison Working Group (Copenhagen)
European Commission Scientific and Technical Committee on Fisheries (Brussels)
Oslo and Paris Commissions Standing Scientific Committees (various centres)
Joint Oceanographic Assembly (Halifax, Nova Scotia) (partly funded by the National Board for Science and Technology)
International Baltic Sea Fishery Commission (Warsaw) (advisory capacity, funded by ICES)
North East Atlantic Fisheries Commission (London) (advisory capacity, funded by ICES)

Home

National Board for Science and Technology
— Mariculture Committee
— Shellfish Advisory Group

Estuarine and Brackish Water Sciences Association
— Seminar on Estuarine Management and Quality Assessment

COST Symposium on Mariculture Genetics

Legislation

Particulars of the Statutory Instruments relating to Sea Fisheries made during the year are included in Appendix No. 21.

PART II

INLAND FISHERIES

CATCHES OF SALMON, SEA TROUT AND EELS

Details of the catches of salmon, sea trout and eels in the various fisheries regions during 1982 are given in Appendices Nos. 11 to 17 of this Report. As usual, the catches in the Foyle Fisheries Commission area, formerly the Moville Fishery District, are not included but they are referred to in a separate section of the Report.

In 1982 the catch of salmon and grilse amounted to 288,587 fish weighing 908 tonnes and valued at IR£4.0m compared with 186,918 fish weighing 649 tonnes and valued at IR£2.2m for 1981. The overall average weight at 3.14kg was slightly lower than in 1981. The commercial catch at 867 tonnes was higher than the 1981 figure of 608 tonnes. The total rod catch amounted to 12,370 fish weighing 40.44 tonnes, and valued at IR£178,340 compared with 1981 when 9,541 fish weighing 40.78 tonnes and valued at IR£144,428 were caught. The total number of licences of all kinds issued for angling for salmon and sea trout was 15,794 compared with 16,737 in 1981. The salmon catch figures for nets and rods for the years 1980, 1981, and 1982 are given in Appendix No. 12.

In 1982 the salmon and grilse catch (by weight) was distributed as follows:—

Drift nets	76%
Draft nets	15%
Stake nets, snap nets, weirs and other commercial methods	5%
Rod and line	4%

The average weight and value of salmon caught by commercial fishing engines during the past three years are given in Appendix No. 11. Details of the catch of sea trout in 1982 in the various Fisheries Regions are given in Appendix No. 13. Very little commercial fishing specifically for sea trout is done in this country and over 50% of the total catch is taken as a by-catch of commercial fishing for salmon. It is difficult therefore to compile accurate statistics.

THE CENTRAL AND REGIONAL FISHERIES BOARDS

The Central Fisheries Board and the seven Regional Fisheries Boards were established in October 1980 under the provisions of the Fisheries Act 1980. The functions of the Boards, which are prescribed in the Act, are primarily the protection and development of inland fisheries.

The annual report of the Central Board gives details of the activities of the Central and Regional Fisheries Boards.

During 1982, the Galway Fishery which was purchased by the Department in 1978 was transferred to the Central Board. The Department is however continuing with its research programme at the fishery designed to provide information for its future management. The Central Board with the consent of the Ministers for Fisheries and Forestry and Finance purchased the Erriff Fishery in 1982. This is an important salmon and sea trout rod fishery.

INTERNATIONAL SALMON CONVENTION

During the year Ireland, as a member State of the European Economic Community, participated in international negotiations about the possible introduction of an international convention for the conservation of the salmon stocks of the North Atlantic Ocean.

SALMON LEVY

On 1st June, 1982, the levy on first sales of salmon, introduced in May 1980, was discontinued. During 1982 a total of IR£32,007 was collected in levy and allocated towards the overall cost of conserving and developing inland fisheries. Summary details of the statutory order made under the Fisheries Act, 1980, which provided for the revocation of the salmon levy, are given in Appendix No. 21.

EMPLOYMENT IN THE INDUSTRY

Exclusive of persons employed on the marketing and transport of fish, a total of some 5,800 persons found either wholetime or part-time employment in inland fisheries during the year. This figure includes 4,300 persons estimated as engaged in netting for salmon, 220 engaged in eel fishing, 450 employed full or part-time by the Central and Regional Fisheries Boards on protection and development of fisheries, 800 engaged in netting and protection work in the Foyle Area, and the remainder employed by proprietors of commercial and sport fisheries or by angling associations.

INSTRUMENTS OF CAPTURE

The numbers of the various types of licences issued in each fishery district and the rates of licence duty are given in Appendices Nos. 19 and 20.

EXPORTS OF FRESHWATER FISH

Salmon

The total quantity of salmon exported in fresh, chilled, frozen, salted and preserved forms was 633 tonnes compared with 437 tonnes in 1981. Total value of these exports rose from IR£2,306,235 in 1981 to IR£3,166,237 in 1982. Details for the two years are as follows:—

	1981		1982	
	Tonnes	IR£'000	Tonnes	IR£'000
Fresh, Chilled Frozen, Salmon	344	1,491	400	1,675
Smoked Salmon	85	795	89	943
Prepared/Preserved Salmon	8	20	144	548

Of the total quantity of fresh, chilled and frozen salmon exported in 1982, 153 tonnes went to Northern Ireland, 132 tonnes went to Great Britain, 79 tonnes went to France, 17 tonnes went to the Netherlands and 7 tonnes went to Spain.

The smoked salmon was exported mainly to the Federal Republic of Germany (28 tonnes), France (18 tonnes), U.S.A. (17 tonnes) and Belgium/Luxembourg (9 tonnes). Quantities of prepared and preserved salmon were exported to Great Britain (137 tonnes) and Northern Ireland (6 tonnes).

The average export price for fresh chilled or frozen salmon was IR£4,188 per tonne as compared with IR£4,337 per tonne in 1981.

Rainbow Trout

Exports of Rainbow Trout in 1982 amounted to 170 tonnes valued at IR£292,581 as compared with 184 tonnes valued at IR£298,000 in 1981.

Eels

Exports of eels in 1982 amounted to 176 tonnes valued at IR£476,511 as compared with 129 tonnes valued at IR£317,000 in 1981.

ARTIFICIAL PROPAGATION

The production and distribution of salmon, sea trout and brown trout ova, fry, fingerlings and smolts produced at the various hatcheries are given in Appendix No. 22.

The total output of ova in the 1981/82 spawning season was as follows:—

Salmon	5,759,000
Brown Trout	1,327,000
Sea Trout	30,000

WATER POLLUTION CONTROL

The Department continued to exercise an advisory role in regard to the issue by local authorities of licences under the Local Government (Water Pollution) Act, 1977. During the year, 217 applications for licences were processed by the Department's licence vetting committee. The Department consulted, in the fisheries interest, with the Department of the Environment, the Department of Agriculture, the Central and Regional Fisheries Boards about water pollution matters. The Department is represented on the Water Pollution Advisory Council.

Water Quality Management Plans

The Department continued to collaborate with An Foras Forbartha in the preparation of draft "water quality" management plans.

Lough Sheelin

Considerable attention was devoted to the problems of Lough Sheelin. In late 1980, a scheme was introduced to remove excess pig slurry from the Lough Sheelin catchment. Under this transport subsidy scheme, a subsidy is payable to farmers outside the catchment to offset the cost of transporting slurry from the catchment to their farms for use as fertiliser. The slurry is provided free of charge by pig producers.

The scheme is run by a special Management Committee representing the various interests and is chaired by an officer of the Department. The scheme worked satisfactorily in 1982 with over 16 million gallons of slurry removed during the year bringing the total number of gallons removed since inception of the scheme to 29.5 million gallons. The scheme has proved effective in reducing the input of nutrients to the lake and since October 1982 a significant improvement in the quality of the lake water has resulted.

RESEARCH AND DEVELOPMENT

Salmon Stocks

The total reported catch of salmon in 1982 of 908 tonnés showed an improvement over the 1980-1981 catch but was well below the average recorded for the decade 1973-1982 (1,348 tonnes). The majority of

the fish captured in 1982 were 1+ sea winter fish. They represented 93.8% (by weight) of the catch. The multi sea-winter (mostly 2 sea winter) at 6.18% by weight was the lowest on record for a number of years. The average weight of the fish at 3.14kg was less than in 1981 (3.47kg). This could be accounted for by the reduction in the 2 sea-winter component, together with reports that 1+ sea-winter fish were smaller on average.

As in previous years the majority of the fish (76%) were taken by coastal and inshore drift nets. A further 20% was taken by seine, snap, loop and fixed nets. The rod catch amounted to 12,370 salmon, or 4% of the total catch. Rod catches are difficult to compile on a region by region basis particularly when large numbers of fish are taken outside the region in which the licence is purchased. Furthermore, rod catches are not recorded in the same way as the commercial catch.

As in previous years data was available on the catch per salmon licence issued in 1982. In the absence of catch per unit effort (CPUE) this is the only method available on which to assess the abundance of salmon. However, it does not account for the catch of unlicensed nets which form an unknown proportion of the national catch. The catch per licence issued is given hereunder for the period 1974-1982 inclusive.

Year	Salmon catch per licence (No. of Fish)			
	Drift Net	Draft Net	Fixed Engines	Snap Net
1974	429	170	416	70
1975	445	224	483	124
1976	314	132	385	97
1977	296	115	199	63
1978	261	109	180	43
1979	277	74	179	25
1980	205	89	338	40
1981	171	35	291	17
1982	265	78	323	18

The catch per licence issued shows an increase when compared with 1981, but in 1981 the catches had reached an all time low level.

Weirs which span the entire width of a river and which incorporate counting devices are the only reliable method of determining salmon escapement into freshwater. Counts are available for a number of river systems and these are given in the engineering section of this report. In addition the ESB operates fish counters on the rivers Shannon and Erne and the Salmon Research Trust on the Burrishoole. The river Shannon count (2,860) was the lowest recorded since 1941 with the exception of 1978. From 1941 to 1970 the average annual count was 13,507 and from 1971 to 1980 (excluding 1979 when no

count was made) the count dropped to an annual average of 9,557 fish. A complete count of ascending fish is available from the Burrishoole system from 1970 onwards. The five year average from 1970 to 1974 was 1,145 and from 1975 to 1979 it was 703. There was a further decline from 1980 to 1982 when the annual count for each of the years listed in order was 637,326 and 461. The Erne alone showed a slight improvement in 1982. The total run into the Erne estuary (catch and escapement) at 1,007 was the highest recorded since 1977. The restrictive measures which were imposed in this fishery since 1978 resulted in an improvement in the stock position in 1982.

Salmon Migrations

The tagging of adult salmon was confined to the tagging of kelts at Virginia Hatchery. A total of 69 females were tagged and a return of 5 (7.2%) was obtained. Four were recaptured as clean fish in the River Boyne and one at Blackrock, Co. Louth. All of the fish exhibited the short absence habit returning to the river in the same year as migration. Two fish tagged as kelts on the River Lee in 1981 returned to that river in 1982. These fish were absent for over a year at sea which is unusual for kelts from Irish waters.

There were two returns from adult salmon tagged as smolts in the River Imsa in south west Norway in 1981. Both these fish were taken off the Donegal coast. Two further fish tagged as smolts in the Allier River in France were recaptured as adults in Irish waters, one fish was returned from the Kerry coast and the other off the Donegal coast.

Following the programme initiated in 1979, a further 78,957 hatchery reared pre-smolts and smolts were tagged with the magnetic coded wire tag from various rearing stations throughout the country. In addition 3,300 wild smolts were tagged in the River Corrib. A total of 736 recaptures were made in 1982 from the tagging of smolts with the coded wire tag. The returns were made mostly from drift nets around the Irish coast. There were two returns from the Faroes long line fishery. As well as the coded wire tag, wild smolts were tagged with the Floy external tag. A total of 383 were tagged in the Cork Blackwater at Clondulane and a further 1,134 were tagged at the smolt trap on the River Corrib. There were nine returns (0.8%) obtained from the Corrib tagging as follows — four in the Corrib, one in Galway Bay, two in the Donegal drift nets and two in the north Mayo drift nets.

Associated with these tagging investigations, information concerning the effect of reared smolts on the national catch was obtained by monitoring the major drift net areas along the coast. A total of 108,478 salmon were examined and 2,315 (2.1%) were derived from reared smolts. The greatest contribution (4.3%) from reared smolts was found in the Galway area and along the south coast.

Juvenile Salmon Surveys

Investigations into the population of juvenile salmon in the nursery streams of the Corrib were continued. On the east side of the Corrib the Sinking River yielded the highest population of salmon per m^2 but on the west side the Cornamona had the highest density of 0 — group salmon. The 1+ salmon parr were very sparse. A tagging experiment was carried out in the Cornamona river on the 0 — group salmon to determine their survival rate to the adult stage.

SEA TROUT

Monitoring of sea trout stocks, as represented by the anglers catch, was continued in the Cummeragh system in Waterville, Co. Kerry. This system is noted for its large sea trout. Ten out of twelve sea trout presented to the Irish Specimen Fish Committee for awards in 1982 were taken by anglers in this system. The specimen weight for sea trout is 2.7kgs (6 lb).

Biochemical analysis of the Cummeragh stock have shown them to be of a distinct genetic strain, containing a genetic marker which is indicative of long life. All of the specimen sea trout captured in 1982 were multiple spawners, having spawned a minimum of five times during their life. The fecundity of these trout is also being examined.

During the year a number of rivers along the western sea board were selected for the evaluation of the juvenile salmonid populations. The investigations were carried out in the usual manner by electrofishing. The sites occupied by both juvenile salmon and trout were characterised. From the survey the relative density of sea trout, brown trout and salmon in the various rivers under review is available. First indications are that the production of fish is very uneven. A comparative study of water quality, availability of food and substratum should provide the answer.

RAINBOW TROUT AND SALMONID CULTURE

The Department continued to advise existing as well as potential fish farmers wishing to undertake new projects during the year. The large number of queries dealt with emphasises the high level of interest in this expanding industry. By the end of the year there were 11 commercial marine and 20 freshwater fish farms in operation.

A regular nutritional monitoring service was established in 1982 and 60 samples of commercially compound fish diets received from fish farmers were analysed. The analysis covered crude protein oil, fibre, moisture, ash, free fatty acids and trace elements. Most samples examined were of the required nutritional standard. Normal protein levels are in the range 40-50%, oil 8-15%, fibre not more than 3%. In a small number (four) the protein levels at 24% were below the tolerable levels; they also had excessive fibre (at 5%) and ash levels

(over 15%) and also very high free fatty acid content (45-50%). Both farmers and feed manufacturers were advised of the results and action was taken to ensure that the quality was improved. It is hoped to provide analysis in advance of bulk consumption to avoid nutritional disorders.

A very limited programme of monitoring freshwater fish farm effluents was undertaken. Results confirmed an earlier report in 1981 of rapid recovery within 200m of the out-fall. Ad hoc analyses were carried out at the request of individual farmers when problems were suspected and remedial action was recommended.

Marine cage farming of salmonids is expanding rapidly. It is important for the success of these farms that good environmental conditions are maintained. A study of the effects of detrital fall out (waste feed and faeces) on the benthic communities, local and remote, and on water quality commenced at two sea farm sites in Co. Donegal. Preliminary results indicated very localised pollution immediately beneath the cages, an enriched zone between 10 and 25 metres away from the cages and a return to normal diversity at 30 metres distance. Chemical data collected at monthly intervals at both cage sites and 4 control stations indicated that no detectable impact on the environment has occurred. Routine monitoring will continue in 1983.

A study of the effects of marine algal blooms on caged rainbow trout in Dunmanus Bay using a Venturator aeration system was carried out from June to September. No major red tide occurred in Dunmanus Bay in 1982 so no definitive conclusions can be drawn. The experiment will be repeated at a future date.

A survey of sites with potential for salmonid culture was carried out in Kenmare Bay in May, 1982. Data on salinity, temperature and currents were collected. Hydrographic data for the south-west area from June to September were obtained and are now being compiled.

High temperatures from 18C-22C were recorded from 18th July to 9th August. Serious mortalities were reported in rainbow trout at a number of sites on the west coast but salmon in adjacent cages were not adversely affected.

A further trial on the survival of salmon ova from 2 sea winter domesticated brood stocks in comparison with those derived from wild stocks was carried out at Virginia Hatchery with the co-operation of the Eastern Regional Fisheries Board's staff. Survival to hatching stage was normal but major losses occurred at sac-fry stage due to blue-sac disease. By mid June survival to alevins was only 7.6%. Survival of ova derived from wild grilse hatched on the same day was over 60% to the alevin stage. Blue-sac disease did not occur in wild stock. No firm conclusion can be drawn as hatching occurred within one week of transfer of the test stocks and mortality may have been

due to environmental stress. The trial will be at two different hatcheries in 1983.

EEL RESEARCH AND DEVELOPMENT

The two major fisheries yielded record catches of silver eels in 1982, amounting to 72 tonnes for the River Shannon and 31 tonnes for the River Corrib at the Galway Fishery. The increase in the Shannon can be partly explained by improvement in fishing gear and by the continued transplantation of elvers. The catch in Galway, an increase of 50% on the previous record, cannot be so easily understood since fishing there follows a traditional pattern.

The first complete season of work on Meelick Bay in Lough Derg confirmed the previous year's observations that eels are migrating through it rather than forming a resident population. The eels caught and tagged in the early months of the season were considerably larger than those found later. Population density was found to be consistently higher in the eastern half of the bay than in the western. Both these observations lead to the conclusion that studies of eel population changes must be based on precisely defined times and places of sampling.

Elver runs were monitored in two rivers, the Shannon and the Erne. The catch on the Shannon, of 5.7 tonnes, was below average. The Erne elver catch of 4.5 tonnes was nearly double the 1962 record of 2.5 tonnes.

ENVIRONMENTAL STUDIES

Water abstraction schemes proposed for Lough Derg, the River Dee, the River Lennon and the Crana River were considered during the year from a fisheries viewpoint. Evidence was given at a Public Inquiry held in Carrickmacross in October on the biological effects of the River Fane abstraction on the fish stocks of the river and Lough Muckno. The amelioration measures recommended were incorporated in the report of the Public Inquiry which was submitted to the Department of the Environment.

At the close of the year the Environmental Impact Statement (EIS) covering the hydrobiology of the Mask/Carra drainage scheme was submitted to the consultants employed by the Environmental Consumer Protection Service (ECPS) of the EEC. As part of the Community's environmental policy the EEC Commission has found it necessary to direct more attention to the environmental impact of major drainage operations. The report evaluated the present status of open waters as a habitat for fish with particular emphasis on salmonids. Estimates were made on the likely changes in fish populations and their environment. The report made recommendations including alterations in the design of the scheme and reinstatement of instream

and bank side vegetation, following drainage. A programme of restocking with a view to ameliorating the effects of the drainage on the fish stocks of the catchment was also recommended.

A similar study was initiated by the Department in the River Bonet at the close of the year. This involved a shift in emphasis from the older predrainage studies to more detailed hydrobiological investigations. Samples of the substratum were taken in known salmonid spawning areas to assess the change in particle size following drainage. The impact of suspended solids on the lower reaches of the river and in Lough Gill was investigated.

The recent development of Kinsale gas has resulted in the laying of a pipe line from Cork which crossed rivers extending from the River Liffey at Ballymore Eustace, Co. Wicklow to the Dungourney River near Middleton, Co. Cork. There were in all seventeen river crossings all of which were important as spawning or nursery areas or angling waters. There were also three minor crossings of rivers which were not of value as fisheries. Rivers were excavated to a depth of two metres approximately wherever the pipe line was laid. Physico-chemical and biological samples were taken in a number of crossings to monitor the effect of silt on both the fish and fauna and on angling due to high turbidity. The excavations resulted in silting which on occasions lasted up to ten days causing some disruption in angling. No adverse effect on fauna and fish stocks were noted in the areas sampled. It was not however possible to sample all of the sites but it can be concluded that the adverse effects were only transitory.

GRANT AIDED RESEARCH PROJECTS

Studentships

There were seven post-graduate studies being carried out under the Department's studentship scheme namely:

(i) Eel migration in the Galway Fishery (UCG)

(ii) A study of estuarine benthic meiofauna with particular reference to pollution (UCC)

(iii) Pollution studies in the River Dodder (UCD)

(iv) Classifying Irish rivers using Chironomid Pupal Exuvae (UCD)

(v) The effect of sewage fungus slimes on survival and growth of river fishes (TCD)

(vi) Mass culture of invertebrates as food for cultured salmonids (TCD)

(vii) The ecology of streams and rivers on the Corrib catchment with reference to salmonid production (UCG).

Three further projects were awarded in 1982 as follows:—

(a) A study of the Ecology of Amphipods in Lough Hyne (UCC)

(b) Invertebrate predator prey interactions in the lower basin of Lough Corrib (UCG).

(c) Effects of organic waste disposal at sea on selected organisms (UCG).

Bursaries

Thirteen undergraduate students were employed on freshwater projects for a period of 8 weeks during the summer vacation to assist the Department's staff on the collection and processing of material. The students were recruited by interview from 3rd level colleges. Six students were engaged in the sampling of adult salmon at various landing points throughout the country, three were engaged in juvenile salmon surveys on the Corrib catchment, one in the collection of biological material for sea trout research, one for "fall-out" from fish cages in Mulroy Bay, one student assisted in the identification of macroinvertebrates from the River Bonet and one on eels stock assessment. The Rivers Liffey and Greese were also examined to determine what effect if any, the gas pipe line crossing had on the food of fish in these rivers.

ENGINEERING

Arterial Drainage

Close contact was maintained between the Department and the Office of Public Works in relation to arterial drainage and post drainage maintenance works in the Corrib/Mask, Moy, Maigue, Bo net and Boyle/Lung systems. Rehabilitation works commenced in the Camoge sub-catchment, Maigue system and in the Robe tributaries of the Corrib/Mask catchment drainage scheme. A programme of rehabilitation works was drawn up for the upper Camoge and the Mahone rivers in the Maigue catchment.

The changing pattern of floods in the Corrib/Mask canal at Cong Salmon Hatchery was observed and, as a result, the Office of Public Works extended the fish-fence in the canal to eliminate the danger of flooding to the Salmon Hatchery grounds.

Discussions were held with the Office of Public Works regarding the proposed Dunkellin drainage scheme and its possible effects on the freshwater fisheries in the catchment and on the Oyster Fishery in Kilcolgan Bay.

Close contact between the Department and the Office of Public Works was also maintained in relation to proposed cross-border arterial drainage schemes for the Monaghan Blackwater and the Finn/Lackey catchments.

Investigation of Inland Fish Movements

The smolt trapping operations at Galway sluice barrage started on April 11th and ended on June 11th 1982. 15,438 salmon smolts were trapped and released during that period. The largest number of smolts trapped in one day was 2,893 on April 27th. In the same period 4 sea trout, 15 brown trout, 15 eels and 2 perch were trapped and released.

A design for the conversion of the existing smolt trap at Galway to meet specific research requirements was drawn up.

Between May 6th and November 6th the fish-counter on the River Erriff, Co. Mayo registered 388 adult salmon as having passed upstream through the counter. This figure is considered to be an undercount, probably related to site conditions. The tendency towards undercounting will be rectified.

The Department advised on the construction of a smolt trap on the River Blackwater at Clondulane.

Water Abstractions

A proposal for a major water abstraction from the Garravogue River, Co. Sligo, was examined by the Department and advice given on a suitable fish-pass design for the weir upstream of Sligo town. The weir is being rehabilitated to its original condition and former control levels.

The Department also examined water abstraction schemes for the Rivers Newport, Kilmallock, Feale (North Kerry Water Supply Scheme) Clodiagh, Mahon, Dee, Lough Keneal, Lough Nadrageal and Skeagh Lough Upper.

Technical assistance was given to the Eastern Regional Fisheries Board at a Public Inquiry into the abstraction of water from Lough Muckno (Co. Monaghan).

River Improvement Works

The Department advised the North Western Regional Fisheries Board on improvements to spawning and nursery grounds which were carried out by the Board on the Glen Island, Crompaun and Pallagh Rivers. The Board will keep the improved stretches under observation in order to assess results. With the help of the Department, the Board also carried out improvement works at Curry fish pass, Co. Sligo. The Department was consulted by the Southern, South-Western and Shannon Regional Fisheries Boards on a number of projects and revised the plans for rehabilitation of part of the River Bride after drainage works by Cork County Council.

Fish-Passes

A pool type fish-pass, designed by the Department was constructed by the Office of Public Works through Bruree Falls on the River Maigue. The cost was borne by OPW.

Fish Culture Installations

The Department continued to advise the Salmon Research Trust of Ireland Inc. on fisheries engineering matters. An anti-predator system, designed by the Department, was erected at Cong Hatchery. The Department also acted for the Western Regional Fisheries Board in matters relating to possible flood problems at the Cong installations. The North Western Regional Fisheries Board was advised on the maintenance and operation of the Salmon Incubation Station at Glencullen, Carrowmore Lake, Co. Mayo. A site for a future pilot smolt trapping unit was selected on the Bunree River for the North Western Board.

Rainbow Trout Farming

Proposed fish farm sites were investigated and assessed. Suggested lay-outs were provided and, in some cases, detailed engineering designs were prepared and provided. Three new rainbow trout farms went into production.

Electronic Fish Counters

Installations were maintained at the sites listed below. A new counting facility was installed in the new fish pass at Scartleigh Weir on the River Feale.

River	Location	Total Count	Maximum Count and Date	
			Count	Date
Blackwater	Clondulane	5,755	344	29/09/82
Boyne*	Navan	269	44	28/09/82
Corrib**	Galway	5,492	289	19/07/82
Lennon***	Ramelton	134	8	20/08/82
Liffey	Islandbridge	928	80	13/07/82
Inagh†	Ennistymon	3,117	519	8/11/82
Erriff‡	Ashleagh Falls	358	135	5/08/82
Maigue	Adare	332	34	11/07/82

*Trapping from 29th September.
**Undercount due to hydraulic problems during floods.
***Counter removed 12th October for servicing.
†High count, awaiting redd count for confirmation.
‡Counter installed 6/5/82.

Small Hydro-Electric Projects

Considerable interest is being shown in the generation of electricity by small water turbines, particularly at old mill sites. Officials of the Department have dealt with projects at Blarney, Daly Cross, and on the Sneem, Flesk, Owensahad and Owenacurra Rivers. The main considerations are the proper screening of intakes and outlets, and the provision of adequate flow in the bye-passed channel.

Gas Pipe Line

Twenty river crossings were supervised and measures to lessen the damage to fish stocks and angling were recommended. Conditions were monitored during the execution of the works and amelioration and remedial measures were supervised.

FOYLE FISHERIES COMMISSION

The Commission is a statutory North/South body and is comprised of a senior and junior member appointed by the Minister for Fisheries and Forestry and a senior and junior member appointed by the Department of Agriculture for Northern Ireland. The post of Chairman rotates each year between the senior members of the Commission. During the year under review it was held by the Dublin senior member.

Detailed information on the Commission's activities during the fishery year ending 30 September, 1982, are given in the Commission's Annual Report.

The spawning count of 3,515 redds in 1982 was slightly lower than the previous year's figure of 3,791. The catch of salmon and grilse by commercial engines amounted to 60,157 fish (177,094kg) as against 34,781 fish (119,578kg) in 1981. The rod catch of salmon and grilse was 2,125 compared with 1,517 for 1981 while the rod catch of sea trout was 4,999 fish as against 7,421 for the previous year.

The operation of the Commission's commercial fishery in the year ended 30 September, 1982, resulted in a deficit of £5,295 sterling compared with a deficit of £6,119 in 1981. This deficit is due largely to the depressed price of salmon on the open market. Each year the profit/deficit realised on the operation of the commercial fishery is credited/debited to the Commission's Accumulated Revenue Account.

During the year under review the Department of Fisheries and Forestry and the Department of Agriculture for Northern Ireland (Fisheries Division) paid subventions totalling £162,782 sterling to the Commission to meet its deficit at 30 September, 1982. This is an increase of £11,254 over last year's deficit and is mainly due to increases in wages and salaries.

The Commission's accounts for the year ended 30 September, 1982, are included as an Appendix to its 1982 Annual Report. Particulars of Regulations made by the Commission in 1982 are included in Appendix No. 21 of this Report.

EEL FISHING DEVELOPMENT

As indicated in the paragraphs dealing with scientific investigations and engineering, research work continued during the year on the investigation of eel stocks and eel fishing techniques. Advice and information on eel fishing was given to interested persons. Forty one eel fishery authorisations were issued during the year bringing the number of fishing engines under such authorisations to 54.

MANAGEMENT OF STATE FISHERIES

In 1982, 132 State-run fisheries — in the main vested in the Land Commission — were managed by Fisheries Division. Rents received during the year amounted to IR£8,320 compared with IR£8,349 in 1981.

Twenty-one fisheries which fell due for re-letting were advertised during the year.

THE SALMON RESEARCH TRUST OF IRELAND INCORPORATED

The Annual Report of the Trust for 1982 gives a detailed account of its work during the year.

The Trust continued to make a valuable contribution to our knowledge of the salmon and factors bearing on its future survival as a species. The Trust is funded jointly by the Department and Messrs Arthur Guinness, Son and Co. Ltd. The grant-in-aid paid to the Trust by the Department in 1982 amounted to IR£54,000.

The count of salmon (2-sea-winter fish) was 21 in 1982, as compared with 64 in 1981 and an annual average of 25 for the period 1970-79. The count of grilse was 438, only slightly more than one third of the annual average for 1970-74. The total spawning escapement was the second lowest yet recorded. To sustain even the low population of 1978, there would need to be two grilse offspring in 1982 for every female grilse spawner in 1978 but this minimum was not achieved. The main cause is heavy exploitation at sea. The 1982 smolt run was normally timed but, at 10,460, was below the 1970-79 average of 12,290. The recapture of previously-spawned grilse, tagged as kelts in 1982, was similar to the recent average at 7%.

The run of sea trout at 1,119 was lower than in 1981, itself the lowest since full trapping began in 1970. The proportion of finnock

(0+ sea years) was 26%. The sea trout smolt number in 1982 was about average, though that of autumn-migrating trout was below average. Analysis of scales from rod-caught sea trout revealed a decline in numbers of previously-spawned fish and in size of 1 sea-winter maidens compared with 1980 and 1981.

The overall recapture rate as grilse in the Burrishoole system of reared smolts released in 1981 was 1.34%, with 2+ smolts surviving less well than 1+ smolts.

Average weights of reared grilse in 1982, at 2.2kg (4¾ lb) for those derived from 1+ smolts and 2.4kg (5¼ lb) from 2+ smolts were normal in 1982. The largest reared grilse weighed 5.03kg (11 lb). Two 2-sea-winter fish were recaptured from grilse-parentage smolts released in 1980.

Coded-wire tagging experiments carried out by the Department of Fisheries showed that at least 65% of the grilse reared by the Trust were caught in coastal nets during the legal fishing season.

More than 2,800 2+ sea trout smolts were externally tagged and released in 1982. The minimum recapture rate during 1982 was 6.4%. 62% of these fish had migrated to sea and returned as finnock, but the remainder had not migrated. Reared finnock made a considerable contribution to the rod catch on L. Furnace. 46% of all reared trout recaptured in 1982 had lost their tags.

17,870 reared smolts were released in 1982, comprising five different experimental batches, of which two, totalling 10,507, were 1+ smolts of grilse and 2-sea-winter parentage. The remainder were 2+ smolts. All were cold-branded.

Survival of eyed-ova to end-of-year parr was 60.5% for those of grilse parentage and 59.2% for those of 2-sea-winter fish parentage.

Reared sea trout which had been held in a sea-cage for more than a year were used as broodstock.

The major disease experienced during the year was furunculosis. Latent furunculosis was assessed in 0+, 1+ and 2+ salmon each month until October, but was detected in 2+ pre-smolts only in February and March.

The catch of salmon (105) was the best for three years but that of sea trout (371) continued to decline. Exploitation rates (proportion of fish caught from total available) were higher for both species than in recent years. The improvement in the salmon catch was probably due to low water conditions in the summer which retained the fish in L. Furnace. The decline of the sea trout catch was related to low stock and unfavourable trout-fishing conditions.

Studies initated or continued in 1982 were:

(i) estimation of genetic differences between Atlantic salmon over the range of the species.

(ii) Genetic analysis of samples of salmon in the Faroes catch, with a view to identifying their country of origin.

(iii) estimation of the extent of genetic diversity between the various populations of trout in the Burrishoole system and neighbouring Newport system.

INTERNATIONAL AND OTHER CONFERENCES

During the year the Department was represented at the following conferences, committees and working groups etc.:—

Abroad

International Council for the Exploration of the Sea (ICES) — Copenhagen, Denmark.

European Inland Fisheries Advisory Commission (EIFAC) — Budapest, Hungary.

ICES Working Group on North Atlantic Salmon.

ICES/EIFAC Working Group on European Eels — Salzburg, Austria.

Proposed International Convention for the Conservation of Salmon in the North Atlantic Ocean — Reykjavik, Iceland.

West European Fishery Technologists Working Group — Hull.

Codex Alimentarius Commission — Bergen, Norway.

Home

Foyle Fisheries Commission

Water Resources Advisory Committee

River Erne Joint Protection Committee

Pollution Control Committee Donegal County Council

The Water Pollution Advisory Council

Water Pollution Advisory Council Survey Sub-Group

Steering Committee on EEC Sponsored Environmental Impact Assessment of Drainage.

NBST Salmonid Advisory Committee.

Irish Search and Rescue Committee.

Lough Sheelin slurry transport Management Committee.

Interdepartmental Environment Committee.

Irish National Committee for the International Commission on Irrigation and Drainage.

LEGISLATION

Particulars of Statutory Instruments made during the year are given in Appendix No. 21.

APPENDIX No. 1

Quantity and Value of Sea Fish (excluding Salmon) returned as landed by Irish registered vessels in Irish Ports during 1981 and 1982.

Species	Quantity (tonnes)		Value (IR£000)	
	1982	1981	1982	1981
DEMERSAL				
Flat Fish				
Brill	98	114	140	130
Dabs	270	262	47	43
Lemon Sole	213	206	124	105
Megrims	1,225	579	330	186
Plaice	1,574	2,071	1,086	1,192
Sole	370	364	1,019	933
Turbot	257	184	594	328
Other Flat Fish	41	88	13	14
Round Fish				
Cod	8,342	8,701	4,021	3,578
Haddock	4,592	2,284	1,357	590
Hake	781	394	596	265
Ling	189	146	56	41
Saithe	2,154	1,813	722	531
Whiting	10,840	15,643	1,976	2,776
Other Demersal				
Dogfish	1,152	405	232	61
Monkfish	972	525	729	328
Ray/Skate	1,641	1,764	764	754
Other Demersal	206	373	102	93
TOTAL DEMERSAL	34,917	35,916	13,908	11,948
PELAGIC				
Herring	29,734	29,611	5,233	5,046
Sprat	4,109	4,984	302	313
Mackerel	110,363	93,802	12,456	9,893
TOTAL PELAGIC	144,206	128,397	17,991	15,252
TOTAL WETFISH	179,123	164,313	31,899	27,200
CRUSTACEANS				
Crabs	1,394	1,107	430	290
Crawfish	110	98	775	662
Dublin Bay Prawns	5,147	3,604	4,725	3,267
Lobsters	367	331	1,948	1,787
Palaemonid Shrimps	142	82	448	256
TOTAL CRUSTACEANS	7,160	5,222	8,326	6,262
MOLLUSCS				
Escallops	603	410	500	372
Queen Escallops	14	15	8	5
Mussels	5,282	4,658	466	360
Oysters	861	400	1,759	554
Periwinkles	1,317	1,198	442	361
Palourdes	3	3	6	8
Squid	372	236	301	203
Other Molluscs	10	19	22	36
TOTAL MOLLUSCS	8,462	6,939	3,504	1,899
Sea Urchins	97	102	79	83
TOTAL ALL FISH	194,842	176,576	43,808	35,444

In addition to the above landings into the Republic, 11,241 tonnes of fish and 26 tonnes of shellfish valued at IR£3,169,522 and IR£37,582 respectively were landed directly into foreign ports or transhipped at sea for export by Irish registered vessels during 1982.

APPENDIX No. 2

Comparison of the Average Price per tonne of various kinds of Sea Fish, 1974-1982

SPECIES	1974	1975	1976	1977	1978	1979	1980	1981	1982
	£	£	£	£	IR£	IR£	IR£	IR£	IR£
Sole	1,006	1,200	1,485	1,732	2,093	2,184	2,192	2,565	2,759
Brill	411	477	515	680	740	826	866	1,145	1,423
Turbot	444	510	799	1,145	1,231	1,444	1,389	1,781	2,314
Plaice	247	276	364	457	519	557	514	575	690
Dabs	81	114	143	176	195	215	193	166	173
Megrims	94	114	149	230	206	260	229	322	269
Ray/Skate	191	200	228	262	306	375	372	428	466
Cod	176	173	242	375	406	448	375	411	482
Haddock	111	181	188	327	365	373	291	258	296
Hake	150	176	288	456	428	571	499	674	764
Whiting	70	90	109	205	217	228	167	177	182
Saithe	97	118	142	255	301	312	297	293	335
Herring	100	112	142	261	295	287	255	170	176
Mackerel	43	44	61	77	63	74	83	105	113
Sprats	19	17	25	33	38	67	75	63	74

N.B.—"Average price" as shown in this table represents total value divided by total weight for each kind of fish, year by year. It does not purport to take direct cognizance of any abnormal rise or fall in price attributable to a seasonal glut or shortage of a particular kind of fish.

APPENDIX No. 3

Value and Quantity of Landings of Sea Fish (excluding Salmon) at ports at which the value of such Landings exceeded IR£200,000 in 1982.

	Total		DEMERSAL		PELAGIC		SHELLFISH	
	IR£'000	Tonnes	IR£'000	Tonnes	IR£'000	Tonnes	IR£'000	Tonnes
1. Killybegs	8,571	58,275	2,278	6,704	6,271	51,556	22	15
2. Castletownbere	4,006	25,438	1,043	2,225	2,753	23,004	210	209
3. Rathmullen	3,178	29,098	2	5	3,168	29,079	8	14
4. Rossaveel	2,324	8,846	1,254	3,549	690	4,777	380	520
5. Howth	2,146	5,817	1,403	4,565	72	513	671	739
6. Greencastle	2,101	4,520	1,989	4,396	—	—	112	124
7. Skerries	2,094	3,857	384	1,233	165	935	1,545	1,689
8. Dunmore East	1,863	6,021	820	1,810	768	3,962	275	249
9. Clogherhead	1,690	2,569	336	977	26	213	1,328	1,379
10. Galway	1,360	8,337	9	21	1,297	8,295	54	21
11. Kilmore Quay	971	1,385	518	815	2	14	451	556
12. Burtonport	970	4,866	462	1,163	454	3,642	54	61
13. Valentia	946	2,932	535	1,137	187	1,664	224	131
14. Dingle	704	1,847	349	1,033	96	690	259	124
15. Carna	644	371	3	4	—	—	641	367
16. Balbriggan	505	823	104	324	5	31	396	468
17. Baltimore	447	1,505	46	95	176	1,345	225	65
18. Kinsale	443	2,064	77	189	339	1,848	27	27
19. Schull	429	1,009	162	399	62	464	205	146
20. Achill	422	1,294	166	331	120	901	136	62
21. Belmullet/ Blacksod	421	180	1	2	—	—	420	178
22. Helvick	397	1,088	257	717	41	293	99	78
23. Cobh	364	3,817	64	134	295	3,681	5	2
24. Killala/ Kilcummin	336	618	317	608	1	5	18	5
25. Clarinbridge	307	153	—	—	—	—	307	153
26. Moville	298	2,297	—	—	251	2,270	47	27
27. Fenit	294	532	1	4	48	356	245	172
28. Wexford	246	3,330	15	13	—	—	231	3,317
29. Dunlaoire	241	416	177	332	3	16	61	68
30. Union Hall	228	727	117	289	47	377	64	61
31. Downings	207	931	3	8	139	725	65	198
32. Ballycotton	207	767	78	162	105	579	24	26
33. Rosslare	204	326	186	304	*	3	18	19
34. Arklow	203	347	159	265	6	33	38	49

*Indicates a value of less than IR£500.

APPENDIX No. 4

Imports and Exports of Fish and Fishery Products in 1982

(as compared with 1981)

	Quantity		Value	
	1982	1981	1982	1981
	Tonnes	Tonnes	IR£'000	IR£'000
I.—IMPORTS:				
Fish: Fresh, chilled	12,335	6,051	2,913	1,627
Fish: Frozen	11,107	5,953	5,061	4,674
Fish: Salted, Dried or Smoked	1,335	1,191	2,069	1,605
Shellfish: Fresh, Salted or Dried	408	383	1,868	1,595
Prepared or preserved fish	5,764*	4,906*	13,203*	11,994*
Prepared or preserved shellfish	95	103	346	355
Fishmeal and fish oils	12,040	11,091	3,944	3,823
TOTALS	43,084	29,678	29,404	25,673
II.—EXPORTS:				
Fish: Fresh, chilled	51,019	42,976	15,995	11,845
Fish: Frozen	90,487	71,402	29,337	19,986
Fish: Salted, Dried or Smoked	10,622	12,177	7,136	7,180
Shellfish: Fresh, Salted or Dried	7,920	6,785	13,616	10,180
Prepared or preserved fish	1,134*	993*	1,616*	1,021*
Prepared or preserved shellfish	641	223	1,034	364
Fishmeal and fish oils	3,450	2,935	759	658
Landed directly in foreign ports or transhipped at sea for export by Irish registered vessels				
Fish	11,241	7,949	3,170	3,257
Shellfish	49	45	66	44
TOTALS	176,563	145,485	72,729	54,535

*Includes prepared and preserved fish products previously classified as frozen.

APPENDIX No. 5

Herring Fishing 1982

Ports at which more than 1,000 tonnes were landed	Total Quantity Tonnes	Total Value IR£'000
1. Killybegs	9,202	1,786
2. Rossaveel	3,754	562
3. Dunmore East	3,604	727
4. Kinsale	1,550	316
5. Baltimore	1,337	175

APPENDIX No. 6

Mackerel Fishing 1982

Ports at which more than 1,000 tonnes were landed	Total Quantity Tonnes	Total Value IR£'000
1. Killybegs	42,246	4,472
2. Rathmullen	28,426	3,047
3. Castletownbere	22,031	2,605
4. Galway	8,295	1,297
5. Burtonport	2,657	272
6. Valentia	1,158	120
7. Rossaveel	1,023	127

APPENDIX No. 7

Regional Distribution and Classification of Fishing Craft and of Personnel Engaged in Fishing in 1982

ICES Statistical Areas	How Engaged	Men	Total Vessels	Motor Vessels — Gross Tons							Boats propelled by outboard engines, sails or oars	
				Over 100	75—99	51—74	26—50	16—25	11—15	10 and under	18' Keel and upwards	18' keel and under
AREA VIIA (Omeath to Helvick)	Solely	865	343	13	26	42	58	5	11	127	61	—
	Partially	598	136	—	—	1	—	—	—	28	97	10
	Laid-up	—	25	2	—	4	4	2	—	—	13	—
	Totals	1,463	504	15	26	47	62	7	11	155	171	10
AREA VIIGH (Ardmore to Clonakilty)	Solely	222	91	—	1	—	7	6	18	59	—	—
	Partially	260	81	—	—	—	—	—	—	2	79	—
	Laid-up	—	—	—	—	—	—	—	—	—	—	—
	Totals	482	172	—	1	—	7	6	18	61	79	—
AREA VIIJK (Union Hall to Ballyduff)	Solely	961	375	18	6	18	21	10	37	214	51	—
	Partially	840	221	—	—	—	—	—	—	44	155	22
	Laid-up	—	10	2	—	2	1	1	—	4	—	—
	Totals	1,801	606	20	6	20	22	11	37	262	206	22
AREA VIIBC (Kilrush to Mullaghmore)	Solely	458	132	10	5	7	17	13	7	66	7	—
	Partially	2,124	946	—	—	—	2	3	1	293	483	164
	Laid-up	—	15	1	—	—	—	—	—	14	—	—
	Totals	2,582	1,093	11	5	7	19	16	8	373	490	164
AREA VIA (Bundoran to Moville)	Solely	899	145	34	4	23	32	14	7	31	—	—
	Partially	1,279	480	—	—	—	3	5	8	157	255	52
	Laid-up	—	—	—	—	—	—	—	—	—	—	—
	Totals	2,178	625	34	4	23	35	19	15	188	255	52
TOTALS (All Areas)	Solely	3,405	1,086	75	42	90	135	48	80	497	119	—
	Partially	5,101	1,864	—	—	1	5	8	9	524	1,069	248
	Laid-up	—	50	5	—	6	5	3	—	18	13	—
	Totals	8,506	3,000	80	42	97	145	59	89	1,039	1,201	248

For comparison purposes with previous years the I.C.E.S. Areas VIIGH and VIIJK together would equate with the former ICES Area VIIGK.

APPENDIX No. 8

Trawling and Seining, 1982

Port or Locality	Number of men engaged	Number of vessels engaged	Tonnage of Motor Vessels			Fishing Period
			Not exceeding 10 tons	Over 10 tons	Over 25 tons	
Clogherhead	91	24	—	1	23	All year
Balbriggan	49	11	—	—	11	All year
Skerries	85	19	—	—	19	All year
Howth	131	27	2	1	27	All year
Dublin	6	2	—	—	—	Occasionally
Dun Laoire	13	3	—	—	3	All year
Wicklow	8	8	8	—	—	All year
Arklow	52	12	3	—	12	All year
Courtown	8	3	—	—	—	Occasionally
Wexford	25	5	—	—	5	All year
Rosslare	5	1	—	—	1	All year
Carne/St. Helens	2	1	—	—	—	Occasionally
Kilmore Quay	115	23	1	1	22	All year
Fethard/Slade	2	1	—	—	—	Occasionally
Duncannon	14	3	—	—	3	All year
Ballyhack	9	3	—	—	—	Occasionally
Cheekpoint	4	2	2	1	1	Occasionally
Passage East	4	2	2	1	1	Occasionally
Dunmore East	35	7	—	—	7	All year
Stradbally	11	4	3	1	5	All year
Helvick	63	21	16	1	4	All year
Dungarvan	9	3	3	—	—	All year
Ardmore	13	5	4	1	—	All year
Youghal	28	10	5	1	3	All year
Ballycotton	27	12	10	1	1	All year
Cobh	25	11	6	3	2	All year
Crosshaven	68	26	14	7	5	All year
Knockadoon	10	5	5	3	—	All year
Kinsale	19	7	5	3	—	All year
Old Head Kinsale	8	4	4	3	—	All year
Courtmacsherry	16	7	5	3	1	All year
Clonakilty	8	4	4	1	—	All year
Union Hall	50	16	7	3	1	All year
Baltimore	11	4	3	1	—	All year
Schull	56	21	3	3	1	All year
Cape Clear	6	3	3	—	—	Occasionally
Goleen/Crookhaven	16	9	8	1	6	All year
Dunmanus Bay	20	10	10	1	2	All year
Castletownbere	155	20	—	2	18	All year
Ballinskelligs	4	1	—	—	1	All year
Valentia	—	—	—	—	—	—
Portmagee	13	3	—	—	3	All year
Cahirciveen	18	3	—	—	3	All year
Dingle	55	13	3	3	10	All year
Fenit	4	1	—	—	1	All year
Kilbaha	4	1	—	—	1	All year
Rossaveel	86	17	1	1	16	All year
Roundstone	4	1	—	—	—	Occasionally
Cleggan	14	5	1	1	4	Occasionally
Killala	28	7	2	1	2	All year
Killybegs	334	42	—	3	41	All year
Burtonport	122	20	—	1	20	All year
Bunbeg	9	2	—	1	2	All year
Magharoarty/Tory	8	2	—	1	1	All year
Urrus/Dunaff	18	4	—	2	2	All year
Dunfanaghy	8	2	—	1	1	Occasionally
Downings	4	1	—	1	—	Occasionally
Buncrana	8	2	—	2	—	All year
Greencastle	128	26	—	1	25	All year
Teelin	28	7	—	2	—	All year

APPENDIX No. 9A

Statement of Account in Respect of Repayable Advances

Advance of IR£24,889,415 made to An Bord Iascaigh Mhara during the period of the thirty-one years to 31 December 1982 for provision of boats and gear and other purposes.

Repayment of Principal	IR£
Made to 31 December 1981	2,467,203
Made during 1982	789,381
Principal written off to 31 December 1982	2,682,213
	5,938,797

Balance of principal outstanding at 31 December 1982: IR£18,950,618

APPENDIX No. 9B

Expenditure on Fisheries for the years ended 31 December 1981 and 31 December 1982

	1 Jan.—31 Dec. 1982	1 Jan.—31 Dec. 1981
	(IR£)	(IR£)
1. SEA FISHERIES		
A. By Department of Fisheries and Forestry (Fisheries Division):		
(i) Development	322,000	236,000
(ii) Fishery Harbours and other marine works	3,931,000	3,970,000
B. By An Bord Iascaigh Mhara		
(i) Administration and Current Development (grant in aid)	5,410,000	5,160,000
(ii) Capital Development (grant in aid)	3,075,000	5,350,000
(iii) Repayable Advances*	2,500,000	139,000
(iv) Repayment of Advances written off	800,000	200,000
C. Roinn na Gaeltachta Grants for marine works	116,000	211,000
2. INLAND FISHERIES		
A. By Department of Fisheries and Forestry (Fisheries Division) and the Inland Fisheries Trust Incorporated (grant in aid)	5,141,000	3,710,000
B. By the Salmon Research Trust of Ireland Incorporated (grant in aid)	54,000	45,000
3. DEPARTMENT OF FISHERIES AND FORESTRY Salaries, wages and other administrative expenses for Fisheries Division	1,817,000	1,396,000
TOTALS	23,166,000	20,417,000

*A Statement of Account in respect of Repayable Advances is given in Appendix 9A.

APPENDIX No. 10

Coastal Extent of Fisheries Regions and Names of the Principal Rivers in each Region

Fisheries Region	Coastal Extent of Region	Principal Rivers
Eastern	Carlingford Lough, Co. Louth to Kiln Bay, Co. Wexford and seawards to a line twelve miles from baselines.	Fane, Dee, Clyde, Boyne Blackwater, Deel, Liffey, Vartry, Slaney, Avoca.
Southern	Kiln Bay, Co. Wexford to Ballycotton Pier, Co. Cork and seawards to a line twelve miles from baselines.	Suir, Barrow, Nore, Blackwater Funcheon, Bride, Awbeg.
South Western	Ballycotton Pier, Co. Cork, to Kerry Head, Co. Kerry and seawards to a line twelve miles from baselines.	Lee, Owenboy, Bandon, Argideen, Ilen, Mealagh, Owvane, Coomhola, Glengarriff, Adrigole, Roughty, Sheen, Finnihy, Blackwater, Sneem, Laune, Flesk, Maine, Caragh, Currane, Cummeragh, Inny.
Shannon	Kerry Head, Co. Kerry to Hag's Head, Co. Clare and seawards to a line twelve miles from baselines.	Shannon, Deel, Fergus, Mulcaire, Little and Upper Brosna, Inny, Maigue, Feale.
Western	Hag's Head, Co. Clare to Pigeon Point, Co. Mayo and seawards to a line twelve miles from baselines.	Corrib, Claregalway, Ballinahinch, Recess, Cashla, Owengowla, Invermore, Inverbeg, Screebe, Furnace, Culfin, Errif, Bundorragh, Dawross, Carrowniskey, Bunowen, (Louisburgh).
North Western	Pigeon Point, Co. Mayo to Mullaghmore Head, Co. Sligo and seawards to a line twelve miles from baselines.	Newport, Burrishoole, Owenduff, Owengarve, Owenmore, Glenamoy, Moy, Cloonaghmore, (Palmerstown), Easkey, Ballisodare, Garavogue (Sligo), Bonet, Drumcliff.
Northern	Mullaghmore Head, Co. Sligo to Rossan Point, Co. Donegal and seawards to a line twelve miles from baselines.	Erne, Bundrowes, Bunduff, Eske, Eaney, Water, Oily Glen, Owenea, Gweebarra, Gweedore, (Crolly), Clody, Lackagh, Lennon, Crana.

APPENDIX No. 11

Quantity and Value of Salmon and Sea Trout taken in 1980, 1981 and 1982 by Instruments of Capture

SALMON

Instruments	Quantity (kg)			Value (IR£)		
	1982	1981	1980	1982	1981	1980
Total for rod and line	40,439	40,914	39,836	177,932	144,321	144,058
Total for drift nets	689,966	492,433	641,918	3,035,850	1,737,007	2,321,302
Total for draft nets	139,892	80,717	171,755	615,525	284,718	621,100
Total for stake nets, weirs etc.	37,508	41,151	40,999	165,035	145,157	148.261
Total for all engines	907,805	655,215	894,508	3,994,342	2,311,203	3,234,721

SEA TROUT

Instruments	Quantity (kg)			Value (IR£)		
	1982	1981	1980	1982	1981	1980
Total for rod and line	9,341	10,542	18,139	31,853	44,173	63,486
Total for drift nets	1,974	3,012	5,597	6,731	12,622	19,586
Total for draft nets	5,822	4,455	13,259	19,853	18,665	46,407
Total for stake nets, weirs etc.	69	226	345	235	946	1,208
Total for all engines	17,206	18,235	37,340	58,672	76,406	130,687

APPENDIX No. 12

Quantity and Value of Salmon taken in 1980, 1981 and 1982 by Fisheries Regions

REGIONS	*	Quantity (kg)			Value (IR£)		
		1982	1981	1980	1982	1981	1980
Eastern							
Dundalk	R	477	302	116	2,099	1,064	418
District	N	4,564	3,270	4,071	20,082	11,534	14,723
Drogheda	R	1,182	1,491	808	5,201	5,259	2,923
District	N	10,498	9,127	10,033	46,191	32,197	36,280
Dublin	R	215	684	632	946	2,411	2,287
District	N	31	1,127	1,088	136	3,977	3,934
Wexford	R	405	95	1,751	1,782	336	6,332
District	N	5,439	8,033	9,580	23,932	28,336	34,642
	R	2,279	2,572	3,307	10,028	9,070	11,960
Total	N	20,532	21,557	24,772	90,341	76,044	89,579
Southern							
Waterford	R	1,443	5,106	5,537	6,349	18,012	20,022
District	N	45,588	79,454	59,813	200,587	280,264	216,296
Lismore	R	1,992	879	1,808	8,765	3,101	6,539
District	N	23,880	60,178	80,168	105,072	212,272	289,902
	R	3,435	5,985	7,345	15,114	21,113	26,561
Total	N	69,468	139,632	139,981	305,659	492,536	506,198
South Western							
Cork	R	709	2,913	3,001	3,119	10,275	10,852
District	N	30,837	57,950	93,783	135,683	204,415	339,137
Kerry	R	4,252	2,755	4,207	18,709	9,720	15,213
District	N	126,391	62,772	75,042	556,120	221,422	271,366
	R	4,961	5,668	7,208	21,828	19,995	26,065
Total	N	157,228	120,722	168,825	691,803	425,837	610,503
Shannon							
Limerick	R	3,006	3,571	6,310	13,226	12,595	22,817
District	N	23,135	29,360	43,332	101,794	103,564	156,699
	R	3,006	3,571	6,310	13,226	12,595	22,817
Total	N	23,135	29,360	43,332	101,794	103,564	156,699
Western							
Galway	R	1,564	3,256	1,826	6,881	11,486	6,605
District	N	20,189	34,225	41,286	88,832	120,724	149,297
Connemara	R	1,532	486	693	6,741	1,714	2,506
District	N	8,847	8,284	6,988	38,927	29,220	25,271
Ballinakill	R	1,970	449	2,832	8,668	1,582	10,240
District	N	7,205	9,492	8,404	31,702	33,484	30,393
	R	5,066	4,191	5,351	22,290	14,782	19,351
Total	N	36,241	52,001	56,678	159,461	183,428	204,961
North-Western							
Bangor	R	2,544	3,385	1,841	11,194	11,942	6,658
District	N	45,968	9,441	70,587	202,259	33,301	255,256
Ballina	R	6,244	5,850	2,020	27,474	20,637	7,306
District	N	87,054	77,778	138,085	383,038	274,351	499,343
Sligo	R	3,971	6,235	1,766	17,472	21,995	6,386
District	N	8,507	10,106	14,799	37,431	35,646	53,515
	R	12,759	15,470	5,627	56,140	54,574	20,350
Total	N	141,529	97,325	223,471	622,728	343,298	808,114
Northern							
Ballyshannon	R	3,903	320	406	17,173	1,128	1,468
District	N	41,693	30,504	40,358	183,449	107,600	145,943
Letterkenny	R	5,029	3,137	4,282	22,128	11,064	15,486
District	N	377,541	123,200	157,255	1,661,180	434,575	568,666
	R	8,932	3,457	4,688	39,301	12,192	16,954
Total	N	419,234	153,704	197,613	1,844,629	542,175	714,609
GRAND TOTAL		907,805	655,215	894,508	3,994,342	2,311,203	3,234,721

*R indicates capture by means of single rod and line.
N by means of nets, weirs, etc.

APPENDIX No. 13

Quantity and Value of Sea Trout taken in 1980, 1981 and 1982 by Fisheries Regions

REGIONS	*	Quantity (kg)			Value (IR£)		
		1982	1981	1980	1982	1981	1980
Eastern							
Dundalk	R	770	136	912	2,625	570	3,192
District	N	245	—	224	836	—	784
Drogheda	R	314	136	1,796	1,070	570	6,286
District	N	200	63	4,329	682	266	15,152
Dublin	R	119	37	830	406	157	2,905
District	N	1,315	2,188	3,268	4,481	9,165	11,434
Wexford	R	322	269	865	1,098	1,129	3,027
District	N	369	383	1,106	1,258	1,602	3,871
	R	1,525	578	4,403	5,199	2,426	15,410
Total	N	2,129	2,634	8,927	7,257	11,033	31,241
Southern							
Waterford	R	—	17	305	—	72	1,068
District	N	144	91	352	491	380	1,232
Lismore	R	—	27	265	—	112	928
District	N	182	580	564	621	2,432	1,974
	R	—	44	570	—	184	1,996
Total	N	326	671	916	1,112	2,812	3,206
South Western							
Cork	R	2,994	2,722	1,187	10,209	11,403	4,154
District	N	772	649	910	2,633	2,720	3,185
Kerry	R	302	454	916	1,030	1,901	3,206
District	N	455	816	314	1,552	3,421	1,099
	R	3,296	3,176	2,103	11,239	13,304	7,360
Total	N	1,227	1,465	1,224	4,185	6,141	4,284
Shannon							
Limerick	R	1	272	719	3	1,140	2,517
District	N	336	227	837	1,146	950	2,930
	R	1	272	719	3	1,140	2,517
Total	N	336	227	837	1,146	950	2,930
Western							
Galway	R	36	—	381	123	—	1,334
District	N	168	73	162	573	304	567
Connemara	R	2,466	3,542	3,501	8,409	14,839	12,253
District	N	—	54	72	—	229	252
Ballinakill	R	1,007	612	684	3,434	2,566	2,394
District	N	647	109	1,586	2,206	456	5,551
	R	3,509	4,154	4,566	11,966	17,405	15,981
Total	N	815	236	1,820	2,779	989	6,370
North Western							
Bangor	R	431	959	1,848	1,469	4,020	6,488
District	N	407	227	612	1,388	950	2,142
Ballina	R	48	160	619	163	671	2,166
District	N	4	227	1,668	14	950	5,838
Sligo	R	14	42	187	48	177	655
District	N	80	36	160	273	152	560
	R	493	1,161	2,654	1,680	4,868	9,309
Total	N	491	490	2,440	1,675	2,052	8,540
Northern							
Ballyshannon	R	101	136	1,301	348	570	4,553
District	N	2,249	1,290	2,236	7,669	5,405	7,826
Letterkenny	R	416	1,021	1,823	1,418	4,276	6,380
District	N	292	680	801	996	2,851	2,804
	R	517	1,157	3,124	1,766	4,846	10,933
Total	N	2,541	1,970	3,037	8,665	8,256	10,630
GRAND TOTAL		17,206	18,235	37,340	58,672	76,406	130,707

* R indicates capture by means of single rod and line.
N by means of nets, weirs etc.

The catch figures set out above for 1982 are based on returns which are not complete. This explains any inconsistency between the figures for 1982 and previous years.

APPENDIX No. 14

Quantity and value of Eels taken in 1980, 1981 and 1982 by Fisheries Regions

REGIONS	Quantity (kg)			Value (IR£)		
	1982	1981	1980	1982	1981	1980
Eastern						
Dundalk District	908	151	590	1,998	217	1,199
Drogheda District	762	762	1,143	1,094	1,094	1,260
Dublin District	—	453	—	—	651	—
Wexford District	393	1,355	134	690	1,947	177
Total	2,063	2,721	1,867	3,782	3,909	2,636
Southern						
Waterford District	4,839	1,437	2,400	9,491	2,028	4,800
Lismore District	769	185	1,270	846	261	1,270
Total	5,608	1,622	3,670	10,337	2,289	6,070
South Western						
Kerry District	5	500	440	5	731	440
Cork District	136	—	—	100	—	—
Total	141	500	440	105	731	440
Shannon						
Limerick District	79,625	46,413	33,459	173,958	99,232	72,821
Total	79,625	46,413	33,459	173,958	99,232	72,821
Western						
Galway District	46,238	31,479	27,637	96,500	64,328	57,520
Total	46,238	31,479	27,637	96,500	64,328	57,520
North Western						
Bangor District	586	620	532	1,289	922	1,064
Ballina District	5,799	3,612	1,000	12,757	7,607	2,000
Sligo District	—	136	—	—	286	—
Total	6,385	4,368	1,532	14,046	8,815	3,064
Northern						
Ballyshannon District	5,280	7,020	6,088	5,029	7,523	7,246
Total	5,280	7,020	6,088	5,029	7,523	7,246
GRAND TOTAL	145,340	94,123	74,693	303,757	186,827	149,797

The catch figures set out above are based on returns which are not completed. This explains any apparent inconsistency between the figures and the official export figures in any particular year.

APPENDIX No. 15

Total Quantity and Value of Salmon, Sea Trout and Eels taken by all Engines in 1980, 1981 and 1982 by Fisheries Regions

REGIONS	Total Quantity per Region (kg)			Total Value per Region (IR£)		
	1982	1981	1980	1982	1981	1980
Eastern						
Dundalk District	6,965	3,859	5,913	28,154	13,385	20,316
Drogheda District	12,957	11,579	18,109	73,929	39,386	61,901
Dublin District	1,679	4,489	5,818	15,421	16,361	20,560
Wexford District	6,929	10,135	13,436	33,302	33,350	48,049
Total	28,530	30,062	43,276	150,806	102,482	150,826
Southern						
Waterford District	52,013	86,105	68,407	218,723	300,756	243,418
Lismore District	26,823	61,849	84,075	117,585	218,178	300,613
Total	78,836	147,954	152,482	336,308	518,934	544,031
South-Western						
Cork District	35,447	64,234	98,881	146,237	228,813	357,328
Kerry District	131,404	67,297	80,919	579,139	237,195	291,324
Total	166,851	131,531	179,800	725,376	466,008	648,652
Shannon						
Limerick District	106,103	79,843	84,657	294,430	217,481	257,784
Total	106,103	79,843	84,657	294,430	217,481	257,784
Western						
Galway District	68,195	69,033	71,292	194,119	196,842	215,323
Connemara District	12,845	12,366	11,254	58,173	46,002	40,282
Ballinakill District	10,828	10,662	13,506	48,311	38,088	48,578
Total	91,868	92,061	96,052	300,603	280,932	304,183
North-Western						
Bangor District	49,936	14,632	75,420	223,372	51,135	271,588
Ballina District	99,148	87,627	143,392	431,268	304,216	516,653
Sligo District	12,572	16,555	16,912	56,118	58,256	61,116
Total	161,656	118,814	235,724	710,758	413,607	849,357
Northern						
Ballyshannon District	53,226	39,270	50,389	218,026	122,226	167,036
Letterkenny District	383,279	128,038	164,161	1,692,496	452,766	593,336
Total	436,505	167,308	214,550	1,910,522	574,992	760,372
GRAND TOTAL	1,070,349	767,573	1,006,541	4,428,803	2,574,436	3,515,205

APPENDIX No. 16

Number, Quantity and Value of Salmon taken by Single Rod and Line in 1980, 1981, and 1982 by Fisheries Regions

REGIONS	No. of Fish			Quantity (kg)			Value (IR£)		
	1982	1981	1980	1982	1981	1980	1982	1981	1980
Eastern									
Dundalk District	146	70	34	477	302	116	2,099	1,064	418
Drogheda District	362	322	198	1,182	1,491	808	5,201	5,259	2,923
Dublin District	66	151	154	216	684	632	950	2,411	2,287
Wexford District	124	20	429	405	95	1,751	1,782	336	6,332
Total	698	563	815	2,280	2,572	3,307	10,032	9,070	11,960
Southern									
Waterford District	442	1,054	1,218	1,443	5,106	5,537	6,349	18,012	20,022
Lismore District	610	274	519	1,992	879	1,808	8,765	3,101	6,539
Total	1,052	1,328	1,737	3,435	5,985	7,345	15,114	21,113	26,561
South Western									
Cork District	217	709	1,018	709	2,913	3,001	3,120	10,275	10,852
Kerry District	1,302	654	1,547	4,252	2,755	4,207	18,708	9,720	15,213
Total	1,519	1,363	2,565	4,961	5,668	7,208	21,828	19,995	26,065
Shannon									
Limerick District	908	984	1,502	3,006	3,571	6,310	13,226	12,595	22,817
Total	908	984	1,502	3,006	3,571	6,310	13,226	12,595	22,817
Western									
Galway District	479	861	537	1,564	3,256	1,826	6,881	11,486	6,605
Connemara District	469	126	232	1,532	486	693	6,741	1,714	2,506
Ballinakill District	603	100	892	1,970	449	2,832	8,668	1,582	10,240
Total	1,551	1,087	1,661	5,066	4,191	5,351	22,290	14,782	19,351
North Western									
Bangor District	779	676	580	2,544	3,385	1,841	11,194	11,942	6,658
Ballina District	1,912	1,308	594	6,244	5,850	2,020	27,474	20,637	7,306
Sligo District	1,216	1,245	538	3,971	6,235	1,766	17,472	21,995	6,386
Total	3,907	3,229	1,712	12,759	15,470	5,627	56,140	54,574	20,350
Northern									
Ballyshannon District	1,195	94	100	3,903	320	406	17,173	1,128	1,468
Letterkenny District	1,540	922	1,259	5,029	3,137	4,282	22,128	11,064	15,486
Total	2,735	1,016	1,359	8,932	3,457	4,688	39,301	12,192	16,954
GRAND TOTAL	12,370	9,570	11,351	40,439	40,914	39,836	177,931	144,321	144,058

APPENDIX No. 17

Number, Quantity and Value of Sea Trout taken by Single Rod and Line in 1980, 1981 and 1982 by Fisheries Regions

REGIONS	No. of Fish			Quantity (kg)			Value (IR£)		
	1982	1981	1980	1982	1981	1980	1982	1981	1980
Eastern									
Dundalk District	1,424	400	1,048	770	136	912	2,625	570	3,192
Drogheda District	1,018	400	2,065	314	136	1,796	1,070	570	6,286
Dublin District	348	110	891	119	37	830	406	157	2,905
Wexford District	949	791	994	322	269	865	1,098	1,129	3,027
Total	3,739	1,701	4,998	1,525	578	4,403	5,199	2,426	15,410
Southern									
Waterford District	—	50	350	—	17	305	—	72	1,068
Lismore District	—	78	378	—	27	265	—	112	928
Total	—	128	728	—	44	570	—	184	1,996
South-Western									
Cork District	4,400	8,000	1,523	2,994	2,722	1,187	10,209	11,403	4,154
Kerry District	459	1.000	1,640	302	454	916	1,030	1,901	3,206
Total	4,859	9,000	3,163	3,296	3,176	2,103	11,239	13,304	7,360
Shannon									
Limerick District	2	800	786	1	272	719	3	1,140	2,517
Total	2	800	786	1	272	719	3	1,140	2,517
Western									
Galway District	99	—	827	36	—	381	123	—	1,334
Connemara District	7,249	10,410	1 0,150	2,466	3,542	3,501	8,409	14,839	12,253
Ballinakill District	2,019	1,800	786	1,007	612	684	3,434	2,566	2,394
Total	9,367	12,210	11,763	3,509	4,154	4,566	11,966	17,405	15,981
North-Western									
Bangor District	1,080	2,819	2,125	431	959	1,848	1,469	4,020	6,468
Ballina District	137	470	563	48	160	619	163	671	2,166
Sligo District	39	123	215	14	42	187	48	177	655
Total	1,256	3,412	2,903	493	1,161	2,654	1,680	4,868	9,289
Northern									
Ballyshannon District	249	400	1,496	101	136	1,301	348	570	4,553
Letterkenny District	1,019	3,000	2,096	416	1,021	1,823	1,418	4,276	6,380
Total	1,268	3,400	3,592	517	1,157	3,124	1,766	4,846	10,933
GRAND TOTAL	20,491	30,651	27,933	9,341	10,542	18,139	31,853	44,173	63,486

APPENDIX No. 18

Particulars of Receipts and Expenditure by the Central and Regional Fisheries Boards for year ended 31 December 1982

Fisheries Board	Opening Balance	RECEIPTS (IR£)					EXPENDITURE (IR£)			Total Expenditure	Closing Balance
		Licence Duty	Fishery Rate	Grant from Department	Misc. Receipts	Total Receipts	Salaries/ Wages	Legal Costs	Travelling and Misc.		
	IR£	IR£	IR£	IR£	IR£	IR£	IR£	IR£	IR£	IR£	IR£
Central	+8,281	—	—	1,801,500	239,249	2,040,749	1,353,524	—	694,056	2,047,580	+1,450
Eastern	+14,861	24,193	10,185	428,667	10,308	473,353	220,474	16,400	222,297	459,171	+29,043
Southern	−12,028	28,685	20,534	438,344	20,591	508,154	303,601	17,209	139,493	460,303	+35,823
South-Western	−7,051	29,217	7,669	484,647	17,464	538,997	322,053	17,455	192,438	531,946	Nil
Shannon	+13,283	18,696	10,713	276,455	22,395	328,259	129,518	6,774	180,161	316,453	+25,089
Western	−14,214	16,180	27,971	277,135	19,433	340,719	235,235	—	115,505	350,740	−24,235
North-Western	+808	24,353	31,891	365,782	7,881	429,907	235,966	15,203	181,091	432,260	−1,545
Northern	+4,862	27,089	11,905	387,353	23,735	450,082	276,874	3,628	172,490	452,992	+1,952

APPENDIX No. 19

Particulars of Licences Issued by Regional Boards for Year 1982

	A	O	R	B	P	S	T	Special Local Licences (Tidal Waters)		D	C	U	E	F	G	H	I	J	N	K	L	M	V
	Annual Valid All Districts	Late Season Valid All Districts	Seven Day Valid All Districts	Annual District of issue Only	Late Season District of issue	Foyle Valid All Districts	Foyle District of issue Only	Rod	Net	Drift Net	Draft Net	Pole Net	Bag Net	Stake Net	Head Weir	Box or Crib	Loop Net	Snap Net	Oyster Dredge	Gap Eye Basket or coghill	Long Line For Eels	Eel Trap	Fyke Net
	IR£10	IR£7	IR£3	IR£5	IR£3	IR£7	IR£2	—	—	IR£50	IR£30	IR£5	IR£30	IR£50	IR£10	IR£20	IR£2	IR£12	IR£15	IR£10	IR£10	IR£20	
Eastern	854	124	41	860	437	—	—	—	—	14	164	—	—	—	—	6	—	—	—	17	25	9	21
Southern	446	15	327	1,630	34	—	—	—	—	238	14	—	1	4	1	1	—	137	—	17	0	0	3
South-Western	523	34	310	1,038	231	—	—	—	—	100	100	—	1	—	—	1	—	—	118	—	—	0	3
Shannon	350	19	13	1,647	68	—	—	—	—	78	110	—	—	0	—	0	—	—	—	94	3	—	3
Western	220	102	400	290	302	—	5	—	—	98	18	—	—	—	—	5	—	—	240	34	8	22	—
North-Western	328	62	472	1,204	700	0	0	0	25	133	22	—	1	—	—	7	—	—	153	31	10	2	—
Northern	307	36	443	1,163	667	4	43	28	25	169	132	—	—	—	—	2	30	—	2	5	27	3	—
TOTAL	3,028	392	2,006	7,832	2,439	4	48	28	50	830	560	—	3	4	1	22	30	137	513	198	73	36	30

APPENDIX No. 20

Licence Duties Payable on Fishing Engines

	IR£
On each Salmon Rod—Annual (valid all districts)	10.00
do. Salmon Rod—Late Season (valid all districts)	7.00
do. Salmon Rod—Seven day (valid all districts)	3.00
do. Salmon Rod—Annual (valid district of issue only)	5.00
do. Salmon Rod—Late Season—(valid district of issue only)	3.00
do. Salmon Rod—Foyle area extension (valid all districts)	7.00
do. Salmon Rod—Foyle area extension (valid district of issue only)	2.00
On each Drift Net	50.00
do. Draft Net	30.00
do. Snap Net	12.00
do. Bag Net	30.00
do. Stake Net	50.00
do. Head Weir	10.00
do. Box or Crib	20.00
do. Pole Net	5.00
do. Loop Net	2.00
do. Gap, Eye, Basket or Coghill Net for Eels	10.00
do. Longline for Eels	10.00
do. Eel trap	20.00
do. Oyster Fishing Engine	15.00
do. Fyke Net for train of 20 or less Plus 50p for each net thereafter.	10.00
Special Local Licences	
Rod	5.00
Draft Net	40.00

Special Local Rod Licences may be reduced to IR£4 for holders of annual (ordinary) or annual (district) licences.

APPENDIX No. 21

Abstract of Statutory Instruments made in 1982

Sea Fisheries:

1. Sea Fisheries (Conservation and Rational Exploitation) Order, 1982 (S.I. No. 23 of 1982), dated 10th February 1982, continues in force the technical conservation measures contained in Council Regulation (EEC) No. 2527/80 of 30 September, 1980 on a national level, notwithstanding the expiry of that Regulation on 31 October 1981.

2. Herring (Restriction of Fishing in the Celtic Sea) Order, 1982 (S.I. No. 369 of 1982), dated 13th December 1982, provides for herring fishing to take place in the specified area in the period 1 October 1982 to 31 March 1983 by vessels registered in Ireland, France, West Germany, Netherlands and the United Kingdom, as agreed by EEC Council of Fisheries Ministers on 8/9 November 1982.

3. Sea Fisheries (Conservation and Rational Exploitation) (No. 2) Order, 1982 (S.I. No. 388 of 1982), dated 31st December 1982 — (a) prohibits vessels from any member state of the EEC from fishing for scheduled species of fish within the exclusive fishery limits of the State except in accordance with the quota proposals of the EEC Commission for such species for 1982, (b) prohibited Danish Vessels from fishing in the area landward of a line 12 miles from baselines, and (c) prohibited Irish vessels from fishing in the area landward of a line 12 miles from baselines of other member states of the EEC except in accordance with a licence issued by the Minister.

Oyster Fishery Orders, 1982

1. Oyster Fishery (Crook Haven) Order, 1972 (Determination) Order, 1982, dated 3rd March 1982, revokes Oyster Fishery (Crook Haven) Order, 1972 granted to Celtic Fisheries Ltd, Goleen, Co. Cork on 1 September 1972.

Bye-Laws, 1982

1. Mulroy Bay (North water and Moross Channel) (Prohibition on Dredging for Escallops) Bye-law No. 625 of 1982, dated 16 February 1982, prohibits dredging for escallops in the area specified by the bye-law.

2. Oysters (Minimum size) Bye-law No. 628 of 1982, dated 20th October 1982, prescribes a minimum size of 76 millimetres (3 inches) for oysters which may be fished or taken, sold or held in possession for sale.

Inland Fisheries

1. Register of Trout, Coarse Fish and Sea Anglers (Fixed Day) Regulations, 1982 (S.I. No. 121 of 1982), dated 27 May, 1982, fix the 31st day of May, in relation to any year, as the day fixed for the purposes of subsection (2) of section 58 of the Fisheries Act, 1980. In accordance with the provisions of that subsection, the latest date by which a person may, by way of payment of the appropriate annual subscription to a Regional Fisheries Board, renew his registration in the Trout, Coarse Fish and Sea Anglers Registration maintained by that Board, shall be the 30th of May each year. Failure to renew his registration by that date shall result in the removal of a person's name from the Register.

2. Shannon Fisheries Region Bye-Law No. 626, 1982, dated 11 May, 1982, prohibits all fishing after the 31st May in each year on that part of the Mulcair River which lies between a line drawn across the river along the upstream face of the New Road Bridge at Annacotty, Co. Limerick and a line drawn across the river channel at right angles to its course from a point on the right bank 50 yards (45.72 metres) upstream from the point of juncture of the upstream face of the Mill Dam (otherwise known as Annacotty Weir) with the right bank.

3. Salmon Levy (Revocation) Order, 1982 (S.I. No. 162 of 1982), dated 28 June, 1982, revokes the Salmon Levy Order, 1980, which provided for the payment of a levy on every first or only sale of salmon.

4. Licensed Salmon Dealer's Register Regulations, 1982 (S.I. No. 163 of 1982), dated 28 June, 1982, prescribe the form of the register to be kept by licensed salmon dealers. They also revoke the Salmon Levy, Licensed Salmon Dealers' Registers and Salmon and Trout Records, Regulations, 1980, and the Sales of Salmon (Attributable Price) Regulations, 1980, which specified arrangements for payment of the levy on every first or only sale of salmon.

5. Salmon and Trout Conservation Bye-Law No. 627, 1982, dated 28 July, 1982, defers the commencement date in 1982 of the annual close season for commercial salmon fishing in the Southern Fisheries Region (Waterford and Lismore Fishery Districts) to 6 a.m. on 7 August.

6. North-Western Fisheries Region (Garvogue River) Bye-Law No. 629, 1982 dated 1st November, 1982, extends the prohibition on all fishing contained in Article 7 of the Sligo District Bye-Law No. 603, 1978, by prohibiting—

   (a) fishing for coarse fish with rod and line during the period 1st November to 31st December in each year in that part of the Garvogue River between the Upper Weir in the townland of Rathquarter and a line drawn due north across the river from the north-eastern corner of the lodge in the townland of Cleaveragh Demesne, and

   (b) fishing for coarse fish with rod and line during the period 1st January to 31st January in each year in that part of the above-mentioned river between a line drawn across the river at right angles to its course from the townland of Rathquarter to the townland of Abbeyquarter North at a point 600 yards (548.64 metres) upstream of the New Bridge and a line drawn due north across the river from the north eastern corner of the lodge in the townland of Cleaveragh Demesne.

   The Bye-Law also extends the annual close season for angling for salmon for 31st December to 31st January in that part of the Garvogue River referred to at (b) above.

7. Fisheries (Alteration of Fishery Year) Order, 1982 (S.I. No. 328 of 1982), dated 16th November, 1982, provides that on and after 31st December, 1982 the term "Fishery Year" means a period which is co-extensive with the calendar year. In conjunction with the alteration of the meaning of Fishery Year, the Order prescribes that—

   (a) the fishery rate must be struck between 1st December preceding the commencement of the fishery year concerned and 31st January next following, and

   (b) the dates by which the first and second moieties of fishery rates are due to be paid are 1st May and 1st September, respectively.

   The Order also provides for a transitional period, viz. 1st October, 1982 to 31st December, 1982 and for the striking of a fishery rate for that period which rate is due to be paid in one amount by 1st May, 1983.

8. Fishery Districts (Alteration of Boundaries) Regulations, 1982 (S.I. No. 329 of 1982), dated 16th November, 1982, alter the boundaries of the fishery districts by the inclusion of waters (as specified in the Regulations) which are in an area or portion of the sea described in section (10) (9) (a) of the Fisheries Act, 1980. In effect, the Regulations extend the boundaries of the fishery districts seaward out as far as twelve nautical miles from baselines.

9. Control of Fishing for Salmon by Drift Net (Kerry Fishery District) Order, 1982 (S.I. No. 367 of 1982), dated 10 December, 1982, prescribes the revised maximum number of salmon fishing drift net licences in the Kerry Fishery District (part of the South Western Fisheries Region). The Order also authorises the issue of those licences by the South Western Regional Fisheries Board and prescribes the criteria under which those licences may be issued.

10. Control of Fishing for Salmon (Amendment) Order, 1982 (S.I. No. 368 of 1982) dated 13 December, 1982,

   (a) revises the prescribed maximum numbers of commercial salmon licences which may be issued by Regional Fisheries Boards under the Control of Fishing for Salmon Order, 1980, and

   (b) provides the applicants for such licences for the 1983 salmon fishing season may be made to the Shannon Regional Fisheries Board up to 31 December, 1982.

11. Drift Nets for Salmon or Trout Fishing (Maximum length) (Amendment) Bye-law No. 630, 1982, dated 9 December, 1982, lays down (in metric measurements) the maximum length of drift net which may be used in fishing for salmon along the South, West and North-West coasts. The following are the metric measurements contained in the Bye-Law and their approximate imperial equivalents:

Metric	*Approximate Imperial Measurements*
220 metres	240 yards
366 metres	400 yards
183 metres	200 yards
119 metres	130 yards
211 metres	230 yards
549 metres	600 yards
732 metres	800 yards
1,372 metres	1,500 yards

12. Salmon, Eel and Oyster (Miscellaneous Licence) (Alteration of Duties) Order, 1982 (S.I. No. 386 of 1982), dated 23 December, 1982, prescribes the rates of salmon, eel and oyster fishing licence duties and salmon dealer's and salmon exporter's licence fees payable from 1 January, 1983.

Foyle Area

1. Foyle Area (Licensing of Fishing Engines) (Amendment) Regulations, 1982, dated 28 January, 1982, increase the licence fees payable in respect of each type of net used and game fishing licence issued in the Foyle Area.

2. Foyle Area (Control of Netting) (Temporary Provisions) Regulations, 1982, dated 14 June, 1982, provide for a temporary amendment of the Foyle Area (Control of Netting) Regulations, 1981, which control and restrict both draft and drift netting for salmon in the Foyle Area. They prescribe that, for the duration of 1982 drift net fishing season, fishing by drift net is prohibited during the period between 1700 hours (5 p.m.) on any day and 0700 hours (7 a.m.) on the next following day instead of during the period between 0500 hours (5 a.m.) and 1700 hours (5 p.m.) on any day.

3. Foyle Area (Elections to Advisory Council) (Amendment) Regulations, 1982, dated 13 September, 1982, take account of current fishing licence duties insofar as those duties relate to the number of votes which the holder of an appropriate fishing licence is entitled to in elections of members to the Foyle Area Advisory Council.

4. Foyle Area (Dealers Licence) (Londonderry Area) Regulations, 1982, dated 2 November, 1982, prescribe that in the Northern Ireland part of the Foyle Area (or the Londonderry Area)—

   (a) the fee on application of a dealer's licence authorising the sale of salmon, trout or eels shall be £20.00, and

   (b) the fee on application for the renewal of a dealer's licence shall be £20.00.

APPENDIX No. 22

Output and Disposal of Fish Hatchery Produce 1981/82

Hatchery	Output of Ova			Disposal	River System Stocked
	Salmon (000)	Sea Trout (000)	Brown Trout (000)	(000)	
Carriga-drohid	1,977			200 Ova	Central Fisheries Board
				25 Ova	Roughty Anglers
				55 Ova	Kenmare
				90 Ova	Southern Regional Fisheries Board
				379 Ova	South Western Regional Fisheries Board
				337 Ova	Ballyshannon Hatchery — R. Erne
				54 eyed Ova	Kealincha Fisheries
				37 eyed Ova	Erble Trout Farm
				22 eyed Ova	Curraun Fisheries
				135 smolts	R. Lee.
Parteen	1,609			129 Fingerlings	Mulcair and tributaries
				83 Fingerlings	Nenagh and tributaries
				26 Fingerlings	Kilmastulla River
				51 Fingerlings	L/Brosna
				116 Fingerlings	River Suck
				71 Fingerlings	Silver River
				27 Fingerlings	Clodia River
				78 Fingerlings	River Inny
				57 Fingerlings	B/Brosna
				58 Fingerlings	Kilcrow River
				38 Fingerlings	Killimore River
				10 Fingerlings	Scarriff River
				18 Pre smolts	Mulcair and Tributaries
				5 pre smolts	Nenagh and Tributaries
				10 pre smolts	Silver River
				13 pre smolts	Kilcrow River
				12 pre smolts	B/Brosna
				5 pre smolts	River Inney
				15 pre smolts	Camcor River
				5 pre smolts	River Feale
				12 pre smolts	Mulcair and Tributaries
				8 smolts	Nenagh and Tributaries
				12 smolts	River Suck
				8 smolts	L/Brosna
				5 smolts	B/Brosna
				10 smolts	River Inny
				86 smolts	Shannon
				14 smolts	Mariculture
				3 smolts	Retained
Fanure Fish Farm	50			2 Parr	Retained
				3 Fry	R. Barrow
			532	15 Ova	
				182 Fry	Various Central Boards waters in Cos. Cavan, Westmeath, Longford, Roscommon and Mayo and Angling Interests.
				17 Fingerlings	
				71 Spring Yearlings	
				1 Autumn Fingerlings	
				15 two year olds	

Hatchery	Output of Ova			Disposal	River System Stocked
	Salmon (000)	Sea Trout (000)	Brown Trout (000)	(000)	
Glenties	95			10 Ova 25 Ova 10 Ova 15 Ova 35 Ova	Upper Glassagh River Bulba River Owentucker River Brackey River Swilly River
Mallow	716			716 Ova	River Blackwater
Inistioge	260			100 Ova 70 Ova 90 Ova	River Barrow River Suir River Nore.
Salmon Research Trust	265	30		50 Salmon Ova 13 Salmon Ova 37 Salmon Ova 10 Salmon Ova 56 Salmon Ova 10 Salmon Ova 20 Salmon Ova 50 Salmon Ova 30 Sea trout Ova	Dingle Trout Farm Buncrana Anglers Bord na Mona Grenisland Co-op. Curraun Fisheries Exchanged for Sea Trout Eggs Exchanged for Spring-fish Ova Retained Retained
Virginia	370			25 Fingerlings 25 Fingerlings 25 Fingerlings 20 Fingerlings 10 Fingerlings 10 Fingerlings 6 Fingerlings 5 Fingerlings 1 Fingerlings 5 Fingerlings 1 Fingerlings 40 Fingerlings 5 Parr 2 Parr 10 Smolts	Stoneyford River Deel River Trimblestown River Knightsbrook River Riverstown River Milltown Pass River Boycetown River Kinnegad River Mattack River Martry River Murmod River Retained Boycetown River Stoneyford River River Boyne.
Cullion (Mullingar)			795	15 Ova 182 Fry 18 Fingerlings 72 Spring Yearlings 2 Autumn Fingerlings 15 two year olds	Various Central Boards Waters in Co.'s Cavan, Longford, Roscommon and Mayo and Angling Interests.
Cong	326			100 Parr 47 smolts	Not yet stocked out.
Carrowmore Lake Incubating Unit.	91			76 Ova 9 Ova 5 Ova	Altnabrockey Oweninney Glencullen

Scientific and Other Papers

DEPARTMENTAL

A. IRISH FISHERIES INVESTIGATIONS

Series B (Marine)

24. M. D. Barry. Distribution and Ecology of Oysters, *Ostrea Edulis* (L) in Kilkieran and Bertnaghboy Bays, Connemara, Co. Galway.
25. Dan Minchin and Nigel F. Mathers. The Escallop, Pecten Maximus (L), in Killary Harbour.

B. FISHERY LEAFLETS

115. J. Browne and P. Gallagher. Population estimates of Juvenile Salmonids in the Corrib System 1981.
116. E. Fahy. The sea trout year 1981.
117. R. Grainger and E. McArdle. Surveys for herring larvae off the Northwest and West Coasts of Ireland in 1981.
118. E. Twomey. The contribution of hatchery-reared smolts to the Irish drift net fishery.

C. FISHERIES BULLETIN

4. E. Fahy. The Beltra Fishery, Co. Mayo and its Sea Trout Salmo Trutta Stocks.
5. E. Fahy. Spawning Trout Salmo Trutta. L. Populations in the Cummeragh System, Co. Kerry.
6. E. Fahy and J. J. Nixon. Spawning Trout in Eastern Connemara.

OTHER PUBLICATIONS

T. Dunne and M. Parker. A Survey for Paralytic Shellfish toxin in Irish waters, with observations of algal blooms during Summer, 1980. ICES CM 1981 L:36.

E. Fahy. A commercial net fishery taking twaite shad *Alosa fallax* (Lacepede) in the estuary of the River Slaney. Irish Naturalists' Journal, 20 498-500.

E. Fahy. Fluctuations in the incidence of large trout in Ireland. Salmon and Trout Magazine, 224, 46-48.

1982 E. Fannon and J. P. Hillis. Studies on cod prey with special attention to *Nephrops norvegicus*. ICES C M 1982. G:51.

R. J. R. Grainger, E. Barnwall and A. Cullen. Herring larval surveys in the Celtic Sea in 1981/82. ICES C M 1982. H:38.

D. de G. Griffith. Review of scientific advice on fisheries management 1982. ICES C M Assess:22.

D. de G. Griffith. The 1982 stock assessments — comments by ACFM. ICES CM 1982 Assess:23.

J. P. Hillis and J. J. Earley. Selectivity in the *Nephrops* trawl ICES C M 1982. B:19.

J. P. Hillis and J. J. Earley. On some problems in sampling the *Nephrops* catch. ICES C M 1982. K:21.
E. McArdle. Fecundity studies on herring from the northwest of Ireland. ICES C M 1982. H:39.
J. McArdle, T. Dunne and M. Parker. A survey of marine flatfish from the East coast of Ireland in 1981. ICES C M 1982. E:47.
J. Molloy and R. J. R. Grainger. Assessment of the herring stocks in the Celtic Sea and Division VIIj. Ices C M Assess:7/Appendix.
C. Moriarty. An analysis of the Irish eel fishery in 1981. ICES C M 1982 M:28.
C. Moriarty. Midwinter migration of bream *Abramis brama* (L.) Irish Naturalists' Journal, 20, 505.
C. Moriarty. Experiences in eel management in Europe. Ontario Fisheries Technical Report Series, 4, 56-65.
C. Moriarty. Development of two eel *Anguilla anguilla* fisheries in Ireland. Ontario Fisheries Technical Report Series, 4, 66-70.
R. Palmer and J. McArdle. Fish diseases, their prevention and treatment: a manual for fish farmers in Ireland. Aquaculture Technical Bulletin (6). NBST, Dublin 52pp.
M. Parker. Exceptional Marine Blooms and their significance for Fisheries. ICES C M 1982/L:43.
M. Parker, T. Dunne and J. McArdle. Exceptional Marine Blooms in Irish Coastal Waters. ICES C M 1982/L:44.
M. Parker, D. Minchin, P. H. Gatland and P. Connolly. Observations on blooms of *Noctiluca* off the south coast of Ireland during Summer, 1977 ICES C M 1981/L:37.

Wt. 143469. 600. 3/84. Cahill. (2595). Spl.