

ROINN NA MARA

CATCH PER UNIT EFFORT BY THE  
JOINT VENTURE (IRISH-SPANISH)  
FLEET FROM 1985 TO 1992

by

EDWARD FAHY AND PAUL GLEESON

Fishery Leaflet 155

Dublin 1993

# CATCH PER UNIT EFFORT BY THE JOINT VENTURE (IRISH -SPANISH) FLEET FROM 1985 TO 1992

by

EDWARD FAHY AND PAUL GLEESON

Fisheries Research Centre, Abbotstown, Dublin 15

*Fishery Leaflet 155*

*July 1993*

Department of the Marine

Dublin 2

---

## *Summary*

The formation in 1979 of the joint venture (Irish-Spanish) fishing fleet, Eiranova, introduced to the industry in Ireland a range of target species and fishing grounds on which the Irish demersal fishery has subsequently expanded. From the second quarter of 1985 the European Communities' Logbook has provided a format on which landings and details of fishing effort have been recorded. This leaflet reviews the catches of various species per effort expended by joint venture demersal trawl and long-lining vessels for the eight years documented by the Logsheets.

The high value components of the trawl fishery are the prime fish (hake, monkfish and megrim) which are exported fresh to Spain. Hake is the principal target of long-liners. The fishery is concentrated in ICES statistical Divisions VIIb and VIIj.

Since 1985, the CPUE of all species has declined by 39% and the trend in prime fish landings runs in parallel with this, mainly because of the reduction in hake landings. CPUE indices for all other species which are consistently recorded are given. Some comparisons are made among CPUE indices in Divisions VIIb,j and adjoining areas. However, these indices depend much on the exploited size range of a target species and the area in which fishing effort is concentrated and the bulk of the data are presented without further comment.

A brief glossary of Spanish terminology is appended.

the logsheets) but it is assumed that the species concerned are of lower value, conger, rays squid and, most recently, dogfish having been mentioned in association with this group.

### *Trends in landings*

Because the time series is brief, it is not possible to state whether the trends in catches have any more than short-term significance. The annual CPUE for all species has apparently declined by 39% since records commenced in 1985 (Fig 2). However, in 1985, there were data from only three of the four quarters and in 1986 the annual index was marginally higher than in 1985. This fleet is most productive in the first two quarters of the year (Fig 3).

### *Prime fish species*

The prime fish species, hake, monk and megrim, make up a large proportion of the total landings (Table 3; Fig 4); for the first three years of the records prime fish contributed between 60 and 65% by weight of the landings; for the most recent three years they had declined to between 46 and 47%. The performance of monk (2 species) has varied relatively little in the period of these records although the two component species have responded to exploitation in a different way (Fahy and Gleeson, 1992), megrim has declined but the most dramatic reduction in CPUE is shown by hake. The reduction in CPUE for the prime fish parallels the decline in total landings by this fleet.

The fisheries for these species display tendencies towards seasonal maxima: the first quarter yields greatest quantities of megrim to the joint venture fleet; hake, fished in spawning and pre-spawning concentrations, is most abundant in the second quarter and monk in the third. Combined, these species have their greatest yields in the first quarter, declining thereafter.

### *Gadoids*

Annual indices of CPUE for cod, saithe, haddock and white pollack are presented in Fig 5 (Table 4). Together, these species have contributed between 14 and 25% by weight of total landings by the joint venture fleet during the years under review.

### *Other fish species*

Ling, witches and greater fork-beard make up, respectively, between 4 and 14%, 2 and 6% and 0 to 3 % of annual landings (Table 5). Ling has apparently gone through a period of greater abundance since these records commenced (Fig 6). Witches appear to have declined while fork-beard, landed in small quantities since the first years of the Communities' Logbook, has been recorded in fairly consistent quantities for the remainder of the series.

Other species which are separately identified by joint venture fishermen are listed in Table 6. These may be characterised by the fact that they rarely yield more than 1 kg/hour's trawling on an annual basis. The vessels probably fish too deep to take sole and plaice in any quantity; whiting also has a more inshore distribution. Turbot has been recorded only in the later years of the log sheets. Prawns are taken regularly but in fairly small quantities; *Nephrops* is probably rarely targetted. Squid, ray and octopus are likely to consist of several species.

Examples of "red bream" examined by the writers have been blue mouth (*Helicolenus dactylopterus*). Conger is certainly under-recorded in this account: column headings provided by the fishermen themselves frequently refer to "conger and mixed fish". Finally, scabbard fish have been recorded only on the latest log-sheets and the species in question is not known.

It is likely that some, or all, of the species which are captured in small quantities are boxed together as "mixed fish" (Table 7). This category may include other species of low value and possibly some of the principal target species when they are too sparse to fill a fish box - the standard unit by which the landings are quantified. There would appear to have been an increase in the landings of mixed fish since the introduction of the Communities' Logbook but that supposition would require more precise information about the species contributing to this category.

### *The Long line fishery*

CPUE for all species taken by long-line are set out in Table 8. Hake is the principal target of these vessels. CPUE indices for a number of species targeted by long-line are set out alongside those for trawl in Figs 7-11. Without more detailed information on the age groups taken by these methods it is difficult to interpret them exactly. In general it can be said that long-line captures individuals of greater weight - hence age - than does demersal trawl and peaks of abundance representing large year classes would not be expected to coincide on the record of both fishing methods. Two separated peaks of CPUE are demonstrated very clearly for hake (Fig 11), supporting the impression of a recent decline in the abundance of this species.

### *Comparison with other indices of CPUE.*

In their review of demersal stocks in sub-areas VII and VIII, the ICES working group remarked on the difficulty of interpreting CPUE data because individual fleets generally concentrate on specific areas and on age ranges of target species. A recent assessment of hake (Fahy and Gleeson, in press a) compared several CPUE indices for the northern stock but found little agreement among them. However, CPUE indices from both the long-line and trawl components of the joint venture fleet displayed close agreement and it was concluded that the Irish hake fishery, located principally in Division VIIj, may react to exploitation in a way which differs from the species elsewhere in Sub-area VII.

A review of three CPUE indices for megrim in Sub-area VII up to 1990, indicated that there was little agreement among them (Fahy and Gleeson, in press b).

Working group reports compiled in 1992 and covering the Divisions adjoining VIIb and VIIj, from which most of the CPUE indices used in this report were derived, were searched for data referring to the species in question and these, for ling and cod, are summarised in Table 9. Both sets of data (that abstracted for the joint venture fleet and the other from the working group report) for ling refer to captures by long-line; for cod the data come from varieties of demersal trawl. Although one of these indices for cod (the data describing other trawl catches taken by France in Division VIIf) correlates significantly with the trawl CPUE figures, the evidence is considered too tenuous to establish a link between the cod in Division VIIf and the stocks in Divisions VIIb and j.

## REFERENCES

- Anon (1993) Report of the working group on the assessment of Northern Shelf demersal stocks. *ICES CM 1993/Assess*: 2.
- Anon (1993) Report of the working group on the assessment of Southern Shelf demersal stocks. *ICES CM 1993/Assess*: 3.
- Fahy, E and E Fannon (1992) The exploitation of megrim (*Lepidorhombus whiffiagonis*) by the Irish demersal fleet. *Irish Fisheries Investigations* B 38: 18pp
- Fahy, E and P Gleeson (1992) The exploitation of angler fish *Lophius* in Irish waters. *Irish Fisheries Investigations* B 40: 18 pp.
- Fahy, E and P Gleeson (in press a) Aspects of the exploitation of hake *Merluccius merluccius* belonging to the Northern stock by fleets based in Ireland. *Fisheries Bulletin*.
- Fahy, E and P Gleeson (in press b) A second assessment of the stock of megrim *Lepidorhombus whiffiagonis* in Divisions VIIb,c,j and k. *Fisheries Bulletin*.

## ACKNOWLEDGMENTS

Gratitude is expressed to the Fishery officers and Fish Quality officers of the Department of the Marine who supplied the logsheets for analysis and to Brendan Minehane of Eiranova who read through and suggested amendments to the glossary of Spanish terminology.

## GLOSSARY

There follows some of the terminology by which the landings of joint venture vessels are described. It is not intended to be a comprehensive species list and the spelling of words may not always conform to that given here. The Spanish terms may be Castilian or Galician.

"SPANISH"	ENGLISH	LATIN
<i>Abadejo</i>	White pollack	<i>Pollachius pollachius</i>
<i>Bacalao</i>	Cod	<i>Gadus morhua</i>
<i>Bacaladilla</i>	Whiting	<i>Merlangius merlangus</i>
<i>Berete</i>	Gurnard	Triglidae
<i>Bertorella</i>	Greater fork-beard	<i>Phycis blennoides</i>
<i>Brotola</i>	Greater fork-beard	<i>Phycis blennoides</i>
<i>Burro</i>	Haddock	<i>Melanogrammus aeglefinus</i>
<i>Carbonero</i>	Saithe	<i>Pollachius virens</i>
<i>Cigala</i>	Prawn	<i>Nephrops norvegicus</i>
<i>Congrio</i>	Conger	<i>Conger conger</i>
<i>Coreano</i>	Witch	<i>Glyptocephalus cynoglossus</i>
<i>Eglefino</i>	Haddock	<i>Melanogrammus aeglefinus</i>
<i>Fogonero</i>	Saithe	<i>Pollachius virens</i>
<i>Gallo</i>	Megrim	<i>Lepidorhombus</i> spp. mainly <i>whiffiagonis</i> , some <i>boscii</i>
<i>Lenguado</i>	Sole	<i>Solea solea</i>
<i>Liva</i>	Whiting	<i>Merlangius merlangus</i>
<i>Maruca</i>	Ling	<i>Molva molva</i>
<i>Meiga</i>	Witch	<i>Glyptocephalus cynoglossus</i>
<i>Mendo</i>	Witch	<i>Glyptocephalus cynoglossus</i>
<i>Merluza</i>	Hake (> 1.5 kg)	<i>Merluccius merluccius</i>
<i>Molva</i>	Ling	<i>Molva molva</i>
<i>Pescadilla</i>	Hake (< 1.5 kg)	<i>Merluccius merluccius</i>
<i>Pota</i>	Squid	?
<i>Rapante</i>	Megrim	<i>Lepidorhombus</i> spp. mainly <i>whiffiagonis</i> , some <i>boscii</i>
<i>Rape</i>	Angler (monk)	<i>Lophius</i> spp.
<i>Rodaballo</i>	Turbot	<i>Scophthalmus maximus</i>
<i>Sable</i>	Scabbard fish	?
<i>San Martina</i>	John dory	<i>Zeus faber</i>
<i>Sapo</i>	Angler (monk)	<i>Lophius</i> spp.
<i>Sollena</i>	Dab	<i>Limanda limanda</i>

Fig 2. CPUE (total landings) by the joint effort trawl fleet between 1985 and 1992.

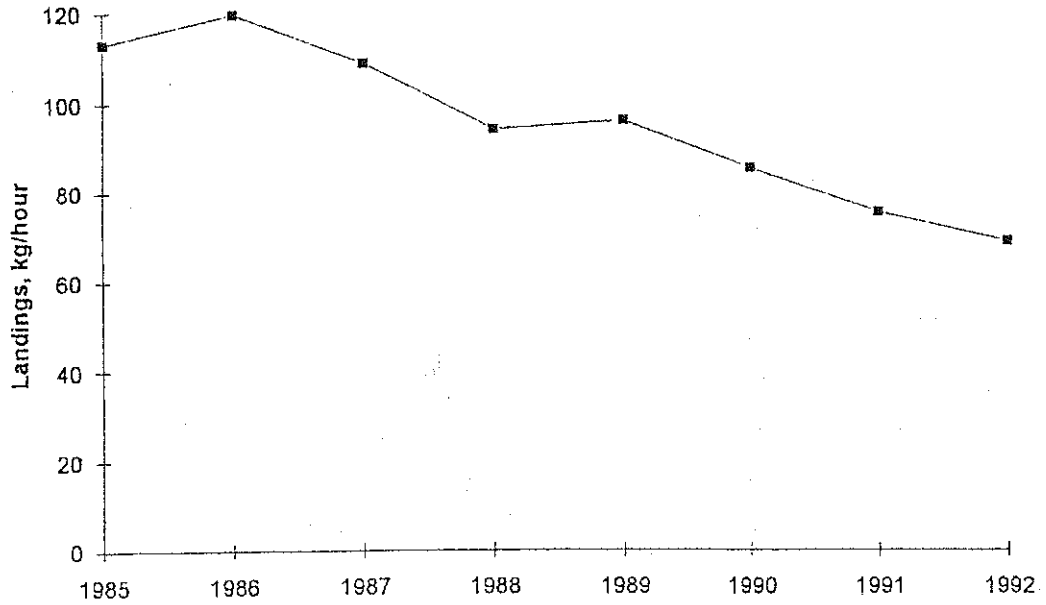


Fig 3. CPUE (all species) by the joint effort trawl fleet, by quarter, from 1985 to 1992.

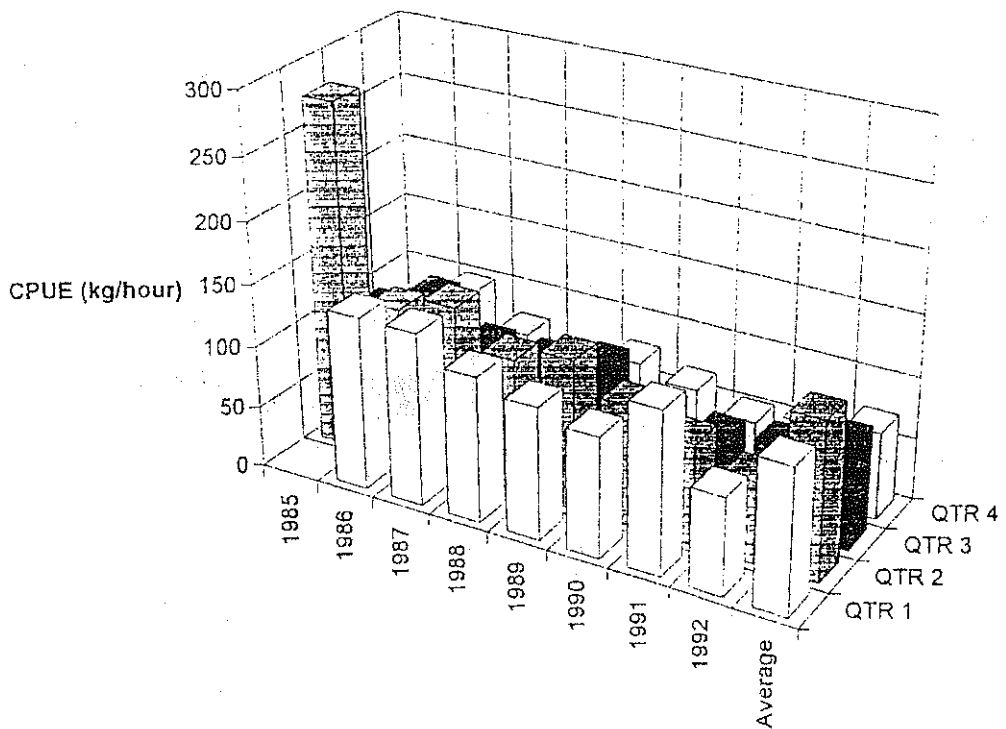


Fig 1. Distribution of effort by the joint venture fleet (left) by trawler and (right) by long-line (from Fahy and Gleeson, in press, a and b).

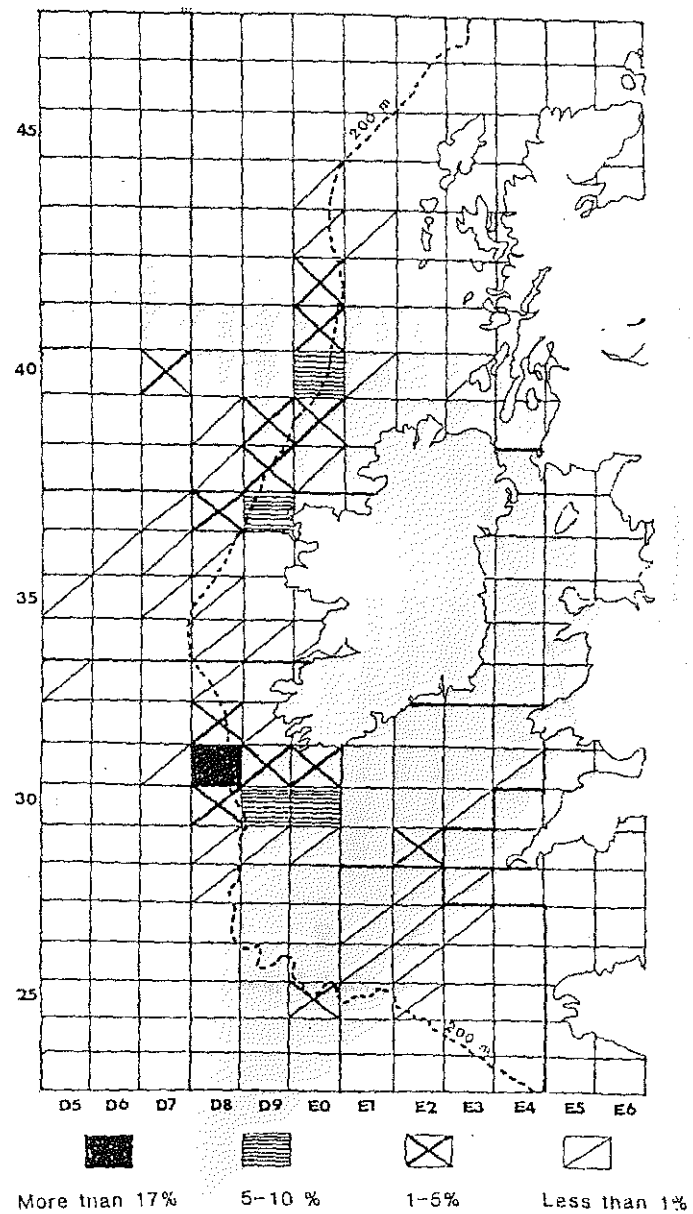
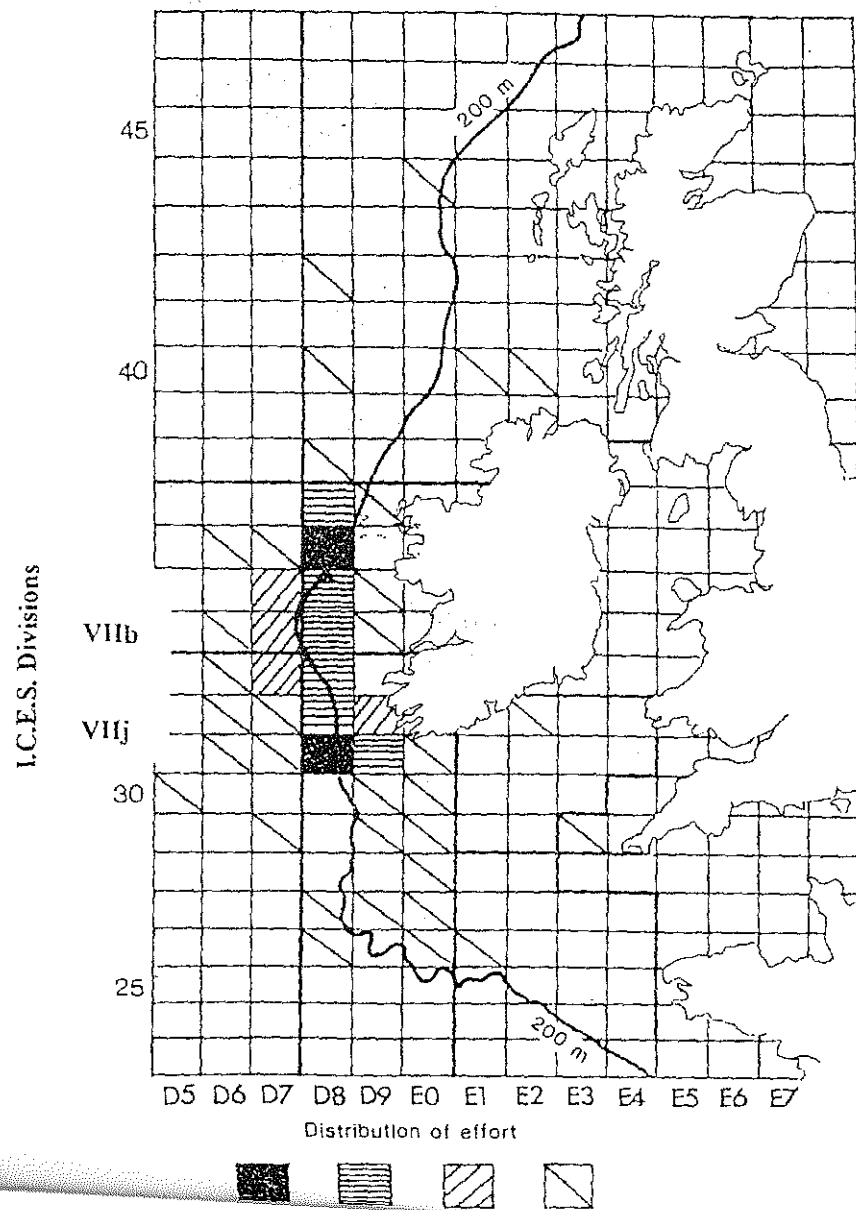




Fig 4. Annual CPUE of hake, monk and megrim taken by joint venture trawl.

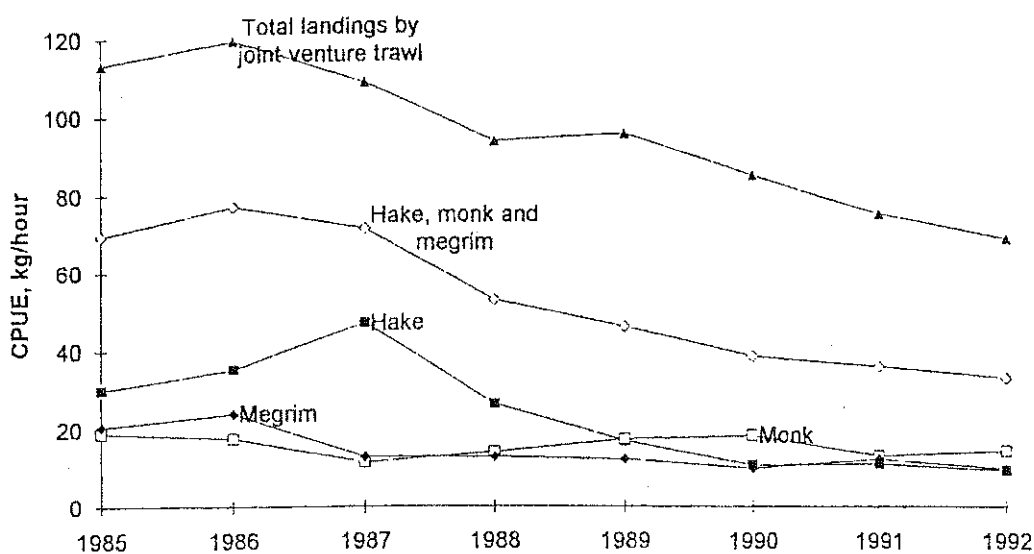


Fig 5. Annual CPUE of cod, saithe, haddock and white pollack.

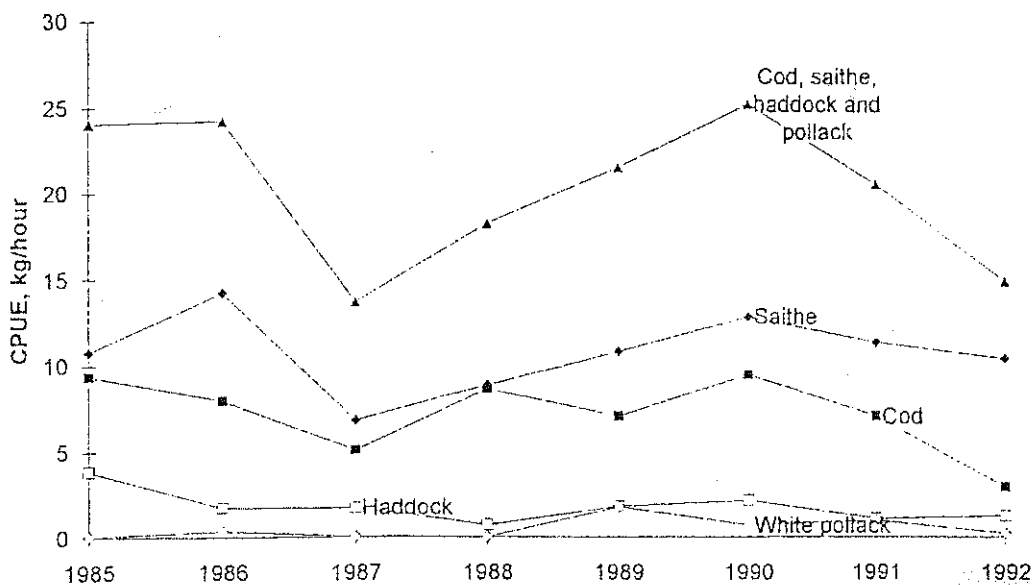


Fig 6. Annual CPUE of ling, witches and fork-beard

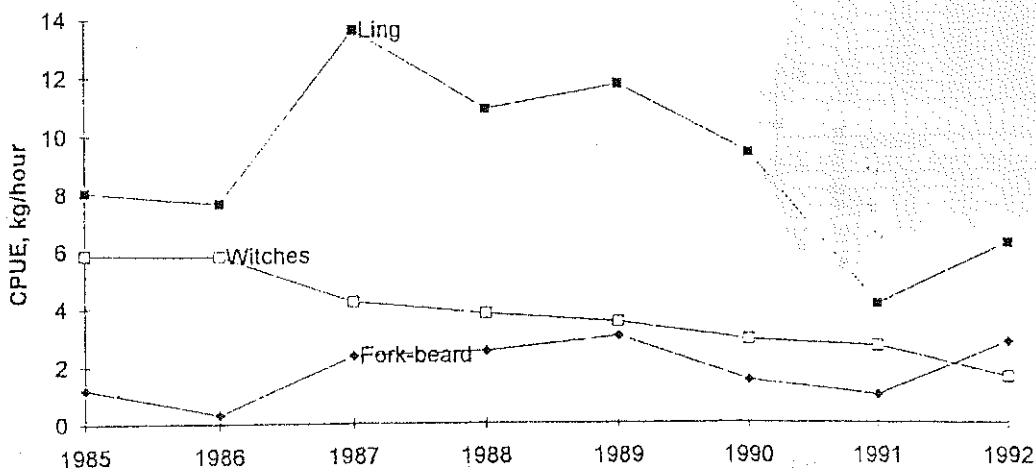


Fig 7. CPUE of cod taken by trawl and by long-line

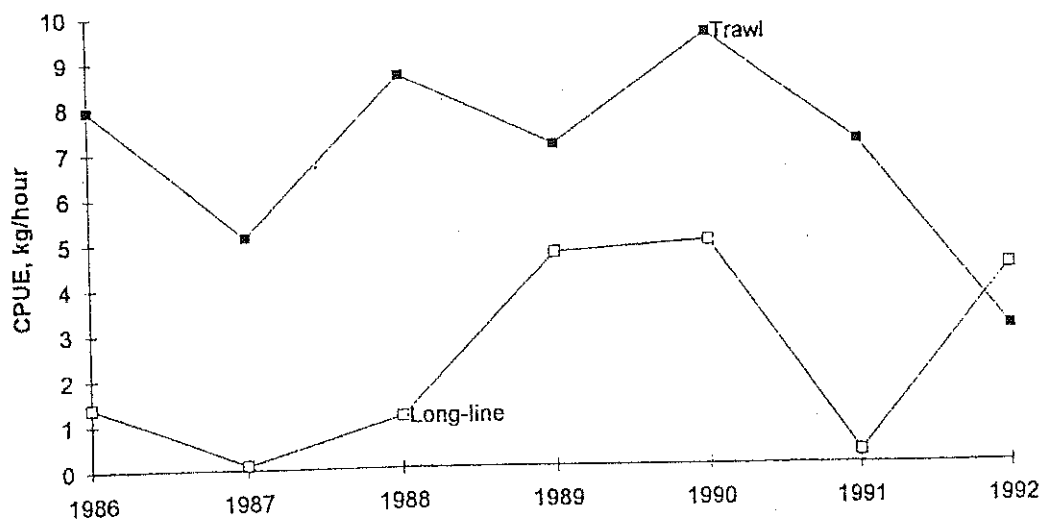


Fig 8. CPUE of saithe taken by Trawl and by Long-line.

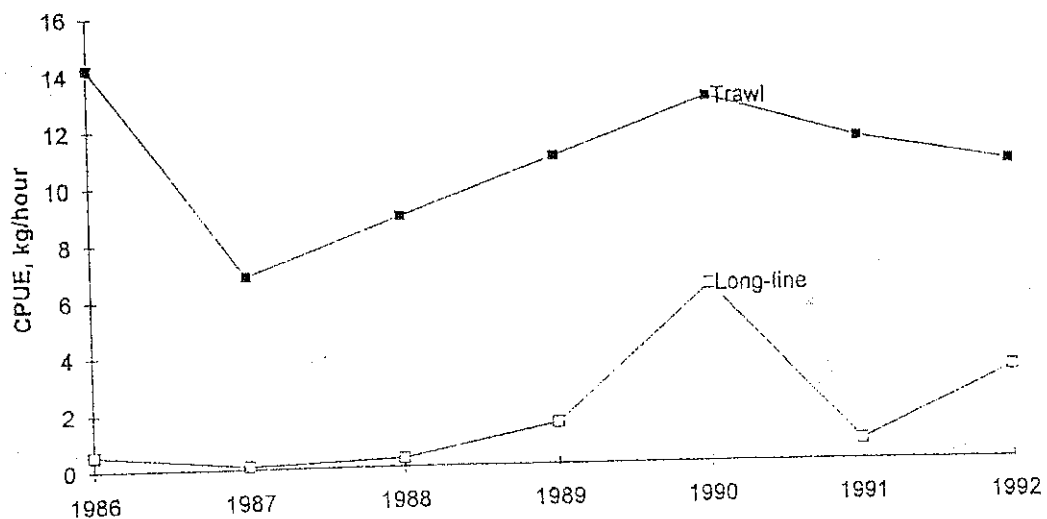
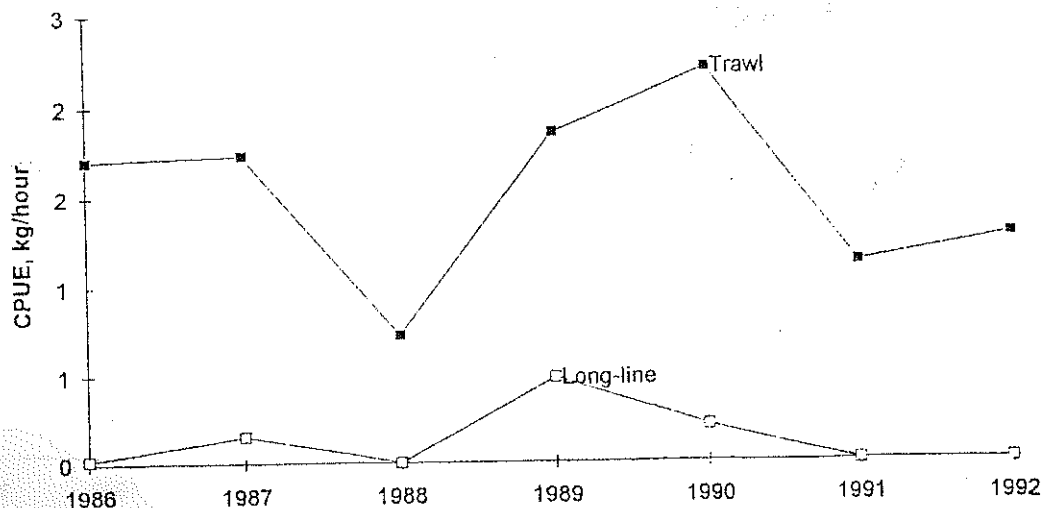


Fig 9. CPUE of haddock taken by Trawl and by Long-line.



taken by the joint venture fleet, by quarter, between 1985 and 1992. Means are of column averages.

LUNG					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		19	4	8	8
1986	2	11	11	5	8
1987	7	33	9	7	14
1988	9	19	7	7	11
1989	9	24	9	7	12
1990	14	13	5	1	9
1991	0	13	4	2	4
1992	4	7	8	5	6
Means	6	17	7	5	9

WITCHES					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		9	4	7	8
1986	5	3	6	10	6
1987	4	6	4	3	4
1988	3	2	4	6	4
1989	3	3	2	5	3
1990	4	3	2	3	3
1991	5	2	2	2	3
1992	1	1	2	2	2
Means	4	4	3	5	4

FORK-BEARD					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		0	0	3	1
1986	0	0	0	1	0
1987	1	3	2	3	2
1988	4	2	1	4	3
1989	1	1	8	2	3
1990	4	1	1	0	1
1991	0	1	1	1	1
1992	3	1	3	4	3
Means	2	1	2	2	2

Table 6. CPUE for a number of species taken in small quantities, by quarter, from 1985 to 1992 inclusive. Means are of column averages.

SOLE					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		0.02	0.00	0.00	0.00
1986	0.13	0.14	0.00	0.09	0.10
1987	0.00	0.00	0.00	0.04	0.01
1988	0.00	0.00	0.00	0.00	0.00
1989	0.00	0.00	0.00	0.02	0.01
1990	0.10	0.17	0.01	0.23	0.12
1991	0.47	0.05	0.09	0.10	0.16
1992	0.19	0.03	0.02	0.07	0.08
Means	0.13	0.05	0.02	0.07	0.06

PLAICE					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		0.11	0.58	0.12	0.27
1986	0.00	0.07	0.95	0.05	0.25
1987	0.00	0.00	0.00	0.00	0.00
1988	0.00	0.00	0.00	0.00	0.00
1989	0.00	0.00	0.00	0.00	0.00
1990	0.00	0.12	0.00	0.17	0.07
1991	0.11	0.00	0.07	0.41	0.18
1992	0.37	0.07	0.00	0.36	0.19
Means	0.07	0.05	0.20	0.14	0.12

WHITING					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		1.40	0.05	0.37	0.43
1986	0.47	0.37	1.02	0.00	0.45
1987	0.02	0.00	0.04	0.00	0.01
1988	0.08	0.00	0.31	0.00	0.10
1989	1.48	0.00	0.00	0.83	0.52
1990	0.91	0.16	0.05	0.24	0.27
1991	8.51	0.11	0.23	1.05	2.06
1992	0.48	0.28	0.31	1.17	0.49
Means	1.71	0.29	0.25	0.46	0.54

TURBOT					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		0.00	0.00	0.00	0.00
1986	0.00	0.00	0.00	0.00	0.00
1987	0.00	0.00	0.00	0.00	0.00
1988	0.00	0.00	0.00	0.00	0.00
1989	0.00	0.00	0.00	0.00	0.00
1990	0.00	0.07	0.02	0.01	0.03
1991	0.00	0.14	0.15	0.00	0.07
1992	0.01	0.07	0.02	0.01	0.03
Means	0.00	0.04	0.02	0.00	0.02

PRAWNS					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		0.77	0.46	1.42	0.88
1986	0.21	0.12	0.47	0.28	0.25
1987	0.69	0.00	2.81	0.00	0.84
1988	1.67	0.01	0.65	2.20	1.05
1989	0.87	0.10	1.10	1.00	0.79
1990	0.39	0.04	0.25	0.13	0.17
1991	0.13	0.00	0.09	0.43	0.51
1992	0.72	0.64	0.42	1.59	0.78
Means	0.67	0.21	0.86	0.88	0.66

SQUID					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		4.24	0.08	1.10	1.27
1986	0.79	0.64	0.00	0.72	0.54
1987	2.26	1.50	0.05	0.98	1.16
1988	0.82	0.27	0.00	0.84	0.44
1989	0.08	0.10	0.00	1.07	0.43
1990	3.72	1.02	0.11	0.00	1.09
1991	0.59	1.35	0.00	1.60	0.86
1992	1.14	0.29	0.00	4.72	1.23
Means	1.34	1.18	0.03	1.38	0.88

species taken by the joint venture fleet, by quarter, between 1985 and 1992. Means are of column averages.

OTHER OR MIXED SPECIES					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1986	1.50	1.84	3.60	2.88	2.41
1987	0.46	0.89	1.14	2.18	1.19
1988	4.50	4.70	1.80	4.53	3.80
1989	5.42	7.68	5.75	10.21	7.77
1990	10.79	6.13	3.04	8.13	6.27
1991	7.26	6.65	4.64	7.84	6.52
1992	5.88	4.80	7.34	10.89	6.95
Means	5.26	4.67	3.90	6.67	4.99

RED BREAM					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		3.69	0.52	0.05	0.99
1986	0.30	0.04	0.07	0.21	0.13
1987	0.15	0.00	0.00	0.00	0.04
1988	0.36	0.00	0.06	0.00	0.09
1989	0.15	0.14	0.02	0.00	0.08
1990	0.00	0.04	0.00	0.00	0.02
1991	0.00	0.00	0.02	0.05	0.02
1992	0.00	0.00	0.00	0.00	0.00
Means	0.14	0.49	0.12	0.04	0.17

CONGER					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		0.00	0.00	0.00	0.00
1986	0.00	0.00	0.07	0.11	0.04
1987	0.00	0.00	0.00	0.00	0.00
1988	0.01	0.09	0.14	0.00	0.07
1989	0.00	0.00	0.00	0.00	0.00
1990	0.00	0.00	0.50	0.00	0.20
1991	0.00	0.00	0.53	0.32	0.27
1992	0.04	0.26	0.94	0.62	0.41
Means	0.01	0.04	0.27	0.13	0.12

SCABBARD FISH					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985					
1986					
1987					
1988					
1989					
1990					
1991					
1992	0.34	0.00	0.04	0.69	0.22
Means	0.05	0.00	0.01	0.09	0.03

RAY					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		0.63	0.64	0.14	0.39
1986	0.02	0.03	0.13	0.08	0.06
1987	0.04	0.00	0.00	0.13	0.04
1988	0.00	0.00	0.01	0.00	0.00
1989	0.00	0.00	0.19	0.43	0.21
1990	0.11	0.00	0.00	0.00	0.02
1991	0.27	0.00	0.00	1.79	0.63
1992	0.04	0.04	0.63	0.40	0.10
Means	0.07	0.06	0.09	0.13	0.37

OCTOPUS					
YEAR	QTR 1	QTR 2	QTR 3	QTR 4	ANNUAL
1985		1.55	0.13	0.00	0.33
1986	0.00	0.28	0.35	0.15	0.21
1987	0.08	0.00	0.00	0.00	0.02
1988	0.00	0.00	0.00	0.00	0.00
1989	0.12	0.00	0.00	0.02	0.02
1990	0.00	0.02	0.01	0.00	0.01
1991	0.00	0.00	0.00	0.00	0.00
1992	0.00	0.00	0.00	0.00	0.00
Means	0.03	0.23	0.06	0.02	0.07

Table 8. Summary of CPUE by joint venture long liners, by quarter, between 1986 and 1992. Mean values are of column averages.

Year	COD				ANNUAL
	QTR1	QTR2	QTR3	QTR4	
1986	0.00	0.08	3.22	0.02	1.39
1987	0.00	0.00	0.35	0.00	0.10
1988	0.00	0.80	0.30	10.55	1.13
1989	3.77	0.57	7.08	14.21	4.67
1990			7.61	1.43	4.91
1991	0.30	0.00	0.65	0.00	0.27
1992	14.15	0.00	0.00		4.33
Means	3.04	0.26	2.74	4.37	2.40

Year	HADDOCK				ANNUAL
	QTR1	QTR2	QTR3	QTR4	
1986	0.13	0.00	0.03	0.00	0.02
1987	0.00	0.00	0.50	0.00	0.15
1988	0.00	0.00	0.00	0.00	0.00
1989	1.70	0.00	0.00	0.00	0.47
1990			0.35	0.00	0.20
1991	0.00	0.00	0.00	0.00	0.00
1992	0.00	0.00	0.00	0.00	0.00
Means	0.31	0.00	0.13	0.00	0.12

Year	SAITHE				ANNUAL
	QTR1	QTR2	QTR3	QTR4	
1986	1.36	0.12	1.00	0.00	0.55
1987	0.00	0.43	0.00	0.00	0.11
1988	0.00	0.12	0.00	2.31	0.30
1989	0.49	2.67	1.32	0.53	1.45
1990			9.50	2.04	6.25
1991	2.28	0.00	0.16	0.00	0.71
1992	0.20	3.17	7.59		3.22
Means	0.72	1.09	2.80	0.61	1.80

Year	LING				ANNUAL
	QTR1	QTR2	QTR3	QTR4	
1986	16.23	4.77	10.80	20.69	10.30
1987	32.90	48.58	16.26	12.21	25.79
1988	41.69	4.77	6.11	6.88	8.29
1989	4.86	0.78	7.26	85.79	9.65
1990			16.32	30.87	22.66
1991	52.54	0.00	1.61	30.00	22.32
1992	24.57	25.67	6.60		16.43
Means	28.80	13.76	9.28	31.07	16.49

Year	WHITE POLLACK				ANNUAL
	QTR1	QTR2	QTR3	QTR4	
1986	0.75	0.00	0.05	0.00	0.07
1987	0.00	0.00	0.00	0.00	0.00
1988	0.00	0.00	0.00	0.60	0.06
1989	0.73	0.00	0.00	0.00	0.20
1990			0.00	0.00	0.00
1991	0.00	0.00	1.77	0.00	0.49
1992	0.00	0.00	0.36	0.00	0.18
Means	0.25	0.06	0.28	0.10	0.14

Year	HAKE				ANNUAL
	QTR1	QTR2	QTR3	QTR4	
1986	36.58	84.62	60.31	22.92	62.57
1987	46.38	96.00	37.78	31.37	52.17
1988	62.21	84.62	70.01	40.20	78.26
1989	25.75	113.67	29.53	11.05	52.77
1990			30.39	21.84	26.66
1991	12.34	32.71	17.28	36.21	23.21
1992	10.61	52.32	24.94		33.61
Means	32.31	77.32	38.60	27.27	46.75

Year	WHITING				ANNUAL
	QTR1	QTR2	QTR3	QTR4	
1986	0.22	0.00	0.15	0.57	0.16
1987	0.07	0.46	0.35	0.35	0.32
1988	0.00	0.00	0.00	0.00	0.00
1989	6.56	0.11	0.00	0.00	1.85
1990			0.00	1.17	0.51
1991	0.00	0.00	2.90	0.00	0.80
1992	0.00	0.00	0.00		0.00
Means	1.14	0.10	0.49	0.35	0.52

Year	OTHERS				ANNUAL
	QTR1	QTR2	QTR3	QTR4	
1986	0.00	0.12	0.00	0.00	0.04
1987	0.00	1.75	1.80	0.49	1.04
1988	0.47	0.12	9.64	7.69	2.28
1989	8.14	1.11	6.51	12.63	5.72
1990			4.26	5.97	5.00
1991	1.52	2.08	1.45	4.34	2.23
1992	5.23	2.43	3.44		3.51
Means	2.55	1.27	3.84	5.19	2.83

Year	TOTALS				ANNUAL
	QTR1	QTR2	QTR3	QTR4	
1986	55.26	89.71	75.56	44.20	75.10
1987	79.35	145.22	56.83	44.41	79.67
1988	104.42	89.71	86.71	68.24	88.42
1989	51.98	119.00	51.70	124.21	76.78
1990			68.44	63.32	66.20
1991	68.98	34.79	25.81	70.55	50.94
1992	54.77	73.98	43.07		61.39
Means	69.13	92.07	58.30	69.16	71.09

Table 9. Correlations of CPUE indices from the present work with time series from adjoining ICES statistical divisions for ling and cod.

Species: Ling in VIIg			
Source: Working group on Northern Shelf demersal stocks, 1992			
Metier: Long-line			
Year	kg/1000 hooks		
1986	70.688		
1987	122.877	r=0.509	
1988	108.036	P>0.05	
1989	104.997		Not significant.
1990	106.667		
1991	101.805		

Species: Cod in VIIIg			
Source: Working group on Southern Shelf demersal stocks, 1992			
Metier: varieties of demersal trawl.			
DIVISION	VIIIg	VIII	VIIg
NATION	France	France	U.K.
GEAR	Gadoid	Otter	Otter
1985	5.16	7.25	7.91
1986	5.71	6.40	5.84
1987	5.65	3.49	3.83
1988	9.45	5.15	2.79
1989	8.00	3.64	3.42
1990	4.77	5.43	5.06
1991	3.54	5.29	4.89

Correlated with otter trawl data from this work.

r	0.164	0.731	0.365
P	>0.05	<0.05	>0.05
Significance	N.S.	Significant	N.S.