MAFF Funded North East Coast Discard Study 1992 Final Report

MAFF Commission

Seafish Report No.416

April 1993

MAFF R&D Commission 1992/93

Sea Fish Industry Authority

Seafish Technology

MAFF Funded North East Coast Discard Study 1992
Final Report

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G. N. Dunlin
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North East Coast Discard Study
Final Report 1993

Summary

The report presents the results of studies of the discarding practices, that is the rejection of unwanted fish by fishermen at sea, of the fisheries of the North East Coast of England. Results for 1992 are analysed and comparisons made with the previous study of 1990-91.

Estimating discard levels is important because of:-

- The need to take discard levels into account in population models and hence stock assessment.

- The requirement to monitor any measures which may be taken to reduce discards.

Fishery discards are amongst the most difficult of population parameters to estimate accurately. This is because discarded fish are only available for a limited period before being thrown back into the sea and there are often difficulties in obtaining representative samples.

There is considerable inherent variability in the data. Factors which would be expected to affect the variability in the levels of discards are:-

- Factors of an environmental and biological origin; weather, climate, season, year class strength, distribution and growth of juvenile fish.

- Factors of a market origin; supply and demand, price and size requirements.

- Factors of a regulatory origin; minimum landing size, mesh size and quota restrictions.

- Factors of a 'fishery-born' origin; chosen trawling grounds, duration of tow, length of the fishing trip and crew motivation.

The fisheries sampled took place in Area IVb (MAFF Area "Humber") from the ports of Seahouses, Amble, Blyth, South Shields, Hartlepool, Whitby, Scarborough and Bridlington. Gears used were Nephrops trawl, demersal trawl, pair trawl and Scottish seine. Estimates of discard levels were made for cod, haddock and whiting. The methods for sampling

discards were based upon the work carried out by S. Jermyn at SOAFD Marine Laboratory, Aberdeen. They are briefly described in this paper, a further more complete description is given in Seafish Report No. 395.

Estimates were obtained for the overall numbers and weights of discards for each species for each haul. A length frequency distribution was obtained for the discarded and landed fish and a sub sample of discarded fish were aged by examination of their otoliths. The total landings in weight for the fishing trip were obtained. It is therefore possible to obtain estimates of the numbers and weight of discards as a proportion of the numbers and weights of fish landed on the deck, i.e. the total of each species brought aboard the vessel.

The results for both years were analysed using spreadsheets on a PC. Estimates were obtained for:-

- Quarterly and annual estimates of discard rates (percentage discards) by gear, by number and by weights.

- Length frequency distributions describing the numbers of each length group discarded per tonne landed. This is divided into the types of gear used.

- Raised age/length distributions.

- Estimated fleet totals.

These data were also entered into the MAFF Fisheries Laboratory at Lowestoft's computer and will be used for stock assessment purposes.

Analysis was also carried out by Seafish to determine whether any correlations could be established between discard levels and other factors. A comparison was made between year class strength, distribution of young haddock and discard rates for haddock in the Nephrop fishery for the winters of 1990-91, 1991-92 and 1992-93. In the first year studied age group 1, which make up the majority of the small discards of this species in the Nephrop trawl, there was an average year class for this species which coincided with high levels of haddock discards. The two subsequent year classes correspond to lower levels of discards per tonne of fish landed in spite of the overall numbers of young fish being large by a factor of two.

Examination of ICES young fish surveys showed that the distribution of the young fish was anomalous during 1990-91 and that in other years it was lower in the Nephrops fishing area. Thus these variations in discards of haddock per ton could best be ascribed to changes in the distribution of young fish. Square mesh panels were compulsorily introduced into the Nephrops fishery in July 1991. Without this analysis it could be wrongly assumed that the introduction of square mesh panels was responsible for the reduction in the numbers of discarded haddock per tonne landings in this fishery, rather than the changing distribution of young fish.

This emphasises the need for monitoring and analysis of discard data.

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1. Introduction

The discarding of the unwanted by-catch of fish is common in nearly all fisheries of the world. However, in the case of immature fish from over exploited commercial stocks which are discarded in significant quantities, appropriate steps should be taken to monitor discard numbers and assess how best to use the data.

All fish discarded dead represent a loss of yield. This is particularly important if the discarded fish are immature, from over exploited stocks and have considerable growth potential. If measures can be taken to prevent or reduce discarding, then yield per recruit can be increased and therefore a knowledge of the amount and size/age structure of the discarded fish is obviously valuable.

Fishery discards are among the most difficult of population assessment data to monitor accurately. The operational problems of estimating the size, age and magnitude of discards at sea can be great (Daan 1976, Jermyn & Robb 1981, Salia 1983, Dunlin & Hepples 1991). Fishermen generally discard undersized fish and unwanted species very quickly after the catch has been landed on the deck and under these circumstances it is very difficult to gain an unsorted sample of the raw fishery catch. The number of trips necessary to be sampled at sea in order to quantify the magnitude and size composition of discards to within levels of precision comparable to landings from a particular fishery are, under the present economic climate, beyond the reach of most (if not all) scientific organisations. It is thus relevant to consider any potential operational problems and pinpoint which gears, fishing areas and seasons present an appreciable discard problem before embarking on any large scale and expensive programs to improve discard estimates.

For this reason MAFF (the Ministry of Agriculture Food and Fisheries) commissioned Seafish (Sea Fish Industry Authority) to carry out a pilot scheme to study discards on the North East Coast of England taking in area 104b in 1990 and to continue with this study for the year 1992 thus providing continuous discard data over a period of two years.

Discarding in general is dependent on many factors:

- Factors of an environmental and biological origin, weather, climate, season, yearclass strengths, distribution of juveniles within an area and growth.

- Factors of a market origin, supply and demand, price and size requirements.

- Factors of a regulatory origin, minimum landing size, minimum mesh size and quota restrictions.

- Factors of a 'fishery-born' origin, chosen trawling grounds, duration of tow, size of catch, length of trip and even the motivation of the crew.

Of all these factors perhaps the most difficult to quantify are the 'fishery-born' factors, however experience and anecdotal evidence show that they do have an appreciable effect on discarding. Because fishing effort varies with gear, season etc, in this particular area (Humber) it was considered unnecessary to examine the discarding practices of all sections of the fishery with equal attention in this study. Using the results from last years study (Dunlin & Hepples 1991) it was decided that the study should concentrate on the Demersal and Nephrop trawl fisheries.

2. Method

Seafish Report No. 395 (Dunlin & Hepples 1991) describes the procedure for the collection of data at sea and the sampling areas that were used. No changes were made during the current study to the collection procedure.

One of the original Discard Officers moved on to a new study and a research assistant was recruited and trained. With the exception of one port, co-operation from the fishermen was unreservedly forthcoming and because the Officers were not seen as being inspectors the results are unbiased in that respect.

The analysis procedure was as follows for all three species sampled; cod, haddock and whiting:-

- The length/frequency distributions of discards were taken for each haul.
- The length/frequency distribution of the landings was obtained by sampling the landings. This was carried out by representative sub-sampling and not on a haul-by-haul basis.

Thus a length/frequency distribution for the three species for the total catch (including discards) was then obtained by summing all the discard and landed length/frequency observations raised appropriately. Estimates of discarded weights and landed weights were obtained using length/weight relationships. Quarterly data were produced for each gear and then combined to give data for the full year. A number of combinations of statistical rectangles, gear types and time periods were obtained to use for comparative analysis.

Ideally several vessels of each gear type should be sampled during each quarter, however, because of manpower restrictions and at certain times weather and quota restrictions this was not always possible.

Analysis was carried out using spreadsheets on P.C's as in the previous years study which, although not perfect did prove equal once again to the task.

3. Results

After consultation and discussions with DFR (Directorate of Fisheries Research) staff at Lowestoft it was decided that the presentation of results would follow the same formats as the previous year with some additional graphical representation and details of year class strengths and distribution of the three species targeted.

3.1 Summary of Data Collection Trips (Tables 1-4a)

These were broken down by type of fishing gear to include the following information:- Ports covered, number of boats sampled, hauls, otoliths taken, number of fish measured and statistical rectangles covered. Each sampling quarter was covered separately in this manner and a yearly summary given.

3.2 Quarterly and Annual Summarisations of the Discard Data (Tables 5-19)

The individual discard rates are expressed as percentages of the total amount of that particular species landed on the deck and not as a percentage of all species. Similarly the total discard rate applies to the total amount of cod, haddock and whiting landed on board and not to the total catch. Each table relates to a specific type of gear - Scottish seine, Nephrop trawl, Pair trawl and Demersal trawl.

Where possible (i.e. if there were greater than two individual trips during the quarter) the mean, standard deviation and coefficient of variation of the discard rates between trips by number were given for each species sampled that quarter and for the full year. The tables give quarterly coverage throughout the year and also the years total for each gear type. The coefficient of variation was calculated on the percentage data and so each trip is weighted equally. Thus is does not correspond to the unweighted data in the tables.

3.2.1 Variation Within The Quarters

Looking at the coefficient of variation it can be seen that it is generally very high emphasising the variability of discard rates within each quarter and over the year as a whole. The coefficients for the demersal gear vary between 52 and 147 for the three species (see Tables 5-8) with cod giving the most consistent coefficients (52-88) and haddock the most wide ranging (56-110) between quarters. The figures for the nephrop trawl show that discard rates within the first quarter for the species whiting do not display a high variation (coefficient of variation - 14, see Table 13) but that the figures for the species cod and haddock (80 and 80 respectively) are more in line with those coefficients found with the demersal gear. Figures for the two other gears sampled (see Tables 11 and 19), i.e. Scottish seine and pair trawl, return high coefficients of variation over the year with the exception of cod sampled from the Scottish seine gear which shows a coefficient of 22. The figures for the Scottish seine gear should be viewed with some doubt due to the low sampling levels.

3.2.2 Comparison Of Discard Rates Between Years (Demersal Gear, Tables 5-7)
The species which showed the largest annual variation in discard rates was cod. These varied from:-

- 2% for the first quarter 1991 to 41% for the same quarter 1992.
- 17% for the second quarter 1991 to 35% for the same quarter 1992.

The discard rates for the third quarter in each year are not consistent with this trend variancy between 30 and 35%. Given the large coefficient of variation within quarters this suggests that the above variations are probably not significant.

Discard rates for haddock are also variable from year to year and within quarters with no clear trend. There is a downward trend in the whiting discard rates from an overall 30% in 1991 to <20% in 1992. Given the large variation within quarters it is difficult to establish the significance of these results.

3.3 Length Distributions of Target Species Raised to Boat Total (Tables 20-34)

These are length frequency tables split into the three species covered. For each species it is sub-divided into numbers discarded and numbers landed. An indication is given of the minimum landing size (MLS) for each species.

3.4 Age Length Distributions (Tables 35-46)

Shown here are the length frequencies at age with an indication of the mean lengths and weight at age 1 year, 2 years etc. As with the previous years study all the gears were grouped together to give tables covering each targeted species per quarter.

One year old fish were the predominant age class for cod discards as previously although in the first quarter year two class appeared in greater numbers. Haddock discards were split between one and two year old with no sign of any zero year age fish. The age range of discarded whiting varied between one and seven years with no particular class being the strongest contributor though in the first and second quarters the two year old age group appear in relatively larger quantities than any other.

3.5 Estimated Fleet Totals (Tables 47-49)

These tables are included to give some indication as to the scale of discarding practices in the area 'Humber'. Raising factors (RF) were calculated by dividing total landings from the area by the raised landings from sampling trips. The raising factor was then applied to raised totals of fish landed on deck and raised discard totals. The estimates for the Nephrop gear were applied to the first quarter due to this being the only sampling period with sufficient trips to warrant the exercise. Pair trawl and demersal trawl estimates were calculated for the complete year (by using each quarters numbers and summing for the year) and those for the Scottish seine were left out entirely as this type of gear is used very little in the area 'Humber'.

It is clear from the magnitude of the raising factors that the discard data available are too limited to prepare really reliable yearly estimates. However as the landings are apparently largely underestimates of the total catch ('black' landings, misreporting etc.) any figure taking discards into account is likely to be nearer the true figure for mortality due to fishing.

3.6 Comparison of Length Distribution By Species For the Nephrop Trawl (Figures 1-3)

The Nephrop 'season' usually runs from October through to March but the commencement and end can fluctuate significantly therefore to obtain reasonable comparative effort, three periods are represented graphically:- October 1990 to March 1991, October 1991 to March 1992 and October 1992 to March 1993. Each graph represents an individual species and all boat raised totals during this period were added together. Two facts are immediately apparent:

- For cod (Figure 1) their are no significant differences with the exception of the 1992/93 season giving rise to a slight increase in numbers discarded within the range 31cms to 35cms.

- Looking at the haddock discards (Figure 2) it can be seen that there is a huge decrease in numbers discarded per tonne landed within the range 11cm to 22cm from a high in the 1990/91 season to virtually nil in the 1992/93 season and an apparent narrowing of distribution between 1990/91 and 1991/92 from 11cms to 24cms and 15cms to 22cms respectively.

- Looking at the whiting discards (Figure 3) it can be seen that in 1990/91 the length distribution followed a distinct pattern of two different year classes ie 11cms to 18cms and 21cms to 27cms. Although the following two seasons reflect the latter length distribution, albeit on a somewhat reduced scale, what is significant is the virtual disappearance of the first length distribution ie from 11cms to 18cms.

3.6.1 Comparison Of Discard Rates Between Years (Nephrop Trawl Figures 1-3)

Perhaps the most significant difference to note would the discard rate for haddock in the nephrop fishery. Taking three seasons into account (i.e. October to March 1990/91, 1991/92, 1992/93) it is immediately apparent that the discard rates which gave such cause for concern in 1990/91 (around 90%) have decreased significantly over the following two seasons to approximately 45% for 1991/92 and 15% for 1992/93. Within the same fishery discard rates for whiting have decreased over the three seasons (approximately 80%, 75% and 55% respectively) and whilst this is not such a significant decrease, along with haddock discard rates, it does highlight variability of discard rates. Discard rates for cod are seasonally uniform with all three rates staying below 20%.

3.7 Comparison of Length Distribution By Species Targeting the Demersal Trawl (Figures 4-12)

A comparison of numbers discarded per tonne landed between 1991 and 1992 is graphically represented to show variation in discard numbers between quarters of each year (except for Quarter 4 as this was not represented in 1992). All discard trips sampled during the quarters are included regardless of mesh size (i.e. 90mm, 100mm or 110mm), however all trips in Quarter 3 1992 used 100mm meshes as per new regulations introduced in June 1992.

- Cod. The most significant fact here is the overall increase in numbers discarded in 1992 with no detectable change in distribution.

- Haddock. Perhaps the main point to be highlighted here is the difference in numbers discarded over the minimum landing size in the first and third quarters. There is no obvious change in distribution patterns.

- Whiting. It can be seen that discarding of oversize fish occurs regularly and the only detectable change in length distribution occurs in the second quarter of 1991 when their is a noticeable discarding of fish within the range 13cms to 19cms.

3.8 Comparison of Length Distribution By Species Between Selected Individual Trips (Figures 13-21)

To give an indication of discard variability between trips all sampling voyages where examined to find matches in gear type, statistical rectangle, boat size, time of year and port. The voyages selected were as follows:-

- Nephrop Gear. Two boats from Seahouses week ending 27th February 1992. It can be seen that neither cod nor haddock appear in any sizeable quantities. With regards to whiting, both trips discarded whiting within the same length distributions, but the trip referenced as 'SEAHO1A' produced a greater number within that range.

- Demersal Gear. The same boat sampled in April 1992 using 90mm mesh and in June 1992 using 100mm mesh. Both sampling voyages were in the same statistical rectangle. Nothing of significance is immediately apparent except perhaps the increase in cod discarded from the range 28cms to 33cms from the gear using 100mm mesh and its absence from the range 19cms to 26cms. The expected shift to the right in length distribution for haddock and whiting using 100mm mesh is seen in only a small degree for haddock and in the case of whiting the opposite could be said to occur.

- Demersal Gear. Two boats from the same port (Scarborough in the same area at the same time in the second quarter 1992 using similar mesh sizes).

These trips do not produce any significant differences although there is a slight variation in numbers and one trip can be seen to discard all three species at a smaller length.

3.9 Variation of Absolute Discard Rates Between Hauls (Table 50, p69)

Three individual demersal trawl voyages with a sufficient number of hauls to give a worthwhile comparison were selected. The discard rates (estimated) for all three species grouped together where calculated per haul and the mean, standard deviation and coefficient of variation for all hauls are indicated. Looking at the coefficient of variation it can be seen that their is an appreciable amount of variation in discard rates between hauls but not as great as that between quarters or trips.

4. Discussion

Discard rates are highly variable between gears depending on their selectivity and mode of action. They can also vary within gears, to a smaller but still significant extent, depending upon the abundance of year classes, spatial distribution of undersize or juvenile fish, availability of other species, by-catch regulations, presentation of landing (i.e. whole rounded or gutted) and expected prices among other factors. The obvious complexity of the inter-relationships suggested above, does not offer much hope for obtaining accurate and precise estimates of the proportions discarded at sea, without carefully planned sampling. In 1988 a report of the Working Group on Methods of Stock Assessments stated that:-

> *"....TAC's can be calculated using estimates of discarded fish or ignoring them. If the estimates of discard data are variable, they will cause errors in the TAC estimates. However if discard data are not used and if the discarded proportion varies from year to year, this will cause errors in the TAC estimate. With current ICES assessment practices, discard data will be useful for this purpose, if it has a lower coefficient of variation than the annual discard proportion..."*

The only occurrence of this requirement can be seen (see Tables 13 and 15) with whiting using the Nephrop gear when the coefficients of variation are 22 and 14 and the annual discard rates are 77 and 79 respectively.

With respect to the factors of year class strength and spatial distribution, the comparison of Nephrop gear data (see Section 3.6) clearly illustrates the influence of these factors upon results. At first glance it could be construed that the compulsory introduction of square mesh panels in July 1991 has had a significant effect on the discarding of haddock. Indeed looking further, i.e. year class strengths (see Table 51) we see that the year class for the 1990/91 season is 33509 millions which is above recent averages but only on a level with the twenty year average, whereas the year classes relevant to the next two seasons (66763 and 56699 millions) are substantially above both recent and twenty year averages. Surely, one would think, this adds more weight to the hypothesis that square mesh panels are doing the job for which they were intended, i.e. selectivity. If, however, the spatial distribution of juvenile haddocks are examined (see Figures 22-24) it can be deduced that this is the most likely cause of such drastic variations. These ICES young fish surveys are carried out in the first quarter and therefore the 1991 one year olds are the relevant year class to the 1990/91 study. Thus the 1990 survey shows the distribution previous to this and the 1992 survey would apply to the 1992 study (see shaded areas in Figures 22-27). Figure 23 shows that for the season 1990/91 the number of age group one haddocks caught per hour in statistical rectangles 39E8, 39E9, 40E8 and 40E9 are 12, 441, 1489 and 2968 respectively compared with the year preceding figures of 156, 21, 91 and 232 respectively and the year following of 7, 15, 0 and 125. It could be construed from this that the pattern of distribution for juvenile haddocks was for some reason disrupted for that particular season, thus resulting in a substantial and worrying increase in both discard rate and numbers caught.

To a lesser degree the distribution of whiting in the same area could in part explain why there is an absence of fish within the lower ranges (see Section 3.5), i.e. there is a reduction of whiting caught per hour in the relevant rectangles (see Figures 25-27) 5985, 1941, 3837 and 4503 for the 1990/91 season and 3159, 1814, 3121 and 1738 respectively for the 1991/92 season. It should be noted however that year class strengths is probably not a factor here as they can be seen to be fairly consistent (see Table 51) and that hopefully the introduction of the square mesh panel has had some effect.

Data presented here should not be seen as an absolute representation of discard practices with regard to the individual gears. It could be misinterpreted if not viewed with due regard to all the circumstances surrounding the sampling regime. The Scottish seine for example could be highlighted as having high discard rates particularly of cod (68%, Table 12) if the sampling levels were not taken into account and the fact that all of the data came from three small boats prosecuting local fisheries. It should also be noted that these boats only use Scottish seines at certain times of the year and that one trip in a quarterly period cannot be seen as representative of this gear.

Although there are many shortcomings in the set of data presented here, it is evident that a routine sampling system should be introduced to monitor discards in problem areas highlighted by experimental studies such as this. The variability of discard rates can to a certain extent be explained by quantifiable factors (year classes etc) but intangibles such as 'Fisheries Born' factors can not be ignored. Statistical study of the data could show that after certain factors have been taken into account, discard sampling could be a useful aid in monitoring the effectiveness of management tools such as increases in minimum landing sizes, mesh sizes and presentation of landed fish etc.

5. Addendum - Suggested Changes To Sampling Details

During discussions with Mr T Macer of MAFF, Lowestoft, a number of points were raised with regard to changes the Discard Officers would make to any future studies of discarding.

The following are recommendations suggested by the Officers which will in their opinion improve the accuracy and the analysis of the data:

- A haul-by-haul proportion of marketable fish with regard to the targeted species (e.g. 2 baskets of cod, 1 of haddock and 3½ of whiting) should be recorded.

- A database should be set up to handle the 'raw' data and each individual hauls discard numbers should be entered separately even if they have the same raising factor.

- When targeting the Nephrop gear, sub-sampling of the unsorted catch should be undertaken throughout the crews sorting process and a basket tally kept to ascertain the true 'bulk'. The total sample of 2 baskets (this is an arbitrary figure which is constrained by Officers available time) should then be sorted and the relevant proportions of marketable nephrops, discarded nephrops and discarded fish noted. These proportions can then be applied to the total 'bulk', thus giving a more accurate assessment of the discarded fish.

- Measurements of marketable species should as far as possible be taken at regular intervals throughout each trip; where this is not practicable, then care should be taken to measure a representative selection in the available time.

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Table 1
Quarterly Period : January-March 1992

	Nephrops Trawl	Demersal Trawl	Pair Trawl	Scottish Seine
Ports Covered	Amble Seahouses	Bridlington Shields Scarborough Whitby Hartlepool	Bridlington	n/a
Number of Boats Sampled	4	8	1	0
Number of Hauls	14	68	4	0
Number of Otoliths Taken	433	170	18	n/a
Statistical Rectangles Covered	39 E8 40 E8	38 E8 37 E9 38 E9 39 E9 37 FO	37 E9	n/a
Number of Fish Measured	Cod 283 Haddock 377 Whiting 3488	Cod 1864 Haddock 842 Whiting 3743	Cod 116 Haddock 0 Whiting 46	n/a
	Total 4148	Total 6449	Total 162	

Table 2
Quarterly Period : April-June 1992

	Nephrops Trawl	Demersal Trawl	Pair Trawl	Scottish Seine
Ports Covered	Nil	Bridlington Scarborough Whitby Hartlepool Shields	Amble Bridlington	Amble
Number of Boats Sampled	Nil	9	2	1
Number of Hauls	Nil	73	15	13
Number of Otoliths Taken	Nil	791	149	114
Statistical Rectangles Covered	Nil	37 E9 37 FO 39 E8 38 FO 38 E9	37 FO 39 E8	40 E9
Number of Fish Measured		Cod 3455 Haddock 1811 Whiting 1193	Cod 528 Haddock 747 Whiting 522	Cod 563 Haddock 1006 Whiting 1671
		Total 6459	Total 1797	Total 3240

Table 3
Quarterly Period : July-September 1992

	Nephrops Trawl	Demersal Trawl	Pair Trawl	Scottish Seine
Ports Covered	Nil	Bridlington Scarborough Whitby Hartlepool Shields Amble	Bridlington Whitby	Amble Hartlepool
Number of Boats Sampled	Nil	8	2	2
Number of Hauls	Nil	55	14	24
Number of Otoliths Taken	Nil	353	110	109
Statistical Rectangles Covered	Nil	37 F0 39 E8 38 E9 37 E9 40 E9	38 F0 37 F0	40 F0 38 E9 38 E8
Number of Fish Measured		Cod 3447 Haddock 1742 Whiting 1633	Cod 1171 Haddock 221 Whiting 509	Cod 1649 Haddock 526 Whiting 262
		Total 5822	Total 1901	Total 2437

Table 4
Quarterly Period : October-December 1992

	Nephrops Trawl	Demersal Trawl	Pair Trawl	Scottish Seine
Ports Covered	Amble	Shields Hartlepool Amble	Whitby Bridlington	n/a
Number of Boats Sampled	1	3	2	0
Number of Hauls	4	24	11	0
Number of Otoliths Taken	n/a	n/a	n/a	n/a
Statistical Rectangles Covered	39 E8	39 E8 38 E8 38 E9 40 E8	38 F0 37 F0	n/a
Number of Fish Measured	Cod 47 Haddock 5 Whiting 611	Cod 1821 Haddock 576 Whiting 995	Cod 873 Haddock 303 Whiting 598	n/a
	Total 663	Total 3392	Total 1774	

Table 4a
Yearly Summary : January-December 1992

	Nephrops Trawl	Demersal Trawl	Pair Trawl	Scottish Seine
Ports Covered	Amble Seahouses	Bridlington Scarborough Shields Whitby Hartlepool Amble	Bridlington Whitby Amble	Amble Hartlepool
Number of Boats Sampled	5	28	7	3
Number of Hauls	18	220	44	37
Number of Otoliths Taken	467	1510	308	223
Statistical Rectangles Covered	39 E8 40 E8	37 F0 39 E8 38 E9 37 E9 40 E9 38 E8 40 E8 39 E9 38 F0	38 F0 37 F0 37 E9 39 E8	40 F0 38 E9 38 E8 40 E9
Number of Fish Measured	Cod 330 Haddock 382 Whiting 4099	Cod 10587 Haddock 4971 Whiting 7564	Cod 2688 Haddock 1271 Whiting 1675	Cod 2212 Haddock 1532 Whiting 1933
	Total 4811	Total 23122	Total 5834	Total 5677

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

1st QUARTER 1992 AREA: 104B GEAR: DEMERSAL TRAWL

1991's Figures in ( )

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	2619	1174	41 (2)	15
Over Min. Size	8	6	0 (0)	0
Total	2627	1180	41 (2)	15
Had. Discards				
Under Min. Size	764	251	46 (14)	32
Over Min. Size	15	6	1 (9)	1
Total	779	258	47 (23)	32
Whg. Discards				
Under Min. Size	4626	633	17 (13)	9
Over Min. Size	616	118	2 (10)	2
Total	5242	751	19 (23)	11

TOTAL DISCARDS RATES:

==========

BY NUMBER: 24 %

BY WEIGHT: 14 %

QUARTERLY VARIATION OF DISCARD RATES BY Nos.

	MEAN	STD	COEFF/VAR
COD	31	28	88
HAD	19	21	110
WHG	15	11	71

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

2nd QUARTER 1992 AREA: 104B GEAR: DEMERSAL TRAWL

1991's Figures in ( )

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	2412	1043	35 (17)	11
Over Min. Size	0	0	0 (0)	0
Total	2412	1043	35 (17)	11
Had. Discards				
Under Min. Size	909	282	15 (34)	9
Over Min. Size	3	1	0 (1)	0
Total	912	283	15 (35)	9
Whg. Discards				
Under Min. Size	511	72	16 (27)	8
Over Min. Size	104	20	3 (5)	2
Total	615	92	19 (32)	11

TOTAL DISCARDS RATES:

==========

BY NUMBER: 24 %

BY WEIGHT: 10 %

QUARTERLY VARIATION OF DISCARD RATES BY Nos.

	MEAN	STD	COEFF/VAR
COD	35	23	66
HAD	19	11	56
WHG	20	14	72

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

3rd QUARTER 1992 AREA: 104B GEAR: DEMERSAL TRAWL

1991's Figures in ( )

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	1758	869	32 (32)	14
Over Min. Size	0	0	0 (0)	0
Total	1758	869	32 (32)	14
Had. Discards				
Under Min. Size	1018	307	26 (26)	14
Over Min. Size	0	0	0 (14)	0
Total	1018	307	26 (40)	14
Whg. Discards				
Under Min. Size	526	75	11 (27)	7
Over Min. Size	48	9	1 (1)	1
Total	574	84	12 (28)	8

TOTAL DISCARDS RATES:

==========

BY NUMBER: 24 %

BY WEIGHT: 13 %

QUARTERLY VARIATION OF DISCARD RATES BY Nos.

	MEAN	STD	COEFF/VAR
COD	41	29	70
HAD	26	26	103
WHG	10	11	105

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

4th QUARTER 1992 AREA: 104B GEAR: DEMERSAL TRAWL

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	1475	757	27	11
Over Min. Size	0	0	0	0
Total	1475	757	27	11
Had. Discards				
Under Min. Size	694	211	23	12
Over Min. Size	9	4	0	0
Total	703	214	24	12
Whg. Discards				
Under Min. Size	430	65	8	5
Over Min. Size	44	8	1	1
Total	474	73	9	6

TOTAL DISCARDS RATES:

==========

BY NUMBER: 19 %

BY WEIGHT: 11 %

QUARTERLY VARIATION OF DISCARD RATES BY Nos.

	MEAN	STD	COEFF/VAR
COD	32	17	52
HAD	6	6	92
WHG	8	12	147

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

YEARS TOTAL JAN92 - DEC92 AREA: 104B GEAR: DEMERSAL TRAWL

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	6506	2974	35	12
Over Min. Size	8	6	0	0
Total	6514	2980	35	12
Had. Discards				
Under Min. Size	2367	744	22	13
Over Min. Size	27	12	0	0
Total	2394	755	22	13
Whg. Discards				
Under Min. Size	5567	770	16	8
Over Min. Size	764	146	2	2
Total	6330	916	18	10

TOTAL DISCARDS RATES:

==========

BY NUMBER: 23 %

BY WEIGHT: 12 %

QUARTERLY VARIATION OF DISCARD RATES BY Nos.

	MEAN	STD	COEFF/VAR
COD	32	22	69
HAD	17	17	100
WHG	15	13	89

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

2nd QUARTER 92 AREA: 104B GEAR: SCOTTISH SEINE

1991's Figures in ( )

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	1925	587	96 (75)	86
Over Min. Size	0	0	0 (0)	0
Total	1925	587	96 (75)	86
Had. Discards				
Under Min. Size	1871	512	62 (60)	41
Over Min. Size	0	0	0 (0)	0
Total	1871	512	62 (60)	41
Whg. Discards				
Under Min. Size	3265	434	71 (24)	57
Over Min. Size	0	0	0 (7)	0
Total	3265	434	71 (31)	57

TOTAL DISCARDS RATES:

==========

BY NUMBER: 74 %

BY WEIGHT: 57 %

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

3rd QUARTER 92 AREA: 104B GEAR: SCOTTISH SEINE

1991's Figures in ( )

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	1677	838	51 (38)	30
Over Min. Size	0	0	0 (3)	0
Total	1677	838	51 (31)	30
Had. Discards				
Under Min. Size	71	24	4 (42)	2
Over Min. Size	0	0	0 (3)	0
Total	71	24	4 (45)	2
Whg. Discards				
Under Min. Size	40	6	2 (47)	1
Over Min. Size	0	0	0 (4)	0
Total	40	6	2 (51)	1

TOTAL DISCARDS RATES:

==========

BY NUMBER: 24 %

BY WEIGHT: 19 %

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

YEARS TOTAL JAN92 - DEC92 AREA: 104B GEAR: SCOTTISH SEINE

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	3602	1425	68	41
Over Min. Size	0	0	0	0
Total	3602	1425	68	41
Had. Discards				
Under Min. Size	1942	536	40	23
Over Min. Size	0	0	0	0
Total	1942	536	40	23
Whg. Discards				
Under Min. Size	3305	440	48	31
Over Min. Size	0	0	0	0
Total	3305	440	48	31

TOTAL DISCARDS RATES:

==========

BY NUMBER: 52 %

BY WEIGHT: 33 %

QUARTERLY VARIATION OF DISCARD RATES BY Nos.

	MEAN	STD	COEFF/VAR
COD	73	16	22
HAD	14	18	128
WHG	18	26	144

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

1st QUARTER 92 AREA: 104B GEAR:NEPHROP TRAWL

1991's Figures in ( )

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	74	23	15 (7)	4
Over Min. Size	0	0	0 (0)	0
Total	74	23	15 (7)	4
Had. Discards				
Under Min. Size	139	32	24 (87)	12
Over Min. Size	0	0	0 (0)	0
Total	139	32	24 (87)	12
Whg. Discards				
Under Min. Size	9883	1209	79 (78)	65
Over Min. Size	164	30	1 (5)	2
Total	10046	1239	80 (83)	67

TOTAL DISCARDS RATES:

==========

BY NUMBER: 75 %

BY WEIGHT: 47 %

QUARTERLY VARIATION OF DISCARD RATES BY Nos.

	MEAN	STD	COEFF/VAR
COD	24	19	80
HAD	24	19	80
WHG	79	11	14

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

4th QUARTER 92 AREA: 104B GEAR:NEPHROP TRAWL

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	%WtDiscarded of Total Catch
Under Min. Size	25	13	15	8
Over Min. Size	0	0	0	8
Total	25	13	15	8
Had. Discards				
Under Min. Size	0	0	0	0
Over Min. Size	0	0	0	0
Total	0	0	0	0
Whg. Discards				
Under Min. Size	648	93	50	37
Over Min. Size	0	0	0	0
Total	648	93	50	37

TOTAL DISCARDS RATES:

==========

BY NUMBER: 46 %

BY WEIGHT: 25 %

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

YEARS TOTAL JAN92 - -DEC92 AREA: 104B GEAR: NEPHROP TRAWL

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	99	36	15	4
Over Min. Size	0	0	0	0
Total	99	36	15	4
Had. Discards				
Under Min. Size	139	32	24	12
Over Min. Size	0	0	0	0
Total	139	32	24	12
Whg. Discards				
Under Min. Size	10530	1302	76	62
Over Min. Size	164	30	1	1
Total	10694	1332	77	63

OTAL DISCARDS RATES:

==========

BY NUMBER: 73 %

BY WEIGHT: 44 %

QUARTERLY VARIATION OF DISCARD RATES BY Nos.

	MEAN	STD	COEFF/VAR
COD	22	17	77
HAD	19	20	103
WHG	73	16	22

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

2nd QUARTER92 AREA: 104B GEAR:PAIR TRAWL

1991's Figures in ( )

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	758	359	32 (3)	12
Over Min. Size	0	0	0 (0)	0
Total	758	359	32 (3)	12
Had. Discards				
Under Min. Size	2393	694	28 (75)	16
Over Min. Size	0	0	0 (6)	0
Total	2393	694	28 (81)	16
Whg. Discards				
Under Min. Size	1610	196	41 (45)	24
Over Min. Size	0	0	0 (55)	0
Total	1610	196	41 (100)	24

TOTAL DISCARDS RATES:

==========

BY NUMBER: 32 %

BY WEIGHT: 15 %

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

3rd QUARTER 92 AREA: 104B GEAR:PAIR TRAWL

1991's Figures in ( )

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	1221	537	17 (22)	7
Over Min. Size	0	0	0 (0)	0
Total	1221	537	17 (22)	7
Had. Discards				
Under Min. Size	465	136	15 (40)	7
Over Min. Size	0	0	0 (0)	0
Total	465	136	15 (40)	7
Whg. Discards				
Under Min. Size	286	36	8 (12)	3
Over Min. Size	22	4	1 (1)	0
Total	307	40	9 (13)	3

TOTAL DISCARDS RATES:

==========

BY NUMBER: 14 %

BY WEIGHT: 6 %

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

4th QUARTER 92 AREA: 104B GEAR:PAIR TRAWL

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	417	192	14	5
Over Min. Size	0	0	0	0
Total	417	192	14	5
Had. Discards				
Under Min. Size	299	87	10	5
Over Min. Size	0	0	0	0
Total	299	87	10	5
Whg. Discards				
Under Min. Size	240	32	11	5
Over Min. Size	3	1	0	0
Total	243	33	11	5

TOTAL DISCARDS RATES:

==========

BY NUMBER: 12 %

BY WEIGHT: 5 %

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

YEARS TOTAL JAN92 - DEC92 AREA: 104B GEAR: PAIR TRAWL

Cod Discards	Numbers Discarded	Weight Discarded(kg)	% No Discarded of Total Catch	% Wt Discarded of Total Catch
Under Min. Size	1189	560	21	8
Over Min. Size	0	0	0	0
Total	1189	560	21	8
Had. Discards				
Under Min. Size	2692	781	23	13
Over Min. Size	0	0	0	0
Total	2692	781	23	13
Whg. Discards				
Under Min. Size	1863	230	30	15
Over Min. Size	3	1	0	0
Total	1866	231	30	15

TOTAL DISCARDS RATES:

==========

BY NUMBER: 25 %

BY WEIGHT: 10 %

QUARTERLY VARIATION OF DISCARD RATES BY Nos.

	MEAN	STD	COEFF/VAR
COD	20	11	54
HAD	11	12	105
WHG	18	18	99

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

1st QUARTER 1992 **AREA: 104B** **GEAR: DEMERSAL TRAWL**

^^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	0	
17	0		17	0		17	0	
18	0		18	0		18	0	
19	11		19	1		19	91	
20	5		20	0		20	20	
21	75		21	2		21	115	
22	78		22	3		22	205	
23	128		23	7		23	522	
24	150		24	29		24	1152	
25	179		25	29		25	1297	
26	197		26	101		26	1226	198
27	210		27	130		^^^^^^27	357	2445
28	66		28	239		28	259	2402
29	164		29	224	0	29		3257
30	194		^^^^^^30	13	150	30		3141
31	214		31	2	160	31		2965
32	316		32	0	126	32		2347
33	261		33		160	33		1813
34	373	10	34		101	34		944
^^^^^^35	8	99	35		24	35		1180
36	0	247	36		23	36		586
37	0	195	37		32	37		289
38		314	38		16	38		217
39		215	39		20	39		72
40		270	40		16	40		236
41		275	41		12	41		17
42		252	42		17	42		4
43		220	43		12	43		10
44		185	44		7	44		11
45		222	45		3	45		0
Over 45		1289	Over 45		7	Over 45		7
Total:	2627	3793	Total:	779	885	Total:	5242	22140

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

2nd QUARTER 1992 **AREA: 104B** **GEAR: DEMERSAL TRAWL**

^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	2	
17	0		17	0		17	1	
18	2		18	2		18	3	
19	7		19	4		19	7	
20	15		20	6		20	8	
21	36		21	19		21	4	
22	57		22	21		22	28	
23	104		23	57		23	43	
24	139		24	50		24	75	
25	177		25	56		25	119	
26	178		26	84		26	221	32
27	156		27	141		^^^^^27	56	227
28	206		28	197		28	47	269
29	240		29	272	0	29		384
30	233		^^^^^30	3	651	30		292
31	203		31	0	938	31		253
32	240		32	0	883	32		302
33	208		33		844	33		254
34	211	3	34		631	34		185
^^^^^35	0	201	35		407	35		219
36	0	227	36		201	36		112
37	0	235	37		197	37		40
38		229	38		130	38		27
39		194	39		86	39		7
40		280	40		29	40		32
41		213	41		27	41		0
42		235	42		57	42		4
43		215	43		19	43		0
44		185	44		0	44		12
45		258	45		0	45		0
Over 45		1912	Over 45		12	Over 45		0
Total:	2412	4387	Total:	912	5113	Total:	615	2647

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

3rd QUARTER 1992 **AREA: 104B** **GEAR: DEMERSAL TRAWL**

^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	1		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	0	
17	0		17	0		17	0	
18	0		18	0		18	0	
19	0		19	0		19	7	
20	0		20	0		20	11	
21	2		21	0		21	25	
22	4		22	0		22	21	
23	12		23	22		23	33	
24	22		24	78		24	58	
25	52		25	135		25	131	
26	108		26	218		26	240	4
27	122		27	230		^^^^^27	44	1431
28	147		28	186		28	4	577
29	208		29	149	0	29		772
30	193		^^^^^30	0	480	30		442
31	221		31	0	439	31		404
32	217		32	0	287	32		112
33	239		33		306	33		92
34	210	0	34		286	34		92
^^^^^35	0	617	35		218	35		51
36	0	337	36		239	36		48
37	0	325	37		278	37		4
38		299	38		127	38		14
39		265	39		64	39		0
40		208	40		61	40		2
41		223	41		52	41		9
42		113	42		45	42		0
43		211	43		39	43		0
44		196	44		6	44		0
45		102	45		6	45		0
Over 45		912	Over 45		22	Over 45		0
Total:	1758	3809	Total:	1018	2956	Total:	574	4054

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

4th QUARTER 1992 **AREA: 104B** **GEAR: DEMERSAL TRAWL**

^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	1		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	0	
17	0		17	0		17	0	
18	0		18	0		18	0	
19	0		19	0		19	2	
20	0		20	0		20	4	
21	0		21	0		21	4	
22	0		22	0		22	2	
23	3		23	18		23	8	
24	11		24	67		24	66	
25	45		25	86		25	114	
26	77		26	122		26	230	0
27	94		27	159		^^^^^27	44	1440
28	103		28	104		28	0	590
29	165		29	138	3	29		737
30	148		^^^^^30	9	331	30		568
31	168		31	0	316	31		499
32	209		32	0	180	32		157
33	200		33		164	33		157
34	251	0	34		204	34		178
^^^^^35	0	638	35		237	35		105
36	0	374	36		141	36		143
37	0	414	37		184	37		58
38		287	38		130	38		24
39		323	39		103	39		32
40		188	40		82	40		14
41		109	41		58	41		18
42		68	42		33	42		9
43		132	43		35	43		7
44		161	44		22	44		2
45		46	45		6	45		0
Over 45		1234	Over 45		30	Over 45		0
Total:	1475	3976	Total:	703	2263	Total:	474	4736

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

YEARS TOTAL JAN92 - DEC92 **AREA: 104B** **GEAR: DEMERSAL TRAWL**

^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	1		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	2	
17	0		17	0		17	1	
18	2		18	2		18	3	
19	18		19	5		19	100	
20	20		20	6		20	32	
21	111		21	21		21	123	
22	135		22	24		22	235	
23	235		23	82		23	573	
24	300		24	146		24	1293	
25	401		25	171		25	1530	
26	452		26	307		26	1677	230
27	460		27	430		^^^^^27	457	4111
28	375		28	540		28	306	3261
29	569		29	634	3	29		4377
30	575		^^^^^30	25	1132	30		4000
31	585		31	2	1414	31		3717
32	765		32	0	1189	32		2806
33	669		33		1168	33		2224
34	835	13	34		937	34		1306
^^^^^35	8	938	35		668	35		1504
36	0	848	36		364	36		840
37	0	845	37		413	37		386
38		830	38		276	38		268
39		732	39		209	39		110
40		738	40		127	40		282
41		598	41		97	41		34
42		555	42		108	42		16
43		567	43		66	43		17
44		531	44		30	44		26
45		526	45		9	45		0
Over 45		4435	Over 45		50	Over 45		7
Total:	6514	12155	Total:	2394	8261	Total:	6330	29524

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

1st QUARTER 1992 **AREA: 104B** **GEAR: SCOTTISH SEINE**

^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	6	
16	4		16	0		16	3	
17	4		17	0		17	38	
18	14		18	17		18	45	
19	42		19	10		19	76	
20	26		20	70		20	103	
21	88		21	98		21	71	
22	83		22	56		22	231	
23	188		23	99		23	342	
24	227		24	110		24	563	
25	228		25	224		25	815	
26	284		26	311		26	972	0
27	279		27	396		^^^^^27	0	396
28	202		28	327		28	0	264
29	104		29	153	0	29		168
30	62		^^^^^30	0	296	30		120
31	26		31	0	191	31		93
32	24		32	0	145	32		61
33	9		33		65	33		64
34	31	0	34		54	34		68
^^^^^35	0	16	35		48	35		16
36	0	5	36		51	36		20
37	0	6	37		40	37		18
38		9	38		102	38		11
39		15	39		27	39		9
40		5	40		22	40		0
41		3	41		22	41		2
42		0	42		22	42		0
43		1	43		35	43		2
44		0	44		3	44		0
45		1	45		3	45		0
Over 45		14	Over 45		13	Over 45		0
Total:	1925	75	Total:	1871	1138	Total:	3265	1311

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

3rd QUARTER 1992 **AREA: 104B** **GEAR: SCOTTISH SEINE**

^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	0	
17	0		17	0		17	0	
18	0		18	0		18	0	
19	0		19	0		19	0	
20	0		20	0		20	0	
21	6		21	0		21	0	
22	9		22	5		22	0	
23	10		23	0		23	0	
24	39		24	0		24	4	
25	53		25	2		25	16	
26	66		26	2		26	20	1
27	91		27	17		^^^^^27	0	347
28	136		28	21		28	0	282
29	169		29	24	0	29		221
30	213		^^^^^30	0	253	30		121
31	197		31	0	263	31		301
32	259		32	0	226	32		312
33	230		33		313	33		121
34	199	0	34		215	34		80
^^^^^35	0	408	35		130	35		196
36	0	204	36		105	36		165
37	0	220	37		77	37		55
38		169	38		78	38		0
39		97	39		30	39		28
40		74	40		7	40		16
41		65	41		1	41		0
42		31	42		22	42		3
43		57	43		7	43		0
44		25	44		15	44		0
45		26	45		0	45		0
Over 45		252	Over 45		5	Over 45		0
Total:	1677	1629	Total:	71	1745	Total:	40	2248

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

YEARS TOTAL JAN 92 - DEC 92 **AREA: 104B** **GEAR: SCOTTISH SEINE**

^^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	6	
16	4		16	0		16	3	
17	4		17	0		17	38	
18	14		18	17		18	45	
19	42		19	10		19	76	
20	26		20	70		20	103	
21	94		21	98		21	71	
22	92		22	61		22	231	
23	198		23	99		23	342	
24	266		24	110		24	567	
25	281		25	226		25	831	
26	350		26	313		26	992	1
27	370		27	413		^^^^^^27	0	743
28	338		28	348		28	0	547
29	273		29	177	0	29		389
30	275		^^^^^^30	0	549	30		241
31	223		31	0	454	31		394
32	283		32	0	371	32		372
33	239		33		377	33		186
34	230	0	34		268	34		148
^^^^^^35	0	425	35		178	35		212
36	0	209	36		157	36		184
37	0	226	37		117	37		72
38		178	38		180	38		11
39		112	39		57	39		37
40		79	40		28	40		16
41		68	41		23	41		2
42		31	42		43	42		3
43		58	43		42	43		2
44		25	44		17	44		0
45		27	45		3	45		0
Over 45		266	Over 45		18	Over 45		0
Total:	3602	1704	Total:	1942	2883	Total:	3305	3558

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

1st QUARTER 1992 **AREA: 104B** **GEAR:NEPHROP TRAWL**

^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	3	
14	0		14	0		14	3	
15	0		15	0		15	11	
16	0		16	0		16	24	
17	0		17	0		17	143	
18	0		18	0		18	107	
19	3		19	0		19	163	
20	8		20	0		20	205	
21	8		21	9		21	547	
22	8		22	47		22	1335	
23	11		23	5		23	1925	
24	7		24	5		24	2313	
25	3		25	35		25	1809	
26	3		26	17		26	1298	3
27	8		27	10		^^^^^27	164	342
28	0		28	5		28	0	591
29	0		29	8	0	29		424
30	0		^^^^^30	0	104	30		405
31	3		31	0	95	31		302
32	0		32	0	82	32		190
33	9		33		45	33		122
34	6	0	34		73	34		38
^^^^^35	0	24	35		9	35		29
36	0	52	36		3	36		30
37	0	55	37		8	37		23
38		27	38		0	38		3
39		24	39		1	39		0
40		26	40		4	40		1
41		26	41		3	41		1
42		21	42		1	42		0
43		24	43		4	43		1
44		8	44		2	44		0
45		9	45		1	45		0
Over 45		104	Over 45		0	Over 45		0
Total:	74	402	Total:	139	435	Total:	10046	2505

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

4th QUARTER 1992 **AREA: 104B** **GEAR:NEPHROP TRAWL**

^^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	0	
17	0		17	0		17	0	
18	0		18	0		18	0	
19	0		19	0		19	0	
20	0		20	0		20	0	
21	0		21	0		21	3	
22	0		22	0		22	71	
23	0		23	0		23	45	
24	0		24	0		24	84	
25	0		25	0		25	135	
26	0		26	0		26	309	0
27	0		27	0		^^^^^^27	0	137
28	0		28	0		28	0	130
29	11		29	0	0	29		80
30	3		^^^^^^30	0	0	30		120
31	1		31	0	0	31		65
32	4		32	0	0	32		40
33	3		33		0	33		27
34	3	0	34		0	34		11
^^^^^^35	0	10	35		0	35		8
36	0	35	36		0	36		6
37	0	5	37		0	37		2
38		5	38		0	38		6
39		15	39		0	39		4
40		30	40		0	40		0
41		20	41		0	41		2
42		10	42		0	42		0
43		5	43		0	43		0
44		0	44		0	44		0
45		5	45		0	45		0
Over 45		5	Over 45		0	Over 45		0
Total:	25	145	Total:	0	0	Total:	648	638

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

YEARS TOTAL JAN 92 - DEC 92 **AREA: 104B** **GEAR: NEPHROP TRAWL**

^^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	3	
14	0		14	0		14	3	
15	0		15	0		15	11	
16	0		16	0		16	24	
17	0		17	0		17	143	
18	0		18	0		18	107	
19	3		19	0		19	163	
20	8		20	0		20	205	
21	8		21	9		21	550	
22	8		22	47		22	1406	
23	11		23	5		23	1970	
24	7		24	5		24	2397	
25	3		25	35		25	1944	
26	3		26	17		26	1607	3
27	8		27	10		^^^^^^27	164	479
28	0		28	5		28	0	721
29	11		29	8	0	29		503
30	3		^^^^^^30	0	104	30		525
31	4		31	0	95	31		367
32	4		32	0	82	32		230
33	12		33		45	33		149
34	9	0	34		73	34		49
^^^^^^35	0	34	35		9	35		37
36	0	87	36		3	36		36
37	0	60	37		8	37		25
38		32	38		0	38		10
39		39	39		1	39		4
40		56	40		4	40		1
41		46	41		3	41		3
42		31	42		1	42		0
43		29	43		4	43		1
44		8	44		2	44		0
45		14	45		1	45		0
Over 45		109	Over 45		0	Over 45		0
Total:	99	547	Total:	139	435	Total:	10694	3143

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

2nd QUARTER 1992 **AREA: 104B** **GEAR:PAIR TRAWL**

^^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	0	
17	0		17	0		17	22	
18	0		18	0		18	47	
19	0		19	6		19	81	
20	0		20	34		20	109	
21	20		21	73		21	129	
22	0		22	78		22	120	
23	34		23	164		23	160	
24	10		24	253		24	309	
25	37		25	265		25	282	
26	27		26	289		26	354	0
27	86		27	298		^^^^^^27	0	200
28	45		28	402		28	0	342
29	59		29	532	0	29		311
30	71		^^^^^^30	0	654	30		490
31	94		31	0	966	31		338
32	97		32	0	900	32		190
33	87		33		1178	33		177
34	94	0	34		1017	34		131
^^^^^^35	0	72	35		707	35		75
36	0	85	36		132	36		23
37	0	45	37		272	37		0
38		42	38		117	38		0
39		42	39		104	39		12
40		79	40		70	40		0
41		78	41		35	41		25
42		92	42		35	42		12
43		78	43		0	43		0
44		140	44		35	44		0
45		152	45		13	45		0
Over 45		741	Over 45		0	Over 45		0
Total:	758	1646	Total:	2393	6234	Total:	1610	2323

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

3rd QUARTER 1992 **AREA: 104B** **GEAR:PAIR TRAWL**

^^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	0	
17	0		17	0		17	0	
18	0		18	0		18	0	
19	0		19	0		19	0	
20	0		20	0		20	12	
21	9		21	0		21	47	
22	11		22	0		22	25	
23	42		23	17		23	26	
24	81		24	35		24	55	
25	63		25	73		25	54	
26	132		26	108		26	66	0
27	60		27	116		^^^^^^27	22	99
28	151		28	65		28	0	138
29	128		29	51	0	29		230
30	106		^^^^^^30	0	286	30		301
31	115		31	0	254	31		276
32	114		32	0	509	32		318
33	92		33		477	33		234
34	117	0	34		318	34		388
^^^^^^35	0	740	35		223	35		281
36	0	827	36		95	36		248
37	0	689	37		127	37		282
38		675	38		159	38		173
39		505	39		127	39		58
40		617	40		64	40		46
41		366	41		32	41		40
42		470	42		0	42		48
43		258	43		32	43		22
44		82	44		0	44		54
45		48	45		32	45		0
Over 45		585	Over 45		0	Over 45		18
Total:	1221	5861	Total:	465	2735	Total:	307	3253

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

4th QUARTER 1992 **AREA: 104B** **GEAR:PAIR TRAWL**

^^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	0	
17	0		17	0		17	0	
18	0		18	0		18	0	
19	0		19	0		19	0	
20	0		20	0		20	3	
21	3		21	0		21	14	
22	2		22	1		22	16	
23	9		23	9		23	32	
24	14		24	25		24	57	
25	30		25	50		25	55	
26	32		26	73		26	63	0
27	36		27	63		^^^^^27	3	148
28	26		28	43		28	0	162
29	45		29	35	0	29		224
30	45		^^^^^30	0	260	30		257
31	44		31	0	325	31		188
32	46		32	0	454	32		160
33	45		33		498	33		170
34	40	0	34		389	34		165
^^^^^35	0	134	35		260	35		83
36	0	316	36		87	36		119
37	0	266	37		108	37		152
38		201	38		87	38		85
39		272	39		87	39		50
40		323	40		65	40		27
41		99	41		22	41		20
42		157	42		0	42		12
43		137	43		43	43		4
44		49	44		0	44		2
45		21	45		22	45		0
Over 45		515	Over 45		0	Over 45		4
Total:	417	2491	Total:	299	2705	Total:	243	2031

SEA FISH INDUSTRY AUTHORITY

ESTIMATES FROM QUARTERLY DISCARD TRIPS

YEARS TOTAL JAN 92 - DEC 92 **AREA: 104B** **GEAR: PAIR TRAWL**

^^^^^ Indicates Minimum Statutory Length

COD			HADDOCK			WHITING		
LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED	LENGTH (Cms.)	Nos. DISC.	Nos. LANDED
11	0		11	0		11	0	
12	0		12	0		12	0	
13	0		13	0		13	0	
14	0		14	0		14	0	
15	0		15	0		15	0	
16	0		16	0		16	0	
17	0		17	0		17	22	
18	0		18	0		18	48	
19	0		19	6		19	81	
20	0		20	34		20	112	
21	23		21	73		21	144	
22	2		22	79		22	136	
23	43		23	173		23	193	
24	24		24	278		24	367	
25	67		25	315		25	339	
26	59		26	362		26	424	0
27	122		27	361		^^^^^27	3	349
28	71		28	445		28	0	508
29	105		29	567	0	29		539
30	117		^^^^^30	0	914	30		752
31	138		31	0	1291	31		537
32	151		32	0	1354	32		353
33	134		33		1676	33		350
34	136	0	34		1406	34		297
^^^^^35	0	215	35		967	35		158
36	0	409	36		219	36		148
37	0	317	37		380	37		155
38		248	38		203	38		86
39		331	39		191	39		62
40		410	40		134	40		27
41		181	41		56	41		45
42		268	42		35	42		23
43		234	43		43	43		4
44		208	44		35	44		2
45		197	45		34	45		3
Over 45		1334	Over 45		0	Over 45		4
Total:	1189	4353	Total:	2692	8938	Total:	1866	4402

ALL GEAR TYPES

1st QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: COD

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13												
14												
15												
16												
17												
18												
19	14		14									
20	13		13									
21	82		72	10								
22	86		86									
23	139		125	14								
24	157		157									
25	182		168	14								
26	199		144	55								
27	218		145	73								
28	66		19	47								
29	164		39	125								
30	194		29	165								
31	217			217								
32	316		54	261								
33	270			270								
34	379			379								
35												
36												
TOTAL			1062	1630								
MEAN LENGTH			26	32								
MEAN WEIGHT			166	317								

ALL GEAR TYPES

1st QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: HADDOCK

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13												
14												
15												
16												
17												
18												
19	1			1								
20												
21	11		11									
22	50		30	20								
23	12			12								
24	34		6	28								
25	64		7	57								
26	118			118								
27	139			139								
28	244			244								
29	231			231								
30	13			13								
31	2			2								
32												
33												
34												
35												
36												
TOTAL			53	864								
MEAN LENGTH			23	28								
MEAN WEIGHT			108	196								

ALL GEAR TYPES

1st QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: WHITING

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13	3											
14	3											
15	11											
16	24		24									
17	143		143									
18	107		107									
19	254		254									
20	225		82	143								
21	662		496		165							
22	1539		330	770	440							
23	2446		98	1565	685			98				
24	3465		239	1911	1314							
25	3105			2253	487	244		61				
26	2524			1705	409	205		171	34			
27	521			226	191	35		52				
28												
29												
30												
31												
32												
33												
34												
35												
36												
TOTAL			1771	8573	3691	483	78	381	34			
MEAN LENGTH			21	25	24	26	26	26	27			
MEAN WEIGHT			75	118	113	136	134	131	143			

ALL GEAR TYPES

2nd QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: COD

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13												
14												
15												
16	4											
17	4		4									
18	16		16									
19	49		49									
20	41		41									
21	144		137	7								
22	140		133	7								
23	326		314	12								
24	376		363	13								
25	442		415	27								
26	489		476	13								
27	521		521									
28	453		395	58								
29	403		392	11								
30	366		300	66								
31	323		255	68								
32	361		273	88								
33	304		206	98								
34	336		204	132								
35												
36												
TOTAL			4492	598								
MEAN LENGTH			28	31								
MEAN WEIGHT			216	305								

ALL GEAR TYPES

2nd QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: HADDOCK

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13												
14												
15												
16												
17												
18	19		15	4								
19	20		16	3								
20	110		80	30								
21	190		150	40								
22	155		124	31								
23	320		225	95								
24	413		254	159								
25	545		244	300								
26	684		111	573								
27	835		58	777								
28	926			926								
29	957			929	28							
30	3			3								
31												
32												
33												
34												
35												
36												
TOTAL			1278	3870	28							
MEAN LENGTH			24	28	30							
MEAN WEIGHT			124	190	232							

ALL GEAR TYPES

2nd QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: WHITING

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13												
14												
15	6		6									
16	5		5									
17	61		61									
18	95		95									
19	164		164									
20	220		220									
21	204		125	78								
22	379		72	306								
23	545		45	476	23							
24	947			807	139							
25	1216			1042	174							
26	1547			1247	150	150						
27	56			8	40	8						
28												
29												
30												
31												
32												
33												
34												
35												
36												
TOTAL			793	3966	525	158						
MEAN LENGTH			20	25	26	27						
MEAN WEIGHT			64	121	129	143						

ALL GEAR TYPES

3rd QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: COD

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11	1											
12												
13												
14												
15												
16												
17												
18												
19												
20												
21	17		17									
22	24		24									
23	64		64									
24	142		142									
25	168		168									
26	306		306									
27	273		273									
28	434		434									
29	505		475	31								
30	512		512									
31	533		487	46								
32	590		571	19								
33	561		502	59								
34	526		480	46								
35												
36												
TOTAL			4454	201								
MEAN LENGTH			30	33								
MEAN WEIGHT			277	337								

ALL GEAR TYPES

3rd QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: HADDOCK

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22	5											
23	39		39									
24	113		113									
25	210		181	29								
26	328		311		17							
27	363		237	95	32							
28	272		147	124								
29	224		43	181								
30												
31												
32												
33												
34												
35												
36												
TOTAL			1071	429	49							
MEAN LENGTH			27	29	27							
MEAN WEIGHT			171	210	180							

ALL GEAR TYPES

3rd QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: WHITING

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13												
14												
15												
16												
17												
18												
19	7		7									
20	23		23									
21	72		72									
22	46		38	8								
23	59		30	30								
24	117		59	50	8							
25	201		56	89	34	11	11					
26	326		18	218	36	36	18					
27	66							66				
28												
29												
30												
31												
32												
33												
34												
35												
36												
TOTAL			302	395	78	47	29	66				
MEAN LENGTH			23	26	26	26	26	28				
MEAN WEIGHT			98	131	132	139	137	160				

ALL GEAR TYPES

4th QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: COD

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11	1											
12												
13												
14												
15												
16												
17												
18												
19	3											
20	8											
21	11											
22	10											
23	23											
24	32		32									
25	78		78									
26	112		112									
27	138		138									
28	129		129									
29	221		210	12								
30	196		196									
31	216		216									
32	259		237	23								
33	257		244	13								
34	300		300									
35												
36												
TOTAL			1890	47								
MEAN LENGTH			31	32								
MEAN WEIGHT			291	320								

ALL GEAR TYPES

4th QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: HADDOCK

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21	9											
22	48											
23	32											
24	97											
25	171		171									
26	212											
27	232		174	58								
28	152		122	30								
29	181		181									
30	9			9								
31												
32												
33												
34												
35												
36												
TOTAL			647	97								
MEAN LENGTH			28	28								
MEAN WEIGHT			194	200								

ALL GEAR TYPES

4th QUARTER 1992

RAISED AGE LENGTH DISTRIBUTION
SPECIES: WHITING

LENGTH	TOTAL FISH (RAISED)	AGE(YEARS) 0	1	2	3	4	5	6	7	8	9	10
11												
12												
13	3											
14	3											
15	11											
16	24											
17	143											
18	107											
19	165											
20	212											
21	568		568									
22	1424		1424									
23	2010		2010									
24	2520		2310	210								
25	2113		2113									
26	1900		792	950	158							
27	211											
28												
29												
30												
31												
32												
33												
34												
35												
36												
TOTAL			9215	1160	158							
MEAN LENGTH			24	26	27							
MEAN WEIGHT			109	137	143							

ESTIMATED FLEET TOTALS - JAN.-DEC 1992 PAIR TRAWL

Table 47

	TOTAL Wt.(tonnes)	TOTAL Nos.(000's)	TOTALS DISCARDED UNDER AND OVER MSL			
			NOs.(000's)		Wt.(TONNES)	
			UNDER	OVER	UNDER	OVER
COD: RF: 58	426	327	70	0	32	0
HADDOCK: RF: 57	354	659	156	0	44	0
WHITING: RF: 134	201	827	245	0,7	29	0,10

ESTIMATED FLEET TOTALS - JAN.-DEC 1992 DEMERSAL TRAWL

Table 48

	TOTAL Wt.(tonnes)	TOTAL Nos.(000's)	TOTALS DISCARDED UNDER AND OVER MSL			
			NOs.(000's)		Wt.(TONNES)	
			UNDER	OVER	UNDER	OVER
COD: RF: 184	4139	3685	1211	1	574	1
HADDOCK: RF: 241	1341	2614	671	5	204	2
WHITING: RF: 162	1362	5913	780	100	110	19

ESTIMATED FLEET TOTALS - JAN.-MAR 1992 NEPHROP TRAWL

Table 49

	TOTAL Wt.(tonnes)	TOTAL Nos.(000's)	TOTALS DISCARDED UNDER AND OVER MSL			
			NOs.(000's)		Wt.(TONNES)	
			UNDER	OVER	UNDER	OVER
COD: RF: 141	92	67	10	0	3	0
HADDOCK: RF: 77	21	44	11	0	2	0
WHITING: RF: 56	103	700	551	9	67	2

COMPARISON OF COD DISCARDED USING A NEPHROPS TRAWL OVER A THREE YEAR PERIOD

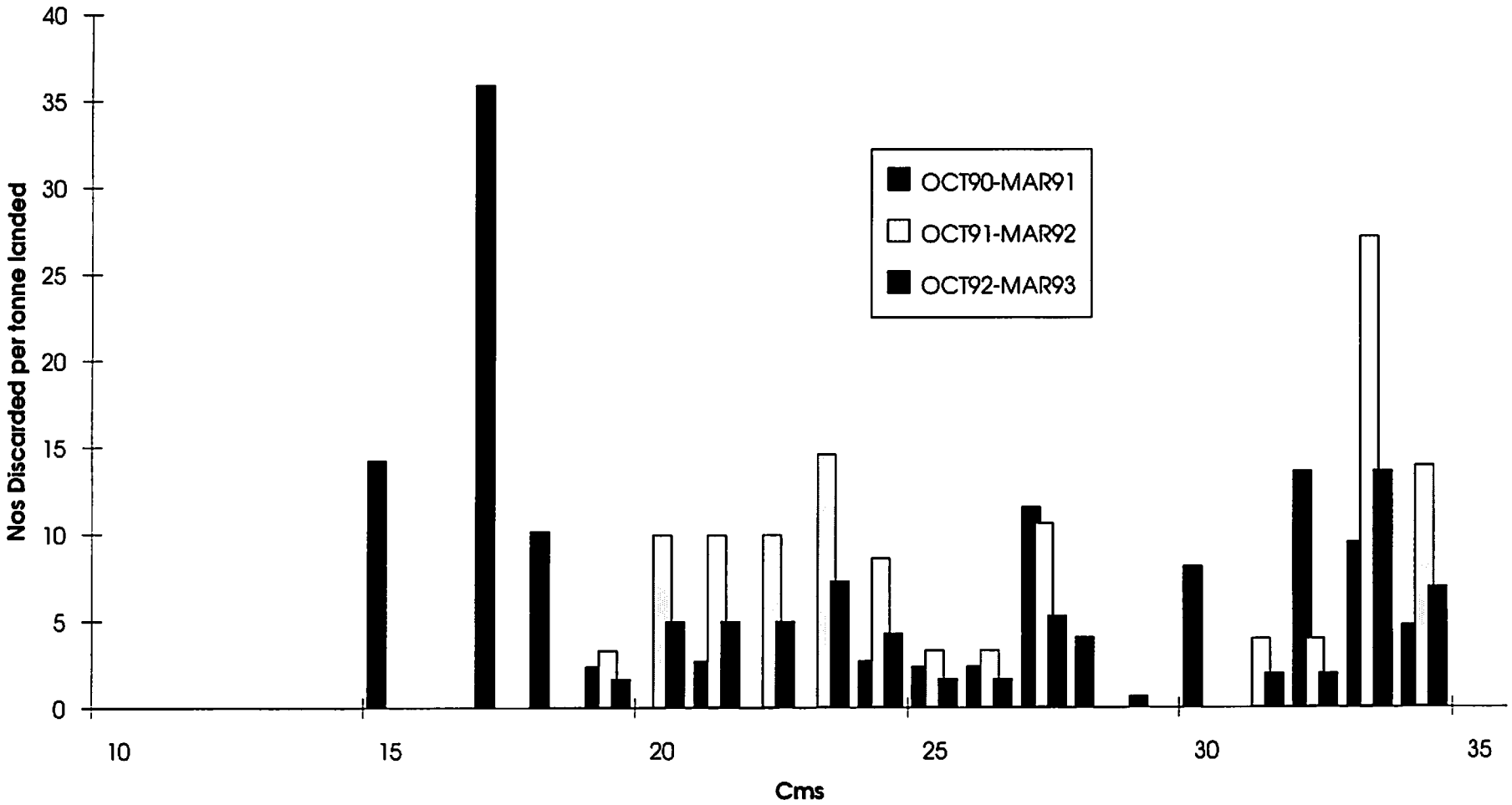


FIGURE 1

COMPARISON OF HAD DISCARDED USING A NETHROP TRAWL OVER A THREE YEAR PERIOD

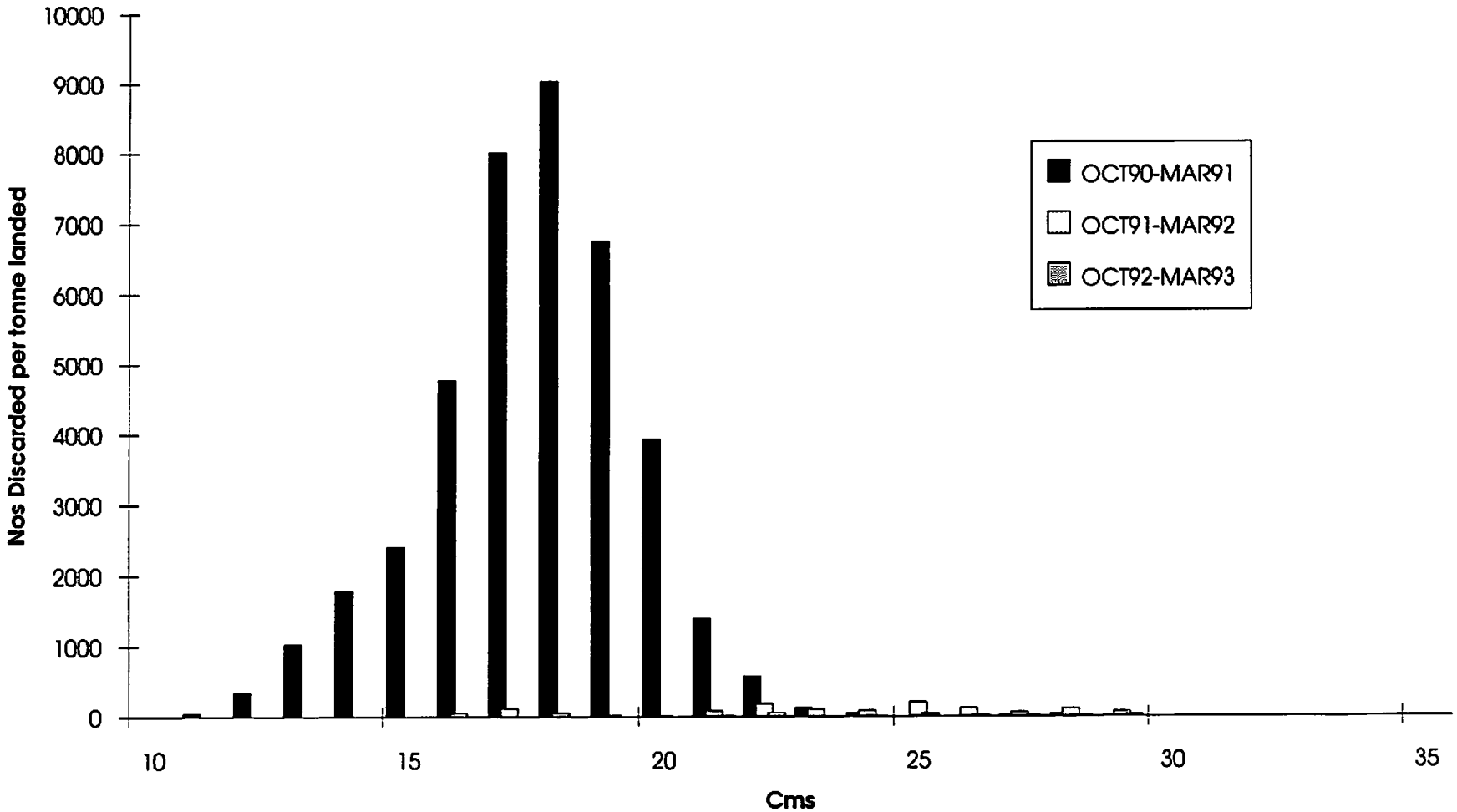


FIGURE 2

COMPARISON OF WHG DISCARDED USING A NEPHROP TRAWL OVER A THREE YEAR PERIOD

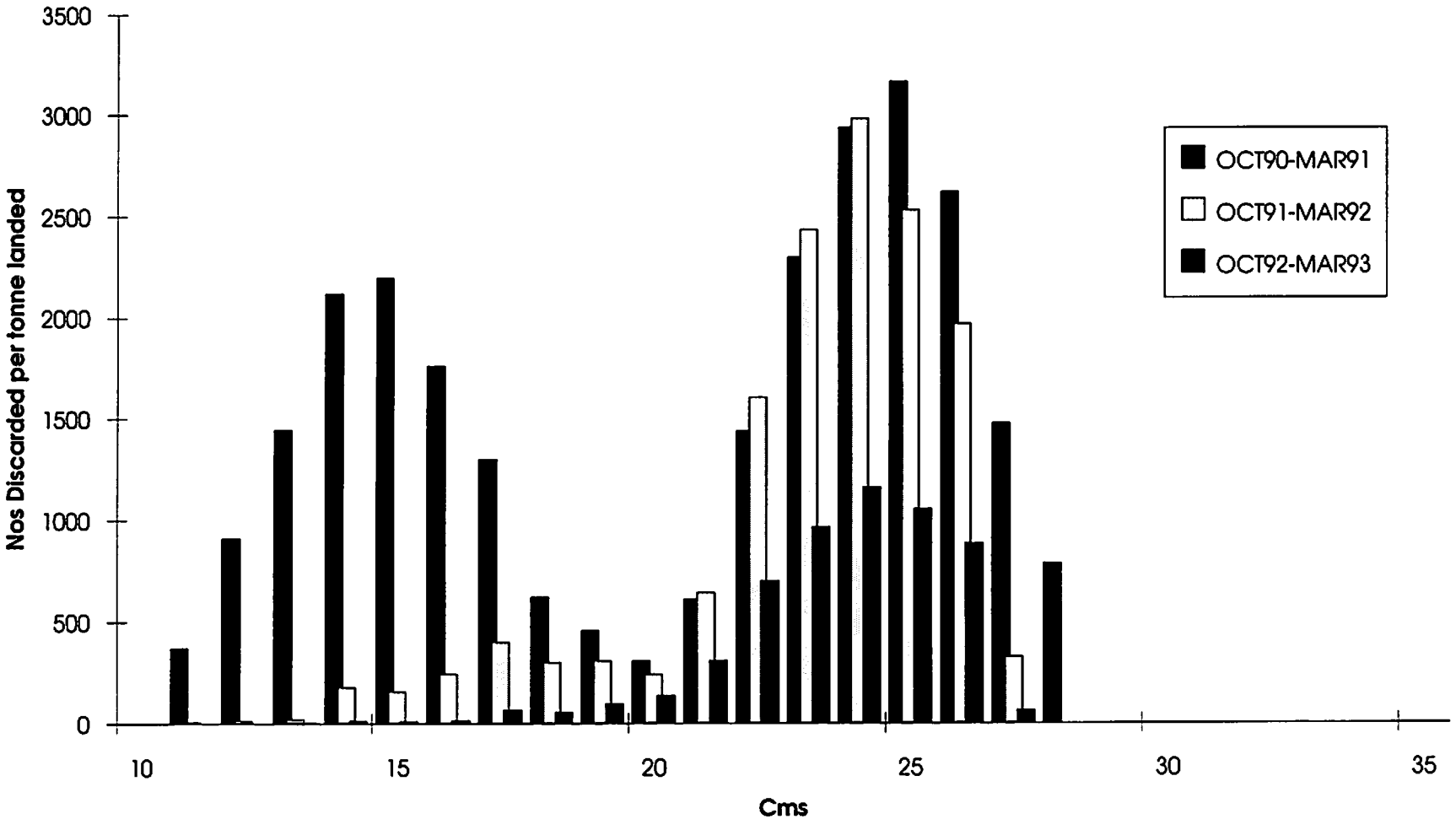


FIGURE 3

COMPARISON OF COD DISCARDED USING DEMERSAL TRAWL

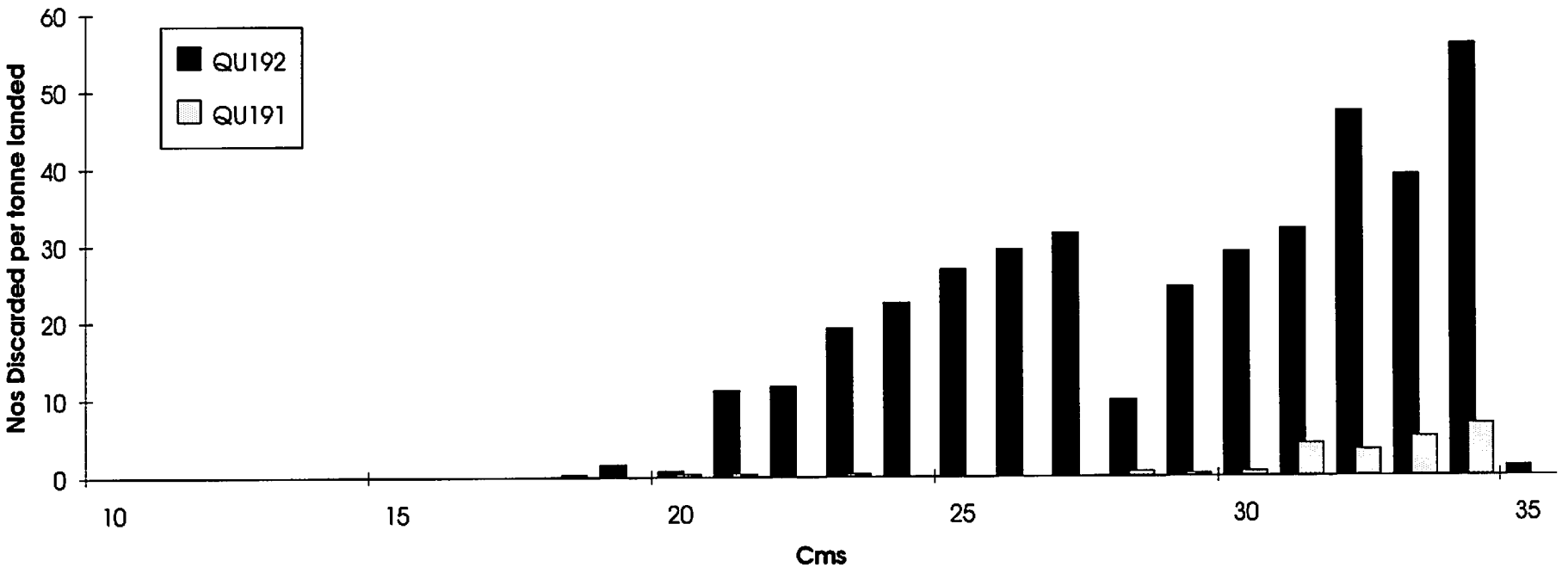


FIGURE 4

COMPARISON OF HAD DISCARDED USING DEMERSAL TRAWL

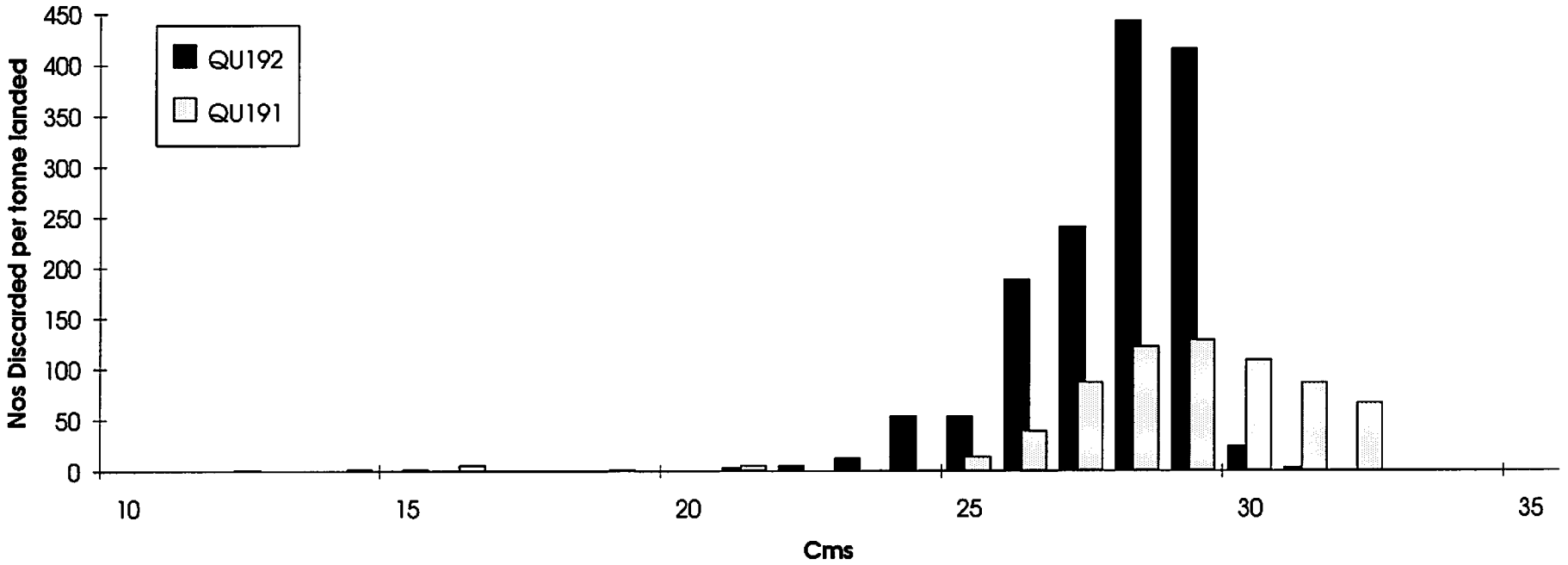


FIGURE 5

COMPARISON OF WHG DISCARDED USING DEMERSAL TRAWL

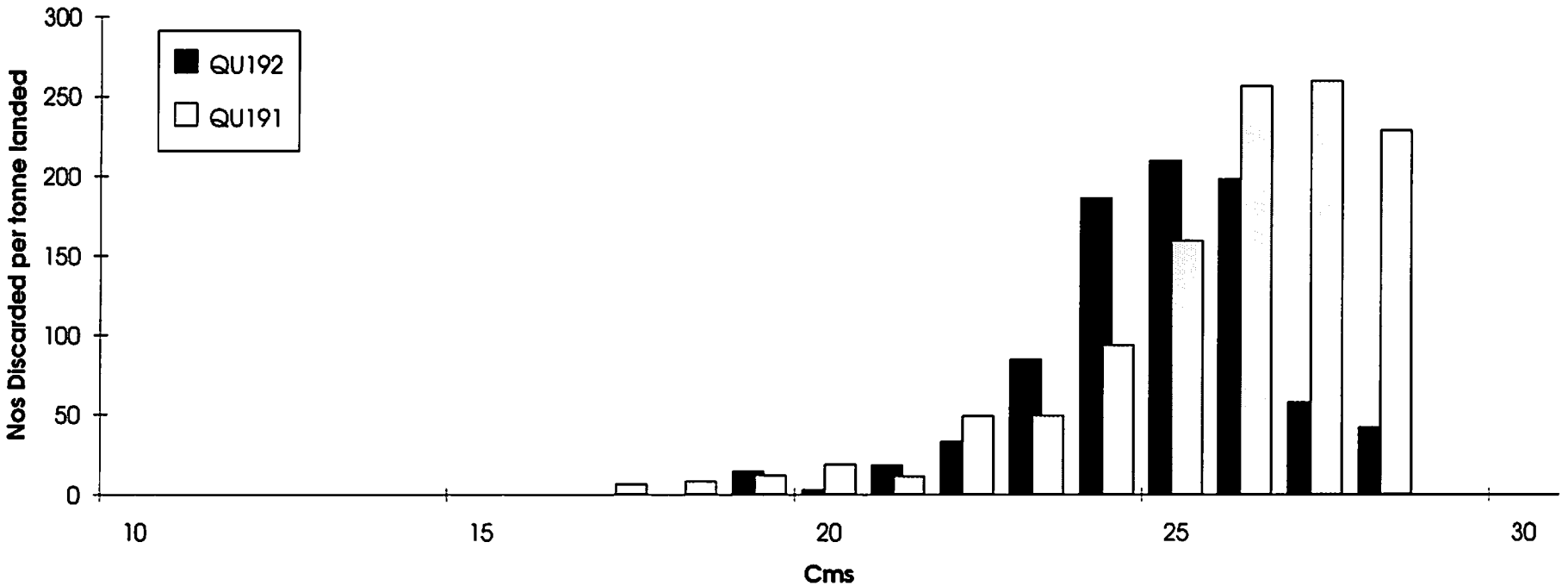


FIGURE 6

COMPARISON OF COD DISCARDED USING DEMERSAL TRAWL

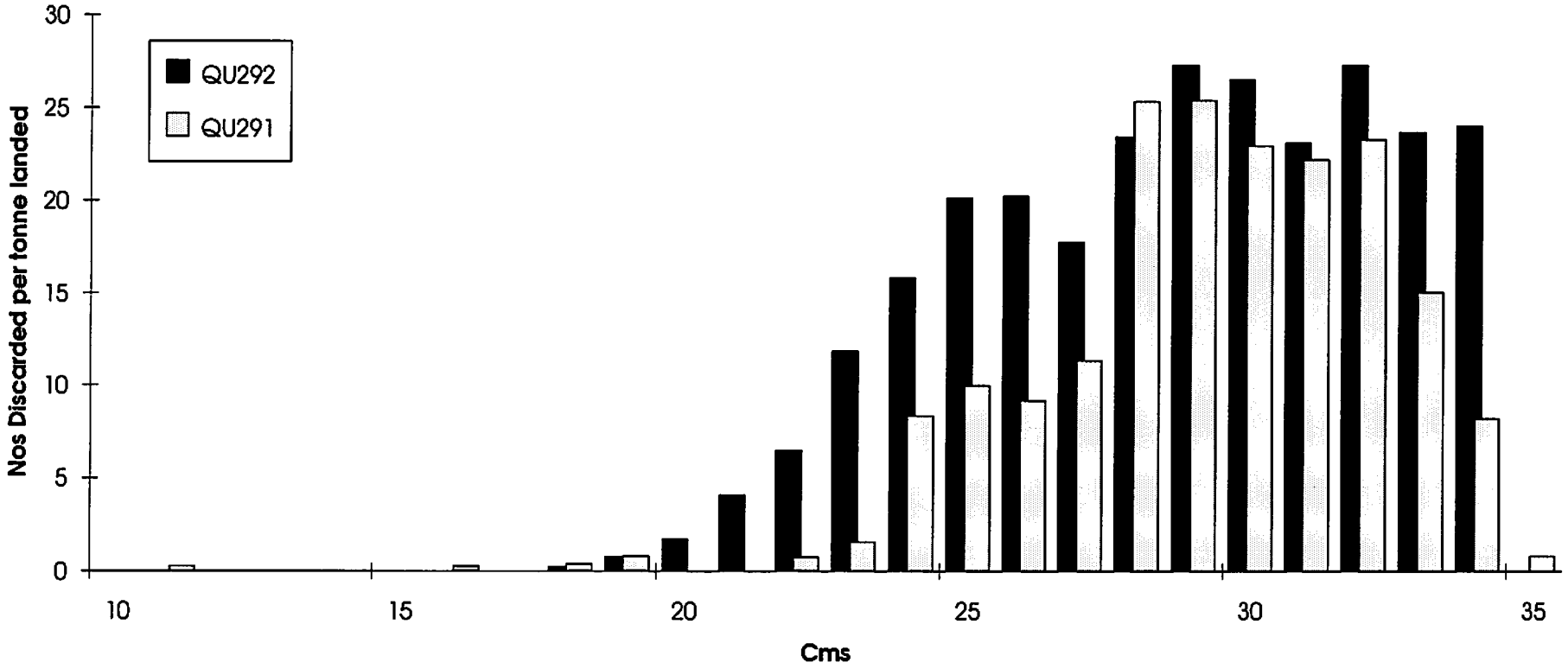


FIGURE 7

COMPARISON OF HAD DISCARDED USING DEMERSAL TRAWL

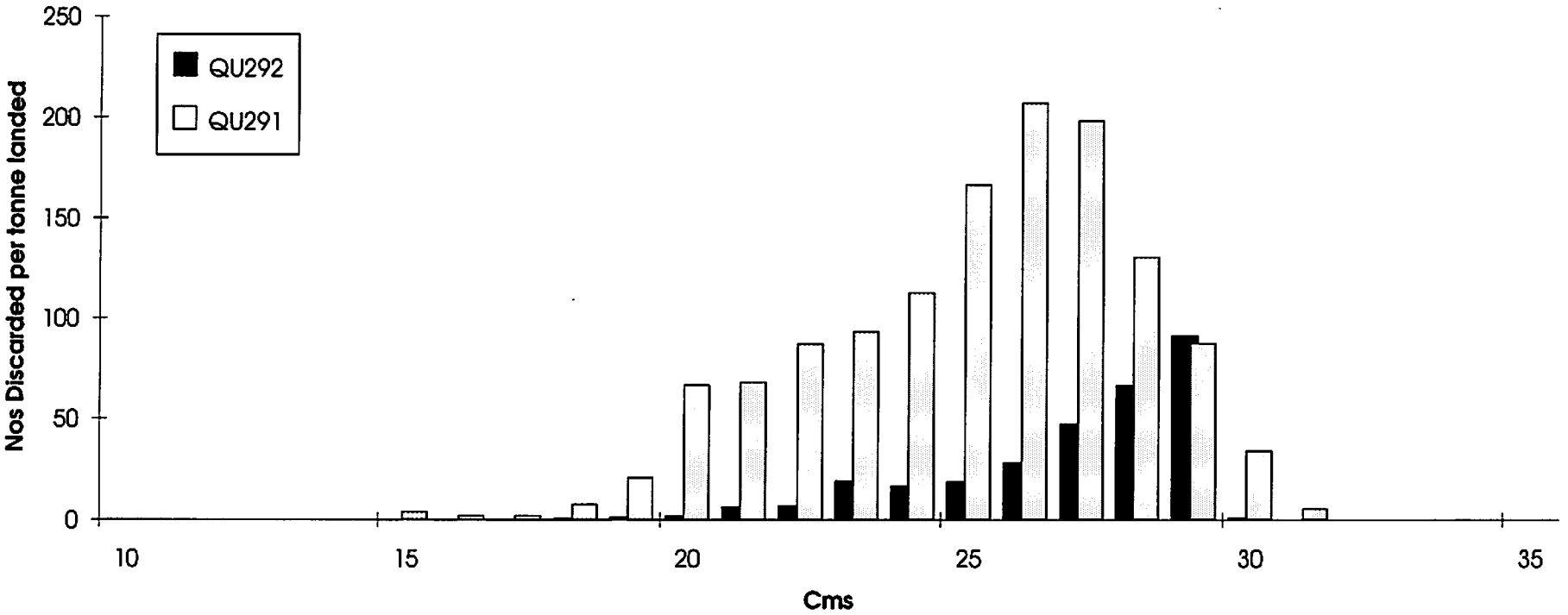


FIGURE 8

COMPARISON OF WHG DISCARDED USING DEMERSAL TRAWL

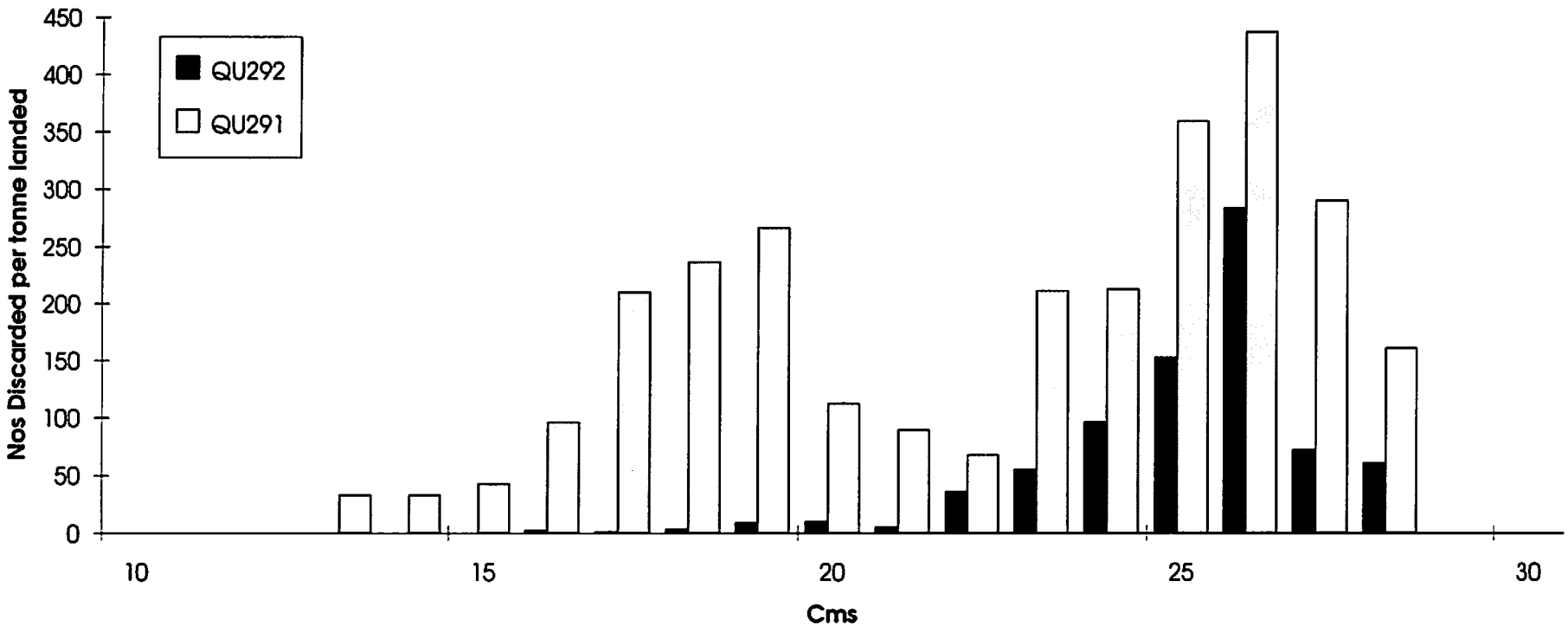


FIGURE 9

COMPARISON OF COD DISCARDED USING DEMERSAL TRAWL

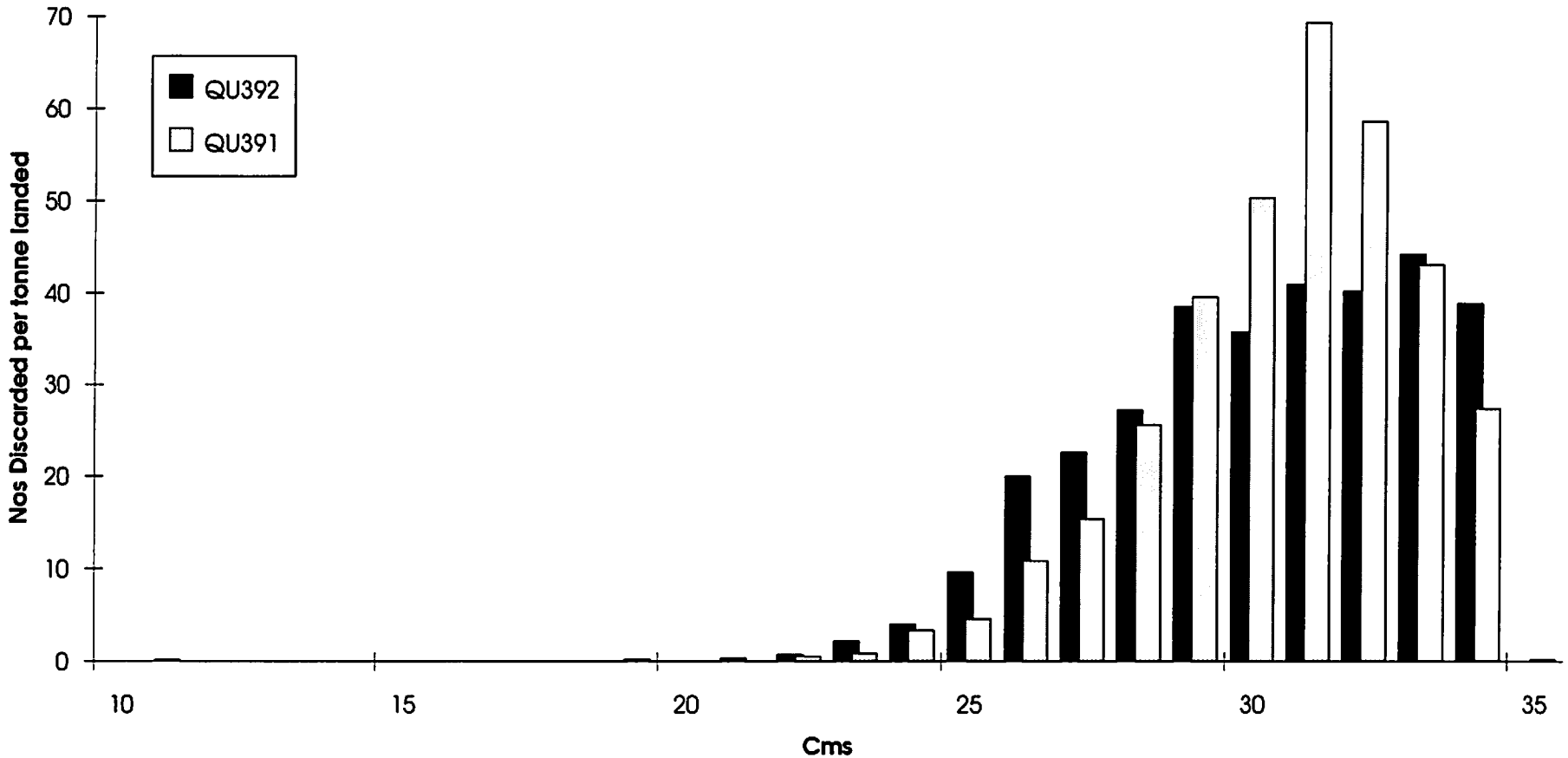


FIGURE 10

COMPARISON OF HAD DISCARDED USING DEMERSAL TRAWL

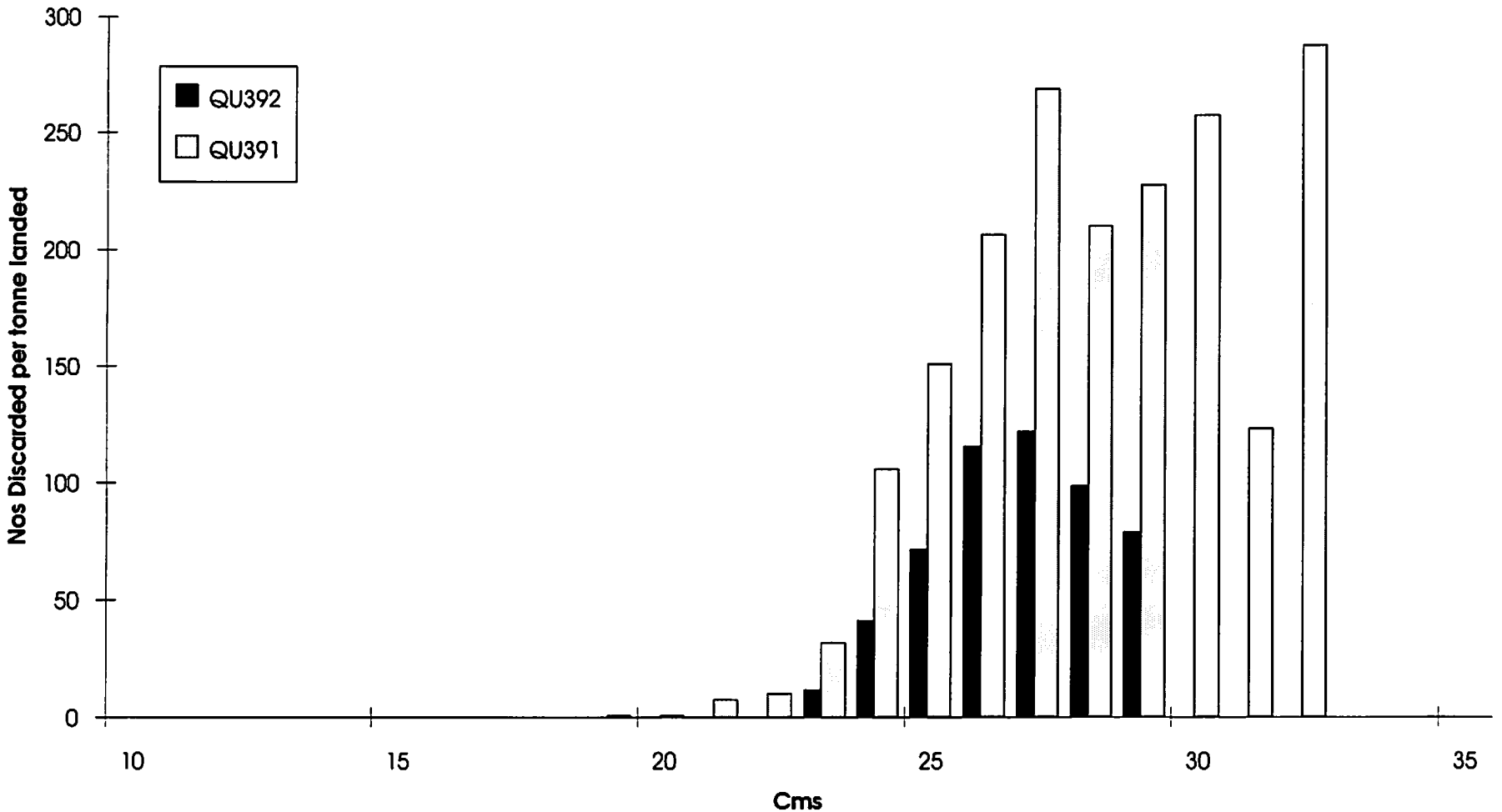


FIGURE 11

COMPARISON OF COD DISCARDED USING DEMERSAL TRAWL

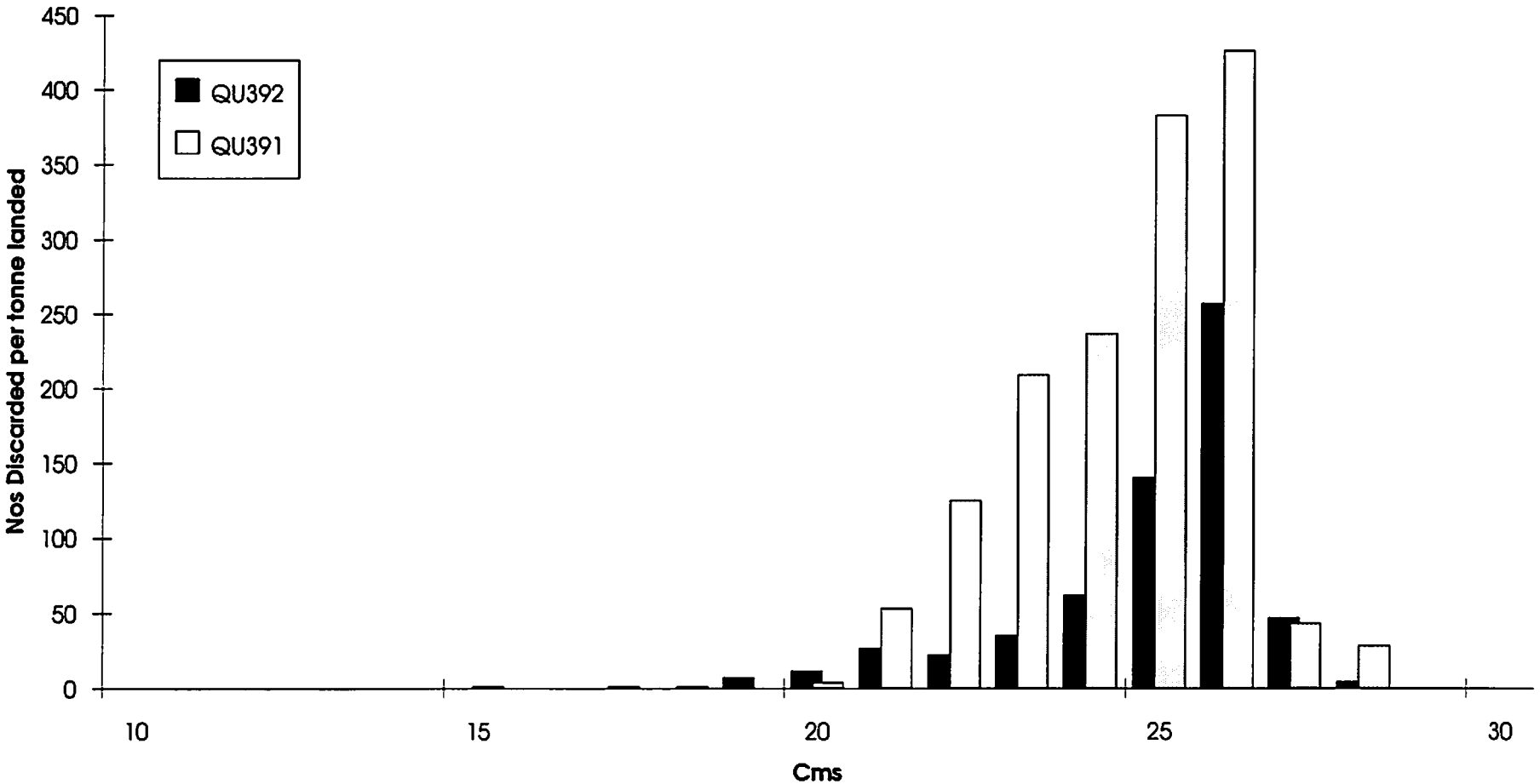


FIGURE 12

COMPARISON OF COD DISCARDED USING A NETHROP TRAWL IN THE 1st QUARTER 1992

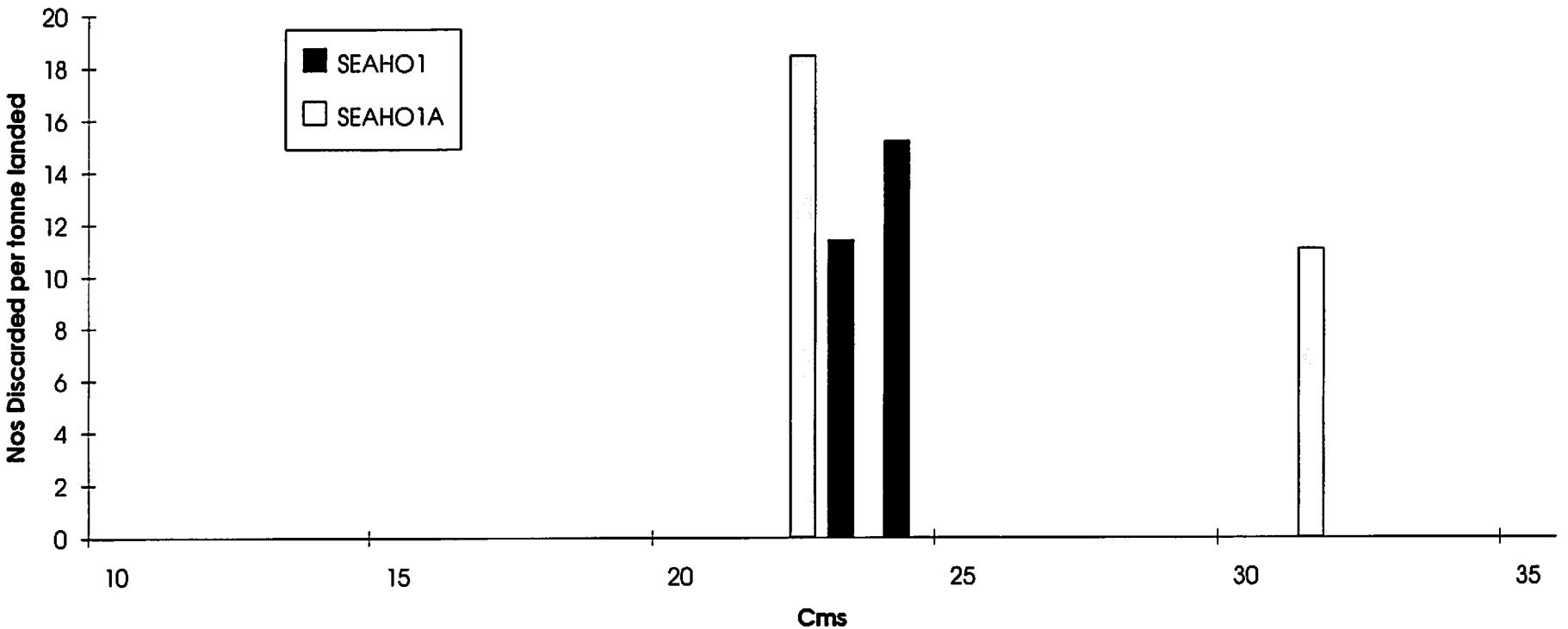


FIGURE 13

COMPARISON OF HAD DISCARDED USING A NEPHROP TRAWL IN THE 1st QUARTER 1992

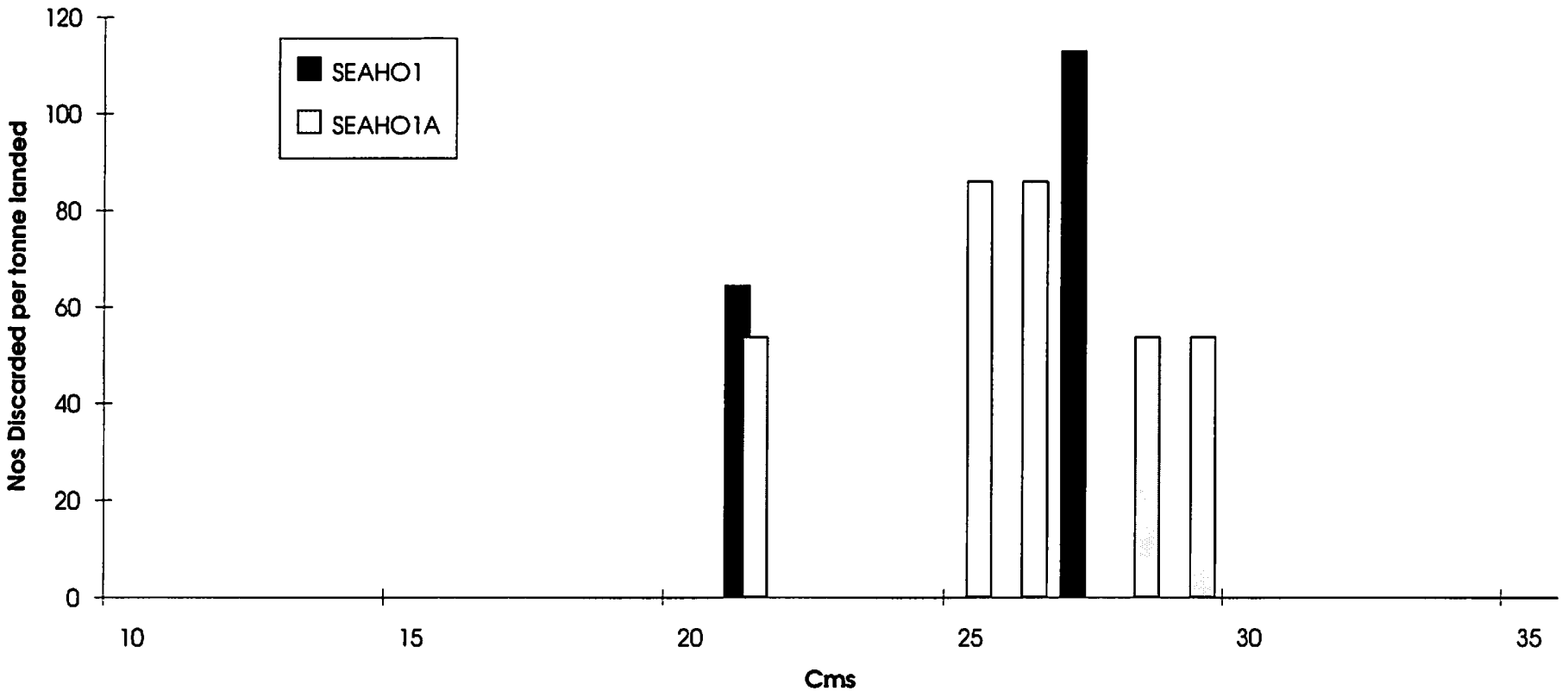


FIGURE 14

COMPARISON OF WHG DISCARDED USING A NEPHROP TRAWL IN THE 1st QUARTER 1992

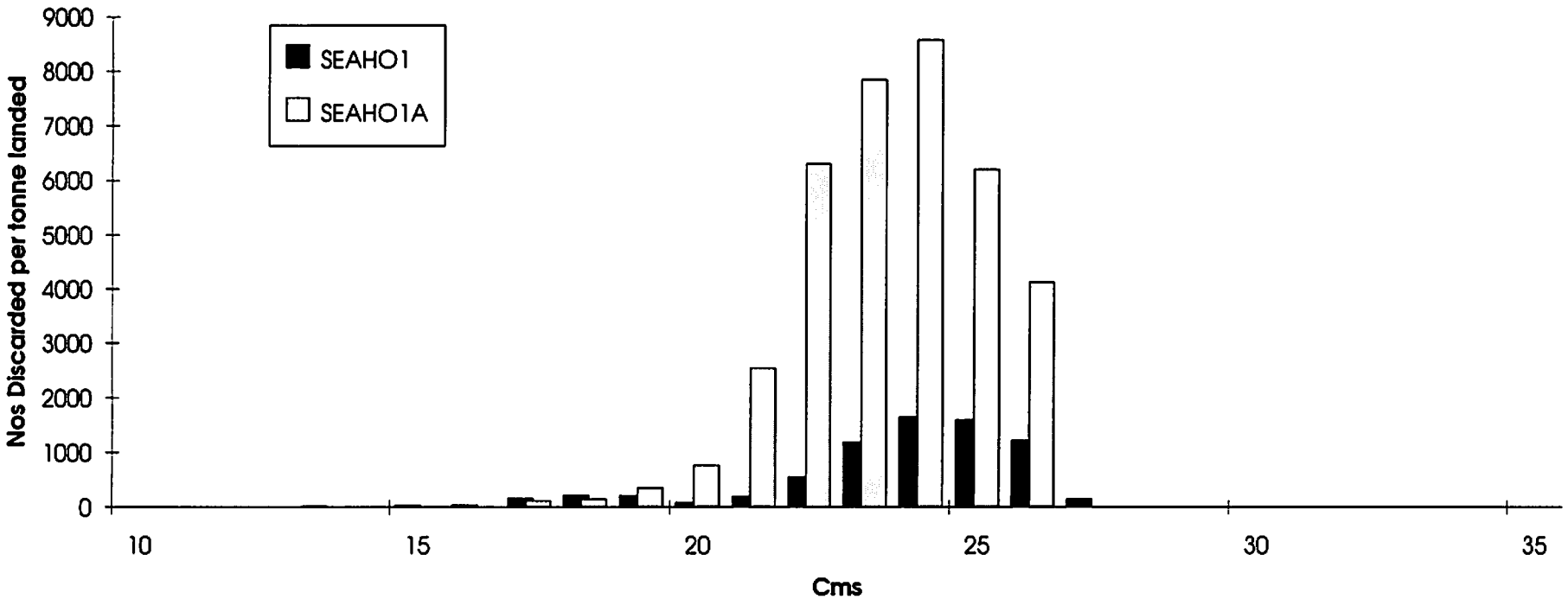


FIGURE 15

COMPARISON OF COD DISCARDED USING DEMERSAL TRAWL

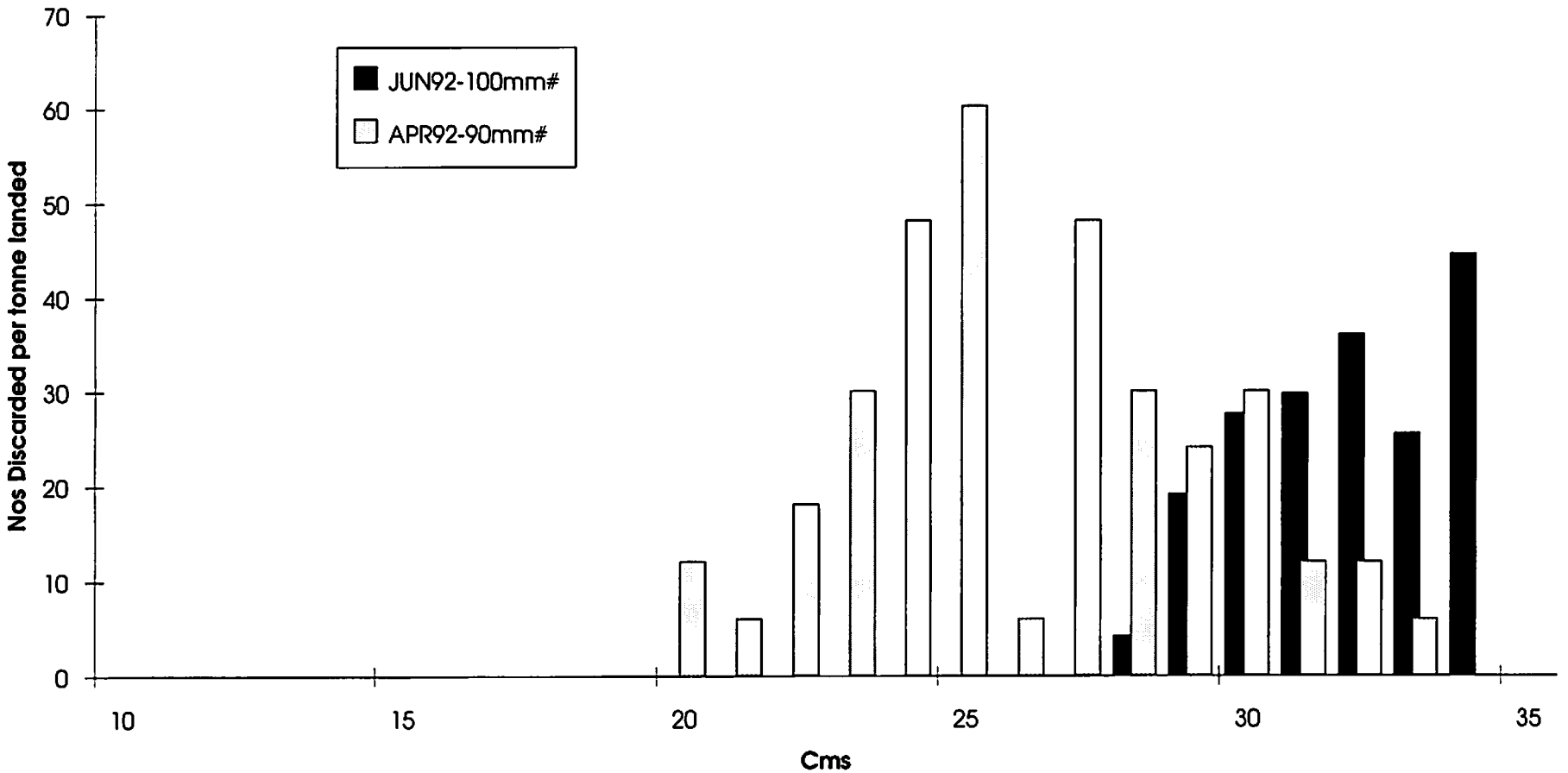


FIGURE 16

COMPARISON OF HAD DISCARDED USING DEMERSAL TRAWL

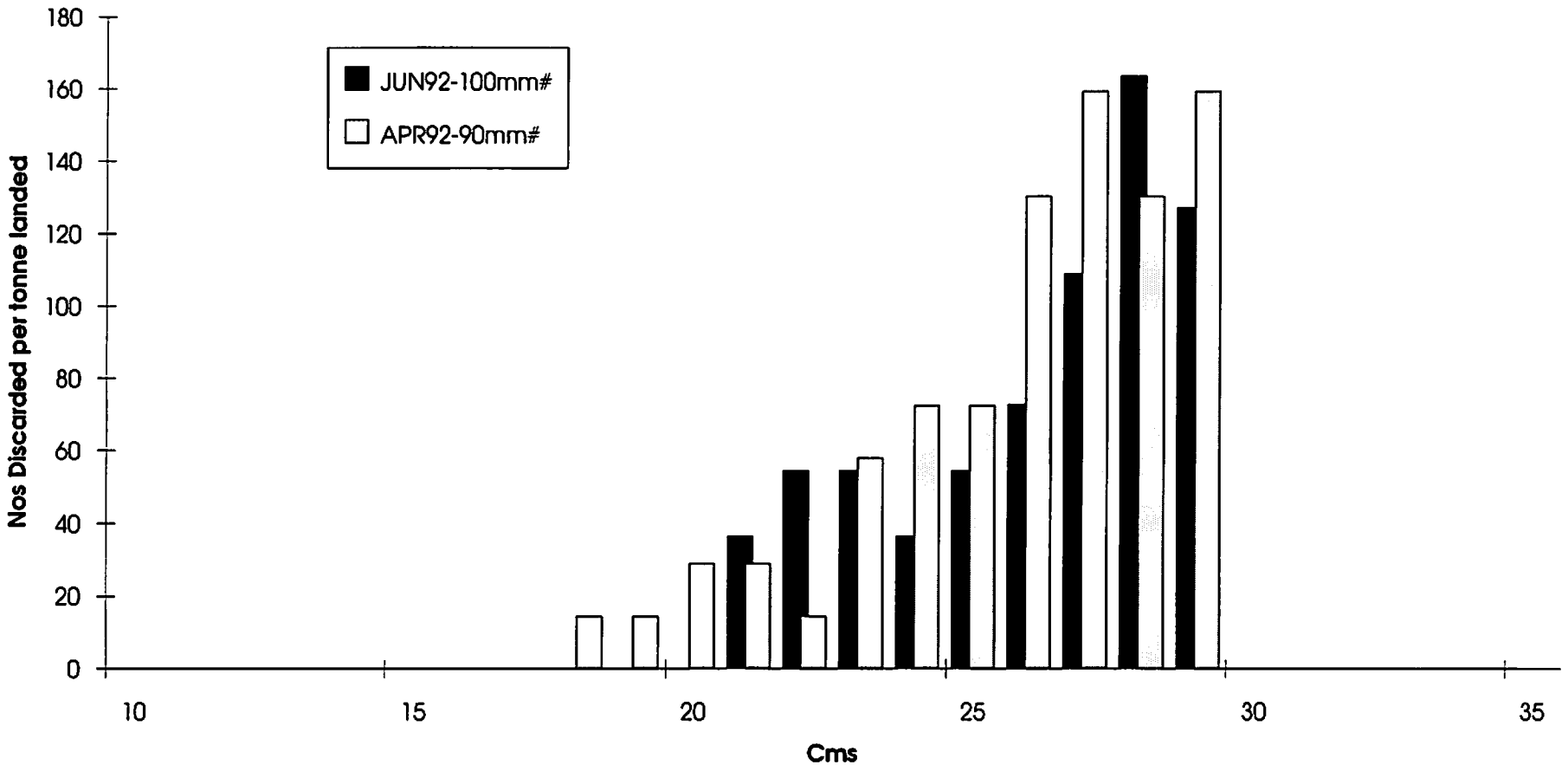


FIGURE 17

COMPARISON OF WHG DISCARDED USING DEMERSAL TRAWL

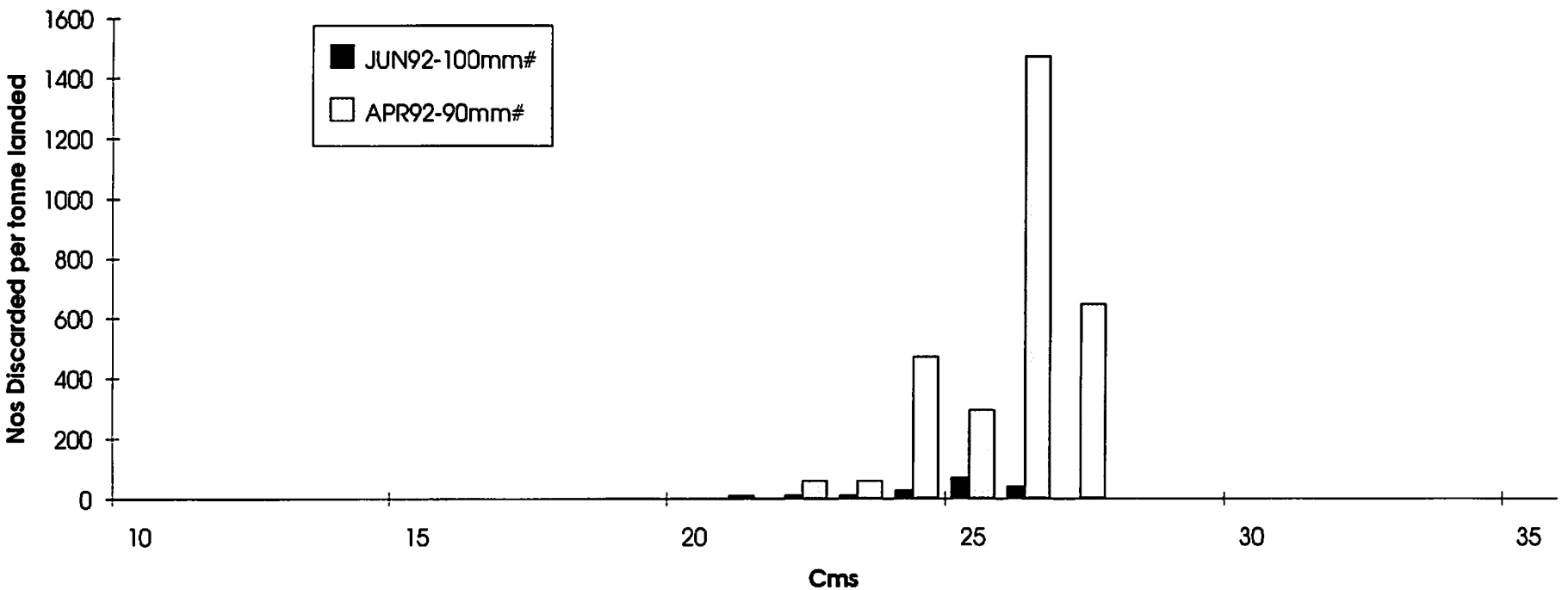


FIGURE 18

COMPARISON OF COD DISCARDED USING DEMERSAL TRAWL

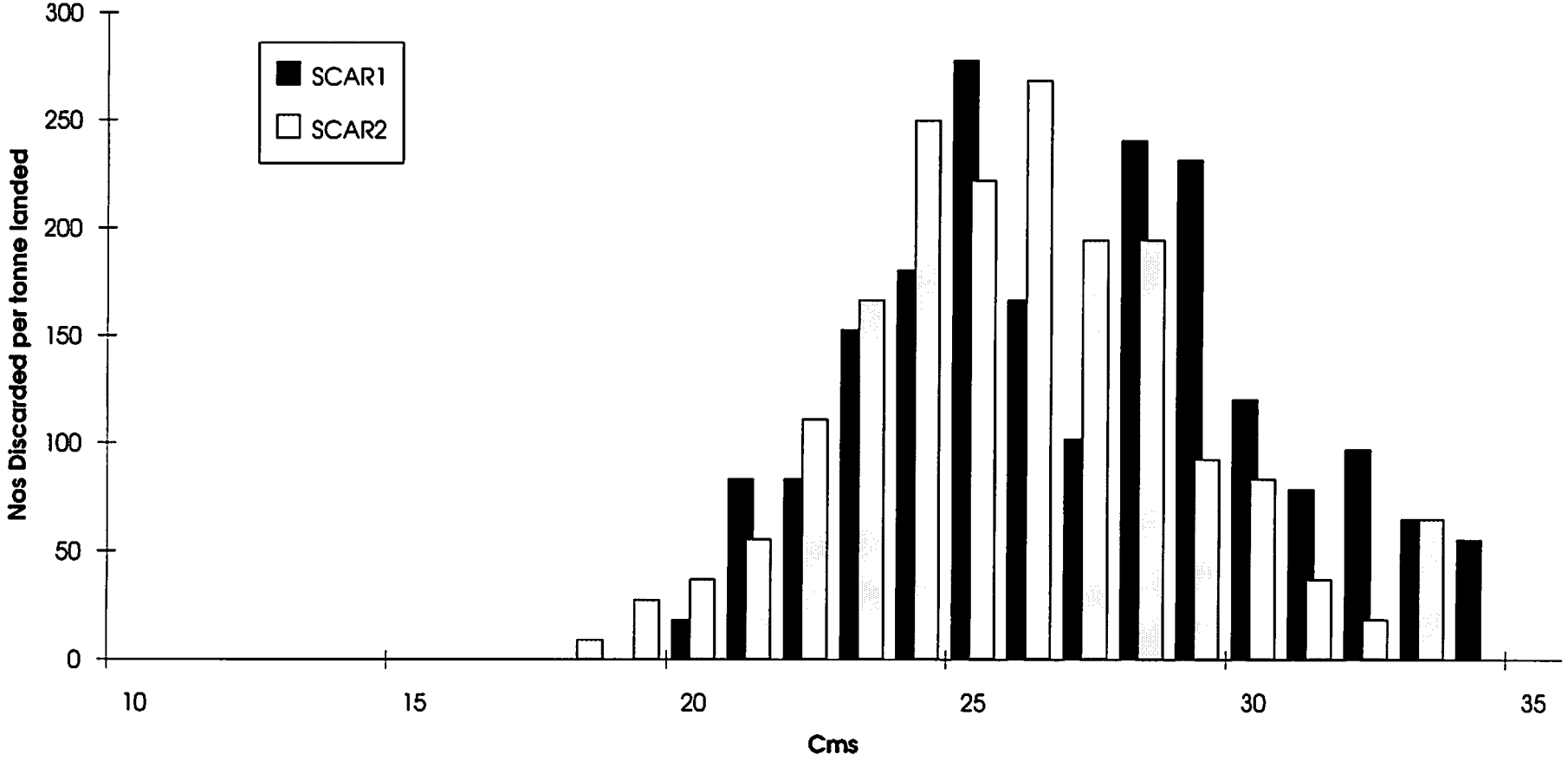


FIGURE 19

COMPARISON OF HAD DISCARDED USING DEMERSAL TRAWL

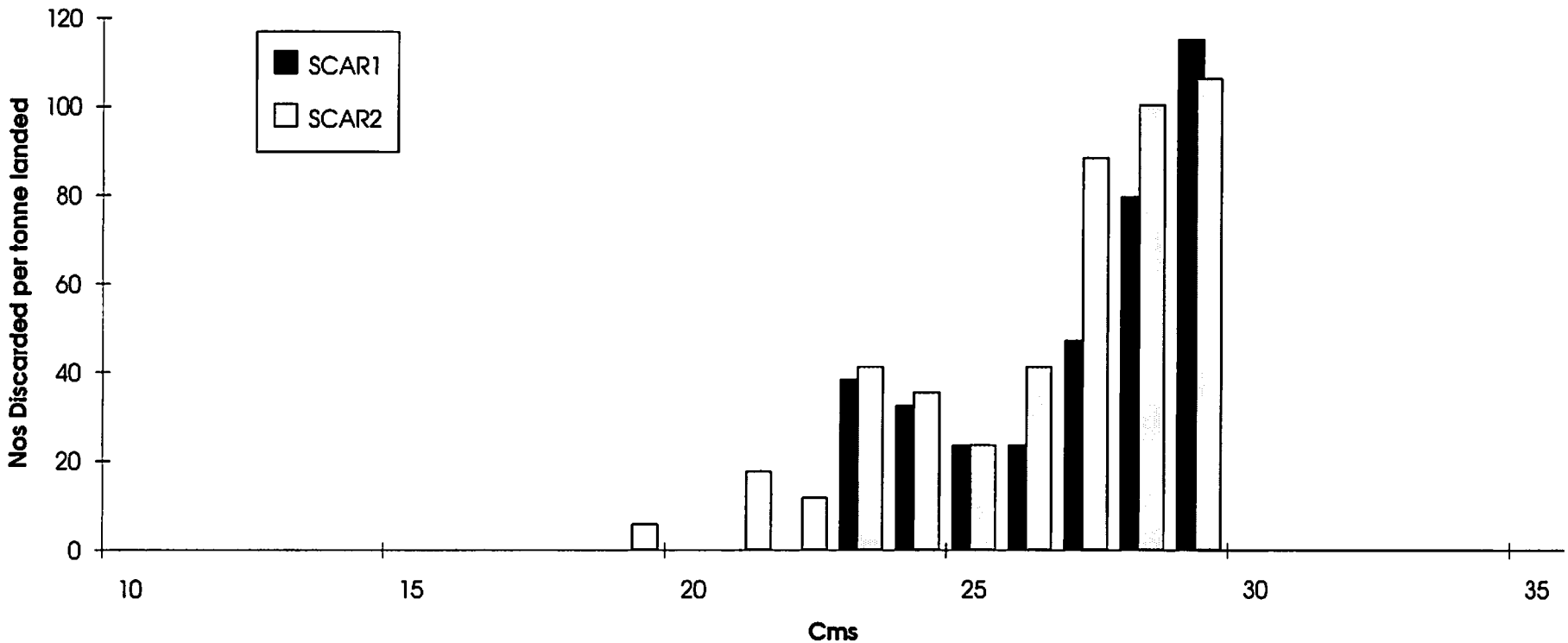


FIGURE 20

COMPARISON OF WHG DISCARDED USING DEMERSAL TRAWL

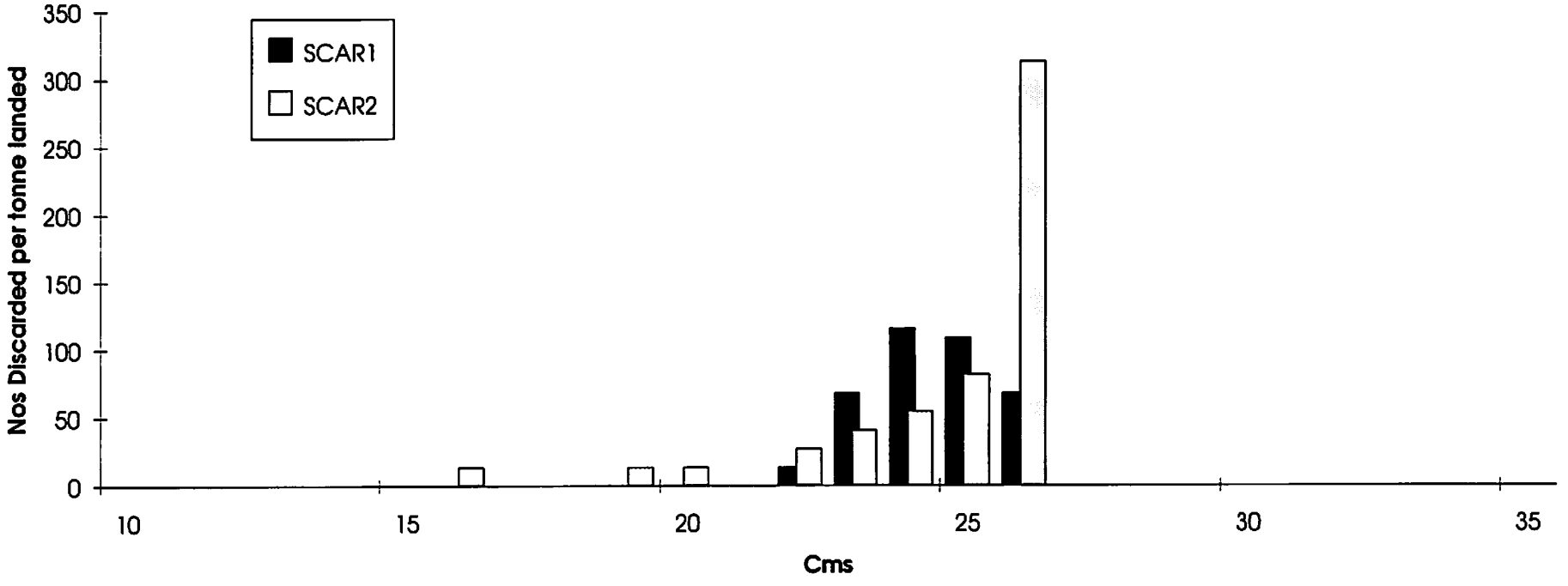


FIGURE 21

ABSOLUTE DISCARD RATES
PER HAUL FOR SELECTED TRIPS

TRIP	HAUL No.	SHOOT	HAUL	DISC.*	MARKET*	TOTAL*	%DIS**	MEAN	STD	COEFF OF VAR
WY110mm	1	1100	1500	0,5	5,5	6	8	6,53	1,79	27,35
	2	1545	2005	0,5	8,5	9	6			
	3	2030	0145	0,5	6	6,5	8			
	4	0210	0645	0,5	6	6,5	8			
	5	0730	1200	0,5	6	6,5	8			
	6	1230	1700	0,5	7	7,5	7			
	7	1720	2230	0,25	7	7,25	3			
	8	2300	0340	0,5	6	6,5	8			
	9	0400	0730	0,25	6	6,25	4			
SC90mm	1	0650	1010	5	5	10	50	MEAN	STD	COEFF OF VAR
	2	1040	1430	3	4	7	43	35,18	10,22	29,06
	3	1530	1930	4	7	11	36			
	4	2030	0030	3	9	12	25			
	5	0100	0430	2	4	6	33			
	6	0530	1000	2	6,5	8,5	24			
BRID90mm	2	1500	2000	4	9	13	31	MEAN	STD	COEFF OF VAR
	4	0400	0830	3	5	8	38	30,59	8,88	29,04
	5	1040	1515	4	5	9	44			
	6	1600	2100	3	8	11	27			
	7	2130	0230	3	9	12	25			
	8	0310	0815	2	6	8	25			
	9	0900	1400	8	11	19	42			
	10	1530	2030	2	6	8	25			
	11	2120	0220	1	4,5	5,5	18			

** RATE IS CALCULATED AS FOLLOWS: DISCARDS/DISCARDS+MARKETABLE

* FIGURES SHOW No. OF 5 STONE BASKETS (ESTIMATED)

Table 51

North Sea Year Classes (Millions)
Source: CM 1993/Assess:5 (ICES)

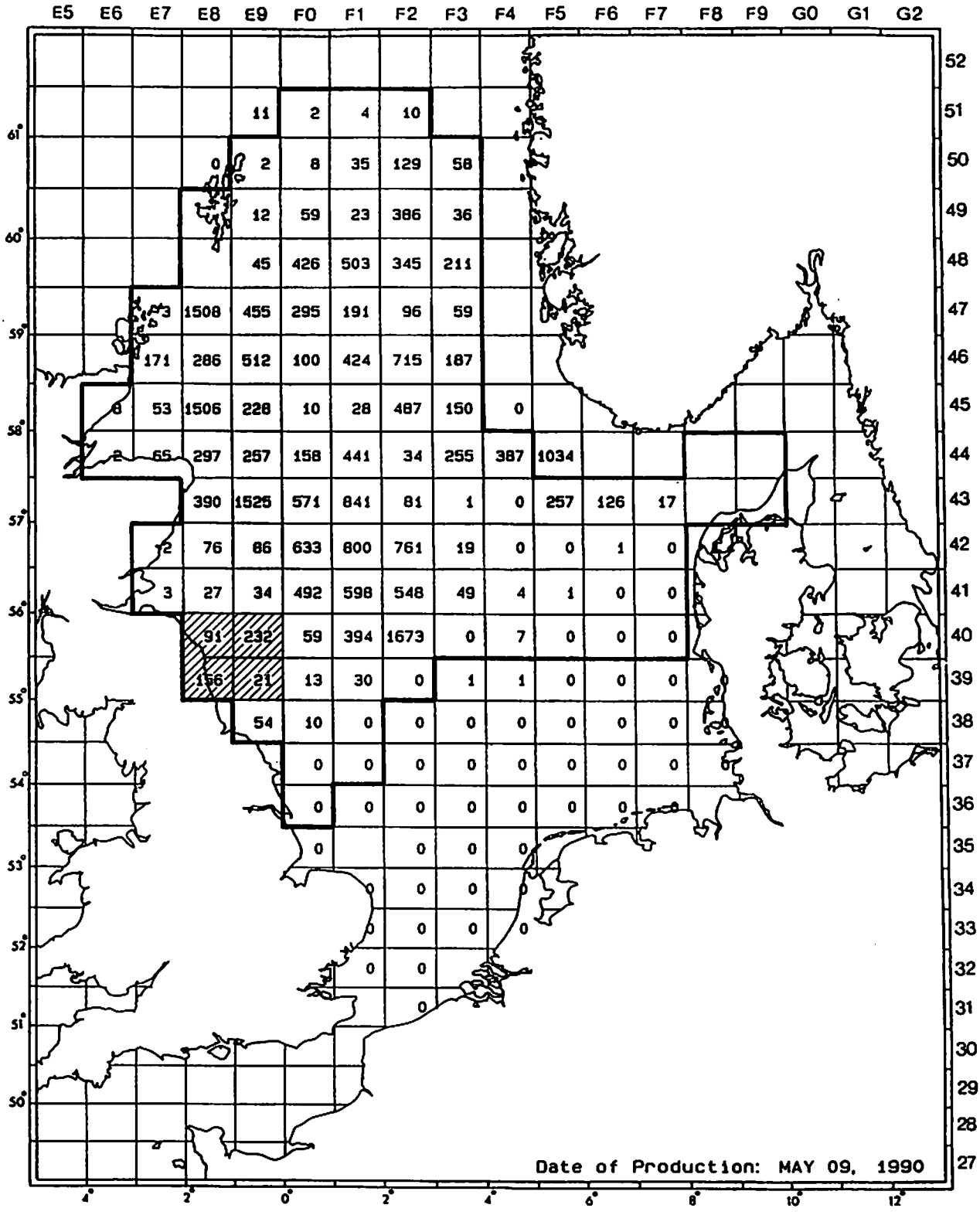
	Cod	Haddock	Whiting
Year Class	Age 1	Age 0	Age 0
1989	137	8351	38134
1990	155	33509	45240
1991	342	66763	43856
1992	176	56699	38104
Average (1)	265	19732	33860
Average (2)	346	34637	45848

(1) Recent Average

(2) 20 Year Average

International Young Fish Survey 1990

Source: ICES



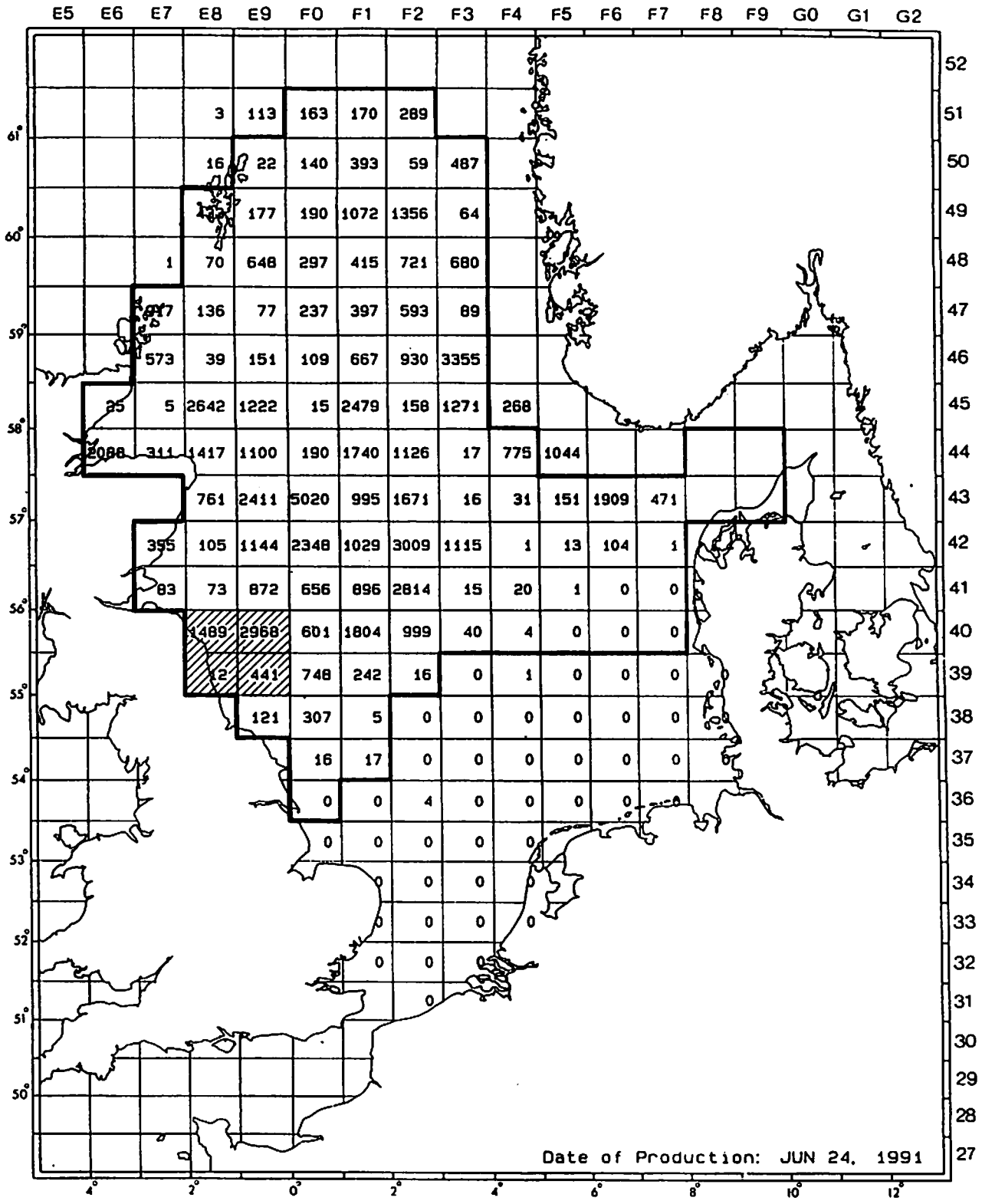
Haddock, MELA AEG

Number per Hour per Haul, Age Group 1

Figure 22

International Young Fish Survey 1991

Source: ICES



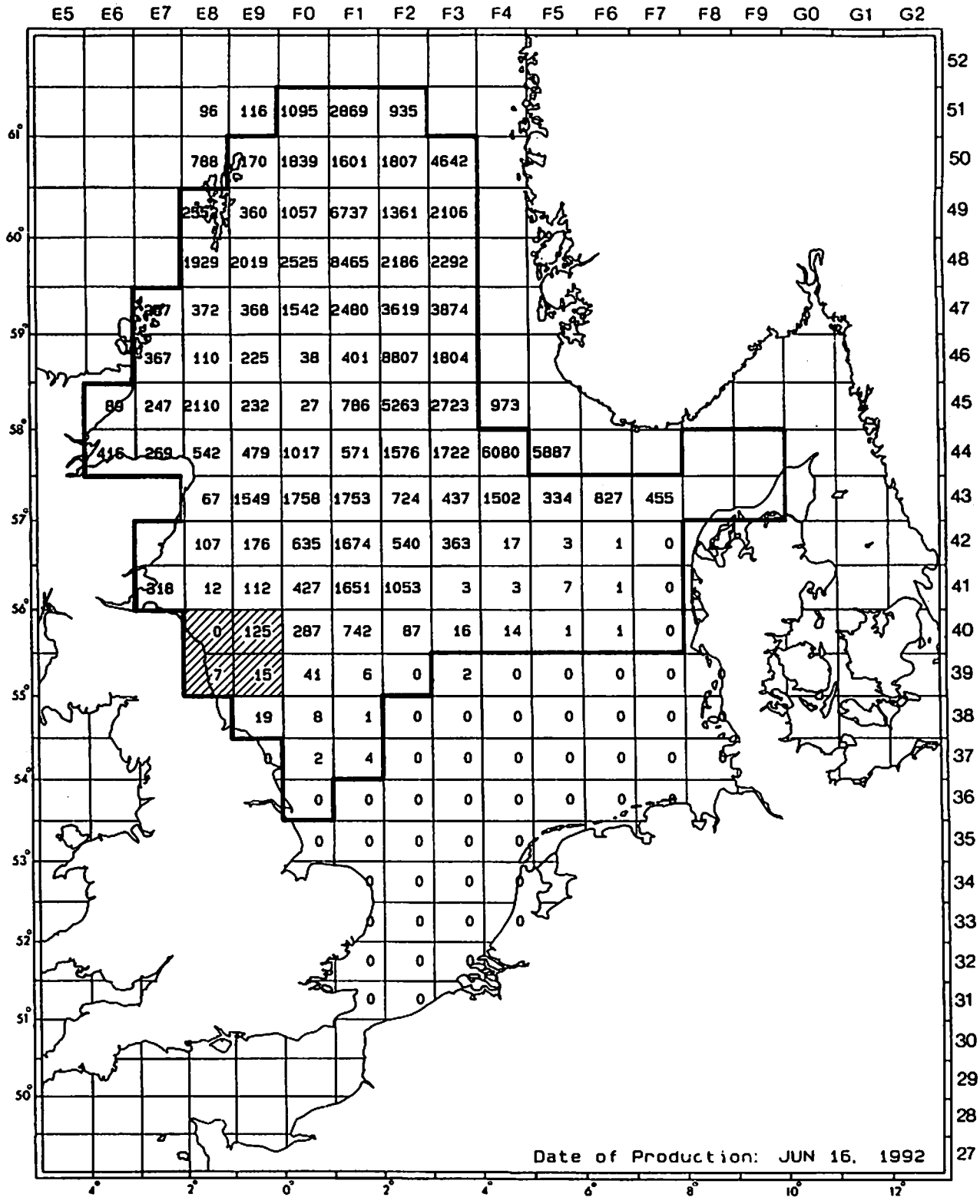
Haddock, MELA AEG

Number per Hour, Age Group 1

Figure 23

International Young Fish Survey 1992

Source: ICES



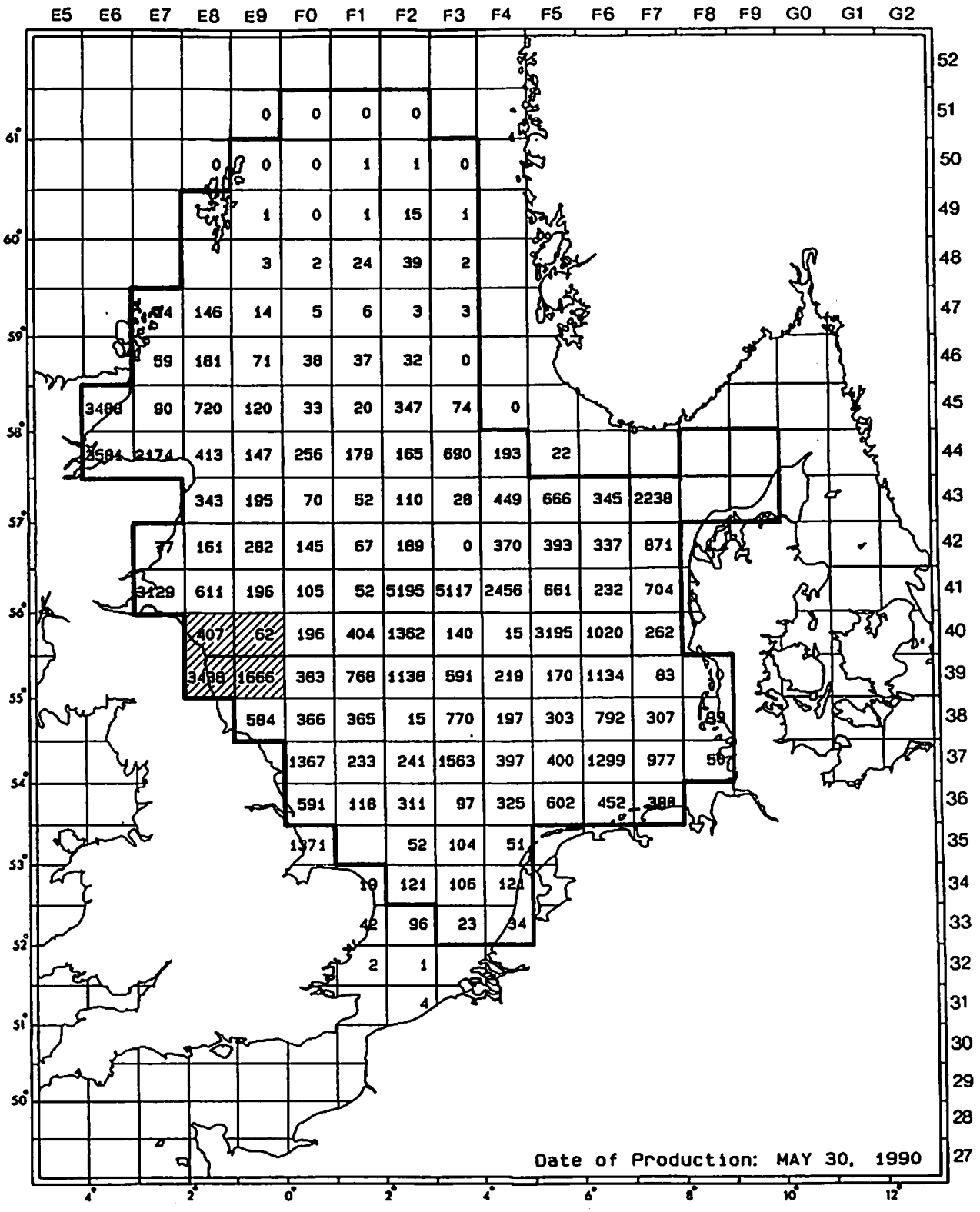
Haddock, MELA AEG

Number per Hour, Age Group 1

Figure 24

International Young Fish Survey 1990

Source: ICES



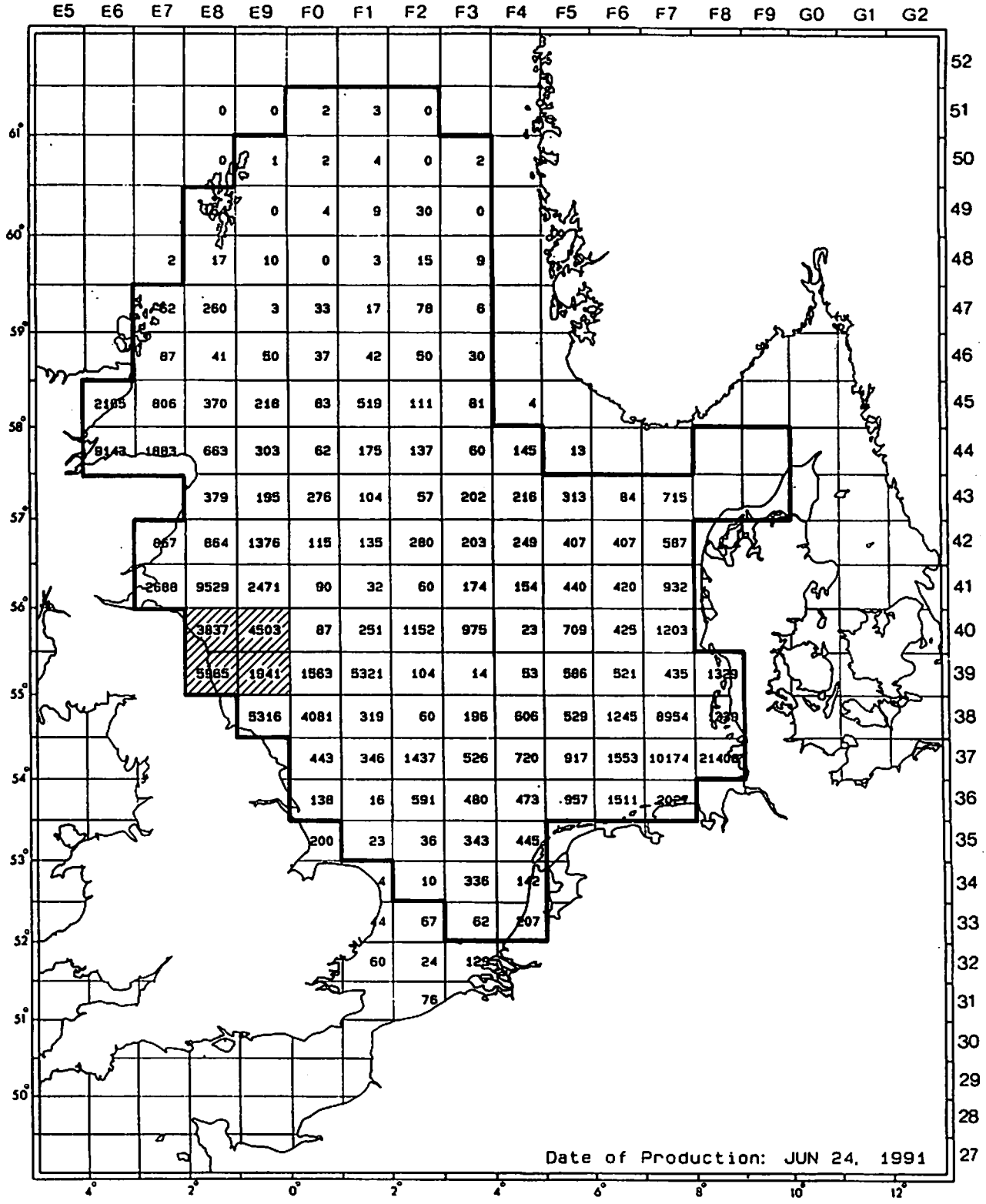
Whiting, MERL MNG

Number per Hour per Haul, Age Group 1

Figure 25

International Young Fish Survey 1991

Source: ICES



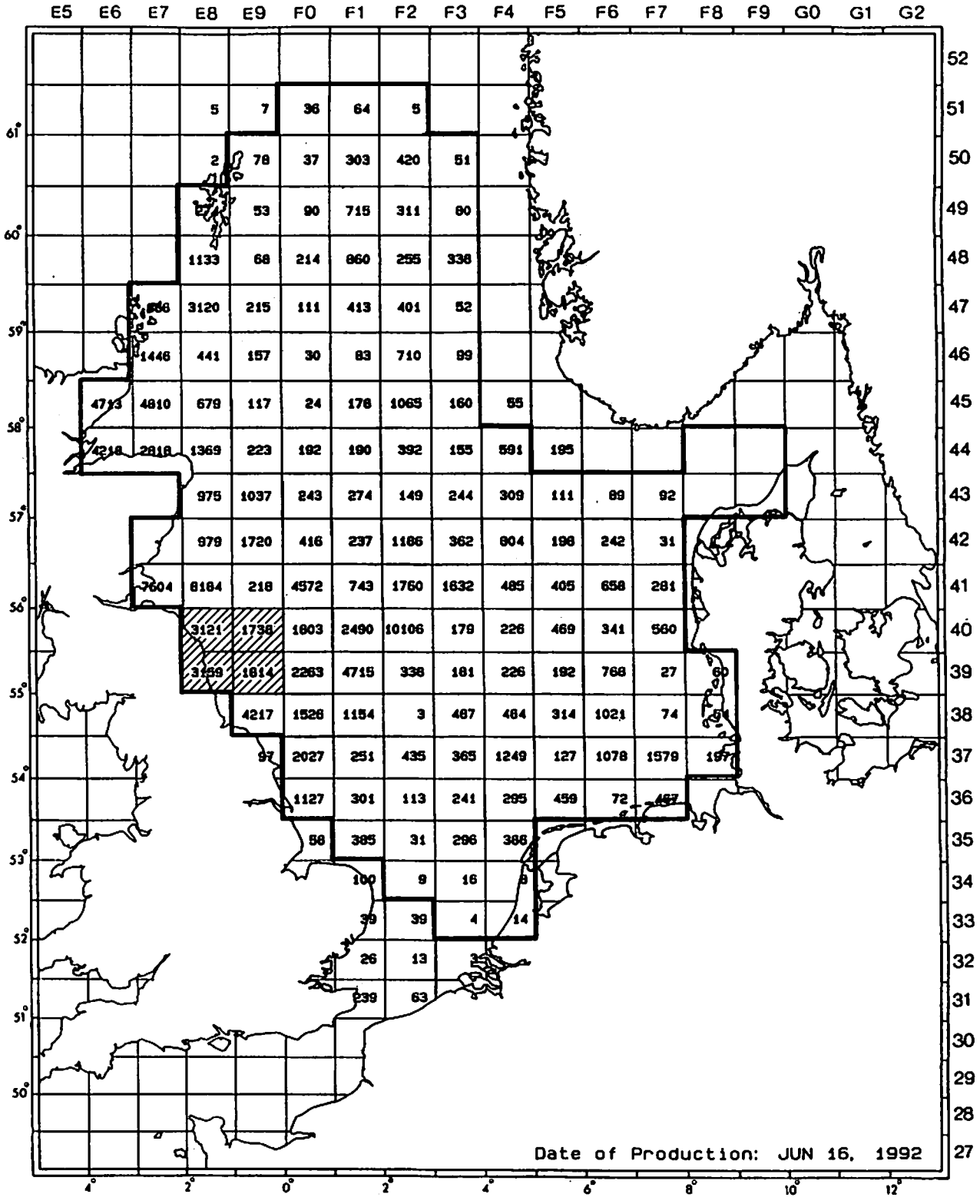
Whiting, MERL MNG

Number per Hour, Age Group 1

Figure 26

International Young Fish Survey 1992

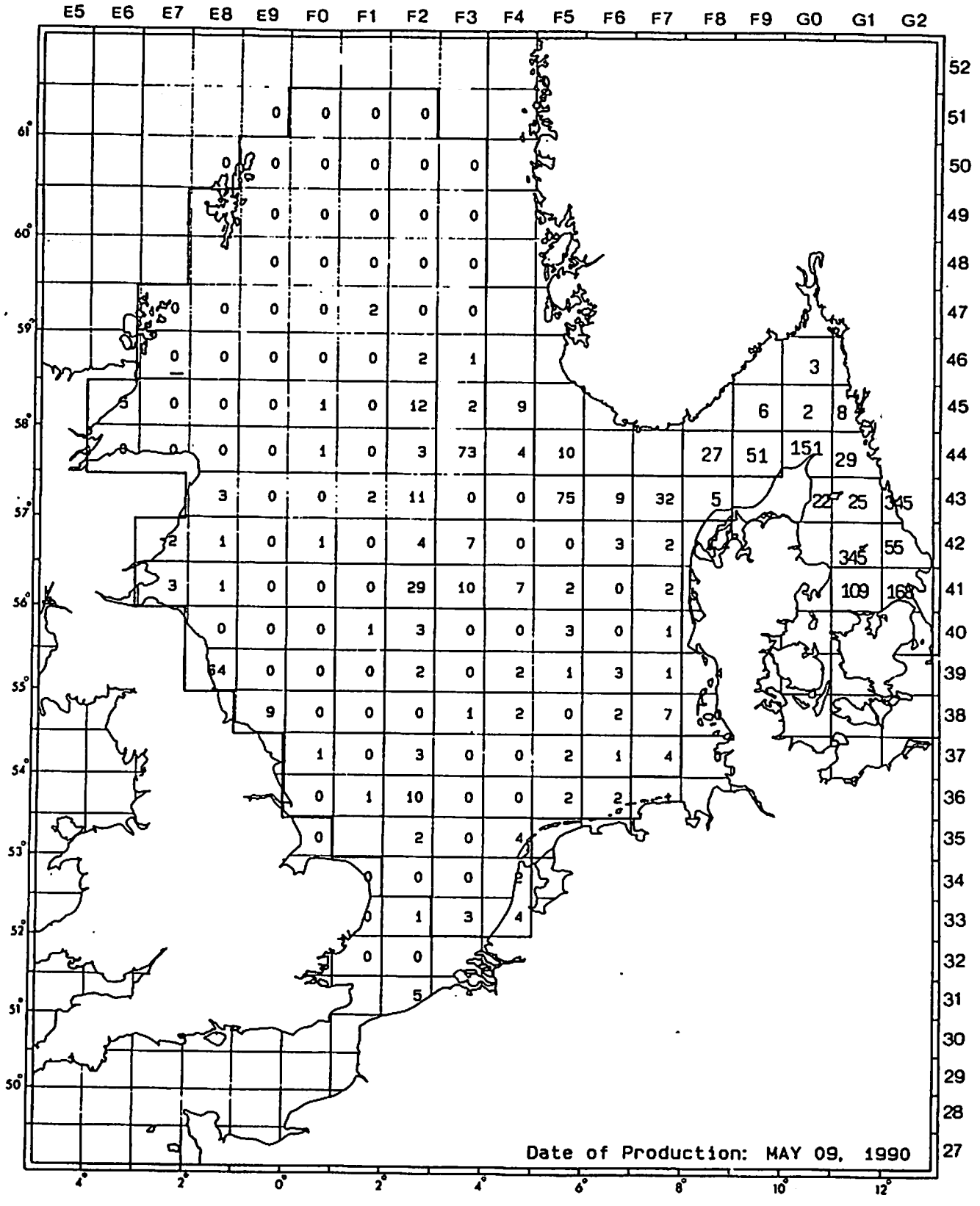
Source: ICES



Whiting, MERL MNG

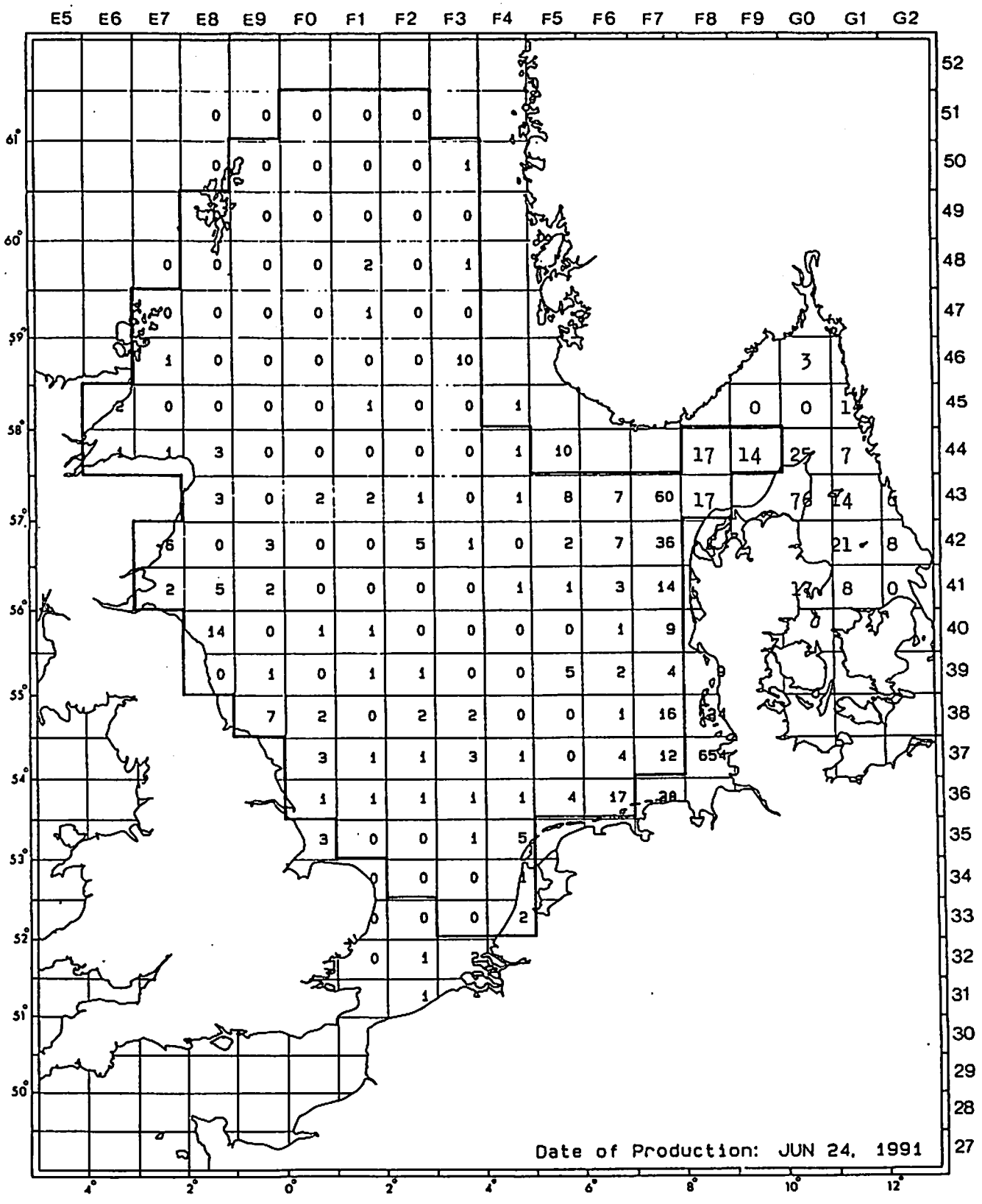
Number per Hour, Age Group 1

Figure 27



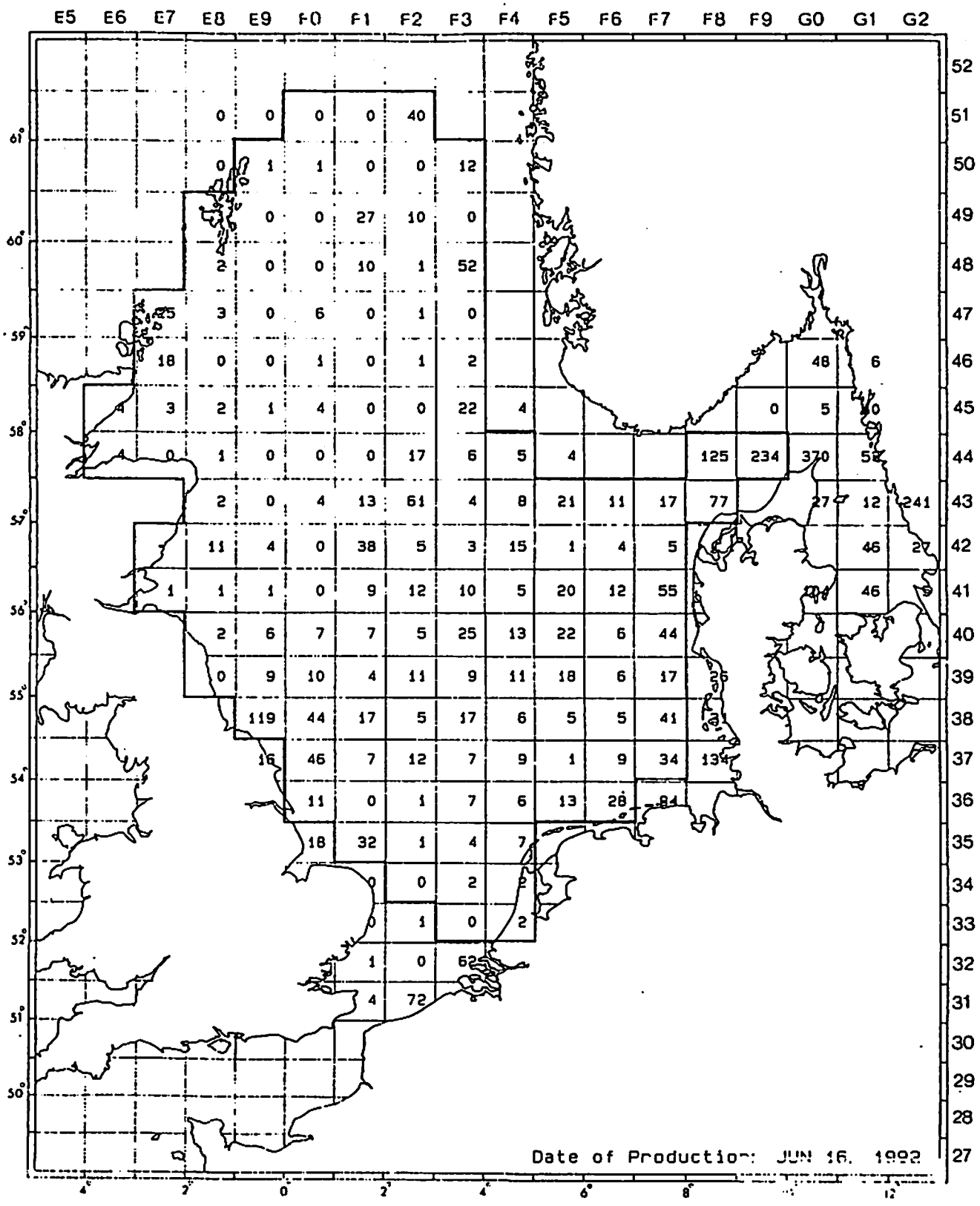
Cod, GADU MOR
Number per Hour, Age Group 1

Figure 28



Cod, GADU MOR
Number per Hour, Age Group 1

Figure 29



Cod, GADU MOR
Number per Hour, Age Group 1

Figure 30