MAFF funded English Channel Discard Study

Interim Report 1st Quarter Jan-March 1995

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1 Introduction

In January 1995 the MAFF funded effort survey and discard study in UK towed gear metiers in the English Channel (ICES Areas VIId and VIIe) was initiated. This was to be carried out for 1 year in the first instance.

This report outlines the methodology used to weight the sampling effort and describes preliminary results from the effort survey and the first quarter's sampling. An outline of proposed further analysis is discussed.

2 Objectives

The objectives of this quarter's work were to:

i) Gather information through questionnaires on the subfleets/metiers and their levels of activity.

ii) Calculate the weighting of sampling effort required for each metier.

iii) Further examine the characteristics of the sampling technique devised in the previous study and assess its suitability for use in the Channel fisheries.

iv) Gather data on discards stratified by metier.

v) Provide a preliminary analysis of the first quarter's data.

3 Methods

3.1 Effort Survey

Questionnaires were designed so that information from both fishermen and fisheries related organisations could be obtained. Unfilled examples of these are shown in Figures 1 and 2 respectively.

The organisations' questionnaires were sent out prior to the commencement of sampling so that the completed forms could be used to aid in the distribution of sampling effort and manpower. These requested information on fishing effort from the important ports in that area, so that the number of boats targeting a particular species could be identified.

The fishermens' questionaires were designed to provide information on the boats' specifications, which species were targeted and in which months this occcurred. Fishing effort levels for each boat were requested, as was their own estimate of total effort from the port where they were interviewed.

The questionnaires for fisherman were expected to be retrieved by one of three routes:

i)During reconiassance tours of the ports questionaires were distributed, with completed forms to be gathered in again on the next visit to that area.

ii)To be completed during personal interviews with fishermen in port.

iii)To be completed during personal interviews with fishermen whilst the sample officer is on board carrying out a sample trip.

3.2 Sampling Trips

3.2.1 Planning

IFREMER (1992) was used as the main source of information on towed gears metiers in the Channel and their relative importance. From this a sampling strategy which weighted metiers and port areas was devised based on their proportional share of total landings.

The percentage landings by metier were used to apportion the levels of sampling effort in man weeks for the year. This was further divided into number of man weeks sampling/quarter for each metier, as is shown in Table 1.

The sampling effort levels obtained in Table 1 were then split between the important ports in each metier to obtain representative samples. IFREMER (1992) was used to select the main target ports based on the total landings to that port by a particular metier. These ports are shown in Table 2. The targets also had to take into account seasonal fluctuations in fishing activity. The planned sampling strategy can be seen in Table 3 which indicates which metier and port should be targeted and how often for each quarter. (The Channel was divided into 3 port areas Area1; Southwest, Area 2; Southcentre, Area 3; Southeast).

3.2.1 On-board Catch Sampling Method

This was based on the method developed in the Irish Sea Discard Study (Seafish CR99). In order to further investigate the characteristics of this technique and assess its suitabilty for the current work, an intensive study of between sample variation on one trip in the otter trawl west metier was undertaken. Successive samples of the whole catch were taken from every haul using 6 stone fish baskets. The discards and the marketable fish in each sample were measured seperately in order that the between sample variation may be analysed.

4 Results

4.1 Effort Survey

Only 2 questionnaires were returned from organisations, but they contained detailed information. Questionnaires designed for the fishermen were filled in in some numbers (20), but success was found to depend upon the method of distribution;

i) No completed questionnaires were returned for the en mass distribution method. Therefore it was decided to abandon this method of distribution and concentrate on getting good quality information through forms completed in the sampling officers' presence.

ii) The personal interviews with the fishermen whilst they were in port produced completed questionnaires with good quality information. They also provided the initial contacts for arranging sampling trips. Therefore this method was to be continued during periods of poor weather and when opportunities arose.

iii) Completing the questionnaires on board during a sampling trip also provided good quality information and ensured that there were completed questionnaire from all the boats sampled. This method will continue to be used throughout the study.

From the 20 completed questionnaires it was possible to estimate the numbers of boats in the sample in each metier and their mean monthly effort in days at sea. The distribution of effort between named target species by month was also calculated. These results are shown in Figure 3.

Some of the vessels in question are multi-purpose and therefore belong to more than one metier, whereas others may move in and out of the study area and to different ends of the Channel depending on which species they are targeting.

There are considerable seasonal fluctuations in activity between named target species (Figure 3). Effort is directed onto lemon sole in the first quarter of the year particularly by the otter trawlers in the western end of the channel. The effort on cuttlefish increases during the period November- February in the western channel. In the eastern channel the information is less complete; plaice, sole and whiting are named as target species during the first quarter.

These results are therefore only indicative of the activities of the boats in the survey; substantiating information will be gained from further structured interviews. Obtaining reliable information on the number of boats engaged in each metier may require a

different approach because fishermen do not always know the numbers of boats involved in the various activities. Analysis of the organisation questionnaires (Figure 2) would help to elucidate on numbers of vessels involved.

4.2 Catch Survey

4.2.1 Targets and achievements

For the 1st quarter's sampling there were 13 targeted man weeks of sampling, with one man week being taken as one sea trip. From Table 4 though it can be seen that only 8 sea trips were achieved. This was mainly due to the constraints of poor winter weather leading to cancelled trips and through the necessity to establish contacts. Area 2 being less important was not sampled at all. The length of the beam trawler trips in area 1 (up to 10 nights) also reduced the manpower available for other metiers. The discard officers were unable to find any vessels scallop dredging from the ports surveyed this quarter in Area 3.

4.2.2 On-board Sampling Method

The results from the intensive sampling trip designed to examine the characteristics of the techinque, were analysed by Tamsett etal (1995). There was no evidence of differences in the discard rate of lemon soles between the successive samples form the same haul.

These results suggest that the method uesd for sampling the catch avoided bias between the first and last samples. Analyses of the variance components of the levels; samples, hauls and trips indicates there may also be scope for reducing the sample size and increasing the number of hauls sampled. Full details are in Tamsett etal (1995).

4.2.3 Catch Results by Species and Metier

The raised numbers of discard and landings by species for each metier are shown in Tables 5a, b, c, and d. The percentage discard rate by number was also calculated and is shown for each species caught. From these tables, the main species were selected to illustrate discarding practices with length and by metier These are shown in Figures 4a, b, c, d, e, f, g, and h.

4.2.3.1 Lemon Sole (Figure 4a)

The only fishery in which there were substantial numbers of lemon sole sampled was the western otter trawl metier. This coincides with the stated target species during this time of year (figure 3). Discard rates are low in this metier at 6% and are concentrated around the MLS of 25cm. It should be noted that several different mesh sizes were used in the otter trawl metiers. Mesh size differences will be investigated in the final report. In the other three metiers very few fish were sampled but the trend appears to be toward higher discard rates in the eastern metiers (43% for Beam Inshore East and 51% for Otter Trawl East). The catch was composed of smaller fish in the eastern metiers and discarded fish were predominantely below the MLS.

A small amount of undersized landings occurred in the beam offshore west metier. This was probably due to confusion over the correct MLS rather than a conscious decision to keep undersized fish. This metier also had a low discard rate (5%).

4.2.3.2 Sole (Figure 4b)

Sole were only caught in the two beam trawl metiers and virtually no discarding occurred. Some discarding did occur above the MLS of 24cm but this was probably due to poor fish quality. No undersize fish were landed.

4.2.3.3 Plaice (Figure 4c)

In the otter trawl west metier discarding and landing occurs both sides of the MLS of 25cm. In the otter trawl east metier there is a sharp differentiation between discards and landings at the MLS. This difference in discarding practice may be in part due to the different size distribution of plaice captured; in the otter trawl west there was a preponderance of large plaice in the catches. The appears to have resulted in small plaice above MLS being discarded.

No undersize plaice were caught in the beam offshore west metier and no discarding occurred. This contrasts with the beam inshore east where there was an 18% discard rate for plaice.

4.2.3.4 Whiting (Figure 4d)

The discard rate for whiting varies between 5% and 82%. Very few whiting below the MLS were captured with the exception of the beam inshore east metier. Only a small proportion of the small quantity of marketable whiting caught were landed from this metier. In contrast the beam offshore west landed all marketable whiting with few undersized whiting captured.

In both otter trawling metiers the length distributions are similar with discarding above and below the MLS.

4.2.3.5 Cuttlefish (Figure 4e)

Both western metiers consider cuttlefish an important target species. No MLS exists for cuttlefish in these metiers, so discarding practices are dictated by market forces. The length distributions contrast between the two metiers with a larger proportion of small cuttlefish being captured in the beam offshore west. However only small numbers of cuttlefish were captured in the otter trawl west metier.

4.2.3.6 Pout Whiting (BIB) (Figure 4f)

In all the metiers a very high percentage of the pout whiting were discarded. The lowest percentage was 73% in the otter trawl east metier. Predominantly the pout whiting over 30cm were retained. The high discard rates reported for this species are due to pout whiting having a low market value.

4.2.3.7 Dab (Figure 4g)

Dabs have a very high percentage discard rate. Most of the discards are above the MLS of 15cm with those retained predominantly larger than 25cm. Only a very small amount of undersized dabs were brought aboard the trawlers, and no undersized fish were landed. Dabs are considered to be an increasingly utilised species and anecdotal evidence suggests that dabs as small as 15cm have been landed to Cherbourg by the otter trawl west metier.

4.2.3.8 Squid (Figure 4h)

This is reported as a main target species for this quarter (Figure 3) in the otter trawl west metier. Squid were only caught in the two otter trawl metier and discard rates were very low (6% west and 11 % east). Fishing effort on squid in the otter trawl east metier is low (Figure 3) resulting in a small sample.

5 Discussion and Further Analysis

These results are based on a single quarter's data. Further analysis of this and future data will give a more complete picture of the discarding practices in these fisheries.

The effort survey results will be analysed in order to describe fleet activity and assess the proportion of effort sampled. The results from the catch survey will be examined in order to characterise the discarding practices in the various metiers and discuss environmental, market and other influences. Where feasible age structures of discarded and /or landed fish will be examined in order to indicate the extent of discarding of the various year classes present. In order to achieve these objectives the analyses outlined in sections 5.1 and 5.2 will be carried out on this and subsequent quarters' data.

5.1 Effort Survey

An examination of effort and catch surveys to determine the proportion of the effort sampled. Comparison could also be made with the reported effort if available.

5.2 Catch Survey

i) Raised catch numbers by species and metier, divided into landings, discards, and % discards above MLS (Tables 5a, b, c, and d).

Estimated weights and values for discards and landings.

ii) Length frequency (divided into discards and landings) distributions of selected species by metier.

iii) Age structures (where avaliable) by metier.

iv) The between trip and haul variation in discard rate will be examined by metier for the main species in order to examine the consistency of the results.

v) Examine for any relationships between discard rates and environmental, spatial or temporal factors, e.g. depth, location, season.

References

IFREMER, (1992). International Catalogue of Fishing Fleet Activity for the English Channel in Relation to technical Interactions. RIDRV - 040

Tamsett, D., Janacek, G., Emberton, M., Course, G., and Lart, W., (1995). Mulitilevel Modelling of Discards in Commercial Fishing (Part 2): The Irish Sea from NW England and N Wales. (In Production).

	WEST			EAST		
GEAR TYPE	No. OF BOATS	TONNES LANDED	% OF LANDINGS	No. OF BOATS	TONNES LANDED	% OF LANDINGS
OTTER INSHORE	190	6743	38.33	280	1183	6.73
BEAM OFFSHORE	30	2130	12.11	10	1550	8.81
BEAM INSHORE	43	3236	18.40	0	0	0.00
SCALLOP DREDGE	71	2569	14.60	9	112	0.64
QUEENIE TRAWL	2	68	0.39	0	0	0.00

NUMBER OF MAN WEEKS = APPROXIMATELY 30/MAN/YEAR * NO. OF MEN (2)

SO EFFORT SHOULD BE (WEEKS)

GEAR TYPE	WEST	EAST		SAMPLE EFFORT BY QUARTER WEST	SAMPLE EFFORT BY QUARTER EAST	
OTTER INSHORE	23	4		6	1	
BEAM OFFSHORE	7	5		2	1	
BEAM INSHORE	11	0		3	0	
SCALLOP DREDGE	9	0		2	0	
QUEENIE TRAWL	0	0		0	0	
TOTAL	50	10	60	13	2	15

Table 1. British fishing effort in the English Channel and corresponding sampling effort levels.

PORT	OTTER W.	OTTER E.	BEAM OFF W.	BEAM OFF E	BEAM IN W	SCAL DRED W.	SCAL DRED E	QUEEN TR. WEST
Brixham	*		*		*	*		
Looe	*					*		*
Newhaven		*					*	
Newlyn	*		*		*	*		
Plymouth	*		*		*	*		*
Poole		*						
Portsmouth				*		*	*	
Rye		*					*	
Shoreham				*				
Weymouth						*		

Table 2. The main ports associated with the different metiers in the English Channel

QUARTER 1

PORT	OTTER	BEAM OFF	BEAM IN	SCAL DRED	QUEEN TRAWL
Newlyn	1	1	1		
Looe					
Plymouth	1			1	
Brixham	1		1		
Weymouth					
Poole	1				
Portsmouth		1			
Shoreham					
Newhaven	1				
Rye	1		1	1	

QUARTER 2

PORT	OTTER	BEAM OFF	BEAM IN	SCAL DRED	QUEEN TRAWL
Newlyn	1		2		
Looe	1				
Plymouth	1			1	
Brixham	1	1	1	1	
Weymouth					
Poole	1				
Portsmouth					
Shoreham					
Newhaven	1		1		
Rye	1			1	

QUARTER 3

PORT	OTTER	BEAM OFF	BEAM IN	SCAL DRED	QUEEN TRAWL
Newlyn	1		1	1	
Looe	1				
Plymouth	1			1	1
Brixham	1	1	1	1	
Weymouth					
Poole	1				
Portsmouth					
Shoreham					
Newhaven	1				
Rye	1		1		

QUARTER 4

PORT	OTTER	BEAM OFF	BEAM IN	SCAL DRED	QUEEN TRAWL
Newlyn	1	1	1	1	
Looe	1				
Plymouth	1		1		1
Brixham	1		1		
Weymouth					
Poole	1				
Portsmouth					
Shoreham					
Newhaven	1				
Rye	1		1	1	

Table 3. The target ports and man week allocations for the English Channel.

First Quarter(Jan-Mar Inclusive)	Manweeks											
UPDATE 24/10/95	Beam			Otter			Scallop		Difference	Queenie		Difference
	Target	Achieved	Difference	Target	Achieved	Difference	Target	Achieved		Target	Achieved	
Area1;South West (Newt, Looe, Plym, Brix).	3	1	2	3	4	-1	1	0	1	0	0	0
Area2;South Centre (Weym, Poole, Portsm).	1	0	1	1	0	1	0	0	0	0	0	0
Area3;South East (Shoreham, Newh, Rye).	1	1	0	2	2	0	1	0	1	0	0	0
TOTALS	5	2	3	6	6	0	2	0	2	0	0	0
TOTAL TRIPS	13	8	5									

Table 4. Targets and achievements for the first quarter

METIER CODE	FULL NAME	SPECIES	RAISED NUMBERS		
			DISCARD	LANDING	%DISCARD
U1.1	UK OTTER TRAWL WEST	BIB	63	10	86
No. of Trips = 4		BLL	1	0	100
No. of Hauls = 18		BLR	0	1	0
Hours Fished = 65		BSE	0	6	0
		COD	0	9	0
		CRE	4	0	100
		CTL	42	43	49
		CUR	1	1	50
		DAB	2020	249	89
		DET	537	0	100
		FLE	2	32	5
		GUX	1887	2	100
		HAD	0	5	0
		HER	5	4	56
		HKE	5	0	100
		HOM	195	0	100
		JOD	18	58	24
		LEM	152	2211	6
		LSD	235	0	100
		MAC	30	15	67
		MEG	3	0	100
		MON	10	10	50
		MUR	98	4	96
		PIL	15	0	100
		PLE	110	733	13
		SCA	13	0	100
		SCR	4	0	100
		SOL	0	6	0
		SOS	37	0	100
		SPR	1	8	12
		SQC	13	224	6
		STR	1	0	100
		THR	0	2	0
		TUR	0	7	0
		WHG	71	387	16
		WIT	1	1	50

Table 5a Percentage discards and numbers of fish discarded and landed for each species in the otter Trawl West metier.

METIER CODE	FULL NAME	SPECIES	RAISED NUMBERS		
			DISCARD	LANDING	%DISCARD
U1.2	UK OTTER TRAWL EAST	BIB	1122	413	73
No. of Trips = 2		BLL	3	0	100
No. of Hauls = 12		BLR	3	6	33
Hours Fished = 33		BSE	0	108	0
		COD	14	18	44
		CTL	0	10	0
		CUR	10	0	100
		DAB	3139	449	87
		DET	33	0	100
		DGH	38	0	100
		FLE	705	569	55
		GUX	451	30	94
		HER	0	3	0
		HOM	35	340	9
		JOD	0	10	0
		LBD	0	10	0
		LEM	179	170	51
		LSD	10	117	8
		MUR	10	10	50
		PLE	182	357	34
		SBZ	0	10	0
		SCR	30	0	100
		SOL	0	44	0
		SPR	10	10	50
		SQC	20	158	11
		THR	19	10	66
		WHG	309	577	35

Table 5b. Percentage discards and numbers of fish discarded and landed for each species in the otter trawl east metier.

METIER CODE	FULL NAME	SPECIES	RAISED NUMBERS		
			DISCARD	LANDING	%DISCARD
U2.0	UK BEAM INSHORE EAST	BIB	940	162	85
No. of Trips = 1		BLL	0	31	0
No. of Hauls = 9		BLR	0	4	0
Hours Fished = 20		COD	0	9	0
		CRE	10	18	35
		CUR	15	7	68
		DAB	848	37	96
		DET	92	0	100
		DGH	12	0	100
		FLE	35	42	45
		GUX	145	78	65
		LEM	148	198	43
		LSD	10	10	50
		MON	6	0	100
		PLE	195	918	18
		SCR	51	0	100
		SCX	0	23	0
		SOL	50	896	5
		SPR	65	16	80
		SQC	0	8	0
		THR	0	6	0
		TUR	0	6	0
		WHG	111	24	82

Table 5c. Percentage discards and numbers of fish discarded and landed for each species in the beam inshore east metier.

METIER CODE	FULL NAME	SPECIES	RAISED NUMBERS		
			DISCARD	LANDING	%DISCARD
U2.2	UK BEAM OFFSHORE WEST	BIB	574	26	96
No. of Trips = 1		CRE	3	0	100
No. of Hauls = 16		CTL	1508	412	79
Hours Fished = 30		DAB	1888	233	89
		DET	2761	0	100
		GUX	756	47	94
		HER	46	0	100
		HKE	0	9	0
		HOM	21	0	100
		JOD	0	9	0
		LEM	13	232	5
		LSD	37	0	100
		MAC	113	0	100
		MON	39	33	54
		PLE	0	333	0
		QSC	1027	0	100
		SCA	230	0	100
		SCR	29	0	100
		SCX	0	428	0
		SOL	8	171	4
		SOS	115	0	100
		SQC	0	14	0
		WHG	7	124	5
		WIT	7	9	43

Table 5d. Percentage discards and numbers of fish discarded and landed for each species in the beam offshore west metier.

Figure 1. Example of the questionaire distributed to the fishermen of the English Channel

DATE:		SHEET NO:	

Boat Code No:	
Registered (Y/N):	
Home Port:	
Power (HP):	
LOA:	
Gear Type:	

Target Species:											
Seasons Fished by Month for the Main Target Species:											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Main Fishing Grounds:	

Typical Seabed Type:	
Distance to Grounds:	
No. of Hauls/Day:	
Average Tow Time:	
Number of Days Fished/Month:	
General Towing Speed:	

Any gear changeover in year (Y/N): If Yes, when and why:

How many boats do you think are involved in this activity with this gear from this port:	
Does this change throughout the year. If Yes, why?	

Additional comments:

All information will be treated in the strictest confidence. No individual vessel or gear will be identified of any material published as a result of this survey. Your assistance is greatly appreciated.

Signed Research Officer .....

Figure 2. Example of the questionnaire distributed to the fisheries organisations of the English Channel.

Date		Sheet No.

Name of Organisation	
Please give a brief explanation of your role in fisheries.	
What area of coast and 3 main ports are you associated with? Area: Main Ports 1) 2) 3)	

Please fill in the following tables with approximate number of boats, main target species and ground usually fished.

Port 1	Number	Target Species	Ground
Otter Inshore			
Otter Offshore			
Beam Inshore			
Beam Offshore			
Scallop Dredge Inshore			
Scallop Dredge Offshore			
Important Others			

Port 2	Number	Target Species	Ground
Otter Inshore			
Otter Offshore			
Beam Inshore			
Beam Offshore			
Scallop Dredge Inshore			
Scallop Dredge Offshore			
Important Others			

Port 3	Number	Target Species	Ground
Otter Inshore			
Otter Offshore			
Beam Inshore			
Beam Offshore			
Scallop Dredge Inshore			
Scallop Dredge Offshore			
Important Others			

How many days a month does your average vessel spend at sea?

Are there any regular seasonal variations that occur in your area?

Additional Comments:

All information will be treated in the strictest confidence and no individual vessel or gear will be identified.

Signed Research Officer.....

AREA	GEAR TYPE	SPECIES	AVERAGE DAYS FISHED/MONTH	1ST QUARTER JAN	FEB	MAR	2ND QUARTER APR	MAY	JUN	3RD QUARTER JUL	AUG	SEP	4TH QUARTER OCT	NOV	DEC
WEST	OT	CTL	19.75												
		LEM	19.73												
		PLE	19.67												
		SOL	20.00												
		SQC	20.13												
		WHG	20.67												
EAST	OT	CTL	19.60												
		LEM	20.67												
		PLE	20.00												
		SCX	18.00												
		SOL	20.40												
		SQC	20.00												
		WHG	20.00												
WEST	PT	LEM	20.00												
		SQC	20.67												
		WHG	20.67												
WEST	BT	CTL	19.86												
		PLE	19.40												
		SOL	21.10												
WEST	SD	SCX	20.20												
		SCX	20.00												

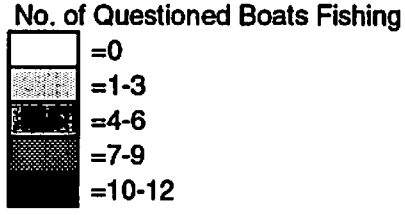

Figure 3. Number of boats fishing in each metier by month and the species targeted. Sample size = 20 vessels.

LEMON SOLE

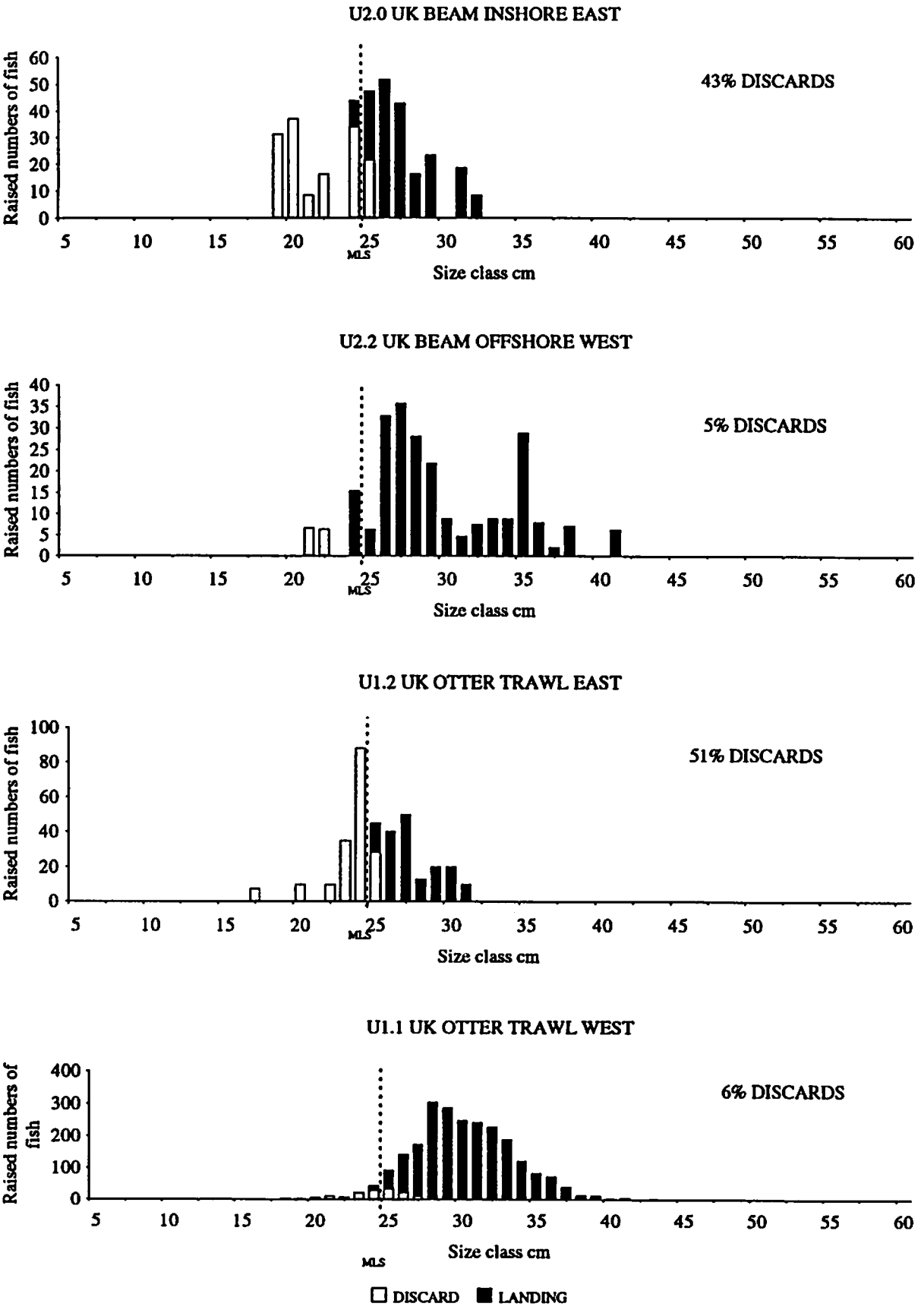

Figure 4a. Length/frequency distributions for Lemon Sole landings and discards

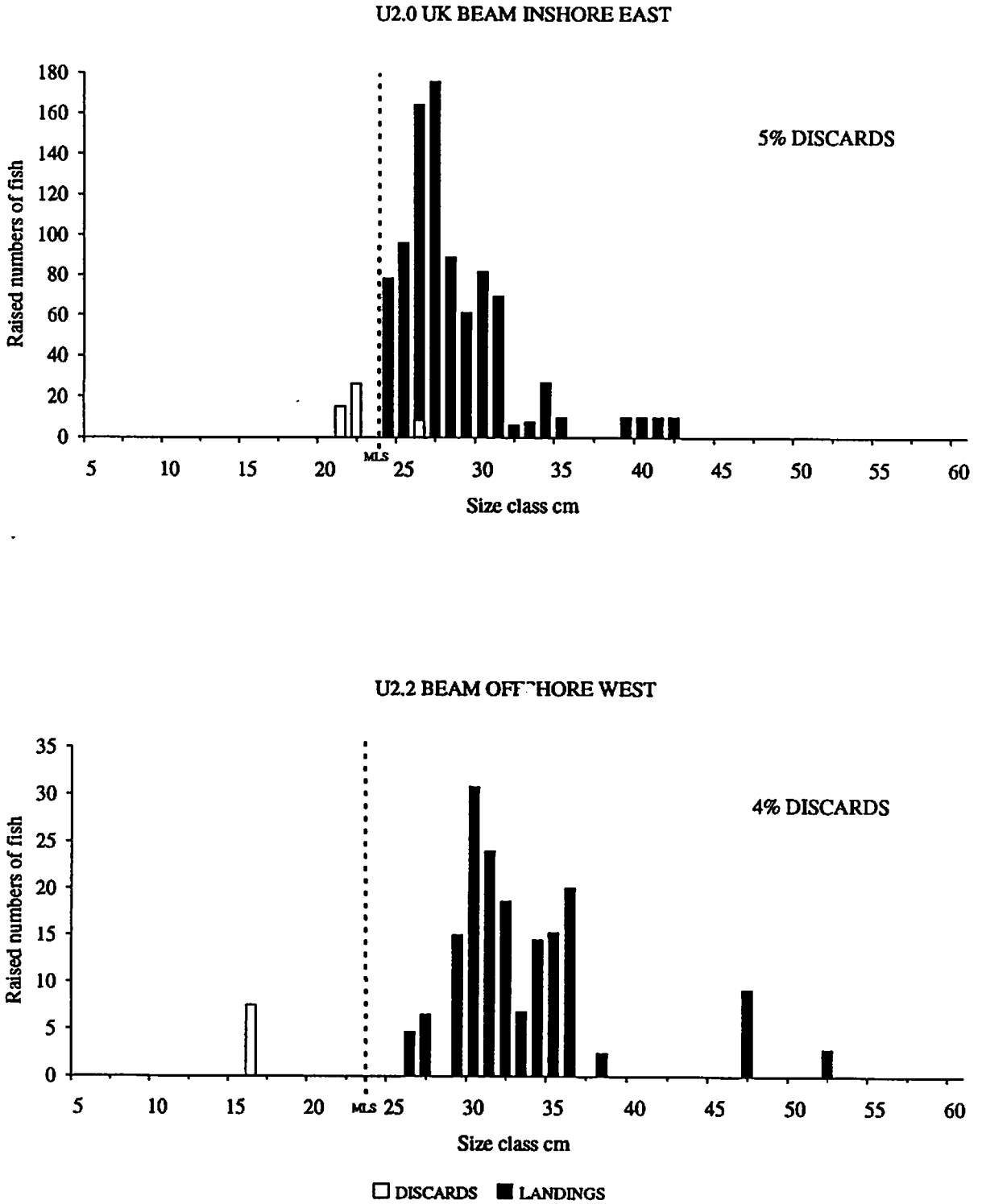

Figure 4b. Length/frequency distributions of Sole landings and discards.

PLAICE

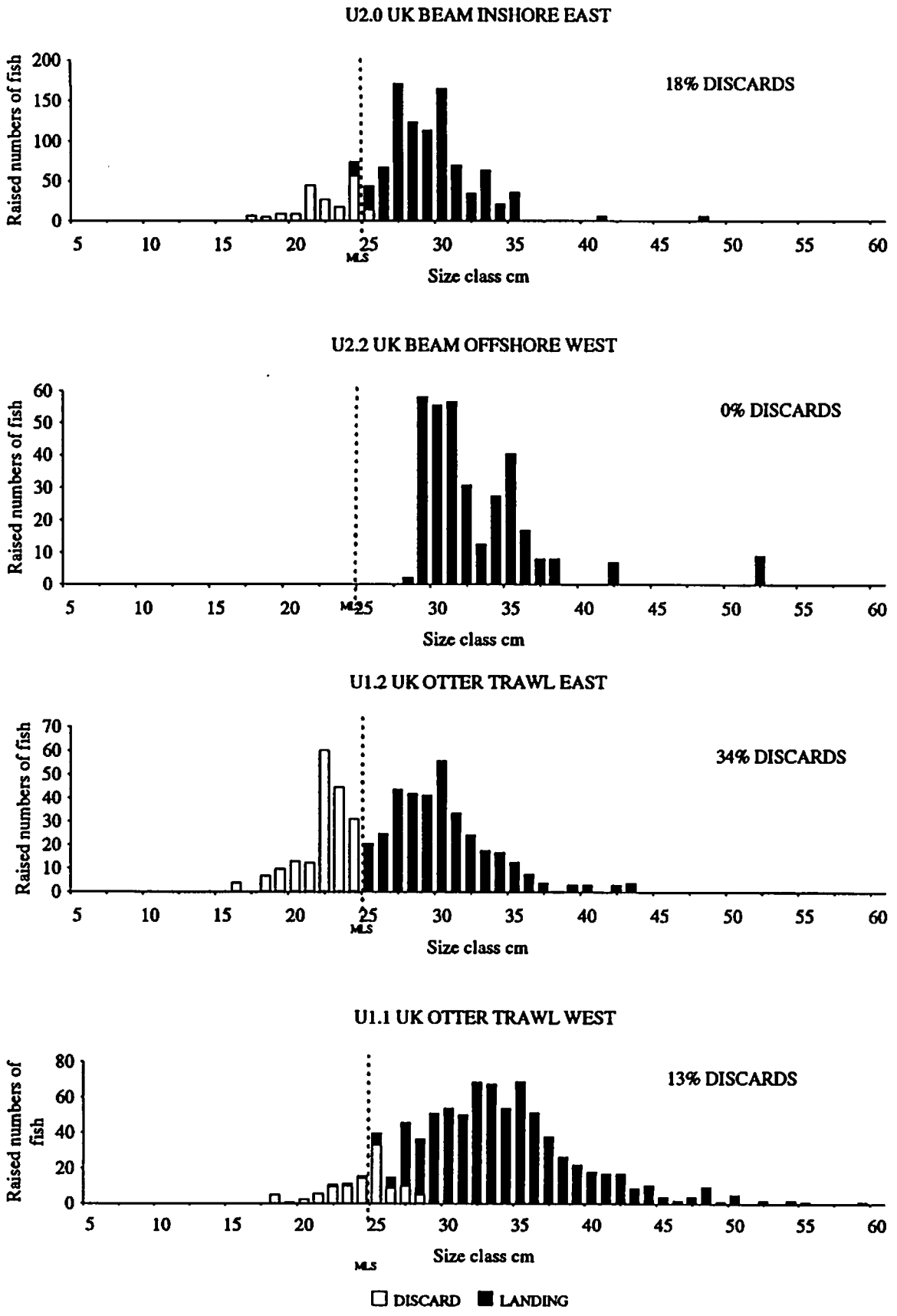

Figure 4c. Length/frequency distributions for Plaice landings and discards.

CUTTLEFISH

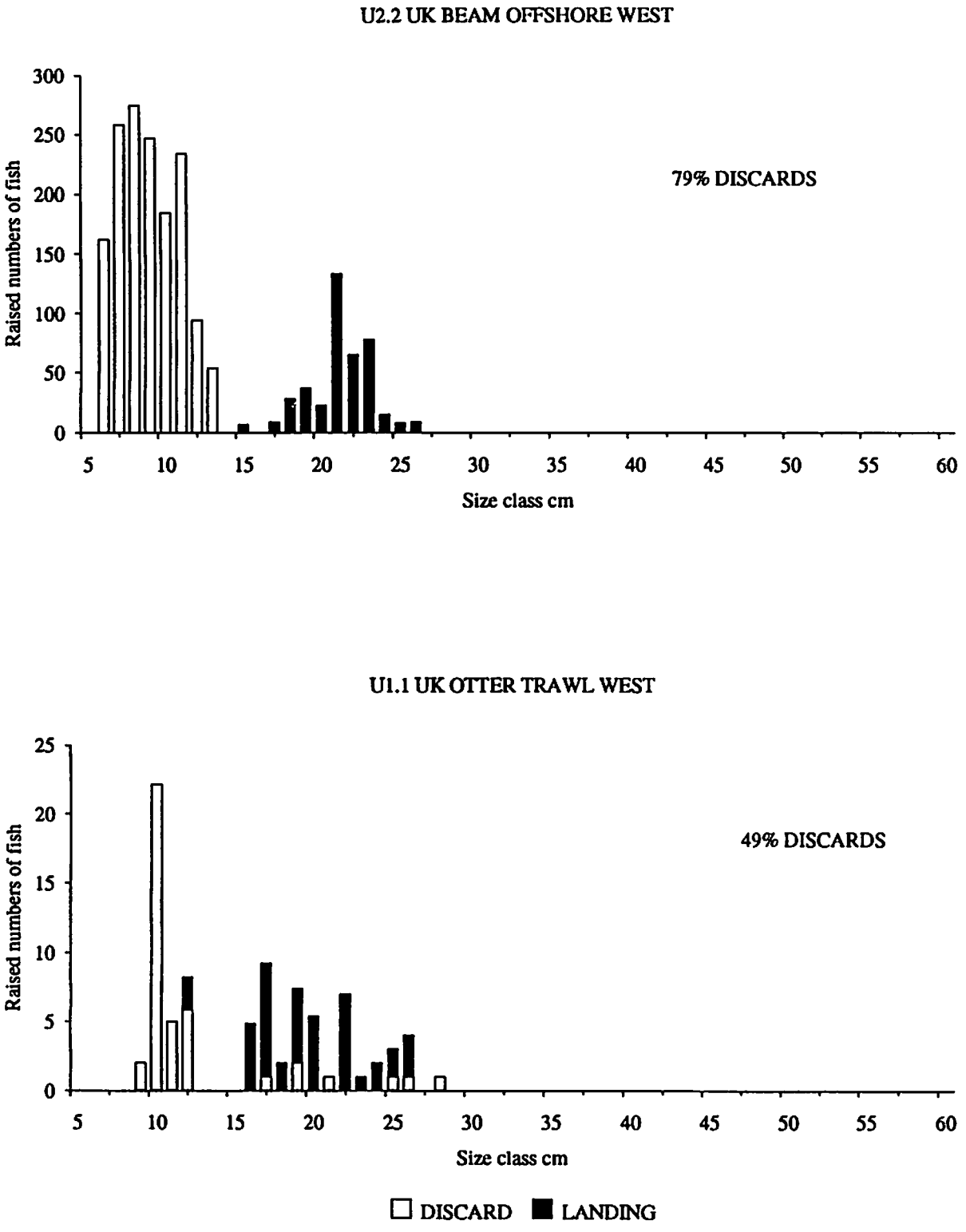

Figure 4e. Length/frequency distributions for Cuttlefish landings and discards.

WHITING

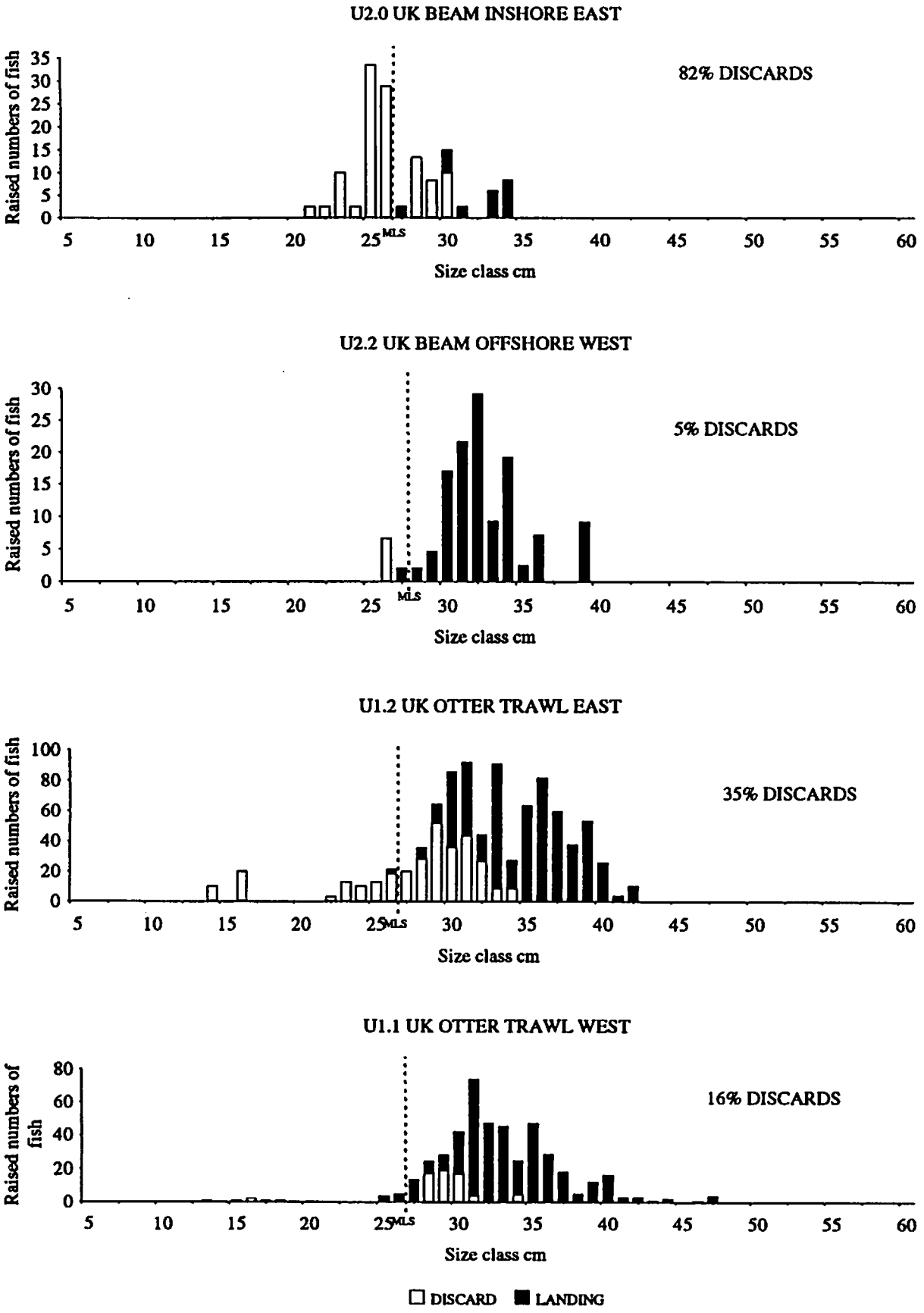

Figure 4d. Length/ frequency distributions of Whiting landings and discards

POUT WHITING

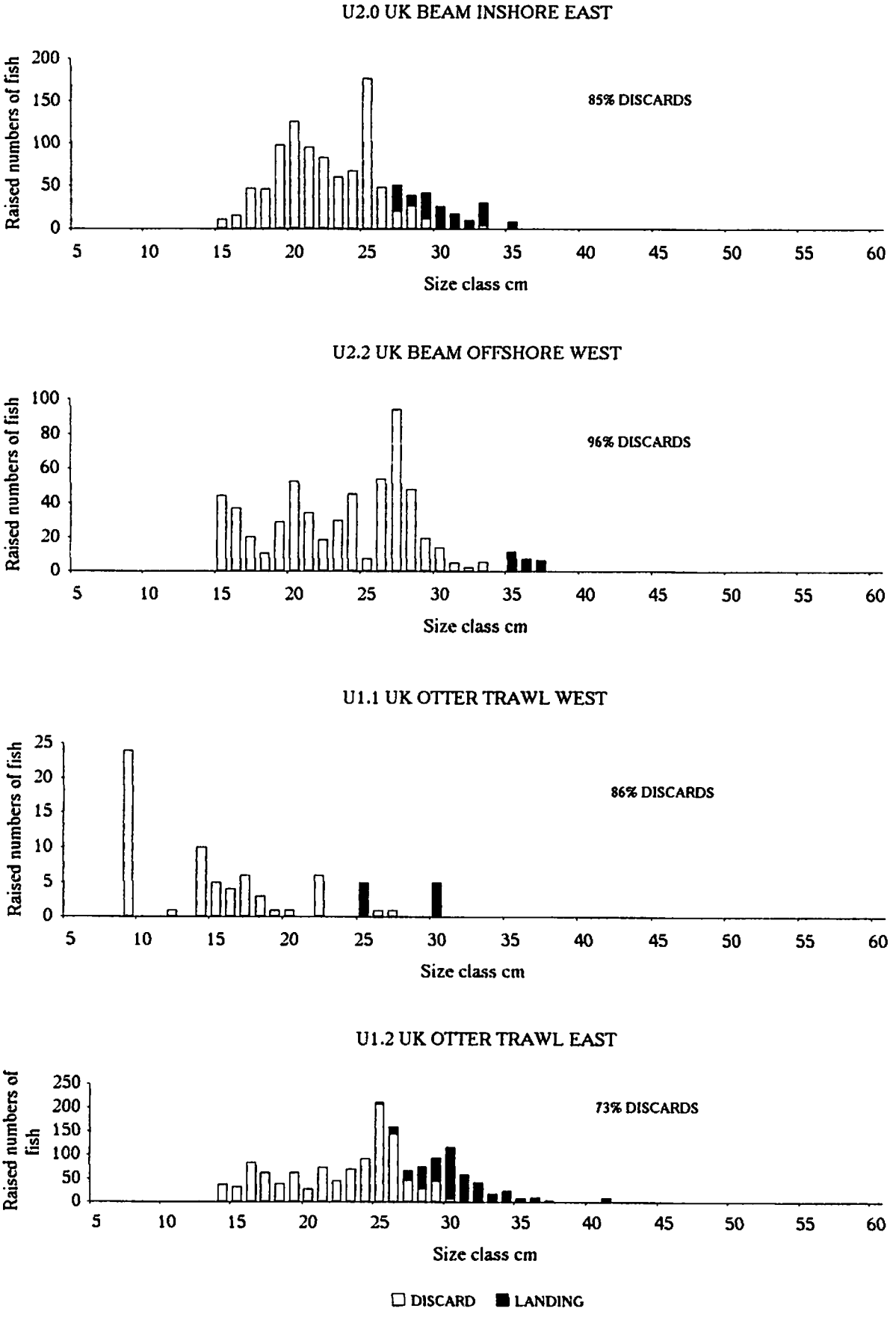

Figure 4f. Length/frequency distrubution of pout whiting landings and discards.

DAB

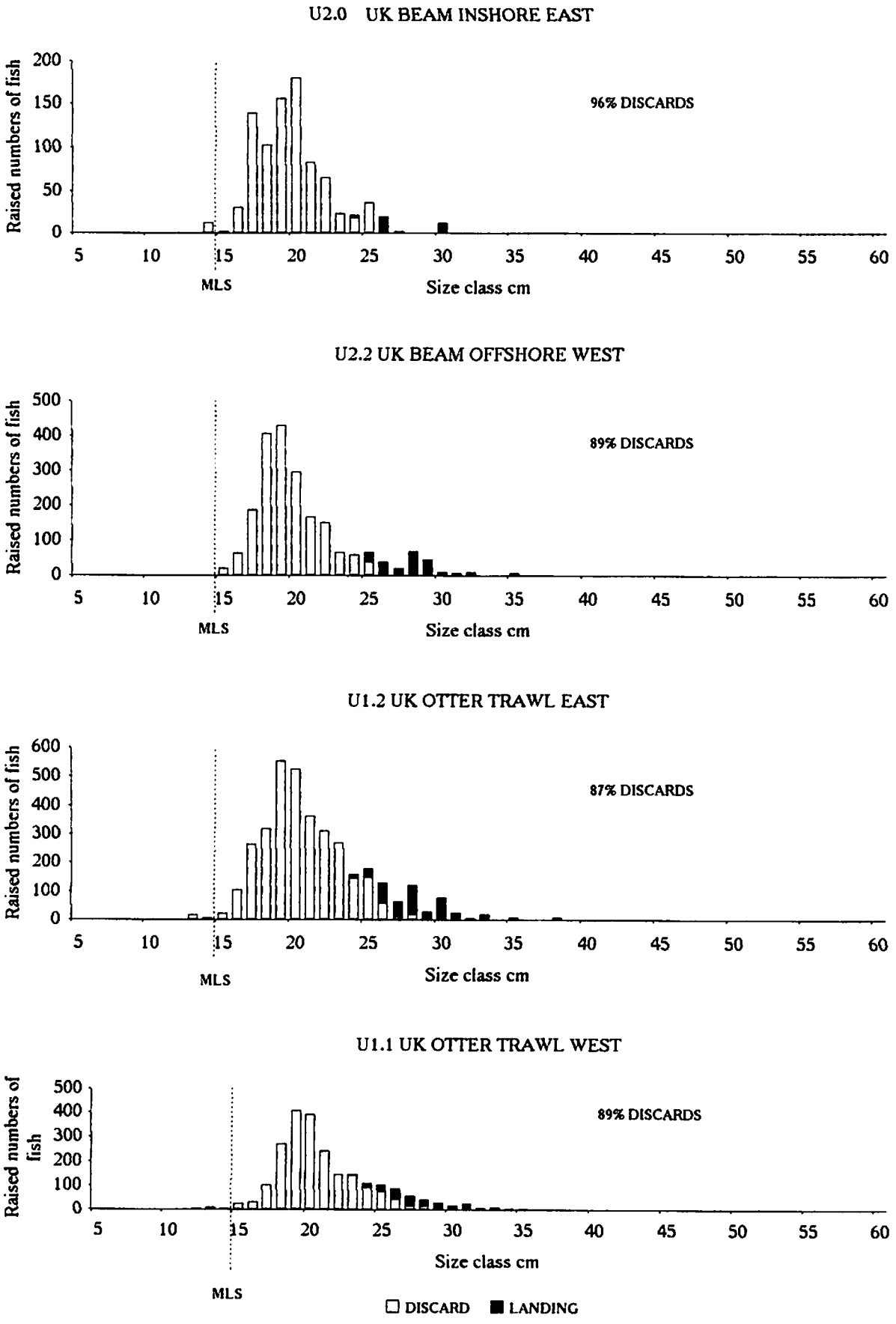

Figure 4g. Length/frequency distrubution of Dab landings and discards.

SQUID

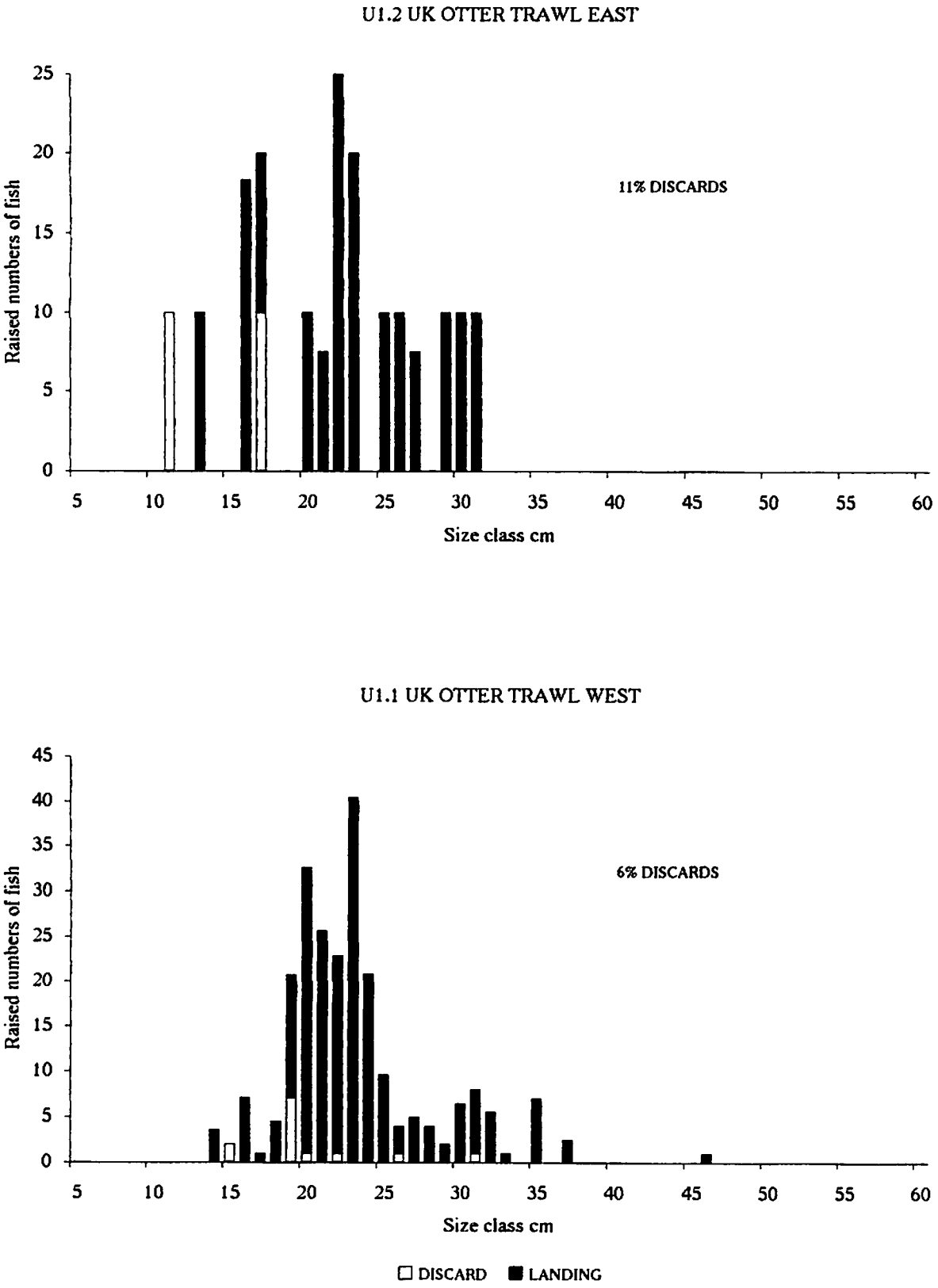

Figure 4h. Length/frequency distrubution of Squid landings and discards.