



Marine Management Organisation

**Western Haddock Catch
Quota Trial: Interim
Report November 2013**



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Executive summary

The trial is being carried out on a twin-rig otter trawler operating under a landing obligation for ICES VIIb-k haddock. Haddock makes up about 30% of the gross catch value for this vessel in the area of the Celtic Sea, south and west of the Lizard, where important target species include anglerfish and megrim among a mixed fishery incorporating in the region of 20 main species. Haddock landing opportunities for this vessel are heavily reliant on swaps for other stocks to minimise unnecessary haddock discards.

The mixed fishery is fished by over 130 UK vessels using demersal trawls in the area in which about 62% of haddock is discarded (based on an average discard rate across TR1 and TR2 trawlers).

The fishery was monitored using electronic monitoring and CCTV (EM) and over 10% of fishing operations were audited by on-shore observers.

The UK share of the 5% of additional quota for VIIb-k haddock made available under Council Regulation (EU) No 39/2013 for trials for fully documented fisheries was insufficient to cover the full entitlement for the participant vessel.

The vessel adhered to the landing obligation until October (on-shore observers estimated less than 0.01% incidental discards). Less than 1% of the haddock catch was below the minimum landing size or damaged.

The vessel was authorised to continue fishing after the quota became exhausted at the beginning of October without having to continue to meet the landing obligation for haddock. This was on the basis that the full catch quota allocation could not be provided. Following all quota being caught, the vessel has been observed discarding significant quantities of haddock while fishing for stocks with quota remaining. The quantity of discarded haddock is being fully documented and will be available in the final report – during October 7 tonnes of haddock were discarded despite relatively low fishing effort.

During the trials the participant vessel owners sought haddock quota through internal and international swaps in order to build a VIIb-k haddock allocation similar to that in 2012. The expected swap opportunities were not fully realised in 2013 because of a reduction in the total allowable catches (TAC) and higher uptakes amongst potential donor fleets.

Cornish Fish Producers' Organisation (FPO) over-10-metre fleet's 2012 landings data was used to estimate the level of discards of haddock. The vessels in the Cornish FPO are considered to be indicative of the mixed trawl fishery and the catch composition for important demersal stocks is similar across all vessels.

The industry has reported increasingly large catches of haddock in the Celtic Sea in recent years. It is evident that the small share of the TAC causes high levels of discards in this mixed demersal fishery. The landings and discard data for haddock indicate that it would act as a choke species under a landings obligation at current

quota levels. Any further reductions in the haddock VIIb-k TAC would have significant impacts on this fishery under a landing obligation.

It is estimated, based on 2012 Scientific, Technical and Economic Committee for Fisheries (STECF) discard data, averaged across 80 to 99mm and 100mm+ codend mesh size, that the Cornish FPO over-10-metre demersal trawl fleet discarded about 1,400 tonnes of haddock.

At UK demersal trawl fleet level (including under-10-metre vessels) the total discarded quantity is estimated to be more than 2,700 tonnes. It is possible that this discard quantity may be significantly higher in 2014 in line with the proposed reduction in the total allowable landed catch depending on the abundance of the 2009 haddock cohort. Significant improvements in selectivity would be required to reduce haddock catch in 2014, although this may have a significant economic impact resulting from a reduction in catch of other commercial species.

The vessel works gear with large mesh (200mm) headline panels and a 106mm codend. Recent trials with different headline panel configurations are inconclusive, although the trial has shown that the gear in use has resulted in negligible catches of undersized haddock.

It is recommended that full catch documentation of haddock and other species should be encouraged across a number of reference vessels in 2014 to monitor the catch and discard rates. This should allow the impact of the landing obligation and possible mitigation measures to be assessed in more detail.

Introduction

The aim of this trial is to assess the impact of a discard ban in relation to ICES area VIIb-k haddock in the context of a mixed demersal trawl fishery. Additional VIIb-k haddock quota was made available for trials in fully documented fisheries under article 7 of Council Regulation (EU) No 39/2013. This was set at a maximum of 5% of the member state share of the total allowable catch (TAC).

The UK share of the haddock VIIb-k TAC in 2013 was 1,415 tonnes, which allowed for 70.75 tonnes of additional quota to be used in trials. Vessels participating in trials are required to bring aboard, land and count against quota, all catches of VIIb-k haddock. Participant vessels must be equipped with electronic monitoring equipment incorporating CCTV (EM) to be able to verify the landing obligation.

Participant vessel fishing patterns

One application to participate in trials was received from the owners of a 20-metre twin-rig otter trawler. This vessel uses 106mm codend mesh to target a mixed demersal fishery in the Celtic Sea. The vessel relies on a diverse range of species including quota species such as haddock, megrim and angler as well as a range of non-quota species such as lemon sole.

The vessel landed 321 tonnes of haddock in 2012 (UK quota 1,902 tonnes). This amounted to about 30% of the vessel grossing with 46% made up of other quota species and 24% non-quota species. Figures 1 and 2 show that the spatial fishing

pattern in 2012 and 2013 are very similar with the exception of some fishing in Lyme Bay in 2013 which was due to very poor weather conditions further west.

The fishing industry has reported an increasing abundance of haddock in the Celtic Sea over recent years although landings have largely been restricted because of the small share of the TAC that is attributed to the UK. The participant vessel owners have made considerable investments in securing additional haddock quota either through the purchase of fixed quota allocations or through in-year swaps. It is difficult to assess to what degree the vessel actually targets haddock but haddock is an important species.

Figure 3 shows the landings of the vessel by species in 2012 and 2013 by month. In all months in 2012, haddock was the main single species contributor to the total landings by weight. In August and September 2012, over 50 tonnes of haddock was landed each month which was a percentage contribution of over 70% (Figure 4) of the total landings in these months.

The catches in June 2012 and 2013 are low because the vessel only fished for 10 days and spent the rest of the time being refitted. In both years, catches from October onwards began to reduce. This is in line with a reduction in fishing effort (Figure 3).

The data from Figure 3 is also displayed in Figure 4 as a percentage contribution to the total catch for each month. This shows that, in 2012, haddock made up 12 to 75% of the total catch in each month, which is about 50% over the whole of 2012. In 2013, haddock made up 12 to 71% of the total catch each month in 2013 and this contributes about 44% to the end of October 2013 (Figure 5).

The other main contributing species to the total catch weight are anglerfish, megrim and whiting, in that order.

When comparing monthly catches between the two years, the catches of haddock were higher on every month in 2012 than 2013, except February and March where the 2013 catch was marginally higher.

When these weights are converted to values (Figures 6) haddock is still an important species but with a lower value per kilo than other species. The contribution range is slightly different from the weight values, with a contribution range of 13 to 52% in 2012 and 12 to 59% in 2013. Anglerfish and John Dory emerge as important contributing species when weights are converted to value and in some months anglerfish are the most valuable fish species caught, particularly through the winter months October through to March.

Figure 7 shows the annual overall percentage contribution by species for each year, 2012 and 2013 (up to end of September). Haddock, anglerfish, John Dory and lemon sole are the most important individual species landed, with haddock making up 30% and 33% of the total catch value in 2012 and 2013, respectively. Given that the catches of haddock seem to reduce in November and December the importance of haddock to the total overall 2013 catch should also reduce slightly, bringing it in line with 2012.

South west (UK) mixed demersal trawl fishery

The trial needs to be set in the context of the mixed demersal trawl fishery which targets a range of species using codend mesh sizes of over 80mm. Vessels using 80 to 99mm mesh sizes are restricted in their catch composition by Council Regulation (EC) No 850/98 which requires retained catches to comprise a maximum of 30% non-target species including cod, haddock and saithe. Vessels are required to use a codend mesh size of 100mm or more in order to avoid any restriction on catch composition and thus avoid regulatory discarding.

Target species include angler, megrim, lemon sole, haddock, plaice, sole and cuttlefish amongst a typical catch composition of in excess of 20 species. An important driver in the use of codend mesh size towards the small end of the 80 to 99mm range, particularly for smaller vessels, is to retain smaller valuable species such as squid and red mullet.

It is notable that vessels under 15 metres (see figures 8 and 9) are more reliant on non-quota species such as lemon sole, while the proportion of angler and megrim caught by the larger vessels working further offshore increases. Haddock remains a significant part of the landed catch across the whole fleet although it is likely that discards are higher from smaller vessels because of a lack of quota.

Haddock discard rates and additional quota incentive

The discard rate in the TR1 (100mm+ codend mesh size) as evaluated by Scientific, Technical and Economic Committee for Fisheries (STECF) for VIIb-k haddock in 2011 was 41.6%. Council Regulation (EU) No 39/2013 retained the cap for maximum additional allocations at 30% so the vessel was entitled to 96 tonnes of additional quota which exceeded the UK allowance of 70.7 tonnes. The vessel was offered the full 70.7 tonnes available.

It was hoped that the shortfall in the additional allocation (26 tonnes) could be made up from the UK's 2% available for scientific research but this was committed to other purposes. It was agreed that the uptake of quota would be reviewed towards the end of 2013. By October 2013 the vessel had caught a total of 221 tonnes of VIIb-k haddock, of which 32% was made up of additional quota. The UK quota for VIIb-k haddock was close to exhaustion at this point and the owners found that swap opportunities with other member states and UK producer organisations were not available. The vessel was therefore allowed to continue fishing as it was considered that the full allocation of 96 tonnes coupled with expected swap opportunities would have enabled adherence to the landing obligation for the full year were it available.

Methodology

Shore-based observers audited a 10% random selection of hauls to verify that all haddock were being retained on board and landed to quantify the levels of any haddock discards and verify the quantities of undersized haddock caught. Audits of EM footage and data were carried out from February 2013, so the results reflect this period.

Between 1 February 2013 and 17 August (interim results), the vessel completed 30 fishing trips totalling 485 fishing hauls (see table 1). 3 of these trips, totalling 33 hauls, were unable to be audited as a result of corrupt data. Of the remaining 27 fishing trips 61 fishing hauls were sampled out of a total of 452 fishing hauls completed. The positions of these sampled and un-sampled hauls are shown in Figure 10.

Sampling 61 hauls out of a total of 485 hauls gave a sample rate of over 12% of the total fishing effort between February and August (Table 1). No EM auditing took place in January.

Results

Discards

In total 1.9kg of haddock was observed being discarded during on-shore audit of 61 hauls. When raised to the total fishing effort (up to 17 August 2013) this equals 15kg of haddock discarded (Table 2), or less than 0.001% of the total catch. The discards observed are clearly incidental and the results show that the crew have complied with the landing obligation.

The catch rates of haddock below the minimum landing size (MLS) of 30cm is demonstrated by the low catches of undersized or damaged haddock reported by the master. It is also shown in the length frequency distribution collected on a research trip carried out during this period (see Figure 11) which clearly shows that virtually all haddock caught during this trip, using 106mm codends, were above the MLS.

A total of 1091kg of undersized or damaged haddock were reported by the master up to 17 August which was about 0.7% of the total haddock catches for this period (Table 3). Values reported on randomly selected hauls were audited to ensure they were reported accurately. Shore-based observers estimated a total of 90kg of undersized haddock on the 61 randomly selected hauls. For these observed hauls the master reported 152kg of undersized haddock. The audit estimates of undersized haddock caught were about 40% less than the estimated weights reported by the master on the same hauls as a result of the on-shore observer not being able to identify this component of the catch on a number of hauls. On 19 of the 61 hauls analysed, the analyst recorded 0kg undersized or damaged haddock observed, though the master had recorded weights of up to 5kg on these same hauls, as shown in Figure 12.

When raised to total effort, the shore-based observer estimate gives a total of 717kg of damaged or undersized haddock compared to the master's reported total of 1,091kg. Therefore the raised estimate is about 34% less than the weight reported by the master.

Impact of the landing obligation

The proposed Common Fisheries Policy (CFP) reformed text states that by 1 January 2016 the landing obligation will apply to "species defining the fisheries and not later than 1 January 2019 for all other species in North Western waters (area VII included) for fisheries for cod, haddock whiting and saithe...", plus other named

stocks and fisheries. Although the definition of what is a defining species is still to be decided, it will be difficult to argue against haddock being a species that defines this vessel's mixed demersal trawl fishery, given that haddock make up over 40% of the catch by weight and 30% by value in both years.

However, these percentages are considerably lower for other vessels with more limited access to haddock quota. By 2019 haddock will certainly be included as a discard ban species. The availability of quota will be a major hurdle to overcome in meeting a landing obligation for haddock because the UK share of the overall TAC is small coupled with the poor status of the stock for which a large reduction in the TAC in 2014 is advised by ICES.

The CFP proposal provides for up to 9% inter-species flexibility to count non-target species against target species quota. While this may provide some mitigation, the measure does not appear applicable to haddock as it is considered to be a target species and the stock is not within the pre-requisite safe biological limits. Similarly, the 5% de minimis exemption could offer some mitigation if haddock is shown to be very difficult to select. However, the limit of 5% is considered to be too small to make a significant impact.

The landing obligation is likely to have an economic impact on the south-west demersal trawl fishery as they will be required to land all haddock caught and count them against quota. The average discard rate for VIIb-k haddock caught in the TR1/TR2 otter trawl fishery was 62% in 2012.

Given that the Cornish FPO TR1/TR2 over-10-metre fleet landed 839 tonnes in 2012, then discards of about 1,370 tonnes would also have occurred in 2012. Figure 13 shows the monthly landings for the Cornish FPO vessels using TR1/TR2 gear in 2012 with the estimated quantities of discards caught. This discard estimate is reduced to about 1,350 tonnes when separate discard rates (58% for TR1 and 76% for TR2) are applied to the Cornish FPO haddock landings for over-10-metre trawl fleet. This is to be expected as the majority of haddock landings in 2012 were made by TR1 vessels with the lower discard rate (Figure 14).

The quota available to the whole of the UK fleet in 2012 was 1,902 tonnes. If no other vessels within the UK were catching haddock VIIb-k then the quota would have been exhausted before the end of September because the cumulative total of haddock catches (including estimated discards) would equal 1,916 tonnes. However, other vessels are catching VIIb-k haddock, either as an important target species or as a by-catch, so the available quota would be exhausted long before September. Unless this fishery can either access additional haddock quota in line with catches or reduce discards by using catch avoidance measures, then haddock will be a potential choke species to this mixed demersal fishery and any other fishery where VIIb-k haddock are caught above de minimis levels.

Selectivity

In July 2013, Marine Management Organisation (MMO) carried out gear trials aboard the participant vessel. The aim was to test to what extent the large 200mm headline meshes used by the vessel improve haddock selectivity compared to smaller 150mm headline meshes used by other vessels.

A 150mm and a 200mm top panel were compared on 3 hauls during the trip. The 150mm gear haddock catch was higher overall than the 200mm gear (Table 4). This result did not appear to show significant evidence of improved selectivity when taking account of the size distribution of haddock on the grounds and the potential effect of the smaller mesh headline panel on overall trawl dynamics.

A gear trial was carried out by Centre for Environment, Fisheries and Aquaculture Science (Cefas) during 2013 using 4 different gear configurations using large diamond meshes in the back and headline. One configuration made a significant reduction in the catches of haddock (-41% by number). This configuration also showed reductions in other species in this fishery with numbers caught down on megrim (-33%), lemon sole (-59%), whiting (-93%) and sole (-57%), although the numbers caught were not large enough to be conclusive – Smith & Catchpole (2013), 'Area VII Haddock Discard Eliminations using Technical Measures', available from www.cefas.defra.gov.uk/media/625804/mf056%20report_final.pdf.

Commission Regulation (EU) No 737/2012 requires a 100mm square mesh panels to be inserted in TR1 otter trawls in the Celtic Sea area (VIIIf, VIIIg and the part of VIIj north of 50° and east of 11° west). The scope of this regulation does not cover the area fished by the participant vessel. It should be noted that this regulation intends to reduce the capture of juvenile haddock, cod and whiting in trawls with poor selectivity so far.

There has been concern among industry working in the Celtic Sea that the use of a square mesh panel would result in the loss of commercially important species such as squid and red mullet.

The catches of haddock during this trial in the western part of area VIIe have been almost exclusively above the minimum landing size (MLS). Although the abundance of haddock below MLS in the area is not known, length frequency data for whiting collected in July also show catches exclusively above MLS which suggests that good selectivity is being achieved for the mixed gadoid component of the catch (Figure 15).

Conclusion

The vessel has complied with the landing obligation for VIIb-k haddock for the first 9 months of the year at the end of which the vessel's haddock quota was exhausted. It is considered that the vessel could have operated under the landing obligation for the final quarter of 2013 provided that the full catch quota entitlement was provided and that swap opportunities in line with those in 2012 were available.

In October 2013 the vessel landed 114kg of haddock and discarded about 7 tonnes. The vessel had expected to receive an extra 20 tonnes of scientific quota as part of this trial and had also expected to be able to rent in about 40 or more tonnes of quota from other sources. This is likely to have been enough to allow the vessel to comply with the landing obligation.

The vessel seeks to avoid capture of small haddock through the use of large meshes in the headline panel combined with 106mm codends. The observer data for July shows that very few haddock below the MLS were caught although it is not known whether this is because smaller haddock were not present or had escaped the net.

However, the trial has shown through fully verified documentation that the catch has consisted of less than 1% undersized or damaged haddock between February and August at the interim stage.

While there is evidence that spatial avoidance can also be achieved it is considered that this may jeopardise the ability to catch vital target species, including megrim and anglerfish, which are more abundant in the area in which high catches of haddock are also taken.

One initiative that the owner has considered is avoiding high haddock catches in August by laying the vessel up for its annual refit at this time.

In the context of the UK fleet, the current catch and discard data suggests that haddock could act as a choke species within the mixed demersal trawl fishery. This could lead to an early closure resulting in a large proportion of other quota opportunities being left uncaught. In the context of a large reduction in the TAC for 2014 it is also clear that high levels of discarding of marketable haddock are likely. Further work is required to complete the data for this trial over the full 2013 period.

Recommendations

The level of gadoid species catches (including haddock) in demersal trawl fisheries would appear to present potential challenges under a landing obligation and lead to potential choke scenarios depending on the levels of total allowable catch. It is recommended that more detailed information on catch quantity and size profile of gadoid species is gathered through the use of a reference fleet during 2014 and 2015 using electronic monitoring as a means of verifying self reported catch data.

Annex: Figures and tables

Figure 1: 2013 haul positions from EM GPS data for February to September (blue points) and October onwards (red points)

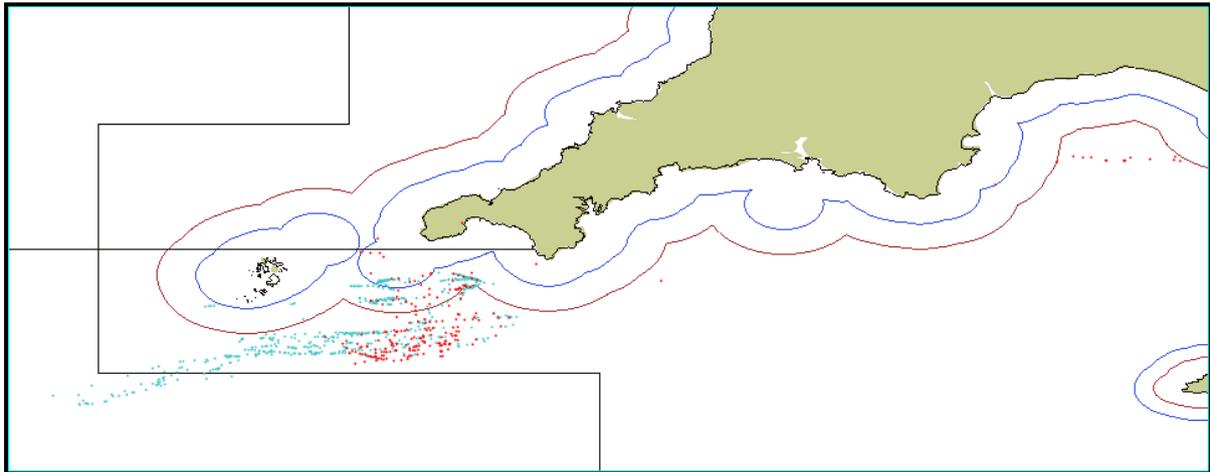


Figure 2: Vessel monitoring system data of the participant vessel in 2012, which shows a similar fishing pattern to 2013 (see Figure 1)

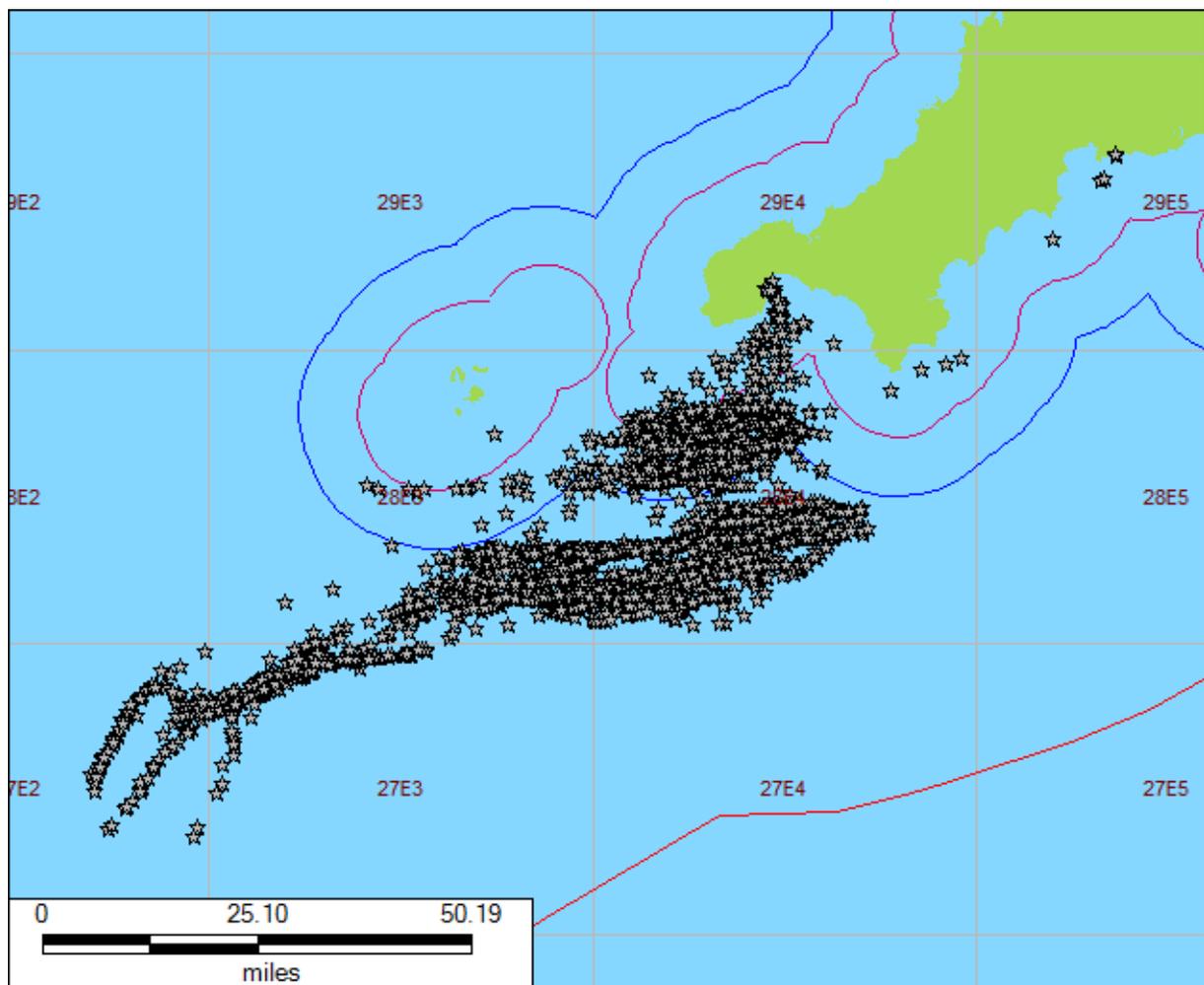


Figure 3: The weights of each fish species landed and days at sea by month by the participant vessel in 2012 and 2013, including discarded haddock in October 2013

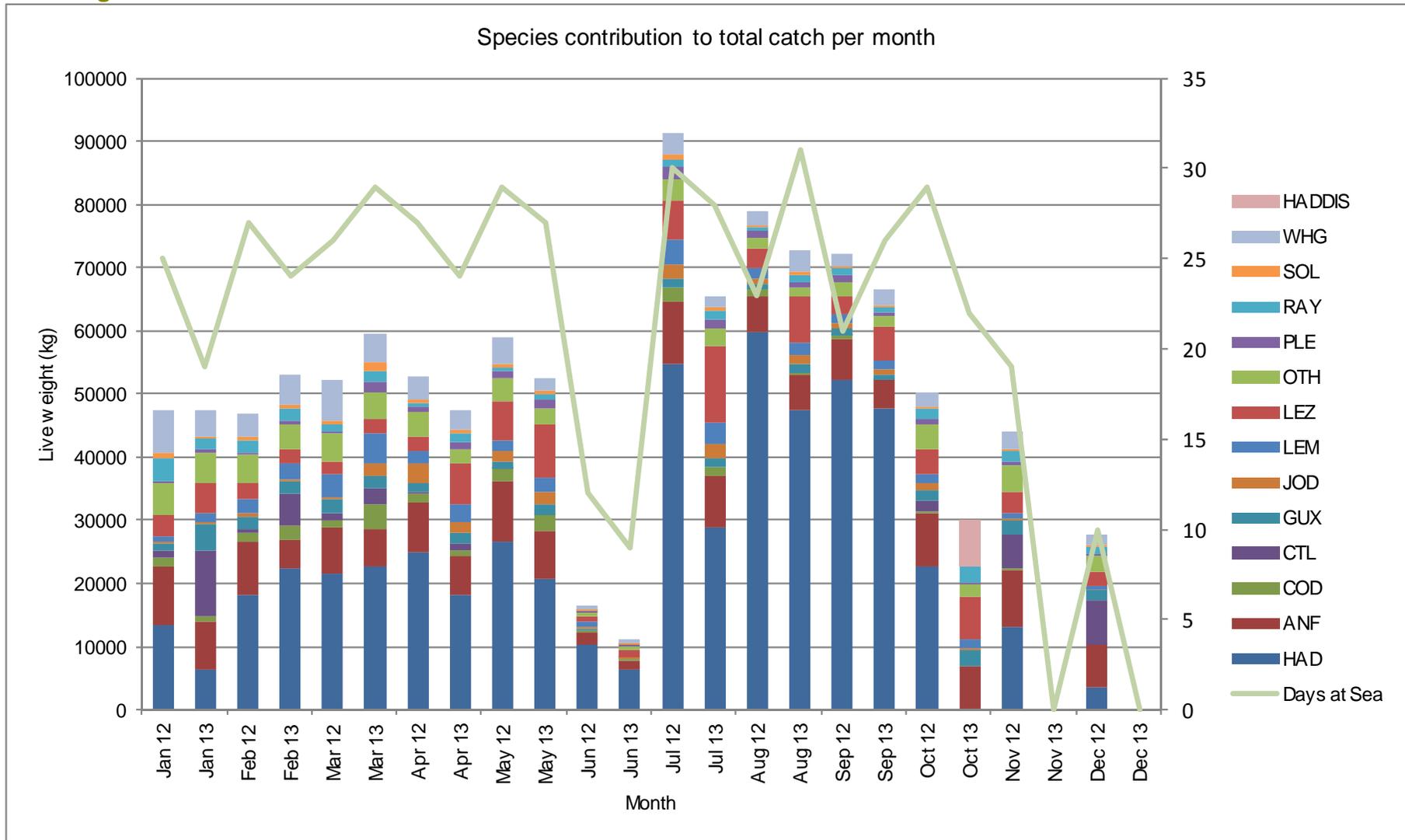


Figure 4: The percentage contribution made by each species by month in 2012 and 2013 to weight landed, including discarded haddock in 2013

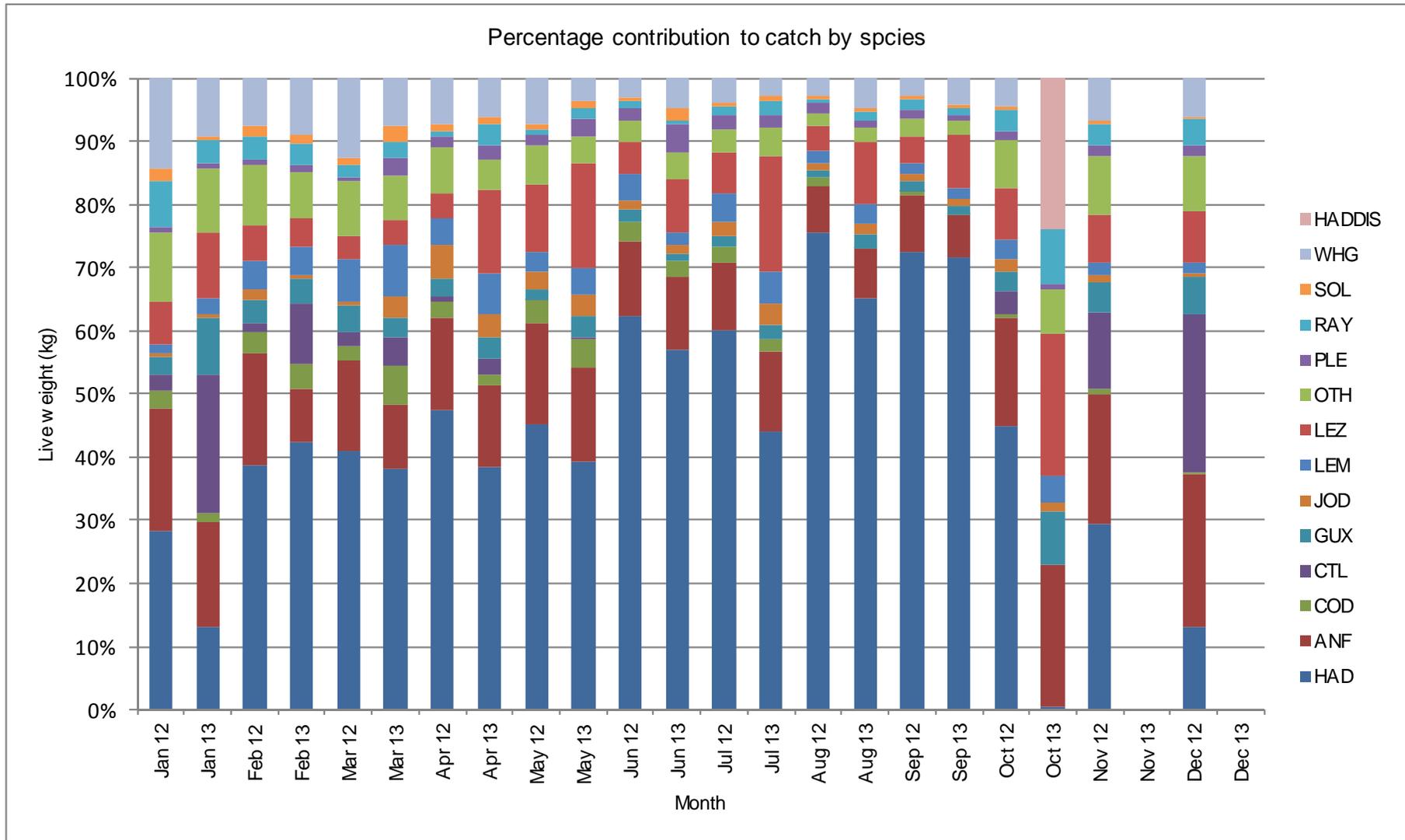


Figure 5: The total landings by weight shown as a percentage of the total catch in 2012 and 2013

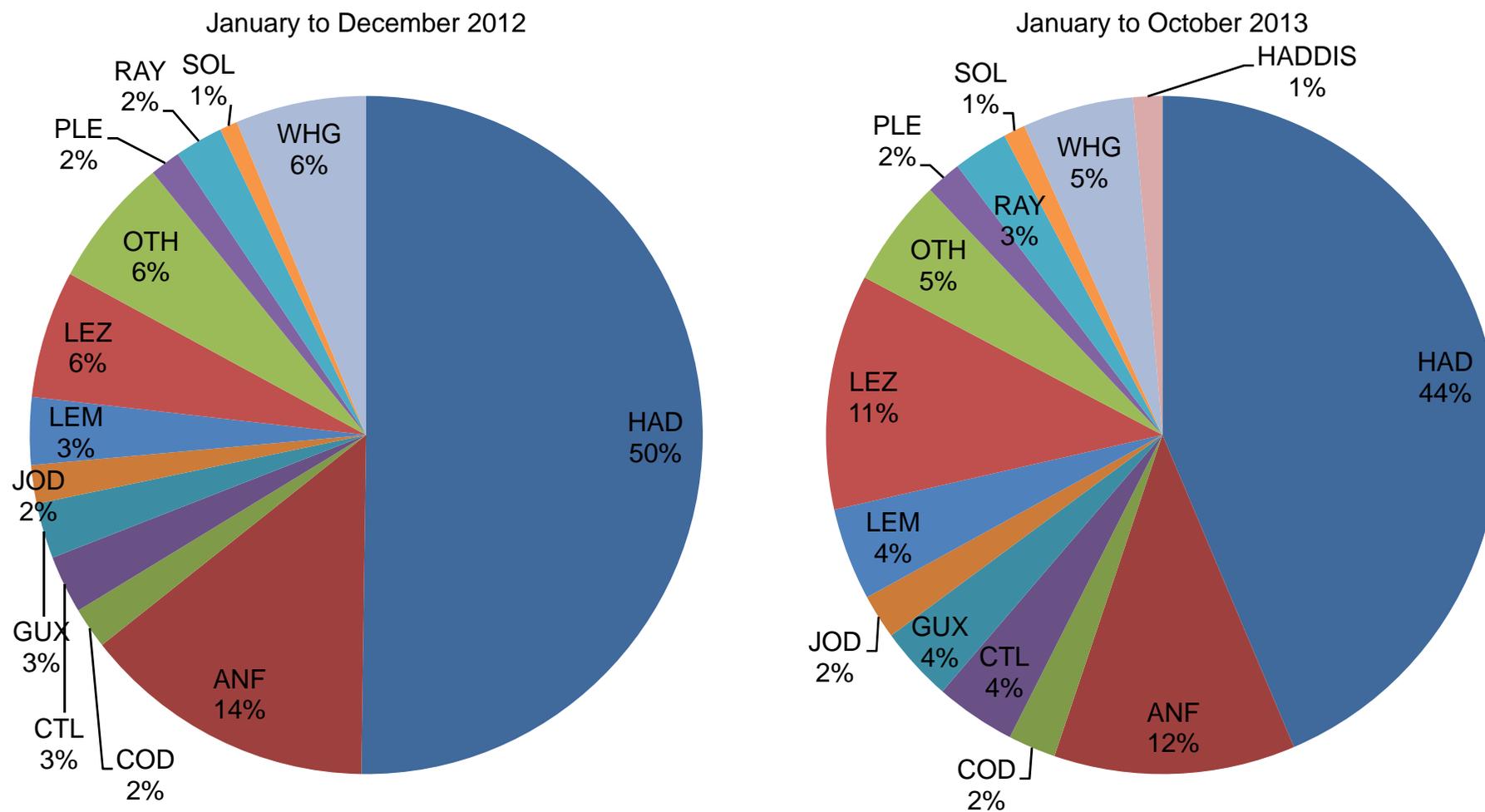
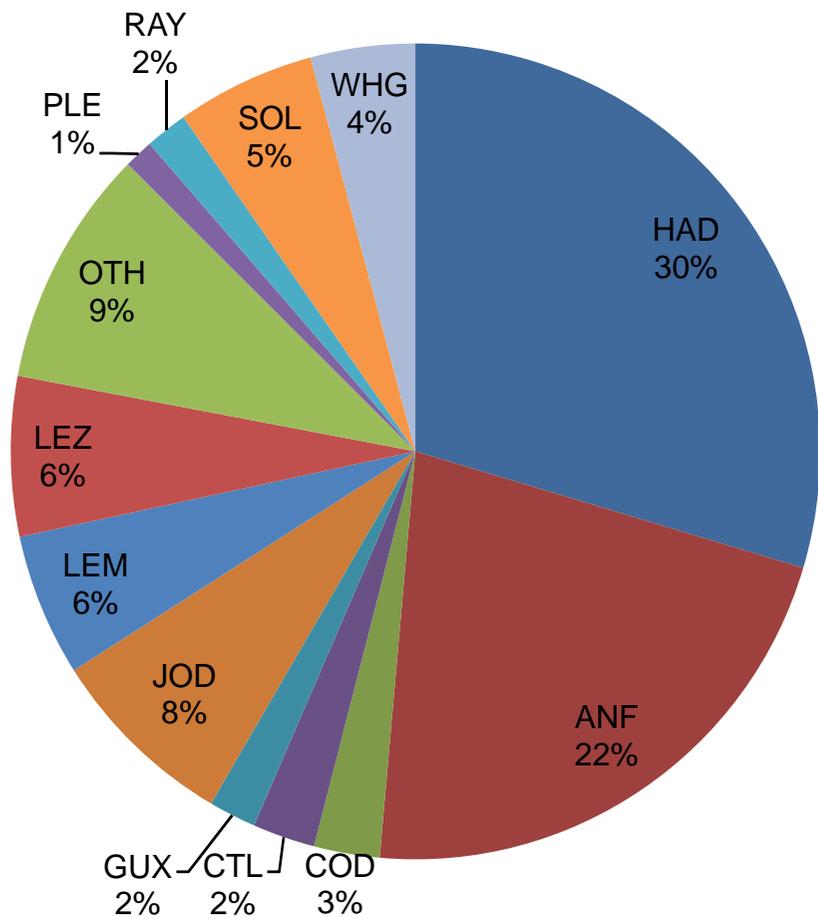


Figure 7: The total landings by value shown as a percentage of the total catch revenue in 2012 and 2013

January to December 2012



January to September 2013

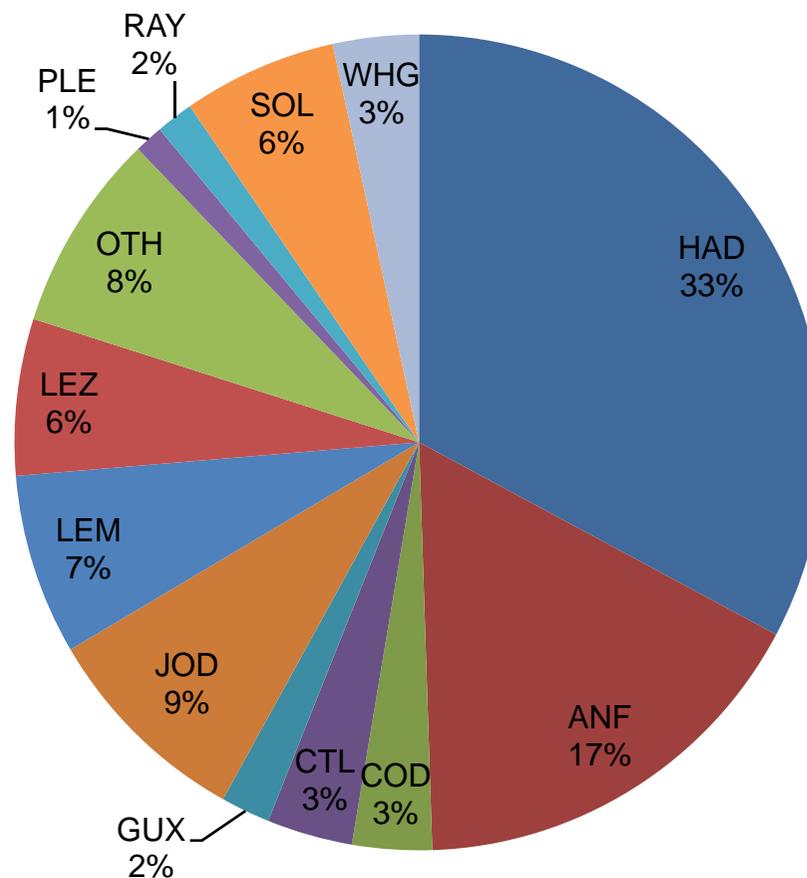


Figure 8: Percentage live weight of 2012 landings by Cornish FPO member vessels using otter trawl with 80+mm codends

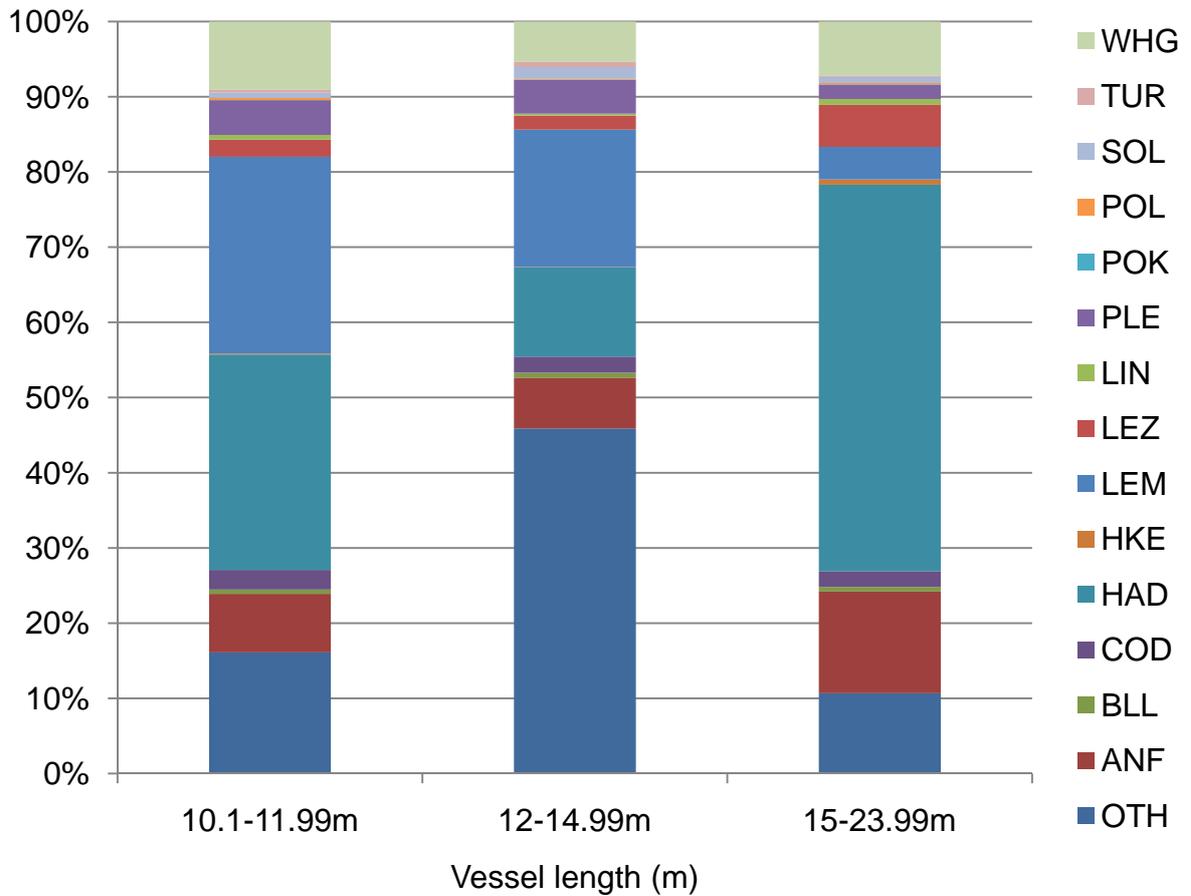


Figure 9: Percentage of landings by value for Cornish FPO vessels using otter trawls with 80+mm codends

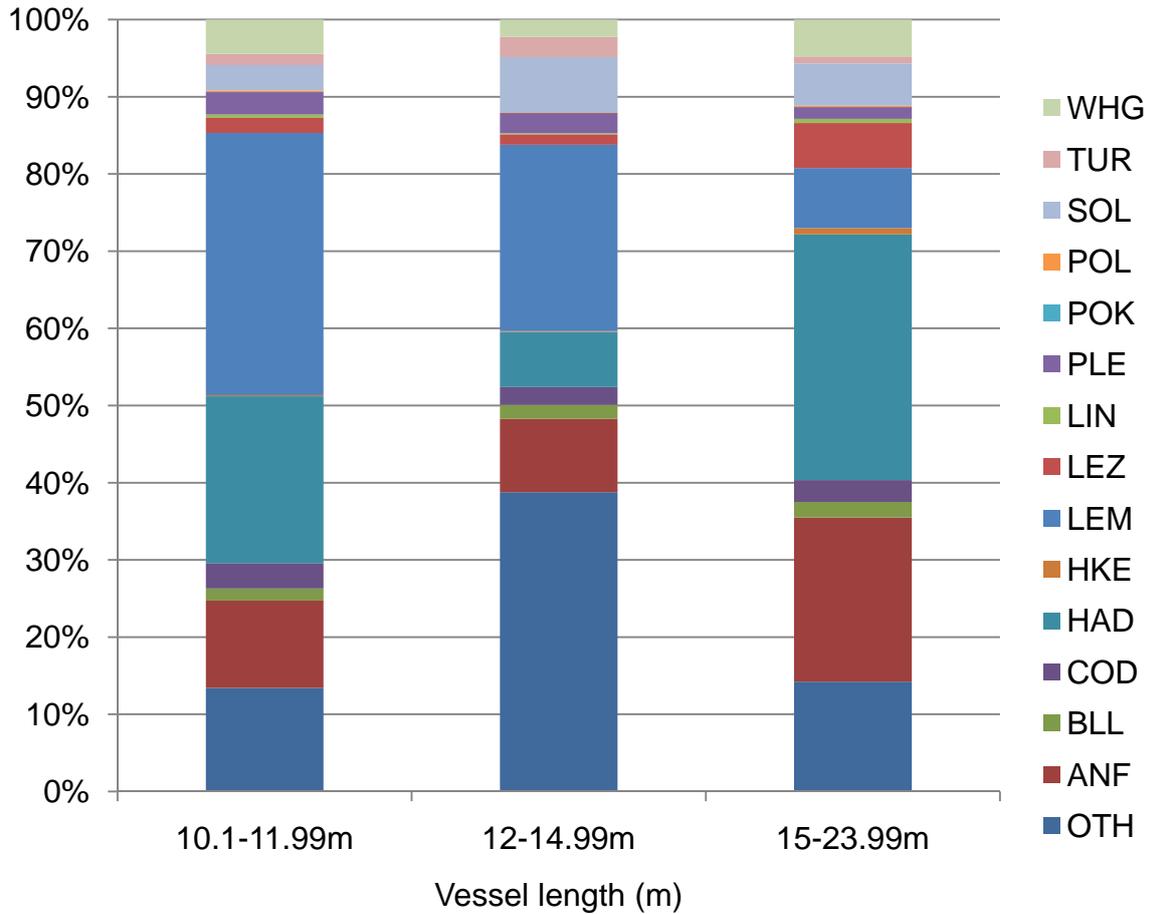


Figure 10: The quantities of undersized or damaged haddock estimated by onshore observers compared to the estimates made by the master

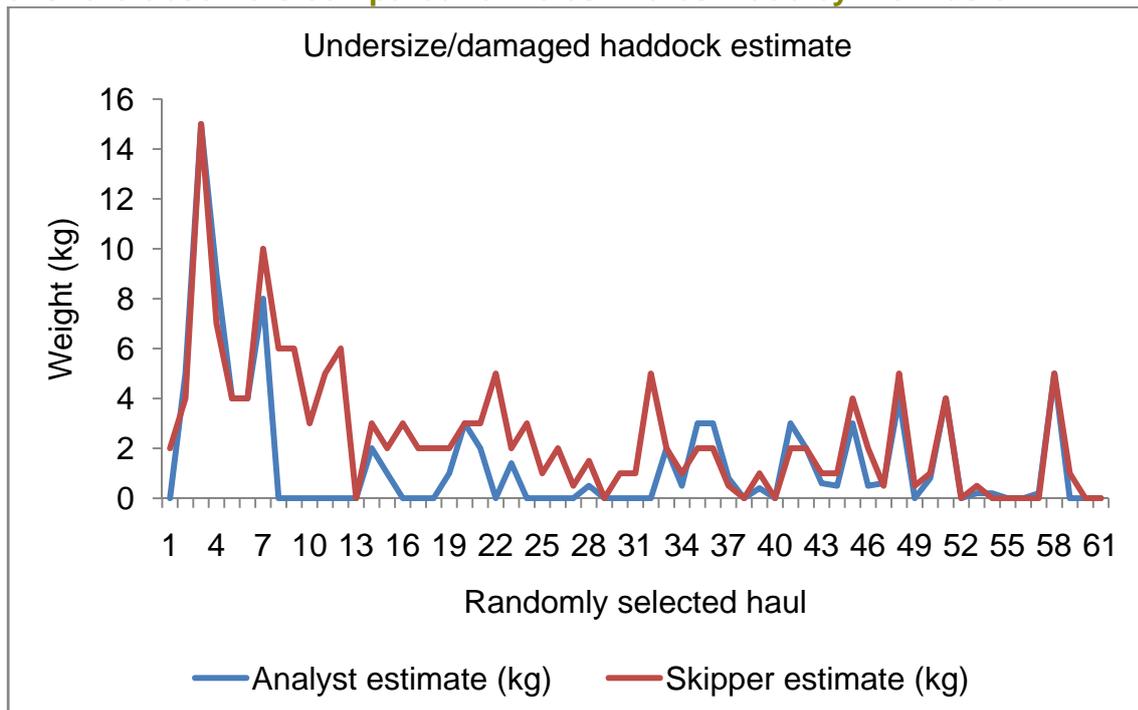


Figure 11: Haul positions of the participant vessel, between 1 February and 17 August 2013

Red points indicate audited hauls.

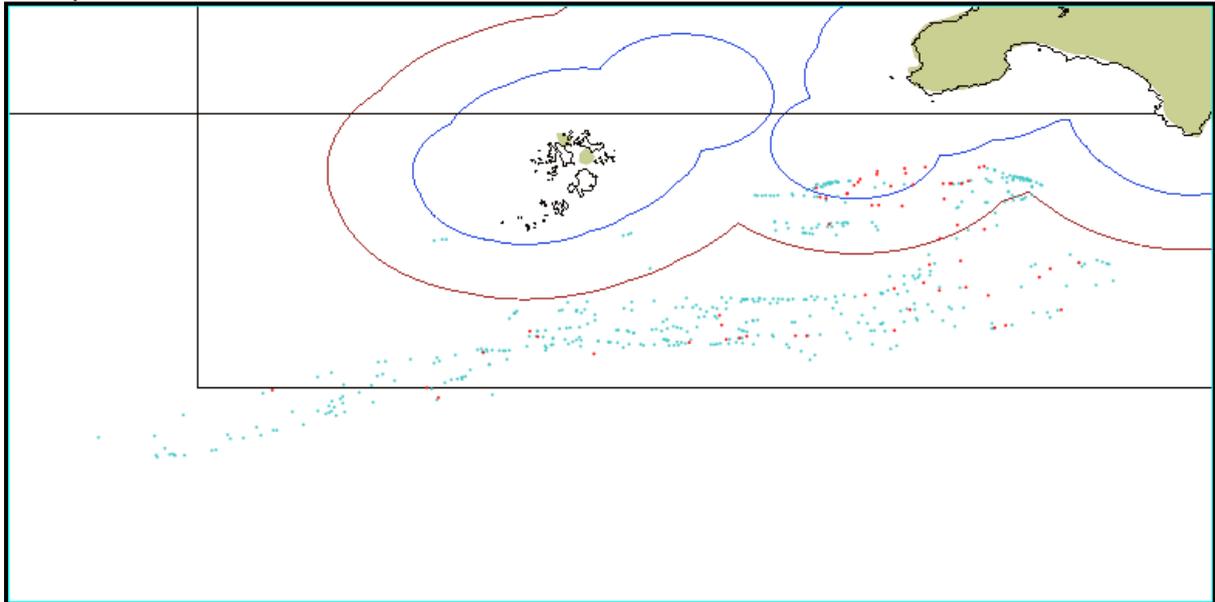


Figure 12: Length frequency distribution of haddock caught during an MMO observer trip in July 2013

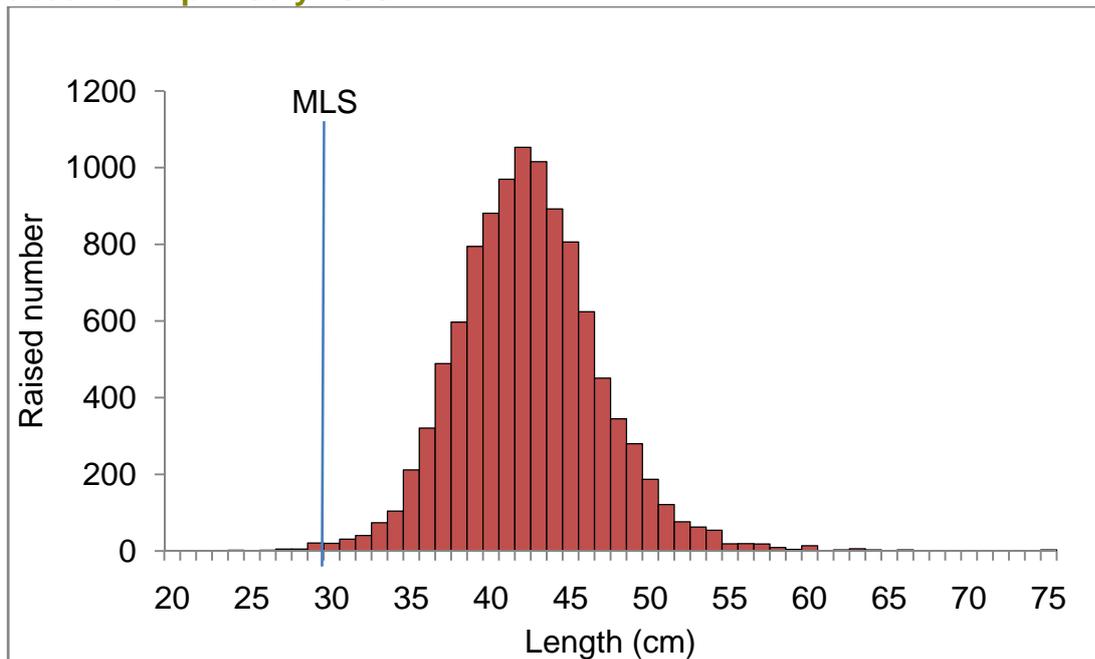


Figure 13: The 2012 monthly landings (blue) of haddock by over 10m Cornish FPO vessels using 80+mm codend trawls and estimated quantity of discards (red) using an average 62% discard rate

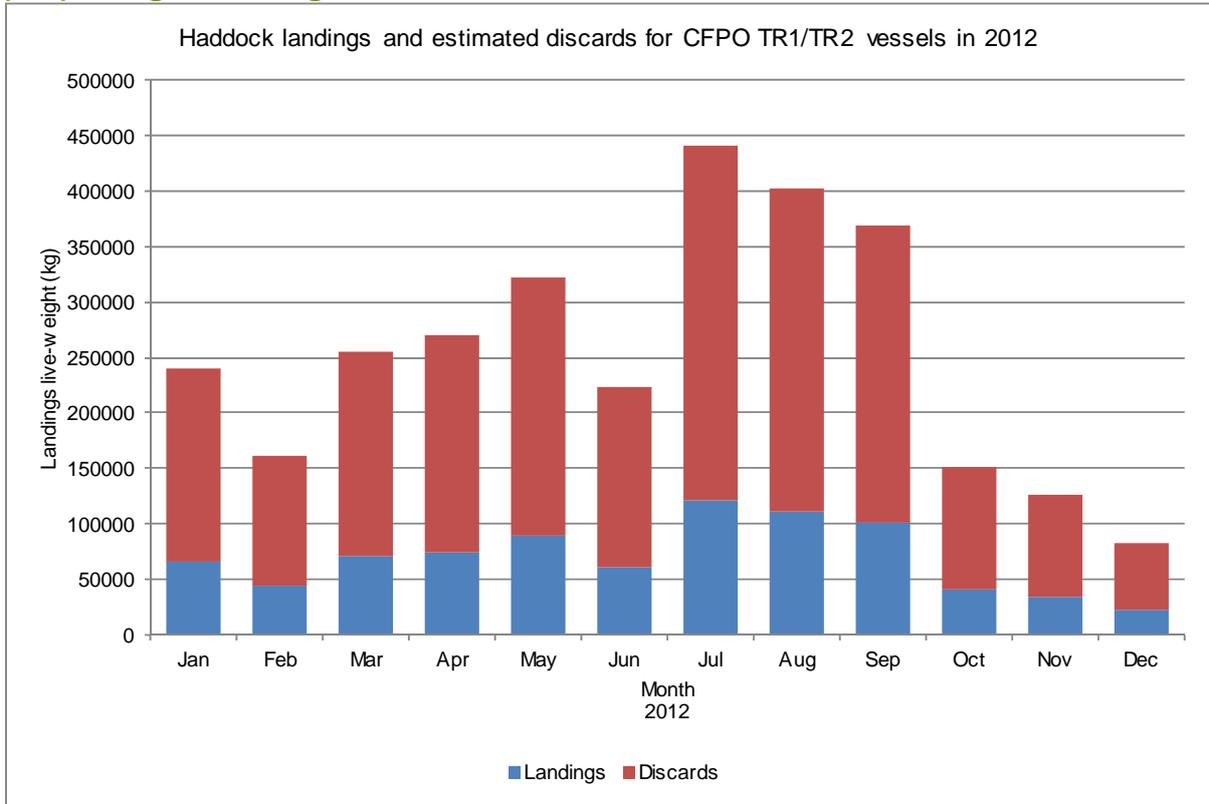


Figure 14: Haddock catches by the CFPO otter trawl fleet in 2012, split by vessel size class and codend mesh range used

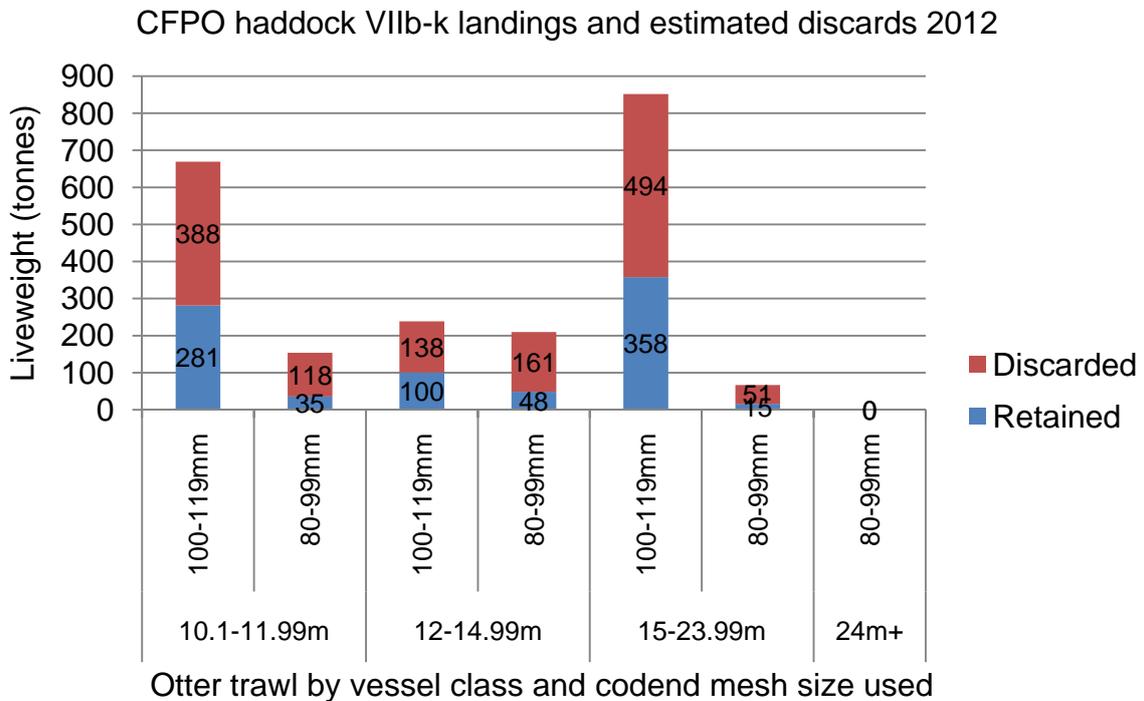


Figure 15: Length frequency distribution of whiting caught during an MMO observer trip in July 2013.

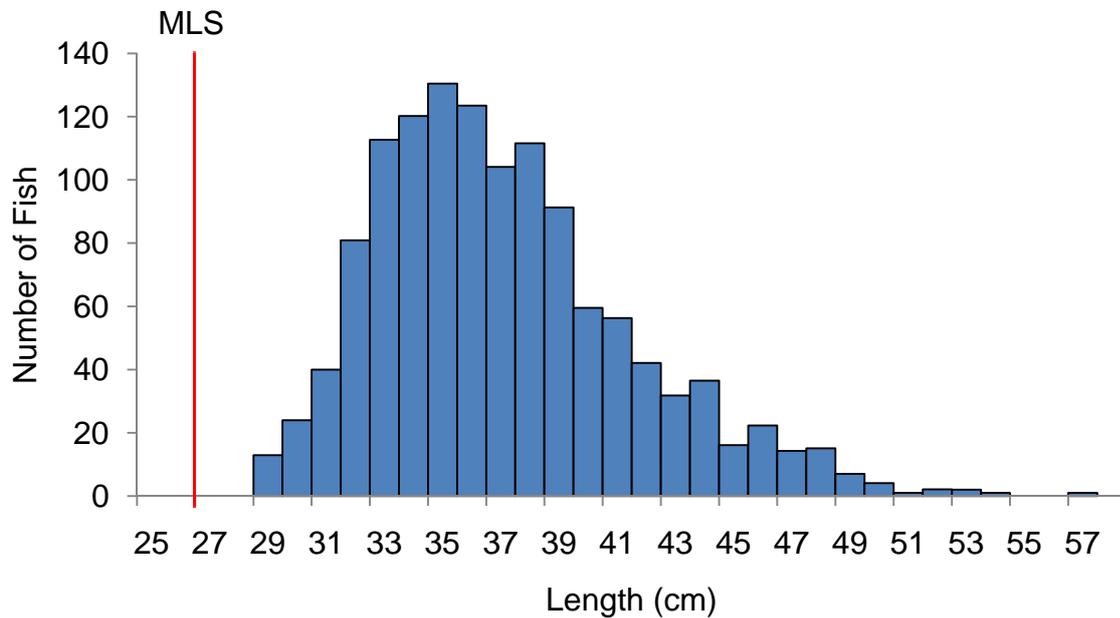


Table 1: Weight (kg) of haddock caught during a twin rig otter trawl top panel comparison trial in July 2013.

Haul code	150mm top panel	200mm top panel
3	411	327
10	353	405
16	52	44

Table 2: Fishing effort and sampling effort for the participant vessel

	Number of trips	Number of hauls fished	Number of hauls sampled	Percentage of hauls analysed	Valid and useable trips
Total sampled	27	452	61	13.5	Yes*
Total un-sampled	3	33	0	0 (12.6**)	No

*This includes 6 valid fishing trips of 101 fishing hauls which were combined together with other fishing trips to make one sampling unit. This was done to allow the 10% analysis rate to be met.

**The 12.6% represents how much of the total fishing effort carried out between these dates was analysed, including trips which could not be analysed due to data loss.

Table 3: Discarded and undersized or damaged catches of haddock for fishing trips between February and September 2013, for the participant vessel

	Total catch*	Observed discards	Undersized retained
Live weight (kg)	150243	15	1091
	Percentage	0.001	0.7

*Total catch value includes declared weights of undersize/damaged haddock but excludes discards

Table 4: Weight (kg) of haddock observed on sampled hauls, raised to all hauls fished between 1 February and 17 August 2013.

	Weight observed not raised (kg)	Raising factor*	Total raised weight (kg)	Reported by master (kg)
Discarded	1.9	7.95	15	0
Undersized or damaged	90.2	7.95	717	1091

* Raising factor = Number of hauls fished / Number of hauls sampled = 485/61 = 7.95 and this includes the hauls that could not be sampled due to data corruption.

Table 5: Species codes and names used throughout the report and figures

Species code used	Common name	Scientific name*
ANF	Anglerfish species	<i>Lophius spp.</i>
COD	Cod	<i>Gadus morhua</i>
CTL	Cuttlefish	<i>Sepia spp.</i>
GUX	Gurnard species	<i>Triglidae spp</i>
HAD	Haddock	<i>Melanogrammus aeglefinus</i>
HADDIS	Haddock discards	<i>Melanogrammus aeglefinus</i> discards
JOD	John Dory	<i>Zeus faber</i>
LEM	Lemon Sole	<i>Microstomus kitt</i>
LEZ	Megrim species	<i>Lepidorhombus spp.</i>
OTH	Other mixed species	
PLE	Plaice	<i>Pleuronectes platessa</i>
RAY	Mixed skates and rays	<i>Rajidae</i>
SOL	Dover sole	<i>Solea solea</i>
WHG	Whiting	<i>Merlangius merlangus</i>

*Obtained from fishbase.org