



Marine Management Organisation

Catch Quota Trial final report 2013 – western haddock

September 2014





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Executive summary

This report is a consolidated version of the interim report published in November 2013 and incorporates the results to the end of 2013.

The trial was carried out on a twin-rig otter trawler operating under a landing obligation (discard ban) for ICES VIIb-k haddock. Haddock has made up about 30% of the gross catch value for this vessel in the area of the Celtic Sea in recent years, south and west of the Lizard, where key target species include anglerfish and megrim amongst 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 prosecuted by over 130 UK vessels using demersal trawls in the area in which approximately 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); 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 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 up to this date). Less than 1% of the haddock catch was below the minimum landing size or damaged.

The vessel was authorised to continue fishing after the haddock quota became exhausted at the beginning of October 2013 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 the exhaustion of haddock quota, the vessel has been observed discarding significant quantities of haddock whilst fishing for stocks with quota remaining. The quantity of discarded haddock was fully documented and 24.4 tonnes of haddock were self-reported as discarded, between October and December 2013. The total discard rate of haddock over the full trial was estimated to be between 8 and 10 percent, although it is likely this figure could have been maintained at less than 1% had the vessel been provided with its full additional quota allocation.

During the trials the participant vessel owners sought additional 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 manifested in 2013 because of a reduction in the TAC and higher uptakes amongst potential donor fleets.

2012 landings data for the Cornish FPO over 10m fleet were 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 key 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 UK's 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 unless much improved selectivity and catch avoidance can be achieved.

It is estimated, based on 2012 STECF discard data (averaged across 80-99mm and 100mm+ codend mesh size) that the CFPO over 10m demersal trawl fleet discarded approximately 1400 tonnes of haddock. At UK demersal trawl fleet level (including under 10m vessels) the total discarded quantity is estimated to be in excess of 2700 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 catches of other commercial species.

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

The vessel has continued on the scheme in 2014 and preliminary analysis of catches from a range of innovative gear designs suggest that there is considerable scope for reducing haddock catches while maintaining a viable fishery for other key stocks. Results from these trials are [published on the MMO website](#).

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 was 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 39/2013](#); this was set at a maximum of 5% of the Member State share of the TAC.

The UK share of the haddock VIIb-k TAC in 2013 was 1415 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; verification of the landing obligation requires participant vessels to be

equipped with remote electronic monitoring equipment incorporating CCTV (REM). A list of applicable species codes used in the report is provided in Table 1.

Table 1: Species codes and names used throughout the report

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>

Participant vessel fishing patterns

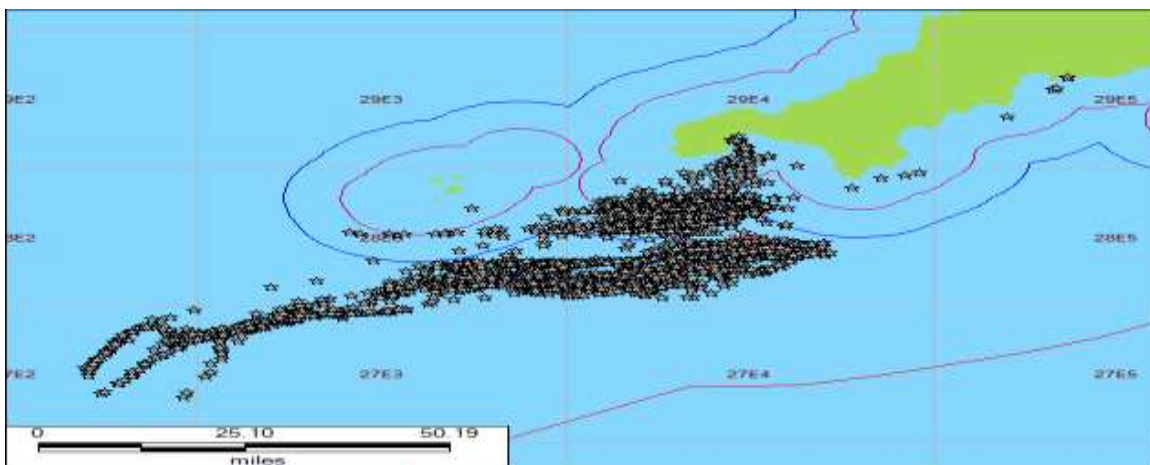
One application to participate in trials was received from the owners of a 20m twin-rig otter trawler. This vessel uses 106mm codend mesh to target a mixed demersal fishery in the Celtic Sea. The vessel relies on a diverse range of species including quota species such as haddock, megrim and angler as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

The vessel landed 321 tonnes of haddock in 2012 (UK quota 1902 tonnes). This amounted to approximately 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. Figure 1 data is the actual haul position, taken from REM data, whilst Figure 2 was taken from 2012 VMS data plots.

Figure 1: 2013 Haul positions from EM GPS data for February to September (dark points) and October to December (red points)



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



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 the current stock assessment advises avoidance of haddock catches to reduce fishing mortality and to preserve the 2013 year class (ICES advice June 2014).

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 July, 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.

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

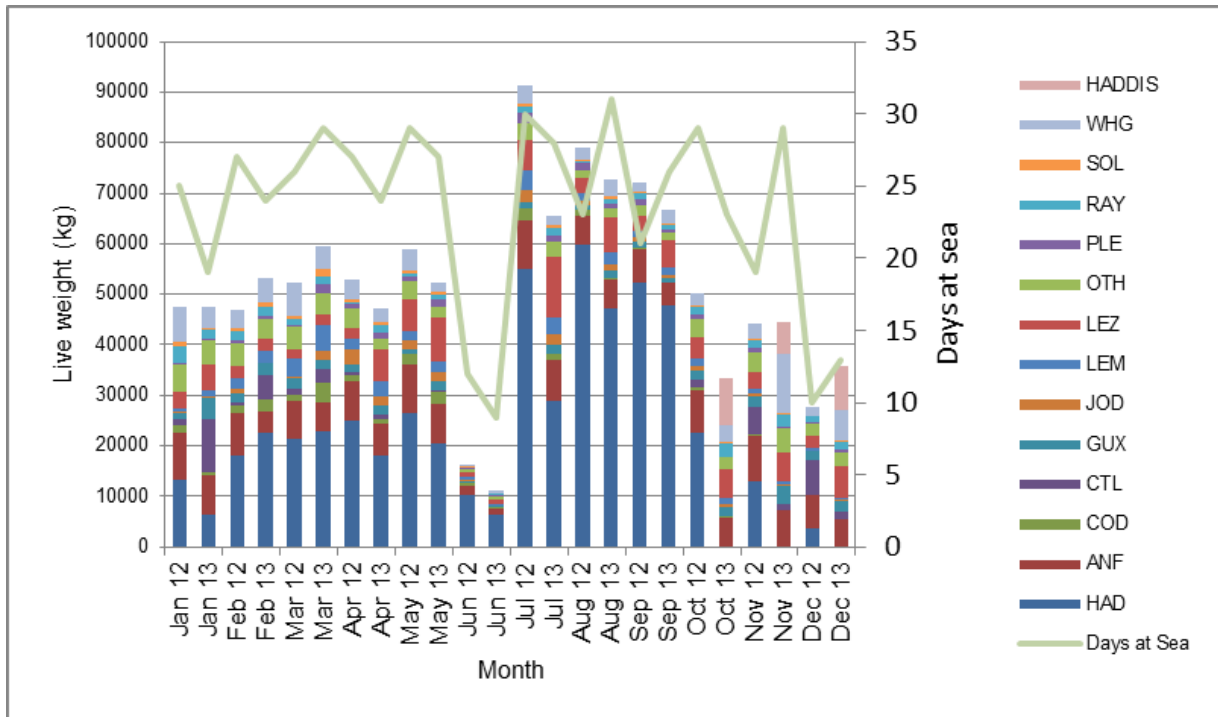
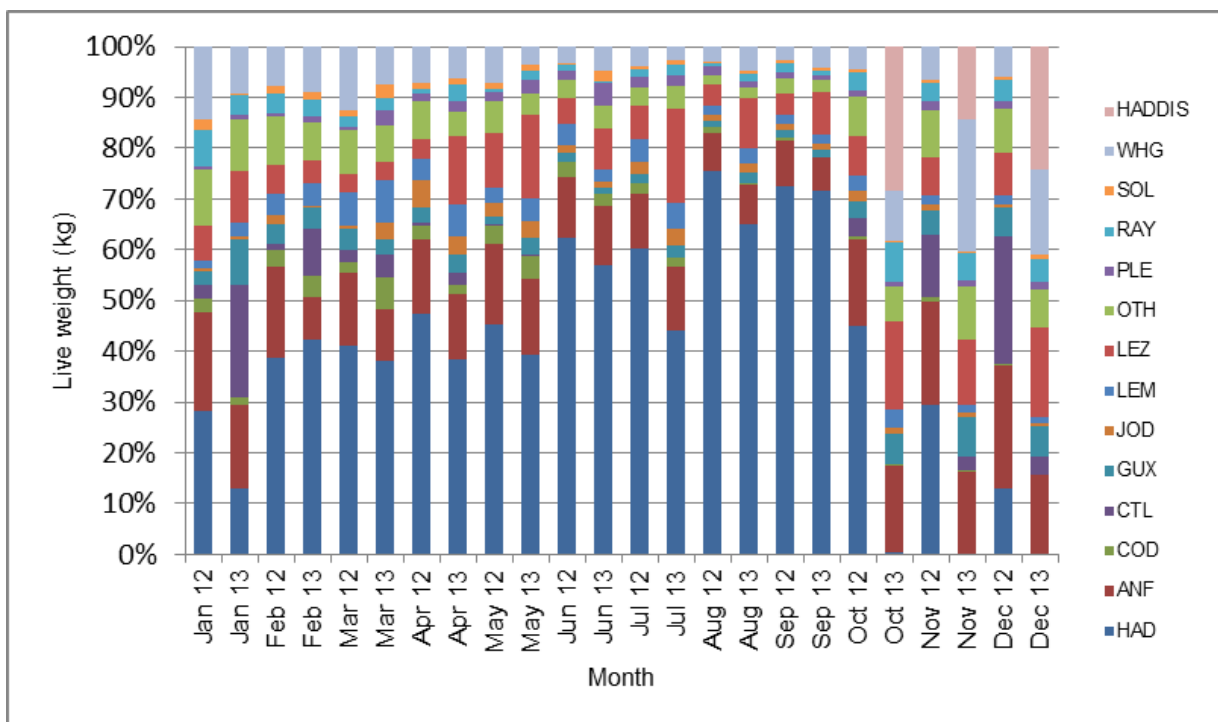


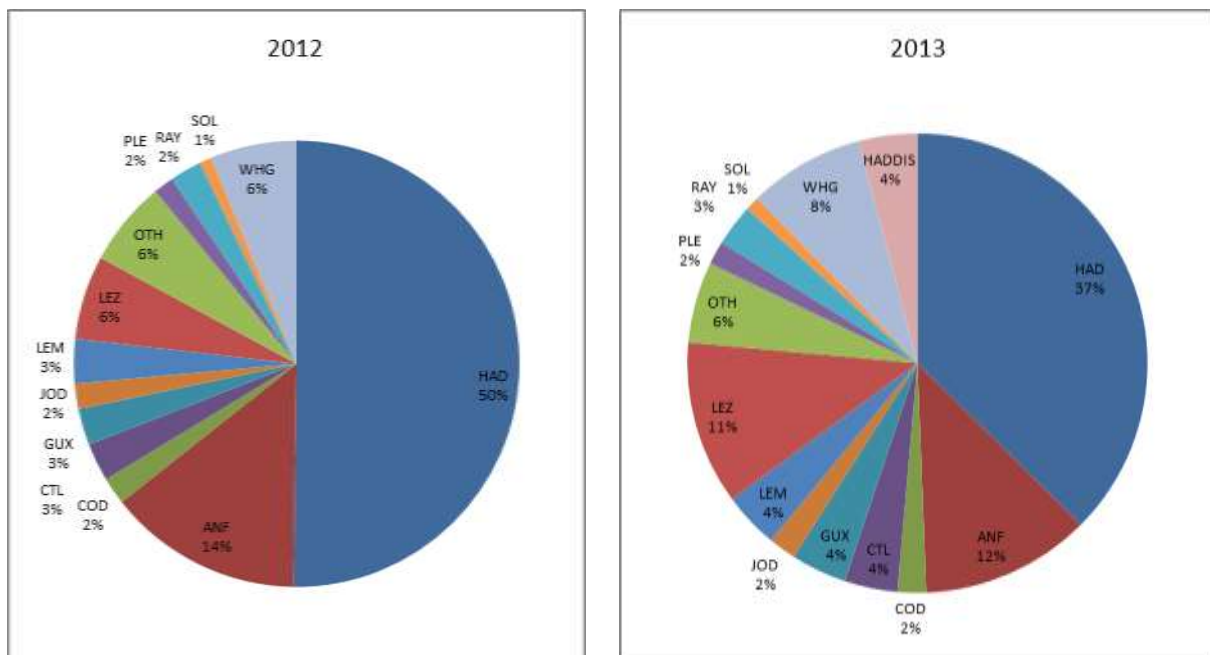
Figure 4: The percentage contribution made by each species by month in 2012 and 2013 to weight landed. This also includes haddock discards (HADDIS) in October to December 2013



The catches in June 2012 and 2013 are low because the vessel only fished for 10 to 12 days and spent the rest of the time in refit. In both years total catches from October onwards begin to reduce. This is in line with a reduction in fishing effort (Figure 3). Although in November 2013 the fishing effort is high but with relatively low total catch weights.

The data from Figure 3 is also displayed in Figure 4 as a percentage contribution to the total catch per month. This shows that in 2012 haddock made up 12-75% of the total catch in each month, which is approximately 50% contribution over the whole of 2012. In 2013 haddock made up 12-71% of the total catch each month in 2013 and this equals approximately 41% when the retained and discarded haddock catches are added together (Figure 5). The other main contributing species to the total catch weight are anglerfish, megrim and whiting, in that order, for both years.

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



When comparing monthly catches between the two years, the catches of haddock were higher in each month in 2012 than 2013, except in February, March and December where the 2013 catch was marginally higher. It should be noted that 2012 data does not include any estimates for discarded haddock, only those that were landed.

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 13-52% in 2012 and 12-59% in 2013. This does not include October to December 2013, where all haddock were discarded (except 114kg in October) and therefore contributed almost 0% to the catch value in these months. 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, above haddock, particularly through the winter months October through to March.

Figure 6: The percentage contribution by each species by value for 2012 and 2013

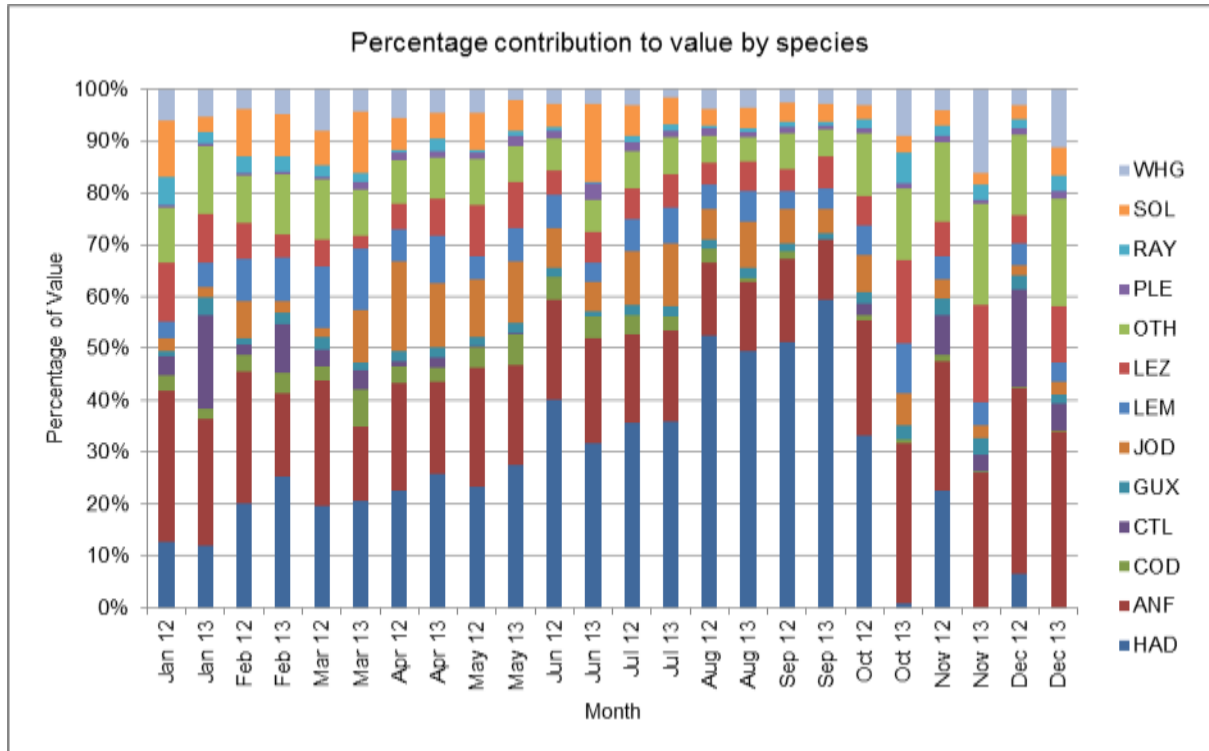
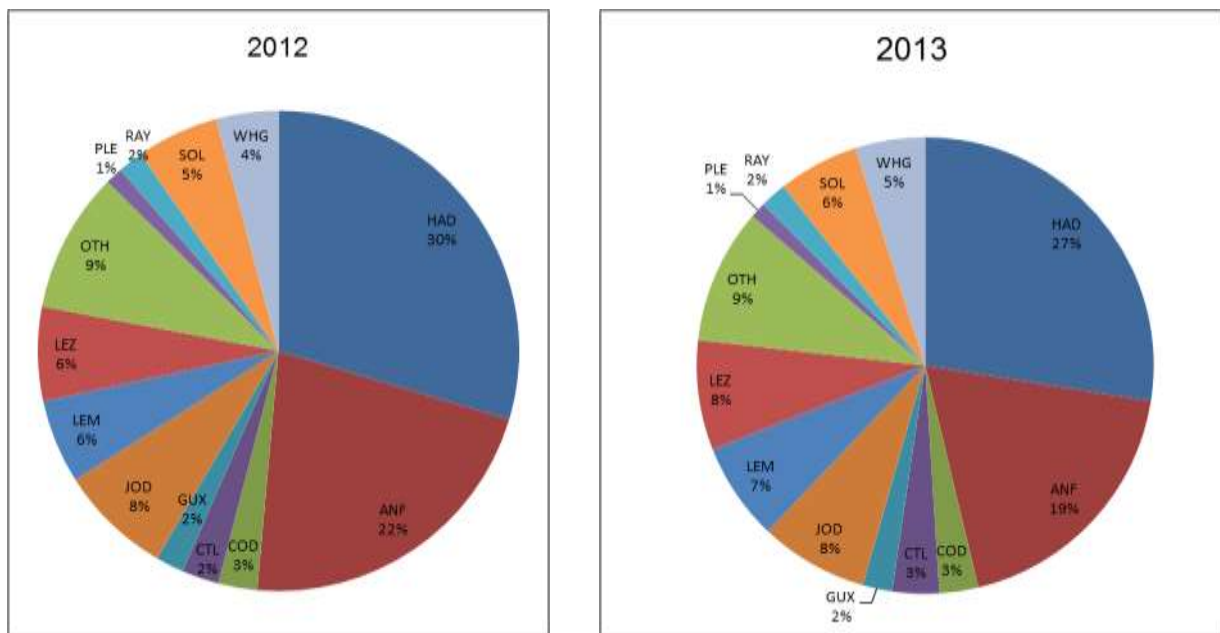


Figure 7 shows the annual overall percentage contribution by species for each year by value, for 2012 and 2013. Haddock, anglerfish, John Dory, megrim and lemon sole are the most important individual species landed, with haddock making up 30% and 27% of the total catch value in 2012 and 2013, respectively. Both years have a very similar catch composition by value, with the largest change being a 3% reduction in haddock and a 3% reduction in anglerfish, between 2012 and 2013.

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



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 80-99mm mesh sizes are restricted in their catch composition by EU Council Regulation 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. A key driver in the use of codend mesh size towards the small end of the 80-99mm range, particularly for smaller vessels is the retention of smaller valuable species such as squid and red mullet.

It is notable that vessels under 15m (see Figures 8 and 9) are more reliant on non-quota species such as lemon sole, whereas 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 due to a lack of quota.

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

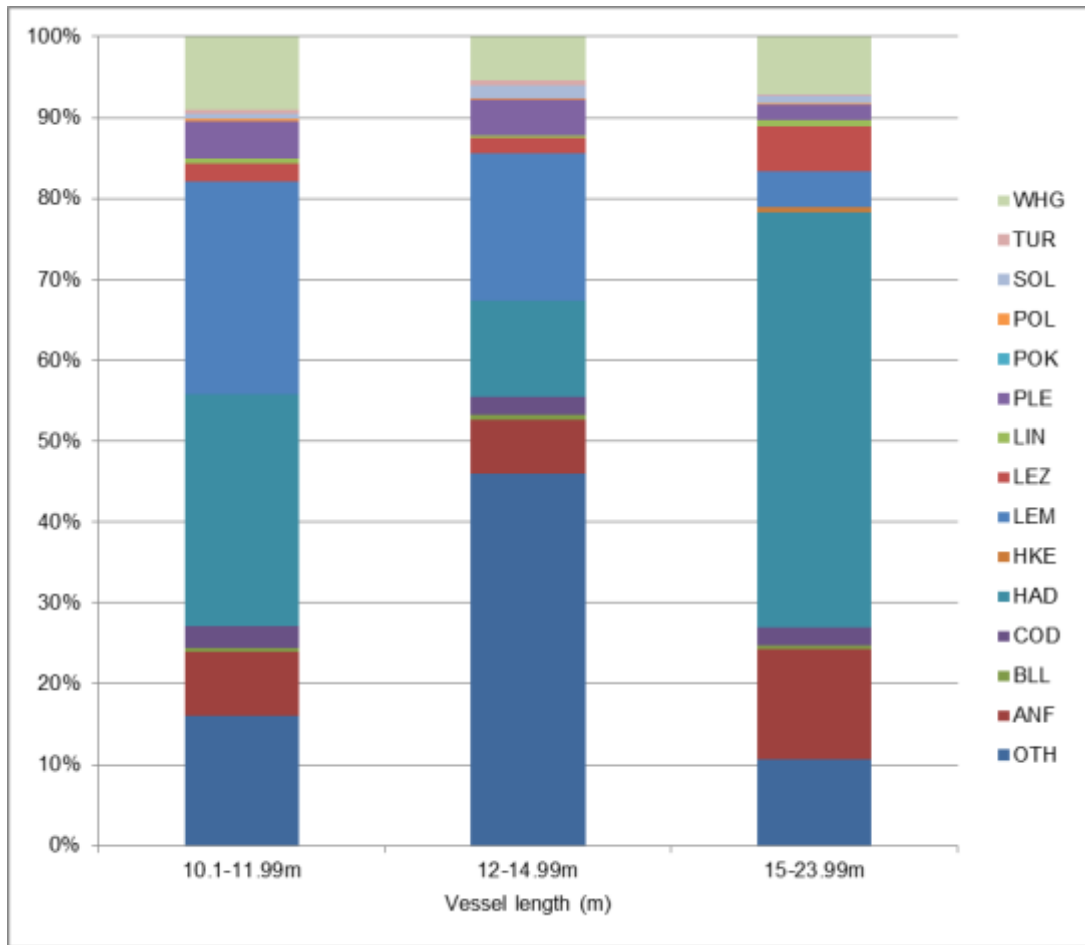
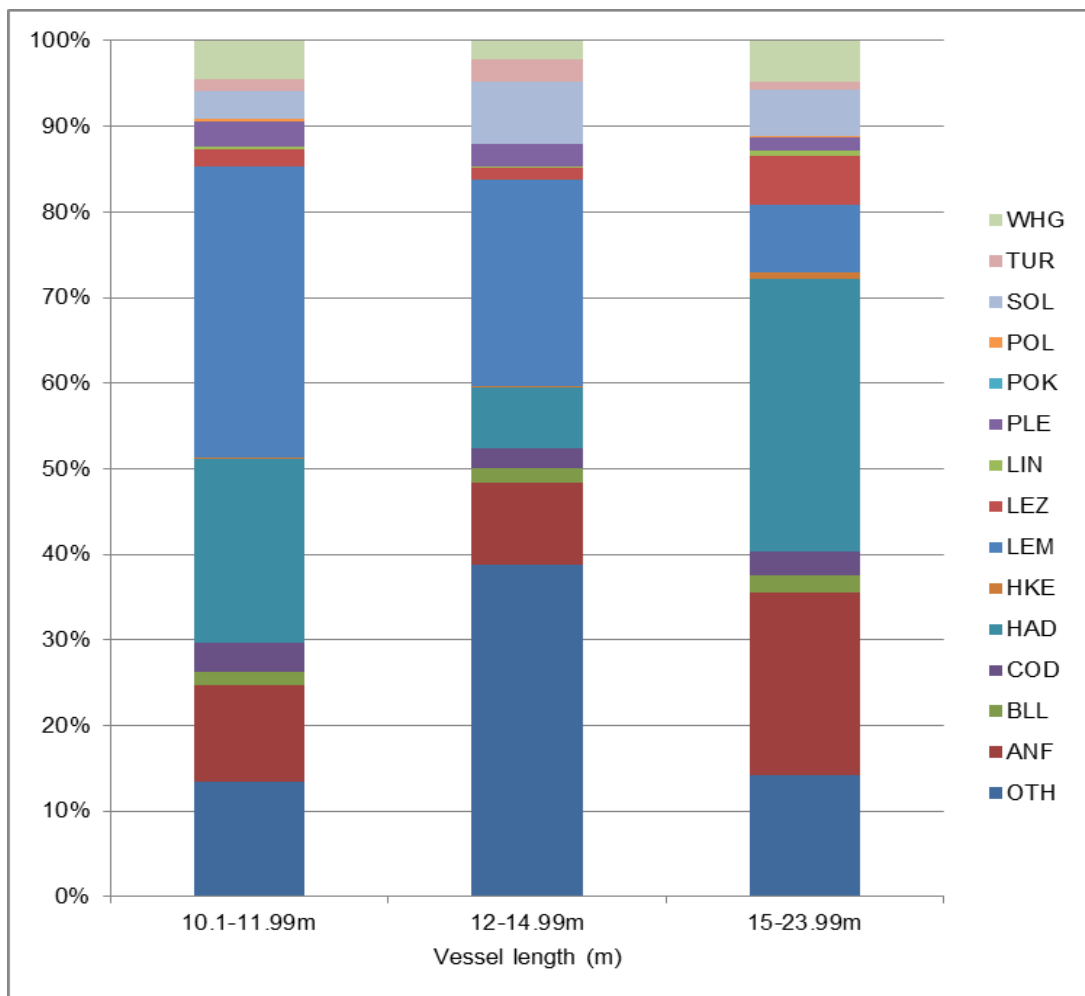


Figure 9: Percentage of landings by value for Cornish FPO vessels using otter trawls with 80+mm codends



Haddock discard rates and additional quota incentive

The discard rate in the TR1 (100mm+ codend mesh size) as evaluated by STECF for VIIb-k haddock in 2011 was 41.6%. Council Regulation 39/2013 retained the cap for maximum additional allocations at 30%, therefore the vessel was entitled to 96t of additional quota which exceeded the UK allowance of 70.7 tonnes. The vessel was offered the full 70.7t available.

It was hoped that the shortfall in the additional allocation (26t) could be made up from the UK's 2% top slice available for scientific research, however this was committed to other purposes. It was therefore agreed that the uptake of quota would be reviewed towards the end of 2013. By October 2013 the vessel had caught a total of 221t 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 96t 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 undersize haddock caught. Audits of EM footage and data were carried out from February to December 2013, hence the results reflect this period.

Between 1st February 2013 and 31st December, the vessel completed 50 fishing trips totalling 776 fishing hauls (see Table 2). However 3 of these trips, totalling 33 hauls, were unable to be audited as a result of data corruption. Of the remaining 47 fishing trips 80 fishing hauls were sampled out of a total of 743 fishing hauls completed. The positions of these sampled and un-sampled hauls are shown in Figure 10.

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	47	743	80	10.8	Yes*
Total Unsampled	3	33	0	0 (10.3**)	No

*This includes 10 valid fishing trips of 119 fishing hauls which were combined or linked with another fishing trip to make one sampling unit. This was done to allow the 10% analysis rate to be met.

**The 10.3% 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

Figure 10: Haul positions of the participant vessel, between 1st February and 31st December 2013. Red points indicate audited hauls



Sampling 80 hauls out of a total of 776 hauls gave a sample rate of 10.3% of the total fishing effort between February and December (Table 2). No EM auditing took place in January 2013.

Results

Discards

When discussing discards the two different time periods, February to September and October to December need to be treated separately. This is because in the earlier period discarding of haddock was against the terms and conditions whilst in the latter period the vessel was no longer required to retain undersize or over quota haddock, but only to estimate and document the quantities being discarded.

February to September – In total an estimated 2.2kg of haddock was observed being discarded during onshore an audit of 68 hauls. When raised to the total fishing effort for this period this equals 19.4kg of haddock discarded (Table 2), or less than 0.009% of the total catch of 214,338kg. The discards observed were clearly incidental and these results demonstrate that the crew were complying with the landing obligation.

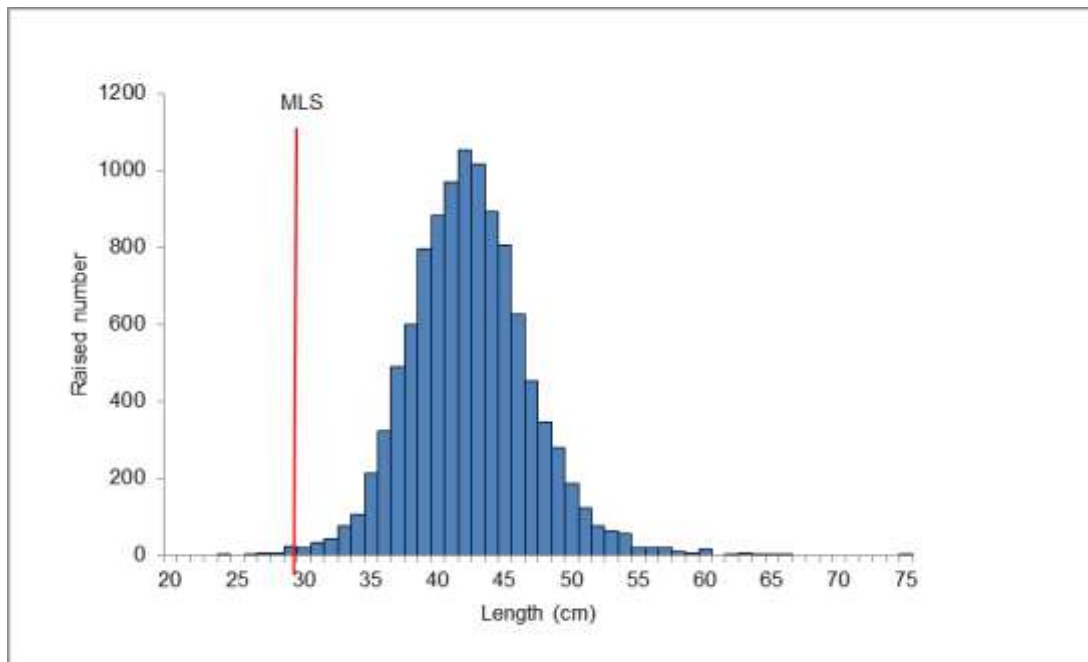
Table 3: Discarded and undersize/damaged catches of haddock for fishing trips between February and September 2013, for the participant vessel

Period	Total catch* (kg)	Observed discards (kg)	Undersize retained (kg)
Feb – Sept	214338	19.4	1305
	Percentage	0.009	0.6

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

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

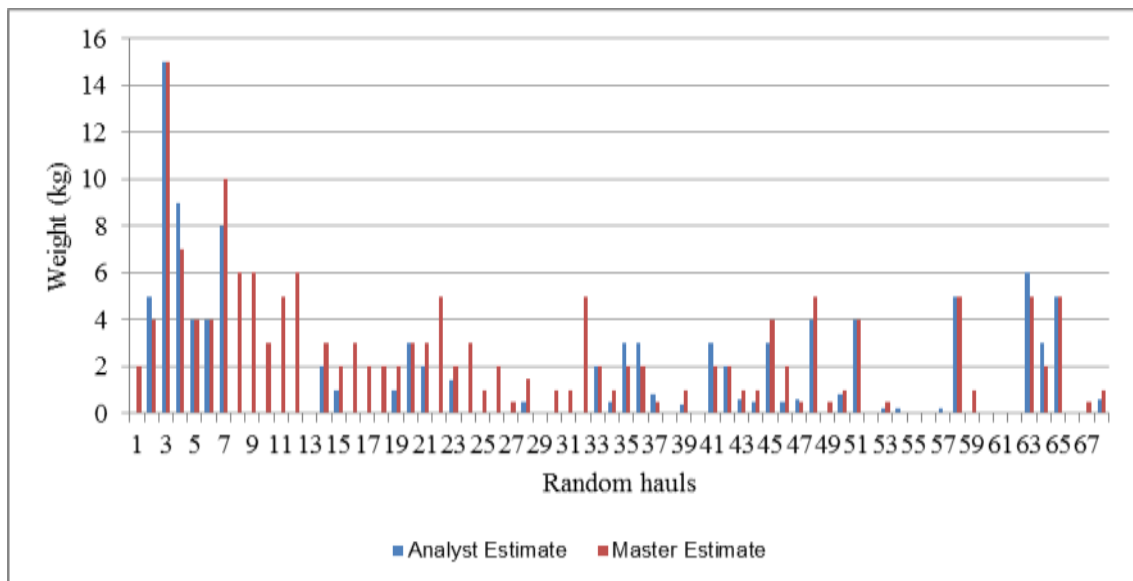
Figure 11: Length frequency distribution of haddock caught during an MMO observer trip in July 2013



A total of 1305kg of undersize or damaged haddock were reported by the Master up to the end of September which was approximately 0.6% of the total haddock catches for this period (Table 3). Weights reported on randomly selected hauls were audited to ensure the undersize catches were reported accurately. Shore-based observers estimated a total of 104.8kg of undersize haddock on the 68 randomly selected hauls. For these observed hauls the Master reported 165.5kg of undersize haddock.

The audit estimates of undersize haddock caught were approximately 37% 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 20 of the 68 hauls analysed, the analyst recorded 0kg undersize/damaged haddock observed, whereas the Master had recorded weights of up to 5kg on these same hauls, as shown in Figure 12.

Figure 12: The quantities of undersize or damaged haddock estimated by onshore observers compared to the estimates made by the Master, Feb-Sept inclusive



When raised to total effort the shore-based observer estimate gives a total of 924kg of damaged/undersized haddock compared to the Master’s reported total of 1305kg (Table 4). Therefore the raised observer estimate is approximately 29% less than the weight reported by the Master.

Table 4: Weight (kg) of haddock observed on sampled hauls, raised to all hauls fished between 1st February and 30th September; and 1st October and 31st December 2013

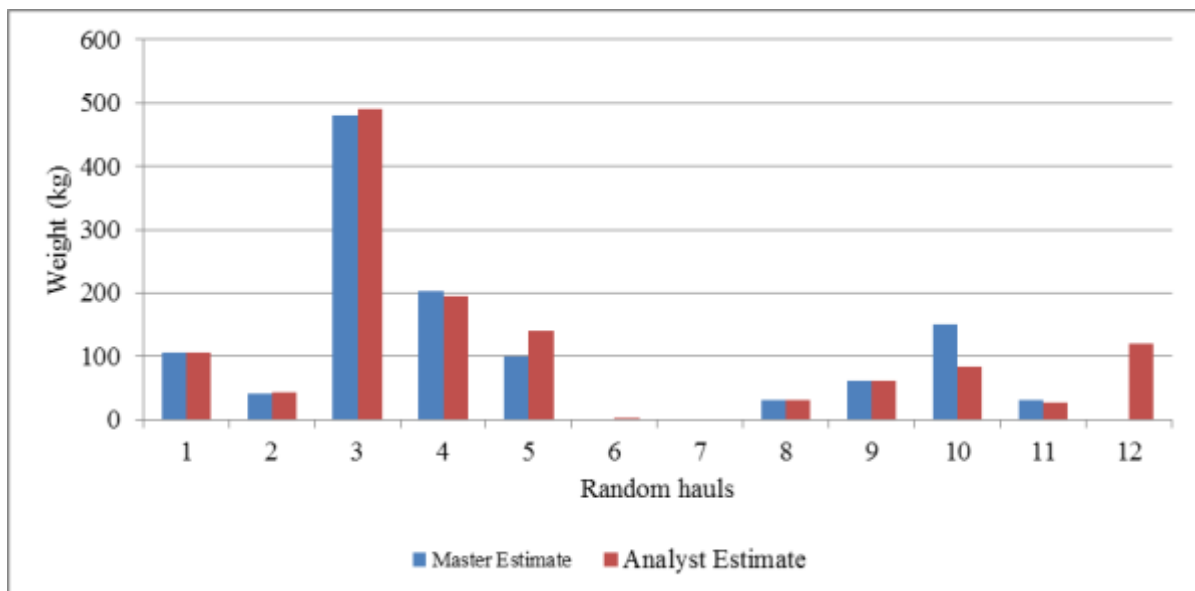
	Weight observed unraised (kg)	Raising factor*	Total raised weight (kg)	Reported by Master (kg)
Discarded (Feb-Sept)	2.2	8.82	19.4	0
Undersize/Damaged (Feb-Sept)	104.8	8.82	924.3	1305
Discarded (Oct-Dec)	1068.6	14.67	15676	24360
Undersize/Damaged (Oct-Dec)	0	14.67	0	0

* Raising factor = Number of hauls fished / Number of hauls sampled. For Feb – Sept = 600/68 = 8.82 and Oct – Dec = 176/12 = 14.67 and these include all hauls that could not be sampled due to data corruption.

October to December – From October onwards the vessel had no quota available to continue to land undersize or over quota haddock and was therefore allowed to discard haddock on the condition that the quantities were estimated and reported. During this time only 114kg of haddock were actually retained and landed and the rest of the catch was discarded. In total an estimate of 1292.85kg of haddock was observed being discarded during an onshore audit of 12 hauls. When raised to the total fishing effort for this period (a total of 176 hauls) this equals 18,966kg of discarded haddock. For the same period the Master reported an estimate of 24,360kg of discarded haddock (Table 4).

The observer’s estimate is approximately 22% less than the Master’s estimate. The estimates made by the observer and the Master on the 12 audited hauls are shown in Figure 13. The differences between these estimates are thought to be due to the way in which catches were handled during processing. It was felt that if the crew had basketed the haddock prior to discarding, then the observer would have been better able to estimate the quantities being discarded more easily. It is also unclear which estimate is the most accurate because the Master’s estimate was based on an estimation of total volume of catch minus the retained catch (resulting in a total discard volume), when the total unsorted catch was still in the fish hopper. Whilst the observer’s estimate is based on raising the data from 12 observed hauls to 176 fished hauls using this effort ratio. Either way both estimates would have been improved and probably closer to each other had the crew processed the catch in a way that allowed a count of total baskets to be made.

Figure 13: The quantities of discarded haddock estimated by onshore observers compared to the estimates made by the Master on the same hauls, Oct-Dec 2013 inclusive



The total discard rate of haddock over the full trial is therefore estimated to be between 8 and 10 percent although it is likely this figure could have been maintained at less than 1% had the vessel been provided with its full additional quota allocation.

Impact of the landing obligation

The [proposed Common Fisheries Policy \(CFP\) reformed text](#) states that by 1st 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 determined, 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 27% 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, whilst 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 currently being fished within maximum sustainable yield. Further evidence relating to selectivity and avoidance would need to be taken into account in any proposal to allow discarding under the *de minimis* exemption.

The landing obligation is likely to have an economic impact on the SW 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 CFPO TR1/TR2 over 10m fleet landed 839 tonnes in 2012, then discards of approximately 1370 tonnes would also have occurred in 2012. Figure 14 shows the monthly landings for the CFPO vessels using TR1/TR2 gear in 2012 with the estimated quantities of discards caught. This discard estimate is reduced to approximately 1350 tonnes when separate discard rates (58% for TR1 and 76% for TR2) are applied to the CFPO haddock landings for >10m 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 15). The quota available to the whole of the UK fleet in 2012 was 1902 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 1916 tonnes. However other vessels are catching VIIb-k haddock, either as an important target species or as a bycatch, 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.

Figure 14: 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

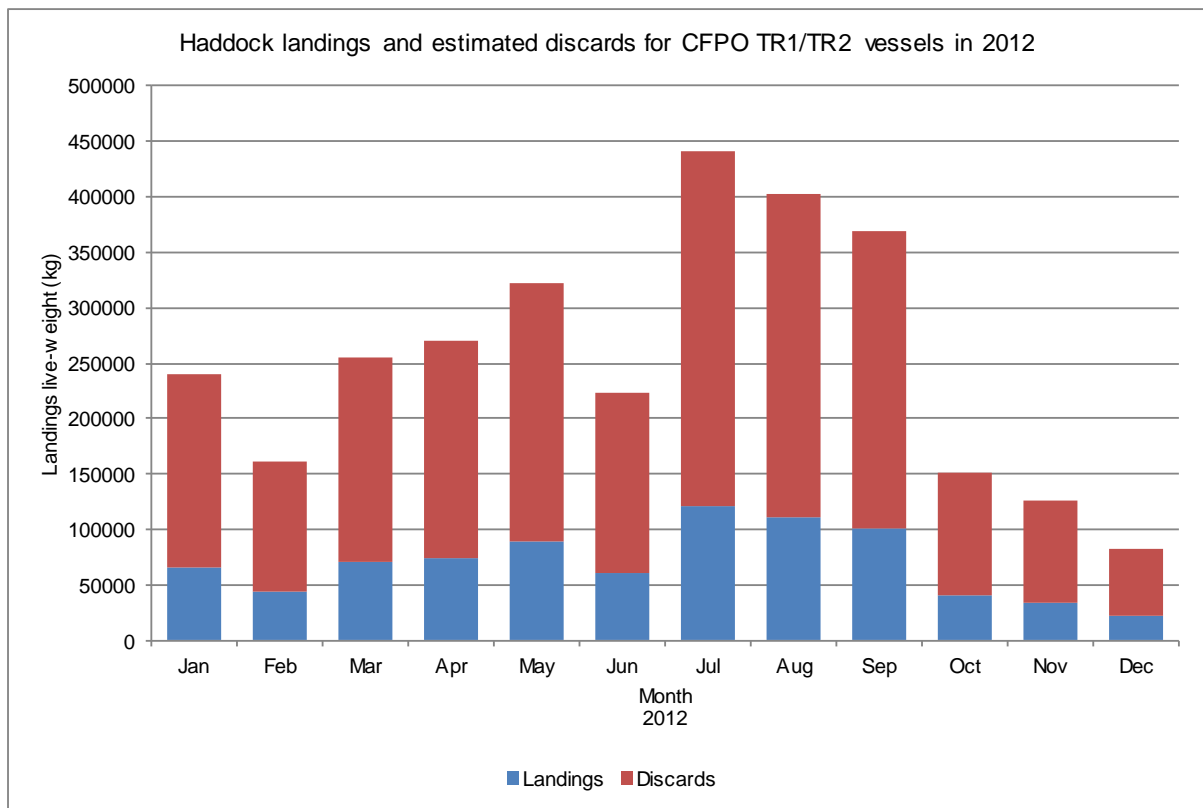
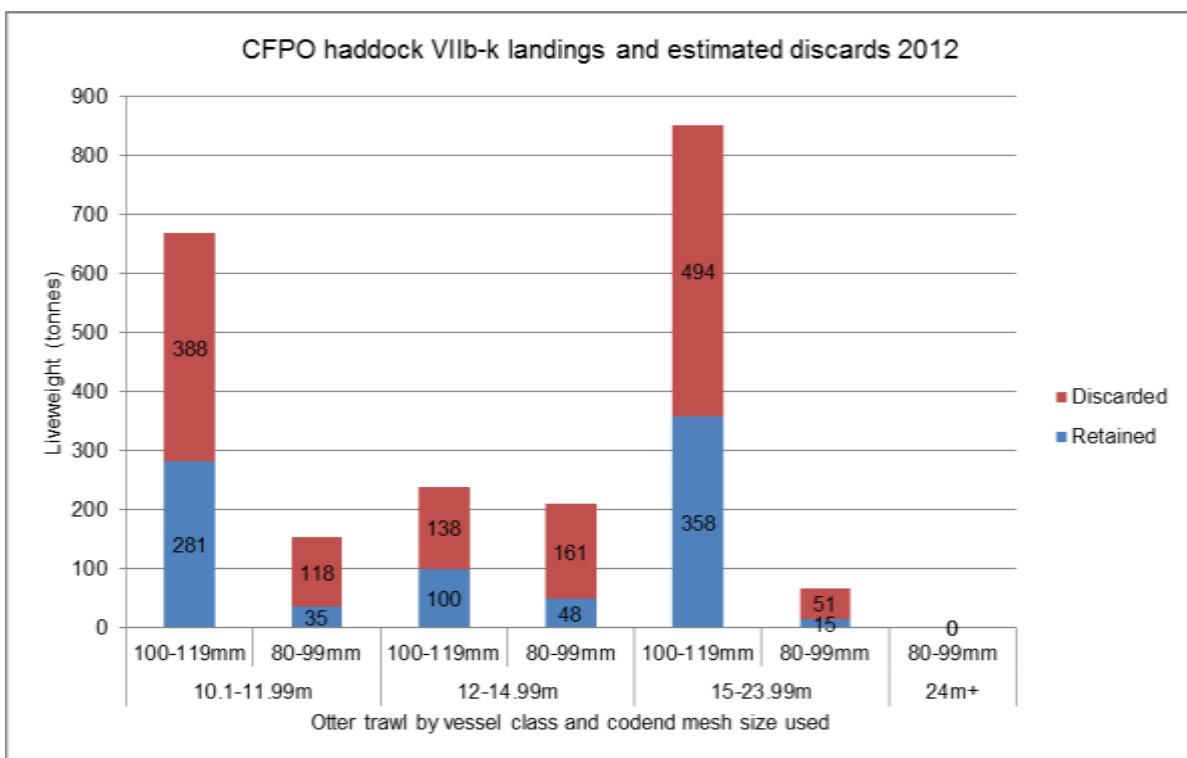


Figure 15: Haddock catches by the CFPO otter trawl fleet in 2012, split by vessel size class and codend mesh range used



Selectivity

In July 2013, 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 5). 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.

Table 5: 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

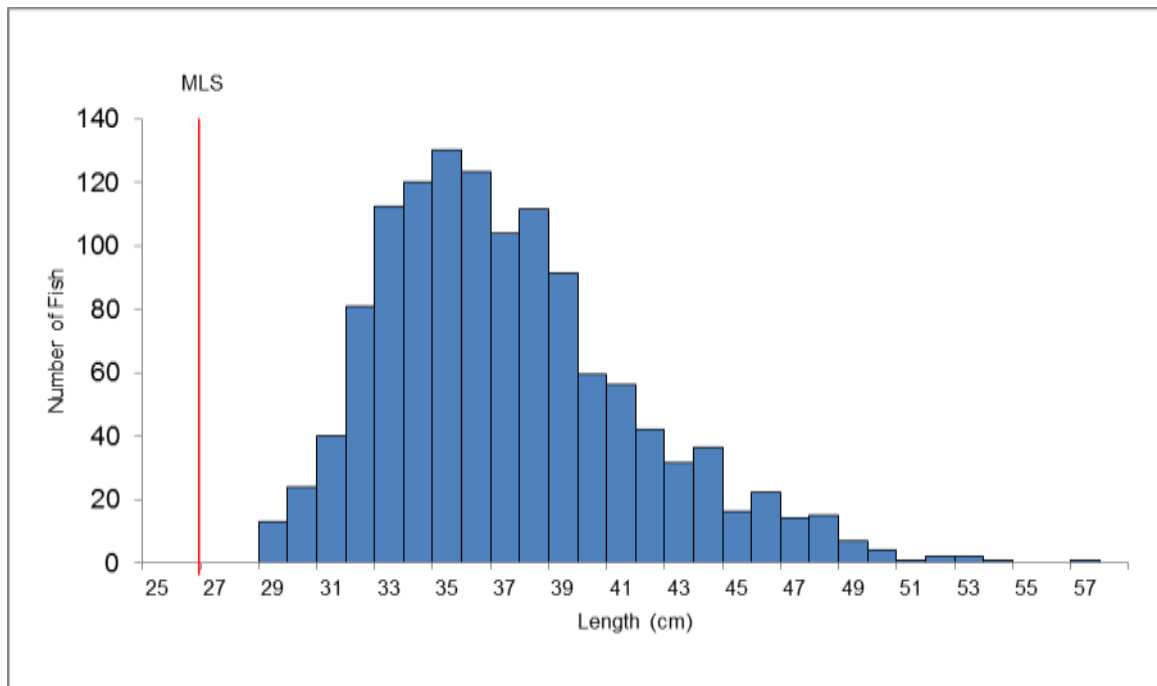
A gear trial was carried out by Cefas on a different vessel during 2013 using 4 different gear configurations using large diamond meshes in the back and headline. One configuration made a significant reduction in the catches of haddock (-41% by number). This configuration also showed reductions in other 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).

Commission Regulation (EU) No 737/2012 requires the insertion of 100mm square mesh panels in TR1 otter trawls in the Celtic Sea area (VIIIf, VIlg and to that 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 is intended to reduce the capture of juvenile haddock, cod and whiting in trawls with hitherto poor selectivity.

There has been concern amongst 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, 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 16).

Figure 16: Length frequency distribution of whiting caught during an MMO observer trip in July 2013



In addition to the selectivity work, the MMO onshore observer trialled the virtual calliper measuring tool that has been incorporated into the EmilInterpret software from Archipelago Marine Research Ltd. By taking reference measurements from the conveyor belt and then calibrating the virtual callipers using these measurements, estimates of individual fish length can be taken. The callipers work by counting the pixels between the nose and tail of the fish and referencing these against the measurements (and pixel counts) previously established.

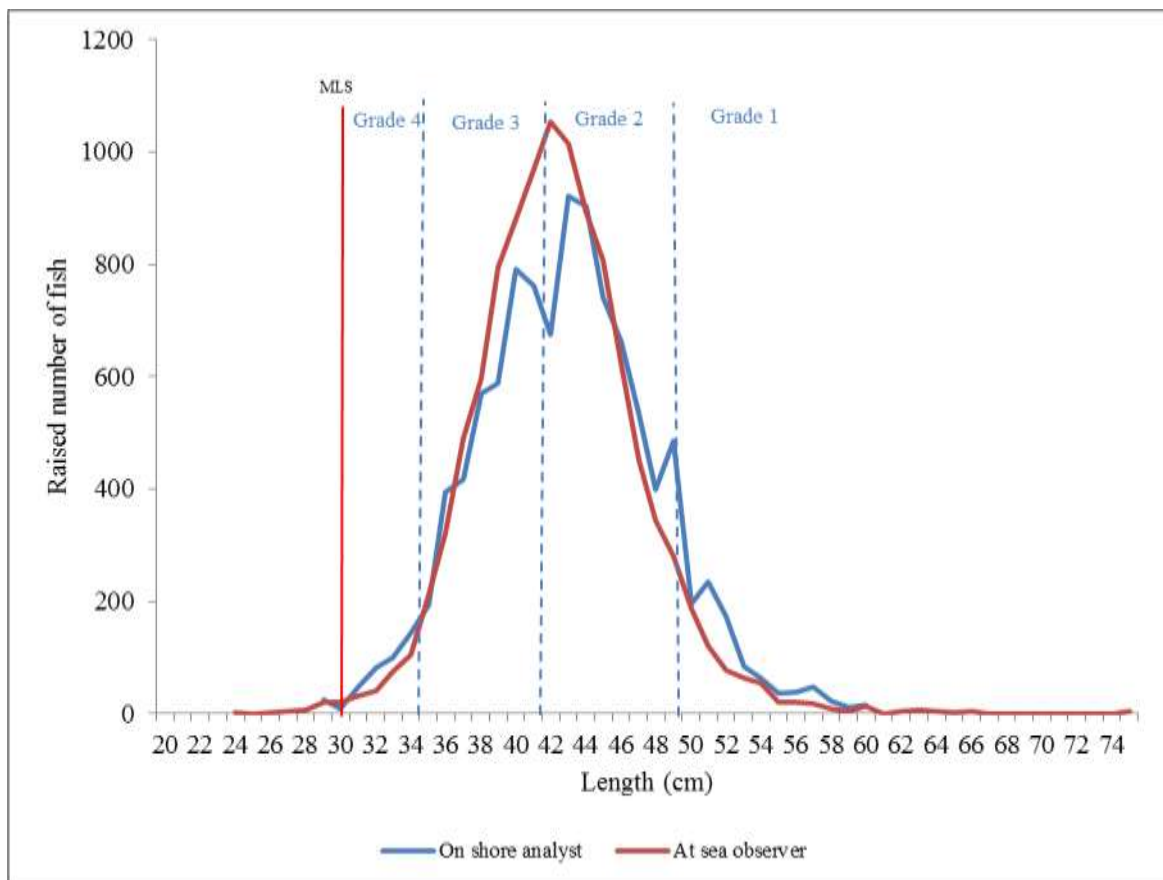
The accuracy of these callipers depends on the position of the cameras and the presentation of the fish to be measured to the camera view. The best results are obtained by using a camera that is directly above the conveyor where the fish will pass. Fish that are then presented in line with the conveyor and completely flat, straight and unobscured will be the most accurately measured. During normal commercial catch processing this will not be the case and the onshore observer will need to try and select the fish that are best presented.

During this MMO research trip, length measurements were taken for haddock by the at sea observer and this data was used to test the accuracy of the virtual measuring tool. The at sea observer measured 4365 haddock from subsamples collected on each haul. When raised to the trip level (using the ratio between volume caught/volume sampled) the total number of haddock caught was 10636 fish. The on shore observer was unable to measure as many haddock as the at sea observer because they were not always presented to the camera view in a way that allowed it to be measured, or were totally obscured. In total though, 1114 haddock were measured using this on screen measuring tool and these were raised to give a total number of haddock caught of 10363 fish, approximately 2.6% difference from the at sea observer estimate. The raising factor was calculated by estimating the average

number of haddock in a basket (taken from watching haddock being thrown into 3 baskets until full) and then counting the number of baskets caught per haul. Numbers of fish were then raised to haul and then summated to obtain a trip count.

The length frequency distributions for the raised numbers of haddock caught are shown in Figure 17. It can be seen that both length frequency distributions are very similar although there are slight differences in the length ranges obtained. The at sea observer measured fish down to 24cm and as high as 75cm, whilst the on shore observer's length range was 29 to 60cm. The on shore observer also underestimated haddock at 41-42cm. However the similarities between the two distributions are clear and show that the on screen callipers could be a useful tool in gathering length data for use in biological studies. It should be noted that it took the onshore observer several days to measure the 1114 haddock, so if this is to prove a useful and cost effective tool for obtaining length data of commercially important species, then work will need to be carried out to determine the minimum number of measurements that would be acceptable to construct a length frequency distribution for a particular species. It would also be useful to somehow improve the presentation of the fish to the camera as this would make more fish available for measuring as well as speed up the process.

Figure 17: Comparison between length frequency data obtained from an at sea observer and a shore based analyst



Also shown in Figure 17 is the size range for each of the four EU grades for haddock. The majority of the catch (57%) is made up of grades 1 and 2 sized haddock. Very few grade 4 haddock (2%) were caught. The smaller lengths of the grade 3 haddock group are caught in lesser numbers than the larger half of the length group, however grade 3 makes up 41% of the haddock catch. During 2014 the vessel has continued on the scheme and has been trialling various trawl designs to improve selectivity for juvenile haddock as well as reduce overall catches.

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 approximately 24.4 tonnes. The vessel had expected to receive an additional 26 tonnes of scientific quota as part of this trial and had also expected to be able to rent in approximately 40 or more tonnes of quota from other sources. This would have been more than 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.

Whilst there is evidence that spatial avoidance can also be achieved it is considered that this may jeopardise the ability to catch key target species including megrim and angler which are more abundant in the area in which high catches of haddock are also taken. One initiative that the owner has considered is the avoidance of 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; which 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. However, the results of further initiatives in gear design during 2014 show real potential to reduce haddock catches whilst maintaining a viable fishery for other key species.

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

therefore 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.

References

Smith, S and Catchpole, T; CEFAS 2013. Area VII Haddock Discard Eliminations using Technical Measures.

http://www.cefass.defra.gov.uk/media/625804/mf056%20report_final.pdf

