C7488: Project UK Fisheries Improvements: Task 4

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Executive Summary

This report fulfils the project output requirements detailed in the project documentation, namely to produce a “Report with principle content tables ranking the primary and secondary species in scallop fisheries and their temporal/spatial variation”. The report therefore details the catch composition data resulting from the Cefas observer program whilst monitoring scallop dredge fisheries in the English Channel.

The fisheries for King Scallops (*Pecten maximus*) in the Channel are the most valuable single species targets for UK vessels with landings typically in the region of £15-£20 million. The vast majority of these landings are generated by towed dredge operations.

Although prosecuted by many of the same vessels, the fisheries in 27.7.d and 27.7.e are quite distinct in seasonality and catch composition hence the two areas are described separately.

The number of trips observed is a limiting factor in terms of analyses particularly so in 27.7.d where no form of temporal analysis is possible due to low sample numbers.

Nevertheless, 27.7.d has a less diverse catch composition with 32 bycatch species recorded in the observer data compared to 61 in 27.7.e. The total number of animals recorded per trip has an influence upon the number of species observed with very large catches increasing the number of species observed.

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# Introduction: Scallop fisheries in the Channel (ICES subdivisions 27.7.d and 27.7.e)

## Fishery description

The fisheries for King Scallops (*Pecten maximus*) in the Channel are the most valuable single species targets for UK vessels with landings typically in the region of £15-$20 million per year. These fisheries are almost exclusively targeted with scallop dredges although a few hand dive fisheries exist in the western channel, mainly in the Lyme bay area. *P maximus* are also taken as bycatch in beam trawls in the Channel; where scallops are reported as being landed from beam trawl trips they average 2% of the landings biomass (MMO data, 2007-2016).

*P. maximus* prefers gravelly sandy substrates and consequently the fisheries are concentrated on grounds with this substrate type. This places some natural restrictions on the bycatch composition as it will be mostly restricted to those animals frequenting the same habitats. (figure 1.1). There is a clear distinction between the eastern and western channel with a gap running essentially from Selsey in the east to Portland in the west where there is little or no scalloping activity. Landings and observer data show that there is a contrast in the species composition of fisheries and general ecology between 27.7.d ad 27.7.e and therefore it is appropriate to analyse the bycatch data seperately.

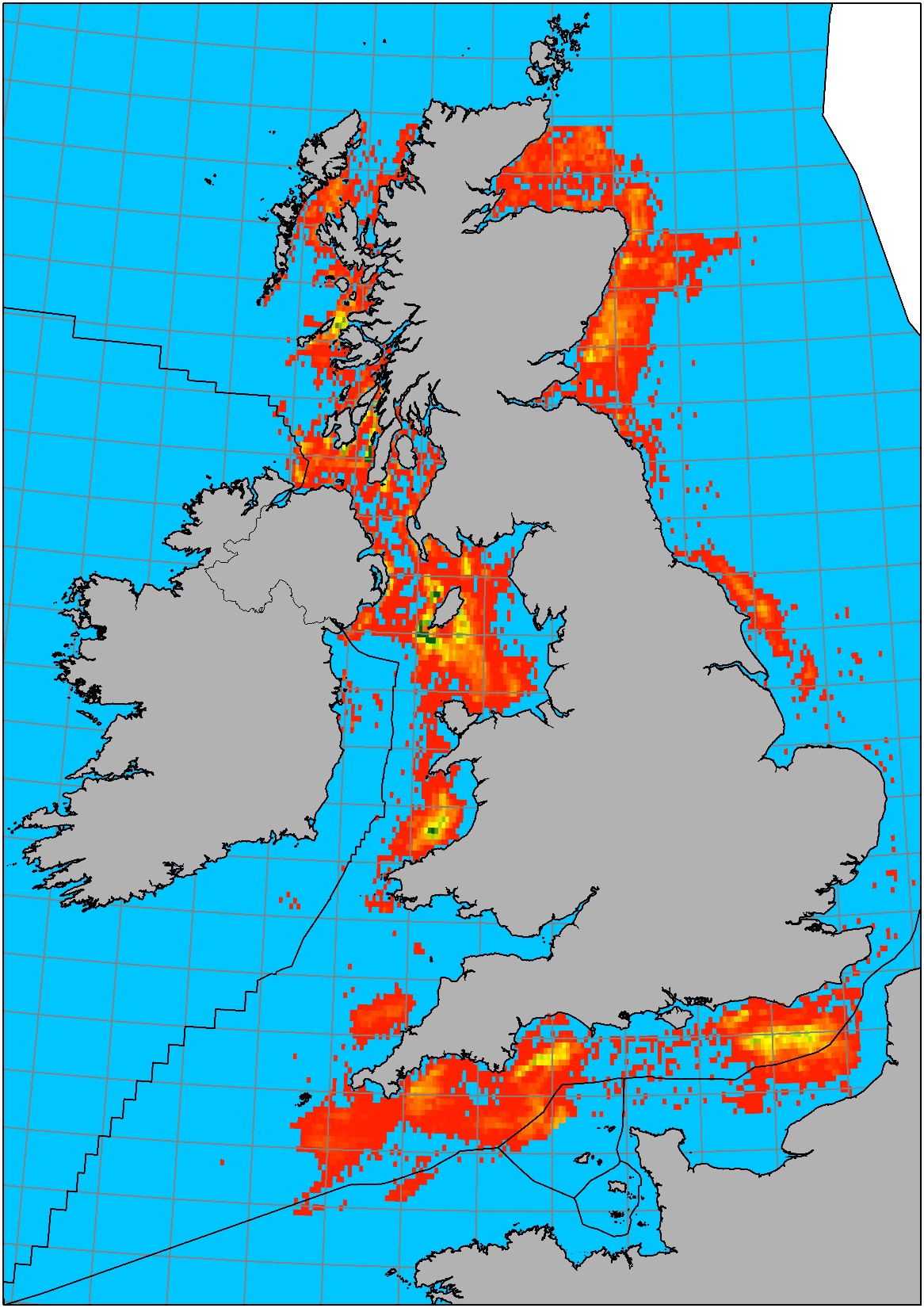


Figure 1.1: Map of UK fishery activity in Divisions 27.7.d and 27.7.e

Species selection within scallop dredges will be affected by the construction of the dredges and technical measures govern the construction methods for scallop dredges for UK vessels fishing inside the 12 mile limit of English waters (Sea Fisheries England, Scallop Fishing Order 2012). In effect, these technical specifications are therefore used by all UK vessels fishing in the Channel to save carrying multiple gear types. The ring-size is not defined but rather the limits on the number of rings that can be stretched across the back and belly of the dredge, which is itself limited in width (85cm max). As a result, most scallop dredges in the channel use between 75-85mm (internal ring width diameter). Size selectivity by dredge gear is not exclusively a function of ring size as the gaps between the rings is considered to be influential and selection therefore also depends upon the tightness of the linkages as well as the ring size itself.

In terms of minimum landing sizes (MLS), there is a different minimum landing size for scallop between 27.7.d and 27.7.e. However, vessels rarely change gear to accommodate the change in MLS.

Scallop landings are controlled through composition regulations, *P. maximus* having to represent at least 95% of the landings by weight. This regulation was introduced to prevent the targeting of sole with dredges. Landings data are therefore not a reliable indicator of the catch composition and true catch observations are required.

## Data used

The analysis of by-catch composition presented here uses data from the Cefas observer programme collected onboard scallop dredgers between 2012-2016. This year range has been selected as being representative of current fishery practice but not so narrow as to be dominated by strong year classes of bycatch species. The number of trips undertaken in each year is shown in the text table below. Within each trip, the observer will examine a sub-sample of the retained and discarded portion of a number of different hauls. To provide an estimate of the numbers caught on a trip, these sub-samples are then raised to be representative of the entire trip.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| 27.7.d | 1 | 4 | 0 | 1 | 0 | 0 |
| 27.7.e | 1 | 10 | 13 | 13 | 16 | 10 |

Landings records for dredgers targeting scallops were examined from official UK data holdings (iFish) at a daily record level between 2007-2016 to determine the relative value of landed bycatch components.

Cefas observers count and measure all animals in the by-catch samples, at sea weights are not always possible. Length to weight conversion factors are available for many but not all species, so to ensure maximum coverage of the species composition, the bycatch analysis here is presented in terms of numbers. The MSC standard requires bycatch rates to be determined in biomass terms, therefore in order to satisfy accreditation criterion it will be necessary to either establish weight-length parameters for all species encountered in these dredge fisheries, or for future data collection to ensure that weighing facilities are available.

## Data representativeness

The available observer data, particularly for 27.7.d is low and the seasonal profile of the available samples is out of line with the seasonality of the fishery (table 1.1). For 27.7.e, the available observer data is spread more throughout the year. Observer trips are undertaken on a range of vessel sizes. The largest of scallop vessels will undertake trips of ~5-7 days and be capable of landing large tonnages. However, the majority of observer trips are relatively short with less than 10 tonnes being landed. Conversion of the observer records of scallop to biomass shows that the tonnage profile of the available observer trips bears some resemblance to the landings data, albeit skewed to smaller catches particularly in 27.7.e (figure 1.2).

Ideally the observer data would be raised to the total trips undertaken by the UK fleet and preferably by fleet size-sector, however given the sparseness of the coverage this has not been feasible, and data are analysed as annual totals.

Table 1.1: Monthly profile of scallop dredge observer data (2011-2016) and the mean UK scallop landings (10-year period, 2007-2016) in tonnes by ICES division.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Number of individuals observed | Number of trips observed | Average scallop landings | Number of individuals observed | Number of trips observed | Average scallop landings |
|  | 27.7.d | | | 27.7.e | | |
| Jan | - | - | 440 | 11 251 | 1 | 313 |
| Feb | 5 001 | 2 | 406 | 477 375 | 5 | 332 |
| Mar | 5 392 | 2 | 401 | 36 475 | 8 | 497 |
| Apr | - | - | 190 | 44 735 | 4 | 685 |
| May | - | - | 149 | 63 397 | 4 | 1 008 |
| Jun | - | - | 154 | 79 587 | 9 | 945 |
| Jul | - | - | 234 | 17 974 | 3 | 797 |
| Aug | - | - | 306 | 65 113 | 8 | 683 |
| Sep | 120 884 | 1 | 735 | 78 952 | 8 | 441 |
| Oct | - | - | 1 191 | 40 995 | 7 | 283 |
| Nov | - | - | 841 | 12713 | 4 | 237 |
| Dec | 197 230 | 1 | 416 | 4 041 | 3 | 201 |



Figure 1.2: Histogram of scallop biomass from the observer data and reported landings for dredge gears in 27.7.d and 27.7.e.

There does appear to be a relationship between the total number of bycatch species observed on a trip and the total raised number of animals (figure 1.3). Trips with very high total catch numbers have much higher numbers of species observed.



Figure 1.3: Number of bycatch species vs total individuals observed from observer data on scallop dredgers in 27.7.d and 27.7.e.

There are clearly some issues with the low sampling rate in 27.7.d and the results in the following section should therefore be viewed with caution.

## Other research

Bycatch in *Pecten maximus* fisheries has been examined in a number of other studies although not necessarily in the area of interest. Craven et al (2013) looked at the potential impact of scallop dredging on teleost fish communities around the Isle of Man. Craven found bycatch rates of fish in dredgers to be generally low (reflecting generally depressed stock statuses) but still potentially impactful. Szostek et al (2016) undertook sampling to look at regional variation in bycatches between the Channel and the Irish Sea and included analysis of all benthic organisms as well contrasting with the commercial species included in Cefas observer data. Szostek found in their sampling that the bycatch rates were higher in 7d compared to 7e, mostly due to the presence of cuttlefish in the Baie de Seine. This is in contrast to the Cefas data analysed below, highlighting the large spatial and temporal variations that occur in this fishery.

# Scallop dredge fisheries in Division 27.7.d

Given the low numbers of scallop dredge trips undertaken in 27.7.d, no temporal analysis is possible, and the observer data have been pooled across the sampled trips.

Table 2.1 summarises the catch profile for this region, ranked in order of abundance in the observed catches. The overall percentage of scallop within the catch in this region is high at 95.2% by number. The recorded bycatch comprises 32 species of which plaice is the dominant species comprising 42% of bycatch by number followed by cuttlefish and spider crab. The top 10 species account for 92% of bycatch by number. 10 of these 32 species can be considered “Primary” according to the MSC criterion in that there are targets for biomass and fishing mortality on these species.

Retention rates are variable and will depend upon minimum landing size, quota holding and marketability of the species in question. The construction material and design of scallop dredges is fairly unforgiving and the incidental mortality rate (organisms impacted by the gear but not entering) may be higher than for those organisms entering the gear (Jenkins, Beuker-Stewart & Brand 2001). Damage for organisms in the dredge bycatch is sometimes fatal and may be higher than in some other towed gears although directly comparable datasets were not found. The proportion of bycatch that is landed from this region has a median of 1.2% by weight and 2.6% by value.

Bycatch rates for each of the recorded bycatch species have been calculated in relation to the target species and presented as numbers caught per million scallops retained. To put this into the perspective of the fishery in 27.7.d, the UK removed approximately 16 million scallops in 2016. This is derived from landings of 3105t (STECF, 2016) and a mean catch weight of 195g per scallop (Cefas unpublished). Total international landings in 2016 were ~20,000 tonnes, however the international fishery is dominated by French vessels fishing in inshore waters around France which are likely to generate very different by-catch profiles, so extrapolation of discard estimates is not considered appropriate.

Figure 2.1: Cumulative % of bycatch within the dredge fisheries targeting Pecten maximus in Division 27.7.d.

Table 2.1: Scallop dredge fisheries in Division 27.7.d: Summary catch composition from UK dredge fisheries targeting scallops from observer data. Primary bycatch species are where fisheries are managed to targets.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | % catch | % of bycatch | N caught per million scallops retained | Retention rate | Catch type |
| GREAT SCALLOP | **95.20%** |  |  | **4%** | **Target** |
| EUROPEAN PLAICE | 2.00% | 42% | 2 069 | 3% | Primary |
| UNDULATE RAY | 0.00% | 1% | 34 | 4% | Primary |
| THORNBACK RAY (ROKER) | 0.00% | 1% | 30 | 2% | Primary |
| BLONDE RAY | 0.00% | 1% | 26 | 0% | Primary |
| STARRY SMOOTH HOUND | 0.00% | 0% | 13 | 0% | Primary |
| SPOTTED RAY | 0.00% | 0% | 13 | 0% | Primary |
| COD | 0.00% | 0% | 4 | 100% | Primary |
| ANGLERFISH (MONK) | 0.00% | 0% | 2 | 0% | Primary |
| LESSER SPOTTED DOGFISH | 0.00% | 0% | 2 | 100% | Primary |
| POLLACK | 0.00% | 0% | 0 | 100% | Primary |
| WHITING | 0.00% | 0% | 0 | 65% | Primary |
| COMMON CUTTLEFISH | 1.00% | 20% | 981 | 0% | Secondary |
| COMMON SPIDER CRAB | 0.70% | 15% | 735 | 1% | Secondary |
| EDIBLE CRAB | 0.10% | 3% | 138 | 19% | Secondary |
| LEMON SOLE | 0.10% | 3% | 126 | 0% | Secondary |
| PILCHARD | 0.10% | 2% | 118 | 0% | Secondary |
| TUB GURNARD | 0.10% | 2% | 112 | 68% | Secondary |
| SOLE (DOVER SOLE) | 0.10% | 2% | 107 | 49% | Secondary |
| BRILL | 0.10% | 2% | 77 | 0% | Secondary |
| THICKBACK SOLE | 0.10% | 1% | 73 | 62% | Secondary |
| TURBOT | 0.10% | 1% | 53 | 0% | Secondary |
| WHITING-POUT (BIB) | 0.00% | 1% | 48 | 0% | Secondary |
| COMMON DRAGONET | 0.00% | 1% | 47 | 0% | Secondary |
| DAB | 0.00% | 1% | 27 | 0% | Secondary |
| SANDEELS | 0.00% | 0% | 20 | 0% | Secondary |
| POOR COD | 0.00% | 0% | 20 | 0% | Secondary |
| SAND SOLE | 0.00% | 0% | 13 | 0% | Secondary |
| TWP SPOTTED CLINGFISH | 0.00% | 0% | 13 | 0% | Secondary |
| GREAT SANDEEL | 0.00% | 0% | 13 | 0% | Secondary |
| COMMON FLAT OYSTER | 0.00% | 0% | 7 | 100% | Secondary |
| JOHN DORY | 0.00% | 0% | 0 | 100% | Secondary |
| COMMON LOBSTER | 0.00% | 0% | 0 | 0% | Secondary |

# Scallop dredge fisheries in Division 27.7.e

As stated in the results for 27.7.d, Cefas observers count and measure all animals in the by-catch samples, at sea weights are not always possible. Length to weight conversion factors are available for many but not all species, so to ensure maximum coverage of the species composition, the bycatch analysis here is presented in terms of numbers.

Table 3.1 summarises the catch profile for this ICES Division, ranked in order of abundance in the observed catches. The bycatch in 27.7.e is more varied than in 27.7.d as expected with its more varied ecology (McClellan et al 2014). The observer data record 61 bycatch species within the catches of scallop dredges, the top 10 of which account for 92% of the bycatch by number. Edible crab is the most common bycatch species followed by monkfish and spider crab. The proportion of the target species (scallop) is higher than in 27.7.d at 96.6% by number. Retention rates are again variable, but the higher value species seem to have a higher retention rate than in 27.7.d. 18 of the 61 bycatch species can be considered “Primary” according to the MSC criterion in that there are targets for biomass and fishing mortality on these species.

As with 27.7.d, bycatch rates for each of the recorded bycatch species have been calculated in relation to the target species and presented as numbers caught per million scallops. The fishery in 27.7.e saw removals of 5147t (STECF 2016) and a mean catch weight of 140g per scallop (Cefas, unpublished). In total, the UK removed approximately 36.7 million scallops in 2016. This is derived from landings of 3105t (STECF, 2016) and a mean catch weight of 140g (Cefas unpublished).

Figure 3.1: Cumulative % of bycatch within the dredge fisheries targeting Pecten maximus in Division 27.7.e.

There are only 7 years of observer data available for this fishery in which temporal analysis could be done. Considering those bycatch species which comprise the top 10 (by number) when summed across all years, they form between 85-96% of all discards when split by year (figure 3.2). The larger proportion of Anglerfish in 2012 can be traced back to a single trip, highlighting the potential inherent variability when dealing with low sample numbers (10 trips in 2012). The proportion of discards comprising these species is steadily declining over the observed period (figure 3.3). This implies that the diversity of bycatch is increasing although the cause of this is unclear. It could represent a decline in the relative abundance in the most abundant species, alternatively it could represent a systematic change in the spatial distribution of fishing effort.

Figure 3.2: Annual breakdown of bycatch for the most common species within the dredge fisheries targeting Pecten maximus in Division 27.7.e.

Figure 3.3: Change through time of the proportion of discards accounted for by the top 10 most common species within the dredge fisheries targeting Pecten maximus in Division 27.7.e.

Table 3.1: Summary catch statistics from UK dredge fisheries targeting scallops from observer data in Division 27.7.e. Primary bycatch species are where fisheries are managed to targets.

|  | % catch | % of bycatch | N caught per million scallops retained | Retention rate |  |
| --- | --- | --- | --- | --- | --- |
| GREAT SCALLOP | 96.60% |  |  | 67% | Target |
| ANGLERFISH (MONK) | 0.50% | 19% | 2 557 | 31% | Primary |
| EUROPEAN PLAICE | 0.20% | 7% | 913 | 27% | Primary |
| SOLE (DOVER SOLE) | 0.00% | 3% | 401 | 90% | Primary |
| THORNBACK RAY (ROKER) | 0.10% | 2% | 255 | 2% | Primary |
| LESSER SPOTTED DOGFISH | 0.00% | 1% | 86 | 4% | Primary |
| BLACK-BELLIED ANGLERFISH | 0.00% | 0% | 49 | 80% | Primary |
| SPOTTED RAY | 0.00% | 0% | 41 | 18% | Primary |
| BLONDE RAY | 0.00% | 0% | 41 | 24% | Primary |
| CUCKOO RAY | 0.00% | 0% | 17 | 7% | Primary |
| (EUROPEAN) MACKEREL | 0.00% | 0% | 13 | 0% | Primary |
| UNDULATE RAY | 0.00% | 0% | 10 | 0% | Primary |
| SMALLEYED (PAINTED) RAY | 0.00% | 0% | 10 | 0% | Primary |
| COMMON LING | 0.00% | 0% | 4 | 100% | Primary |
| SPURDOG | 0.00% | 0% | 4 | 0% | Primary |
| NURSE HOUND | 0.00% | 0% | 3 | 0% | Primary |
| COD | 0.00% | 0% | 2 | 0% | Primary |
| WHITING | 0.00% | 0% | 1 | 0% | Primary |
| EDIBLE CRAB | 1.20% | 31% | 4 206 | 1% | Secondary |
| COMMON SPIDER CRAB | 0.50% | 14% | 1 864 | 0% | Secondary |
| COMMON CUTTLEFISH | 0.40% | 11% | 1 504 | 2% | Secondary |
| COMMON DRAGONET | 0.10% | 2% | 287 | 0% | Secondary |
| LEMON SOLE | 0.00% | 2% | 257 | 83% | Secondary |
| POOR COD | 0.10% | 2% | 213 | 0% | Secondary |
| THICKBACK SOLE | 0.10% | 1% | 185 | 0% | Secondary |
| WHITING-POUT (BIB) | 0.10% | 1% | 180 | 1% | Secondary |
| RED GURNARD | 0.00% | 1% | 159 | 0% | Secondary |
| BRILL | 0.00% | 0% | 50 | 95% | Secondary |
| TURBOT | 0.00% | 0% | 47 | 100% | Secondary |
| GREAT SANDEEL | 0.00% | 0% | 27 | 0% | Secondary |
| MEGRIM | 0.00% | 0% | 25 | 65% | Secondary |
| SCALD FISH | 0.00% | 0% | 19 | 0% | Secondary |
| JOHN DORY | 0.00% | 0% | 19 | 0% | Secondary |
| COMMON LOBSTER | 0.00% | 0% | 16 | 36% | Secondary |
| SPOTTED DRAGONET | 0.00% | 0% | 15 | 0% | Secondary |
| STREAKED GURNARD | 0.00% | 0% | 15 | 0% | Secondary |
| SOLENETTE | 0.00% | 0% | 13 | 0% | Secondary |
| TOMPOT BLENNY | 0.00% | 0% | 10 | 0% | Secondary |
| CUTTLE-FISH | 0.00% | 0% | 7 | 83% | Secondary |
| MARBLED ELECTRIC RAY | 0.00% | 0% | 7 | 0% | Secondary |
| WHELK | 0.00% | 0% | 5 | 0% | Secondary |
| GREY GURNARD | 0.00% | 0% | 5 | 0% | Secondary |
| VELVET SWIMMING CRAB | 0.00% | 0% | 5 | 0% | Secondary |
| CUCKOO WRASSE | 0.00% | 0% | 5 | 0% | Secondary |
| STARRY SMOOTH HOUND | 0.00% | 0% | 5 | 26% | Secondary |
| RED MULLET | 0.00% | 0% | 4 | 46% | Secondary |
| SQUID | 0.00% | 0% | 4 | 0% | Secondary |
| TUB GURNARD | 0.00% | 0% | 4 | 0% | Secondary |
| DAB | 0.00% | 0% | 4 | 0% | Secondary |
| RED BANDFISH | 0.00% | 0% | 3 | 0% | Secondary |
| Pink Cuttlefish | 0.00% | 0% | 3 | 0% | Secondary |
| TOPKNOT | 0.00% | 0% | 2 | 0% | Secondary |
| POGGE (ARMED BULLHEAD) | 0.00% | 0% | 2 | 0% | Secondary |
| GREAT PIPEFISH | 0.00% | 0% | 2 | 0% | Secondary |
| EUROPEAN CONGER EEL | 0.00% | 0% | 2 | 0% | Secondary |
| BUTTERFLY BLENNY | 0.00% | 0% | 2 | 0% | Secondary |
| NORWEGIAN TOPKNOT | 0.00% | 0% | 1 | 0% | Secondary |
| IMPERIAL SCALDFISH | 0.00% | 0% | 1 | 0% | Secondary |
| SQUAT LOBSTERS | 0.00% | 0% | 1 | 0% | Secondary |
| European spiny lobster | 0.00% | 0% | 1 | 0% | Secondary |
| COMMON SPINY LOBSTER | 0.00% | 0% | 1 | 0% | Secondary |
| YARREL'S BLENNY | 0.00% | 0% | 1 | 0% | Secondary |

# Conclusions

Although the scallop fisheries are relatively well targeted with over 90% of catches comprising *Pecten maximus*, there is clearly scope for these fisheries to take a wide range of other species as bycatch.

The data presented here indicates that a higher proportion of individuals from species which would attract a “Primary” designation under MSC rules are caught as bycatch compared to those classed as “Secondary”.

Table 4.1: Number of individuals in bycatch by primary and secondary designation.

|  |  |  |
| --- | --- | --- |
|  | 27.7.d | 27.7.e |
| Primary | 8,213 | 7,429 |
| Secondary | 7,537 | 5,082 |

It is, however, evident that the sampling rate, particularly in 27.7.d is very low and the results of this analysis are therefore highly uncertain. Even in 27.7.e where the sampling rate is higher and covers the full year there are questions as to the representativeness of the samples. Evidence from scientific surveys using dredges demonstrates that cuttlefish regularly features as bycatch and yet the data presented here suggests 7 cuttlefish per 1 million scallops in area 27.7.e (~7 cuttlefish per 6500t of scallop) which is far below expectations, particularly for a fishery conducted mainly in the summer. It is therefore likely that a more intensive bycatch recording program will be required to improve the robustness of the dataset.

The Scope of Work for task 4 of this project includes work on “Observer program design if necessary”, although the specifics for this preliminary report only require the identification and tabulation of bycatch species. Therefore Annex 1 below summarises the scope of an observer program.

# References

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# Annex 1 Scope of an observer programme

The analysis presented above is based on data gathered through the ongoing Cefas Observer Programme (COP). Under the current programme, a minimum of 12 trips on board English registered fishing vessels are sampled each year, with a target of three trips per quarter. This is the minimum number of sampling trips for all metiers covered by the Cefas programme and spans all English scallop activity therefore covering the North Sea, Channel, Celtic sea and Irish sea. Realistically as the majority of English vessel scallop activity is in the western channel, that is where the sampled trips have taken place with a more limited set in the eastern channel. While there is the option under the Data Collection Framework to cease sampling the scallop dredge sector due to the relatively low catches and landings of quota species, sampling has continued. The design of the existing programme means that:

* The two areas (7d and 7e) are not distinct when randomly selecting vessels so naturally sampling effort is focused on where most of the English vessels are fishing (more in 7e than 7d).
* In terms of records for UK over 10m vessels, there are more records in 7e compared to 7d, but much more landings in 7d than 7e. This is due to the presence of Scottish vessels which are not sampled under the Cefas Observer Programme.
* Skippers can refuse to take observers and this information is recorded - refusal or success rates provide a quality indicator for statistically based sampling designs. It is worth noting however, that vessel operators take part in the COP on a voluntary basis.

According to the MSC Fisheries Standard, the SG 80 (pass) requires that “Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary / secondary species with respect to status”. This suggests that monitoring does not necessarily need to be annual but enough to detect any on-going variability / trends following any baseline work done when the fishery is first certified. The data available therefore (i) can be used to provide this baseline, and (ii) for 7e, can be used to explore changes over time. The COP in its current format is likely to provide a time series of data to monitor future bycatch rates at the same level of comprehensiveness.

If data specific to 7d are required, then there are several options:

* The current sampling under the Cefas Observer Programme could be modified/expanded to specifically target scallop vessels in 7d. Whilst technically possible, this would require additional funding without impacting the sampling in 7e.
* Monitoring technology, such as cameras to collect data, could be considered. This technology is being employed in some Scottish scallop fisheries, primarily as a tool for checking gear regulations are adhered to although the use of the technology for catch monitoring is being trialled. Again, the costs of such a program would need to be met.
* Sampling of Scottish vessels could be included. At present no Scottish vessels fishing in the Channel are sampled in the COP, nor are they sampled as part of the Scottish sampling program. In order to address this, the Scottish Observer Programme could cover Scottish scallop vessels fishing in the English Channel. Alternatively these vessels could also be included in the Cefas drawlist and be targeted by Cefas observers (since observers from Marine Scotland Science also sample English trawlers that regularly land into Scotland). There are some logistical difficulties to overcome as the Scottish registered scallopers are typically more nomadic than the English registered vessels. This process would naturally increase the proportion of trips sampled in the eastern channel, however the sampling rate in 7e would decrease to compensate.
* A bespoke observer program could be developed, funded externally to the COP, which runs on a periodic basis (i.e. every 3-5 years) to generate the additional data required for the acquisition and maintenance of any accreditation. Whilst there are advantages to this process in terms of guaranteeing spatial coverage, the ownership of this long-term process (including organisation, data ownership, storage and processing) would need to be addressed to ensure that data were properly comparable between survey years rather than a more ad-hoc collection of one-off studies.

About us

The Centre for Environment, Fisheries and Aquaculture Science is the UK’s leading and most diverse centre for applied marine and freshwater science.

We advise UK government and private sector customers on the environmental impact of their policies, programmes and activities through our scientific evidence and impartial expert advice.

Our environmental monitoring and assessment programmes are fundamental to the sustainable development of marine and freshwater industries.

Through the application of our science and technology, we play a major role in growing the marine and freshwater economy, creating jobs, and safeguarding public health and the health of our seas and aquatic resources

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We offer a range of multidisciplinary bespoke scientific programmes covering a range of sectors, both public and private. Our broad capability covers shelf sea dynamics, climate effects on the aquatic environment, ecosystems and food security. We are growing our business in overseas markets, with a particular emphasis on Kuwait and the Middle East.

Our customer base and partnerships are broad, spanning Government, public and private sectors, academia, non-governmental organisations (NGOs), at home and internationally.

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* a wide range of UK Government departments and agencies, including Department for the Environment Food and Rural Affairs (Defra) and Department for Energy and Climate and Change (DECC), Natural Resources Wales, Scotland, Northern Ireland and governments overseas.
* industries across a range of sectors including offshore renewable energy, oil and gas emergency response, marine surveying, fishing and aquaculture.
* other scientists from research councils, universities and EU research programmes.
* NGOs interested in marine and freshwater.
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