

IVc Regional Fisheries Groups (RFGs) collaborative science questions, actions and MMO/Defra/Cefas responses

Three questions were posed by the IVc group during the April RFG meeting, these are detailed here along with the answers and suggested next steps.

Could Cefas advise whether there is any merit in conducting survey work into the abundance of NS sole in the inshore of area IVc? It is alleged by fishers, and appears true when looking at up take data that there has been a significant reduction in sole on the inshore grounds in the past 3-4 years. Is this something you think could be investigated further and if so how? Could we involve the RFG for Area IVc in the investigation?

CEFAS Response

The issue raised for sole in the southern North Sea has also been raised in the adjacent eastern Channel (Division 7.d), with both areas subject to a recent desk-based review. The decline of sole in both areas seems to be particularly pronounced in quarter 2 (Q2), which is also the sole spawning season. The landings of sole decreased by 76% and 74% in Q2 and Q3 respectively in Division 7.d since 2010. This recent project highlighted the various issues that could usefully be researched in a dedicated project, including:

(a) Implementation of a commercial survey. Given the lack of fishery-independent data in Q2, a survey on a chartered commercial vessel (inshore beam- or otter-trawler rigged for flatfish) to collect data on sole abundance, distribution, condition etc. within the UK EEZ could be considered. Such a survey could be augmented with partial charter/observer surveys on inshore sole netters to collect additional data.

(b) Ecosystem considerations. The surveys described above may also provide a platform for collecting data on other ecosystem components which may have interactions with sole (e.g. examining the stomach content of potential predators such as undulate ray; abundance of spider crab). Additional (partial charter) trips on commercial vessels to collect further, site-specific information on sole and potential predators could also be considered, in order to augment the broader-scale survey approach.

(c) Data on the eggs, larvae and young (0-group) of sole in the inshore coastal waters off England. There is a lack of contemporary data on the earlier stages of sole in both Divisions 4.c and 7.d, which limits recruitment information for the assessment (current recruitment indices are supplied by data from the French coastal surveys only) and has been highlighted by ICES. To provide relevant data for sole, any ichthyoplankton surveys would need to be conducted in the latter half of April and during May. A reintroduction of the Young Fish Survey (YFS) in the coastal waters of Divisions 7.d and 4.c (August-September) could enable the collection of contemporary data on early life-history stages and potentially contribute to recruitment indices.

Such future work could usefully be discussed with the RFG for Area 4.c with a view to collaboration.

Suggested next steps:

Data collection on the eggs, larvae and young sole (option c above) is the better option but is budget dependent, requiring a minimum of three year's compared to (a) and (b) which could be completed in a year.

To work towards this it is suggested in the first instance a one-year project to (i) review current relevant data and design a potential ichthyoplankton survey, and (ii) trial the utility of using a chartered vessel to collect such samples (i.e. sample only a small part of the area in order to determine whether inshore vessels could serve as platforms for this) could be considered.

Note - these surveys are required at different times of the year, and so cannot be combined in one piece of fieldwork. Ichthyoplankton surveys would need to be done from April-May-early June (so budget needs to be in place across FYs). Young Fish Surveys would be best in September time, when young sole have recruited to the grounds.

Can any work be done to progress Thornback Ray being given a separate quota in the NS?

CEFAS Response

Tagging studies have shown connectivity in thornback ray in the southern/central North Sea with the eastern Channel. Furthermore, ICES assess and advise on thornback ray in the North Sea, Skagerrak and eastern Channel (rjc.27.3a47d), with the main part of the stock straddling the southern North Sea (especially the Outer Thames) and the eastern Channel.

Creating a separate TAC for thornback ray in the North Sea could result in wider questions, including whether the TAC area should equate with the biological stock unit, as assessed by ICES.

Whilst the stock-size indicator for thornback ray is increasing, and helps inform on changes to the quota, this increase is driven by the southern North Sea. If there was a separate quota for thornback ray in just Subarea 4, then there may also be more specific questions raised relating to the current status of this species in the north-western North Sea and German Bight, two areas where thornback ray has shown an historical decline.

There have been recent reviews of management options for skates, and there is also future work on options for 'skate and ray' management to be undertaken by Cefas, with this work scheduled to be completed next year.

In summary, work on this area is on-going and the options for future management regimes, which could also potentially be developed under the future framework of Fishery Management Plans (FMPs) should be considered very carefully in order to minimise chances of it having unintended impacts on the fishery.

Suggested next steps:

A one-year project on data-limited species has now been agreed with Defra, and there is a WP in this project to look at skate and ray management.

Results of project could be presented in 2022, and it would be useful to have a specific meeting on this topic with the RFG in the autumn of 2021 to collate the views of fishers.

Can any work be done to trial a fishery for Spurdog in IVc, similar to in the Spurdog avoidance program in the SW?

CEFAS Response

Reported landings of spurdog (DGS, whilst noting that an unknown proportion may have been landed under more generic landings codes) showed a clear decline in Division 4.c from 2002–2007 (ca. 12–75 t y⁻¹) to 2008–2009 (when quota was restricted, ca. 4 t y⁻¹) and have been negligible since then (Table 1).

Over the years 2002–2007, before management measures became very restrictive, the majority of landings were from demersal longline (annual mean = 70%; Table 2), followed by bottom trawl (annual mean = 14%) and gillnet (including other entangling nets; annual mean = 12.6%).

There was seasonality in the reported landings of spurdog over the years 2002–2006; 2007 data were more skewed).

It should be noted that longline and gillnets were among the main gears used in this fishery, and whilst such gears have been used in target fisheries for spurdog, both gears are used in a 'mixed demersal fishery' context. It is also noted that spurdog, as predatory fish, are not only attracted to longline bait, but may also potentially be indirectly attracted to gillnets, depending on sensory cues from other catch components. Consequently, 'move-on' rules for such gears may not be appropriate, especially as the inshore fleet in this area has a limited range of fishing grounds from their home port.

Inshore vessels have highlighted the seasonal, local abundance of spurdog. Furthermore, when longliners (usually targeting thornback ray, cod, bass) encounter large aggregations of spurdog, this can result in trips being 'loss-making' (i.e. after crew, fuel and bait costs), as the majority of the catch may have to be discarded.

If opportunities to land some spurdog bycatch were to be re-introduced for the inshore fleet (with these vessels often interchanging between demersal longlines and nets), and given the need to avoid target fisheries, it may be more practical to have the following suite of measures:

- (a) Limited quota. This could be considered for a defined number of vessels and made available in Q1 (January to March), with a potential to allow some

landings in Q4 (October to December), depending on uptake in Q1. Landings could be not allowed by any vessel in Q2 and Q3.

- (b) Trip and monthly limits. Having a defined and limited **trip limit** would prevent target fisheries re-establishing but could allow for some bycatch to be landed. This would enable inshore vessels to reduce ‘loss-making’ trips. A **monthly limit** would be expected to deter fishers trying to repeatedly fish to the maximum trip limit during the month. Providing that appropriate trip and monthly limits are identified, then this combination of measures would be expected to prevent vessels targeting spurdog.
- (c) Maximum landing length. Earlier directed fisheries for spurdog often targeted aggregations of mature females. Males attain a maximum length of <95 cm, whilst mature females may attain a length of ca. 120 cm. Larger females also produce more and larger pups. Preventing the retention of large, mature females could be supported by the re-introduction of the **100 cm maximum landing length**. This would require all large females to be returned and would deter vessels fishing such aggregations.

Table 1: Annual reported landings of spurdog (DGS) by UK-registered fishing vessels (2002–2020) from the southern North Sea (Division 4.c).

Year	Reported landings (t)
2002	75.1
2003	25.6
2004	50.6
2005	28.6
2006	11.9
2007	16.9
2008	4.3
2009	3.9
2010	0.7
2011	0.1
2012	0.0
2013	0.0
2020	0.1

Table 2: Annual reported landings of spurdog (DGS) by UK-registered fishing vessels (2002–2007) from the southern North Sea (Division 4.c) shown by gear and given in tonnage (top) and as a percentage (bottom).

Gear	2002	2003	2004	2005	2006	2007
Beam trawl	0.1	2.6	0.3	0.2	0.3	1.0
Bottom otter trawl	8.3	2.3	20.6	4.0	0.8	0.5
Gillnets and trammel nets	17.3	3.7	3.9	3.0	1.8	0.9
Hooks and lines	49.3	17.0	25.8	21.6	9.1	14.5
Other	0.1	0.0	0.0	–	–	–
Total	75.1	25.6	50.6	28.6	11.9	16.9

Beam trawl	0.1%	10.3%	0.6%	0.6%	2.1%	5.9%
Bottom otter trawl	11.1%	9.1%	40.7%	13.8%	6.5%	3.1%
Gillnets and trammel nets	23.0%	14.4%	7.8%	10.3%	15.0%	5.2%
Hooks and lines	65.6%	66.1%	51.0%	75.3%	76.5%	85.8%
Other	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%

Wrt trialling a programme similar to that in the South-west, in FY 2018/19 Cefas carried out a feasibility study to extend the near real-time Spurdog Bycatch Management Programme, underway in the South-west, to the southern North Sea longline fishery. The finding was: *Using the spurdog bycatch Smartphone App, the skippers indicated that at least 73% and possibly up to 100% of spurdog were alive on deck, in line with that reported previously by Hetherington et al., 2015 (78% alive on-deck). The driver of the near real-time Spurdog Bycatch Management Programme in the Celtic Sea is to reduce bycatch, dead discards and fishing mortality of spurdog. With on-deck survival high; i.e. low dead discards and fishing induced mortality of spurdog, and the assumption that immediate on-deck survival translates to long-term discard survival, the same driver, and therefore incentive (dead spurdog bycatch allowance) is absent, therefore extension of the Spurdog Bycatch Management Programme to the southern North Sea is not appropriate.*

It is Cefas' scientists understanding that fishermen along the East Anglian coast believe (i) the number, size and distribution of spurdog caught in fisheries along the East Anglian coast are increasing, year-on-year, displacing fishermen from their traditional fishing grounds, and; (ii) spurdog are seasonally and locally abundant between October-May; however, the Prohibited Species listing of spurdog negatively impacts on fishermen's earnings, putting the prosperity and longevity of the East Anglian longline fishery at risk. Social research undertaken by Lede (2019) through qualitative interviews with six fishermen from the southern North Sea longline fishery, reported the East Anglian fishing industry's objective is to assess the state of the spurdog stock in the Southern North Sea fishery.

In FY 2020/21, Defra funded a fisher-led, fishery-dependent Spurdog Relative Abundance Survey off the coast of East Anglia. If funded long-term, the survey could establish a time-series of catch rates of spurdog to develop a trend in relative abundance in the southern North Sea. These fishery-dependent data could inform future potential policy of spatial-temporal measures for managing spurdog bycatch in the East Anglian region. This survey only ran from November 2020 – March 2021. The survey data will be written up and presented to Defra in September 2021.

If industry are willing to contribute, and Defra are able to fund (or a Defra-industry funding model) then the Spurdog Relative Abundance Survey in 4.c could be continued to inform the 4.c spurdog bycatch issue.

Such future work could usefully be discussed with the RFG for Area 4.c with a view to collaboration.

Suggested next steps:

Defra to share the outputs of the Spurdog Relative Abundance Survey off the coast of East Anglia when available. Defra/MMO/Cefas and industry to discuss the feasibility of extending the survey.

In terms of future fishing opportunities for vessels in 4.c regarding spurdog, this is a policy question. If Defra choose to consider the allowance of some bycatch to be landed, Cefas can provide the supporting scientific information and advice.

Can you share the work Cefas have been doing on the effect of windfarms on fish abundance / migration please? This was raised during the Vlld meeting. Is this something that the RFG for Vlld and perhaps IVc could contribute to?

CEFAS Response

Though not specific to windfarms, the FSP (Fisheries Science Partnership) did commission a report into industry generated data (document attached: Report_Strategy for Industry generated data_2016-17.pdf).



Report_Strategy for
Industry generated da

A recent Oceanography Special edition focussed on windfarms and fisheries – this is open access and has some UK context <https://tos.org/oceanography/issue/volume-33-issue-4>.

The papers in the issue entitled: *The impact of offshore wind farms on marine ecosystems: A review taking an ecosystems services perspective* and *Sustainable co-location solutions for offshore wind farms and fisheries need to account for socio-ecological trade-offs* provide background to the issues.

Beyond the RFG discussions, the fishing industry are voicing their concerns on the scale of future site designations:

[Can Fisheries Co-exist with Offshore Wind in the Race to Carbon Net Zero? | NFFO](#)

Suggested next steps:

Further discussion would be useful; as well as confirming which aspects of fisheries the question relates to – the fishers or the fish.