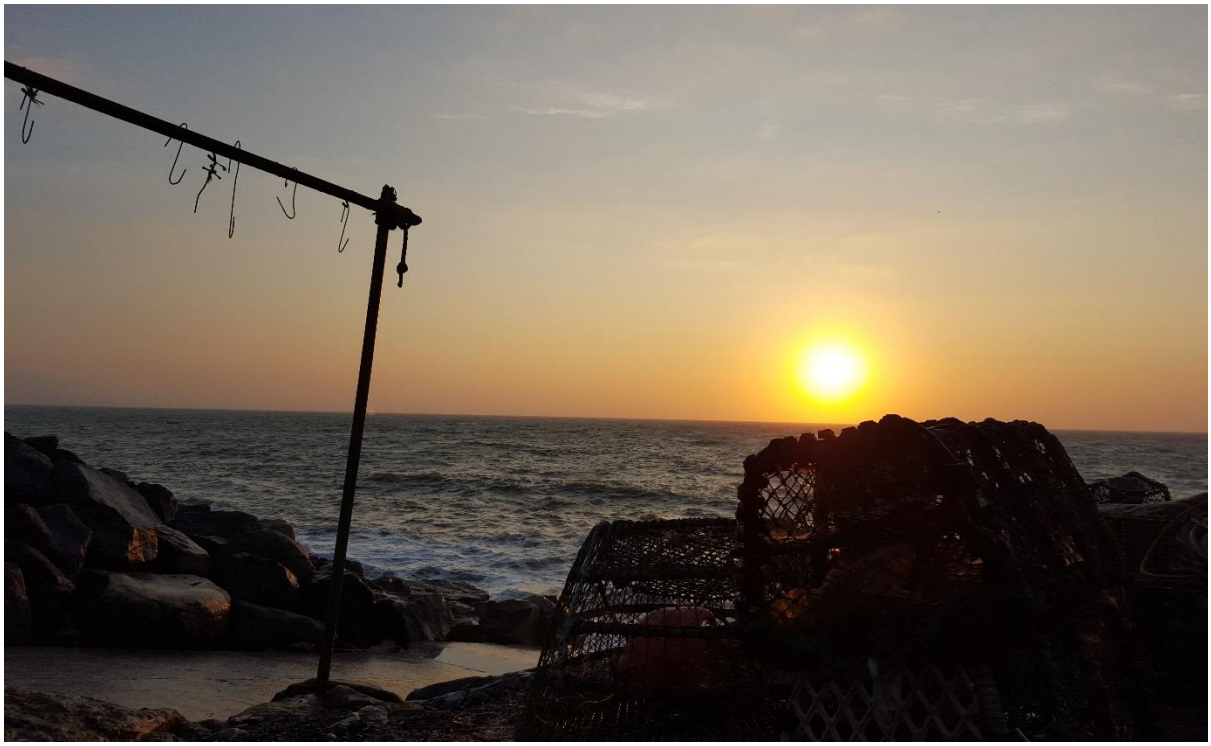
Temporal and Spatial Use of the Skerries Bank Angling Zone by Shore-Based Anglers



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Contents

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Sarah Curtin		Draft report	0.1
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James Stewart Sarah Clark	07/09/2020 15/03/2021	Review and edit of text and analyses, re-plotting of figures for finalised report	1.0
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1. Introduction

Devon and Severn Inshore Fisheries and Conservation Authority (D&S IFCA) has a duty to seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the District. Recreational Sea Angling (RSA) was one of three core work areas in the D&S IFCA's Annual Plans between 2012 and 2015. Following the publication of its first Recreational Sea Angling Strategy, D&S IFCA was looking to introduce fisheries management that would proactively develop the sector. Initial scoping of potential sites was carried out with the assistance of the RSA representatives on the IFCA. Three potential pilot study areas were identified to assess the impact of introducing management measures to improve sea angling: the Emsstrom wreck site close to Torbay, the Skerries Bank in Start Bay and Burnham, Berrow and Brean beaches in Somerset.

The Skerries Bank is a 6.5km sand and shell bank running underwater in a north east direction from Start Point in South Devon. Skerries Bank lies within an area which was designated as the Skerries Bank and Surrounds MCZ in 2013 (Fig. 1). The MCZ designation includes various intertidal and sublittoral rock and sediment habitats as well as spiny lobster, *Palinurus elephas*, and the pink sea fan, *Eunicella verrucosa.* The Skerries Bank also sits adjacent to the South Devon Inshore Potting Agreement area (Fig. 2), which introduced voluntary closures to trawling from 1978 (Blyth *et al.*, 2002), and management through legislation was introduced in the late 1990s. The Skerries Bank itself lies within an area which was closed to trawling under a Devon Sea Fisheries Committee Byelaw, which existed for much of the 20th Century. The Skerries Bank/Start Bay closure to mobile demersal gear is still in place today under D&S IFCA's Mobile Fishing Permit Byelaw (Fig. 3). In addition, the Skerries Bank lies within an area that is subject to prohibitions on certain netting types under the Netting Permit Byelaw Conditions which were introduced in 2018.

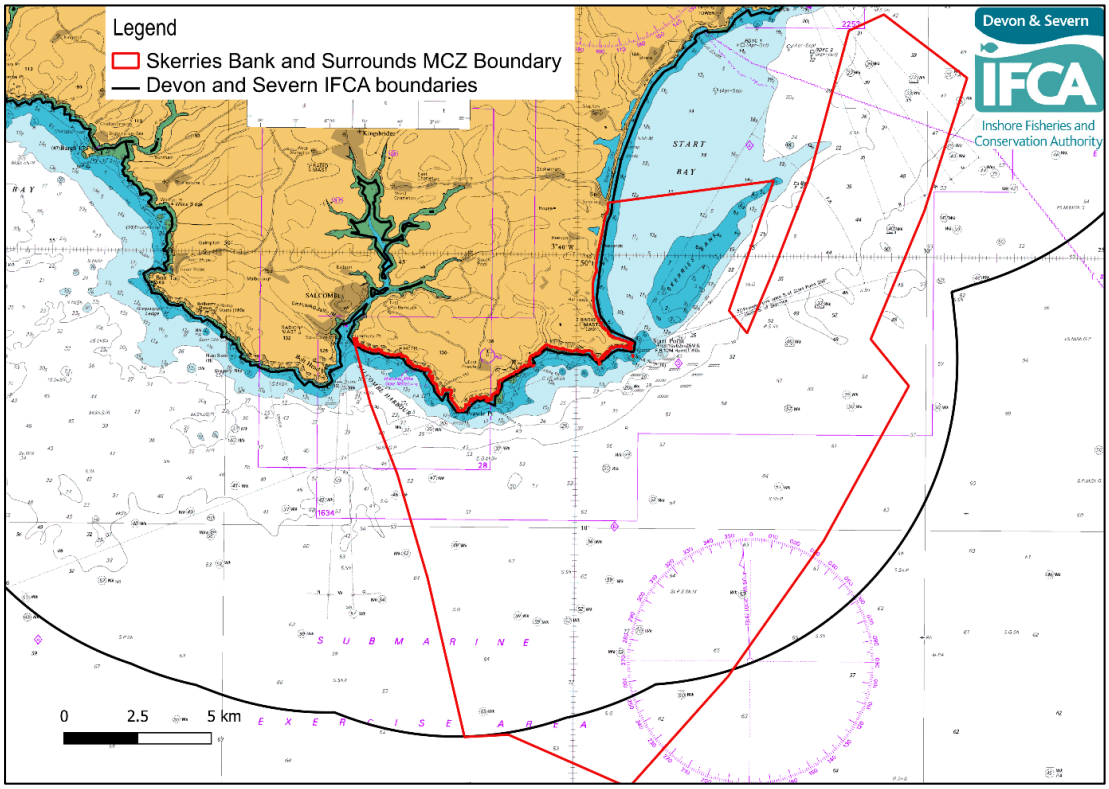

Figure 1. Map of Skerries Bank and Surrounds MCZ.

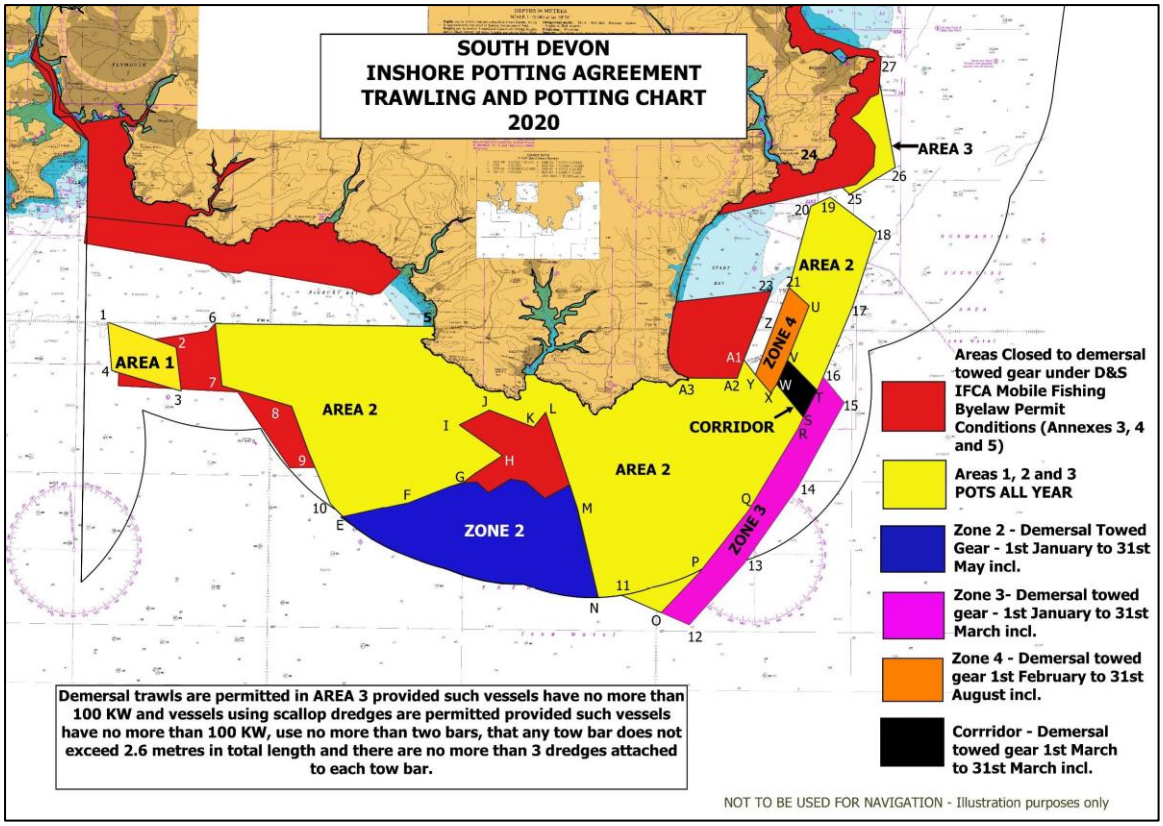

Figure 2. Map of the Inshore Potting Agreement areas

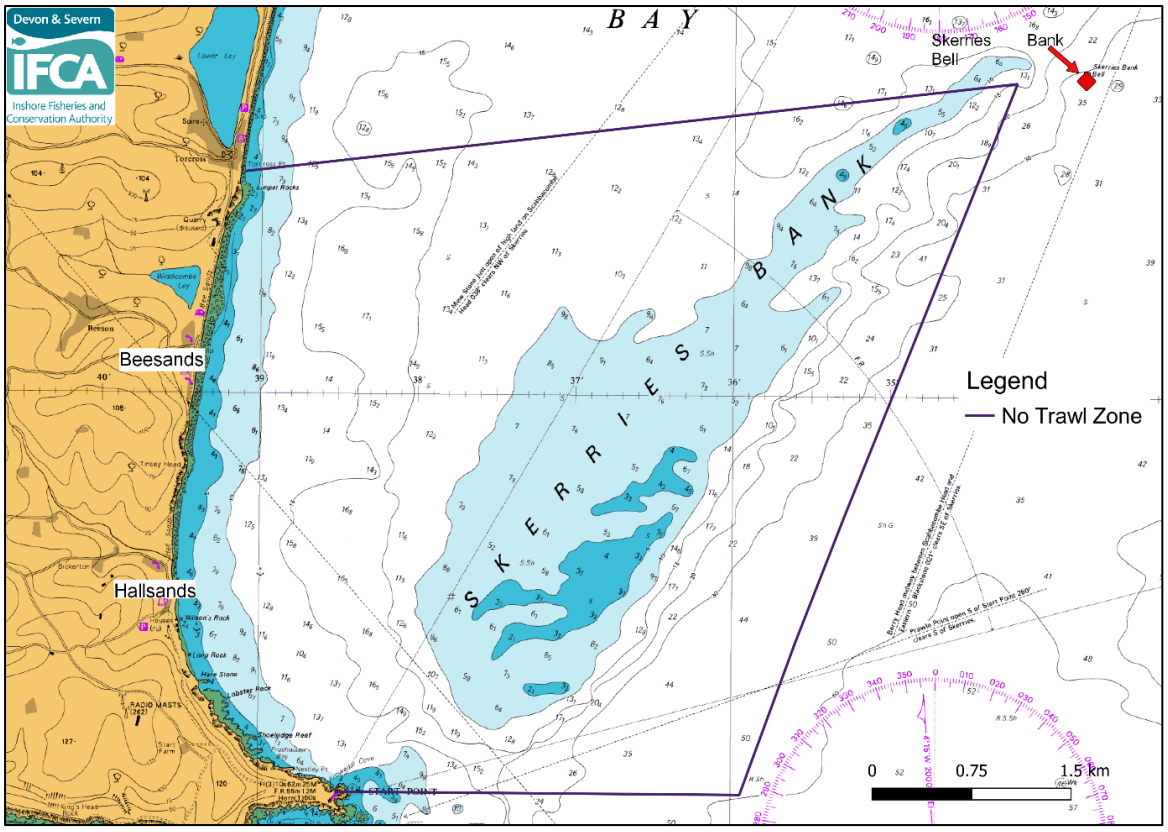

Figure 3. Map of Skerries Bank showing no-trawl zone, Beesands beach and Hallsands beach.

The beaches of Beesands and Hallands (Fig. 3) are sheltered from prevailing south-westerly winds and are close to the rich feeding grounds of the Skerries Bank, making them popular spots for shore anglers. Plaice, *Pleuronectes platessa*, and blonde ray, *Raja brachyura*, utilise the sand bank features of the Skerries Bank and are the primary species targeted by the RSA sector. The area is also popular with private RSA boats and commercial fishers. Angling surveys conducted by D&S IFCA, as part of its participation in the Sea Angling 2012 project, recorded a high density of private RSA angling boats in the Skerries Bank area. Reports of commercial fishing activities include fyke netting, potting, longlining and monofilament netting, primarily from small vessels operating from Beesands, Hallsands and Dartmouth. Anecdotal reports have suggested increasing pressure from static net fisheries, particularly for rays. These reports pre-date the introduction of the Netting Permit Byelaw.

After an initial period of public consultation on a proposal to remove netting and longlining from the Skerries Bank Angling Zone area, in July 2014, D&S IFCA's Officers held three workshops with stakeholders (one meeting per stakeholder group) in order to better understand fishing activities relevant to the Skerries Bank. Recreational sea anglers, charter boat operators and commercial fishermen, who fished from ports close to the site, were invited to attend these sector-specific workshops. The first round of workshops focused on each user group's knowledge of the site, their fishing activities (including spatial and temporal use of the Skerries) and their concerns and ambitions relating to the proposed Angling Zone. From this first round of in-depth consultation, revised proposals were compiled and sent to interested parties. A second round of workshops was held in late August 2014 to give the sectors an opportunity to respond to the revised proposals before officers formulated a final proposal and recommendations for D&S IFCA.

The workshops highlighted a great deal of consensus between the groups on how management of an Angling Zone would improve their activities. The charter boat user group felt that current static gear levels are not detrimental to their fishing activities. Although concern was voiced by the RSA user group regarding current levels of netting, all three groups saw an increase in current levels of static gear as undesirable and potentially damaging. The workshops also highlighted the importance of the area primarily for plaice for the charter boats, although rays were reported to add value to the area as a whole for this sector. Rays and plaice were equally important to the RSA sector. The commercial catching sector felt that they could agree to a complete ban on commercial targeting of plaice in the Skerries Bank Angling Zone area in order to acknowledge the importance of this species to recreational sea angling and charter boats. The commercial sector was concerned about the removal of opportunities for ray fishing and longlining, as this would prove a significant risk to their businesses. The commercial user group also felt that their 'stewardship' of the area, with families fishing the area from small boats for generations, should be recognised; this view was echoed by the charter boat sector. The commercial catching sector felt that, in order to acknowledge their compromise in giving up the potential for plaice fishing, they would like to see balance in management by the placing of sensible bag limits on recreational anglers (including charter boats), in order to remove the risk to their business of fish being caught by unlicensed vessels in the area being sold on the 'grey market'. The RSA sector saw the introduction of a bag limit as acceptable, providing the numbers were not overly restrictive. Consensus could not be reached on an area free from all forms of netting. The RSA sector felt that this was an important part of the original proposal and therefore suggested the placement of smaller, more localised no-netting zones to benefit shore anglers. In the second round of consultations, an area off Beesands beach was

therefore proposed as no-netting. The commercial sector strongly rejected this area and questioned the perception held by anglers that the current levels of commercial netting activity in the vicinity of Beesands is sufficient to be detrimental to shore-based angling activities. In the absence of evidence to guide decisions, the IFCA have therefore suggested a reporting scheme for licensed boats to record commercial fishing activity within the Angling Zone to guide future decisions. After the initial and subsequent workshops a voluntary Code of Conduct was developed and the Skerries Bank Angling Zone was created, including the following provisions:

1. No commercial targeted fishing for plaice by any method may take place within the entire area of the Skerries Angling Zone.
2. Vessels which exceed 10m in overall length are prohibited from engaging in any commercial or recreational netting or longlining activity within the entire area of the Skerries Angling Zone.
3. All nets used within the pilot Angling Zone should be clearly marked using buoys with flags to aid efficient differentiation between pots and nets.
4. There is a bag limit for recreational sea anglers fishing within the Angling Zone of 10 plaice and 3 rays per angler, per day.

The Code aims to balance the needs of all three user groups by restricting commercial netting and longlining effort to preserve the importance of the area to recreational anglers and charter boats, whilst maintaining access for small commercial fishing vessels that rely on access to the area.

In order to supplement anecdotal information gained through the stakeholder engagement phase and to provide a baseline for monitoring the impacts of implementing small-scale spatial management to benefit the RSA and charter boat sectors, D&S IFCA determined that detailed information regarding the use of, and compliance at, the site was required. This would allow D&S IFCA to understand how different user groups use the site throughout the year and monitor compliance with the voluntary Code of Conduct.

A Baseline Report on the temporal and spatial use of the Skerries Bank Angling Zone was produced using data from boat-based surveys, interviews and completion of commercial log books (Curtin and West, 2019). The report highlighted the importance of the site to commercial, private and charter boats and identifies that there is much overlap in their use of the site. In order to obtain a broader understanding of the temporal and spatial use of the site, data collected from shore-based surveys at Hallsands and Beesands beaches are presented in this report, which focuses on use by recreational sea anglers operating from the shore. This report should be read in conjunction with the Baseline Report, and with the Blonde Rays and Plaice Landings and Stock Assessment Report for Skerries Bank (Curtin and Stewart, 2020), which provides important context regarding the local and regional patterns in stocks and landings of plaice and blonde ray.

2. Methodology

A detailed methodology of the data collection for this Angling Zone can be found in the Baseline Report. In summary, the data presented in this report were obtained through shore-based surveys conducted at Hallsands and Beesands beaches (Fig. 3) between May 2015 and April 2016. A total of 63 surveys were carried out during the survey period (29 at

Beesands and 34 at Hallsands), including a total of 47 interviews (39 at Beesands and 8 at Hallsands). The average survey time was equal at both sites (3.8 hours).

The number of shore anglers and rods were recorded as well as any other fishing activity or sightings of commercial, charter and private RSA boats observed from the shore. Interviews with anglers were conducted where possible to obtain data on fishing effort, species targeted, compliance and awareness of the Angling Zone and Code of Conduct. Mann Whitney U tests were used to assess differences in angling effort between locations, and Kruskal-Wallis tests were used to assess differences in angling effort between seasons within locations. For these analyses, seasons are defined as follows: Spring is March to May, Summer is June to August, Autumn is September to November and Winter is December to February; therefore, the spring data include May 2015 and March – April 2016. The proportion of recreational anglers targeting specific species were also calculated for each site. All plotting and analyses contained in this report were completed in R statistical software, version 3.5.1 or later (R Core Team, 2018).

3. Results

3.1. Angling effort, location and seasonality

Angling effort was significantly higher at Beesands (0.78 anglers per survey hour) than at Hallsands (0.10 anglers per survey hour) (Mann Whitney U; W = 735.50, $p < 0.001$). A total of 84 anglers were observed at Beesands across the entire survey period, using 151 rods. At Hallsands only 13 anglers were observed across the survey period, using a total of 20 rods. Based on angler estimates of their own angling activity, the respondents suggested that they fished in the Skerries Bank area for an average of 5.3 days out of the three months preceding the interviews (range 1 – 28).

Though angling activity appears to vary seasonally at both sites (Fig. 4), there was substantial within-season variability in number of anglers, and seasonal differences in mean number of anglers per hour were not statistically significant at either Beesands (Kruskal-Wallis $X^2 = 1.42$, $p = 0.701$; Fig. 4) or Hallsands (Kruskal-Wallis $X^2 = 4.05$, $p = 0.256$; Fig. 4).

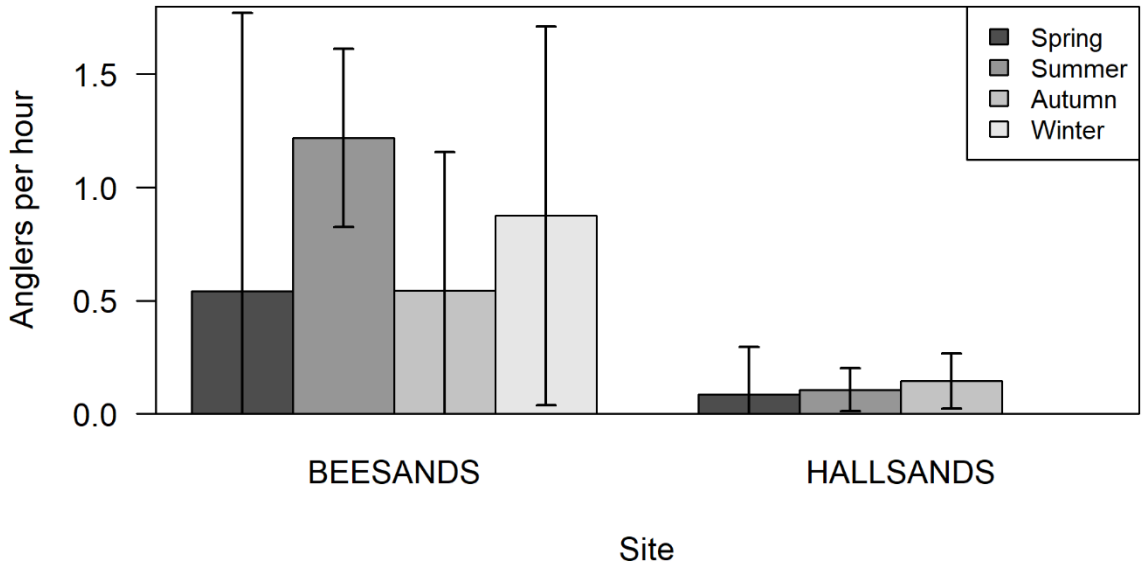

Figure 4. Seasonal mean number of anglers per hour at each site, showing 95% confidence intervals as error bars.

3.2. Target species

During the interviews, anglers indicated that a wide variety of species are targeted across Beesands and Hallsands with plaice and bass being important species for both sites (Fig. 5). Mackerel is also a popular species targeted at Beesands. One of the main concerns among the respondents was the view that there has been a decline in one or more species of fish in the area. This view was expressed by 23 individuals, though 8 others thought there had been no change, and 3 thought that one or more species had increased in abundance.

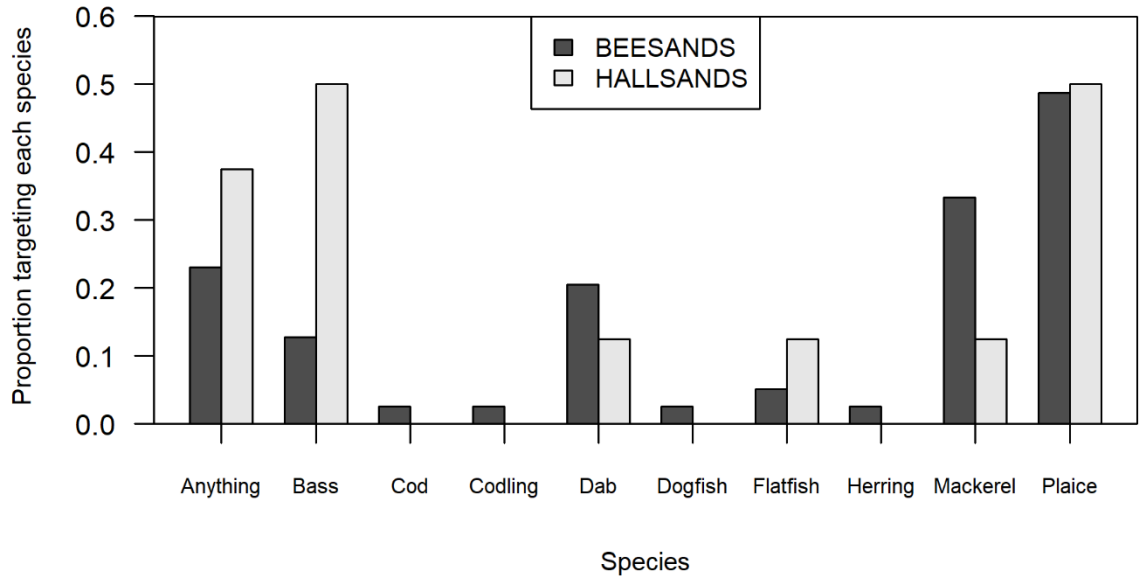

Figure 5. Proportion of anglers targeting each species at Beesands and Hallsands, as identified in 39 and 8 interviews at each site respectively.

3.3. Angler behaviour and knowledge

The majority of recreational sea anglers interviewed (32 out of 47) advised they have been fishing these sites for several years, with over half (29) fishing the areas for both sport and food. Most respondents were not members of an angling club (30 non-members, and 15 members).

Interviews included sections on compliance and on the level of knowledge of the work of D&S IFCA. Out of 47 respondents, 49% were aware of D&S IFCA, while 51% were unaware. The level of awareness of the Angling Zone and the Code of Conduct was also low: only 22% of respondents were aware of the Angling Zone and the Code of Conduct. Given the low awareness, it was difficult to assess compliance with the Code, including with recreational bag limits. The fishing activities of three individuals were found to be compliant with the Code of Conduct even though the individuals concerned were unaware of the Code.

One of the main concerns regarding broader compliance issues, as highlighted by respondents, was illegal netting and trawling being carried out in the area. It should be noted that there were no instances of illegal fishing activity observed by D&S IFCA officers or the respondents during the survey period.

4. Discussion and Conclusions

Recreational and commercial fisheries are complex social-ecological systems that are constantly adapting due to fisher priorities and behaviours (Brownscombe *et al*., 2019, Matsumura *et al*., 2019). These stakeholder groups play an equally important role in inland coastal environments (Kearney *et al*., 2002). However, conflict between the commercial and recreational sector over shared resources, spatial access and different management measures is a persistent issue for the majority of developed countries (Brownscombe *et al*., 2019, Kearney *et al*., 2002). These existing conflicts within and between user groups must be acknowledged and addressed in order for fisheries management to be successful (Arlinghaus *et al*., 2019).

In combination with the Baseline Report, this shore-based survey indicates some crossover in the spatial use of the Beesands and Hallsands area within the Skerries Bank Angling Zone between commercial fishers, private RSA boats and shore-based anglers. Beesands appears to be an important area within the Angling Zone for shore anglers as the majority of angling effort was concentrated there during the survey period. The baseline report highlight that this area is also utilised by the commercial sector and private RSA sector (Curtin and West, 2019); however, the temporal use of the area varies between the shore anglers, commercial boats and private RSA boats. During the summer months, activity at Hallsands appears to be dominated by commercial fishers operating fixed nets, rod and line, and pots (Curtin and West, 2019). Private RSA boats, however, tend to focus their efforts at Hallsands during the spring. Shore-based RSA activity appears to be relatively consistent across the year at both Hallsands and Beesands.

Boucquey (2017) highlighted that a common perception among recreational fishers is that commercial netters use large nets that take up too much space and remove a large proportion of the fish, therefore damaging their fishing opportunities. In turn, many commercial fishers are of the opinion that recreational fishers invade their space and disrespect the traditional use of nets (Boucquey, 2017). Similar concerns were raised by each sector during the initial consultations outlined in the introduction to the current report. Between data collection and the writing of this report, the Netting Permit Byelaw has been introduced. This Byelaw and associated Permit Conditions prohibit the use any net in a significant section of the site except where; the headline of the fixed net is set at least 3 meters below the surface of the water at any state of the tide, the net used is a seine or drift net (Annex 1). This legislation will therefore help to reduce any conflict between recreational fishers and commercial netters. Full details of the Byelaw, Permit Conditions and Annexes are available on D&S IFCA's website.

Although spatial use by the three sectors overlaps in Beesands and Hallsands, competition over spatial access and target species is likely to be minimal and limited to a relatively small number of species due to fisheries targeting different species and the temporal variation in use of these sites between the user groups. Plaice are an important species for shore anglers, charter and private boat anglers. Anecdotal reports from the RSA sector suggest that there has been a decline of fish within the Angling Zone. This could be a result of environmental or biological variation, or increased commercial effort within the broader geographic area. This issue is explored in greater detail in D&S IFCA's linked report on the status of key stocks (plaice and rays) and local landings of these species (Curtin and Stewart, 2020).

The Code of Conduct was thought to be the most appropriate method of management at the time. The introduction of the Netting Permit Byelaw in addition to the code of Conduct may have helped to reduce any conflict between recreational fishers and commercial netters and further develop RSA opportunities. Plaice were not targeted by the commercial sector, suggesting that their activities were compliant with the Code of Conduct. However, it is important to note that awareness of the Code of Conduct is low amongst the commercial sector (S. Curtin, *pers. obs*). Despite there being good representation and involvement from all sectors at the initial consultations and workshops, there is a lack of understanding and awareness of the Angling Zone and Code of Conduct. This general lack of knowledge within the RSA sector may lead to non-compliance undermining the effectiveness of the Code of Conduct.

Several studies suggest that involving stakeholders and adopting a co-management approach to inshore fisheries management can improve compliance and lead to a sustainable fishery when compared to entirely top-down imposition of management measures (Costanza *et al*., 1998; Ostrom, 1990; Rodwell *et al*., 2014). In the context of this report, considering angler interests on equal footing with those of commercial fishers can promote a shift in the community towards forward-looking and cooperative attitudes to fisheries management and conservation (Arlinghaus *et al*., 2019). Similarly, education, fisher participation in the management process and positive perceptions of conservation can all contribute to increased compliance (Arias and Sutton, 2013; Pita, 2013; Smallwood and Beckley, 2012). Promoting cooperative behaviour and improving awareness on a wider level within the RSA sector may prove to be challenging based on the low level of club membership (33%) seen during this survey, though it may be possible to engage with non-club members through angling stores and other organisations such as the Angling Trust. Sea angling clubs and Angling Trusts can prove to be pivotal stakeholders in the education process within the RSA sector, as these types of organisations campaign on environmental and conservation issues and advocate best fishing practices within their angling community (Arlinghaus *et al*., 2019; Guckian *et al.,* 2018).

The Skerries Bank Baseline Report (Curtin and West, 2019), the Blonde Rays and Plaice Landings and Stock Assessment Report for Skerries Bank (Curtin and Stewart, 2020) and this Shore Report are the first steps in monitoring a resource shared by various stakeholder groups. It was beyond the scope of this work to assess the social, economic and environmental benefits and impacts of the different activities, though such an assessment would help to balance the costs and benefits of the exploitation of these sea fisheries resources across multiple user groups. In addition, further engagement work is required in order to account for the Netting Permit Byelaw Conditions and how the use of the site by anglers and commercial fishers may have changed under the Code of Conduct and the Netting Permit Byelaw.. The comparison will provide valuable information on changes in use and perceived value of the area and whether the current management measures are sufficient in promoting RSA opportunities, helping to balance the needs of multiple users of these resources.

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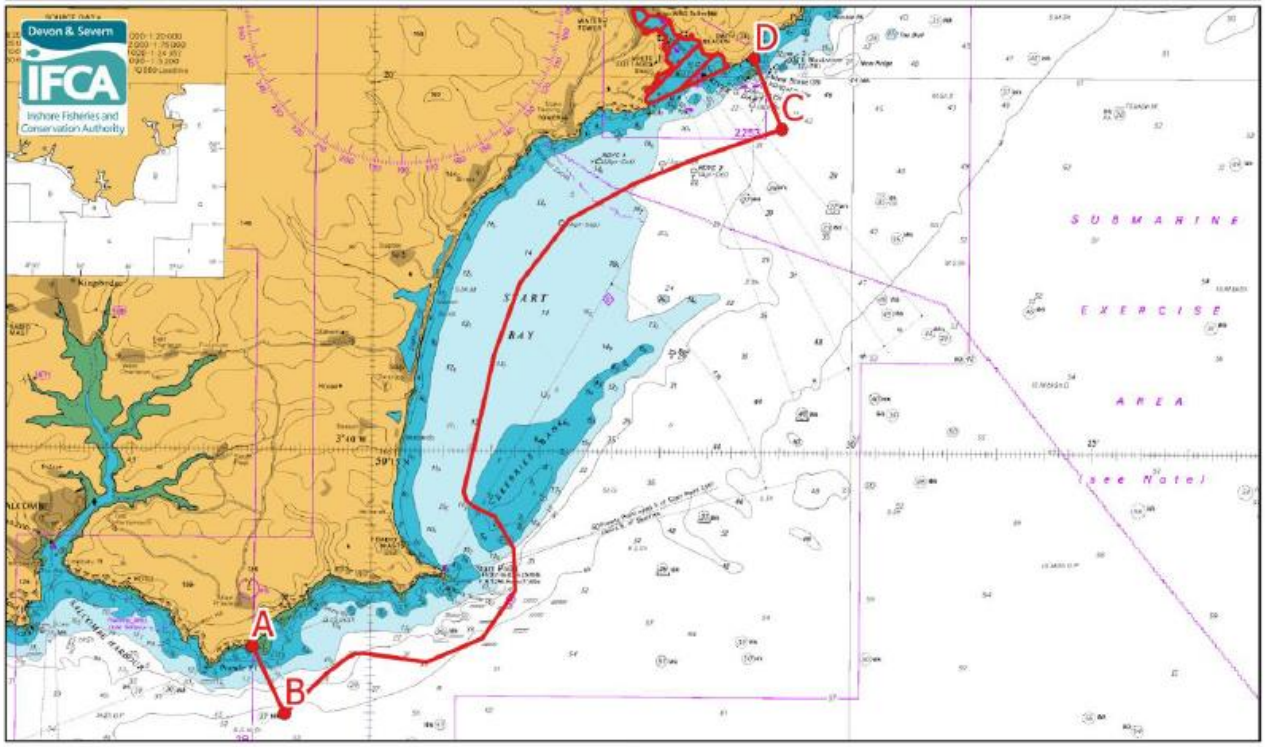
Annex 1

Copy of a section of Annex 3 of the Netting Permit Byelaw conditions that is relevant to the Skerries Bank

Annex 3 Chart of Coastal Area 3 - No access for the use of nets other than in accordance with paragraph 3.4 of the Netting Permit Conditions



Coastal Area 3

Access to netting in accordance with paragraph 3.2

Coastal Area 3 latitude and longitude positions:

Point	Latitude	Longitude
A (Langerstone Point)	50° 12.363'N	003° 42.455'W
B	50° 11.464'N	003° 41.769'W
C	50° 19.307'N	003° 31.491'W
D (Mew Stone, east of Dartmouth)	50° 20.242'N	003° 32.082'W

Between points B and C the seaward boundary is 1 nautical mile seaward of the shore as defined by the lowest astronomical tide