Document Control

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Southern Inshore Fisheries and Conservation Authority (IFCA)
Marine Conservation Zone Fisheries Assessment (Part B)

Marine Conservation Zone: Southbourne Rough MCZ

Feature: Black seabream (*Spondyliosoma cantharus*) (nesting)

Broad Gear Type: Bottom Towed Fishing Gear

Gear type(s) Assessed: Light otter trawl; Beam trawl

Technical Summary

As part of the MCZ assessment process for the tranche three Southbourne Rough MCZ, it was identified that trawling (specifically light otter trawl, and beam trawl) and its potential impacts required an in-depth assessment. The level of trawling is believed to be low (1-2 times per month), outside of and on the fringes of the site, over subtidal mixed sediments.

The potential pressures likely to be exerted by the activity upon designated features were identified as abrasion, disturbance and penetration of the seabed below and on the surface of the seabed and the removal of target and non-target species. Scientific literature shows that whilst trawling has the potential to cause physical disturbance to the seabed, through flattening, moving, piling up sediment and dragging boulders and biogenic structures across the seafloor. Black seabream are caught in trawls both as a target species and as bycatch.

When considering that trawling may occur within Southbourne Rough MCZ, in combination with other evidence (scientific literature, sightings data) it was concluded the activity is likely to pose a significant risk to Black seabream (nesting). The physical impacts of trawling on the seabed would be likely to disturb and destroy nests and eggs. Additionally, the removal of black seabream through fishing pressure at a time when they are considered highly venerably due to their nesting behaviour could lead to changes in sex ratio within the population, egg mortality through adult males being removed from the nests, and over fishing. As such, it is believed the activity will hinder the achievement of the designated features 'recover' general management approaches and that it is not compatible with the site's conservation objectives.

Existing management measures are therefore not considered sufficient and to ensure that trawling remains consistent with the conservative objectives of the site. Therefore, an additional closed area to bottom towed fishing gear will be introduced which will protect nesting black seabream.

When scientific literature, fishing activity, sightings data and existing and proposed management is considered, it is considered sufficient to ensure that trawling remains consistent with the conservative objectives of the site, fishing effort will continue to be monitored.

Contents

1 Introduction

1.1 Need for an MCZ assessment

This assessment has been undertaken by Southern IFCA in order to document and determine whether management measures are required to achieve the conservation objectives of Southbourne Rough Marine Conservation Zone (MCZ). Southern IFCA has duties under section 154 of the Marine and Coastal Access Act 2009 which states;

154 Protection of marine conservation zones

> (1) The authority for an IFC district must seek to ensure that the conservation objectives of any MCZ in the district are furthered.
>
> (2) Nothing in section 153(2) is to affect the performance of the duty imposed by this section.
>
> (3) In this section—
>
> > (a) "MCZ" means a marine conservation zone designated by an order under section 116;
> >
> > (b) the reference to the conservation objectives of an MCZ is a reference to the conservation objectives stated for the MCZ under section 117(2)(b).

Section 125 of the 2009 Act also requires that public bodies (which includes the IFCA) exercise its functions in a manner to best further (or, if not possible, least hinder) the conservation objectives for MCZs.

This MCZ assessment will complement Southern IFCA's assessment of commercial fishing activities in European Marine Sites (EMS) – designated to protect habitats and species in line with the EU Habitats Directive and Birds Directive. To bring fisheries in line with other activities, the Department for Environment, Food and Rural Affairs (DEFRA) announced on the 14th August 2012 a new approach to manage fishing activities within EMSs. This change in approach will promote sustainable fisheries while conserving the marine environment and resources, securing a sustainable future for both.

1.2 Documents reviewed to inform this assessment

- Reference list (Section 8)
- Defra's matrix of fisheries gear types and European Marine Site protected features[1]
- Site map(s) – feature location and extent (Annex 1)
- Natural England's Advice on Operations for Southbourne Rough MCZ[2] (Annex 4)
- Natural England's Supplementary Advice for Southbourne Rough MCZ[3]
- Fishing activity data (map(s), etc) (Annex 6)
- Fisheries Impact Evidence Database (FIED)

2 Information about the MCZ

2.1 Overview and designated features

Southbourne Rough MCZ was designated in May 2019 and covers an area of the Dorset inshore sea to the east of Poole Rocks MCZ, off of Southbourne and Hengistbury Head. The site covers a rectangular area of 5km^2 and protects the mobile species Black seabream during the nesting stage of their lifecycle. This species of fish creates nests, where the males guard eggs within them, during their breeding season between April and July. Nesting habitats are characterised by smooth bedrock with a veneer of sediment in shallow water. The males return to the same nesting site for approximately 14 years.

[1] https://www.gov.uk/government/publications/fisheries-in-european-marine-sites-matrix

[2] https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UKMCZ0071&SiteName=southbourne+rough&SiteNameDisplay=Southbourne+Rough+MCZ&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=1

[3] https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UKMCZ0071&SiteName=southbourne%20rough&SiteNameDisplay=Southbourne+Rough+MCZ&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=1,1

A summary of the site's designated features is provided in Table 1. together with the recommended General Management Approach (GMA) for each feature. The GMA required for a feature in a MCZ will either be for it to be maintained in favourable condition (if it is currently in this state), or for it to be recovered to favourable condition (if it is currently in a damaged state) and then to be maintained in favourable condition.

Designated feature	General Management Approach
Black seabream (*Spondyliosoma cantharus*) (nesting)	Recover to a favourable condition

Please refer to Annex 1 for site feature maps of broad-scale habitats and features of conservation importance. This feature data comes from the Natural England, 2019 data set given to Southern IFCA, containing a collation of marine habitat and species records that contribute to the designation of marine habitats and features. This corresponds with the feature data on Magic Map which represents Natural England's best available evidence (https://magic.defra.gov.uk/MagicMap.aspx).

2.2 Conservation objectives

The site's conservation objectives apply to the Marine Conservation Zone and the individual species and/or habitat for which the site has been designated (the "Designated features" listed below).

The conservation objective of each of the zones is that the protected habitats:

1. are maintained in favourable condition if they are already in favourable condition
2. be brought into favourable condition if they are not already in favourable condition

For each protected feature, favourable condition means that, within a zone:

1. its extent is stable or increasing
2. its structure and functions, its quality, and the composition of its characteristic biological communities (including diversity and abundance of species forming part or inhabiting the habitat) are sufficient to ensure that its condition remains healthy and does not deteriorate

Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery.

For each species of marine fauna, favourable condition means that the population within a zone is supported in numbers which enable it to thrive, by maintaining:

1. the quality and quantity of its habitat
2. the number, age and sex ratio of its population. Any temporary reduction of numbers of a species is to be disregarded if the population is sufficiently thriving and resilient to enable its recovery.

Any alteration to a feature brought about entirely by natural processes is to be disregarded when determining whether a protected feature is in favourable condition.

3 MCZ assessment process

3.1 Overview of the assessment process

The assessment of commercial fishing activities within the Southbourne Rough MCZ will be undertaken using a staged process, akin to that proposed by the Marine Management Organisation (MMO)[4], for marine license applications (Annex 2). The assessment process comprises of an initial screening stage to establish whether an activity occurs or is anticipated to occur/has the potential to occur within the site. Activities which are not screened out are subject to a simple 'part A' assessment, akin to the Test of Likely Significant Effect required

[4] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/410273/Marine_conservation_zones_and_marine_licensing.pdf

by article 6(3) of the Habitats Directive. The aim of this assessment is to identify pressures capable of significantly affecting designated features or their related processes. Fishing activities and their associated pressures which are not screened out in the part A assessment and then subject to a more detailed 'part B' assessment, where assessment is undertaken on a gear type basis. A part B assessment is akin to the Appropriate Assessment required by article 6(3) of the Habitats Directive. The aim of this assessment is to determine whether there is a significant risk of the activity hindering the conservation objectives of the MCZ. Within this stage of assessment, 'hinder' is defined as any act that could, either alone or in combination:

- in the case of a conservation objective of 'maintain', increase the likelihood that the current status of a feature would go downwards (e.g. from favourable to degraded) either immediately or in the future (i.e. they would be placed on a downward trend); or

- in the case of a conservation objective of 'recover', decrease the likelihood that the current status of a feature could move upwards (e.g. from degraded to favourable) either immediately or in the future (i.e. they would be placed on a flat or downward trend) (MMO, 2013).

If the part B assessment is unable to conclude that there is no significant risk of an activity hindering the conservation objectives of the MCZ, then the activity may be subject to management and consideration will be given to whether or not the public benefit of the activity outweighs the risk of damage to the environment; and if so, whether the activity is able to deliver measures of equivalent environmental benefit to the damage that is likely to occur to the MCZ.

3.1.1 Screening and part A assessment

The aim of the screening stage and part A assessment is to determine whether, under section 125 and 154 of MCAA, fishing activities occurring or those which have the potential to occur within the site are compatible with the conservation objectives of the MCZ.

The screening of commercial fishing activities in Southbourne Rough MCZ was undertaken using broad gear type categories. Sightings data collected by the Southern IFCA, together with officers' knowledge, was used to ascertain whether each activity occurs within the site, or has the potential to occur/is anticipated to occur in the foreseeable future. For these occurring/potentially occurring activities, an assessment of pressures upon MCZ designated features was undertaken using Natural England's Advice on Operations for the Southbourne Rough MCZ.

Activities were screened out for further part B assessment if they satisfied one or more of the following criteria:

1. The activity does not occur within the site, does not have the potential to occur and/or is not anticipated to occur in the foreseeable future.

2. The activity does occur but the pressure(s) does not significantly affect/ interact with the designated feature(s).

3. The activity does occur but the designated feature(s) is not sensitive to the pressure(s) exerted by the activity.

3.1.2 Screening of commercial fishing activities based on occurrence

Initial screening was undertaken to identify the commercial fishing activities which currently occur within the site, together with those which have the potential to occur or/and are reasonably foreseen to occur in the future (Annex 3). To maintain consistency with Southern IFCA's assessment of commercial fishing activities in European Marine Sites, the individual gear types identified in Defra's matrix were assessed and these were grouped into broad gear types.

3.1.3 Screening of commercial fishing activities based on pressure-feature interaction

Fishing activities which were identified as occurring, have the potential to occur and/or are anticipated to occur in the foreseeable future within the site were screened with respect to the potential pressures which they may be exert upon designated features (Part A assessment). This screening exercise was undertaken using Natural England's Advice on Operations and Supplementary Advice on Conservation Objectives for Southbourne Rough MCZ (Annex 4). The Advice on Operations provides a broad scale assessment of the sensitivity of designated features to different activity-derived pressures, using nationally available evidence on their resilience (an ability to recover) and resistance (the level of tolerance) to physical, chemical and biological pressures. The assessments of sensitivity to these pressures are measured against a benchmark. It should be noted that these benchmarks are representative of the likely intensity of a pressure caused by typical activities, and do not represent a threshold of an 'acceptable' intensity of a pressure. It is therefore necessary to consider how the level of fishing intensity observed within Southbourne Rough MCZ compares with these benchmarks when screening individual activities.

Due to the broad-scale nature of the sensitivity assessments provided in Natural England's Advice on operations, each pressure is assigned a risk profile based upon the likelihood of the pressure occurring and the magnitude of the impact should that pressure occur. These risk profiles have been used, together with site-specific knowledge, to identify those pressures which could significantly affect designated features.

Table 1. Summary of fishing pressure-feature screening for black sea bream and demersal trawls and dredges. Please note only pressures screened in for the Part B assessment are presented here.

Potential pressures	Advice on operations	Considered in Part B Assessment	Justification	Relevant Attributes (effected by identified pressures)
Abrasion/disturbance of the substrate on the surface of the seabed	S	Y	This gear type is known to cause abrasion and disturbance to the seabed surface. Male Black Bream clear a patch of sediment revealing smooth bedrock as a nest site. The female lays the eggs on this site and the male guards them until they hatch. This gear type has the potential to move cleared sediment areas destroying the nest and to smother and destroy eggs. Further investigation is needed on the magnitude of the pressure including spatial scale/intensity of the activity and location of the activity in relation to the feature.	Supporting habitat: extent and distribution, Nest abundance
Removal of non-target species	S	Y	Impacts on the feature may occur through the removal of the feature itself, whilst smaller organisms are likely to pass through the gear. Further investigation is needed as to the magnitude of disturbance to associated communities/species and location of the activity in relation to the feature.	Population: age/size frequency, Nest abundance, Population: population size, Population: recruitment and reproductive capability, Presence and spatial distribution of the species

Removal of target species	S	Y	Impacts on the feature may occur through the removal of the feature itself, whilst smaller organisms are likely to pass through the gear. Further investigation is needed as to the magnitude of disturbance to associated communities/species and location of the activity in relation to the feature.	Population: age/size frequency, Nest abundance, Population: population size, Population: recruitment and reproductive capability, Presence and spatial distribution of the species
Smothering and siltation rate changes (Light)	S	Y	This gear type is known to cause abrasion and disturbance to the seabed surface. Male Black Bream clear a patch of sediment revealing smooth bedrock as a nest site. The female lays the eggs on this site and the male guards them until they hatch. This gear type has the potential to move cleared sediment areas destroying the nest and to smother and destroy eggs. Further investigation is needed on the magnitude of the pressure including spatial scale/intensity of the activity and location of the activity in relation to the feature.	Supporting processes: water quality - turbidity
Penetration and / or disturbance of the substrate below the surface of the seabed, including abrasion	Assumed: S	Y	This gear type is known to cause penetration and disturbance to the seabed surface. Male Black Bream clear a patch of sediment revealing smooth bedrock as a nest site. The female lays the eggs on this site and the male guards them until they hatch. This gear type has the potential to move cleared sediment areas destroying the nest and to smother and destroy eggs. Further investigation is needed on the magnitude of the pressure including spatial scale/intensity of the activity and location of the activity in relation to the feature.	Supporting habitat: extent and distribution, Nest abundance

4 Part B Assessment

The aim of the part B assessment is for the IFCA to ensure that that there is no significant risk of a fishing activity hindering the conservation objectives of the MCZ; and to confirm that the authority is able to exercise its functions to further the site's conservation objectives.

In order to adequately assess the potential impacts of an activity upon a designated feature, it is necessary to consider the relevant attributes of that feature that may be affected. Attributes are provided in Natural England's Supplementary Advice on Conservation Objectives (SACOs) and represent the ecological characteristics or requirements of the designated species and habitats within a site. These attributes are considered to be those which best describe the site's ecological integrity and which if safeguarded will enable achievement of the Conservation Objectives. Each attribute has an associated target which identifies the desired state to be achieved; and is either quantified or qualified depending on the available evidence. After relevant pressures were identified from the pressure-feature interaction screening (part A assessment), suitable attributes were identified from Natural England's Supplementary Advice package for the Southbourne Rough MCZ. These are outlined in Table 1.

4.1 Assessment of trawling in Southbourne Rough MCZ

4.1.1 Summary of the fishery

Trawling can take place all year round in the area around the Southbourne Rough MCZ. The level of activity is however low, with up to 3 vessels partaking in the fishery, fishing roughly once every two weeks, although not all at the same time. The activity does not target a specific species. The species caught is dependent on the time of year and catches can include common sole (*Solea solea*) and European plaice (*Pleuronectes platessa*), with a bycatch of bass and black bream.

4.1.2 Technical gear specifications

Light otter trawls are used to fish for a number of fish species in Poole Bay around the Southbourne Rough MCZ. There is also the potential for a beam trawl to be used within the site, although it is not currently active.

4.1.3 Light otter trawl

An otter trawl comprises of following design (see Figure 1). Two shaped panels of netting are laced together at each side to form an elongated funnel shaped bag (Seafish, 2015). The funnel tapers down to a cod-end where fish are collected (Seafish, 2015). The remaining cut edges of the net and net mouth are strengthened by lacing them to ropes to form 'wings' that are used to drive fish into the net (Seafish, 2015). The upper edge of the rope is referred to as the head line, the lower edge is referred to as the foot rope of fishing line and side ropes are known as wing lines (Seafish, 2015). Floats are attached to the headline to hold the net open and the foot rope is weighted to maintain contact with the seabed and prevent damage to the net (Seafish, 2015). The wings of the net are held open by a pair of trawl doors, also known as otter boards, and are attached to the wings by wires, ropes or chains known as bridles and sweeps (Seafish, 2015). The sweep connects the trawl door to top and bottom bridles which are attached to the headline and footrope of the net, respectively (Seafish, 2015). The choice of material used for the sweeps and bridles depends on the size of gear and nature of the seabed, with smaller inshore boats using thin wire and combination rope (Seafish, 2015). The trawl doors, which are made of wood or steel are towed through the water at an angle which causes them to spread apart and open the net in a horizontal direction (Seafish, 2015). The trawl doors are attached to the fishing vessel using wires referred to as trawl warps (Seafish, 2015). The trawl doors must be heavy enough to keep the net on the seabed as it is towed (Seafish, 2015). As the trawl doors are towed along the sea bed they generate a sediment cloud which helps to herd fish towards the mouth of the trawl (Seafish, 2015). The bridles and sweeps continue the herding action of the trawl doors as the trail on the seabed and disturb the sediment, creating a sediment cloud (Seafish, 2015). The length of the sweeps and bridles and distance between the two trawl doors is tuned to the target species (Seafish, 2015). Species such as lemon sole and plaice can be herded into the trawl over long distances and so the length of the sweeps is longer (Seafish, 2015).

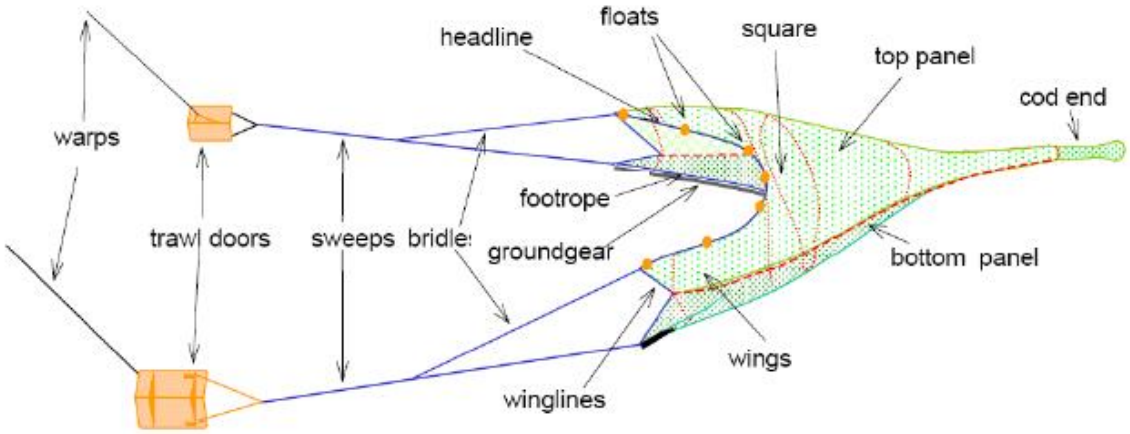

Figure 1. Key components of an otter trawl. Source: www.seafish.org/upload/b2b/file/r_d/BOTTOM%20TRAWL_5a.pdf

The mesh size of the net used varies depending on the type of trawl (Seafish, 2015). In the UK, there has been a move towards an increase in mesh size, particularly in the top panel and wings, in order to improve gear selectivity (Seafish, 2015).

The ground rope will have some form of ground gear attached to protect the netting from damage on the seabed (Seafish, 2015). The ground gear can largely vary. The most basic is where bare fishing line and the netting is laced directly to the rope of combination rope (Seafish, 2015). Chains may also be used and the style of attachment can vary (Seafish, 2015). Ground gear may also include bobbins and rock hoppers which commonly use small and large rubber discs (up to 600 mm) (Seafish, 2015).

The drag of the gear, combined with the floats on the headline, mean the weight of the trawl on the seabed is in the region of 10 to 20% of what it would be in air (Seafish, 2015).

A light otter trawl is one that uses anything less than the definition given for a heavy otter trawl, which include any of the following (MMO, 2014):

- Sheet netting of greater than 4 mm twine thickness
- Rockhoppers or discs of 200 mm or above in diameter
- A chain for the foot/ground line (instead of wire)

Generally, vessels will shoot and haul their gear over the stern of the boat (Seafish, 2015). Restrictions on vessels over 12 metres in length in the Southern IFCA district limits the size of gear that can be used within the district.

4.1.4 Beam trawl

A net is held open by a rigid framework to maintain trawl opening, regardless of towing speed, in addition to supporting the net (Seafish, 2015). The framework consists of a heavy tubular steel beam which is supported by steel beam heads at each end. Each beam head has wide shoes at the base which slide over the seabed (Seafish, 2015). A cone shaped net is towed from the framework, with the head rope attached to the beam and foot rope connected to the base of the shoes (Seafish, 2015). The footrope forms a ‘U’ shape curve behind the beam as it is towed over the seabed (Seafish, 2015). The beam is towed using a chain bridle which is attached to both shoes and at the centre of the beam; all coming together to form a single trawl warp which leads to the vessel (Seafish, 2015).

There are two types of beam trawl and these are referred to as ‘open gear’ and ‘chain mat gear’ (Seafish, 2015). Open gear uses a lighter rig, with a number of chains, known as ‘ticklers’, which are towed along the seabed across the mouth of the net (Figure 2) (Seafish, 2015). Tickler chains help to disturb fish from a muddy seabed. Open gear is used on clean and soft ground. Chain mat gear on the other hand is used for towing over harder and stonier seabed and if often used by larger vessels (Seafish, 2015). The chain mat gear uses a lattice work of chains which are towed from the back of the beam and attach to the footrope of

the net (Figure 3) (Seafish, 2015). Lighter styles of beam, using fewer tickler chains and without a chain mat, are used to target shrimp (Seafish, 2015).

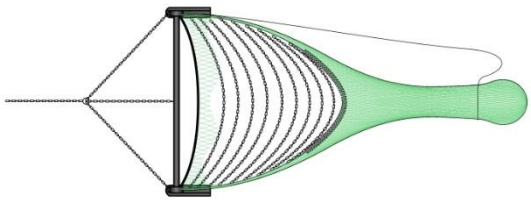

Figure 2. 'Open gear' beam trawl.

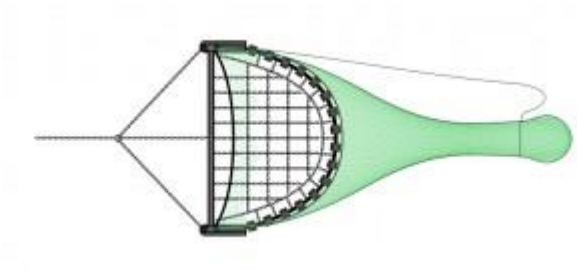

Figure 3. 'Chain mat gear' beam trawl.

Generally, vessels below 12 metres, like those used in the Southern IFCA district, tow one trawl from the stern of the vessel (Seafish, 2015). The size of the beam towed, and the horsepower of many vessels, can be restricted by the local fishery regulations (Seafish, 2015).

4.1.5 Location, Effort and Scale of Fishing Activities

Light otter trawling takes place subtidally and occurs regularly (approx. once every two weeks) around the site, occasionally crossing the outer fringes of the site.

A maximum of 4 vessels can partake in the fishery. These Vessels operate out of Lymington, Poole and Weymouth. Three of the vessels use otter trawls, and one uses beam trawl. The beam trawl vessel is only seen once a year in the district.

Based on the information described above; trawling may occur on the fringes of the site once a month in the Southbourne Rough MCZ. Hall *et al.* (2008) assessed the sensitivity of marine habitats and species to fishing activities. According to their fishing intensity categories[5] the fishing level in Yarmouth to Cowes MCZ is classed as a Light (1 to 2 times a month during a season in 2.5 nm x 2.5 nm).

Sightings data displayed in Annex 6 illustrates trawl sightings between 2008-2019 in the area. No trawl sightings have been made in the area around Southbourne Rough MCZ over the past three years. Between 2008 and 2016 sightings of trawl activity have been made both north and south of the site. It is known that potting activity occurs in the Southbourne Rough MCZ which may prevent trawlers entering the site. Please note that Southern IFCA's sightings data may reflect home ports of patrol vessels, high risk areas and typical patrol routes and therefore are only indicative of fishing activity. Over the eleven-year period covered by sightings data (2008-2019), it is likely that the geographical extent of the fishery is well reflected, however intensity may be skewed by aforementioned factors.

4.2 Co-location of fishing activity and features under assessment

Currently, no data is available on the habitats within the Southbourne Rough MCZ. Two points of data are available for the presence of Black Sea Bream within the site. However, due to the lack of additional data, or habitat data is difficult to know where within the site Black Sea Bream may be nesting.

4.3 Black sea bream (*Spondyliosoma cantharus*)

Black bream, *Spondyliosoma cantharus* (Linnaeus,1758) are a deep bodied fish, silver in colour with blue hints, and in juveniles long golden lines (Wheeler, 1978). However, nesting males are often almost black in colour, with a vertical white bar (Carleton, 2009). Black seabream overwinter in deep waters and visit the south and west coasts of the UK during the summer to breed (Pawson, 1995; Collins & Mallinson, 2012). Bream are known to bread of the Dorset coast from April to July (Doggett & Openshaw, 2018), however, Pawson (1995) also reported that black seabream in the Baie de Seine were breeding during September and October.

[5] Heavy – Daily in 2.5 nm x 2.5 nm, Moderate – 1 to 2 times a week in 2.5 nm x 2.5 nm, Light – 1 to 2 times a month during a season in 2.5 nm x 2.5 nm, Single pass – Single pass of fishing activity in a year overall

Black seabream are protogynous hermaphrodites (Reinboth, 1962); all are born male and at around 23cm mature (Pawson, 1995). At a size of approximately 30cm males become females, with all individuals over 40cm being female (Pawson, 1995). The species spawns over rock substrates with a sediment veneer. The male excavates a nest, by fanning its tail to remove the sediment over the rock (Douglas & Wilson, 1958; Clark & James, 2011). Under water this creates a lunar like landscape. A patch work of round craters in the sediment. The nests are excavated on shallow subtidal rock (typically <20m) covered in a thin veneer of sediment (Collins and Mallinson, 2012).

In the UK the species has been found more commonly along the south coast and mostly in waters shallower than 15m depth (Rogers, 1998). Migration patterns have been inferred from fisheries data. It is thought that as the temperature rises, the species follow the movement of the 9°C isotherm (Pawson, 1995). Exact spawning periods are uncertain as the activity is thought to be temperature driven and second spawning events have been seen in certain locations.

Nests may be between 1-2m wide and 5-30cm sediment depth. Multiple nest sites have been identified using side scan sonar (Clark & James, 2011; Collins & Mallinson, 2012). A female then selects a nest and lays a thin layer of eggs within the nest which become strongly attached to the rock (Clark & James, 2011; James et al., 2010). Once the male has fertilised the eggs, he will guard them and the nest site, and ensure they are not smothered by sediments or predated upon (Douglas & Wilson, 1958; Clark & James, 2011).

In Southbourne Rough, the northern part is covered with a thin layer of sandy shell gravel and it is here that black seabream excavate their nests (Collins, 2003).

4.4 Pressures

4.4.1 General: Abrasion/disturbance of the substrate on the surface of the seabed/ Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion

Abrasion and disturbance is generally related to the direct and physical effects of bottom towed fishing gear on the seabed. Such effects include the scraping and ploughing of the substrate, scouring and flattening of the seabed, sediment resuspension and changes in the vertical redistribution of sediment layers (Roberts *et al*. 2010).

Otter trawl

Otter trawl fishing gear has contact with the seabed through the ground rope, chains and bobbins, sweeps, doors and any chaffing mats or parts of the net bag (Jones, 1992). Otter boards, or doors, leave distinct tracks on the seafloor ploughing distinct groove or furrows, which can be 0.2-2 metres wide and up to 30 centimetres deep (Jones, 1992; Thrush & Dayton, 2002). The depth of furrows depends on the weight of the board, the angle of attack, towing speed, and the nature of the substrate, being greatest in soft mud (Jones, 1992; Løkkeborg, 2005). The passage of the doors also creates sediment mounds known as berms (Gilkinson *et al*. 1998; Johnson *et al*. 2002). Marks on the seabed caused by other parts of the gear are faint when compared with those caused by trawl doors (Løkkeborg *et al*. 2005). Ground ropes and weights can scour and flatten the seabed, skimming the surface sediment between the grooves left by the trawl doors (Jones, 1992; Roberts *et al*. 2010; Grieve *et al*., 2014). Spherical footrope bobbins can cause compressed tracks on surficial sediments (Brylinsky *et al*. 1994). In areas of surface roughness i.e. sand waves and ripples, features can be flattened and the habitat smoothed (Kaiser & Spencer, 1996; Tuck *et al*., 1998; Schwinghamer *et al*., 1996; 1998). It has been reported that the bridles do not appear to result in any marks on the seabed (Brylinsky *et al*. 1994).

A side-scan survey, used to assess the effects of otter trawl over sand and mud sediments in lower Narragansett Bay, revealed 5 to 10 cm deep tracks from otter trawl doors and 10 to 20 cm high berms in mud bottom channels (DeAlteris *et al*., 1999). No information on the type of gear used was provided in the study. Sediment profile images (SPIs) were used to estimate the physical impacts of experimental trawling using a shrimp otter trawl with a head rope length of 10 m, otter boards measuring 90 x 140 cm and weighing 125 kg each and ground rope of 14 m with 20 kg of lead weight distributed across its length in an area of muddy sediments in the Gullmarfjord (Nilsson & Rosenberg, 2003). Forty-three percent of the images in trawl area had signs of physical disturbance (Nilsson & Rosenberg, 2003). A crude estimate of the scale of disturbance

was made from the images, with an estimated depth of the trawl tracks at approximately 10 cm, and width between 30 and 60 cm (Nilsson & Rosenberg, 2003). It was calculated that one-tenth of the area affected by trawling would be directly affected by ploughing from the otter boards themselves (Nilsson & Rosenberg, 2003).

Beam trawl

The gear used by beam trawl is known to penetrate the seabed, leaving tracks and disturbing the surface sediments (Gubbay & Knapman, 1999). Beam trawls flatten seabed features and can also leave trenches in soft sediment (Tuck *et al*., 1998). It is important to point out however that generally speaking beam trawling does not occur in mud habitats as it cannot be used effectively in such habitat types (Kaiser *et al*. 2002). Studies have revealed that the penetration depth of tickler chains on a beam trawl range from a few centimetres to at least 8 cm (Løkkeborg, 2005). Using a light beam trawl, of 700 kg with 15 tickler chains, disturbance was revealed to be restricted to the upper 1 cm in sandy sediments and 3 cm in muddy silt (Bridger, 1972). An average penetration depth of 40 to 70 mm was reported by de Groot *et al*. (1995). Experimental trawling, using a 3.5 tonne 4 m beam trawl with chain matrix, led to the flattening of sand ripples, suspension of fine materials and a reduction in the consolidation of sediments in areas of stable coarse sand and gravel and mobile sand in the eastern Irish sea (Kaiser & Spencer 1996, Kaiser *et al*. 1996, 1998, 1999). In the North Sea, experimental trawling, using a 7000 kg 12 m beam trawl with tickler chains, resulted in the physical penetration of the year to at least 6 cm in an area of medium hard sandy sediment (Bergman *et al*. 1990; Bergman & Hup, 1992).

Sediment character (general)

Johnson *et al*. (2002) found a number of studies on the effects of otter trawling in gravel and variable habitats and these revealed trawling physically removed fine sediments and biogenic structures through the removal of structure-forming epifauna, moved or overturned stones and boulders, smoothed the seafloor and exposed sediment/shell fragments (Bridger, 1972; Auster *et al*., 1996; Collie *et al*., 1997; Engel & Kvitek, 1998; Freese *et al*., 1999; Johnson *et al*., 2002; Sewell and Hiscock, 2005).

4.4.2 Smothering and siltation rate changes

The resuspension of sediment can impact upon benthic communities through smothering, burial and increased turbidity. These effects may extend to organisms living a distance away from the fished area (Kyte & Chew, 1975). If high levels of sediment are resuspended and exposure to such events is regular, impacts may be severe (Mercaldo-Allen & Goldberg, 2011). Increased turbidity can inhibit respiratory and feeding functions of benthic organisms, in addition to causing hypoxia or anoxia (Morgan & Chuenpagdee, 2003). Sediment resuspension can jeopardise the survival of bivalves and fish as a result of clogged gills and inhibition of burrowing activity (Dorsey & Pederson, 1998). Small organisms and immobile species are particularly vulnerable to smothering (Manning, 1957). A redistribution of finer sediment can also hinder the settlement of organisms if shell or cultch material is buried (Tarnowski, 2006). The severity of such impacts are largely determined by sediment type, the level of sediment burden and the tolerance of organisms which is largely related to their biology (i.e. size, relationship to substrate, life history, mobility) (Coen, 1995).

4.4.3 Black bream nesting

Black seabream nest on thin sediment over rock habitat (Douglas & Wilson, 1958; Clark & James, 2011). From the above literature we can infer the potential for trawling to disturb, move and pile up sediments, and, drag boulders and biogenic structures across bream nesting sites. This would lead to the smothering of cleared nest sites, and dragging of larger substrate types through nest areas, thereby resulting in the direct destruction of individual nests as well as larger nest congregations. If eggs are present on cleared rock, they may be smothered preventing oxygenated water flowing over them, and, potentially pulled from the rock surface, which could result in egg mortality. As bream work tirelessly to keep nests clear of sediment, they may be able to clear a nest site of debris from a trawl, although this will be dependent on the level of disturbance to each individual nest. Information from The Black Bream Project (Doggett & Openshaw, 2018), explains that after nest sites were smothered and destroyed by storms in May 2015, Black seabream returned to the site, remade their nests, and relayed eggs, which successfully hatched later.

4.4.4 Removal of target and non-target species

The removal of target and non-target species refers to the removal of a species or community and includes the removal of a specific species/ community/ keystone species in a biotope. Fishing leads to the removal of certain species from an ecosystem.

In 2016, 900kg of Black seabream were landed in ICES rectangles 30 E8 and 30 E7 (in the Southern IFCA district) which had been caught by either beam trawl or demersal trawl/ seine. Black seabream are both a target and non-target species caught in demersal trawls throughout their range (Dunn, 1999). Trawling activity which targets and/or catches black seabream as a bycatch will result in direct mortality of individuals of this species.

Black sea bream are protogynous hermaphrodites. All begin life as females and change into males when they reach a certain size (Reinboth, 1962). Black seabream minimum size in the Southern IFCA district is 23cm. Therefore, the fishery is by default size selective, aiming to take the larger individuals of the species (predominantly mature males and females), a practise which can skew sex ratios and lead to limitation of fish which can provide sperm for fertilisation (Coleman et al. 1996, McGovern et al. 1998, Hawkins & Roberts 2004, Hamilton et al. 2007). Overall, this may lead to reduced reproduction within a species (Alonzo et al. 2008). Fishing which removes an even distribution between age classes can also skew species sex ratios towards smaller aniamls of one sex, as many of these are removed before they become the other sex (Heppell et al. 2006). If the cue for sexual transition is endogenous (a fixed developmental schedule e.g. size) the size selective fishing effort will be more detrimental to the sex ratio (Alonzo & Mangel 2005, Ellis & Powers 2012). Overall, fishing selectively for a certain species, unless well managed leads to over fishing through both direct and indirect pathways. Most commonly fishing which targets larger individuals, will then target smaller individuals once the large are depleted and so on. The incorrect management of a fish stock, which enables this process of fishing to occur, can lead to stock collapse from which it may take may years or decades for that species to recover.

During the reproductive cycle, males create and guard a nest, and remain in a 1-2m nest site to ensure eggs are not smothered by sediments or predated upon (Douglas & Wilson, 1958; Clark & James, 2011). This behaviour, where by many of the large, and therefore reproductively active males are ‘tied’ to one location for a fixed amount of time can lead to an increased vulnerability to fishing pressure (Pinder et al., 2016).

4.5 Existing management measures

- **Vessel Used in Fishing** byelaw – prohibits commercial fishing vessels over 12 metres from the Southern IFCA district. The reduction in vessel size also restricts the type of gear that can be used, with vessels often using lighter towed gear and restricted to carry less static gear.
- Southern IFCA has a **Minimum Fish Sizes** byelaw, which states that no person shall take from the fishery any fish of the following species that measures less than the size listed when measured from the tip of the snout to the end of the tail. The size for Black Seabream is 23cm. The minimum sizes contained within this byelaw differ from that in EU legislation.
- Other regulations include minimum sizes, mesh sizes and catch composition as dictated by European legislation. However, when certain gear types are used **The Landing Obligation** requires that specified bycatch species are retained at all sizes.

4.6 Table 2. Assessment of trawling activity on Black Seabream (nesting).

Feature	Attribute	Target	Potential pressure(s) and Associated Impacts	Likelihood of Impacts Occurring/Level of Exposure to Pressure	Current mitigation measures
Black seabream (nesting)	Supporting habitat: extent and distribution, Nest abundance	Not available	Abrasion/ disturbance of the substrate on the surface of the seabed and penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion were identified as potential pressures. Black seabream nest over thin layers of coarse/mixed sediments over bedrock. Physical impacts on the seabed from trawling include scraping and ploughing, creation of depressions, trenches, scouring and flattening of the seabed, sediment resuspension and changes in the vertical distribution of sediment layers. Studies on the effects of otter trawling in gravel and variable habitats have revealed trawling can lead to the removal of fine sediments and biogenic structures, moved or overturn stones and boulders, smooth the seafloor and exposed sediment/shell fragments. Otter boards can leave distinct grooves or furrows, up to 10 centimetres deep and 0.2 to 2 metres wide. The penetration depth of tickler chains on a beam trawl can be up to 6 cm. The depth of such marks on the seafloor depend on the nature of the substrate, and are less in areas of coarser sediments. Physical recovery of sediments largely depends on sediment type and energy regime. In high energy environments physical recovery can take days, whereas recovery in low energy environments can take months.	Light otter trawling occurs regularly (2 times per month) around the site, potentially crossing the outer fringes of the site. A maximum of 4 vessels can partake in the fishery, three of which use light otter trawls. The remaining vessel is only seen in the Southern IFCA district once a year may use a beam trawl. Sightings data (Annex 6) shows no trawl sightings have been made in the area around Southbourne Rough MCZ over the past three years. Between 2008 and 2016 sightings of trawl activity have been made both north and south of the site. It is known that potting activity occurs in the Southbourne Rough MCZ which may prevent trawlers entering the site. Nesting black seabream are strongly associated with shallow (<10m) rock outcrops with thin sediment veneers. Literature shows that trawling can cause abrasion and disturbance to benthic sediments through flattening the seabed, creating tracks, furrows, burs and dragging large boulders and biogenic structures across the seabed. Nesting Black Seabream, have been observed to fan (using swift movements of the tail) sediments to create the nest and to keep the nest sediment free whilst eggs are present. They also pick up, with their mouth and remove small cobbles from the nest site. A 2015 storm smothered and destroyed nest sites on the Dorset coast however, black seabream returned to the site shortly after and rebuilt nests, which successfully hatched eggs. Trawling is known to occur around and potentially on the fringes of the Southbourne rough MCZ. Trawling can cause abrasion and disturbance to sediments, penetrating	**Vessel Used in Fishing byelaw** prohibits commercial fishing vessels over 12 metres from the Southern IFCA district. The reduction in vessel size also restricts the type of gear that can be used, with vessels often using lighter towed gear **Minimum fish sizes** – Southern IFCA byelaw prohibiting the removal of bream under 23cm in length.

				and moving sediments across the seabed. Therefore, it is likely that trawling through a black bream nesting area is likely to lead to the destruction of nests, and smothering of black bream eggs. Black bream are known to invest a lot of time and energy into building and guarding a nest site, however they are able to nest again if the site experiences significant damage. Therefore, based on the above it is believed that trawling will pose a significant risk to the Black bream nesting in the MCZ, and could therefore hinder the ability of the feature to achieve its 'recover' general management approach. It is worth noting that in the absence of a condition assessment for the site, Natural England undertook a vulnerability assessment for each feature as a proxy for condition. This assessment considers the activities which take place in the site and determines the GMA for each feature. However, such an assessment is relatively generic and does not take into a number of site-specific factors.	
	Population: age/size frequency, Population: population size, Population: recruitment and reproductive capability, Presence and spatial distribution of the species	Not available	Removal of target and non-target species were identified as pressures. Trawling leads to the direct removal of target species and indirect damage to non-target species. Bream are protogenos hermaphrodites and are therefore more vulnerable to fishing pressures which remove the larger sized animals first. In the Southern IFCA district trawls both target and catch as bycatch black seabream, and land these fish for sale. Thereby, leading to the direct mortality of the species.	Light otter trawling occurs regularly (2 times per month) around the site, potentially crossing the outer fringes of the site. A maximum of 4 vessels can partake in the fishery, three of which use light otter trawls. The remaining vessel is only seen in the Southern IFCA district once a year may use a beam trawl. Sightings data (Annex 6) shows no trawl sightings have been made in the area around Southbourne Rough MCZ over the past three years. Between 2008 and 2016 sightings of trawl activity have been made both north and south of the site. It is known that potting activity occurs in the Southbourne Rough MCZ which may prevent trawlers entering the site. In 2016, 900kg of Black Seabream were landed in ICES rectangles 30 E8 and 30 E7 (in the Southern IFCA district) which had been caught by either Beam trawl or Demersal trawl/ Seine.	Addressed above

				Black seabream guards a nest site during the breeding season and therefore remain in a very small area for a fixed period (10-12 days). This increases their vulnerability to fishing pressure. Additionally, the fishing of this species during this time of year (April to July), may lead to the removal of the larger males which could result in changes to the sex ratio of the species. The removal of bream through trawling during this period would lead to the direct mortality of eggs through predation, and the direct mortality of the species through fishing pressure. Therefore, based on the above it is believed that trawling will pose a significant risk to the Black bream nesting in the MCZ, and could therefore hinder the ability of the feature to achieve its 'recover' general management approach. It is worth noting that in the absence of a condition assessment for the site, Natural England undertook a vulnerability assessment for each feature as a proxy for condition. This assessment considers the activities which take place in the site and determines the GMA for each feature. However, such an assessment is relatively generic and does not take into a number of site-specific factors.	
	Smothering and siltation rate changes (Light)	Not available	Smothering and siltation rate changes (Light) was identified as a potential pressure. Trawling can lead to the resuspension of fine sediments, organics, chemicals and nutrients found in the sediments.	Light otter trawling occurs regularly (2 times per month) around the site, potentially crossing the outer fringes of the site. A maximum of 4 vessels can partake in the fishery, three of which use light otter trawls. The remaining vessel is only seen in the Southern IFCA district once a year may use a beam trawl. Sightings data (Annex 6) shows no trawl sightings have been made in the area around Southbourne Rough MCZ over the past three years. Between 2008 and 2016 sightings of trawl activity have been made both north and south of the site. It is known that potting activity occurs in the Southbourne Rough MCZ which may prevent trawlers entering the site. The area in which the site sits in Poole Bay is exposed to moderate levels of natural disturbance (Bolam et al., 2014). However, Black bream spend a great majority of their time	Addressed above

				ensuring the eggs do not become smothered in silt and removing any other object from within or near to the nest. This behaviour suggests that changes in this pressure beyond that which an individual bream could rectify would be likely to smother bream eggs leading to egg mortality. Therefore, based on the above it is believed that trawling will pose a significant risk of smothering and siltation rate changes to the Black bream nesting in the MCZ, and could therefore hinder the ability of the feature to achieve its 'recover' general management approach. It is worth noting that in the absence of a condition assessment for the site, Natural England undertook a vulnerability assessment for each feature as a proxy for condition. This assessment considers the activities which take place in the site and determines the GMA for each feature. However, such an assessment is relatively generic and does not take into a number of site-specific factors.	

5 Proposed management measures

In recognition of the potential pressures of bottom towed fishing gear (particularly trawling) upon designated features and their supporting habitats, Southern IFCA will follow the process of introducing a bottom towed fishing gear (BTFG) closure area in order to protect black seabream (nesting) in the Southbourne Rough MCZ.

The bottom towed fishing gear closed area has been chosen based on the MCZ site boundary data provided by Natural England. The bottom towed gear fishing closure area is designed to fully protect Black seabream (nesting) and their supporting habitat against BTFG, by completely prohibiting all types of bottom towed fishing, including trawling and dredging, over the site during their breeding season.

The measures presented are draft and used to illustrate protection based purely on location. When developing management other evidence such as fishing activity and consultation with the local community may feed into the development of spatial closed areas.

Management will be introduced in the upcoming update to the Southern IFCA Bottom towed Fishing Gear Byelaw 2016. The primary reason for the management option is to protect black seabream (nesting), which are known to be sensitive against the impacts caused by bottom towed fishing gear during the time period.

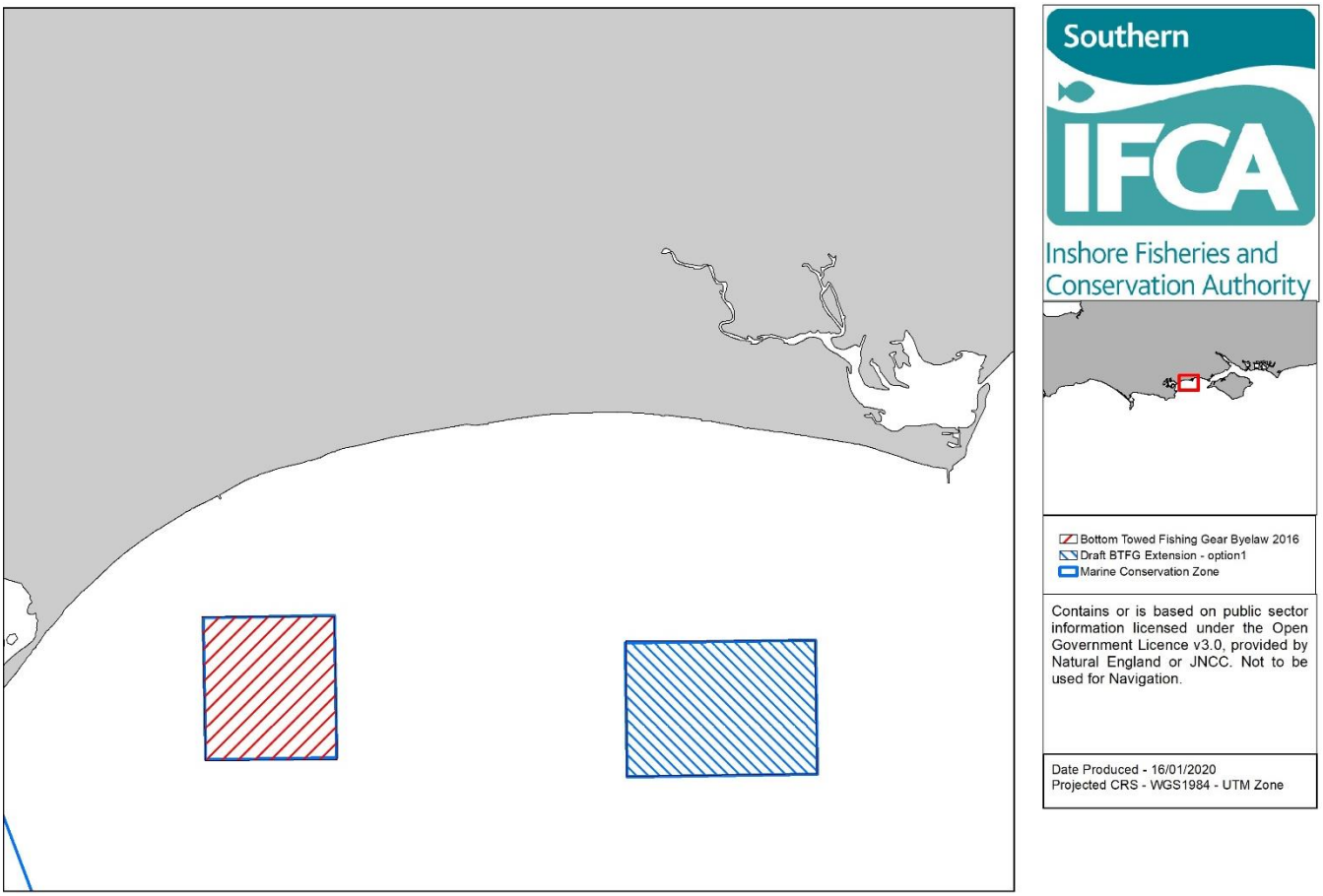

Figure 4 Draft Bottom Towed Fishing Gear Closure Areas for the Southbourne Rough MCZ.

6 Conclusion

In order to conclude whether types of bottom towed fishing gear (light otter trawl and beam trawl) pose a significant risk, it is necessary to assess whether the impacts of the activities will hinder the achievement of the general management approach of the designated feature (Black seabream, nesting) of 'recover to favourable condition' and the sites conservation objectives, namely:

"The conservation objective of each of the zones is that, in relation to black seabream:

> the habitat used by individuals of that species for the purposes of spawning (spawning habitat); (a) are maintained in favourable condition if they are already in favourable condition, or (b) be brought into favourable condition if they are not already in favourable condition.
>
> the population (whether temporary of otherwise) of that species occurring in the zone be free of the disturbance of a kind likely to significantly affect the survival of its members or their ability to aggregate, nest, or lay, fertilise or guard eggs during breeding.

For the spawning habitat of black seabream within the zone, favourable condition means that the habitat is of sufficient quality and quantity to enable individuals of this species using the habitat to survive, aggregate, nest, lay, fertilise or guard eggs during breeding.

Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery.

The review of the research into the impacts of bottom towed fishing gear over sediment habitats (as the supporting habitat of black bream nesting) found that trawling can cause significant physical disturbance, abrasion and penetration, which could lead to the destruction of bream nest sites. Additionally, trawling through the site, during a time when the species remains in a specific and small area, can lead to the direct removal and mortality for black bream themselves through fishing pressure. Therefore, it is concluded the activity will prevent the ability of these sediments to support Black seabream, and will prevent the feature themselves (black seabream, nesting) to achieve its recover general management approach.

It is therefore recognised that the activities have the potential to pose a significant risk upon the following Black seabream attributes:

- Supporting habitat: extent and distribution
- Nest abundance
- Population: age/size frequency
- Population: population size
- Population: recruitment and reproductive capability
- Presence and spatial distribution of the species

Therefore, upon the provision of additional evidence, including conservation advice for the site, and up to date habitat maps, Southern IFCA feel it is now appropriate for refinement of the bottom towed fishing gear byelaw and inclusion of additional bottom towed fishing gear closed area. This is to support the general management approach to 'recover' the black seabream to a favourable condition. The primary reason for management is to protect the black seabream feature during their breeding season.

When the above evidence, fishing activity levels, current and proposed management measures are considered it has been concluded that bottom towed fishing gear will not pose a significant risk to the achievement of sites conservation objectives to 'recover' black seabream to favourable condition. Southern IFCA must seek to ensure that the conservation objectives of any MCZ in the district are furthered.

7 In-combination assessment

Fishing activity	Potential for in-combination effect
Static – pots/traps (Pots/creels – crustacean/gastropod & cuttle pots)	Potting for crab and lobster takes place over rocky substrate and will therefore not overlap with trawling activity which takes place outside of and on the fringes of the site over subtidal sediments. There is potential for whelk potting to occur on the fringes of the site over subtidal sediments. The level at which the activity takes place however is unknown. Potting in general is also considered to be low impact (Grieve *et al.,* 2014) and unlikely to lead to any in-combination effects. In addition, static gear types such as potting and mobile gear types such as trawling are not compatible and so often occur in different areas, thus eliminating any spatial overlap between the two.
Static – fixed nets (trammels, entangling)	Trammel nets, used to target flat fish, and large mesh entangling nets are used to target rays and skates. Neither nets target black seabream and therefore there is little likelihood of in-combination effects. Large mesh entangling nets will not catch black seabream as the mesh is too large and therefore there will not be in-combination effects through this method. Trammel nets may catch black seabream as a bycatch, which will be landed for sale. However, as trawling activity will be prohibited over the site, in combination effect through removal of non-target species cannot occur. Net activity will be assessed in a separate MCZ assessment. In addition, static gear types such as netting and mobile gear types such as trawling are not compatible and so often occur in different areas, thus largely eliminating any spatial overlap between the two.
Lines (Handlines)	It is anticipated that handlines are used within the site. Handlines may lead to the direct removal of black seabream through targeted catch and bycatch. However, as trawling activity will be prohibited over the site, in combination effects through removal of target and non-target species cannot occur. Additionally, static gear types such as handlines and mobile gear types such as trawling are not compatible and so often occur in different areas, thus largely eliminating any spatial overlap between the two.
Diving	It is known that diving activity occurs within the site. However, diving does not lead to any of the same pressures as trawling and therefore there cannot be and in combination effect.

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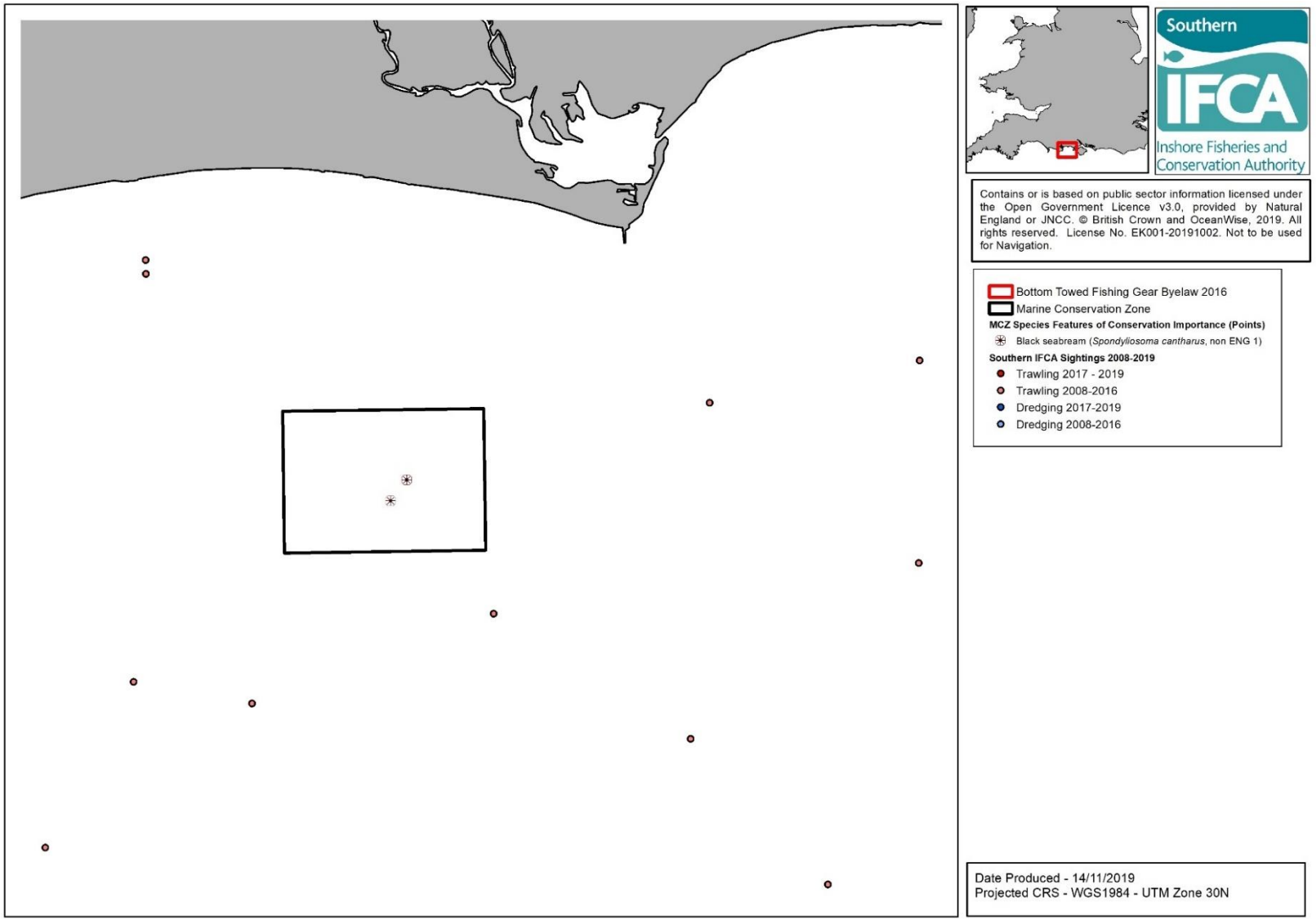
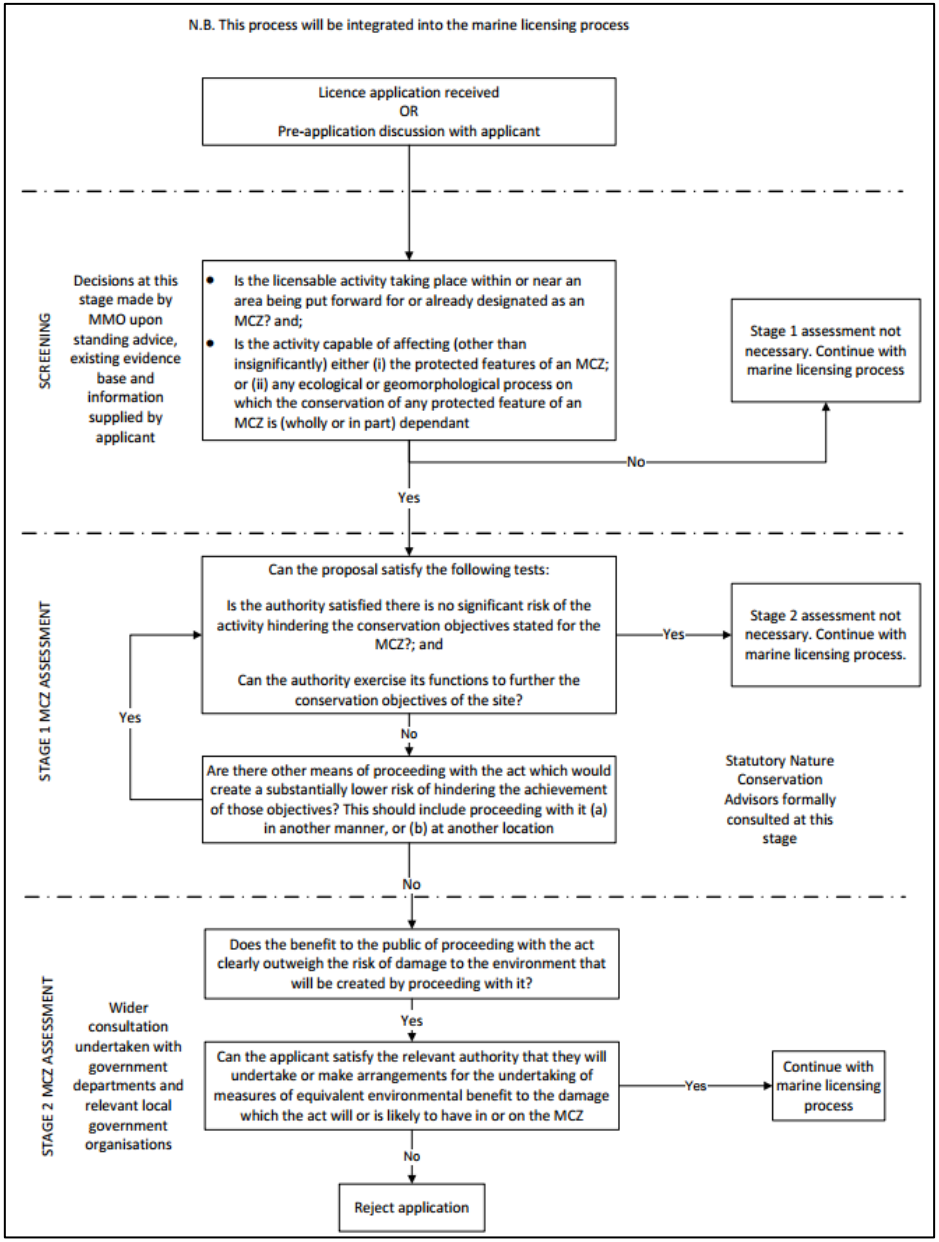
Annex 1. Broad scale habitat and species features of conservation importance (FOCI) map of the Southbourne Rough MCZ.



Annex 2. Summary of MMO assessment process for MCZs.



Annex 3. Initial screening of commercial fishing activities in the Southbourne Rough MCZ.

Broad Gear Type (for assessment)	Aggregated Gear Type (EMS Matrix)	Fishing gear type	Does it Occur?	Details	Sources of Information	Potential For Activity Occur/ Is the activity anticipated to occur?	Justification	Suitable for Part A Assessment?	Priority
Bottom towed fishing gear	Towed (demersal)	Beam trawl (whitefish)	Y	1 vessel known to fish in the area, but not known to fish in the site.	Local IFCO	Y		Y	High
		Beam trawl (shrimp)	N		Local IFCO	N	Target species does not occur within the site.		
		Beam trawl (pulse/wing)	N		Local IFCO	N	This activity is prohibited by 'Electric Current' byelaw.		
		Heavy otter trawl	N		Local IFCO	N	There is a limited potential for the activity to occur as vessels are restricted in length to 12 m or less (as per the Southern IFCA byelaw) and therefore have limited capacity to deploy a heavy otter trawl. In addition, the activity does not take place within the site or surrounding area of Poole Bay and has not historically done so. It is therefore not anticipated to take place in the future.		

		Multi-rig trawls	N		Local IFCO	N	There is limited potential for the activity to occur as vessels are restricted in length to 12 m or less (as per the Southern IFCA byelaw) and are therefore limited by size and probably power necessary for a multi-rig set up. In addition, the activity does not take place within the site or surrounding area of Poole Bay and has not historically done so. It is therefore not anticipated to take place in the future.		
		Light otter trawl	Y	Up to 3 vessels (Lymington and Weymouth) known to fish in the area of Poole Bay. Vessel tend to pass inshore and offshore of the site, but may cross over the fringes from time to time. Majority of the site is covered with potting gear and therefore this and the presence of rocks prevents trawlers from trawling across it.	Local IFCO	Y		Y	High

		Pair trawl	N		Local IFCO	N	It is not anticipated to occur as it has not historically occurred. Furthermore, there is limited potential due to the space required to accommodate two vessels and the size/power of vessels needed.		
		Anchor seine	N		Local IFCO	N	Gear type has not been historically used within the area and is not anticipated to occur. Activity needs a large area and, in the site, considered would be limited. In addition, large vessels are also required for this gear type and vessels over 12 m in length are prohibited from fishing within the Southern IFCA district.		
		Scottish/fly seine	N		Local IFCO	N	Gear type has not been historically used within the area and is not anticipated to occur. Activity needs a large area and, in the site, considered would be limited. In addition, large vessels are also required for this gear type and vessels		

							over 12 m in length are prohibited from fishing within the Southern IFCA district.		
Pelagic towed fishing gear	Towed (pelagic)	Mid-water trawl (single)	N		Local IFCO	N	The activity is not known to occur and is not anticipated to occur as the area is shallow water and the trawl activity in the district is demersal.		
		Mid-water trawl (pair)	N		Local IFCO	N	The activity is not known to occur and is not anticipated to occur as the area is shallow water and the trawl activity in the district is demersal.		
		Industrial trawls	N		Local IFCO	N	Activity is not able to occur due to the size of vessel required. Vessels over 12 m are prohibited from fishing within the Southern IFCA district.		

Bottom towed fishing gear	Dredges (towed)	Scallops	N		Local IFCO	N	The target species are not known to occur within the site and therefore the activity is not anticipated to occur.		
		Mussels, clams, oysters	N		Local IFCO	N	The target species are not known to occur within the site. The activity is not anticipated to occur within the site within the foreseeable future.		
		Pump scoop (cockles, clams)	N		Local IFCO	N	The target species (clam and cockle) are not known to occur within the site and the water depth is too deep for this method. Therefore the activity would not occur.		
Suction	Dredges (other)	Suction (cockles...)	N		Local IFCO	N	Suction dredging for cockles, clams, mussels and oysters is prohibited in the Southern IFCA district (by Southern IFCA byelaws).		
Tractor		Tractor	N		Local IFCO	N	The site is subtidal and therefore the activity cannot occur.		
Intertidal work	Intertidal handwork	Hand working (access from vessel)	N		Local IFCO	N	The site is subtidal and therefore the activity cannot occur.		
		Hand work (access from land)	N		Local IFCO	N	The site is subtidal and therefore the activity cannot occur.		

Static - pots/traps	Static - pots/traps	Pots/creels (crustacea/gastropods)	Y	1 vessel is known to place crab and lobster pots in the site.	Local IFCO	Y	Whelk pots are also placed in the vicinity of the site an may cross the fringes occasionally.	Y	Medium
		Cuttle pots	N		Local IFCO	Y	In the past cuttle traps have been laid on the outskirts of the site.		
		Fish traps	N		Local IFCO	N	This activity is known not to occur in the site or area.		
Demersal nets/lines	Static - fixed nets	Gill nets	N		Local IFCO	N	The activity is not known to occur and is not anticipated to occur.		
		Trammels	Y	Trammel nets are known to be set in the area around the site. Target species are sole, with bycatch of plaice, turbot and brill.	Local IFCO	Y	The activity is known to occur	Y	Medium
		Entangling	Y	Entangling nets with a large mesh size are known to be set in the area around the site. Target species are ray and skate. Nets are set on neap tides.	Local IFCO	Y	The activity is known to occur	Y	
Pelagic nets/lines	Passive - nets	Drift nets (pelagic)	N		Local IFCO	N	The activity is known not to occur		
Demersal nets/lines		Drift nets (demersal)	N		Local IFCO	N	The activity is known not to occur		
	Lines	Longlines (demersal)	N		Local IFCO	N	The activity is not known to occur and		

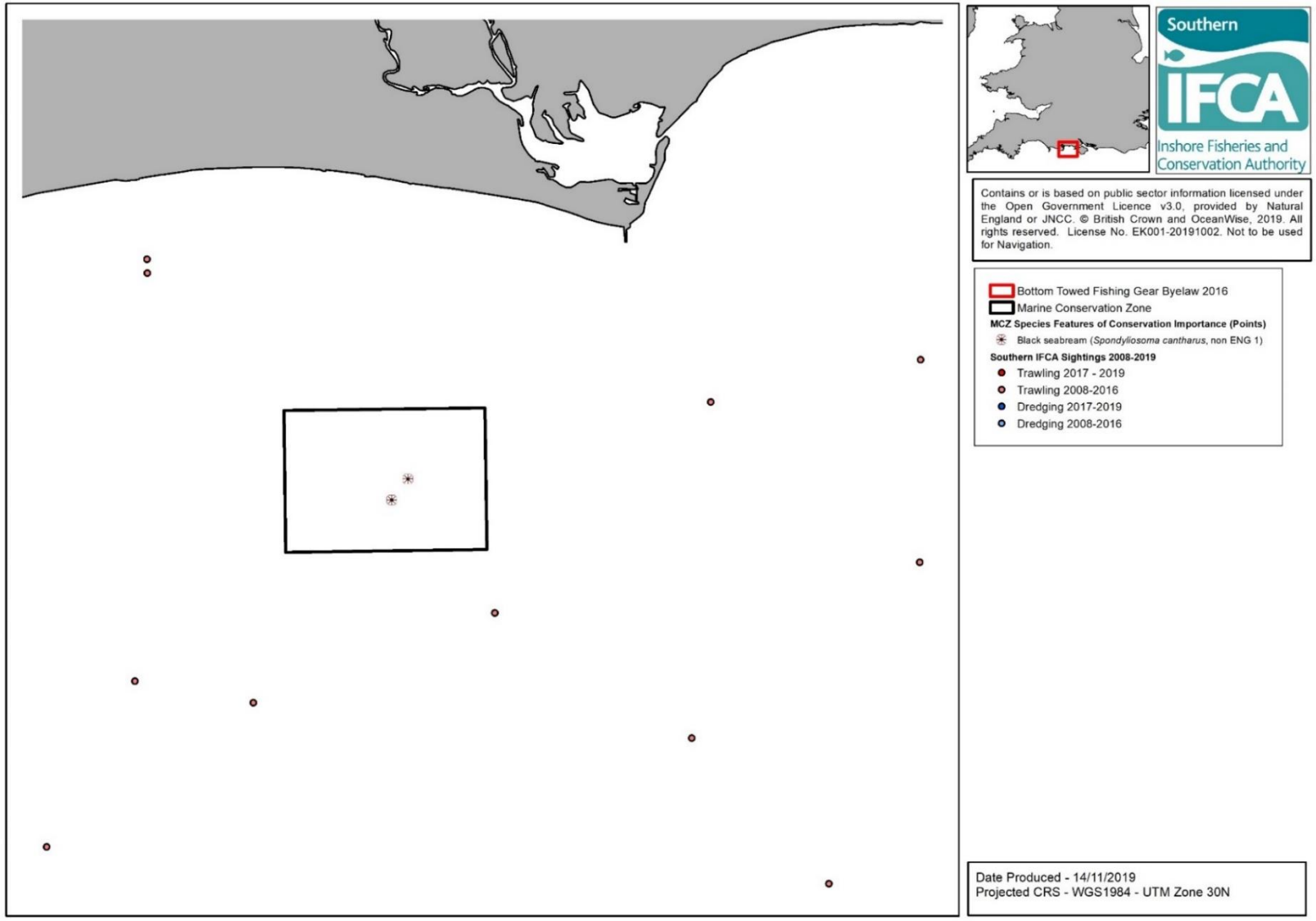
							is not anticipated to occur.		
Pelagic nets/lines		Longlines (pelagic)	N	See longlines (demersal)	Local IFCO	N	The activity is not known to occur and is not anticipated to occur.		
		Handlines (rod/gurdy etc)	Y	The activity is known to occur in the site with charter vessels targeting Bream.	Local IFCO	Y		Y	Medium
		Jigging/trolling	Y	See 'handlines (rod/gurdy etc)'	Local IFCO	Y	See 'handlines (rod/gurdy etc)'		
Purse seine	Seine nets and other	Purse seine	N		Local IFCO	N	The activity is not known to occur and is not anticipated to occur.		
Demersal nets/lines		Beach seines/ring nets	N		Local IFCO	N	The activity is not known to occur and is not anticipated to occur.		
Miscellaneous		Shrimp push-nets	N		Local IFCO	N	The activity is not known to occur and is not anticipated to occur.		
EA Only		Fyke and stake nets	EA Only						
Miscellaneous	Miscellaneous	Commercial diving	N			N	The activity is not known to occur but has the potential to occur as there are species in the site such as crab and lobster which could be caught by divers.	Y	Low

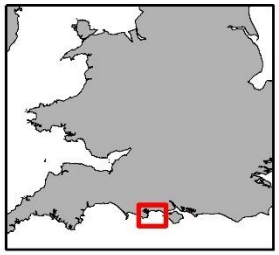
Bottom towed fishing gear		Bait dragging	N			N	Activity has not historically occurred within the site and is not anticipated to occur. The majority substrate present is not suitable for the activity to take place. As such, the target species are also not present.		
Miscellaneous		Crab tiling	N			N	The site is subtidal and therefore the activity cannot occur.		
Intertidal work	Bait collection	Digging with forks	N			N	The site is subtidal and therefore the activity cannot occur.		

Annex 4. Natural England's Advice on Operations for Southbourne Rough MCZ for trawling.

Pressure name	Species
	Black seabream
Abrasion/disturbance of the substrate on the surface of the seabed	S
Removal of non-target species	S
Removal of target species	S
Smothering and siltation rate changes (Light)	S
Deoxygenation	S
Hydrocarbon & PAH contamination	NA
Introduction or spread of invasive non-indigenous species (INIS)	IE
Litter	IE
Physical change (to another seabed type)	IE
Physical change (to another sediment type)	IE
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	NA
Transition elements & organo-metal (e.g. TBT) contamination	NA
Underwater noise changes	S
Visual disturbance	IE

Annex 6. Fishing activity maps using trawl and dredge sighting data from 2008-2019 in (a) Southbourne Rough MCZ and (b) Poole Bay





Southern IFCA
Inshore Fisheries and Conservation Authority

Bottom Towed Fishing Gear Byelaw 2016
Marine Conservation Zone
Sightings-BTFG-2008-2019
Southern IFCA Sightings 2008-2019
- Trawling 2017 - 2019
- Trawling 2008-2016
- Dredging 2017-2019
- Dredging 2008-2016

Date Produced - 14/11/2019
Projected CRS - WGS1984 - UTM Zone 30N