Document Control

Title	**Chesil Beach and Stennis Ledges MCZ – Part B Fisheries Assessment – Bottom Towed Fishing Gear**
SIFCA Reference	MCZ/01/001
Author	V Gravestock
Approver	
Owner	V Gravestock
Template Used	MCZ Assessment Template v1.0

Revision History

Date	Author	Version	Status	Reason	Approver(s)
18/08/2016	V Gravestock	1.0	Draft	Initial Draft	
13/09/2016	V Gravestock	1.1	Draft	RC Comments	
15/09/2016	V Gravestock	1.2	Draft	Native oyster supporting habitat. Annexes, Figures and Tables included.	
19/09/2016	V Gravestock	1.3	Draft	Reference list.	
23/09/2016	V Gravestock	1.4	Draft	Addition to reference list	
24/10/2016	V Gravestock	1.5	Final Draft	Response to NE comments	
04/11/2016	V Gravestock	1.6	Final Draft	Small amendments to Annex 2 and reference made to Part A assessment document.	
05/11/2016	V Gravestock	1.7	Final Draft	Minor changes made to text	
06/12/2016	V Gravestock	1.8	Final Draft	Addition of colocation map and text and feature map.	
14/12/2016	V Gravestock	1.8	FINAL		

This document has been distributed for information and comment to:

Title	Name	Date sent	Comments received
Chesil Beach and Stennis Ledges MCZ Assessment – BTFG – 001 v1.1	Natural England	13/09/2016	Yes
Chesil Beach and Stennis Ledges MCZ Assessment – BTFG – 001 v1.2	Natural England	16/09/2016	Yes
Chesil Beach and Stennis Ledges MCZ Assessment – BTFG – 001 v1.5	Natural England	25/10/2016	Yes
Chesil Beach and Stennis Ledges MCZ Assessment – BTFG – 001 v1.8 FINAL	Natural England	14/12/2016	

Southern Inshore Fisheries and Conservation Authority (IFCA)

Marine Conservation Zone Fisheries Assessment (Part B)

Marine Conservation Zone: Chesil Beach and Stennis Ledges

Feature: Pink sea-fan (*Eunicella verrucosa*); Native oyster (*Ostrea edulis*)

Broad Gear Type: Bottom Towed Fishing Gear

Gear type(s) Assessed: Light otter trawl; Scallop dredging

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 the Chesil Beach and Stennis Ledges 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

- Defra's matrix of fisheries gear types and European Marine Site protected features
- Natural England's High Level Conservation Objectives for the Chesil Beach and Stennis Ledges MCZ
- Natural England's Supplementary Advice on Conservation Objectives for the Chesil Beach and Stennis Ledges MCZ
- Natural England's Advice on Operations for the Chesil Beach and Stennis Ledges MCZ

2. Information about the MCZ

2.1 Overview and designated features

Chesil Beach and Stennis Ledges MCZ is an inshore site located off the Dorset coast. It runs along the length of Chesil Beach from Abbotsbury, to Weston on the Isle of Portland in the south-east. The site covers an area of approximately 37 km^2 and extends seawards to include the reefs of the Stennis Ledges, an area of rocky ridges and rugged seabed. The site was designated in 2013, with an additional feature (high energy infralittoral rock) added in January 2016. 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.

Table 1. Designated features and General Management Approach

Designated feature	General Management Approach
High energy infralittoral rock	Maintain in favourable condition
High energy intertidal rock	Maintain in favourable condition
Intertidal coarse sediment	Maintain in favourable condition
Native oyster (*Ostrea edulis*)	**Recover to favourable condition**
Pink sea-fan (*Eunicella verrucosa*)	**Recover to favourable condition**

Please refer to Annex 1 for a site feature map.

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 Chesil Beach and Stennis Ledges MCZ will be undertaken using a staged process, akin to that proposed by the Marine Management Organisation (MMO)[1], for marine license applications. The assessment process comprises of an initial screening stage to establish whether an activity occurs or is anticipated to occur/has the

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

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 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.

3.2 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 the Chesil Beach and Stennis Ledges 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. Engagement with the local fishing industry was also undertaken as part of this process. For these occurring/potentially occurring activities, an assessment of pressures upon MCZ designated features was undertaken using Natural England's Advice on Operations.

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.

3.2.3 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 2). 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.

3.2.4 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 for the Chesil Beach and Stennis Ledges MCZ[2]. This advice 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[3]. 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 the Chesil Beach and Stennis Ledges 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.

A summary of Natural England's Advice on Operations for the Chesil Beach and Stennis Ledges MCZ is provided in Annex 4. The resultant activity pressure-feature interactions which have been screened in for bottom towed fishing gear for the part B assessment are summarised in Tables 2 and 3 for sensitive designated features. The activity pressure-feature interactions which were screened out in the Part A Assessment are detailed in a standalone document ('Screening and Part A Assessment') for Chesil Beach and Stennis Ledges MCZ. Where there is insufficient evidence on the sensitivity of a designated feature to fishing-related pressures, and these pressures present a risk to designated features, these pressure-feature interactions have been included for further assessment.

Table 2. Summary of fishing pressure-feature screening for Pink sea-fan (*Eunicella verrucosa*). Please note only pressures screened in for the part B are presented here.

Potential Pressures	Demersal Trawl	Dredges	Considered in Part B Assessment?	Justification	Relevant Attributes
Abrasion/disturbance of the substrate on the surface of the seabed	S	S	Y	This gear type is known to cause abrasion and disturbance to the seabed surface. A part	Population: population size; Presence

[2] https://www.gov.uk/government/publications/conservation-advice-for-marine-conservation-zone-chesil-beach-and-stennis-ledges-fs19

[3] https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0004&SiteName=chesil%20beach&countyCode=&responsiblePerson=

				B assessment will be necessary to investigate the magnitude of the pressure, including the effect of the gear and the spatial scale/intensity of the activity.	and spatial distribution of the species;
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	S	S	Y (Scallop dredging only)	Trawling: Due to the nature of the gear and fishing practices (i.e. location), the activity is likely to lead to insignificant penetration/disturbance of the seabed. Abrasion is assessed under 'abrasion/disturbance of the substrate on the surface of the seabed'. Scallop dredging: This gear type Is known to cause abrasion and disturbance to the seabed. A part B assessment will be necessary to investigate the magnitude of the pressure, including effect of the gear and the spatial scale/intensity of the activity	Population: population size; Presence and spatial distribution of the species; Supporting habitats: extent and distribution

Table 3. Summary of fishing pressure-feature screening for Native oyster (*Ostrea edulis*). Please note only pressures screened in for the part B are presented here.

Potential Pressures	Demersal Trawl	Dredges	Considered in Part B Assessment?	Justification	Relevant Attributes
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	S	S	Y	Trawling: Any contact with the gear is unlikely to lead to damage of native oyster shells. Native oysters are typically harvested using dredges and are therefore robust enough to withstand contact from demersal trawl gear. The only relevant attribute with respect to the Native oysters supporting habitat is extent and	Supporting habitats: extent and distribution

				distribution. Supporting habitats include subtidal rock and subtidal sediments. It is not believed that demersal trawl gear will lead to any changes in the extent and distribution of subtidal sediments and subtidal rock through penetration of the substrate below the surface of the seabed due to the nature of the gear and fishing practices (i.e location). Scallop dredging: Any contact with the gear is unlikely to lead to damage of native oyster shells. Native oysters are typically harvested using dredges and are therefore robust enough to withstand contact from such gear. The only relevant attribute with respect to the Native oysters supporting habitat is extent and distribution. Supporting habitats include subtidal rock and subtidal sediments. It is not believed oyster dredging will lead to any changes in the extent and distribution of subtidal sediments, but the activity does have the potential to lead to changes in the extent and distribution of subtidal rock, through penetration of the substrate below the surface of the seabed. This is assessed under other designated features (supporting habitat of Pink sea-fans).	

				Bottom towed fishing gear does not interact with high energy intertidal rock or infralittoral rock due to a lack of spatial overlap.	

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[4].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, suitable attributes were identified from Natural England's Supplementary Advice. These are outlined in Tables 2 and 3.

4.1 Assessment of scallop dredging in the Chesil Beach and Stennis Ledges MCZ

4.1.1 Summary of the fishery

Scallop dredging occurs on a sporadic basis throughout the year within the Chesil Beach and Stennis Ledges MCZ. The activity targets the king scallop (*Pecten maximus*).

4.1.2 Technical gear specifications

Scallop dredges are rigid structures of the following design (see Figure 1). A triangular frame, with a width of up 85 cm in the Southern IFCA district, is attached to a collection bag and chain mesh which sits behind it. The triangular frame is fitted with a toothed bar at the front to dislodge scallops from the seabed and into the collection bag. In the Southern IFCA district, the dredge must be fitted with a spring loaded tooth bar. The teeth on the bar are approximately 120 mm long; with 20 mm penetrating the seabed (depending on the substrate).The collection bag sits on top on the chain mesh. A number of dredges are attached to and towed behind a spreading bar with a bar usually deployed from each side of the vessel. The length of the bar and number of dredges depends on the size and power of the vessel. In Southern IFCA, the maximum number of dredges which may be towed at any time is twelve.

4 https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0004&SiteName=chesil%20beach&countyCode=&responsiblePerson=

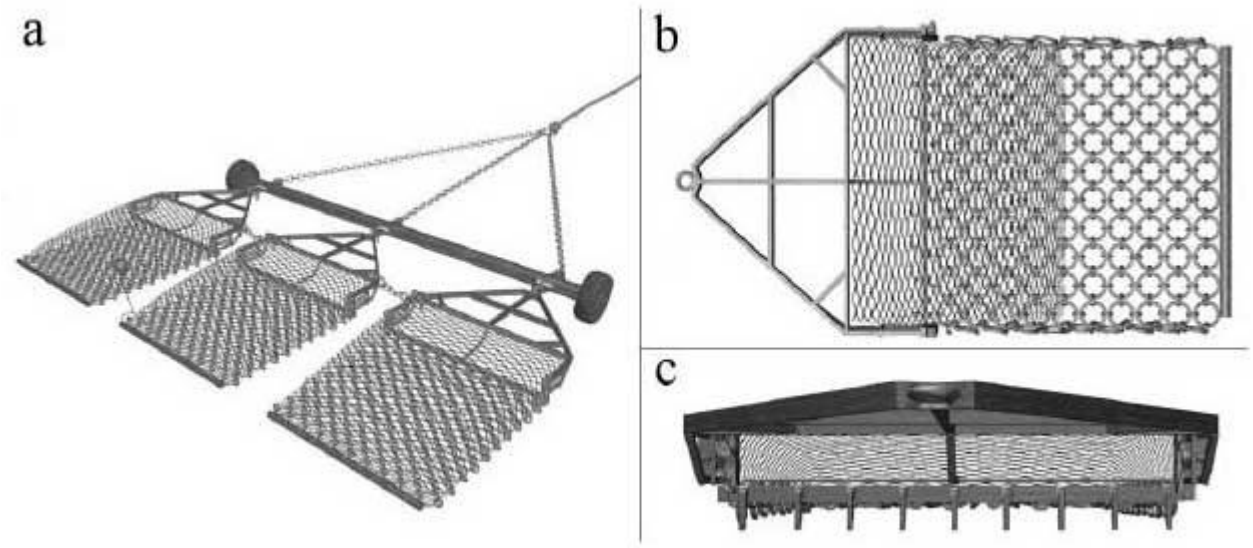

Figure 1. Typical scallop dredge set up used in the UK. (a) 3-dredge-a-side set up and spreading bar. (b) Chain mesh and collection bag (top side). (c) Spring-loaded toothed bar. Source: http://www.gov.scot/Publications/2012/10/7781/4

4.1.3 Location, Effort and Scale of fishing activities

Scallop dredging takes places subtidally and is focused over areas of reef including Stennis Ledges, Chesil Cove and a small area of reef in the western end of the site. A successful voluntary agreement has prevented fishing over Stennis Ledges within the last three years in order to protect Pink sea-fans and their supporting habitat (Annex 5 and 6).

There is the potential for up to ten vessels to operate within the site, although only three vessels currently operate within the site (in areas outside of the voluntary agreement). The activity occurs sporadically at any time of year and can occur for up to two weeks at a time up to approximately five times a year. This equates to roughly 10 weeks of the year. The activity predominantly occurs in periods of easterly or north easterly winds when vessels are sheltered by Chesil Beach and Portland.

Sightings data for scallop dredging was split into 2005-2012 and 2013-2016 (Figure 2). The reason for this is to demonstrate any changes in the spatial distribution of the activity following the voluntary agreement introduced in February 2013. The sightings data shows no scallop dredging over Stennis Ledges since 2013. Prior to 2013, the greatest number of sightings occurred over Stennis Ledges, as well as a small number in the western end of 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 ten year period covered by sightings data (2005-2016), it is likely that the geographical extent of the fishery is relatively well reflected; however intensity may be skewed by aforementioned factors.

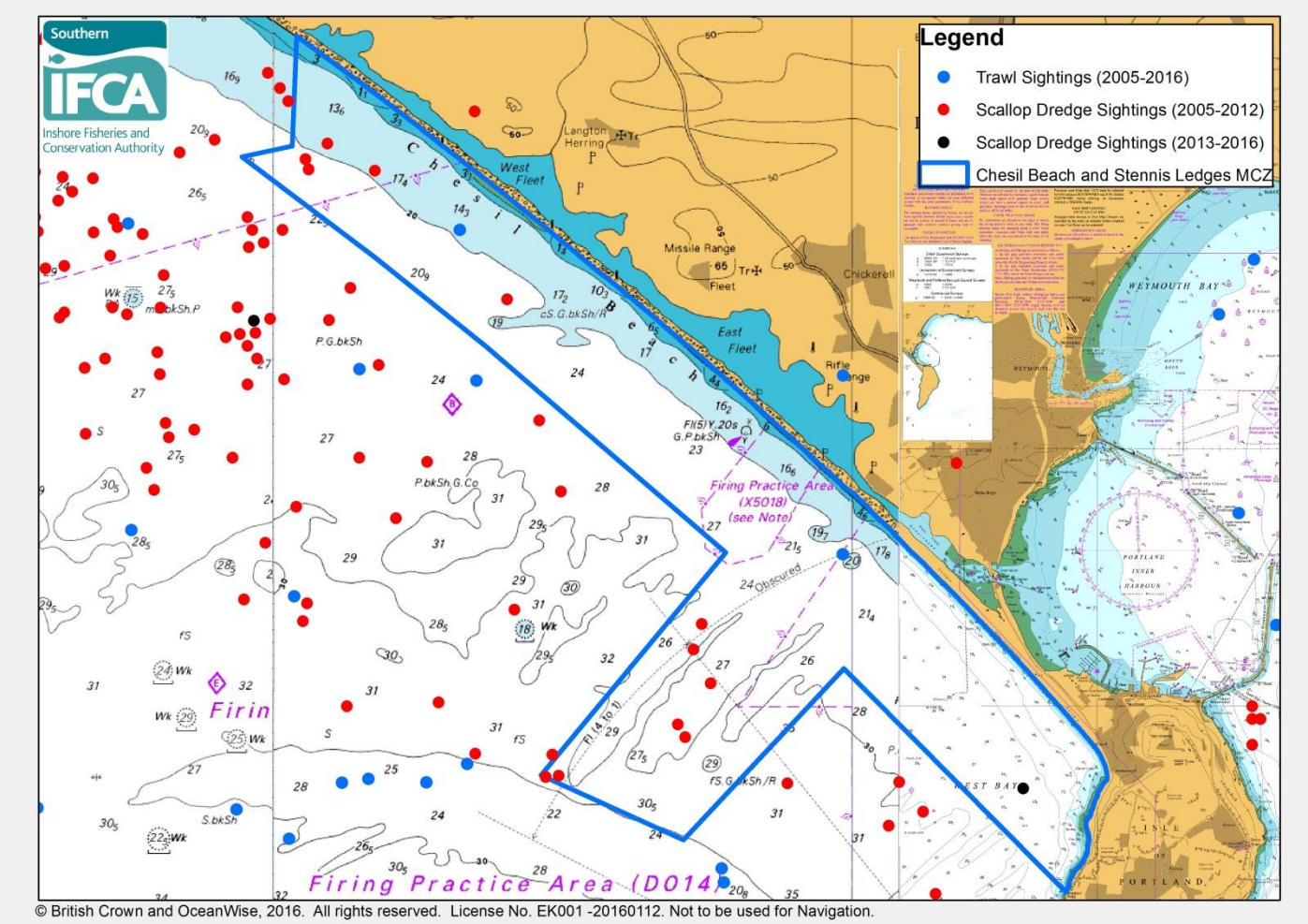

Figure 2. Fishing activity map(s) using trawl sightings data from 2005-2016 and scallop dredge sightings data from 2005-2016 (split between 2005-2012 and 2013-2016 to reflect any changes in spatial extent of the activity after in the introduction of voluntary agreement) in the Chesil Beach and Stennis Ledges MCZ.

4.2 Assessment of trawling in the Chesil Beach and Stennis Ledges MCZ

4.2.1Summary of the Fishery

Trawling, using a light otter trawl occurs on a seasonal basis, predominantly within the winter months, within the Chesil Beach and Stennis Ledges MCZ. The activity targets flatfish, skates and rays.

4.2.2 Technical Gear Specifications

There is occurrence of one type of demersal trawl within the Chesil Beach and Stennis Ledges MCZ. This includes a light otter trawl.

4.2.3 Light otter trawl

An otter trawl comprises of following design (see Figure 3). 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 seabed 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).

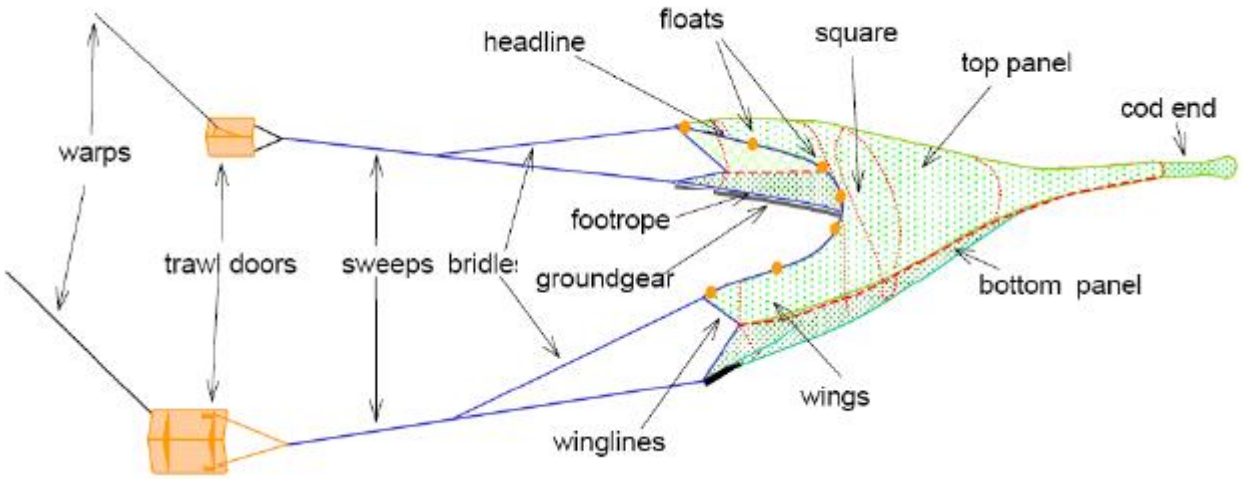

Figure 3. Key components of an otter trawl.
Source: www.seafish.org/upload/b2b/file/r_d/BOTTOM%20TRAWL_5a.pdf

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.

4.2.5 Location, Effort and Scale of Fishing Activities

Light otter trawling takes place subtidally and is generally focused over areas of coarse and mixed sediment, potentially fringing areas of rock or cobbles. These habitats are found adjacent to Chesil Beach and form a corridor adjacent to the beach.

There are currently a total of four vessels operating light otter trawls. Activity is generally seasonal, concentrated in the summer months with a total of approximately 20 to 30 instances of trawling a year over the site. Fishing typically occurs for up to 4 hours a day.

Sightings data is limited for trawling with 2 sightings over a period of ten years. The two sightings confirm the area adjacent to the beach is used as a trawl corridor.

4.3 Co-Location of Fishing Activity and Pink Sea-fans and their supporting habitat

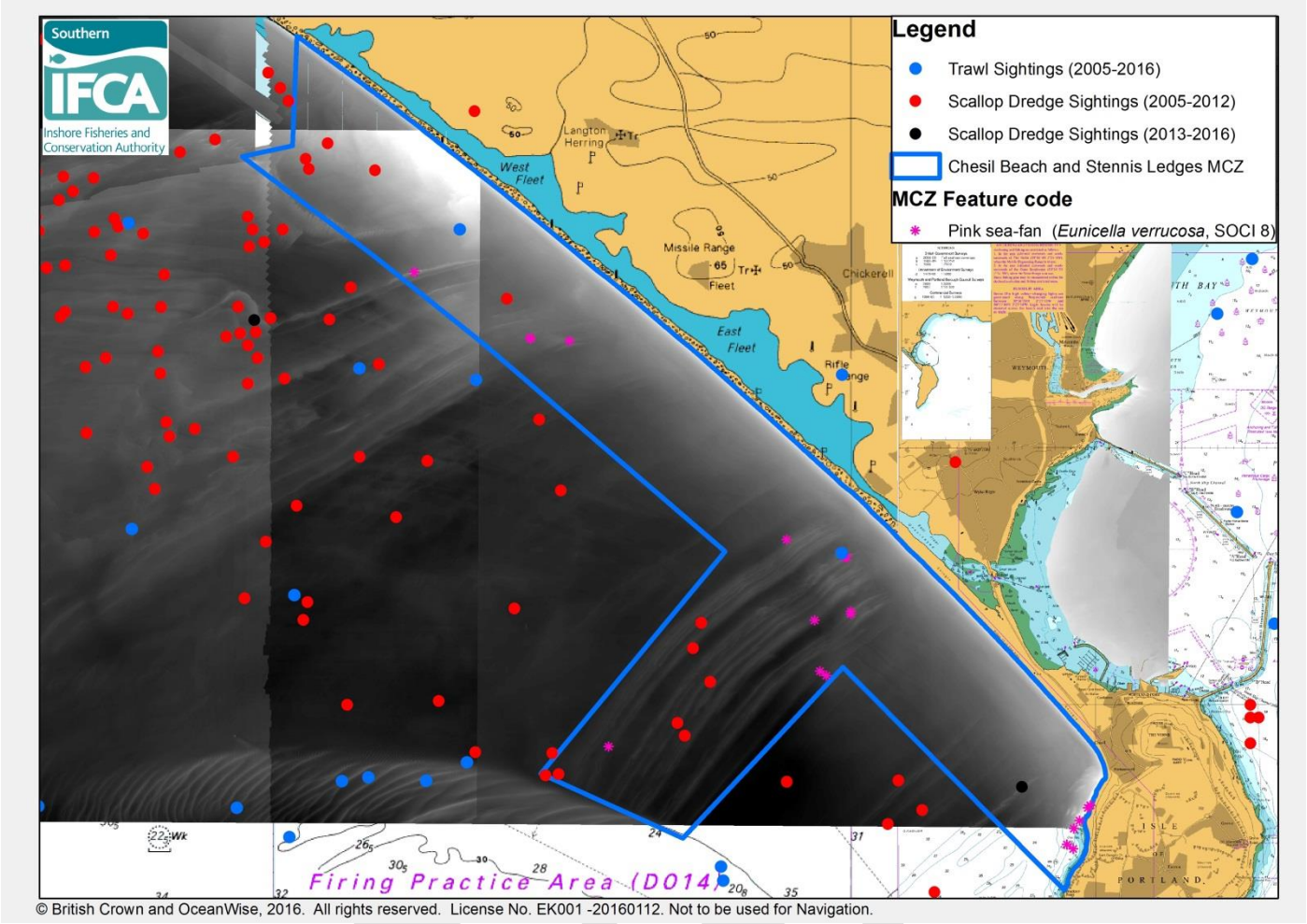

Figure 4. Co-location of trawl sightings data (2005-2016) and scallop dredge sightings data (2005-2012 & 2013-2016) and Pink sea-fans and their supporting habitat (inferred from DORIS multibeam data) in the Chesil Beach and Stennis Ledges MCZ. Pink sea-fan presence data was provided by Seasearch diver records and Natural England.

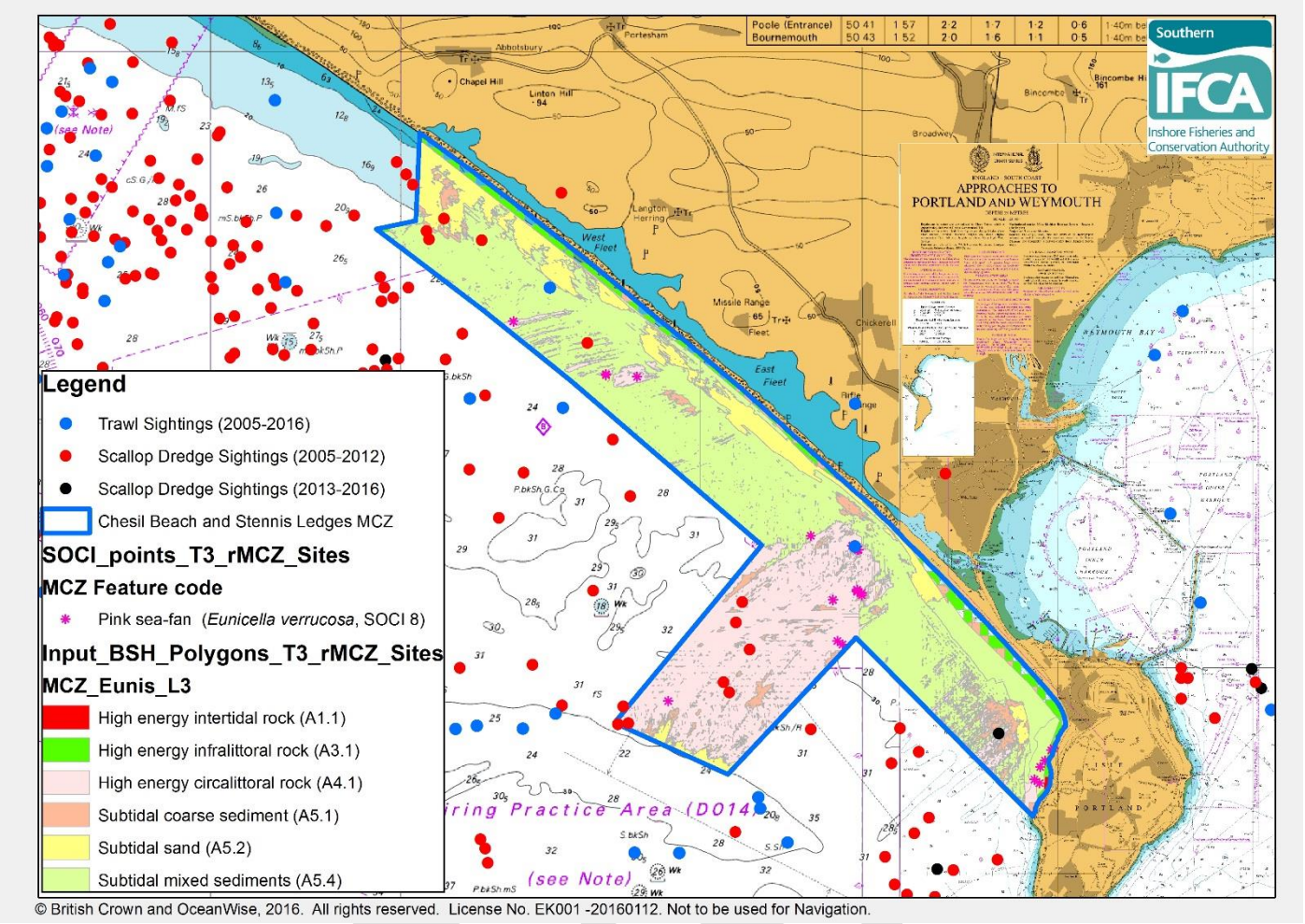

Figure 5. Co-location of trawl sightings data (2005-2016) and scallop dredge sightings data (2005-2012 & 2013-2016) and Pink sea-fans and their supporting habitat (circalittoral rock), including other undesignated habitat types, in the Chesil Beach and Stennis Ledges MCZ. Pink sea-fan presence data was provided by Seasearch diver records and Natural England.

The map of trawl and scallop dredge sightings reveals where fishing activity occurs in relation to Pink sea-fan populations and likely supporting reef habitats (inferred through DORIS multibeam data in Figure 4) and other habitat feature data (Figure 5). Trawling is shown to occur on the fringes of supporting reef habitats (on the edges of Stennis Ledges) and over subtidal sand/mixed sediments. Scallop dredging is shown to be focused over areas of harder ground, either over circalittoral rock or on the fringes of this habitat type. In relation to the location of recorded Pink sea-fan populations, there appears to be direct interactions with trawling on the north eastern edges of Stennis Ledges. Other populations of Pink sea-fans also likely to be at risk are those located in western end of the site, where sightings of scallop dredging occur in relatively close proximity. Pink sea-fan populations recorded on the eastern fringes of the site are much less likely to be at risk from impacts of bottom towed fishing gear, due to their closeness to shore and lack of activity in this area.

4.4 Pressures

4.4.1 *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*

The environmental impacts of bottom towed fishing gear are complex (Boulcott *et al*., 2014). The extent of disturbance depends on a number of factors including substrate type (Kaiser *et al*., 2002), design and weight of the gear (Boulcott & Howell, 2011) performance of the gear over a

particular substrate (Caddy, 1973; Currie and Parry, 1999) and the sensitivity of the benthic community (Currie and Parry, 1996; Bergman *et al*., 1998; Collie *et al*., 2000a; Boulcott *et al*., 2014).

4.4.1.1 Scallop dredging

Scallop dredging is considered to be one of the most destructive forms of bottom towed fishing (Kaiser *et al*., 2006; Hinz *et al*., 2011). A meta-analysis of 101 different fishing impact manipulation concluded that the most severe impact was caused by scallop dredging in biogenic habitats (those constructed or composed of primarily living biota) (Kaiser *et al*., 2006). The main effects of scallop dredging largely relate to the direct physical passage of gear over the seabed (Kaiser, Unpublished). Impacts include physical damage to soft rocky outcrops, soft or fragile and long-lived species are killed or damaged, removal of erect faunal species and large sessile species, reduction in biodiversity and a reduction in structural complexity and subsequent habitat homogenisation (Sewell & Hiscock, 2005).

The tooth bar on the gear is designed to penetrate into the seabed as the target species, *Pecten maximus*, will generally bury in the seabed so that their shell is level with the sediment surface (Kaiser, Unpublished). The teeth can penetrate up to 12 cm of the seabed (Kaiser, Unpublished). Over harder substrata (i.e. bedrock, cobble or boulder fields) the teeth are known to scrape the surface and if soft, the rock can be broken up or physically damaged by the passage of the gear (Kaiser, Unpublished), potentially leading to a reduction in complexity (Roberts *et al*., 2010). Softer rock (slate, limestone, mica), like that found off the south Devon and Dorset coasts, is less resistant to damage (JNCC & NE, 2011; Kaiser, Unpublished).

The removal of erect faunal species, which increase topographic relief of the habitat, can also lead to reductions in biogenic structure and habitat complexity (Kaiser, Unpublished). Many of these erect faunal species, such as sea fans such as the Pink sea-fan, soft corals and bryozoans such as Ross coral, have slow growth rates, large body sizes and attach to the substratum, making them particularly susceptible to the impacts of bottomed towed fishing gear (Kaiser, Unpublished). The Pink sea-fan it often used as proxy for the presence of hard ground as their basal ‘holdfasts’ must recruit onto a solid substratum (Pikesley *et al*., 2016). Furthermore, the topographic relief and complexity created by these emergent epifauna, support diverse seabed communities and provide shelter for juvenile fish, shellfish and their prey (Kaiser, Unpublished). In a meta-analysis, scallop dredging was reported to cause an immediate reduction in mean abundance of animals from -22% to 98%, with the greatest declines observed for sea-fans and sponges in biogenic habitats (Kaiser *et al*., 2006).

Typically scallop dredging occurs over gravel or mixed substrata, although can occur in areas of mud or harder seabed type which support populations of the target species (Shumway and Parsons, 2006; Hinz *et al*., 2011). Rocky-reef habitats can also present a considerable risk to dredging gear, with the gear known to come fast (Boulcott and Howell, 2011). As a result, there is a severe lack of impact studies on scallop dredging in areas of rocky reef (Boulcott and Howell, 2011; Hinz *et al*., 2011). Improvements in electronic navigation and bottom discrimination technology have allowed for the expansion of scallop dredging into previously inaccessible areas of the seabed (Boulcott & Howell, 2011).

Boulcott and Howell (2011) and Boulcott *et al*. (2014) investigated the impact of scallop dredging in areas of rocky-reef and mixed substrate (including bedrock, boulder, cobble) in south west Scotland. The former study used a photographic survey of four experimental tows performed in two areas of rocky-reef biotopes. The prevalence of tow marks of faunal turf was difficult to identify from digital images and where they were detected resembled the action of sprung teeth (Boulcott and Howell, 2011). Visible signs of damage to dead man’s fingers *Alcyonium digitatum*, a species

considered to be potentially vulnerable, were limited in only 13% of photographic quadrats. The elephant hide sponge *Pachymatisma johnstonia* on the other hand, also considered to be of the most vulnerable species, showed consistent signs of visible damage in 69% of photographic quadrat. Whilst the study provides evidence of damage to epifaunal communities, only one species of emergent displayed high rates of physical damage, despite the presence of various other species. This suggests that damage caused to rocky reef communities is likely to be incremental in nature, increasing with repeated tows (Boulcott and Howell, 2011).

The latter study (by Boulcott *et al*. (2014) investigated the impact of experimental scallop dredging (before and after) over hard substrates in three sites. To investigate the potential of recovery, all sites were resurveyed 2.5 months after experimental dredging. Each site had an 'impact' box that was subject to experimental dredging and two 'control' boxes, one open to fishing and another closed to fishing for the past two years (within an SAC). Although not significant, all three impact boxes had lower point estimates of coverage of faunal turf communities immediately after dredging, with estimates of -69%, -10% and -22% compared with before-impact coverage. There were however significant shifts in community composition in impact boxes before and after impact surveys at two sites. This was driven by a reduction in the numbers of *Alcyonium digitatum* and sponges, erect epibenthic species that are vulnerable to dredging. Coverage of faunal turfs was significantly greater in the SAC than outside control boxes in 4 out of 6 comparisons with a medium reduction in coverage of 33% between the outside and SAC controls, consistent with a reduction in the abundance of emergent epifauna caused by dredging. Immediately after dredging communities in all three impact boxes become less similar to those inside the SAC boxes.

Hinz *et al*. (2011) investigated the impacts scallop dredging in Lyme Bay SCI, a marine protected area, adjacent to the Chesil Beach and Stennis Ledges MCZ, where Pink sea-fans occur. The study compared areas subject to different fishing activity levels. These were arranged around 4 voluntary reserved closed to fishing and included 2 fixed treatments with 2 levels (1. Protection i.e. stations inside the reserves (Closed) and outside (Open); 2. Past Fishing Activity i.e. stations that had been fished prior to the implementation of the reserves (Fished) and stations that had experienced no prior dredging or at very low intensities (Not Fished). Fished sites were estimated to have been dredged on average 1.2 times per year. The study found sessile emergent epifauna occurred at significantly lower levels and abundances at fished sites compared to unfished sites, with a significant negative effect on 3 out of 9 species analysed. The abundance of ross coral *Pentapora fascialis* and dead men's fingers *Alcyonium digitatum, and presence of Axinella dissimilis* (erect sponge) were 73%, 67% and 54% lower in fished sites compared to non-fished sites, respectively. The Pink sea-fan *Eucinella verrucosa* however did not show a significant negative response with respect to abundance and body size in relation to fishing intensity, despite being 3.4 times abundant inside the reserve areas compared to outside the reserve areas. Using least squares regression to investigate the effect of fishing intensity, *E. verrucosa* showed no noticeable trend.

The lack of widespread damage or impact on structural and potentially vulnerable species reported by Boulcott and Howell (2011) and Hinz *et al*. (2011) is thought to be related to a scallop dredge passes over morphologically complex substrata like rocky reefs (Boulcott *et al*., 2014). This is also supported by results reported by Boulcott *et al*. (2014) who found that at one site the community composition of one impact box did not significantly differ after dredging and became more to the SAC control box during the 2.5 month recovery period. It is thought this is because of the higher proportion of bedrock at this site. When passing out morphologically complex substrata, the dredge loses continuous contact with the substrate which limits the area of substrate impacted. The spring action of the toot bar against uneven substrate also reduces contact with the seabed. It is therefore expected that scallop dredging has a more severe impact on even ground where continuous contact with seabed is more likely to occur. In addition, Hinz *et al*. (2011) speculated the flexibility of *E. verrucosa* colonies may also make this species less susceptible to damage from

scallop dredging. This has been shown to occur in response to contact with lobster pots (Eno *et al*., 2001).

Species such as the Pink sea-fan and others associated with rocky habitats are likely to have prolonged recovery times of over 5 years when compared with dynamic sandy seabed habitats where recovery can be less than a year (Dernie *et al*., 2003; Kaiser *et al*., 2006; Hinz *et al*., 2011). Ultimately recovery will depend on life history characteristics of the species affected, including the ability of damaged adults to repair lost or damaged parts and the ability of larvae to reach and recolonise a habitat (Roberts *et al*., 2010). Recovery potential of the Pink sea-fan was scored as 'long' and 'low' by MacDonald *et al*. (1996) and Jackson *et al*. (2008) respectively. This is likely to reflect their slow growth rate (Pikesley *et al*., 2016). A number of the aforementioned studies examined potential recovery to scallop dredging on rocky reef habitats. Boulcott *et al*. 2014 and Hinz *et al*. (2011) investigated recovery after 2.5 and 12 months respectively, but neither found any clear evidence of recovery after the cessation of scallop dredging.

Since the prohibition of bottom towed fishing gear within the Lyme Bay Designated Area in 2008, in order to maintain reef structure and aid recovery of benthos, the response of benthos has been monitored (Attrill *et al*., 2012). Monitoring was undertaken yearly from 2008 until 2011 using towed video analysis of four treatment levels New Closure and 3 controls Closed Control, Near Open Control and Far Open Control. Over the course of the study, the assemblage structure in the new closure areas became more similar to that within the closed control areas and less similar to that within the other two control areas, giving indications of a trend towards recovery. Size class analysis, also supports the theory of a trend towards recovery. A high level of uncertainty is associated with this trend towards recovery due to strong spatial variation. With respect to *E. verrucosa*, abundance decreased in 2011 compared to 2010 in both the new closure and closed control areas (Figure 5). Abundance of size class C (medium – 11-18 cm) continued to increase in new closure areas in 2011 and other size classes remained stable (Figure 6). Recruitment has occurred throughout the study period in new closure and closed control areas and has continued to be successful. This study proves that following 4 years after closures to bottom towed fishing gear recovery is still uncertain. This is in line with a recovery times estimated for Lyme Bay reefs to be in excess of 5 to 10 years (Hiddink *et al*., 2006; Kaiser, Unpublished).

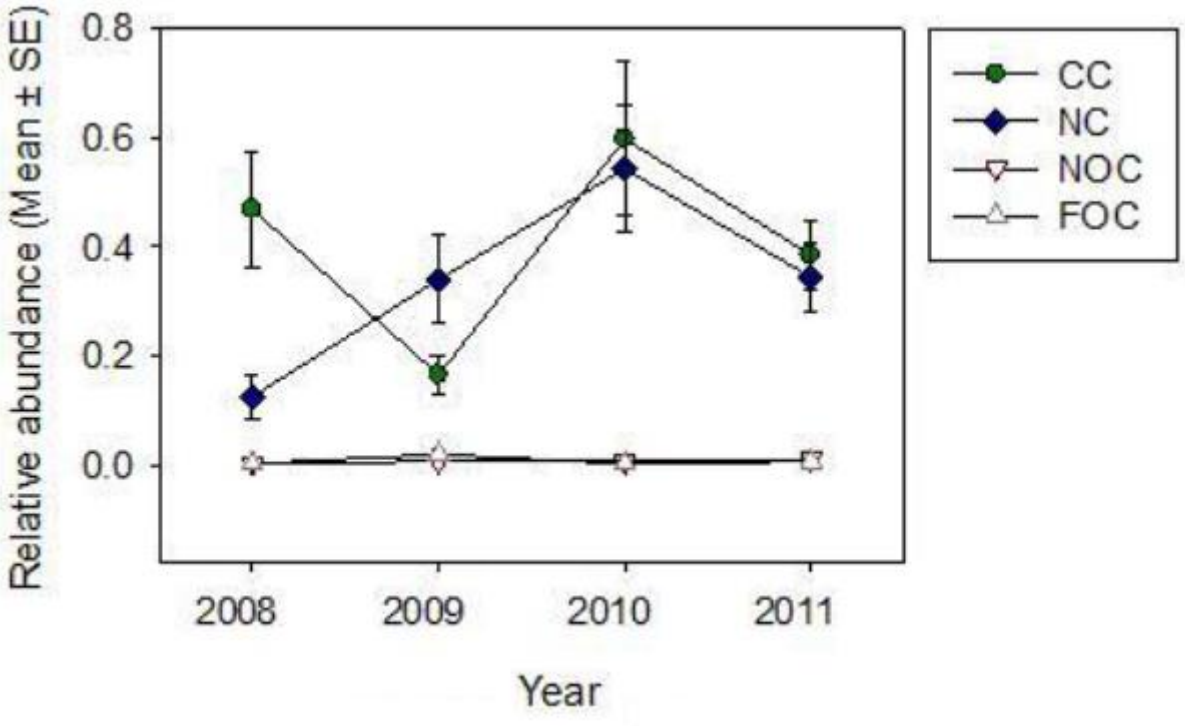

Figure 5. Relative abundance (Mean m^{-2} ± SE) of Pink sea-fans (*Eucinella verrucosa*) in Lyme Bay following the closure to bottom towed fishing gear in 2008 between 2008-2011. CC = closed control, NC = new closure, NOC = new open control, FOC = far open control.

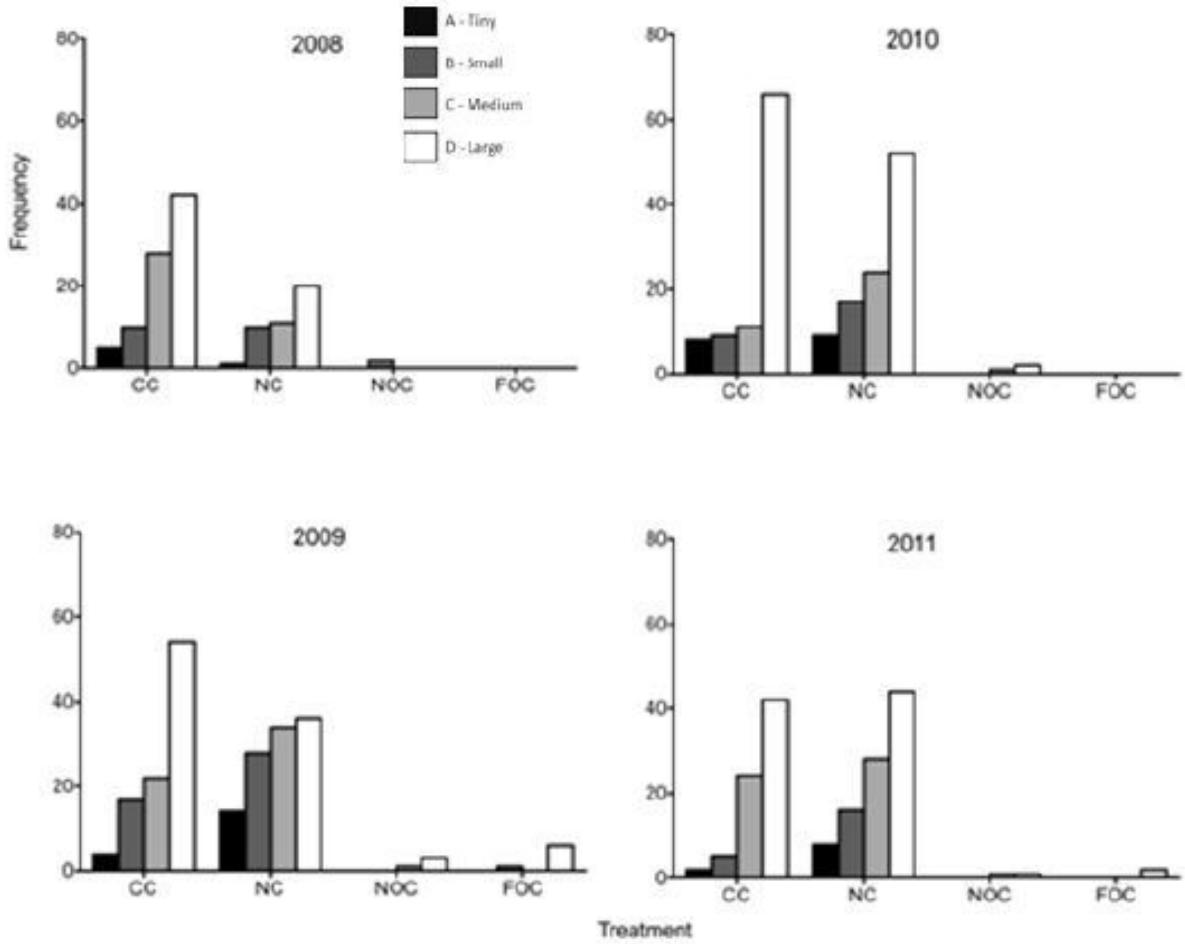

Figure 6. Size class distributions for *Eucinella verrucosa* showing the frequency of individuals by size class (A= Tiny (<6 cm), B= Small (6-11 cm), C= Medium (11-18 cm), D= Large (>18 cm)) for each treatment (CC = closed control, NC = new closure, NOC = new open control, FOC = far open control) between 2008 and 2011.

4.4.1.2 Trawling

The potential effects of demersal trawls over areas of rocky reefs are similar to those caused by scallop dredging (Sewell and Hiscock, 2005). Although a meta-analysis of 39 fishing impact studies revealed dredging had a more negative impact than trawling (Collie *et al*., 2000b). Potential effects include reductions in habitat structural complexity and subsequent habitat homogenisation, reduction in biodiversity, removal of erect epifaunal species and large sessile species some of which are likely to large, fragile and long-lived and physical damage to fragile structures (Sewell and Hiscock, 2005). Such impacts are caused through direct contact with the seabed.

Otter trawl fishing gear has contact with the seabed through ground rope, chains and bobbins, sweeps, doors and any chaffing mats or parts of the net bag (Jones, 1992). Otter door marks are often the most recognisable ad commonly observed effects of otter trawls on the seabed (Caddy, 1973; Friedlander *et al*., 1999; Grieve *et al*., 2014). Bridles or sweeps, the cables that connect the trawl doors to the trawl net, can snag on boulders or other obstructions over rough ground (Grieve *et al*., 2014).

A number of studies have reported impacts of otter trawling in areas of reef and where corals are present. In an area of mixed substrata at 50 to 100 m depth in north-western Australia, Moran and Stephenson (2000) reported, on each tow of an otter trawl (dimensions unknown), a 15.5% reduction in benthic organisms that stood higher than 20 cm off the seabed, comprised mainly of gorgonians, sponges and soft corals. Van Dolah *et al*. (1987) reported significant decreases in the density of barrel sponges and damage to finger sponges, vase sponges, whip corals, fan corals, stock corals and stony tree corals after a single pass with an otter trawl in a hard bottom sponge and coral community at 20 m in Grays Reef, Georgia. The otter trawl used had a 40/54 fly net,12.2-m headrope,16.5-m footrope with 30 cm rubber rollers and 15-cm rubber discs and 1.8 x 1.2 m China V-doors. Recover was reported to occur within one year (Van Dolah *et al*.,1987).

Deep-water trawling has had a clear and significant impact on deep-water coral reefs (200-1300m) and other organisms, including *Lophelia*, in the North Atlantic since the 1980s (Sewell and Hiscock, 2005). Halls-Spencer *et al*. (2002) analysed commercial otter trawl catches taken from the West Ireland continental shelf break and West Norway and reported large amounts of coral bycatch in 5 out of 229 trawls, including pieces up to 1 m^2. ROV video observation revealed sparse living coral, coral rubble and track marks in trawled area. The otter trawls used in the fishery are fitted with rockhopper gear and 900 kilogram trawl doors.

Unfortunately, due to the lack of similarity between areas and habitats in which otter trawling has been shown to cause adverse effects and those found in Chesil Beach and Stennis Ledges MCZ, the studies examined are of limited relevance.

4.4.2 Sensitivity

MacDonald *et al*. (1996) assessed the fragility and recovery potential of different benthic species to determine their sensitivity to fishing disturbance. Recovery represents the time taken for a species to recover in a disturbed area and fragility represents the inability of an individual or colony of the species to withstand physical impacts from fishing gear. Recovery was scored on a scale of 1 to 4 (1 – short, 2 – moderate, 3 – long and 4 – very long) and fragility was scored on a scale of 1 to 3 (1 – not very fragile, 2 – moderately fragile and 3 – very fragile). The scores assigned to the Pink sea-fan are provided in table 4. The table also includes sensitivity information assigned by MarLIN in relation to physical disturbance and abrasion. Please note that the sensitivity ratings assigned by MarLIN are based on a single dredging event.

Table 4. Likely sensitivity of Pink sea-fans to disturbance caused by an encounter with fishing gear scored by MacDonald *et al*. (1996) and MarLIN (in relation to physical disturbance and abrasion). Medium intensity gears include otter trawls. Fragility is derived from personal knowledge of species structure and recovery values were derived from a review of literature on life-histories of the species. Source: MacDonald *et al*. (1996) and www.marlin.ac.uk/).

		MacDonald *et al.* (1996)			**MarLIN**		
Species	**Common name**	**Fragility**	**Recovery**	**Sensitivity (for medium intensity gears)**	**Intolerance**	**Recoverability**	**Sensitivity**
Eucinella verrucoa	Pink sea fan	3	3	67	Intermediate	Moderate	Moderate

4.4.2.1 Sensitivity analyses

A number of recent studies have endeavoured to map the sensitivity of habitats to different pressures (Tillin *et al*., 2010) and fishing activities (Hall *et al*., 2008).

Tillin *et al*. (2010) developed a pressure-feature sensitivity matrix, which in effect is a risk assessment of the compatibility of specific pressure levels and different features of marine protected areas. The approach used considered the resistance (tolerance) and resilience (recovery) of a feature in order to assess its sensitivity to relevant pressures (Tillin *et al*., 2010). Where features have been identified as moderately or highly sensitive to benchmark pressure levels, management measures may be needed to support achievement of conservation objectives in situations where activities are likely to exert comparable levels of pressure (Tillin *et al*., 2010). In the context of this assessment, the relevant pressures likely to be exerted are surface abrasion, shallow abrasion/penetration and penetration and/or disturbance of the substrate below the surface of the seabed. Sensitivity to all pressures is considered high for Pink sea-fans, with medium confidence in these assessments (Table 5).

Hall *et al*. 2008 aimed to assess the sensitivity of benthic habitats to fishing activities. A matrix approach was used, composed of fishing activities and marine habitat types and for each fishing activity sensitivity was scored for four levels of activity (Hall *et al*., 2008). The matrix was completed using a mixture of scientific literature and expert judgement (Hall *et al*., 2008). The type of fishing activity chosen was 'beam trawls and scallop dredges' and 'light demersal trawls and seines' as they best encompassed the fishing activities under consideration. The majority towed bottom gears where considered unlikely to be deployed in these habitat types and as such were not assessed for heavy to light gear intensities. Rock with erect and branching species appears to be slightly less sensitive to a single pass of the heavier gear types than very slow growing erect and branching species (Table 6). On the other hand, the assessment for the lighter gear type revealed a high sensitivity for both habitat types to a single pass, which may be inaccurate when considering against the sensitivity assigned for heavier gear types.

Table 5. Sensitivity of Pink sea-fan (*Eucinella verrucosa*) to pressures identified by Tillin *et al*. (2010). Confidence of sensitivity assessment is included in brackets.

	Pressure		
Feature	Surface abrasion: damage to seabed surface features	Shallow abrasion/penetration: damage to seabed surface and penetration	Penetration and/or disturbance of the substrate below the surface of the seabed
Eucinella verrucosa	High (Medium)	High (Medium)	High (Medium)

Table 6. Sensitivity of relevant features to different intensities (high, medium, low, single pass) of static gear (fishing activities which anchor to the seabed) as identified by Hall *et al*. (2008).

Gear Type	**Habitat Type**	**Gear Intensity***			
		Heavy	Moderate	Light	Single pass
Beam trawls and scallop dredges	**Rock with erect and branching species**				Medium
	Erect and branching spp. very slow growing				High
Light demersal trawls and seines	**Rock with erect and branching species**				High
	Erect and branching spp. very slow growing				High

There is no information on sensitivity for heavy, moderate or light gear intensity as the gear types are considered unlikely to occur in these habitat types.

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

4.5 Existing Management Measures

- A voluntary agreement with scallop dredgers has been in place since 2013 which prevents scallop dredging over Stennis Ledges; a known area of rocky habitat likely to support populations of Pink sea-fan (see Annex 5 for a copy of the letter sent to stakeholders and

Annex 6 for a map of the voluntary closed area). The voluntary agreement has been abided by since it was introduced.

- **Fishing Under Mechanical Power – Closed Area** byelaw – this prohibits trawling (where the vessel is propelled entirely or in part by means of mechanical power) between 1st May and 31st August within one nautical mile from any part of the coast from Golden Cap to Chesil Beach. This area falls within the western portion of the site.

- The **Scallop Fishing (England) Order 2012** provides details for dredge configuration (i.e. a dredge cannot exceed 150 kg including all fittings).

- **Scallop Fishing** byelaw – prohibits any person from taking or fishing for scallops before 0700 local time and after 1900 local time. The byelaw dictates the fishing set up that can be used including a limit on the maximum which number of dredges that can be towed at anyone time (up to 12), all dredges must be fitted with a spring loaded tooth bar, the mouth of a dredge must not exceed 85 cm in overall width and no more than two tow bars can be used any time with a maximum length of 5.18 metres (including attachments).

- **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.

- **Minimum Fish Sizes** byelaw - states that no person shall take from the fishery any fish of the following species (black seabream, brill, dab, conger eel, flounder, lemon sole, red mullet, shad, turbot, witch flounder) that measures less than the size listed when measured from the tip of the snout to the end of the tail. The minimum size for flounder is 27 cm. The minimum sizes contained within this byelaw differ from that in EU legislation.

- A separate Minimum Size Southern IFCA byelaw exists for Skates and Rays and this states that no person shall take any ray that measures less than 40 cm between the extreme tips of the wings or any wing which measures less than 20 cm in its maximum dimension and which is detached from the body of a skate or ray.

- Other regulations include minimum sizes, mesh sizes and catch composition as dictated by European legislation. European minimum sizes, listed under Council Regulation (EEC) 850/98 specify the minimum size for plaice is 27 cm and for scallops is 10 cm in ICES region VII e and 11 cm in ICES region VII d.

4.7 Site Condition

Natural England provides information on the condition of designated sites and describes the status of interest features. Under the Habitats Directive, relevant for SACs and SCIs, the UK is obliged to report on the Favourable Condition Status of Annex I and Annex II features every 6 years. Similar reporting requirements under the Birds Directive are required for SPAs. Under the Marine and Coastal Access Act there is a need to assess the achievement of conservation objectives for MCZs. Alongside these national reporting requirements is the need to provide a current view of feature condition within protected sites is crucial to underpin advice on site management and casework.

During 2015/16 Natural England reviewed, refined and tested the condition assessment methodology. This methodology will be used to start a rolling programme of marine feature

condition assessments in 2016/17. As such, the feature condition of Pink sea-fans is currently not assessed.[5]

Where there is no evidence to determine a marine feature's condition, a vulnerability assessment, which includes sensitivity and exposure information for features and activities in a site, has been used as a proxy for condition[6].

5 https://designatedsites.naturalengland.org.uk/Marine/MarineFeatureCondition.aspx?SiteCode=UKMCZ0004&SiteNameDisplay=Chesil+Beach+and+Stennis+Ledges+MCZ

6 https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0004&SiteName=chesil%20beach&countyCode=&responsiblePerson=

4.6 Table 7. Assessment of trawling and scalloping dredging pressures upon Pink sea-fan (*Eucinella verrucosa*) and Native oyster (*Ostrea edulis*)

Feature	Attribute	Target	Potential pressure(s) and Associated Impacts	Likelihood of Impacts Occurring/Level of Exposure to Pressure	Mitigation measures
Pink sea-fan (*Eunicella verrucosa*)	Population: population size	Recover the population size within the site.	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. Bottom towed fishing gear directly impacts on soft, fragile and long-lived species like the Pink sea-fan through physical passage of fishing gear over the seabed. The teeth found on scallop dredging gear scrape the surface and can lead to the of removal erect epifaunal species. Scientific evidence of scallop dredging on rocky reef habitats is relatively	A total of four vessels are known to operate light otter trawls and the potential for up to ten vessels to scallop dredge within the site, although only three currently operate. Trawling is seasonal, with up to 30 instances per year over the site, each instance lasting up to 4 hours a day. Trawling is generally focused over areas of coarse and mixed sediment, potentially fringing areas of rock or cobbles and therefore interaction with Pink sea-fans is likely to be limited as the species is heavily associated with hard ground. Scallop dredging occurs sporadically in areas outside of the voluntary agreement	Vessels Used in Fishing byelaw prohibits commercial fishing vessels over 12 metres from the Southern IFCA district. The reduction in vessel size also limits the size of fishing gear (i.e. number of scallop dredge of size of trawl) that can be deployed. A voluntary agreement with scallop dredgers has prevented scallop dredging from taking place within Stennis Ledges in order to protect Pink sea-fans. The voluntary

			sparse, with only one study based in an area where Pink sea-fans exist (Hinz *et al*., 2011). Unexpectedly, the Pink sea-fan did not show a significant negative response, unlike other fragile and long-lived species known to co-occur alongside the Pink sea-fan. Other studies based over rocky reef habitats (Boutlcott and Howell, 2011; Boutcott *et al*. 2014) reported a lack of widespread damage or impact on structurally and potentially vulnerable species. The reason for this is thought to be because of the lack of continuous contact with the substrate, however the damage is likely to be incremental in nature, increasing with repeated tows (Boulcott and Howell, 2011). Studies on the recovery of pink sea-fans and their associated habitat shows that after 4 years of closures to bottom towed fishing gear, recovery is still uncertain (Attrill *et al*.,	(see existing management measures) for approximately 10 weeks of the year and is focused over areas of reef. Scallop dredging is known to overlap with the supporting habitat type of Pink sea-fans and is therefore likely to take place where the species occurs. Scientific literature reveals the impacts of scallop dredging over rocky reef habitat is less than expected, however damage is likely to be incremental. The lack of negative response of Pink sea-fans is also unexpected (Hinz *et al*., 2009). The level of damage however is likely to be incremental so may not be captured through fishing impact studies. In an area closed to bottom towed fishing gear, the recovery of Pink sea-fans gives indications of a trend towards recovery with continued successful recruitment (Attrill *et al*., 2012). Recovery times are however still estimated in	agreement has successful since 2013. Proposed bottom towed fishing gear closures are outlined in section 5.

			2012). Prolonged recovery times of over 5 years to 10 years are estimated for Lyme Bay reefs, a reef system located adjacent to Chesil beach and Stennis Ledges MCZ (Hiddink *et al*., 2006; Kaiser, Unpublished). Potential impacts of trawling similar to those caused by scallop dredging, with dredging likely to be more damaging (Collie *et al*., 2000b; Sewell & Hiscock, 2005). This is due to the nature of the scallop dredging gear, which is more likely to penetrate deeper into the substrate (Collie *et al*., 2000b).	excess of 5 to 10 years (Hiddink *et al*., 2006; Kaiser, Unpublished). Potential impacts caused by trawling are similar to those discussed for scallop dredging, although likely to be less severe. Despite a lower incidence of trawling within rocky reef areas, fringing of this habitat may still occur. The voluntary agreement currently protects a large area (Stennis Ledges; see Annex 6) of supporting habitat for the Pink sea-fan and its success has afforded protection for the species in this area since 2013. Based on the long recovery times for Pink sea-fans and their supporting habitat, impacts from bottom towed fishing gear and the incidence of this gear type (scallop dredging in particular) outside areas subject to the voluntary agreement, bottom towed fishing gear is likely to pose a significant risk to the	

				population size of the Pink sea-fan. Furthermore, the target to 'recover' Pink sea-fans populations is unlikely to be achieved with the current level (albeit at relatively low levels) of bottom towed fishing gear occurring over areas of supporting habitat (i.e. rocky reef) within the site. It is important to recognise however that a relatively large proportion of Pink sea-fan supporting habitat has been afforded protection through the voluntary agreement since 2013 which will have already helped towards achieving the 'recovery' target.	
	Presence and spatial distribution of the species	Recover the presence and spatial distribution of the species.	Addressed above.	Addressed above. Based on the long recovery times for Pink sea-fans and their supporting habitat, impacts from bottom towed fishing gear and the incidence of this gear type (scallop dredging in particular), bottom towed fishing gear is likely to pose a significant risk to the presence and spatial	Addressed above.

				distribution of the Pink sea-fan. Furthermore, the target to 'recover' Pink sea-fans presence and spatial distribution is unlikely to be achieved with the current level (albeit at relatively low levels) of bottom towed fishing gear occurring over areas of supporting habitat (i.e. rocky reef) within the site. It is important to recognise however that a relatively large proportion of Pink sea-fan supporting habitat has been afforded protection through the voluntary agreement since 2013 which will have already helped towards achieving the 'recovery' target.	
	Supporting habitats: extent and distribution	Maintain the distribution and abundance of the following supporting habitats: reef.	Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion was identified as a potential pressure of scallop dredging. The teeth found on scallop dredging gear scrapes the surface of hard substrata.	There is the potential for up to ten vessels to scallop dredge within the site, although only three currently operate. Scallop dredging occurs sporadically in areas outside of the voluntary agreement (see existing management measures) for approximately	Vessels Used in Fishing byelaw prohibits commercial fishing vessels over 12 metres from the Southern IFCA district. The reduction in vessel size also limits the size of fishing gear (i.e. number of scallop

			This can lead to soft rock (like that found off the Dorset coast) being broken up or physically damaged. Scientific evidence of scallop dredging on rocky reef habitats is relatively sparse however damage caused by this gear type is thought to be incremental; increasing with repeated tows (Boulcott and Howell, 2011). The reason for this is thought to be because of the lack of continuous contact with the substrate (Boulcott and Howell, 2011). Prolonged recovery times of over 5 years to 10 years are estimated for Lyme Bay reefs, a reef system located adjacent to Chesil beach and Stennis Ledges MCZ (Hiddink *et al*., 2006; Kaiser, Unpublished).	10 weeks of the year and is focused over areas of reef. Scallop dredging is known to overlap with the supporting habitat type of Pink sea-fans. Scientific literature reveals the impacts of scallop dredging over rocky reef habitat is less than expected, however damage is likely to be incremental. The soft nature of the rock type is likely to lead to greater physical damage and once damaged will not return to its former condition. The voluntary agreement currently protects a large area (Stennis Ledges; see Annex 6) of supporting habitat for the Pink sea-fan and its success has maintained the condition of this area since 2013. Based on the permanent physical damage caused to soft rock by scallop dredging and the prevalence of this gear type (outside areas subject to the voluntary agreement) over rocky reef	dredge of size of trawl) that can be deployed. A voluntary agreement with scallop dredgers has prevented scallop dredging from taking place within Stennis Ledges in order to protect Pink sea-fans. The voluntary agreement has successful since 2013.

				habitat, scallop dredging is likely to pose a significant risk to the extent and distribution of supporting reef habitat for Pink sea-fans. Furthermore, the target to 'maintain' the distribution and abundance of supporting habitats is unlikely to be achieved with occurrence (albeit at relatively low levels) of scallop dredging over areas of supporting habitat within the site. It is important to recognise however that a relatively large proportion of Pink sea-fan supporting habitat has been afforded protection through the voluntary agreement since 2013 which will have already have achieved the 'maintain' target within this area.	
Native oyster (*Ostrea edulis*)	Supporting habitats: extent and distribution	Maintain the extent and spatial distribution of the following habitats: subtidal rock.	Addressed above under the extent and distribution of supporting habitats for Pink sea-fan (rock habitats), which overlap with those of the Native oyster.	Addressed above under the extent and distribution of supporting habitats for Pink sea-fan (rock habitats), which overlap with those of the Native oyster.	Addressed above under the extent and distribution of supporting habitats for Pink sea-fan (rock habitats), which overlap with those of the Native oyster.

5. Management Options

In recognition of the potential pressures of bottom towed fishing gear (particularly scallop dredging) upon designated features and their supporting habitats, Southern IFCA is in the process of introducing permanent bottom towed fishing gear closure areas in order to protect Pink sea-fans and their supporting habitat.

Southern IFCA recognise that an interim voluntary agreement, preventing scallop dredging from occurring over Stennis Ledges, has been successful in protecting Pink sea-fans and their supporting habitats after designation of the site. Upon the provision of additional evidence, including conservation advice for the site, bathymetric data and up to date habitat maps, Southern IFCA feel it is now appropriate for refinement to the spatial extent of the closure and inclusion of other bottom towed gear types (i.e. trawling).

The bottom towed gear fishing closure areas are designed to protect Pink sea-fans and their supporting habitat against bottom towed fishing gear which are likely to pose a significant risk to the achievement of general management approach of the feature and conservation objectives of the site. The areas have been chosen based updated Pink sea-fan presence data (provided by Seasearch diver records and Natural England), habitat mapping data and bathymetric mapping data (DORIS) in order identify where supporting reef habitat occurs within the site (Figure 7). Three areas have been identified which include Stennis Ledges and Chesil Cove (Figure 8). These areas cover approximately 93.4 km^2 which equates to approximately 40.5% of the site.

The primary reason for management outlined above is to protect Pink sea-fans and their supporting habitat and by virtue this corresponds with the supporting subtidal rock habitat of the Native oyster. It is important to note that there are uncertainties surrounding the spatial distribution and abundance of the Native oyster within the Chesil Beach and Stennis Ledges site. No records of Native oysters (*Ostrea edulis*) were reported in the post-survey site report.

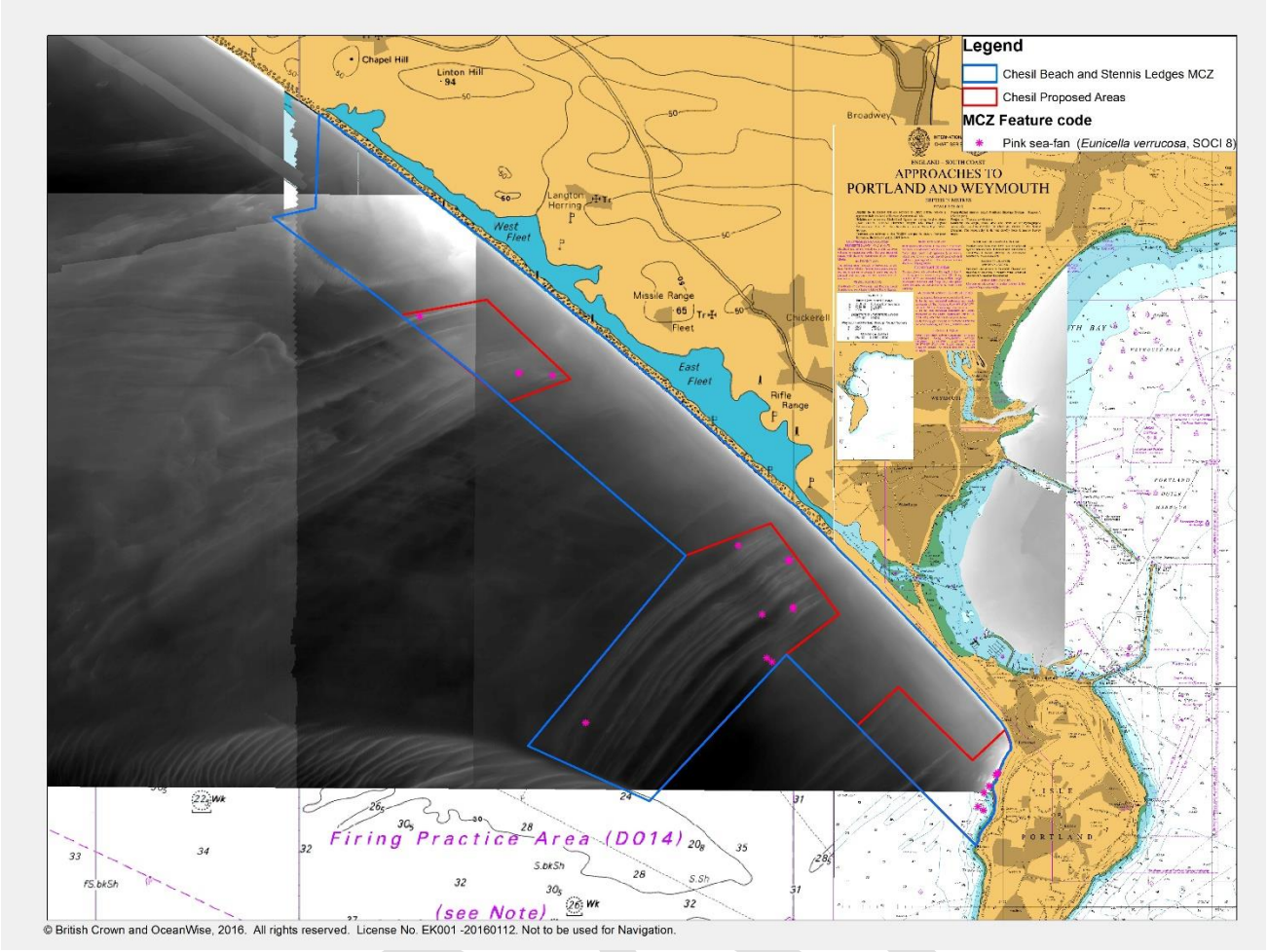

Figure 7. A map showing the location of Pink sea-fan populations and proposed bottom towed fishing gear closure areas within Chesil Beach and Stennis Ledges MCZ, overlaid with DORIS multibeam data. Pink sea-fan presence data was provided by Seasearch diver records and Natural England.

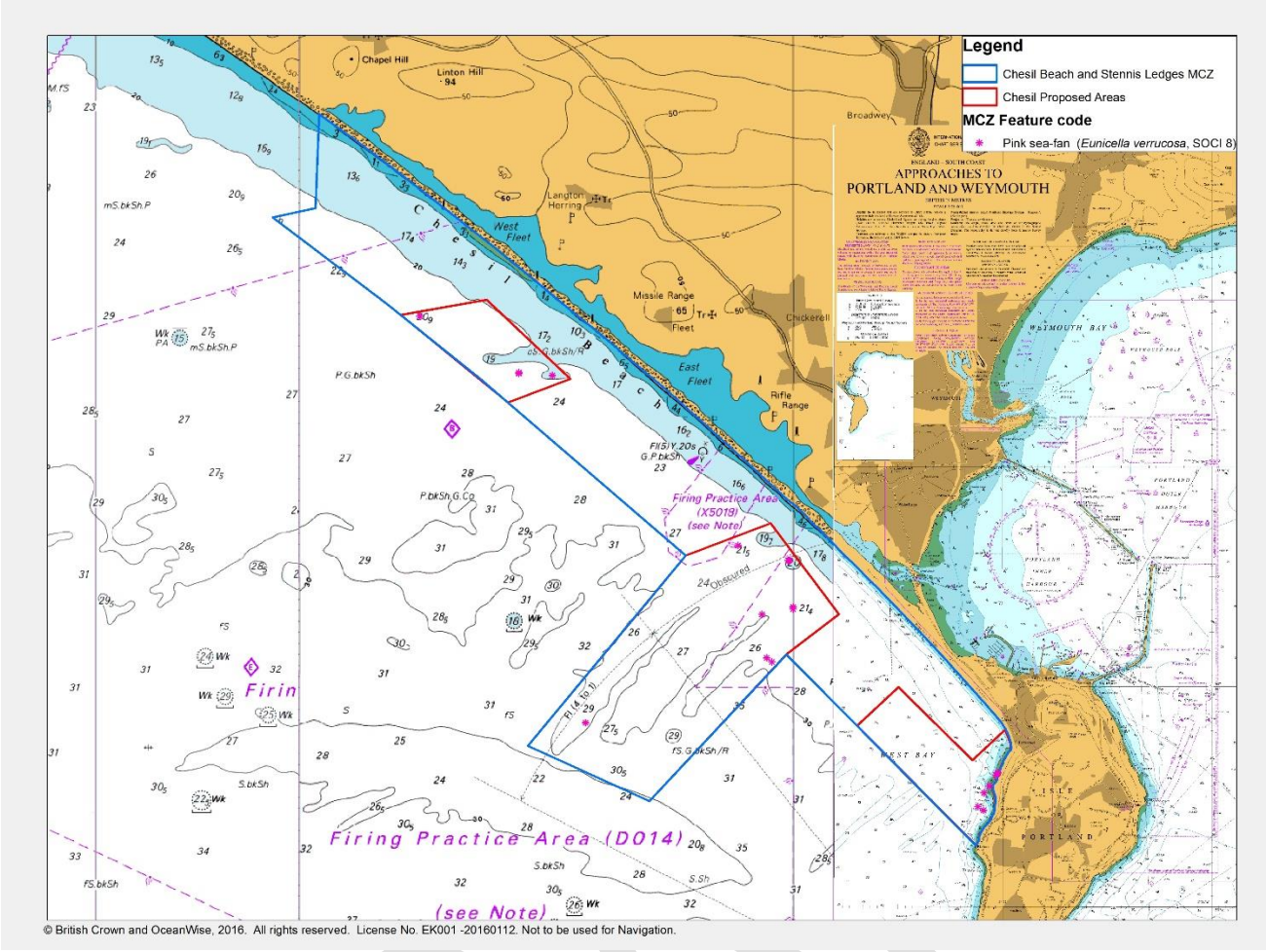

Figure 8. A map showing the location of Pink sea-fan populations and proposed bottom towed fishing gear closure areas within Chesil Beach and Stennis Ledges MCZ. Pink sea-fan presence data was provided by Seasearch diver records and Natural England.

6. Conclusion

In order to conclude whether types of bottom towed fishing gear (scallop dredging and light otter 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 (Pink sea-fan) of 'recover to favourable condition' and the sites conservation objectives, namely:
"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."

The review of the research into the impacts of bottom towed fishing gear (particularly scallop dredging) on Pink sea-fans and over areas of the supporting reef habitat identifies that the activity has the capability to cause both physical and biological disturbance. Physical disturbance can occur through the removal of biogenic structures, damage to soft rock and subsequent habitat homogenisation. Biological disturbance can occur through the mortality, damage and removal of epifaunal species, predomiantly erect and large sessile species which are often fragile and long-lived. As such, the recovery of Pink sea-fans and their supporting reef habitat is considered to be in excess of 5 years. It is therefore recognised that the activities have the potential to pose a significant risk upon the following Pink sea-fan attributes:

- Population: population size
- Presence and spatial distribution of the species
- Supporting habitats: extent and distribution (a relevant attribute for Native oysters also)

The likelihood and magnitude of impacts associated with bottom towed fishing gear upon these attributes will be determined by the following variable:

I. Number of vessels participating
II. Location of bottom towed fishing gear activity
III. Timing and duration of bottom towed fishing gear activity
IV. Sensitivity of Pink sea-fans and their supporting habitat to the impacts of bottom towed fishing gear
V. Ability of Pink sea-fans and their supporting habitat to recover from the impacts of bottom towed fishing gear

Additionally, the location, timing, duration and intensity of bottom towed fishing gear within the site will be influenced by existing management measures (section 4.5) and/or those being developed to mitigate against the significant risk posed by the activities.

Having reviewed a wide range of evidence, including scientific literature, IFCO knowledge, habitat feature mapping (including bathymetric data), it has been concluded that bottom towed fishing gear is likely to pose a significant risk to Pink sea-fans and their supporting habitat within the Chesil Beach and Stennis Ledges MCZ. The rationale for this conclusion is summarised below:

- IFCO knowledge indicates the number of vessels scallop dredging and light otter trawling within the MCZ is relatively low, with both activities occurring for limited periods during any one year depending on the season (light otter trawling) or weather (scallop dredging). There is the potential however for a relatively large number of vessels (up to 10) to scallop dredge within the site.
- Scallop dredging is the main threat to Pink sea-fans due to the focus over rocky reef habitats, whilst light otter trawling is known to fringe areas of rocky reef habitat.
- A review of scientific literature demonstrated a lack of widespread damage on structural and potentially vulnerable species as a result of scallop dredging during experimental studies. This is thought to be because the uneven nature and lack of continuous contact with the substrate, however damage is likely to be incremental in nature; increasing with the number of repeated tows. A lack of fishing impact studies on light otter trawling over rocky reef habitats were found, although impacts are likely to be similar in nature to scallop dredging.
- Sensitivity of Pink sea-fans to pressures associated with bottom towed fishing gear is high.
- Recovery of reef habitats, similar to those found in the MCZ, are predicted to be in excess of 5 years.
- It is acknowledged that scallop dredgers within the site have demonstrated the industry's responsible approach to Marine Protected Area management through a successful voluntary

agreement preventing scallop dredging over Stennis Ledges, which covers a relatively large area of the site.

- Upon the provision of additional evidence, including conservation advice for the site, bathymetric data and up to date habitat maps, Southern IFCA feel it is now appropriate for refinement to the spatial extent of the closure and inclusion of other bottom towed gear types (i.e. trawling). This is to support the general management approach to 'recover' the Pink sea-fan (and its supporting habitat) to a favourable condition.
- The primary reason for management is to protect Pink sea-fans and their supporting habitat and by virtue this corresponds with the supporting subtidal rock habitat of the Native oyster. It is important to note that there are uncertainties surrounding the spatial distribution and abundance of the Native oyster within the Chesil Beach and Stennis Ledges site.

In summary, it has been concluded that bottom towed fishing gear will not pose a significant risk to the achievement of sites conservation objectives to 'recover' Pink sea-fans to favourable condition with the introduction of proposed bottom towed fishing gear management measures. Southern IFCA must seek to ensure that the conservation objectives of any MCZ in the district are furthered.

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Annex 1. Broadscale Habitat Map for Chesil Beach and Stennis Ledges MCZ. Source: Chesil Beach and Stennis Ledges MCZ Post-survey Site Report 2015.

SIFCA Reference: SIFCA/MCZ/

Annex 2. Initial screening of commercial fishing activities which take place in the Chesil Beach and Stennis Ledges 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)	N	Currently does not occur. Last known occurrence was 6 years ago.	Local IFCO.	**Y**	**Previously known to occur and suitable trawl ground because of substrate type and species known to occur i.e. flatfish. Having said this, with the loss of boats with grandfather rights (i.e. boats above 12 m which are capable of deploying larger gear such as beam trawls) in the district, the activity is not anticipated to occur in foreseeable future.**	N	

		Beam trawl (shrimp)	N		Local IFCO.	**N**	**Target species does not occur.**	N	
		Beam trawl (pulse/wing)	N		Local IFCO.	**N**	**Prohibited via Electric fishing byelaw.**	N	
		Heavy otter trawl	N		Local IFCO.	**Y**	**The activity has the potential to occur but is not anticipated to due loss of boats with grandfather rights (i.e. boats above 12 m which are capable of deploying larger gear such as heavy otter trawls) and lack of historical heavy otter trawling within the site.**	N	
		Multi-rig trawls	N		Local IFCO.	**N**	**It not likely to occur as it has not occurred historically. Limited potential and not anticipated to occur for multi-rig set up due to size and power of vessel needed.**	N	

		Light otter trawl	Y	Currently four vessels. Regular activity (every couple of weeks) - seasonal - winter months. Approx. 20 - 30 instances a year of trawling within the site overall - 4 hours per day. Fishing over coarse and mixed sediments, potentially fringing rocky/cobbly areas. Corridor adjacent to Chesil Beach. Target species - flatfish, skates and rays.	Local IFCO.	**N/A**	**Activity is known to occur.**	Y	High
		Pair trawl	N		Local IFCO.	**N**	**Not anticipated to occur and very limited potential due to restricted area of the site to accommodate for two vessels.**	N	

		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 very 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.**	N	

		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 very 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.**	N	
Pelagic towed fishing gear	**Towed (pelagic)**	Mid-water trawl (single)	N		Local IFCO.	**Y**	**Activity has the potential to occur however this gear type does not come into contact with the seabed and therefore there is no chance for interaction with designated features.**	N	

		Mid-water trawl (pair)	N		Local IFCO.	**Y**	**Activity has the potential to occur however this gear type does not come into contact with the seabed and therefore there is no chance for interaction with designated features. Also very limited potential due to the restricted area of the site to accommodate for two vessels.**	N	
		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.**	N	
Bottom towed fishing gear	**Dredges (towed)**	Scallops	Y	Potential for up to ten vessels to operate within the site. Currently three vessels operate within the site but within the last three years	Local IFCO.	**N/A**		Y	High

				a successful voluntary agreement has prevented fishing over Stennis Ledges. Areas where the vessels do fish include Chesil Cove and small area of reef in the western end of the site. Target species are the king scallop (*Pecten maximus*). Sporadic activity at any time of year - can be up to two weeks at a time, up to five times a year for all vessels - approximately 10 weeks a year. Predominantly in periods of easterley/ north easterley winds when vessels are sheltered by Chesil Beach and Portland.					

		Mussels, clams, oysters	N		Local IFCO.	**N**	**Target species do either not occur within the site or do not occur in commercial viable population.**	N	
		Pump scoop (cockles, clams)	N		Local IFCO.	**N**	**Site is too deep and the substrate is unsuitable for fishing method.**	N	
Suction	**Dredges (other)**	Suction (cockles...)	N		Local IFCO.	**N**	**Suction dredging for cockles, clams, mussels and oysters is prohibited (by default) in the Southern IFCA district (by Southern IFCA byelaws).**	N	
Tractor		Tractor	N		Local IFCO.	**N**	**No access and substrate is unsuitable.**	N	
Intertidal work	**Intertidal handwork**	Hand working (access from vessel)	N		Local IFCO.	**N**	**Unsuitable substrate for fishing and as supporting habitat for target species.**	N	
		Hand work (access from land)	N		Local IFCO.	**N**	**Unsuitable substrate for fishing and as supporting habitat for target species.**	N	

Static - pots/traps	**Static - pots/traps**	Pots/creels (crustacea/gastropods)	Y	Approximately six vessels, small under ten metres (three under 8 m), operating all year. Light to medium intensity - no more than 1000 parlour pots all year round and 1000-2000 whelk pots in the winter/spring within the site. Activity occurring in Chesil Cove and over Stennis Ledges. Regular activity. Target species include European lobster and brown crab. 24 to 72 hour soak period.	Local IFCO.	**N/A**		Y	Medium
		Cuttle pots	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur. The presence of cuttle fish within this area is unknown.**	N	

		Fish traps	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur. No known target species within the site.**		
Demersal nets/lines	**Static - fixed nets**	Gill nets	Y	Mainly use gill and trammel nets. Approximately three boats are known to go netting. Activity of the vessels is seasonal - summer and autumn. Targeting flatfish, skates and rays. Activity occurs throughout the site but concentrated in areas of subtidal mixed/coarse sediment. Nets will be worked over a tide with a one or two day lay.	Local IFCO.	**N/A**		Y	Medium
		Trammels	Y	See above.	Local IFCO.	**N/A**		Y	Medium
		Entangling	Y	See above.	Local IFCO.	**N/A**		Y	Medium

Pelagic nets/lines	**Passive - nets**	Drift nets (pelagic)	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur.**	N	
Demersal nets/lines		Drift nets (demersal)	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur.**	N	
	Lines	Longlines (demersal)	N		Local IFCO.	**Y**	**It is likely the activity has taken place in the past but is not currently known to occur. It has the potential to occur in the future.**	Y	Medium
Pelagic nets/lines		Longlines (pelagic)	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur.**	N	

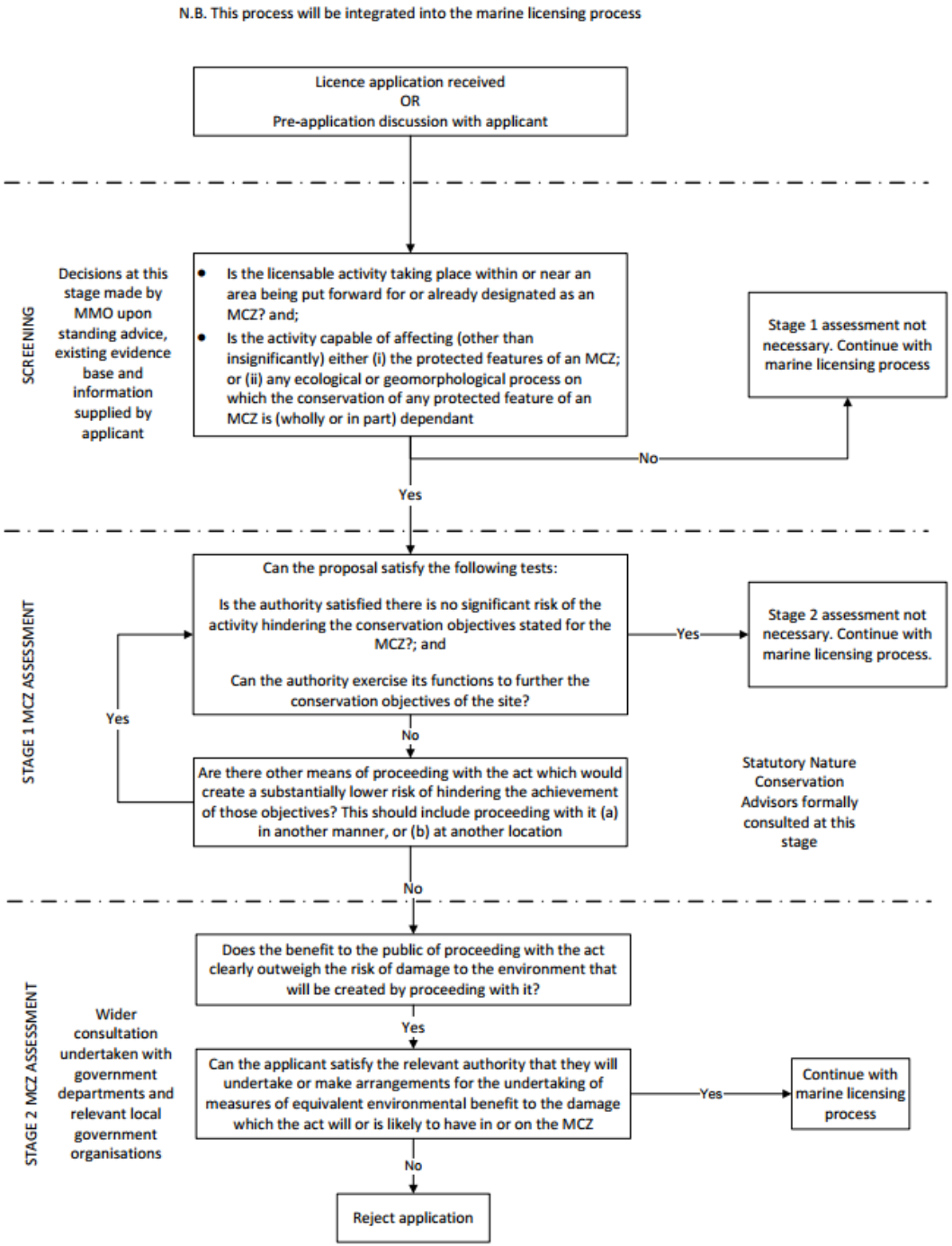
		Handlines (rod/gurdy etc)	Y	Up to approximately five vessels at any one time, including recreational and commercial operators. Activity is undertaken throughout the year, particularly in the autumn. Target species include bass. Activity is generally concentrated around wrecks.	Local IFCO.	**N/A**	**Activity is known to occur however this gear type does not come into contact with the seabed and therefore there is no chance for interaction with designated features.**	N	
		Jigging/trolling	Y	See above.	Local IFCO.	**N/A**	**See above.**	N	
Purse seine	**Seine nets and other**	Purse seine	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur.**	N	
Demersal nets/lines		Beach seines/ring nets	Y	One vessel operating one to two times a year from Chesil Beach at various access points. Target species include mackerel and sprats. Gear is deployed using a rowing boat.	Local IFCO.	**N/A**		Y	Low

Miscellanous		Shrimp push-nets	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur. The target species of the activity does not occur within the site. No suitable area or access to allow the activity to occur from.**	N	
EA Only		Fyke and stakenets	**EA Only**	**EA Only**	**EA Only**	**EA Only**	**EA Only**	**EA Only**	**EA Only**
Miscellanous	**Miscellaneous**	Commercial diving	N		Local IFCO.	**Y**	**Activity has not historically occurred but has the potential to occur over circalittoral rock habitats for king scallops (*Pecten maximus*).**	Y	Low

Bottom towed fishing gear		Bait dragging	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur. The substrate present is not suitable for the activity to take place. As such, the target species are also not present.**	N	
Miscellanous		Crab tiling	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur. There are not suitable areas for the activity to take place.**	N	
Intertidal work	**Bait collection**	Digging with forks	N		Local IFCO.	**N**	**Activity has not historically occurred within the site and is not anticipated to occur. There are not suitable areas for the activity to take place, the substrate is unsuitable and as such the target species**	N	

							is not present within the site.		

Annex 3. Summary of MMO assessment process for MCZs


N.B. This process will be integrated into the marine licensing process
Licence application received
OR
Pre-application discussion with applicant
SCREENING
Decisions at this stage made by MMO upon standing advice, existing evidence base and information supplied by applicant
Is the licensable activity taking place within or near an area being put forward for or already designated as an MCZ? and;
Is the activity capable of affecting (other than insignificantly) either (i) the protected features of an MCZ; or (ii) any ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependant
Stage 1 assessment not necessary. Continue with marine licensing process
No
Yes
STAGE 1 MCZ ASSESSMENT
Can the proposal satisfy the following tests:
Is the authority satisfied there is no significant risk of the activity hindering the conservation objectives stated for the MCZ?; and
Can the authority exercise its functions to further the conservation objectives of the site?
Yes
Stage 2 assessment not necessary. Continue with marine licensing process.
Yes
No
Are there other means of proceeding with the act which would create a substantially lower risk of hindering the achievement of those objectives? This should include proceeding with it (a) in another manner, or (b) at another location
Statutory Nature Conservation Advisors formally consulted at this stage
No
STAGE 2 MCZ ASSESSMENT
Wider consultation undertaken with government departments and relevant local government organisations
Does the benefit to the public of proceeding with the act clearly outweigh the risk of damage to the environment that will be created by proceeding with it?
Yes
Can the applicant satisfy the relevant authority that they will undertake or make arrangements for the undertaking of measures of equivalent environmental benefit to the damage which the act will or is likely to have in or on the MCZ
Yes
Continue with marine licensing process
No
Reject application

Annex 4. Summary of Natural England's Advice on Operations for commercial fishing activities in Chesil Beach & Stennis Ledges MCZ

Activity	Pressure	Habitats				Species		Risk profile
		High energy infralittoral rock	High energy intertidal rock	Intertidal coarse sediment	Subtidal coarse sediment	Native oyster (Ostrea edulis)	Pink sea-fan (Eunicella verrucosa)	
Demersal trawl	Above water noise							Low
Demersal trawl	Abrasion/disturbance of the substrate on the surface of the seabed	S		NS	S	S	S	Medium-high
Demersal trawl	Changes in suspended solids (water clarity)	S		NS	S	NS	NS	Medium-high
Demersal trawl	Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)							Low
Demersal trawl	Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)							Low

Demersal trawl	Deoxygenation	IE		NS	NS	NS	NS	Low
Demersal trawl	Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS		NS	NS	NS	IE	Low
Demersal trawl	Introduction of light							Low
Demersal trawl	Introduction or spread of non-indigenous species	S		IE	IE	S	S	Low
Demersal trawl	Litter	IE		IE	IE	IE	IE	Low
Demersal trawl	Nutrient enrichment	NS		IE	NS	NS	NS	Low
Demersal trawl	Organic enrichment	S		IE	S	NS	NS	Low
Demersal trawl	Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	S		NS	S	S	S	Medium-high
Demersal trawl	Physical change (to another seabed type)	S		S	S	S		Low
Demersal trawl	Removal of non-target species	S			S	S		Medium-high
Demersal trawl	Removal of target species							Medium-high

Demersal trawl	Siltation rate changes (Low), including smothering (depth of vertical sediment overburden)	S		S	S	S	S	Medium-high
Demersal trawl	Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS		IE	NS	NS	IE	Low
Demersal trawl	Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS		IE	NS	NS	IE	Low
Demersal trawl	Underwater noise changes							Low
Demersal trawl	Visual disturbance							Low
Dredges	Above water noise							Low
Dredges	Abrasion/disturbance of the substrate on the surface of the seabed	S		NS	S	S	S	Medium-high
Dredges	Changes in suspended solids (water clarity)	S		NS	S	NS	NS	Medium-high
Dredges	Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)							Low
Dredges	Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)							Low
Dredges	Deoxygenation	IE		NS	NS	NS	NS	Low

Dredges	Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS		NS	NS	NS	IE	Low
Dredges	Introduction of light							Low
Dredges	Introduction of microbial pathogens	IE		IE		S		Low
Dredges	Introduction or spread of non-indigenous species	S		IE	IE	S	S	Low
Dredges	Litter	IE		IE	IE	IE	IE	Low
Dredges	Nutrient enrichment	NS		IE	NS	NS	NS	Low
Dredges	Organic enrichment	S		IE	S	NS	NS	Low
Dredges	Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	S		NS	S	S	S	Medium-high
Dredges	Physical change (to another seabed type)	S		S	S	S		Low
Dredges	Removal of non-target species	S			S	S		Medium-high
Dredges	Removal of target species	NA			NA	S		Medium-high

Dredges	Siltation rate changes (Low), including smothering (depth of vertical sediment overburden)	S		S	S	S	S	Medium-high
Dredges	Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS		IE	NS	NS	IE	Low
Dredges	Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS		IE	NS	NS	IE	Low
Dredges	Underwater noise changes							Low
Dredges	Visual disturbance							Medium-high

Legend:

S	Sensitive
NS	Not sensitive at this benchmark
IE	Insufficient evidence to assess
NA	Not applicable
	Not relevant

Annex 5. Letter sent to stakeholders (On 25th February 2013) asking all vessels to avoid scallop dredging within Stennis Ledges.

Dear Stakeholder

Scallop Dredging on Stennis Ledges

The Chesil Beach and Stennis Ledges site has been proposed for designation in the first tranche of Marine Conservation Zone (MCZ) sites. The pink sea-fan (*Eunicella verrucosa*) is a feature of conservation interest (FOCI) for the site and its recommended conservation objective is recover.

Industry representatives were fully involved throughout the MCZ process and Southern IFCA understands that the Chesil Beach and Stennis Ledges site boundary was chosen with consideration for scallop dredging activity close to the Stennis Ledges. More information on the MCZ consultation can be found at: www.defra.gov.uk/consult/2012/12/13/marine-conservation-zones-1212/.

Southern IFCA officers observed scallop dredging taking place within the Stennis Ledges section (see co-ordinates below) of the proposed MCZ on Friday 22nd February 2013. As a consequence of this recent activity Southern IFCA feels that the integrity of the Stennis Ledges section of the proposed MCZ is at high risk due to the low resilience of pink sea-fans (*Eunicella verrucosa*) to scallop dredging[1].

Due to the high risk to the Stennis Ledges area Southern IFCA is asking **all vessels to avoid scallop dredging activity within the Stennis Ledges** section of the proposed Chesil Beach and Stennis Ledges MCZ, the boundary of which is formed by a line joining the following co-ordinates:

50° 35.685’N 002° 30.061’W;
50° 34.936’N 002° 28.850’W;
50° 34.296’N 002° 30.096’W;
50° 32.958’N 002° 32.064’W;
50° 33.462’N 002° 33.810’W;
50° 35.196’N 002° 31.548’W.

For MCZs proposed for designation in 2013, DERFA considers it wise that public authorities follow the precautionary principle and take the potential MCZ into account when considering licensing decisions and their other regulatory functions.

Southern IFCA is working with the Marine Management Organisation (MMO) and Natural England (NE) to develop a satisfactory outcome to this issue. Should scallop dredging continue within this area Southern IFCA and the MMO would have no option but to introduce emergency legislation to prohibit the use of demersal towed gear within the site.

Southern IFCA recognises the good work of the local scallop dredging vessels in responsibly avoiding sensitive reefs and other features in Lyme Bay and hopes that the industry can continue working with regulators to manage fishing activity with minimal socio-economic impacts.

Yours Sincerely

Simon Pengelly

Simon Pengelly
Inshore Fisheries and Conservation Officer

[1]Kaiser, M.J. & Spencer, B.E. (1996). The effects of beam-trawl disturbance on infaunal communities in different habitats. *Journal of Animal Ecology,* 65: 348-358.

Annex 6: Map of Voluntary Closed Area (to Scallop Dredging) over Stennis Ledges