

Appendix C: Habitat Risk Assessment Executive Summary

This Appendix is provided in support to the following report:

Marine Planning Consultants Ltd. (2014). Lyme Bay Fisheries and Conservation Reserve: Integrated Fisheries Management Plan. A report produced for the Lyme Bay Fisheries and Conservation Reserve Working Group, UK.

The report, submitted 18/09/2014, addresses comments made by the wider Lyme Bay Fisheries and conservation Reserve Working Group at a Workshop 09/09/2014.

Executive Summary

Overview

The Lyme Bay study area sits within the 'Jurassic Coast' World Heritage Site, an area famed for its abundant fossils and varied coastal geomorphology. In addition the offshore environment is known nationally for its extensive subtidal reefs, attracting highly abundant and diverse wildlife. The project Area of Interest (AOI) extends down to 30m in depth and is almost exclusively in the 'photic' zone, i.e. the upper layer where a good level of light reaches the seabed to support species growth, particularly macro algae.

Conservation

To date a wealth of studies have focused on the impact of fishing activities on conservation features in Lyme Bay. Attention has been targeted on conservation features at the seabed, primarily those features protected by the candidate Special Area of Conservation (cSAC) that have been proposed under the Habitats Directive (92/43/EEC), i.e. the Lyme Bay and Torbay cSAC¹. As mapped in the main report (**Figure 1**), this cSAC protects Annex I reefs which, for the Lyme Bay part of the cSAC, includes bedrock reef and stony reef (Natural England, 2013). This designation means that evidence exists to support that the Lyme Bay reefs and are worthy of protecting in the national context. This considers their contribution to the wider reef network, its condition and diversity, ensuring that the UK government fulfils its requirements under the Habitats Directive. In the case of Lyme Bay other features were not selected for designation either because they were not the best examples nationally and had been covered elsewhere at other sites (Natural England, 2010).

In addition to the location specific cSAC designation, a number of other habitats and species in Lyme Bay are listed to have conservation status. These originate from both national and international legislation, as identified through the JNCC conservation designations for UK taxa², including:

- International Union for Conservation of Nature Red List (2013.v1)
- European Commission - Convention on International Trade in Endangered Species (12.06.2013)
- EU Habitats Directive
- OSPAR (Convention for the Protection of the Marine Environment of the North-East Atlantic) List of threatened and / or declining species and habitats
- Bern Convention

¹ Whilst commonly stated as a cSAC, at present this is actually a Site of Community Importance (CSI), which is a site that has been adopted by the European Commission but not yet formally designated by the government. However to avoid any misunderstandings, the term cSAC has been used within this report.

² <http://jncc.defra.gov.uk/page-3408>

- Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals (CMS))
- English Natural Environment and Rural Communities List
- Wildlife and Countryside Act 1981
- UK Conservation Status (Rare and Scarce)
- UK Conservation Status (Birds)

Due to the number of different conservation status / legislation of habitats and species, the management put in place for these differ in nature and the public bodies responsible. For European Marine Sites (EMS) the legal duty of the IFCA and MMO is strictly adhered to in management of the cSAC, i.e. the designated subtidal reefs in Lyme Bay. However other lists and conventions (e.g. Bern Convention, Bonn Convention, IUCN Red List) are generally high level and designed to feed into national legislation such as designation of European Marine Sites.

Aside from the designated cSAC Annex I reef, it is possible for legal offences to occur within the project Area of Interest under the Wildlife and Countryside Act 1981, the Natural Environment and Rural Communities Act 2006 (both national law) and The Conservation of Habitats and Species Regulations 2010 (National Law) which implements the EU Habitats Regulations 2010[2] (European law). These state various offences regarding listed species, including: deliberate capture, injuring or killing; intentional or reckless disturbance and impairment of its functions; taking or destruction of eggs; damage or destruction of a breeding site/resting place; and keeping/transporting/selling/exchanging. For a full understanding of offences the actual text of each statutory Act or Regulation should be referred to.

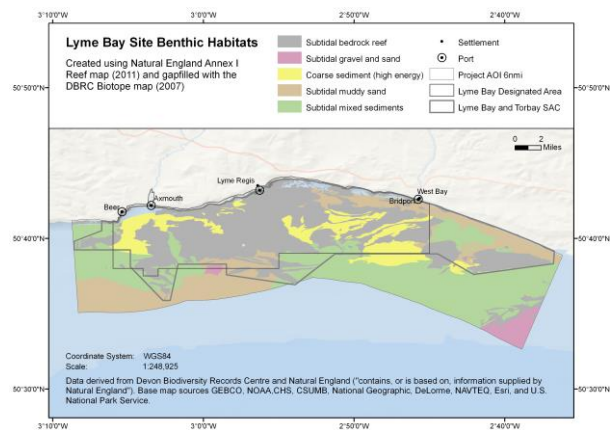
In addition most of the cSAC area is protected by the Designated Area (Fishing Restriction) Order 2008 (**Figure C1**) which prohibits dredging for shellfish and demersal trawling; but other areas have also been mapped as sensitive within the cSAC³ and area addressed by IFCA Byelaws.

Habitats

The Lyme Bay AOI, up to 6nm offshore from the east Devon and west Dorset coast, is famed for the extensive subtidal reefs, distributed across an area of approximately 25nm alongshore. Within this region the reefs account for a large proportion of the total area, providing a rich ecosystem comprising of outcropping bedrock reef (including igneous, chalk, mudstone and limestone) as well as pebble/cobble/boulder reef. In-between the reefs are pockets of what is generally coarse sediment; and around the periphery of the general reef area, mixed sediments and muddy sands, as well as gravel and sand further offshore. These sediments are understood to originate from the quaternary period.

³http://webarchive.nationalarchives.gov.uk/20140108121958/http://www.marinemanagement.org.uk/protecting/conservation/documents/lyme_bay/prohibited_sensitive_a.pdf

Figure C1: Combined habitat map (NE Annex I Reef and DBRC Biotope maps) (All figures in this section are thumbnail images, see following sections for full resolution.)



Species

The reefs attract a large number of benthic and epibenthic species seeking habitat, food and protection, such as hydroids, algae, sponges and corals, including the iconic pink sea-fan. In addition, this area is visited by marine mammals such as bottlenose dolphins and diving seabirds. As such Lyme Bay has been named as a marine biodiversity ‘hotspot’ (Hiscock and Breckels, 2007). The available data sourced in this project accounted for a total of 951 benthic species, 251 algae and lichen species, 80 fish species, 6 cetaceans, 3 turtles and 55 seabirds to use the Lyme Bay AOI⁴. The full species inventory has been cross-checked against all of the conservation legislation and protected status lists which are applicable to the AOI.

A selection of those species with conservation status are shown mapped in **Figure C2**, including Ross Worm *Sabllaria spinulosa*, Honeycombe Worm *Sabellaria alveolata*, Native Oyster *Ostrea edulis*, Maerl species *Lithothamnion* and *Phymatolithon*, Ocean Quahog *Arctica islandica*, Blue Mussel Beds *Mytilus edulis*, the Pink Sea-fan *Eunicella verrucosa*, Sea-fan anemone *Amthianthis doreni* and the Sea Slug *Tritonia nisodhneri*. These species with conservation status were selected for the risk assessment where associated records were relatively recent and had more than 1 or 2 recordings, to inform the risk assessment.

Fish and marine mammals of conservation importance and with the greatest evidence documented included Atlantic Cod, Whiting, Plaice, Sole, Basking Shark, Common Dolphin, Harbour Porpoise, Bottlenose dolphin and Grey Seal; while for birds these included a much larger number of surface feeding and pursuit and plunge birds, for example the Common Guillemot and Great Cormorant⁵. For birds, their use of habitat in the Lyme Bay marine area is shown from calculating their foraging distance from known breeding/territory sites and/or Special Protection Areas, as in **Figure C2**. However for fish and marine mammals, for the purposes of the risk assessment, it was assumed they have full coverage across the whole AOI due to their high mobility.

⁴ Sourced from all publically available data identified including the Devon Biodiversity Records Centre, the NBN Gateway / JNCC, Seasearch, Bangor University, Marine-LIFE and the University of St Andrews.

⁵ Full Latin names of mobile species are provided in **Appendix D** and **J**.

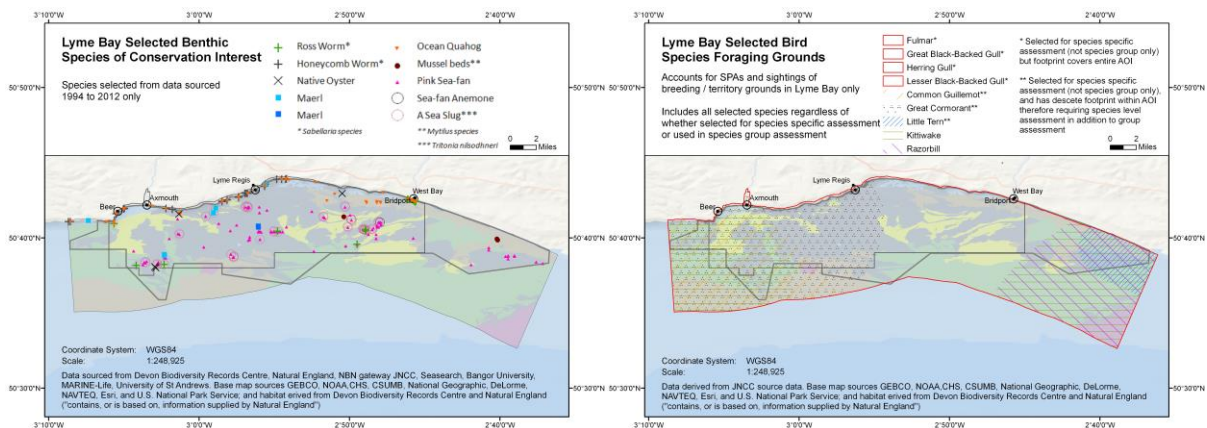


Figure C2: Location of benthic species and birds selected for risk assessment (common names)⁶.

Fishing activity

As the Lyme Bay AOI is predominantly used by the under 12m fishing vessel fleet and these vessels are not required to operate vessel positioning equipment by law (unless to use bottom towed gear in protected areas), there is no continuous record of fishing activities in the area. Spatial use of the area is instead informed from sightings and questionnaires, albeit with certain uncertainties relating to patrol effort and sample size / bias respectively.

In broad terms, as informed through questionnaire data collected by the Southern IFCA, bottom towed gear are operated throughout the outside of the Designated Area / cSAC. In decreasing order of intensity these include dredging, then trawling. However the sightings data⁷ indicate that these activities are somewhat focused on the outside perimeter of the closed Designated Area. This is particularly evident on the south-east where reefs extend beyond the Designated Area, suggesting gravitation towards the richer wildlife found here; and the west.

Non-towed gears are used mostly throughout the AOI with a certain focus on the reefs, such as potting (including cuttle potting and whelking) and rod and line. Whelking whilst also taking place throughout the AOI has conflicting spatial footprints, with the questionnaire data indicating slight focus on the eastern reefs; whilst the sightings data indicate greater attraction to the offshore environment and around the perimeter (both inside and outside) of the Designated Area. It is possible this may be caused by a focus of patrol effort on this boundary.

Lastly, diving is focussed on the general reef area and is not reported in some areas offshore.

⁶ Note only the benthic species Pink Sea-fan *Eunicella verrucosa* and sea slug *Tritonia nilsodhneri* were selected for 'Tier 1' assessment for risk. Also note areas of bird's habitat were calculated by foraging distances. These maps show only those species that carry conservation status (see later sections).

⁷ Processed by MPC for February 2010 to November 2013, see **Appendix D** for further information.

Approach to risk assessment

The primary focus of the risk assessment was to establish and map areas that are vulnerable to fishing activities to inform management of fishing activity. This relied on the spatial mapping of each of the habitats and species and fishing activities using the best available information (**Appendix A** and **B**); and assessing where these coincide, or overlap. Our approach closely followed that adopted by the statutory revised approach to management of commercial fisheries in European Marine Sites (EMS) in England (EC 2012, NE 2013), which is currently being implemented by IFCA for the Lyme Bay cSAC. However we looked beyond these legal duties to also assess habitats and species that are not specifically designated in Lyme Bay yet are listed to have conservation status both nationally and internationally. Habitats and species selection was otherwise based on spatial evidence acquired (as demonstrated in the previous section); and strength of evidence. Those put forward were then divided into two 'Tiers' based on the strength of evidence, with Tier 1 as

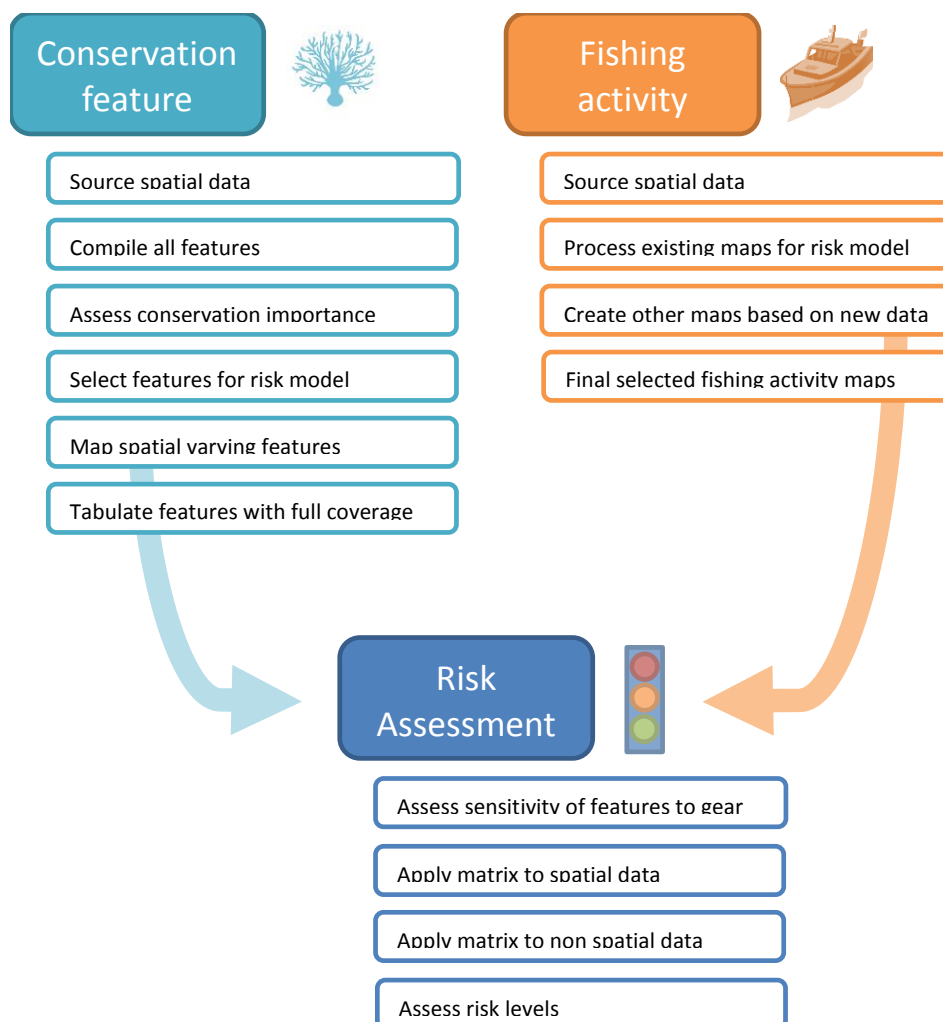


Figure C3: Overview of processes taken in the habitat risk assessment

strong evidence and Tier 2 as weak. However Tier 2 features were considered important to include as evidence may be low due to their rarity in current times. Final selected species are shown below in **Figure C4**.

The risk assessment was focused on development of a risk matrix that provides the level of risk to features if they are exposed to fishing activity pressure. Building on work carried out previously for the revised approach to management of commercial fisheries in European Marine Sites (EMS) in England, our project further extended this matrix beyond EMS management to account for the additional conservation species selected for assessment in this project. It also simplified some of the fishing activity types due to the resolution of data acquired. Where species were selected but were not included in the EMS matrix, a category of risk was assigned based on extensive literature review. The resulting matrix is shown in **Table C1**.

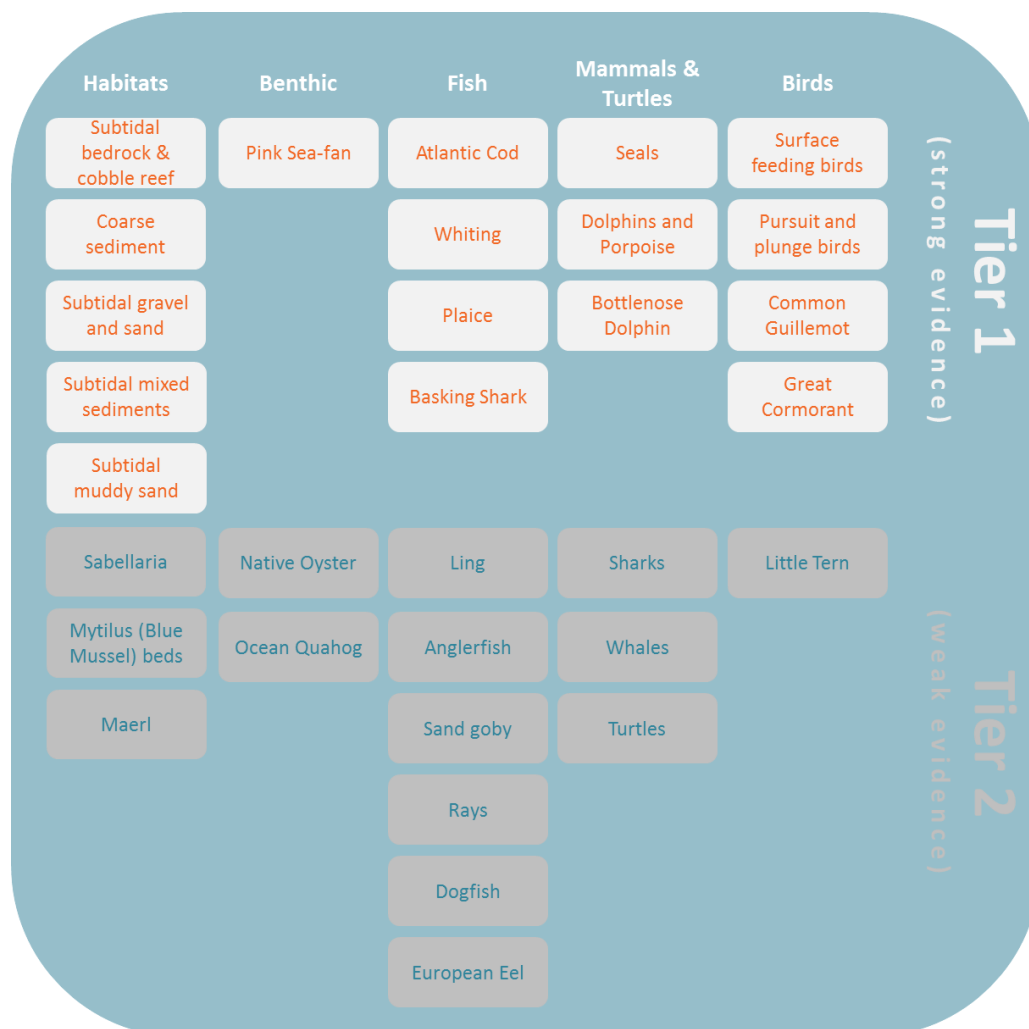


Figure C4: Species selected for Risk Assessment

Note that only those bird species that were shown to have as discrete spatial footprint covering the Project AOI are shown, those with full coverage are shown in groups as surface feedings birds or pursuit and plunge birds.

Table C1: The Lyme Bay Risk Matrix

			Trawling	Dredging	Scalloping	Potting	Cuttle potting	Whelking	Crabbing	Netting	Diving		
Full coverage map	Habitat	Coarse sediment (high energy)	Orange	Orange	Orange	Green	Green	Green	Green	Green	Green		
		Subtidal sand (high energy)	Orange	Orange	Orange	Green	Green	Green	Green	Green	Green		
		Subtidal mixed sediments	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green		
		Subtidal gravel and sand	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green		
		Subtidal muddy sand	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green		
		Subtidal mud	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green		
		Brittlestar beds	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green		
		Subtidal bedrock reef	Red	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange		
		Subtidal boulder and cobble reef	Red	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange		
Point locations	Benthic	Sabellaria spp reef	Red	Red	Red	Orange	Orange	Orange	Orange	Orange	Orange		
		Maerl	Red	Red	Red	Orange	Orange	Orange	Orange	Orange	Green		
		Mytilus beds	Red	Red	Red	Orange	Orange	Orange	Orange	Orange	Green		
		Pink Sea-fan	Red	Red	Red	Orange	Orange	Orange	Orange	Orange	Green		
		Native oyster	Red	Red	Red	Orange	Orange	Orange	Orange	Orange	Green		
Assumed to cover the whole AOI	Fish	Ocean quahog	Orange	Red	Red	Orange	Orange	Orange	Orange	Orange	Green		
		Sharks	Red	Red	Red	Green	Green	Green	Green	Red	Green		
		Rays	Red	Red	Red	Orange	Orange	Orange	Orange	Red	Green		
		Dogfish	Red	Red	Red	Orange	Orange	Orange	Orange	Red	Green		
		Basking Shark	Red	Orange	Orange	Orange	Orange	Orange	Orange	Red	Green		
		European Eel	Red	Orange	Orange	Orange	Orange	Orange	Orange	Red	Green		
		Cod	Red	Orange	Orange	Orange	Orange	Orange	Orange	Red	Green		
		Whiting	Red	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green		
		Ling	Red	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green		
		Anglerfish	Red	Red	Red	Orange	Orange	Orange	Orange	Orange	Green		
		Sand goby	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green		
		Plaice	Red	Red	Red	Orange	Orange	Orange	Orange	Red	Green		
		Mammals & Turtles	Grey and Common Seal	Orange	Blue	Blue	Orange	Blue	×	×	×	Blue	
			Dolphins & Porpoise	Orange	Orange	Orange	Green	Green	Green	Green	Red	Green	
			Bottlenose Dolphin	Red	Orange	Orange	Green	Green	Green	Green	Red	Green	
			Whales	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green	
			Turtles	Orange	Orange	Orange	Green	Green	Green	Green	Red	Green	
		Foraging distance	Birds	Surface feeding birds	Green	Blue	Blue	Orange	Blue	×	×	×	Blue
				Pursuit and plunge diving birds	Orange	Blue	Blue	Orange	Blue	×	×	×	Blue

Notes:

- a) High risk = red (score of 3), medium risk = amber (2), low risk = green (1), no risk = blue (0).
- b) Blue text is shown for species added by this project since the EMS risk matrix was developed by the Government
- c) Habitats and species are highlighted as light grey for Tier 1 species taken forward to risk assessment; and dark grey for Tier 2 where spatial evidence was weaker
- d) Due to the different types of fishing gears provided in the source data and the use of more than one source in the assessment, there is some overlap between gear types.

Outcomes of risk assessment

Habitats

Of all the habitats assessed, only Annex I reefs are designated for the site. All habitats were included however to provide a full coverage assessment and inform any future assessment of species' feeding grounds.

A baseline risk assessment was carried out for habitats where it was assumed for each fishing activity that it takes place across the entire AOI. This helps inform future management without prejudice to just those areas that are fished today or any biases in the methods used to collect locational fishing data. The highest risk (RED) was found in the Designated Area where the reefs mostly occur, for towed bottom gear (trawling, dredging/scalloping); however this is mitigated by ban of such activities by current legislation for the area. For the remainder of gears almost full coverage medium (AMBER) risk is indicated between potting and diving activities, should these take place.

Considering where fishing activity takes place currently does, however, help identify those areas we can be more confident in saying there is a real risk occurring now. Based on the 2010/11 Southern IFCA questionnaire fishing activity maps, which have data for the east and middle of the AOI, there are only a minority of areas where trawling and dredging are found to be at high (RED) risk, on the reefs that are not protected by the Designated Area / cSAC to the southeast of the AOI. However the MMO and IFCA sightings based fishing activity data (2010-13) also reveal RED risk areas for these same gears along the outside periphery of the closed areas. As this is primarily an overspill from the Designated Area and as these risk areas are mostly now managed for the AOI as a whole, this is not a major issue, however it does require monitoring to assess scale of pressure from fishing activities (i.e. amount of time fishing takes place). The remainder of the cSAC is otherwise shown to be at AMBER risk wherever fishing data exists (the majority of the area), owing to the same risk assigned to the various substrates found here including muddy sand, gravel and sand, coarse sediment and mixed sediments.

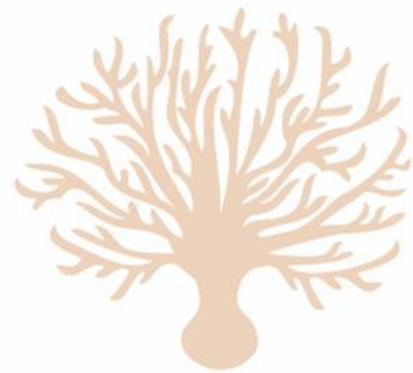
The potting and netting activities from the SIFCA questionnaire data all present an AMBER risk across the AOI for various substrate types (where fishing data is available). With exception to this are areas of coarse sediment which are GREEN (low risk). The sightings data show some emphasis within this pattern towards the offshore area between 3 and 6nm. Diving presents a slightly different pattern with all reef areas at AMBER and some at GREEN, though the more offshore environment has no risk (BLUE). However this represents commercial diving and it is likely to be far less at risk than shown in reality, depending on what divers are targeting within the reef habitats.

Benthic / Epibenthic Species

The only locations found to contain the selected benthic / epibenthic species, given the data available, were within the cSAC. Therefore there is no evidence for selected species being at

risk from towed bottom gear which is restricted here through the Designated Area restrictions and IFCA byelaws for the wider cSAC.

Tier 1 of the selected species, i.e. those with stronger evidence sources including Pink Sea-fan *Eunicella verrucosa* and the sea slug *Tritonia nilsodhneri*, were found scattered around the cSAC on different reef/substrate areas. As the Southern IFCA questionnaire data show the whole cSAC to be used by potting and netting activities, this indicates all locations are at AMBER risk. However the sightings based data indicate no risk to these species, which may (or may not) be owing to the reduced coverage in data from patrol effort and increase from generalising in questionnaire data.



The Pink Sea-fan is part of the Annex I community for which the cSAC is designated; and is separately listed under OSPAR (2008), IUCN Red List, English NERC List, Wildlife & Countryside Act 1981 and lastly the UK Conservation Status (Rare & Scarce) list.

Tier 2 selected species, i.e. those with reduced evidence sources including Sabellaria species *Sabellaria alveolata* and *Sabellaria spinulosa*, Maerl species *Lithothamnion* and *Phymatolithon calcareum*, Native Oyster *Ostrea edulis*, Blue Mussel beds *Mytilus edulis*, Ocean Quahog *Arctica islandica* and Sea-fan Anemone *Amphianthus dohrnii*, again have AMBER risk across the cSAC, but for whelking activities only. The sightings data confines this to a cluster east and southeast or West Bay from the shore and up to 4nm offshore; and a few records west of Lyme Regis, west of Beer and another cluster towards the edge of the south western boundary of the Designated Area. Whilst Maerl, Native Oyster and Ocean Quahog only occur at AMBER risk for up to 3 records / locations each, the potential reef/bed forming species *Sabellaria spinulosa* and *Mytilus edulis* each occur with 24 and 16 records respectively. The relevance of this depends on whether the species are forming reefs/beds here (which is not indicated in the data) as these are of most interest in terms of conservation. However the *Mytilus edulis* species is protected as a singular species. Therefore *Mytilus edulis* is of the highest concern of the Tier 2 benthic and epibenthic species. *Mytilus edulis* is listed on the Habitats Directive, OSPAR (2008) and the English NERC List.

Mobile species: Fish, marine mammals, turtles and birds

Species from each of the bird groups, pursuit & plunge and surface feeding birds, were found to use the whole of the project AOI for foraging. However three individual bird species that fall within these groups were found to have discrete spatial footprints over the western AOI. These included the Common Guillemot, Great Cormorant (both pursuit and plunge), and Little Tern (surface feeder). Risk is therefore slightly increased in the west. The

Common Guillemot and Great Cormorant, both pursuit and plunge birds, have AMBER risk to each of trawling, potting (including cuttle potting, whelking, crabbing) and netting, whilst the Little Tern is a surface feeding bird with the same except trawling and netting drop to a GREEN risk. From overlay with the fishing data, these risk levels were applied to the area between the Designated Order boundary and the offshore 6nm limit according to the SIFCA questionnaire fishing data, with clustering outside of the Designated Area / cSAC boundary for trawling according to the sightings data.

All other mobile species selected through conservation status were assumed to have a spatial footprint across the whole of the AOI, due to lack of data available on spatial preference. At a high level, the gear types most at risk from mobile species are trawling, potting and netting. Species at most risk are Plaice, followed next by Atlantic Cod then Whiting. Lower down the rung are Bottlenose Dolphin and the Dolphins and Porpoise group. Lastly, at the lower end of risk, are Sand Goby, Whales, Seals, pursuit and plunge birds and surface feeding birds.