



**Pre-consultation scientific advice to Defra
from the Joint Nature Conservation
Committee and Natural England on the
ecological merit of the candidate Highly
Protected Marine Areas in English waters**

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Written jointly by the Joint Nature Conservation Committee and Natural England

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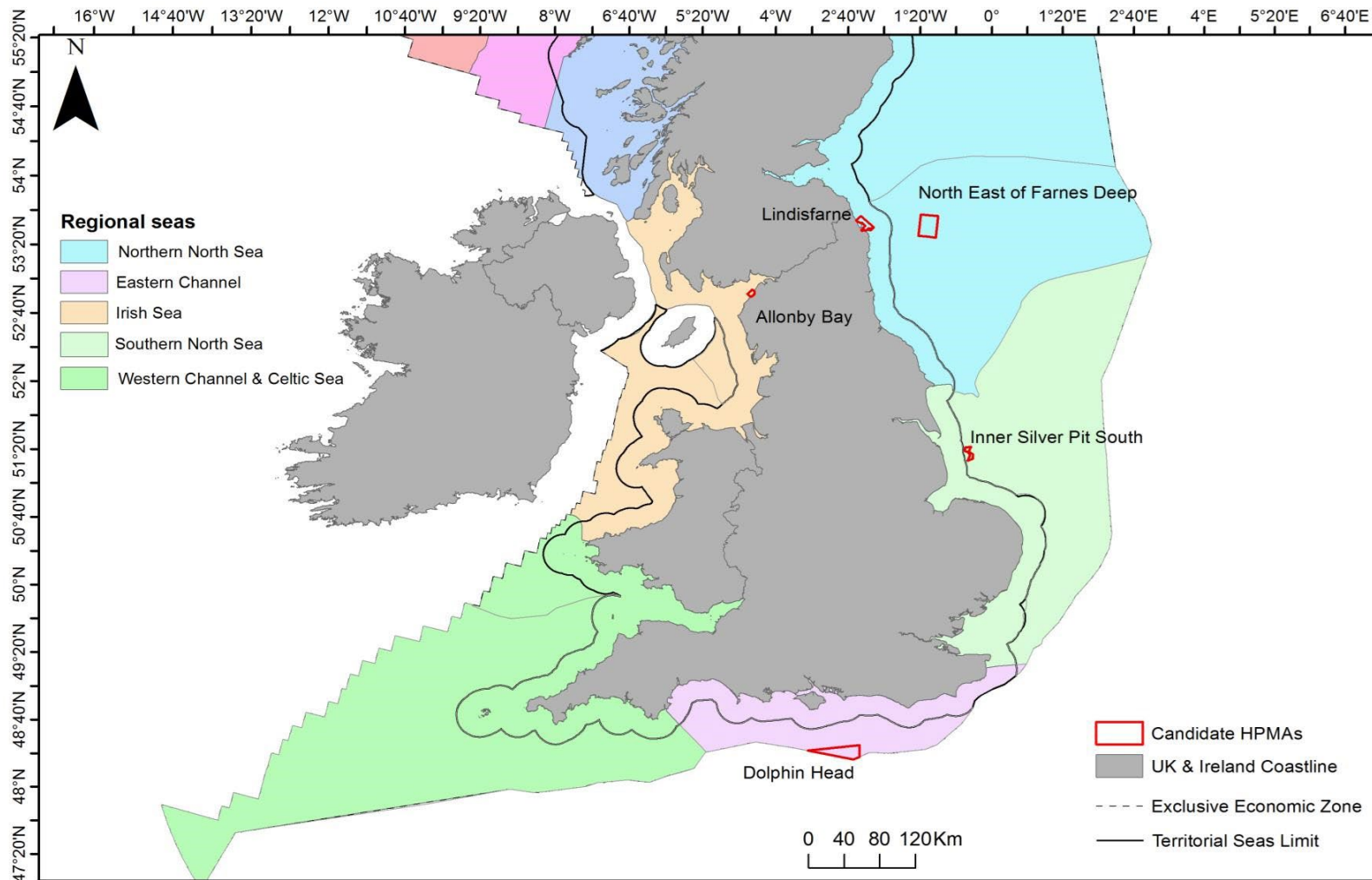
1. Introduction

Natural England and the Joint Nature Conservation Committee (JNCC) were commissioned by Defra to develop and apply a range of ecological criteria to identify pilot Highly Protected Marine Areas (HPMAs) based on the ecology. A document setting out the process Natural England and JNCC applied when identifying Areas of Ecological Interest (AEIs) for pilot HPMAs in England can be found on [JNCC's Resource Hub](#). This document set out the reasons why each area was identified according to the ecological criteria, along with the evidence underpinning these selections.

This pre-consultation scientific advice presents the ecological merit for each of the following five candidate HPMAs included in this consultation which Natural England and JNCC provided to Defra as part of our advice (also see further information in site factsheets at Annexes C–G which are available on the Defra website):

- Allonby Bay;
- Dolphin Head;
- Inner Silver Pit South;
- Lindisfarne; and,
- North East of Farnes Deep.

Figure 1 shows an overview map showing the location of the candidate HPMAs.



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Figure 1. Candidate HPMAs in English waters.

2. Scientific advice on the ecological merit of the candidate HPMAs

2.1. Allonby Bay

Table 1. Scientific advice on the ecological merit of the Allonby Bay Candidate HPMA.

GENERIC INFORMATION	
Candidate HPMA name	Allonby Bay
Biogeographic region	Irish Sea (Inshore)
Geographic description	<p>Allonby Bay candidate HPMA covers 38.5 km² of the southern region at the mouth of the Solway Firth, extending approximately 8 km seaward from the shoreline between Maryport and Mawbray. The boundary follows the Mean High-water mark along the length of the enclosed shoreline, out to a maximum depth of 8 m and the area is located within the 12 nm territorial sea limit of the Irish Sea region. It overlaps with Allonby Bay MCZ and the Solway Firth SPA.</p> <p>This Northwest facing bay is relatively sheltered and seawater temperatures range from 6°C in coldest months to 16.5°C in late summer.</p>
Known habitats and species¹	<p>The key habitats and species present in the area are as follows:</p> <p>EUNIS level 3 broad-scale habitats:</p> <ul style="list-style-type: none"> • High energy littoral rock • Moderate energy littoral rock • Low energy littoral rock

¹ The known habitats and species listed above refer to the key important habitats and species found on national and international lists of conservation importance, including: Priority Marine Species, OSPAR (threatened and declining), FOCl (Features of Conservation Importance – Habitats and Species), IUCN red list, EC Habitats Directive (Habitats and Species), EC Birds Directive (Annex I and II), BoCC4 (Birds of Conservation Concern 4 – Red and Amber lists) and WCA 1981 (Wildlife & Countryside Act 1981). There are additional species and habitats also reported as being present, including commercial fish and shellfish species.

- Features of littoral rock (rockpools / ephemeral algae)
- Littoral sand and muddy sand
- Littoral mixed sediments littoral biogenic reefs
- Features of littoral sediment (ephemeral algae)
- High energy infralittoral rock
- Moderate energy infralittoral rock
- High energy circalittoral rock
- Moderate energy circalittoral rock
- Sublittoral coarse sediment
- Sublittoral sand
- Sublittoral mud
- Sublittoral mixed sediments
- Sublittoral biogenic reefs

Important habitats:

- Blue mussel (*Mytilus edulis*) beds (Habitat Feature Of Conservation Importance (FOCI))
- Estuarine rocky habitats (Habitat FOCI)
- Honeycomb worm (*Sabellaria alveolata*) reefs (Habitat FOCI)
- Peat and clay exposures (Habitat FOCI)
- Mudflats and sandflats not covered by seawater at low tide (EC Habitats Directive - Annex I)
- Reefs (EC Habitats Directive - Annex I)
- Sandbanks which are slightly covered by seawater at low tide (EC Habitats Directive - Annex I)
- Sea pens and burrowing megafauna (Habitat FOCI)

Important benthic/demersal species:

- Ocean quahog (*Arctica islandica*) (Species FOCI, OSPAR threatened and/or declining species (OSPAR T&D species))

Important bird species:

- Barnacled goose (*Branta leucopsis*) (EC Birds Directive - Annex I, IUCN: Least Concern – Nonbreeding, Bird of Conservation Concern 4 (BoCC4): Amber)
- Bar-tailed godwit (*Limosa lapponica*) (EC Birds Directive - Annex I & II, IUCN: Least Concern - Non-breeding, BoCC4: Amber)
- Curlew (*Numenius arquata*) (IUCN: Endangered - Breeding, BoCC4: Red, UK Priority Species)
- Gannet (*Morus bassanus*) (IUCN: Least Concern – Breeding, BoCC4: Amber)
- Golden plover (*Pluvialis apricaria*) (EC Birds Directive - Annex I & II2, IUCN: Least Concern – Breeding & Non-breeding)
- Knot (*Calidris canutus*) (EC Birds Directive - Annex II, IUCN: Least Concern – Non-breeding, BoCC4: Amber)
- Lesser black-backed gull (*Larus fuscus*) (EC Birds Directive - Annex II, IUCN: Data Deficient - Breeding, BoCC4: Amber)
- Manx shearwater (*Puffinus puffinus*) (IUCN: Least Concern - Breeding, BoCC4: Amber)
- Oystercatcher (*Haematopus ostralegus*) (EC Birds Directive - Annex II, IUCN: Least Concern - Breeding, BoCC4: Amber)
- Pink-footed goose (*Anser brachyrhynchus*) (EC Birds Directive - Annex II, IUCN: Least Concern – Non-breeding, BoCC4: Amber)
- Pintail (*Anas acuta*) (EC Birds Directive - Annex II, CITES, IUCN: Critically Endangered - Breeding / Endangered - Non-breeding, BoCC4: Amber, WCA 1981 - Sch I)
- Redshank (*Tringa tetanus*) (EC Birds Directive - Annex II, IUCN: Vulnerable - Breeding / Near Threatened - Non-breeding, BoCC4: Amber)
- Ringed plover (*Charadrius hiaticula*) (IUCN: Near Threatened – Breeding / Vulnerable – Nonbreeding, BoCC4: Red)
- Red throated diver (*Gavia stellata*) (EC Birds Directive - Annex I, IUCN: Least Concern – Breeding & Non-breeding, WCA 1981 - Sch I)
- Common guillemot (*Uria aalge*) (IUCN: Least Concern – Breeding, BoCC4: Amber)
- Razorbill (*Alca torda*) (IUCN: Least Concern – Breeding, BoCC4: Amber)

	<p>Important marine mammal species:</p> <ul style="list-style-type: none"> • Harbour porpoise (<i>Phocoena phocoena</i>) (CITES, OSPAR T&D species, EC Habitats Directive - Annex II & IV, IUCN: Least Concern, WCA 1981 - Sch V, UK Priority Species) <p>Important fish and shellfish species:</p> <ul style="list-style-type: none"> • Atlantic herring (<i>Clupea harengus</i>) (IUCN: Least Concern, UK Priority Species, a commercial species) • Thornback ray (<i>Raja clavate</i>) (OSPAR T&D species, IUCN: Near Threatened, a commercial species) • Bass (<i>Dicentrarchus labrax</i>) (IUCN: Least Concern, a commercial species) • Sole (<i>Solea solea</i>) (UK Priority Species, a commercial species) • Atlantic cod (<i>Gadus morhua</i>) (OSPAR T&D species, IUCN: Vulnerable, UK Priority Species, a commercial species) • Plaice (<i>Pleuronectes platessa</i>) (IUCN: Least Concern, UK Priority Species, a commercial species) • Common whelk (<i>Buccinum undatum</i>) (a commercial species) • Edible crab (<i>Cancer pagurus</i>) (a commercial species) • Common lobster (<i>Homarus Gammarus</i>) (a commercial species) • European eel (<i>Anguilla Anguilla</i>) (OSPAR T&D species, IUCN: Critically Endangered, UK Priority Species)
<p>Rationale for candidate area</p>	<p>Allonby Bay is of relatively high abundance for the Irish Sea region, with 278 species being recorded at a density of 8.1 species, habitats or biotopes being recorded per km². It consists of a complex mix of intertidal and subtidal muds, sands and rock, swept by strong currents and big tides. It includes 16 broad scale habitats, such as sublittoral and intertidal sediments and circalittoral, infralittoral and intertidal rock.</p> <p>The shoreline features blue mussel beds (<i>Mytilus edulis</i>) and honeycomb worm reefs (<i>Sabellaria alveolate</i>), providing habitat for crabs and foraging area for some bird species, with small outcrops of high energy intertidal rock. This leads down to intertidal sand dominated by burrowing amphipod</p>

shrimps and a range of polychaete worms such as *Scolecopsis* spp. and subtidal muddy sand also supporting a range of polychaetes and bivalve molluscs. There are large areas of subtidal coarse sediment supporting keelworms, and venerid bivalves. Although less charismatic in nature, these sediment habitats and species provide important food for a wide range of bird species, and during high tide sediment species and the supporting water column above provide food a source for flatfish and juvenile fish such as bass (*Dicentrarchus labrax*) and herring (*Clupea harengus*).

Areas of subtidal rock and reef include records of *Sabellaria alveolata*, subtidal biogenic reef comprised of blue mussels *Mytilus edulis* and occasional rocky outcrops which would support crabs and lobsters.

The area contains multiple species of national and international importance recognised in the overlapping MCZ and SPA designations.

The area is likely to support harbour porpoise (*Phocoena phocoena*), as well as several commercial fish species. It is a known nursery and spawning area for cod (*Gadus morhua*), herring (*Clupea harengus*), plaice (*Pleurionectes platessa*), sole (*Solea solea*) and thornback ray (*Raja clavate*). The area is also important for other commercial species such as bass (*Dicentrarchus labrax*) and common lobster (*Homarus Gammarus*). Records show the presence of the European eel (*Anguilla Anguilla*) and the ocean quahog (*Artica islandica*) which lives within subtidal sediments.

The rich sediments and intertidal rock habitats attract important migratory, non-breeding bird species, with large assemblages of around 16 different species congregating along the shoreline and the area seeing some of the largest densities of shore birds in the Solway Firth SPA.

Several habitats considered to be 'blue carbon' habitats can be found in the area including intertidal sand, muddy sand and subtidal sand, covering 17.5 km² (45% of the site). There are small areas of coastal sand dunes, which provide extremely limited flood mitigation habitat in the proximity of at-risk coastline.

This candidate HPMA represents a relatively natural ecosystem, providing an opportunity to safeguard its biodiversity through an HPMA designation.

Identified via SNCBs or 3rd party proposal	This candidate HPMA was identified as a 3 rd party proposal and was identified by Natural England, following the agreed ecological criteria for pilot HPMA selection.																																			
Boundary of candidate area	<table border="1" data-bbox="546 368 1939 679"> <thead> <tr> <th>Point</th> <th>Lat</th> <th>Long</th> <th>Point</th> <th>Lat</th> <th>Long</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>54° 43' 45.651" N</td> <td>3° 29' 9.585" W</td> <td>E</td> <td>54° 47' 49.631" N</td> <td>3° 26' 50.084" W</td> </tr> <tr> <td>B</td> <td>54° 44' 0.166" N</td> <td>3° 30' 7.910" W</td> <td>F</td> <td>54° 47' 32.632" N</td> <td>3° 26' 36.376" W</td> </tr> <tr> <td>C</td> <td>54° 45' 16.937" N</td> <td>3° 33' 0.635" W</td> <td>G</td> <td>54° 47' 28.115" N</td> <td>3° 26' 7.838" W</td> </tr> <tr> <td>D</td> <td>54° 48' 11.783" N</td> <td>3° 29' 20.566" W</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Point	Lat	Long	Point	Lat	Long	A	54° 43' 45.651" N	3° 29' 9.585" W	E	54° 47' 49.631" N	3° 26' 50.084" W	B	54° 44' 0.166" N	3° 30' 7.910" W	F	54° 47' 32.632" N	3° 26' 36.376" W	C	54° 45' 16.937" N	3° 33' 0.635" W	G	54° 47' 28.115" N	3° 26' 7.838" W	D	54° 48' 11.783" N	3° 29' 20.566" W			
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Evidence/references	<p>Bradbury, G. et al. (2014). Mapping Seabird Sensitivity to Offshore Wind Farms. PLOS One 9, 1-17. http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0106366</p> <p>Brereton, T., Davies, R., Babey, L., Kitching, M. and Walker, R., 2020. Temporal and spatial analysis of Marinelife and Orca white-beaked dolphin data from Northumberland and adjacent sea areas. Natural England Commissioned Report NECR 289.</p> <p>Brereton, T., Kitching, M., Davies, R., Mcnie, F., and Walker, R., 2016. Photo-identification of whitebeaked dolphins off Southwest and North east England 2007 - 2014. Natural England.</p> <p>Carter, M. I. D., Boehme, L., Duck, C.D., Grecian, W.J., Hastie, B.J., McConnell, B.J., Miller, D.L., Morris C.D., Moss, S.E.W., Thompson, P.M., AND Russell, D.J.F, 2020. Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles. Sea Mammal Research Unit, University of St Andrews, Report to BEIS, OESEA-16-76/OESEA-17-78.</p> <p>Corr, S., 2020. Using citizen science data to assess the vulnerability of bottlenose dolphins (<i>Tursiops truncatus</i>) along England's south coast. Unpublished MRes. thesis. University of Plymouth.</p>																																			

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2.2. Dolphin Head

Table 2. Scientific advice on the ecological merit of the Dolphin Head Candidate HPMA.

GENERIC INFORMATION	
Candidate HPMA name	Dolphin Head
Biogeographic region	Eastern Channel (Offshore)
Geographic description	The candidate HPMA Dolphin Head is situated beyond the 12 nm territorial sea limit in the Eastern Channel region. The area is approximately 55 km South of Selsey Bill, West Sussex and has an area of 508 km ² . This area partially overlaps with the designated MPA Offshore Brighton MCZ and the nondesignated MPAs: Dolphin Head recommended MCZ and Wight-Barfleur extension recommended MCZ. The depth of the area ranges from approximately 40 m to 58 m.
Known habitats and species²	<p>The key habitats and species present in the area are as follows:</p> <p>EUNIS level 3 broad-scale habitats:</p> <ul style="list-style-type: none"> • Atlantic and Mediterranean high energy circalittoral rock • Sublittoral coarse sediment • Sublittoral mixed sediment <p>Important habitats:</p> <ul style="list-style-type: none"> • Bedrock Reefs (EC Habitats Directive - Annex I)

² The known habitats and species listed above refer to the key important habitats and species found on national and international lists of conservation importance, including: Priority Marine Species, OSPAR (threatened and declining), FOCI (Features of Conservation Importance – Habitats and Species), IUCN red list, EC Habitats Directive (Habitats and Species), EC Birds Directive (Annex I and II), BoCC4 (Birds of Conservation Concern 4 – Red and Amber lists) and WCA 1981 (Wildlife & Countryside Act 1981). There are additional species and habitats also reported as being present, including commercial fish and shellfish species.

- *Sabellaria spinulosa* reefs (EC Habitats Directive - Annex I, UK Priority Species, Habitat FOCI, OSPAR T&D habitats)
- Stony Reefs (EC Habitats Directive - Annex I)
- Subtidal sands and gravels (Habitat FOCI)

Important bird species:

- Atlantic puffin (*Fratercula arctica*) (IUCN: Least Concern, BoCC4: Red)
- Arctic tern (*Sterna paradisaea*) (BoCC4: Amber)
- Black-headed gull (*Larus ridibundus*) (BoCC4: Amber)
- Black-legged kittiwake (*Rissa tridactyla*) (EC Birds Directive - Annex I, OSPAR T&D species, IUCN: Vulnerable, BoCC4: Red)
- Common guillemot (*Uria aalge*) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC4: Amber)
- Common tern (*Sterna hirundo*) (EC Birds Directive - Annex I, BoCC4: Amber)
- Great skua (*Stercorarius skua*) (EC Birds Directive - Annex I, BoCC4: Amber)
- Lesser black-backed gull (*Larus fuscus*) (EC Birds Directive - Annex I, BoCC4: Amber)
- Little tern (*Sterna albifrons*) (EC Birds Directive - Annex I, BoCC4: Amber)
- Mediterranean gull (*Larus melanocephalus*) (EC Birds Directive - Annex I, BoCC4: Amber)
- Northern fulmar (*Fulmarus glacialis*) (EC Birds Directive - Annex I, IUCN: Vulnerable, BoCC4: Amber)
- Northern gannet (*Morus bassanus*) (EC Birds Directive - Annex I, BoCC4: Amber)
- Razorbill (*Alca torda*) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC4: Amber)
- Sandwich tern (*Sterna sandvicensis*) (EC Birds Directive - Annex I, BoCC4: Amber)

Important marine mammal species:

- Harbour porpoise (*Phocoena phocoena*) (CITES, EC Habitats Directive - Annex II & IV, UK Priority Species, OSPAR T&D species, IUCN: Least Concern)
- Short-beaked common dolphin (*Delphinus delphis*) (CITES, EC Habitats Directive - Annex IV, UK Priority Species, IUCN: Least Concern)

	<ul style="list-style-type: none"> • Risso's dolphin (<i>Grampus griseus</i>) (CITES, EC Habitats Directive - Annex IV, UK Priority Species, IUCN: Data Deficient) • Minke whale (<i>Balaenoptera acutorostrata</i>) (CITES, EC Habitats Directive - Annex IV, UK Priority Species, IUCN: Least Concern) <p>Important fish species:</p> <ul style="list-style-type: none"> • Atlantic cod (<i>Gadus morhua</i>) (UK Priority Species, OSPAR T&D species, IUCN: Vulnerable, a commercial species) • Atlantic herring (<i>Clupea harengus</i>) (UK Priority Species, IUCN Red List, a commercial species) • European plaice (<i>Pleuronectes platessa</i>) (UK Priority Species, a commercial species) • Sole (<i>Solea solea</i>) (UK Priority Species, a commercial species) • Thornback ray (<i>Raja clavata</i>) (OSPAR T&D species, IUCN: Near Threatened) • Undulate ray (<i>Raja undulata</i>) (UK Priority Species, Species FOCI, IUCN: Near Threatened)
<p>Rationale for candidate area</p>	<p>The area has relatively high levels of biodiversity within the wider Eastern Channel region and has been identified to be an important area that attracts seabirds, marine mammals and fish species. This assessment is based upon data acquired and analysed from a variety of ground-truth and modelled data products, including Natural England Evidence Base 2021, Marine Recorder 2021, EUSeaMap 2019 and additional survey data (MB0102 Bio-physical Contract, 2010; FOCI, 2016; UK Combined Map, 2021), at a regional level to identify areas that comprised relatively higher levels of biodiversity.</p> <p>The seabed in the area comprises a mix of three broad-scale habitats (BSHs); high energy circalittoral rock, sublittoral coarse sediment and sublittoral mixed sediments. Annex I Reefs are present within this location, which includes bedrock, stony and biogenic Ross-worm (<i>Sabellaria spinulosa</i>) reefs. Ross worm (<i>Sabellaria spinulosa</i>) reefs are an OSPAR threatened and declining habitat (OSPAR Commission, 2013), which is considered to be an extremely variable habitat type that consists of a diverse community structure (Irving, 2009; European Commission, 2013). The wide-ranging habitat types in the area more broadly support a range of benthic, demersal and mobile species such as sponges, tube worms, anemones and bivalves. Data for important demersal/benthic species have been derived from Natural England's Evidence Base 2021, the Marine Recorder 2021 database, the</p>

JNCC Annex I habitats 2021 list, OSPAR's list of threatened and/or declining habitats and species 2020 and additional survey data.

The Ross-worm (*Sabellaria spinulosa*) reef habitats are of significant conservation importance and occur on predominantly sediment or mixed sediment areas, such as the habitats found in Dolphin Head candidate HPMA (BRIG, 2011). These reefs are particularly affected by dredging or trawling and in heavily dredged or disturbed areas an impoverished community may be left.

The oceanographic processes occurring within this area serve to focus primary and secondary production within and adjacent to the area (Parker-Humphreys, 2005; Balanced Seas, 2011). Sublittoral coarse sediments and sublittoral mixed sediments are known to be important habitats for attracting seabirds and marine mammals (such as Risso's dolphin, Short-beaked common dolphin, and Harbour porpoise) due to the common occurrence of prey species (JCP, 2017; JNCC, 2020; SMRU, 2015 and Waggitt *et al.* 2020). It is reported that the area is of importance for the nursery and spawning behaviour of at least six commercially important species of fish, such as Atlantic cod, and Undulate ray (which is classed as Endangered on the IUCN Red List) (Katara *et al.* 2021). In relation to seabirds, there are at least 14 species reported to be present within the area, for example Northern fulmar, Terns, and Black-legged kittiwake (which is classed as Vulnerable on the IUCN Red List), (Eaton *et al.*, 2015; Pettex *et al.*, 2017; Waggitt *et al.*, 2020).

The Eastern Channel is known as a popular area for recreational and commercial fishing. The designation of Dolphin Head would help to protect the feeding and nursery grounds of many highly important commercial fish species, such as Atlantic cod, Atlantic herring, and European plaice, as well as ecologically important species. Since the 1950s, the Thornback ray has seen major declines in abundance and geographical range due to overfishing (Chevolot *et al.*, 2006). Their low fecundity, slow growth rates and later maturity make rays highly vulnerable to exploitation therefore protection of their habitat through the designation of this candidate HPMA may present an opportunity to support species recovery.

The protection of feeding and nursery grounds through the designation of this candidate HPMA may also help to increase biodiversity at a wider scale across English waters. It has been recorded that populations of commercially important fish species such as plaice are connected to wider populations within the Southern North Sea, through migration across the Dover Strait (Arnold & Metcalfe, 1995).

	<p>The area is considered to be a relatively degraded ecosystem with potential to recover subject to pressures being removed. It partially overlaps with the designated Offshore Brighton MCZ, which has protected features considered to be in an unfavourable condition (high energy circalittoral rock, subtidal coarse sediment and subtidal mixed sediment broad-scale habitats). The expanse of subtidal coarse sediment that dominates this area has potential recovery times that are expected between 2 to 10 years. There are some patches of subtidal mixed sediment and high energy circalittoral rock present. These overlap with the designated features of the Offshore Brighton MCZ and are considered to be in unfavourable condition with potential recovery times between 10 to 25 years, due to some species having longer recovery times. Evidence suggests that the area is subject to a range of medium to high disturbance (OSPAR BH3 indicator), meaning that species and habitats are sensitive to some level of fishing pressure (BH3, 2017).</p> <p>A vulnerability assessment of Offshore Brighton MCZ suggests that the MCZ is unlikely to be moving towards its conservation objectives. Therefore, the additional restrictions in human activities associated with the designation of the candidate HPMA Dolphin Head may help the MCZ progress towards its conservation objectives (JNCC, 2021).</p>
<p>Identified via SNCBs or 3rd party proposal</p>	<p>The area was identified by JNCC's analysis of available supporting datasets against the ecological criteria. The non-designated Dolphin Head recommended MCZ was put forward by the North West Wildlife Trust as a third-party proposal, and is partially located within this area. The recommended MCZ was originally a candidate in Reference Area no. 10 by Balanced Seas, capturing an area of high energy and moderate energy circalittoral rock as well as Ross-worm (<i>Sabellaria spinulosa</i>) reef habitat and other features of conservation importance. The area does not fully encompass the thirdparty proposal due to the location of a cable line which runs towards the north of the area, which is part of the list of activities not considered compatible with the definition of a pilot HPMA.</p>

Boundary of candidate area	<table border="1"> <thead> <tr> <th>Point</th> <th>Lat</th> <th>Long</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>50° 08' 46.79" N</td> <td>1° 13' 54.17" E</td> </tr> <tr> <td>B</td> <td>50° 16' 53.07" N</td> <td>0° 26' 05.59" W</td> </tr> <tr> <td>C</td> <td>50° 09' 24.90" N</td> <td>0° 24' 54.52" W</td> </tr> <tr> <td>D</td> <td>50° 07' 24.90" N</td> <td>0° 30' 04.11" W</td> </tr> </tbody> </table>	Point	Lat	Long	A	50° 08' 46.79" N	1° 13' 54.17" E	B	50° 16' 53.07" N	0° 26' 05.59" W	C	50° 09' 24.90" N	0° 24' 54.52" W	D	50° 07' 24.90" N	0° 30' 04.11" W
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Marine Recorder UK Snapshot. 2021. JNCC. © *JNCC*. Contains public sector information licensed under the Open Government License v3.0.

MB0102 Bio-physical Contract. 2010. Marine Protected Areas: Gathering, Developing and Accessing the Data for the Planning of a Network of Marine Conservation Zones - MB0102. 2010. *Derived from data provided by the British Geological Survey © NERC*. © *Crown copyright and Defra*. For specific copyright information and use constraints please contact JNCC in the first instance.

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Results of Joint Cetacean Programme (JCP) Phase 3 Analyses, Scaled to the Results of SCANS 3. 2017. © *JNCC*. Contains public sector information licensed under the Open Government License v3.0.

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UK Combined Map 2021: Full-coverage EUNIS Level 3 Layer Integrating Maps from Surveys and Broad-scale Models. 2019. © *JNCC*. Contains restricted spatial data layers. For specific copyright information and use constraints please contact JNCC in the first instance.

2.3. Inner Silver Pit South

Table 3. Scientific advice on the ecological merit of the Inner Silver Pit South Candidate HPMA.

GENERIC INFORMATION	
Candidate HPMA name	Inner Silver Pit South
Biogeographic region	Southern North Sea (Offshore)
Geographic description	The candidate HPMA Inner Silver Pit South is situated beyond the 12 nm territorial sea limit in the offshore area of the Southern North Sea region, just east of the territorial waters limit and has an area of 62.5 km ² . The area is located approximately 28 km off the coast of Lincolnshire and approximately 35 km south-east of the Humber Estuary. The area overlaps with two MPAs; the Greater Wash SPA and the Inner Dowsing, Race Bank and North Ridge SAC. The area also overlaps with the Silver Pit recommended MCZ and Humber Gravel Area of Search for SACs. The average depth of the area is 30 m, ranging from 12 m to 96 m below sea level.
Known habitats and species ³	The key habitats and species present in the area are as follows: EUNIS level 3 broad scale habitats: <ul style="list-style-type: none"> • Atlantic and Mediterranean moderate energy circalittoral rock • Circalittoral mixed sediments • Sublittoral coarse sediment • Sublittoral sand • Sublittoral mixed sediments

³ The known habitats and species listed above refer to the key important habitats and species found on national and international lists of conservation importance, including: Priority Marine Species, OSPAR (threatened and declining), FOCl (Features of Conservation Importance – Habitats and Species), IUCN red list, EC Habitats Directive (Habitats and Species), EC Birds Directive (Annex I and II), BoCC4 (Birds of Conservation Concern 4 – Red and Amber lists) and WCA 1981 (Wildlife & Countryside Act 1981). There are additional species and habitats also reported as being present, including commercial fish and shellfish species.

- Sublittoral biogenic reefs

Important habitats:

- Blue mussel beds (EC Habitats Directive - Annex I, UK Priority Species, OSPAR T&D species)
- *Sabellaria spinulosa* reefs (EC Habitats Directive - Annex I, UK Priority Species, OSPAR T&D species)
- Sandbanks which are slightly covered by sea water all the time (EC Habitats Directive - Annex I)

Important bird species:

- Black-legged kittiwake (*Rissa tridactyla*) (EC Birds Directive - Annex I, OSPAR T&D species, IUCN: Vulnerable, BoCC4: Amber)
- Common guillemot (*Uria aalge*) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC4: Amber)
- Herring gull (*Larus argentatus*) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC4: Red)
- Lesser black-backed gull (*Larus fuscus*) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC4: Amber)
- Northern fulmar (*Fulmarus glacialis*) (EC Birds Directive - Annex I, IUCN: Vulnerable, BoCC4: Amber)
- Razorbill (*Alca torda*) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC4: Amber)

Important marine mammal species:

- Harbour porpoise (*Phocoena phocoena*) (CITES, EC Habitats Directive - Annex II & IV, IUCN: Least Concern, UK Priority Species, OSPAR T&D species)
- Minke whale (*Balaenoptera acutorostrata*) (CITES, EC Habitats Directive - Annex IV, IUCN: Least Concern, UK Priority Species)
- Grey seal (*Halichoerus grypus*) (EC Habitats Directive - Annex II & V, IUCN: Least Concern)
- Harbour seal (*Phoca vitulina*) (EC Habitats Directive - Annex II & V, IUCN: Least Concern, UK Priority Species)

	<p>Important fish species:</p> <ul style="list-style-type: none"> • Atlantic cod (<i>Gadus morhua</i>) (UK Priority Species, IUCN: Vulnerable, OSPAR T&D species, a commercial species) • Atlantic mackerel (<i>Scomber scombrus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • Atlantic herring (<i>Clupea harengus</i>) (UK Priority Species: IUCN: Least Concern, a commercial species) • Horse mackerel (<i>Trachurus trachurus</i>) (UK Priority Species, IUCN: Vulnerable, a commercial species) • European plaice (<i>Pleuronectes platessa</i>) (UK Priority Species / IUCN: Least Concern, a commercial species) • Smelt (<i>Osmerus eperlanus</i>) (UK Priority Species, IUCN: Least Concern Red list) • Sole (<i>Solea solea</i>) (UK Priority Species, a commercial species) • Thornback ray (<i>Raja clavata</i>) (IUCN: Near Threatened, OSPAR T&D species) • Whiting (<i>Merlangius merlangus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species)
<p>Rationale for candidate area</p>	<p>The area has relatively high levels of biodiversity by comparison to the wider Southern North Sea region. This assessment is based upon data acquired and analysed from a variety of ground-truth and modelled data products, including Natural England Evidence Base 2021, Marine Recorder 2021, EUSeaMap 2019, JNCC Annex I habitats 2021 and additional survey data (UK Combined Map 2021, GB000240 2015, GB200016 2004) at a regional level to identify areas that comprised relatively higher levels of biodiversity.</p> <p>The seabed in the area comprises five broad-scale habitats (BSHs), which are: a mosaic moderate energy circalittoral rock and circalittoral mixed sediments, sublittoral coarse sediment, sublittoral sand, sublittoral mixed sediments and sublittoral biogenic reefs. Ross-worm (<i>Sabellaria spinulosa</i>) reefs and blue mussel (<i>Mytilus edulis</i>) beds are also recorded as being present. The JNCC assessments have found evidence of some blue mussel beds within the area, but the Humber Regional Environmental Characterisation report (Tappin <i>et al.</i> 2011) suggests that these may be present at several locations within the wider Inner Silver Pit region. In the same report (Tappin <i>et al.</i> 2011) it is suggested that there</p>

may be a cyclical succession occurring between *Sabellaria spinulosa* and *Mytilus edulis* and that this may be driven by recruitment success and minor changes in environmental conditions. Both these habitat types are OSPAR threatened and/or declining habitats, are representative of an extremely variable habitat type and consist of a diverse community structure (Irving 2009, European Commission 2013, Tillin *et al.* 2020). Moreover, blue mussel beds and the sandbank features present within the area may enhance levels of primary and secondary productivity through the provision of feeding and nursery grounds for a range of ecologically important and commercial fish species, and, furthermore, foraging areas for seals, cetaceans and seabirds (Camphuysen *et al.* 2007, Scott *et al.* 2010).

The area supports key prey species for the foraging of several species of fish, seabirds and marine mammals. Katara *et al.* (2021) report that the area is of importance for the nursery and spawning behaviour of at least 23 fish and shellfish species. Examples include the Horse mackerel (*Trachurus trachurus*), Cuttlefish (*Sepia* spp.), Edible crab (*Cancer pagurus*), and Black seabream (*Spondyllosoma cantharus*). At least six of these are commercially important species of fish: Atlantic cod (*Gadus morhua*), Atlantic mackerel (*Scomber scombrus*), Atlantic herring (*Clupea harengus*) European plaice (*Pleuronectes platessa*), Sole (*Solea solea*) and Whiting (*Merlangius merlangus*).

In relation to seabirds, there are at least six species reported to be present within the area (Waggitt *et al.* 2020), including the Vulnerable (IUCN Red List) Black-legged kittiwake (*Rissa tridactyla*). Although there are limited data available to support the relative importance of the area for the foraging activity of seabirds, the variable annual abundance of each seabird species during wintering and foraging periods suggests that this area could be used for foraging by several seabird species. Furthermore, the British Trust for Ornithology (BTO) (2020) identified this area as being an important foraging area for Northern Gannet (*Morus bassanus*) and Razorbill (*Alca torda*).

Data from the Sea Mammal Research Unit (SMRU 2015) identified four marine mammal species to be present in this area; Harbour porpoise, Minke whale, Grey seal and Harbour seal. However, there are limited data available to identify the importance of this location in relation to key life cycle stages of marine mammals. There is, however, evidence that the area may be an important foraging area for Grey seal and Harbour seal (JCP 2017).

The area is considered to represent a relatively degraded ecosystem. The area overlaps with Inner Dowsing, Race Bank and North Ridge SAC, of which the site's protected features, Annex I Sandbanks that are covered at all times and Annex I Reef, are considered to be in unfavourable condition.

	<p>Moreover, evidence suggests that the location is subject to a range of low to high disturbance (OSPAR BH3 indicator) meaning that species and habitats are sensitive to some level of fishing pressure (BH3, 2017). Annex I Sandbanks and Annex I Reefs are found in the area, including records of the Ross worm <i>Sabellaria spinulosa</i> (potential recovery times of 2 to 10 years). The BSHs within the area have a range of recovery times from <10 years to >10 years, subject to pressures being removed.</p>																																																						
Identified via SNCBs or 3rd party proposal	<p>The area was identified by JNCC analysis of available supporting datasets against the ecological criteria to identify pilot HPMAs in English waters. Part of the area overlaps with third-party proposals put forward by the Blue Marine Foundation and The Wildlife Trusts: Silver Pit and Inner Silver Pit, respectively.</p>																																																						
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2.4. Lindisfarne

Table 4. Scientific advice on the ecological merit of the Lindisfarne Candidate HPMA.

GENERIC INFORMATION	
<i>Candidate HPMA name</i>	Lindisfarne
<i>Biogeographic region</i>	Northern North Sea (Inshore)
<i>Geographic description</i>	<p>Lindisfarne candidate HPMA covers 129 km² of the Northumberland coast and is located within the 12 nm territorial sea limit of the Northern North Sea region. It covers a wide range of intertidal and subtidal habitats, extending from the intertidal zone north of Goswick, north eastward out to sea, before heading southeast and returning inland south of Budle Bay, at Bamburgh. The area includes the north shore of Holy Island, Budle Bay, and encompasses the outer group of the Farne Islands, excluding Inner Farne.</p> <p>This moderately exposed northeast-facing area includes some of the most diverse habitats in the North Sea, both in a UK and European context. In recognition of this, this part of the Northumberland coast is already heavily designated; the area overlaps with several other areas of conservation significance, including Berwickshire and North Northumberland Coast SAC, Northumbria Coast SPA, Farne Islands SPA, Northumberland Marine SPA, Berwick to St. Mary's MCZ, Lindisfarne SPA, Northumberland Shore SSSI, Farne Islands SSSI and Lindisfarne SSSI.</p> <p>Sea temperatures in this north-east area range from 5°C in colder months to 16°C in warmer months during the year.</p>

Known habitats and species⁴

The key habitats and species present in the proposed area are as follows:

EUNIS level 3 broad-scale habitats:

- High energy littoral rock
- Moderate energy littoral rock
- Low energy littoral rock
- Features of littoral rock (rockpools, ephemeral algae & caves / overhangs)
- Littoral coarse sediment
- Littoral sand and muddy sand
- Littoral mud
- Littoral mixed sediments
- Coastal saltmarshes and saline reedbeds
- Littoral sediments dominated by aquatic angiosperms
- Littoral biogenic reefs
- Features of littoral sediment (ephemeral red / green seaweeds)
- High energy infralittoral rock
- Moderate energy infralittoral rock
- Features of infralittoral rock (animal turf in shallow gullies and caves)
- High energy circalittoral rock
- Moderate energy circalittoral rock
- Sublittoral coarse sediment
- Sublittoral sand
- Sublittoral mixed sediments
- Sublittoral macrophyte-dominated sediment

⁴ The known habitats and species listed above refer to the key important habitats and species found on national and international lists of conservation importance, including: Priority Marine Species, OSPAR (threatened and declining), FOCl (Features of Conservation Importance – Habitats and Species), IUCN red list, EC Habitats Directive (Habitats and Species), EC Birds Directive (Annex I and II), BoCC4 (Birds of Conservation Concern 4 – Red and Amber lists) and WCA 1981 (Wildlife & Countryside Act 1981). There are additional species and habitats also reported as being present, including commercial fish and shellfish species.

Important habitats:

- Seagrass beds (Habitat FOCI)
- Sheltered muddy gravels (Habitat FOCI)
- Blue mussel (*Mytilus edulis*) beds (Habitat FOCI)
- Mudflats and sandflats not covered by seawater at low tide (EC Habitats Directive - Annex I)
- Reefs (EC Habitats Directive - Annex I)
- Sandbanks which are slightly covered by seawater at low tide (EC Habitats Directive - Annex I)
- Fragile sponge and anthozoan communities on subtidal rocky habitats (Habitat FOCI)
- Intertidal under boulder communities (Habitat FOCI)

Important benthic/demersal species:

- Ocean quahog (*Arctica islandica*) (Species FOCI, OSPAR T&D species)
- Stalked jellyfish (*Halicylistus* species) (UK Priority Species)
- Spiny Lobster (*Palinurus elephas*) (UK Priority Species)
- Native oyster (*Ostrea edulis*) (OSPAR T&D species, UK Priority Species)

Important marine mammals

- Grey seal (*Halichoerus grypus*) (CITES, EC Habitats Directive - Annex II2 & V, IUCN: Least Concern)

Important bird species:

- Artic tern (*Sterna paradisaea*) (EC Birds Directive - Annex I1, IUCN: Vulnerable - Breeding, BoCC4: Amber)
- Bar-tailed godwit (*Limosa lapponica*) (EC Birds Directive - Annex I & II, IUCN: Least Concern – Non-breeding, BoCC4: Amber)
- Black-headed gull (*Chroicocephalus ridibundus*) (EC Birds Directive - Annex II, IUCN: Least Concern – Breeding / Vulnerable – Non-breeding, BoCC4: Amber)
- Common guillemot (*Uria aalge*) (IUCN: Least Concern – Breeding, BoCC4: Amber)

- Common scoter (*Melanitta nigra*) (EC Birds Directive - Annex II, IUCN: Critically Endangered – Breeding / Least Concern – Non-breeding, BoCC4: Red, WCA 1981- Sch I, UK Priority Species)
- Common tern (*Sterna hirundo*) (EC Birds Directive - Annex I, IUCN: Near Threatened – Breeding, BoCC4: Amber)
- Dunlin (*Calidris alpina*) (IUCN: Vulnerable – Breeding / Endangered – Non-breeding, BoCC4: Red)
- Eider duck (*Somateria mollissima*) (EC Birds Directive - Annex II, IUCN: Vulnerable – Nonbreeding, BoCC4: Amber)
- Gannet (*Morus bassanus*) (IUCN: Least Concern – Breeding, BoCC4: Amber)
- Golden plover (*Pluvialis apricaria*) (EC Birds Directive - Annex I & II, IUCN: Least Concern – Breeding & Non-breeding)
- Grey plover (*Pluvialis squatarola*) (EC Birds Directive - Annex II, IUCN: Vulnerable – Nonbreeding, BoCC4: Amber)
- Greylag goose (*Anser anser*) (EC Birds Directive - Annex II, IUCN: Least Concern – Breeding & Non-breeding, BoCC4: Amber, WCA 1981 - Sch I)
- Herring gull (*Larus argentatus*) (EC Birds Directive - Annex II, IUCN: Data Deficient – Breeding / Endangered – Non-breeding, BoCC4: Red)
- Light-bellied Brent goose (*Branta bernicla hrota*) (IUCN: Least Concern – Non-breeding)
- Little tern (*Sternula albifrons*) (EC Birds Directive - Annex I, IUCN: Vulnerable – Breeding, BoCC4: Amber, WCA 1981 - Sch I)
- Long-tailed duck (*Clangula hyemalis*) (EC Birds Directive - Annex II, IUCN: Near Threatened – Non-breeding, BoCC4: Red, WCA 1981 -Sch I)
- Puffin (*Fratercula arctica*) (IUCN: Least Concern – Breeding, BoCC4: Red)
- Purple sandpiper (*Calidris maritima*) (IUCN: Critically Endangered – Breeding / Endangered – Non-breeding, BoCC4: Red, WCA 1981 - Sch I)
- Red-breasted merganser (*Mergus serrator*) (EC Birds Directive - Annex II, IUCN: Vulnerable – Non-breeding, BoCC4: Amber)
- Redshank (*Tringa tetanus*) (EC Birds Directive - Annex II, IUCN: Vulnerable – Breeding / Near Threatened – Non-breeding, BoCC4: Amber)
- Ringed plover (*Charadrius hiaticula*) (IUCN: Near Threatened – Breeding / Vulnerable – Non-breeding, BoCC4: Red)

- Roseate tern (*Sterna dougallii*) (EC Birds Directive - Annex 1, OSPAR T&D species, IUCN: Endangered – Breeding, BoCC4: Red, WCA 1981 - Sch I, UK Priority Species)
- Sanderling (*Calidris alba*) (IUCN: Least Concern – Non-breeding, BoCC4: Amber)
- Sandwich tern (*Thalasseus sandvicensis*) (EC Birds Directive - Annex I, IUCN: Least Concern – Breeding, BoCC4: Amber)
- Shelduck (*Tadorna tadorna*) (IUCN: Endangered – Breeding & Non-breeding, BoCC4: Amber)
- Turnstone (*Arenaria interpres*) (IUCN: Vulnerable – Non-breeding, BoCC4: Amber)
- Barnacled goose (*Branta leucopsis*) (EC Birds Directive - Annex I, IUCN: Least Concern – Non-breeding, BoCC4: Amber)
- Curlew (*Numenius arquata*) (IUCN: Endangered – Breeding, BoCC4: Red, UK Priority Species)

Important fish and shellfish species:

- Atlantic cod (*Gadus morhua*) (OSPAR T&D species, IUCN: Vulnerable, UK Priority Species, a commercial species)
- Dab (*Limanda limanda*) (a commercial species)
- Edible crab (*Cancer pagurus*) (a commercial species)
- Atlantic herring *Clupea harengus* (IUCN: Least Concern, UK Priority Species, a commercial species)
- Lemon sole (*Microstomus kitt*) (a commercial species)
- Mackerel (*Scomber scombrus*) (UK Priority Species, a commercial species)
- Plaice (*Pleuronectes platessa*) (IUCN: Least Concern, UK Priority Species, a commercial species)
- Sole (*Solea solea*) (UK Priority Species, commercial species)
- Great/King scallop (*Pecten maximus*) (a commercial species)
- Queen scallop (*Aequipecten opercularis*) (a commercial species)
- Native oyster (*Ostrea edulis*) (OSPAR T&D species, UK Priority Species)
- Blue mussel (*Mytilus edulis*) (a commercial species)
- European lobster (*Homarus gammarus*) (a commercial species)

	<ul style="list-style-type: none"> • Spider crab (<i>Maja brachydactyla</i>) (a commercial species) • Common whelk (<i>Buccinum undatum</i>) (a commercial species) • Spiny Lobster (<i>Palinurus elephas</i>) (UK Priority Species, a commercial species)
<p>Rationale for candidate area</p>	<p>Lindisfarne is an area of relatively high abundance for the inshore Northern North Sea region, with 873 species being recorded. In total the area is home to 40 threatened or important benthic, mammal and bird species and the area overlaps with designations such as SAC, SPA, RAMSAR Site, MCZ and SSSI.</p> <p>This area is located along one of the most varied coastlines in the UK, containing a complex mix of marine habitats and associated species, which are unusually diverse for the North Sea. It includes important intertidal and subtidal biotopes and assemblages, from tide-swept kelp forests to sheltered seagrass and rich, muddy sediments. The intertidal area contains saltmarsh, and intertidal seagrass beds comprised of <i>Zostera noltii</i> and <i>Zostera marina</i>. The muddy sands on the shore contain lugworms and bivalve molluscs, other areas of mud support ragworms and bivalves. Areas of fine sand support a wide range of polychaete bristle worms and mobile intertidal sand is dominated by sand shrimp (<i>Bathyporeia Pilosa</i>). These sediment habitats provide key food sources for many bird species. Mussel beds (<i>Mytilus edulis</i>) provide a varied habitat for a different range of bird and crab species, and during high tide provide a source of food for flatfish.</p> <p>Intertidal rock areas feature mussels, limpets and sea snails, with kelp and mixed seaweeds. Below the tideline the area supports kelp forest and red seaweeds, under this canopy of kelp the habitat supports edible crabs (<i>Cancer pagurus</i>), spider crabs (<i>Maja brachydactyla</i>) and common lobster (<i>Palinurus elephas</i>). Deeper subtidal infralittoral rock is animal dominated and found to be covered in a diverse and colourful mix of encrusting bryozoans, hydroids, sponges and echinoderms. This animal dominated rocky habitat supports species of crabs and lobsters.</p> <p>Deeper subtidal coarse and mixed sediments may appear more barren, but the water column above can provide habitat and a food source for important fish species such as herring (<i>Clupea harengus</i>) and cod (<i>Gadus morhua</i>).</p> <p>This area is important for many mobile species, primarily migrating birds, and grey seals (<i>Halichoerus grypus</i>). The area provides important foraging and haul out areas for grey seals and the Northumberland colony providing 3% of the British annual pup production. Lindisfarne is an important</p>

	<p>area for the behaviours and/or key life cycles stages of 44 species in total: 29 bird species, 14 fish species and 1 mammal species. The area is the only regular British wintering site for light-bellied brent geese (<i>Branta bernicla hrota</i>), during their winter migration from the Arctic and supports thousands of other waders and geese. The area is an important foraging and breeding location for thousands of seabirds which utilise the Farne Islands as their breeding colony, species include puffins (<i>Fratercula arctica</i>), common guillemot (<i>Uria aalge</i>), eider duck (<i>Somateria mollissima</i>), and several tern species such as Arctic tern (<i>Sterna paradisaea</i>).</p> <p>Commercial marine species that may have nursery or spawning areas within the site include lemon sole (<i>Microstomus kitt</i>), herring (<i>Clupea harengus</i>), cod (<i>Gadus morhua</i>), sole (<i>Solea solea</i>), plaice (<i>Pleuronectes platessa</i>), mackerel (<i>Scomber scombrus</i>) and dab (<i>Limanda limanda</i>). The area also supports the key life cycle stages of shellfish including edible crab (<i>Cancer pagurus</i>), scallops, lobsters, spider crab (<i>Maja brachydactyla</i>), whelks and cockles.</p> <p>Several habitats considered to be 'blue carbon' habitats can be found in the area including intertidal mud, kelp on rock substrate, intertidal sand & muddy sand, saltmarsh, seagrass and subtidal sand. There are small areas of habitats that are important for the provision of flooding and coastal erosion protection, including: coastal sand dunes, kelp on rock substrate, saltmarsh, seagrass but these offer only extremely limited flood mitigation in proximity to an at-risk coastline.</p> <p>The area is subject to relatively high intensities of activities, which the habitats in the area are moderately or highly sensitive to, therefore the area is considered to be a degraded ecosystem and no natural habitats were found. The candidate HPMA contains habitats which have been assessed as having a potential recovery from pressures within 2-10 years, making this a suitable area for assessment of HPMA recovery. This site is in a mixed condition; some of the species and habitats are in favourable conservation status, while some are in unfavourable condition.</p> <p>This candidate HPMA offers a range of benefits in terms of both habitat recovery and conservation.</p>
<p>Identified via SNCBs or 3rd party proposal</p>	<p>This candidate HPMA was identified by Natural England, following the agreed ecological criteria for pilot HPMA selection.</p>

Boundary of candidate area	<table border="1"> <thead> <tr> <th>Point</th> <th>Lat</th> <th>Long</th> <th>Point</th> <th>Lat</th> <th>Long</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>55° 42' 12.922" N</td> <td>1° 54' 15.799" W</td> <td>G</td> <td>55° 36' 33.579" N</td> <td>1° 42' 11.115" W</td> </tr> <tr> <td>B</td> <td>55° 45' 15.659" N</td> <td>1° 50' 4.025" W</td> <td>H</td> <td>55° 37' 37.002" N</td> <td>1° 45' 55.478" W</td> </tr> <tr> <td>C</td> <td>55° 39' 33.030" N</td> <td>1° 34' 29.001" W</td> <td>I</td> <td>55° 39' 40.779" N</td> <td>1° 43' 25.831" W</td> </tr> <tr> <td>D</td> <td>55° 37' 25.112" N</td> <td>1° 37' 10.821" W</td> <td>J</td> <td>55° 41' 9.666" N</td> <td>1° 46' 48.538" W</td> </tr> <tr> <td>E</td> <td>55° 38' 29.607" N</td> <td>1° 39' 40.213" W</td> <td>K</td> <td>55° 41' 25.196" N</td> <td>1° 51' 16.045" W</td> </tr> <tr> <td>F</td> <td>55° 37' 46.449" N</td> <td>1° 40' 31.188" W</td> <td>L</td> <td>55° 41' 11.807" N</td> <td>1° 52' 50.963" W</td> </tr> </tbody> </table>						Point	Lat	Long	Point	Lat	Long	A	55° 42' 12.922" N	1° 54' 15.799" W	G	55° 36' 33.579" N	1° 42' 11.115" W	B	55° 45' 15.659" N	1° 50' 4.025" W	H	55° 37' 37.002" N	1° 45' 55.478" W	C	55° 39' 33.030" N	1° 34' 29.001" W	I	55° 39' 40.779" N	1° 43' 25.831" W	D	55° 37' 25.112" N	1° 37' 10.821" W	J	55° 41' 9.666" N	1° 46' 48.538" W	E	55° 38' 29.607" N	1° 39' 40.213" W	K	55° 41' 25.196" N	1° 51' 16.045" W	F	55° 37' 46.449" N	1° 40' 31.188" W	L	55° 41' 11.807" N	1° 52' 50.963" W
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Evidence/references	<p>Bradbury, G. et al. (2014). Mapping Seabird Sensitivity to Offshore Wind Farms. PLOS One 9, 1-17. Available from: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0106366</p> <p>Brereton, T., Davies, R., Babey, L., Kitching, M. and Walker, R., 2020. Temporal and spatial analysis of Marinelife and Orca white-beaked dolphin data from Northumberland and adjacent sea areas. Natural England Commissioned Report NECR 289.</p> <p>Brereton, T., Kitching, M., Davies, R., McNie, F., and Walker, R., 2016. Photo-identification of white-beaked dolphins off Southwest and Northeast England 2007 - 2014. Natural England.</p> <p>Carter, M. I. D., Boehme, L., Duck, C.D., Grecian, W.J., Hastie, B.J., McConnell, B.J., Miller, D.L., Morris C.D., Moss, S.E.W., Thompson, P.M., AND Russell, D.J.F, 2020. Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles. Sea Mammal Research Unit, University of St Andrews, Report to BEIS, OESEA-16-76/OESEA-17-78.</p> <p>Corr, S., 2020. Using citizen science data to assess the vulnerability of bottlenose dolphins (<i>Tursiops truncatus</i>) along England's south coast. Unpublished MRes. thesis. University of Plymouth.</p> <p>Environment Agency, 2021. Ecology & Fish Data Explorer [online]. Available from: https://environment.data.gov.uk/ecology/explorer/</p>																																															

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2.5. North East of Farnes Deep

Table 5. Scientific advice on the ecological merit of the North East of Farnes Deep Candidate HPMA.

GENERIC INFORMATION	
Candidate HPMA name	North East of Farnes Deep
Biogeographic region	Northern North Sea (Offshore)
Geographic description	The candidate HPMA North East of Farnes Deep is situated beyond the 12 nm territorial sea limit in the western offshore area of the Northern North Sea region, approximately 55 km offshore from the Northumberland coast. This area overlaps entirely with the North East of Farnes Deep MCZ, designated in November 2013, and has an area of 491.8 km ² . The depth of the area ranges from approximately 50 m to 100 m.
Known habitats and species⁵	<p>The key habitats and species present in the candidate area are as follows:</p> <p>EUNIS level 3 broad-scale habitats:</p> <ul style="list-style-type: none"> • Sublittoral coarse sediment • Sublittoral sand • Sublittoral mud • Sublittoral mixed sediments <p>Important habitats:</p> <ul style="list-style-type: none"> • Subtidal sands and gravels (UK Priority Species)

⁵ The known habitats and species listed above refer to the key important habitats and species found on national and international lists of conservation importance, including: Priority Marine Species, OSPAR (threatened and declining), FOCl (Features of Conservation Importance – Habitats and Species), IUCN red list, EC Habitats Directive (Habitats and Species), EC Birds Directive (Annex I and II), BoCC4 (Birds of Conservation Concern 4 – Red and Amber lists) and WCA 1981 (Wildlife & Countryside Act 1981). There are additional species and habitats also reported as being present, including commercial fish and shellfish species.

- Seapens and burrowing megafauna (Habitat FOCI, OSPAR T&D habitats)

Important demersal/benthic species:

- Ocean quahog (*Arctica islandica*) (OSPAR T&D species, Species FOCI)

Important bird species:

- Black-legged kittiwake (*Rissa tridactyla*) (EC Birds Directive - Annex I, OSPAR T&D species, IUCN: Vulnerable, BoCC4: Amber)
- Common guillemot (*Uria aalge*) (EC Birds Directive - Annex I, IUCN: Least Concern, BoCC4: Amber)
- Herring gull (*Larus argentatus*) (EC Birds Directive - Annex I, BoCC4: Red, IUCN: Least Concern)
- Northern fulmar (*Fulmarus glacialis*) (EC Birds Directive - Annex I, BoCC4: Amber, IUCN: Vulnerable)
- Northern gannet (*Morus bassanus*) (EC Birds Directive - Annex I, BoCC4: Amber, IUCN: Least Concern)
- Razorbill (*Alca torda*) (EC Birds Directive - Annex I, BoCC4: Amber, IUCN: Least Concern)
- Atlantic puffin (*Fratercula arctica*) (BoCC4: Red, IUCN: Least Concern)
- European storm petrel (*Hydrobates pelagicus*) (EC Birds Directive - Annex I, BoCC4: Amber, IUCN: Least Concern)
- Great skua (*Stercorarius skua*) (EC Birds Directive - Annex I, BoCC4: Amber, IUCN: Least Concern)
- Lesser black-backed gull (*Larus fuscus*) (EC Birds Directive - Annex I, BoCC4: Amber, IUCN: Least Concern)

Important marine mammal species:

- Harbour porpoise (*Phocoena phocoena*) (CITES, EC Habitats Directive - Annex II & IV, IUCN: Least Concern, UK Priority Species, OSPAR T&D species)
- Minke whale (*Balaenoptera acutorostrata*) (CITES, EC Habitats Directive - Annex IV, IUCN: Least Concern, UK Priority Species)

	<ul style="list-style-type: none"> • White-beaked dolphin (<i>Lagenorhynchus albirostris</i>) (CITES, EC Habitats Directive - Annex IV, IUCN: Least Concern, UK Priority Species) • Grey seal (<i>Halichoerus grypus</i>) (EC Habitats Directive - Annex II & V, IUCN: Least Concern) • Harbour seal (<i>Phoca vitulina</i>) (EC Habitats Directive - Annex II & V, IUCN: Least Concern, UK Priority Species) <p>Important fish species:</p> <ul style="list-style-type: none"> • Angler fish (<i>Lophiiformes</i>) (UK Priority Species) • Haddock (<i>Melanogrammus aeglefinus</i>) (IUCN: Least Concern, a commercial species) • European pilchard (<i>Sardina pilchardus</i>) (IUCN: Least Concern, a commercial species) • Whiting (<i>Merlangius merlangus</i>) (UK Priority Species, IUCN: Least Concern, a commercial species) • European Smelt (<i>Osmerus eperlanus</i>) (UK Priority Species, IUCN: a commercial species)
<p>Rationale for candidate area</p>	<p>The area has relatively high levels of biodiversity in comparison to the wider Northern North Sea region.</p> <p>This assessment is based upon data acquired and analysed from a variety of ground-truth and modelled data and data products, including Natural England Evidence Base 2021, Marine Recorder 2021, EUSeaMap 2019 and additional survey data (GB001126 2014), at a regional level to identify areas that comprise relatively higher levels of biodiversity.</p> <p>The seabed in the area comprises four broad-scale habitats (BSHs); sublittoral sand, sublittoral coarse sediment, and sublittoral mixed sediment are interspersed relatively evenly within the area, with sublittoral mixed sediments occupying over one third of the area (Survey GB001126 2014). Sublittoral mud covers 27.63 km² of the area (5.6 % by area) and is thought to be an important habitat in the absorption of atmospheric carbon (JNCC, 2021). Sublittoral mud has been identified to have a large stock of residing carbon more broadly (23.9 million tonnes in English waters) and therefore highlights importance as a carbon reservoir and its role in carbon sequestration (Parker <i>et al.</i> 2020). Sublittoral sand, which occurs within the area, has also the potential to store organic carbon from the water column for decades to centuries (Gregg <i>et al.</i> 2021).</p>

The wide-ranging habitat types in the area are relatively stable and support a diverse range of benthic, demersal and mobile species including sponges, hydroids, anemones, worms, molluscs, crustaceans, echinoderms, fish, marine mammals and seabirds. Survey data indicates the presence of at least 263 benthic and demersal species, including the phosphorescent sea pen (*Pennatula phosphorea*), common dragonet (*Callionymus lyra*), and Atlantic hagfish (*Myxine glutinosa*). Barnacles (*Verruca stroemia*), amphipods (*Atylidae* and *Paraphoxus sp.*) and squat lobsters (*Galathea intermedia*) occur in relatively large numbers across the extent of the area. The area also supports species of conservation importance such as the Ocean quahog (*Arctica islandica*) (OSPAR Commission 2008a, Tyler-Walters & Sabatini 2017).

Many of the mobile species present are considered to be rare/regionally distinctive such as the European smelt (*Osmerus eperlanus*), which is an important prey source for larger fish, seabirds and marine mammals. At least ten nationally important seabird species and five marine mammal species, such as Harbour porpoise (*Phocoena phocoena*) use the area (Waggitt *et al.* 2020, Carter *et al.* 2020, JCP 2017, Paxton *et al.* 2016, OSPAR Commission 2008b). Data for important demersal/benthic species have been derived from Natural England's Evidence Base 2021, the Marine Recorder 2021 database, the JNCC Annex I habitats 2021 list, OSPAR's list of Threatened and/or declining habitats and species 2020 and additional survey data.

The area is exposed to relatively uniform and weak tidal currents running north or south depending on the state of tide. Mean current velocities range from 0.19 ms⁻¹ to 0.23 ms⁻¹ with currents tending to be stronger in the west of the area. The overall hydrodynamic regime indicates a low energy environment in the area. Geological/geomorphological features are present in the area and are depositional glacial features and topographic features of the North-East Bank seabed mound or pinnacle.

The area supports prey items for the foraging of several species of fish, seabirds and marine mammals. Katara *et al.* (2021) reports that the area is of importance for the nursery and spawning behaviour of at least ten commercially important marine species of fish. Examples include Angler fish (*Lophiiformes*), Surmullet (*Mullus surmuletus*), Whiting (*Merlangius merlangus*), as well as Haddock (*Melanogrammus aeglefinus*). In relation to seabirds, there are at least 11 species reported to be present within the area, including the Atlantic puffin (*Fratercula arctica*) and Black-legged kittiwake (*Rissa tridactyla*) (both of which are classified as 'Vulnerable' on the IUCN Red List). Although there are limited data available to support the relative importance of the area for the foraging activity of

	<p>seabirds, the variable annual abundance of each seabird species during wintering and foraging periods suggests that several seabird species use the area for foraging. Data from the Sea Mammal Research Unit (SMRU 2015) and the Joint Cetacean Protocol (JCP 2017) identified a relatively greater presence of five marine mammal species in this area by comparison to the wider region (see list above). However, there are limited data available to identify the importance of this area in relation to the key life cycle stages of marine mammals.</p> <p>The candidate HPMA fully overlaps with the North East of Farnes Deep MCZ. The area was surveyed in May 2016, providing an initial dataset for a monitoring time series. The site was also surveyed between April and May 2018 in an effort to investigate existing and future management measures for the site.</p> <p>The area is considered to represent a relatively natural location. It overlaps entirely with the designated North East of Farnes Deep MCZ, which presents the only example in the English offshore area where all designated features are considered to be in favourable condition. These features are Ocean quahog and four broad-scale habitats: subtidal coarse sediment, subtidal sand, subtidal mixed sediments and subtidal mud. Evidence suggests that the location is subject to a range of low to relatively medium disturbance (OSPAR BH3 indicator), meaning that species and habitats are sensitive to some level of fishing pressure (BH3 2017). The habitats within the area have a range of recovery times from <10 years to >10 years, subject to pressures being removed.</p> <p>This area meets all ecological criteria to identify pilot HPMA, including relatively high levels of biodiversity and the representation of important blue carbon habitats. It is the only candidate HPMA in offshore English waters that represents a relatively natural ecosystem. As the area has previously been surveyed, an initial dataset will be available to monitor the site across a time series and evaluate the impact of HPMA designation in a relatively shorter timeframe.</p>
<p>Identified via SNCBs or 3rd party proposal</p>	<p>The area was not identified, either in full or in part, by any third-party proposals. It was identified based on JNCC's analysis of available supporting evidence against the ecological criteria for selecting pilot HPMA.</p>

<p>Boundary of candidate area</p>	<table border="1"> <thead> <tr> <th>Point</th> <th>Lat</th> <th>Long</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>55° 51' 56" N</td> <td>0° 46' 45" W</td> </tr> <tr> <td>B</td> <td>55° 52' 24" N</td> <td>0° 27' 56" W</td> </tr> <tr> <td>C</td> <td>55° 38' 54" N</td> <td>0° 26' 57" W</td> </tr> <tr> <td>D</td> <td>55° 38' 26" N</td> <td>0° 45' 35" W</td> </tr> </tbody> </table>	Point	Lat	Long	A	55° 51' 56" N	0° 46' 45" W	B	55° 52' 24" N	0° 27' 56" W	C	55° 38' 54" N	0° 26' 57" W	D	55° 38' 26" N	0° 45' 35" W
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<p>Evidence/references</p>	<p>Carter, M.I.D., Boehme, L., Duck, C.D. <i>et al.</i> (2020) Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles. Sea Mammal Research Unit, University of St Andrews, Report to BEIS, OESEA-16-76/OESEA-17-78.</p> <p>Gregg, R., Elias, J.L., Alonso <i>et al.</i> (2021). Carbon storage and sequestration by habitat: a review of the evidence (second edition). <i>Natural England Research Report</i> NERR094.</p> <p>Katara, I., Peden, W.J., Bannister, H. <i>et al.</i> 2021. Conservation hotspots for fish habitats: A case study from English and Welsh waters. <i>Regional Studies in Marine Science</i>, 44, p.101745.</p> <p>JNCC. 2020. Statements on conservation benefits, condition and conservation measures for North East of Farnes Deep Marine Conservation Zone. Available at: https://data.jncc.gov.uk/data/5c5def7f-e1a04a7f-8078-a0ff3050a4fb/NEFD-4-ConservationStatements-V1.0.pdf (Accessed 15/09/2021).</p> <p>JNCC. 2021. Statistics on the extent of blue carbon habitats to support MPA decision-making in Secretary of State waters. Defra Project MB0150. Report 2/2: Results.</p> <p>OSPAR Commission (2008a). Case reports for the OSPAR List of Threatened and/or declining species and habitats. <i>Arctica islandica</i>, Ocean quahog.</p> <p>OSPAR Commission (2008b). Case reports for the OSPAR List of Threatened and/or declining species and habitats. <i>Phocoena</i>, Harbour porpoise.</p> <p>Parker, R., Benson, L., Graves, C., Kröger, S., Vieira, R. 2020. Carbon stocks and accumulation analysis for Secretary of State (SoS) region. <i>Cefas Project Report for Defra</i>, 42pp.</p>															

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