Marine Management Organisation

Seascape Character Assessment for the East Inshore and Offshore Marine Plan Areas

(MMO1369)






MMO1369: Seascape Character Assessment for the East Inshore and Offshore Marine Plan Areas, August 2024

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List of Abbreviations

The following abbreviations are used throughout the report:

- BP (Years) Before Present
- MCA Marine Character Area
- MCZ Marine Conservation Zone
- MMO Marine Management Organisation
- MPS Marine Policy Statement
- NCA National Character Area
- NNR National Nature Reserve
- SAC Special Area of Conservation
- SCA Seascape Character Area
- SPA Special Protection Area
- SSSI Site of Special Scientific Interest
- VRM Visual Resource Mapping

1. Introduction

The Marine Policy Statement (MPS, 2011) (2.6.5.2) states that, when developing marine plans, visual, cultural, historical and archaeological impacts should be considered for all coastal areas. The MPS adds that any wider social and economic impacts of a development or activity on coastal landscapes and seascapes should also be considered, taking into account existing character and quality (2.6.5.3).

In 2023, the Secretary of State for Environment, Food and Rural Affairs agreed with the Marine Management Organisation's recommendation to replace the East Inshore and East Offshore Marine Plans. The adopted East Inshore and East Offshore Marine Plans will be replaced with a new plan which will be the first of a second generation of plans for English waters. The new document will be referred to as the 'East Marine Plan'. To assist the Marine Management Organisation (MMO) in addressing the seascape requirements set out by the MPS, this report presents an updated seascape character assessment (SCA) for the east inshore and offshore marine plan areas.

1.1 Context

The first strategic-scale seascape assessment in the UK was for the east inshore and offshore marine plan areas, commissioned by Natural England in 2011 as part of a pilot study (NECR106), and further updated by the MMO in 2012 following a consultation exercise (the Natural England pilot study and the MMO update are collectively referred to as 'the 2012 SCA'). Subsequently the MMO commissioned the first strategic-scale SCA for the south inshore and offshore marine plan areas in 2014 which included the development of an approach to Visual Resource Mapping (VRM). In 2015, desk based SCAs were completed for the south-east, north-east and north-west marine plan areas, followed by the south-west inshore SCA in 2016. VRM was also undertaken for all plan areas. In 2018, following additional stakeholder verification workshops, the SCAs for the north-east, north-west, south-east and south-west inshore and offshore marine plan areas were published. Building further on this work, in 2019, the MMO commissioned 'an approach to seascape sensitivity assessment' (MMO1204) to enable licence applicants to respond to seascape requirements set out by section 2.6.5.3 of the MPS, thus enabling MMO to assess quality, value and capacity to accommodate change. Natural Resources Wales and the Welsh Government also completed a national study to describe Marine Character Areas (MCAs) for inshore marine plan areas in Wales..

This SCA for the east inshore and offshore marine plan areas follows the guiding principles set out in Natural England's 2012 publication, An approach to Seascape Character Assessment (NECR105). It draws on the experience of previous studies and serves as an update to the 2012 SCA. Building on lessons learned, this SCA focusses on the methods utilised in the assessment for the south-west inshore and offshore marine plan areas in 2018. In this updated SCA, new and updated baseline information is provided, in a format that is consistent with the other SCAs published by the MMO.

An analysis of change in the seascape character was also undertaken under the same project commission (MMO1369). The analysis of change, focusing on changes in seascape character between 2012 and 2024, and their causes, is presented in a separate report ('Understanding change in seascape character in the east marine plan areas').

1.2 Objectives

The objectives of the study were to:

- Undertake a field based SCA for the east marine plan areas, comprising the spatial definition of strategic-scale MCAs and accompanying descriptions, with a focus on key characteristics; and
- Hold stakeholder engagement workshops to refine and validate the seascape character assessment map, MCA definitions, and key characteristics.

1.3 Structure of the report

This report for the east marine plan areas has been structured as follows:

- Section 2 describes the methodology developed and followed for this study.
- Section 3 includes the updated MCA profiles for the east marine plan areas.
- Annex 1 contains overview maps for the for the east marine plan areas.
- Annex 2 lists the spatial datasets used in this study.
- Annex 3 is a list of the organisations consulted as part of this study.
- Annex 4 contains the outputs from the two stakeholder validation workshops.

2. Methodology

This section summarises the methodology for the production of this SCA for the east marine plan areas including the following steps:

- gathering and assimilating data and information;
- desk-based analysis, including review of the existing seascape assessment;
- field surveys;
- stakeholder verification; and
- analysis of change through desk and field-based assessment (separate report).

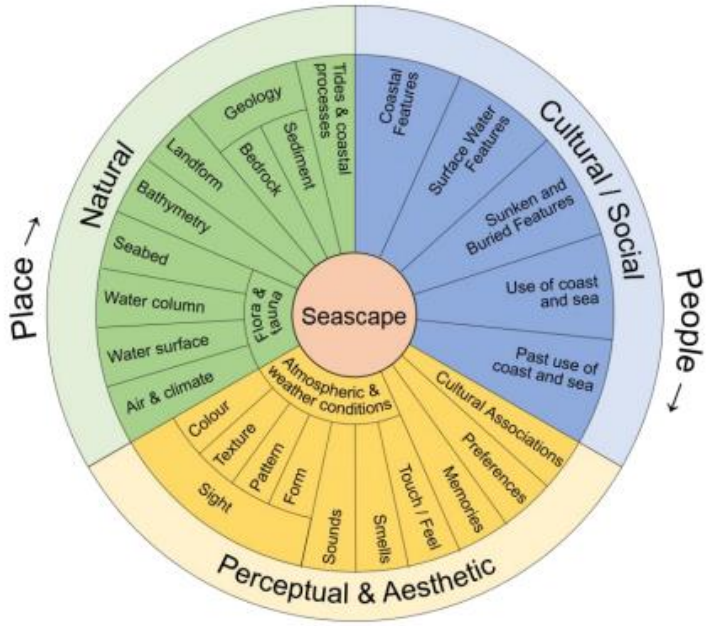
The steps are described below including how the project considered spatial links with adjacent marine plan areas (the south and north-east), as well as existing local-scale seascape character assessment work completed in the area.

2.1 Gathering and assimilating data and information

The first stage involved gathering and assimilating the range of datasets, literature, plans and strategies available to inform the work. Information produced for the 2012 SCA was assimilated into this report where appropriate. This included reference to the desk-based studies and field surveys carried out at that time, all field notes and survey observations were presented in the Appendices to the 2012 SCA.

The majority of the required spatial data was provided by the MMO, organised in a GIS database structured according to the key themes of the 'Seascape Wheel', which is included as Figure 1. The Seascape Wheel illustrates the different aspects which combine to create 'seascape character', under the general themes of natural, cultural/social and perceptual and aesthetic. General information layers such as base-mapping and administrative boundaries were also collated during this first stage.

Figure 1: The Seascape Wheel (Natural England, 2012)



(Adapted from Natural England (2012), Figure 1, page 9)

Numerous GIS layers including geology, bathymetry and designated sites were overlaid onto base maps. Particular attention was paid to aligning the coordinate systems of onshore and offshore datasets to ensure a seamless transition between the marine and terrestrial data, drawing on the experience of previous studies.

A full data list for this work is provided in Annex 2. This includes groupings under the three general themes of the Seascape Wheel, to show how the range of data informs each theme. The nature of the desk-based work undertaken for this study aligns with the 'natural' and 'cultural/social' themes of the Seascape Wheel, while the 'perceptual and aesthetic' information (eg sight, sounds, smells) was gathered by field survey work.

Relevant literature and other written references were also compiled to inform the project. A reference list is provided in Annex 3.

2.2 Desk-based seascape assessment

2.2.1 Review of marine character areas

The study began with a review of the marine character areas (MCAs) that were defined in the 2012 study. The collated data and information relating to the different aspects of the Seascape Wheel were interrogated and emerging patterns were correlated with the MCA boundaries.

The definition of a marine character area, set out in the box below, is consistent with that provided for 'seascape character areas'[1] in Natural England's 2012 publication, An approach to Seascape Character Assessment (NECR105), and applies to all other strategic-scale studies undertaken to-date in England and Wales.

Definition of marine character areas

Each marine character area has its own individual character and identity, even though it can share some of the same general characteristics as other areas. The use of marine character areas provides a good framework within which to draw out patterns of local distinctiveness and those factors influencing sense of place. They can be used to develop more tailored policies or strategies, reflecting the things that make a particular area different, distinctive or special **(Natural England, 2012).**

Boundaries drawn for the MCAs represent broad transitions in character from MCA to MCA, and tend to reflect natural breaks or the clustering of characteristics and/or features deciphered from available data and information.

The features on which the 2012 boundaries rely, tend to be based around bathymetry, and other elements that were not subject to change in the intervening period (12 years). The review concluded that there were no compelling reasons for amending the MCA boundaries established in 2012 and the current classification was retained. The benefits of continuity include:

- Familiarity and consistency for users of MCAs; and
- Relevance of comparison between the previous report and the current update.

In comparing the 2012 report with subsequent reports for the neighbouring north-east and south marine plan areas, it was noted that minor changes were made at boundaries. These changes have been maintained in the updated MCAs, and are summarised below:

- In the north, the boundary between MCA 5: Holderness Coastal Waters and MCA 21: North Yorkshire Coastal Waters was moved south of the marine plan boundary, so that the whole of Flamborough Head lies within the latter MCA 5. This recognises the clear distinction between the low-lying Holderness coast and the more elevated coast in MCA 21.
- In the south, the boundaries of MCA 19: Essex and South Suffolk Estuaries and Coastal Waters, and MCA 20: Thames Approaches, were amended to follow seascape features rather than the marine plan boundary.

The classification of ten MCAs for the east marine plan areas was retained, illustrated within the national context in Figure 2. A summary of the main information used to inform the boundaries of the final MCAs for the south west is included in the 'Location and boundaries' section of each MCA profile included at Section 3.

[1] Marine character areas (MCAs) are more widely known as seascape character areas (SCAs) outside of the marine planning process in England. SCAs was the term used in the 2012 study, but this update has adopted MCA for consistency with other MMO reports.

As noted above, the MCA boundaries represent broad zones of transition, rather than immediate breaks in character. Natural, visual, cultural and socio-economic relationships between adjacent MCAs play a key role in shaping overall character. Therefore, individual MCAs should not be considered in isolation.

2.2.2 Desk study to update the MCA descriptions

The use of GIS is a key tool in the process of seascape character assessment, enabling different information layers to be interrogated in tandem and therefore allowing spatial patterns relevant to character to be investigated.

A review of the existing seascape character descriptions was undertaken, and cross checked with data and information gathered above. Key characteristics were selected from the written descriptions, based on consideration of their potential to shape individual distinctiveness and sense of place. Key characteristics were updated, or new points added, to reflect the updated sources of information, and LUC's own knowledge of the study area (including through previously completed and ongoing projects).

2.2.3 Visual Resource Mapping

As noted in the Introduction, an approach to visual resource mapping (VRM) was developed and methodology documented as part of the seascape assessment for the south marine plan areas (2014), which has subsequently been applied nationally by the MMO. As such, the VRM is referred to in this study for the east marine plan areas to help inform the 'perceptual and aesthetic' theme of the Seascape Wheel as relevant to visual character. The VRM was reviewed alongside assessments from the field surveys. Figure 3 presents the national VRM for England and Wales (showing both sea surface visibility and land with views of the sea). The east section, showing the MCA framework, is included at Figure 16 in Annex 1.

Figure 2: Marine Character Areas in England and Wales

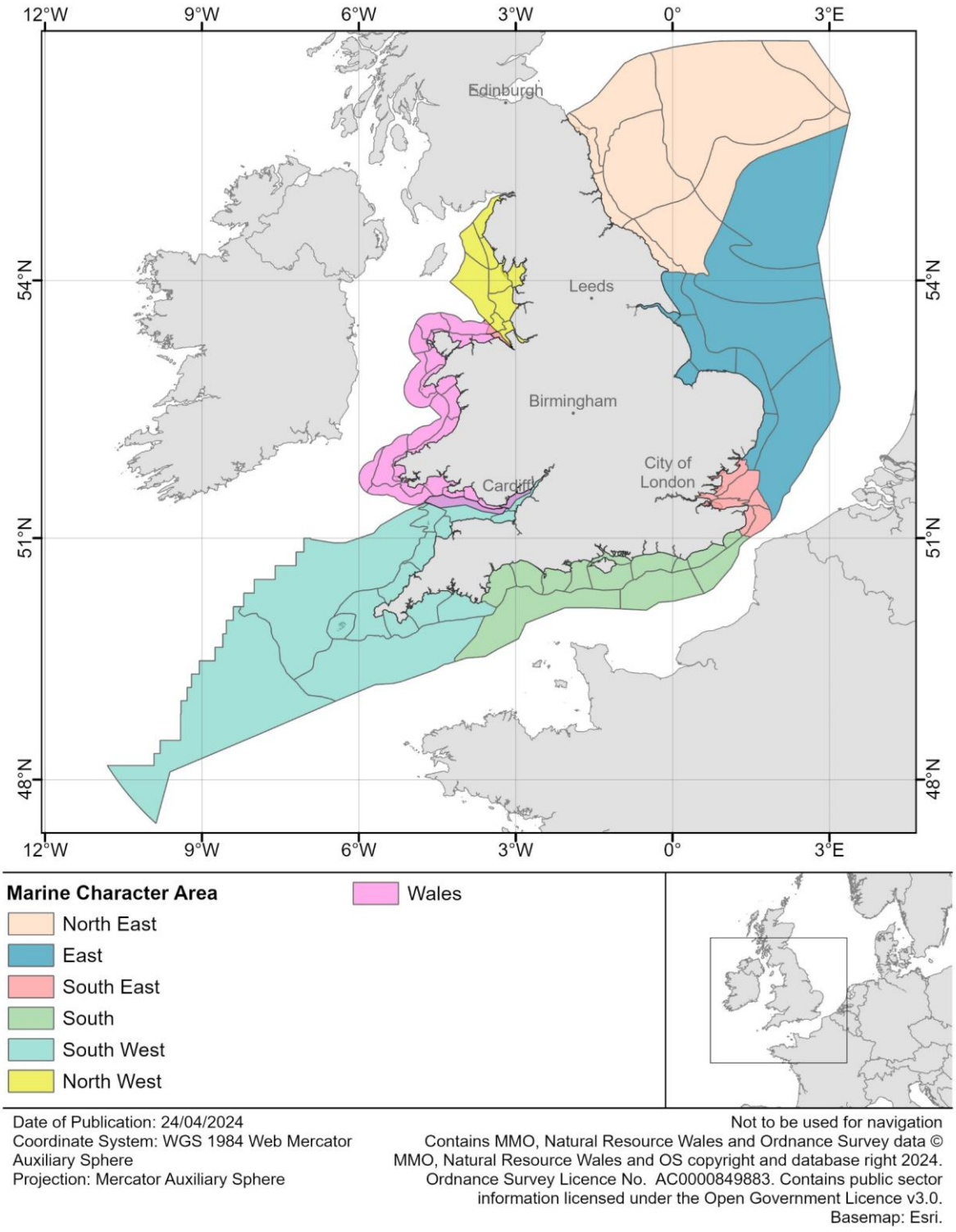
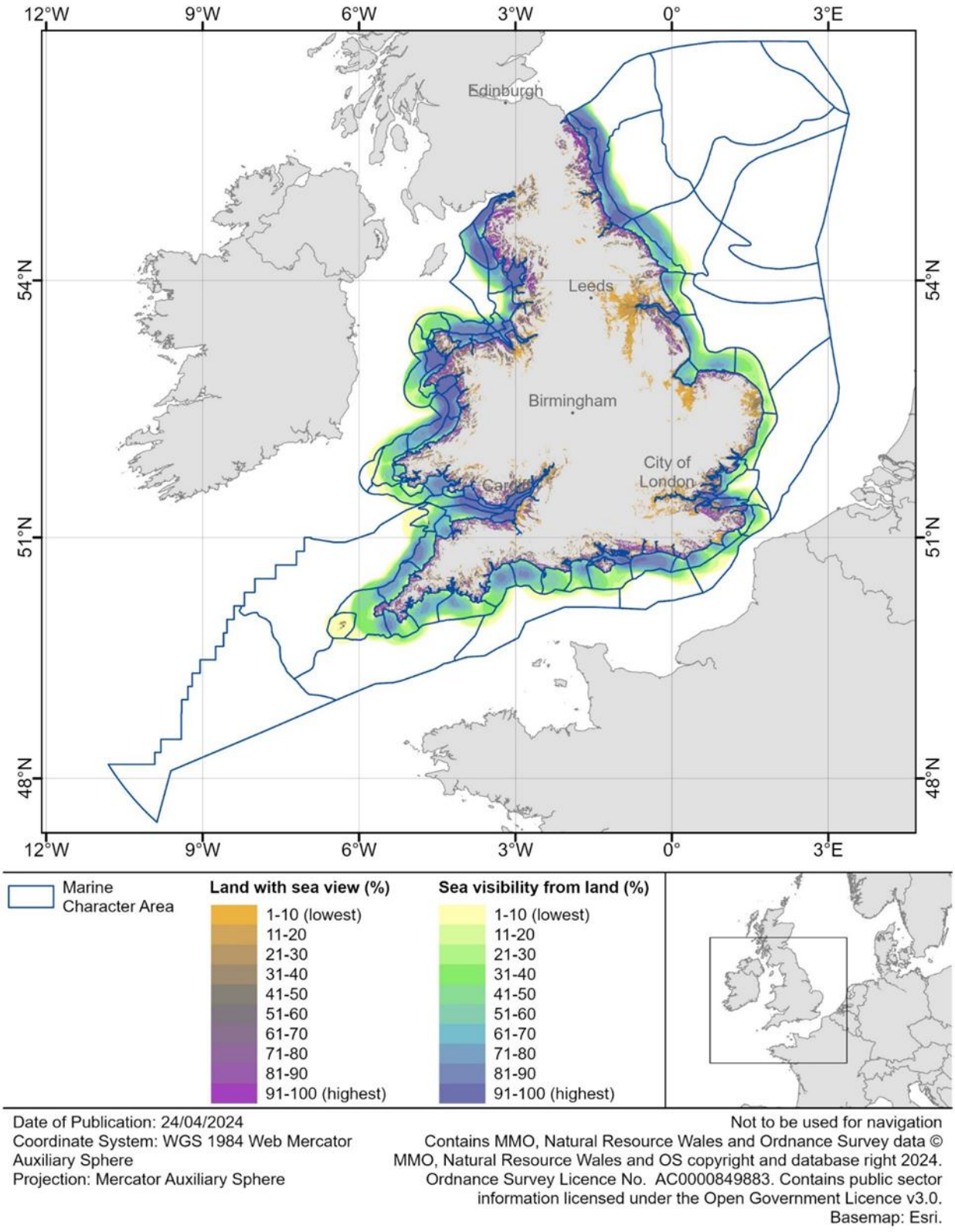


Figure 3: Visual resource mapping for England and Wales



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2.3 Field Surveys

2.3.1 Approach to Field Survey

Field surveys were undertaken exclusively on terrestrial parts of the study area. The methodology was structured using the 2012 pilot study undertaken by URS/Scott Wilson, including replication of the fieldwork proformas. Minor adjustments were made to the proformas to include Table 6 - Seascape Change. Information gathered was relevant to:

- Aesthetic qualities
- Perceptual qualities and local distinctiveness
- Major landmarks
- Physical form
- Topography and geology
- Natural/human influences
- Coastal activity
- Marine activity
- Cultural associations
- Seascape condition
- Seascape change

Proforma-based assessments were carried out at locations surveyed in the 2012 pilot study, and at a number of additional locations selected on site. Proforma locations were recorded to allow future site work to revisit the same locations.

In addition to these key locations, rapid assessments were made at other locations to increase the detail of the study. These additional survey locations were identified by site surveyors where they considered recording would be useful, but a proforma not necessary. This was considered the most practical and time efficient method. Notes and photographs from these additional locations are not presented in this output report but informed the development of key characteristics. While visits to these additional locations cannot be replicated in future, it is anticipated that future site work will also involve general observations of the seascape, as well as visits to specific viewpoints.

2.5 Stakeholder verification

2.5.1 Stakeholder workshops

Stakeholder validation was a key element of the project brief for the updated assessment. Following development of draft updated profiles of each MCA in the east marine plan areas, two online stakeholder workshops were held on the 19th and 20th of March 2024.

A range of different stakeholders attended the workshops, with around 20 people in attendance at each session. A list of organisations represented by attendees is included in Annex 4. Those attending the workshops received an introduction from the MMO on how seascape evidence is feeding into the marine planning process.

This was followed by an overview of the updated seascape character assessment work being undertaken by LUC. Discussions were then facilitated to verify the MCA names, boundaries and key characteristics for consideration in the updated information provided in this report.

2.5.2 Interactive white boards

Collaborative white boards (using the online platform Miro), containing draft key characteristics and maps for each MCA, were made available for review and comment prior to workshops. Discussion at the workshop focused on the collaborative white boards and a series of prompts to elicit information. The outputs from the boards, including the comments received, are included in Annex 4. The outputs of the stakeholder verification were a key information source in finalising the MCA key characteristics.

2.6 Limitations

The main limitations of the updated SCA for the east marine plan areas, and suggestions for future improvements, are summarised as follows:

- The season in which surveys were carried out (winter), coupled with limited resource and project time did not allow for offshore seascape surveys which limited the surveyors' ability to explore all aspects of each MCA from different perspectives.
- Consideration of the condition and sensitivity of the seascape at a point in time in the future was not included in the evaluation of condition, sensitivity and future management. Doing so would enable production of tailored management and planning guidelines.
- Due to the seasonal nature of marine activities, and the dynamic nature of the coast, not all aspects of the seascape were represented at the time of assessment (January 2024). For instance, recreational activities such as sailing might not be observed on a weekday in January, despite being popular in the same location on a summer weekend. Reliance has been placed on literature to inform such gaps.
- It is also important to note the climatic influence on general perception and aesthetic association. Weather during the survey period was generally calm and overcast, with some periods of poorer visibility. It is not considered that this has greatly affected the outcome as conditions were good enough to allow thorough survey.
- Observations recorded at survey locations are subjective and based on the perceptions of the surveyor.

3. Seascape assessment for the east inshore and offshore marine plan areas

3.1 Introduction

This chapter provides descriptive profiles for each MCA identified for the east inshore and offshore marine plan areas. Each stand-alone profile contains the following information:

A location map of the MCA (forming the front cover of each MCA profile).

Overview of the MCA

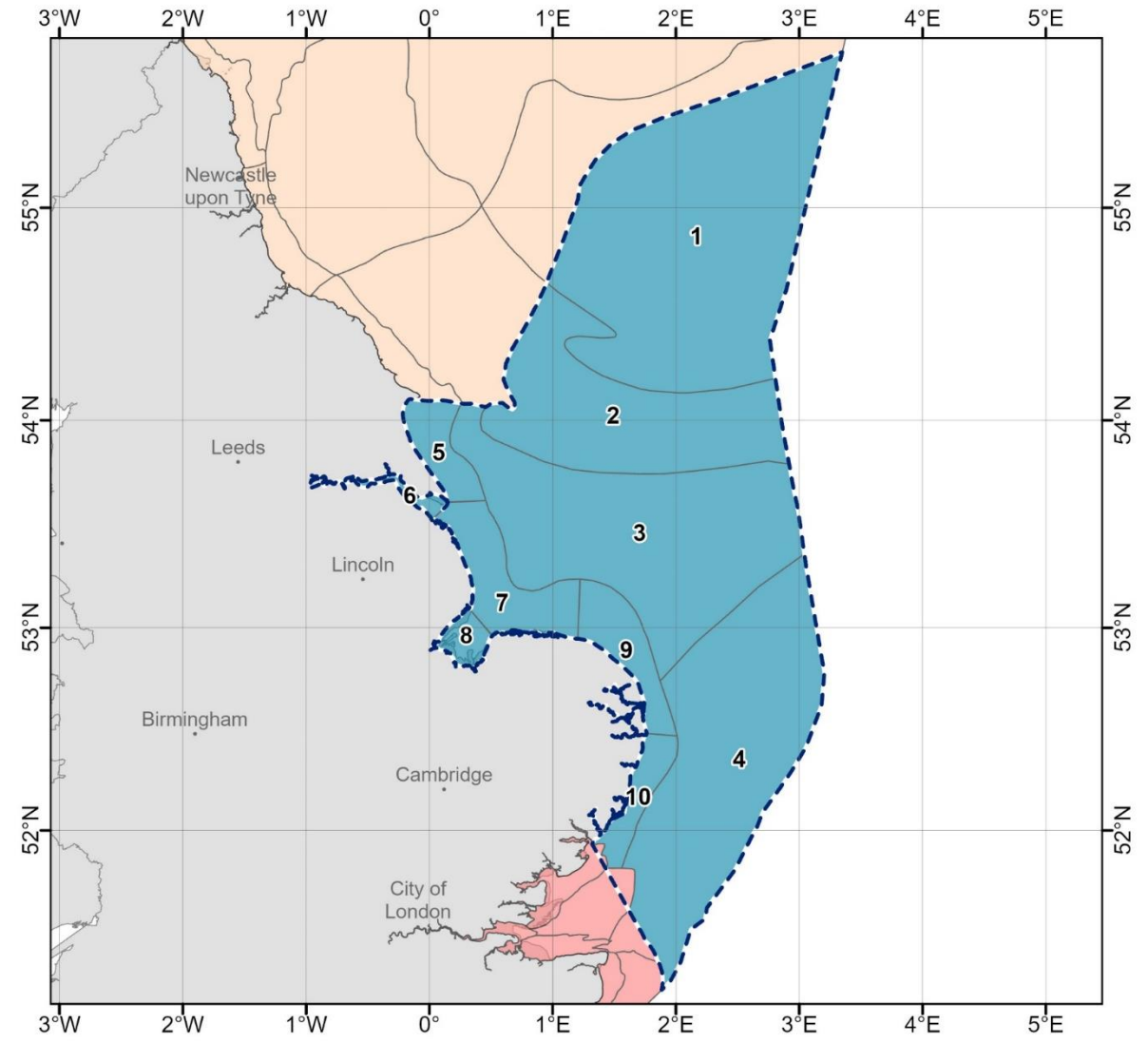
- Location and boundaries
- Overall character (Summary)
- Adjacent National Character Areas (for those MCAs abutting the coast)
- Adjacent nationally protected landscapes (National Parks, National Landscapes, Heritage Coasts and World Heritage Sites).

Key characteristics

- Comprising summary bullet points considering natural, cultural/social and perceptual/aesthetic influences on the MCA's character.

An overview map of the MCAs in the study area is shown in Figure 4. A series of overview maps showing the baseline data which informed the SCA is included in Annex 1.

Figure 4: Marine Character Areas (MCAs) in East England



Study Area

Study area

Marine Character Area

East

North East

South East

East Marine Character Area

MCA 1. Dogger Bank
MCA 2. Dogger Deep Water Channel
MCA 3. East Midlands Offshore Gas Fields
MCA 4. East Anglian Shipping Waters
MCA 5. Holderness Coastal Waters
MCA 6. Humber Waters
MCA 7. East Midlands Coastal Waters
MCA 8. The Wash
MCA 9. Norfolk Coastal Waters
MCA 10. Suffolk Coastal Waters

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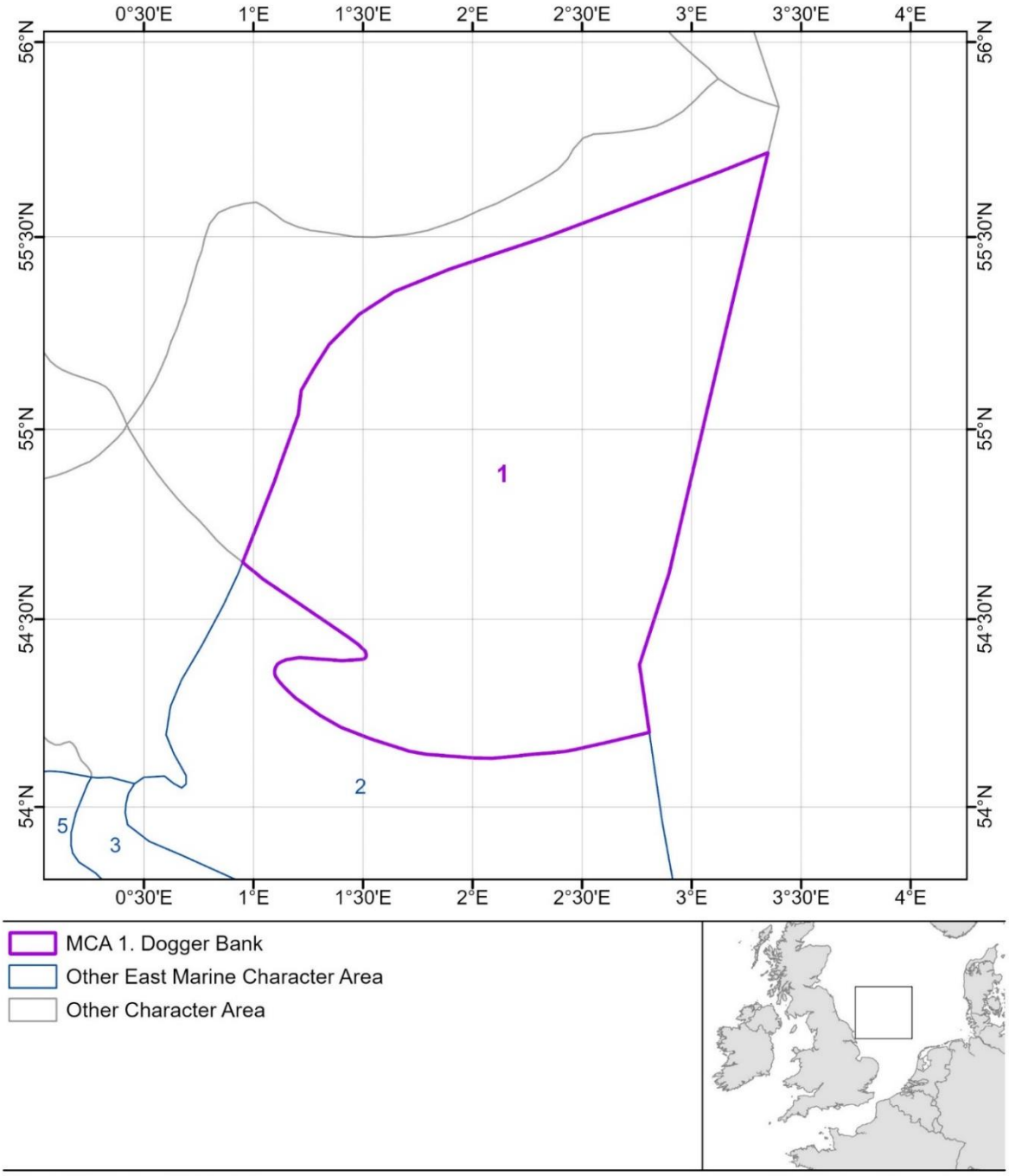
3.2 MCA 1: Dogger Bank

Figure 5: MCA 1: Dogger Bank



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3.2.1 Location and boundaries

The Dogger Bank Marine Character Area (MCA) is at the northern most point of the east offshore marine plan area, bounded by the north east marine plan area. The north boundary of the area broadly follows the -50m Chart Datum contour of Dogger Bank, where it adjoins MCA 27 (Dogger Bank Edge). The south boundary broadly follows the -30m contour of the Outer Silver Pit where it adjoins MCA 2 (Dogger Deep Water Channel). The east boundary is coincident with the territorial limit between UK and Dutch waters.

3.2.2 Overall character

Dogger Bank, otherwise known as “Doggerland”, has been defined by thousands of years of geological movements, leading to dynamic sea level changes, erosion and deposition. The MCA encloses a large submarine plateau, with a large flat offshore sandbank having a water depth generally not exceeding 20m. Its complex bathymetry, particularly at the “Flamborough Front”, the point at which vertically mixed southern waters and deep stratified northern waters meet and form a tidal mixing front, is an important physical, chemical and biological boundary. Flamborough Front influences plankton distribution, in turn supporting spawning grounds for commercially fished species such as herring (*Clupea harengus*), sprat (*Sprattus sprattus*) and Dover sole (*Solea solea*), alongside non-exploited fish such as basking sharks (*Certorhinus maximus*). The complexity of the seabed poses navigational threats to commercial shipping, generally leading to noticeably less sea traffic compared to adjacent waters. Horizons are instead broken by views of wind turbines, with the MCA supporting a series of wind farms. With no views of land, the MCA is characterised as expansive, monochrome and somewhat monotonous, and perceptions are strongly subject to climatic conditions.

3.2.3 Adjacent National Character Areas (NCAs)

N/A - this offshore area does not have an adjacent coastline.

3.2.4 Adjacent nationally protected landscapes

N/A - this offshore area does not have an adjacent coastline.

3.2.5 Key Characteristics

- Dominated by a large submarine plateau which is the north-westerly extent of "Doggerland", an area of approximately 17,600km², rising up to 45m above the surrounding seabed.
- The MCA comprises seabed generally shallower than 50m, and often less than 30m in depth, representing high ground on what was once dry land between Britain and Europe.
- The southern boundary is marked by the Outer Silver Pit, an east-west trench that once formed a lake in Doggerland.

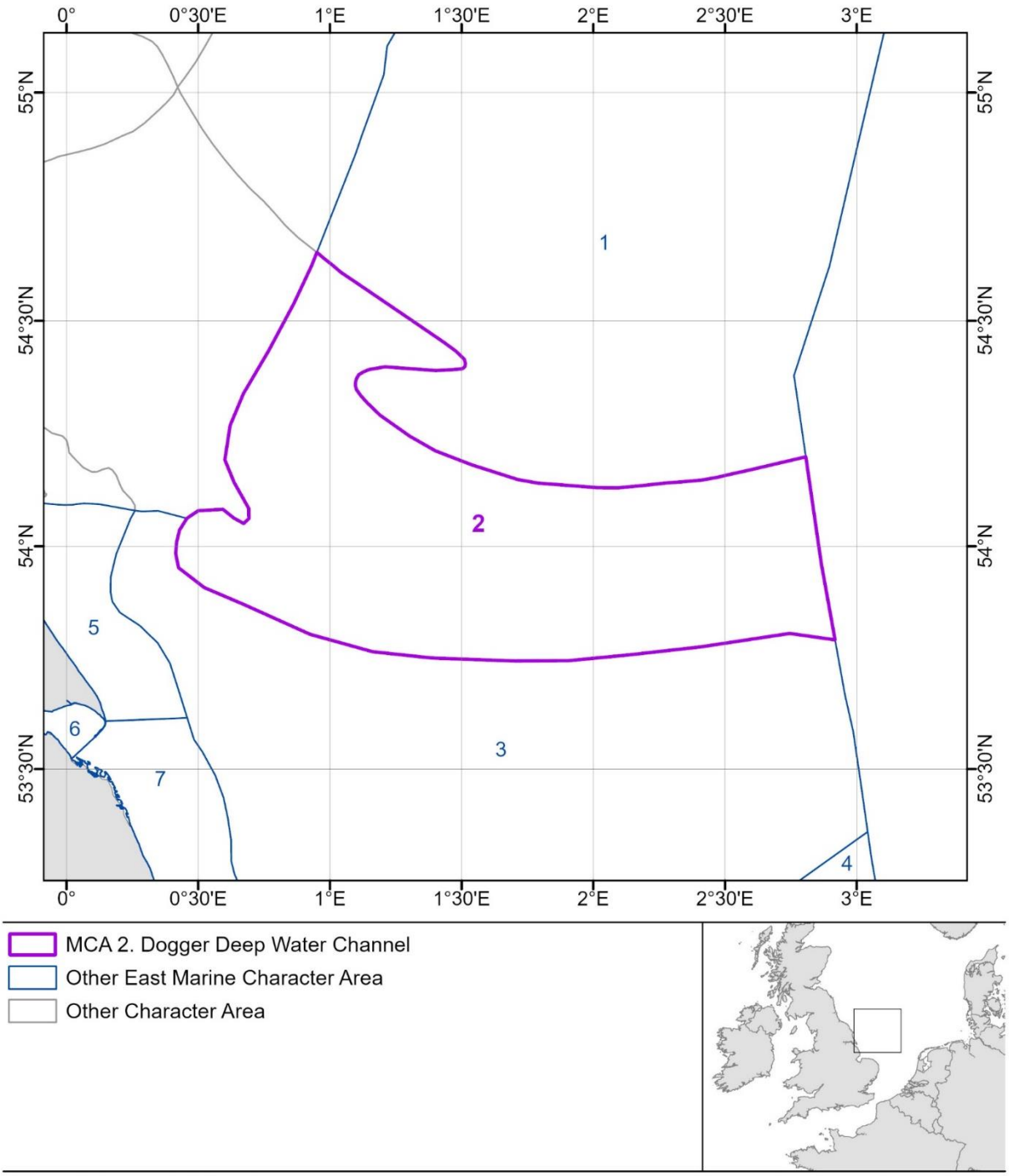
- The area has been subject to thousands of years of dynamic sea level changes, erosion and deposition, with it likely having been exposed as dry land during the Upper Palaeolithic, Mesolithic, and probably Neolithic periods.
- The bedrock of the area is rarely exposed on the seafloor as it is largely buried under Pleistocene and Holocene sediments.
- Bedrock overlain by glacial outwash deposits, with the seabed consisting of sand with patches of gravel, sandy mud and sandy gravel. In the south, a large offshore sandbank creates an extensive, flat area with water depth generally not exceeding 20m.
- An important area for plankton distribution at the Flamborough Front which supports commercial fisheries, benthic and pelagic wildlife, and non-exploited species such as harbour porpoise (*Phocoena phocoena*), minke whale (*Balaenoptera acutorostrata*) and grey seal (*Halichoerus grypus*). Small fish support many seabirds including black-legged kittiwakes (*Rissa tridactyla*), puffins (*Fratercula arctica*) and northern gannets (*Morus bassanus*).
- Generally, the Dogger Bank supports a much wider variety of habitat than is found elsewhere in the North Sea. The Dogger Bank Special Area of Conservation (SAC) covers most of the MCA and protects the sandy sediment which is home to communities of invertebrates including worms, clams, hermit crabs and starfish.
- The Southern North Sea SAC extends into this MCA. The SAC is designated for the protection of harbour porpoise due to its important foraging opportunities. A byelaw prohibits fishing with bottom towed gear in the area[2]. The wider MCA is also important for minke whale and grey seal. It is part of a wider area that extends into Dutch waters.
- The extent of coarse-grained sediment, void of vegetation in most areas, makes this MCA an important spawning ground for plaice (*Pleuronectes platessa*), cod (*Gadus morhua*) and mackerel (*Scomber scombrus*), and spawning and nursery ground for sprat, Dover sole and sandeel (*Ammodytidae*). As of 2024, sandeel fishing has been banned to allow populations to recover and support other species for which they are a vital food source, including haddock (*Melanogrammus aeglefinus*), harbour porpoise, and puffins.
- An important area for archaeology, having been settled by the Mesolithic between approximately 10,000 and 6,000 years before present (BP). Human artefacts have been recovered, associated with hunter-gatherer communities, such as flints and spearheads. Evidence of Pleistocene fauna trawled from Dogger Bank has included mammoth tusks and rhinoceros teeth.
- Recognised for its strong cultural heritage as a historically important fishing ground for cod, plaice and herring, having attracted fishermen from Britain and Europe for centuries.
- The tidal range of 2-3m across the shallow sandbank creates a major navigation hazard for North Sea Traffic, evident in lower rates of sea traffic compared to surrounding areas. There are clear concentrations of wreck sites in the north-west and south of the MCA.
- The MCA forms part of a wider Royal Air Force military practice area, with the eastern part used as a submarine exercise area.

[2] https://www.gov.uk/government/publications/the-dogger-bank-special-area-of-conservation-specified-area-bottom-towed-fishing-gear-byelaw-2022

- A small number of gas platforms lie towards the southern boundary, alongside navigation buoys.
- The Dogger Bank Wind Farm, split into three phases, is currently under construction in the area; when complete, it will be the largest in the world, expected to host 277 wind turbines and produce enough power to sustain 6 million homes.
- An expansive and remote area with no visual links to land, characterised by panoramic views which are monochrome and monotonous. The lack of visual cues gives rise to a sense of disorientation, placing importance on marine vessels, birds, and other wildlife.
- Climatic conditions influence the perception of seascape causing the sensory experiences of sounds and smells to become more important.
- A seascape once renowned for its fishing, now more closely associated with renewable energy production.

3.3 MCA 2: Dogger Deep Water Channel

Figure 6: MCA 2: Dogger Deep Water Channel



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Basemap: Esri.

3.3.1 Location and boundaries

The Dogger Deep Water Channel Marine Character Area (MCA) (Figure 6) runs east to west, separating MCA 1 (Dogger Bank) to the north from MCA 3 (East Midlands Gas Fields) to the south. Its western extent borders MCA 24: Breagh Oil and Gas Fields in the north east offshore marine plan area. The eastern boundary is coincident with the territorial limit between UK and Dutch waters. The channel, also known as the Outer Silver Pit, appears as a band, with its widest point at 175km.

3.3.2 Overall character

The Dogger Deep Water Channel, centred on the deep water known as the Outer Silver Pit, is characterised by average depths of 60-70m, and relatively shallow gradients. It has a complex geology overlain by glacial till which has been subject to thousands of years of dynamic sea level changes, erosion and deposition. It is thought to have been a lake and later a sea embayment, part of Doggerland, an area of dry land which once connected Britain to mainland Europe. The area forms part of an important shipping route connecting Newcastle with mainland Europe. Other activities include military training and commercial fishing. This MCA was once regarded as a high yield fishing ground for centuries, with the most common practice being beam trawling for white fish such as cod and whiting (*Merlangius merlangus*), though fluctuating populations and protection has led to a downward trend in fisheries yields. The Flamborough Front, located to the north-west of the MCA, is responsible for influencing plankton distribution, and in turn supports a wide range of both commercially fished and non-exploited species. The area has become an important location for energy production, with some active gas fields lying within or partly within the MCA. Without sight of land, a feeling of disorientation is common, with offshore activity backed by extensive horizons reinforcing the sense of isolation and remoteness.

3.3.3 Adjacent National Character Areas (NCAs)

N/A - this offshore area does not have an adjacent coastline.

3.3.4 Adjacent nationally protected landscapes

N/A - this offshore area does not have an adjacent coastline.

3.3.5 Key Characteristics

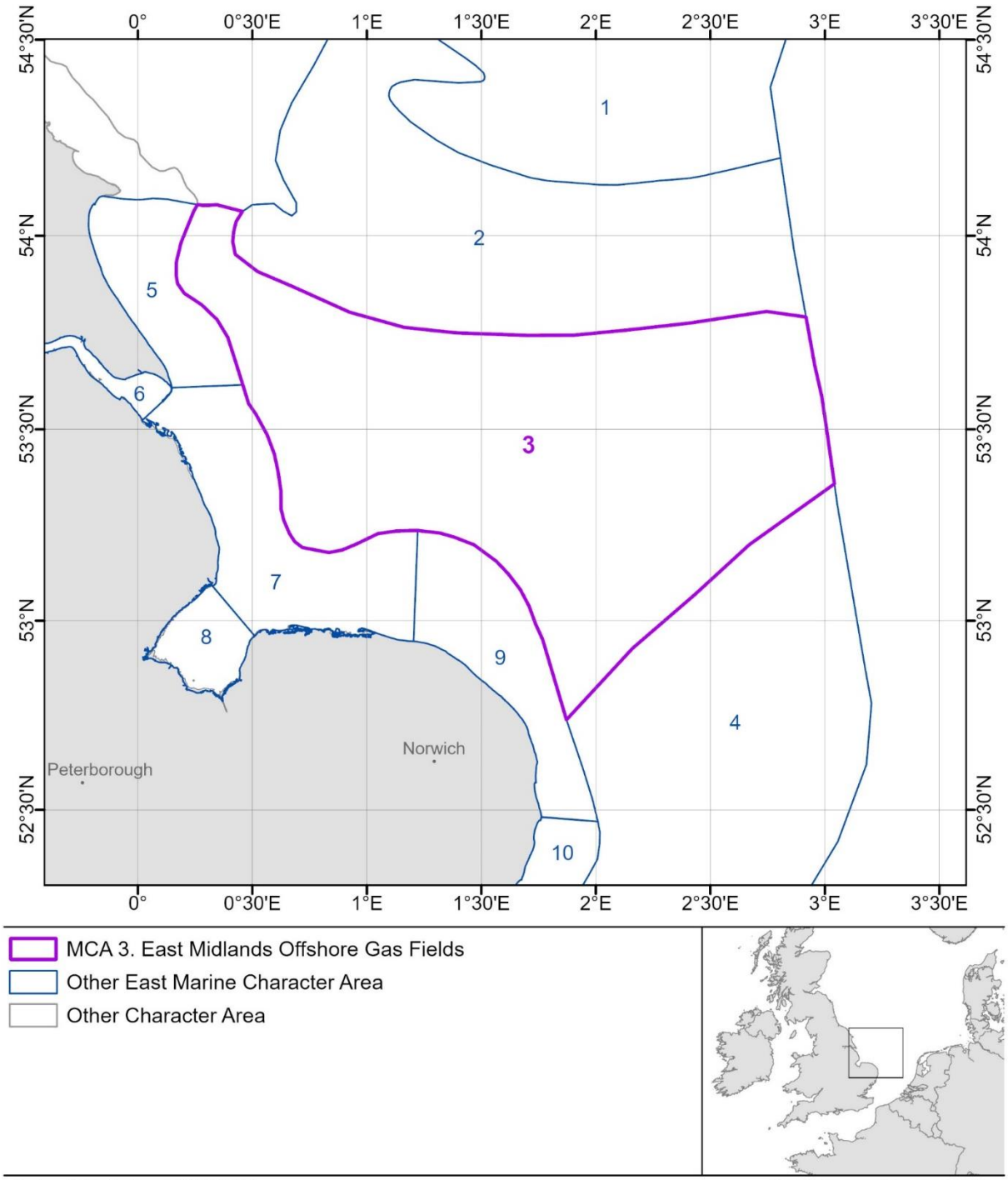
- A deep body of water with an average depth of 60-70m, reducing to 30m at its shallowest point in the south-eastern corner. Other than the steep sides of the trench, the area is characterised by relatively shallow gradients.
- The area is underlain by a complex anticline of Jurassic and Triassic bedrock.
- Bedrock is overlain by glacial till (clay, sand and gravel), with its deepest points (such as the Outer Silver Pit) dominated by muddy, sandy subtidal shelf sediments.
- A channel which has been shaped by thousands of years of dynamic sea level changes, erosion and deposition. During the Mesolithic period

(approximately 6,000 to 10,000 BP), the Outer Silver Pit formed a lake, and later a bay, surrounded by the dry land of Doggerland.

- An important area for plankton distribution at the Flamborough Front, the tidal mixing front which separates stratified, deeper waters to the north and vertically mixed waters to the south of Flamborough Head. Flamborough Front represents a physical, chemical and biological mixing boundary which supports benthic and pelagic wildlife including jellyfish and basking sharks.
- The Southern North Sea SAC extends into this MCA. The SAC is designated for the protection of harbour porpoise, which use this northern portion during the summer season.
- Markham's Triangle Marine Conservation Zone (MCZ) is an area of shallower sea in the east, which is contiguous with protected areas of Dutch waters. It provides habitat for a wide variety of invertebrates including bristleworms (Polychaetes), venus cockles (*Austrovenus stutchburyi*), sea cucumbers (Holothurians), sea stars (*Asteroidea*), sea urchins (Echinoderms) and crabs (Brachyurans), as well as flatfish species (*Pleuronectiformes*).
- Several commercial fisheries are dependent on the plankton around the Flamborough Front. The gravel and coarse-grained sand seabed make these waters important spawning grounds for herring, sprat and Dover sole, with the western extent important for sand eel.
- The most common fishing activity is beam trawling for white fish such as cod and whiting. These waters have been used by generations of fishermen and have been viewed as high yield fishing grounds for centuries, though fluctuating fish populations such as cod show a downward trend in fisheries yield.
- Alongside the fishing industry, this is an important marine area for shipping with commercial vessels operating with regular frequency. The area is crossed by major shipping routes connecting Newcastle and the Humber to mainland Europe.
- An area which is important for energy production, hosting a series of active gas fields and the Hornsea 1 and Hornsea 2 offshore wind farms. Further developments are consented, including Hornsea 3 and 4. This MCA has also been granted carbon storage licences.
- An important area for military practices, with submarines using the deeper waters as an exercise area.
- During the Mesolithic period this part of Doggerland was likely settled by humans and has high archaeological potential.
- A seascape which has seen a shift in character from its fossil fuel extraction to renewable energy production and potentially the sequestering of carbon.
- A remote seascape with its sense of nature and isolation in competition with the density of shipping and fishing activity, military practices and energy production. This overall gives it an industrial character. Remoteness is soon realised when activities are compared to the unbroken horizon. The lack of visual cues gives a sense of disorientation.
- A typically monochrome and monotonous character, with perceptions heavily influenced by climatic conditions which influence the sensory experience.

3.4 MCA 3: East Midlands Offshore Gas Fields

Figure 7: MCA 3: East Midlands Offshore Gas Fields



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Basemap: Esri.

3.4.1 Location and boundaries

The East Midlands Offshore Gas Fields MCA lies off the coasts of Yorkshire, Lincolnshire and Norfolk. The northern boundary of the area meets the north-east offshore marine plan area, and adjoins MCA 2 (Dogger Deep Water Channel), whilst the southern limit runs adjacent to MCA 4 (East Anglian Shipping Waters). The western and south-western boundary of the MCA adjoins MCA 5 (Holderness Coastal Waters), MCA 7 (The East Midlands Coastal Waters) and MCA 9 (Norfolk Coastal Waters). The east boundary is coincident with the territorial limit between UK and Dutch waters.

3.4.2 Overall character

The East Midlands Offshore Gas Fields is characterised by its complex underlying geology which has resulted in significant hydrocarbon formation. The burial of Carboniferous coal forests and the subsequent pressure of overlying rock formations has resulted in extensive coal measures and gas stores. This has defined the area, with the seabed extensively crossed by several active chemical and gas pipelines connecting extraction points with onshore terminals. The horizon is given an industrial feel with the presence of gas platforms now reinforced by the presence of wind farms. The MCA is also an important area for commercial shipping, connecting mainland Europe with the shipping ports of the east coast. Sea traffic extends to commercial fishing, with the area notable for long-lining and netting for cod, roker (thornback ray (*Raja clavata*)), Dover sole and brill (*Scphthalmus rhombus*) alongside trawling for brown (*Crangon crangon)* and pink shrimp (*Pandalus borealis*). Fish populations are supported by extensive sand habitats and plankton blooms which are themselves supported by the well mixed nature of the water column. The MCA is generally monochrome and monotonous without site of land. Even with visible offshore platforms there is typically a sense of remoteness and disorientation.

3.4.3 Adjacent National Character Areas (NCAs)

N/A - this offshore area does not have an adjacent coastline.

3.4.4 Adjacent nationally protected landscapes

N/A - this offshore area does not have an adjacent coastline.

3.4.5 Key Characteristics

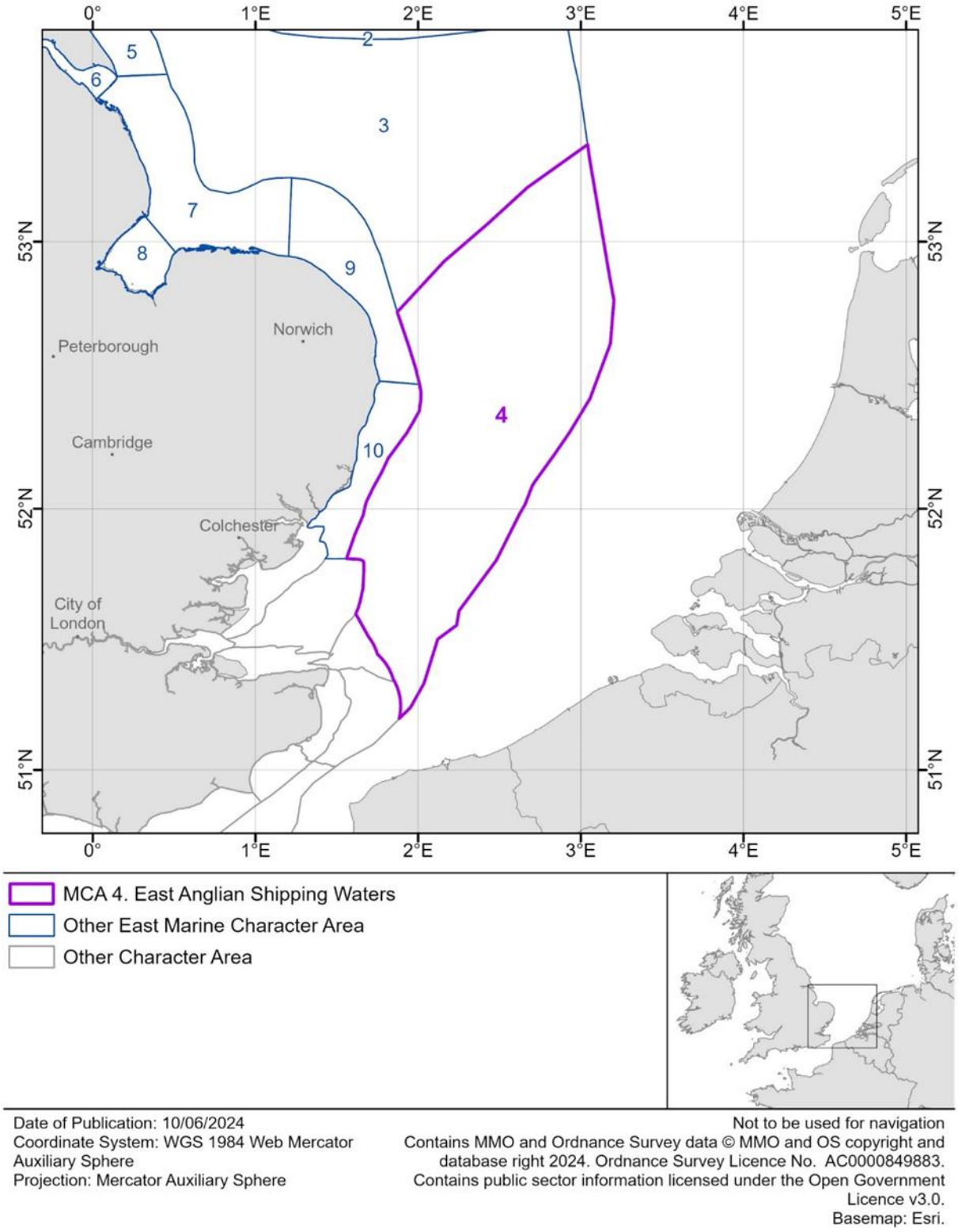
- Bedded by Carboniferous sedimentary rocks such as sandstones and shales, overlain by Pleistocene and Holocene sediments including gravel, sandy mud and sandy gravel.
- The area is comprised of a seabed generally shallower than 30m, and often less than 20m in depth to the west of the MCA, representing elevated ground that once acted as a land bridge between Britain and Europe.

- The western extent of the MCA is marked by the Inner Silver Pit glacial tunnel valley; a 50km long glacial tunnel valley with a maximum depth of up to 100m, at odds with the otherwise shallow bathymetry of the MCA.
- Bathymetry shows characteristic sandbanks such as Burnham Flats and Docking Shoal north-east of The Wash. Sandbanks form part of a wider series with tidal sand ridges in areas which are generally straight in form and run broadly parallel to the general coastal geometry in a north-west to south-east direction.
- The bedrock of the area is rarely exposed, being largely buried under sediments that are composed predominantly of sand with patches of gravel, sandy mud and sandy gravel.
- Substantial hydrocarbon stores exist within the MCA formed from millions of years of geological development and climatic change which saw the burial of prehistoric Carboniferous coal forests.
- The Holderness Offshore MCZ covers a large portion of the north-western part of the MCA and protects the subtidal sand and coarse sediments that support a wide range of species within and on top of the sediment such as mussel beds, sponges (*Porifera spp*.) and sea stars. The site also acts as a spawning ground for fish species including lemon sole (*Microstomus kitt*), plaice and European sprat.
- The Silver Pit was put forward for MCZ status in 2019 due to the variety of marine life it supports though was not designated due to the associated potential overlap of this site with cable routes that connect future wind farms to land such as Dogger Bank offshore wind farm.
- The Southern North Sea SAC, Haisborough, Hammond and Winterton SAC and North Norfolk Sandbanks and Saturn Reef SAC together cover large portions of the MCA.
- An important area for archaeology. Discoveries of human artefacts associated with hunter-gatherer communities such as the Colinda harpoon (discovered in 1931) have been dated to the Mesolithic period (10,000–4000 BP). This was the first piece of evidence suggesting that an extensive landmass had once connected Great Britain to the continent.
- Widespread sand habitats are important for the Southern North Sea ecosystem, supporting ideal spawning grounds for a variety of commercial fish species as well as supporting large concentrations of shellfish fisheries including whelks (*Buccinidae spp*.).
- Fishing activities that take place in these waters include long-lining and some netting for cod, roker, Dover sole and brill. Other fishing activities include trawling for demersal fish by beam trawlers and trawling for brown and pink shrimp. Ongoing trends highlighting the decline in many fish populations are limiting the yield of these practices.
- Some of the UK's most important marine aggregate resources from fine sand (0.063-0.25mm) to medium gravel (20-40mm) are found here, making extraction a common practice in the area.
- Several licensed gas fields are exploited across the MCA, with gas being transported via submerged pipelines to gas terminals (Easington and Bacton) located along the coast where the gas is processed and distributed (see MCA 5 and MCA 9). These gas fields contribute heavily to Britain’s energy supply and economy. Carbon storage licences have also been granted for the MCA.

- Infrastructure associated with hydrocarbon extraction is frequent through the MCA, with clusters of offshore platforms across the seascape.
- The presence of offshore wind turbines now reinforces this energy focus. Triton Knoll, Inner Dowsing, and Dudgeon Offshore Wind Farms are all located in this area, along with the projected Outer Dowsing and Dudgeon Extension.
- The northern section of the MCA is part of an RAF military practice area, the area is also used as a submarine exercise area, due to the diverse bathymetry providing excellent training opportunities.
- A prominent area for commercial shipping with some of the world's busiest shipping lanes associated with key trade and passenger links between the major UK east coast ports and mainland Europe.
- A seascape which has undergone a significant shift in its perceived character, once recognised for its abundance of hydrocarbon stores, the MCA is now associated with renewable energy production.
- With the presence of gas platforms and wind turbines, an industrial character can be portrayed, which may reduce feelings of isolation but amplify the sense of remoteness, which is further heightened by the lack of direct visual links to land.
- Generally, a monochrome and monotonous character is associated with this MCA, with perceptions heavily influenced by climatic conditions.

3.5 MCA 4: East Anglian Shipping Waters

Figure 8: MCA 4: East Anglian Shipping Waters



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Basemap: Esri.

3.5.1 Location and boundaries

The East Anglian Shipping Waters Marine Character Area (MCA) lies to the east of Norfolk and Suffolk, extending south towards the outer Thames. Its western boundary is between approximately 10 and 20km offshore, where it adjoins MCA 9 (Norfolk Coastal Waters) and the entirety of MCA 10 (Suffolk Coastal Waters). Its northern boundary borders MCA 3 (East Midlands Offshore Gas Fields). To the south-west, it adjoins (from north to south) MCA 20 (Thames Approaches); MCA 17 (Thanet Shipping Waters); MCA 15 (Eastern English Channel Approaches); and the south east marine plan area. The eastern boundary of the MCA is coincident with the territorial limit between UK and Dutch, Belgian and French waters.

3.5.2 Overall character

The East Anglian Shipping Waters MCA is largely characterised by its intense activity of commercial shipping routes which connect the east coast to the Baltics as the broadly uniform water depths afford safe movements. Marine traffic is diverse with fishing boats, service boats for offshore industries and cargo ships as well as pleasure craft. The volume of vessel traffic makes navigation difficult leading to strict usage of routing systems. Its benthic habitats support spawning and nursery grounds for a wide variety of commercial fish species, making this a rich area for fishing, as is much of the North Sea. However, trawling poses a threat to Ross worm reefs (*Sabellaria spinulosa*), prompting ecological designations. The extraction of primary resources is important to note, as this area provides almost of half of all the UK's marine construction aggregate, alongside a small area of gas production which is connected to Bacton Gas Terminal. Wind turbines are a prominent feature of the horizon, with developments ranging from planning stages to fully operational. Marine activity creates a sense of familiarity in an otherwise remote environment; however, perceptions are strongly influenced by climatic conditions.

3.5.3 Adjacent National Character Areas (NCAs)

N/A - this offshore area does not have an adjacent coastline.

3.5.4 Adjacent nationally protected landscapes

N/A - this offshore area does not have an adjacent coastline.

3.5.5 Key Characteristics

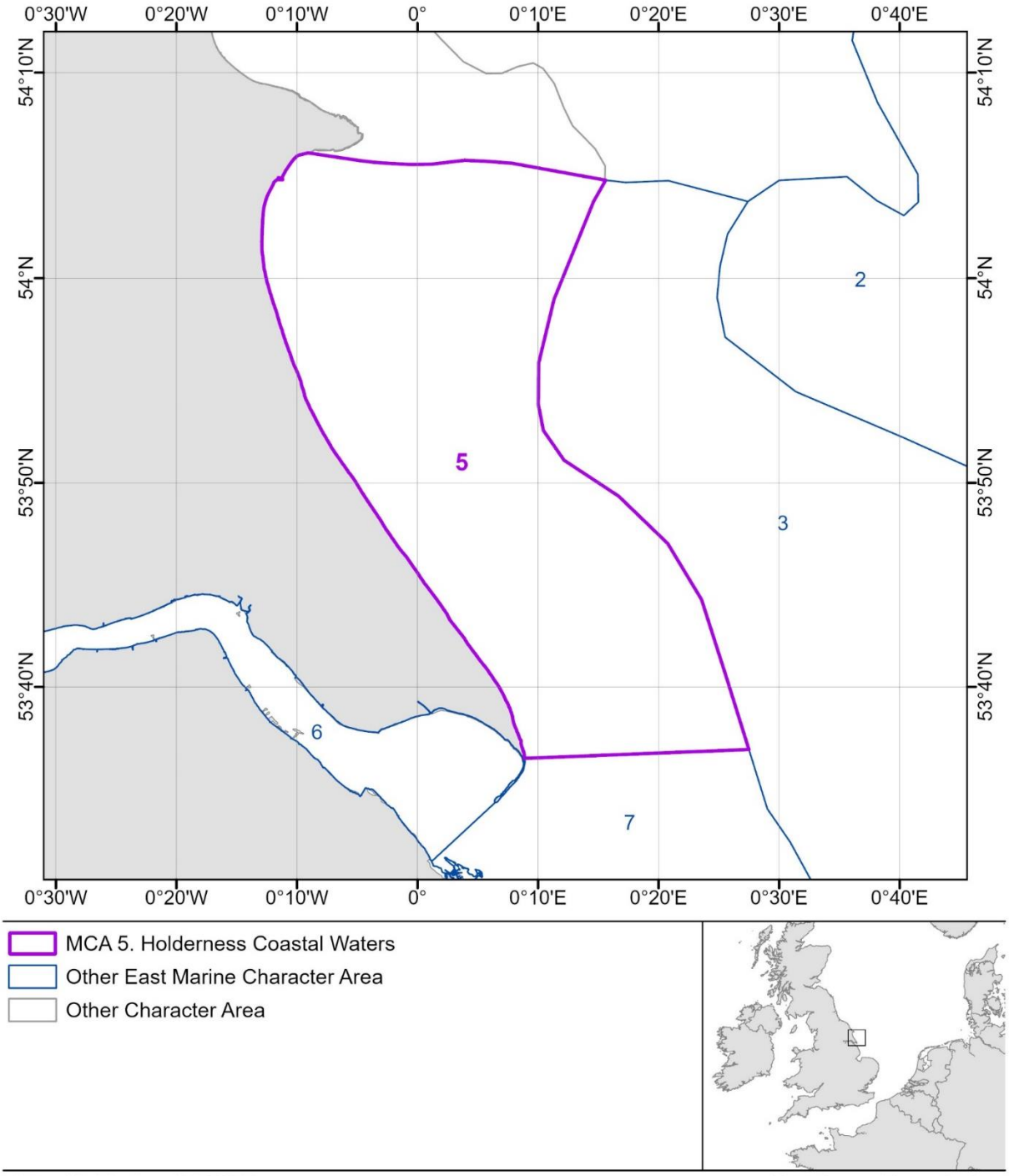
- The bedrock of the area is rarely exposed on the sea floor and is largely buried under Pleistocene and Holocene sediments that are composed predominantly of gravel shelf-subtidal sediments.
- The MCA comprises a relatively shallow and uniform seabed often ranging between 30m and 50m, representing elevated ground that once acted as a land bridge between Britain and Europe.
- A general southward littoral drift occurs within the MCA, with tidal currents moving towards the Dover Straits and the English Channel.

- The area has been subject to thousands of years of dynamic sea level changes, erosion and deposition, with it likely having been exposed as dry land during the Upper Palaeolithic, Mesolithic, and probably Neolithic periods.
- The MCA is covered by the Southern North Sea SAC which is designated for the protection of the harbour porpoise. Other SACs that overlap with parts of the MCA include Haisborough, Hammond and Winterton SAC at the north-western boundary.
- The Orford Inshore MCZ lies east off the Suffolk coast across the 12nm territorial sea limit. The MCZ is dominated by habitats composed of subtidal mixed sediments. These sediments are important as nursery and spawning grounds for many fish species, including Dover sole, lemon sole and sand eels. Species of anemones, sea cucumbers and sea stars can also be found within the MCZ, alongside several nationally important shark species.
- The Outer Thames Estuary Special Protection Area (SPA) abuts the central western area of the MCA and is classified for the protection of the largest aggregation of wintering red-throated diver (*Gavia stellata*) in the UK.
- Important habitats such as the Ross worm (reefs have been formed on the seabed of mixed sediments. These are solid reef structures created by small tube building polychaete worms which stabilise mixed sediment.
- Gravel habitats found in deeper offshore areas tend to be less disturbed than those found closer inshore and so support a diverse marine fauna including anemones, polychaetes, bivalves and amphipods, and both mobile and sessile epifauna.
- The area has a strong historical association with the Mesolithic epoch. Evidence from human settlements and communities can be found embedded in the seafloor where fishing trawlers often find ancient bones and tools that date between 10,000 and 6,000 BP. More recent important historical features include the legacy of shipwrecks displayed here, from the site of the wrecked Gloucester, to the remains of HMS *Exmoor*.
- Benthic habitats are also important for spawning and nursery grounds for a diverse variety of commercially fished species such as cod, plaice, Dover sole, mackerel and herring making this an important fishing area.
- The MCA is also characterised by large amounts of commercial shipping activities, connecting the east coast of England to the Baltics. The broadly uniform water depths afford safe movements, though the density of vessels poses difficulty for navigation.
- An area for marine aggregate extraction due to important glacial deposits, with the extraction of fine sand (0.063-0.25mm) to medium gravel (20-40mm).
- The MCA hosts numerous offshore structures associated with energy production. A small number of gas fields are present, with offshore wind farms at East Anglia One, Greater Gabbard and Galloper. Future development in the area includes East Anglia Two and Three, Five Estuaries, Norfolk Boreas, North Falls and Vanguard, and extensions to Greater Gabbard and Galloper. Planned developments include electricity connections between the UK and Europe such as Lion Link and Sea Link.
- An industrial sense of character is presented with the density of shipping vessels and the presence of energy production and aggregate extraction.

- Deep waters create consistent horizons across extensive and unchanging tracts of water. There is a remote and isolated quality associated with the seascape.
- A general sense of disorientation is presented as a result of the lack of visual cues. Marine activity creates a sense of familiarity in an otherwise remote environment.

3.6 MCA 5: Holderness Coastal Waters

Figure 9: MCA 5: Holderness Coastal Waters



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Basemap: Esri.

3.6.1 Location and boundaries

The Holderness Coastal Waters MCA begins at the Sewerby cliffs, running south to Spurn Point and the Humber. The MCA covers the coastal waters adjacent to the East Riding of Yorkshire. The northern boundary is adjacent with MCA 21 (North Yorkshire Coastal Waters) and the southern boundary is shared with MCA 6 (Humber Waters) and MCA 7 (East Midlands Coastal Waters). MCA 3 (East Midlands Offshore Gas Fields) forms the eastern boundary, which lies between 16 and 26km offshore. The Spurn Point Heritage Coast abuts this MCA. The coastline includes historic seaside towns such as Bridlington and numerous holiday and caravan parks.

3.6.2 Overall character

The Holderness coast is dominated by dynamic coastal processes, with one of the highest erosion rates in Europe. The MCA is characterised by soft glacial till cliffs, which terminate in the south by the spit at Spurn and iconic tall chalk cliffs at Sewerby in the north. In places, erosion results in infrastructure such as caravan parks and roads being lost to the sea. Sea defences protect settlements along the coastline, as well as Easington Gas Terminal, supporting areas of temporary stability. The MCA has a strong commercial fishing heritage, with Bridlington historically a prolific fishing port. The area is renowned for its shellfish fisheries as well as important spawning area and nursery ground for fish such as lemon sole and sand eels. Important nesting sites for birds such as ringed plover (*Charadrius hiaticula)* and little tern (*Sternula albifrons*) are found on sandy shingle beach habitats at Easington and Spurn Point, and the tide-line throughout the MCA is used by a number of species. Recreation is a key land use, with many caravan parks and seaside towns such as Bridlington and Withernsea. Energy infrastructure is a prominent feature across the coastline, with onshore and offshore wind farms visible across the skyline, and Easington Gas Terminal at the southern end of the area. The sense of vulnerability from erosion is an important feature of the character of the area.

3.6.3 Adjacent National Character Areas (NCAs)

The adjacent coastline includes the following NCAs as defined by Natural England:

- 40: Holderness
- 41: Humber Estuary

3.6.4 Adjacent nationally protected landscapes

- Spurn is defined as a Heritage Coast.

3.6.5 Key Characteristics

- A highly dynamic, expansive and sweeping coastline with the highest erosion rates in Europe along virtually the whole area (excluding the chalk cliffs at

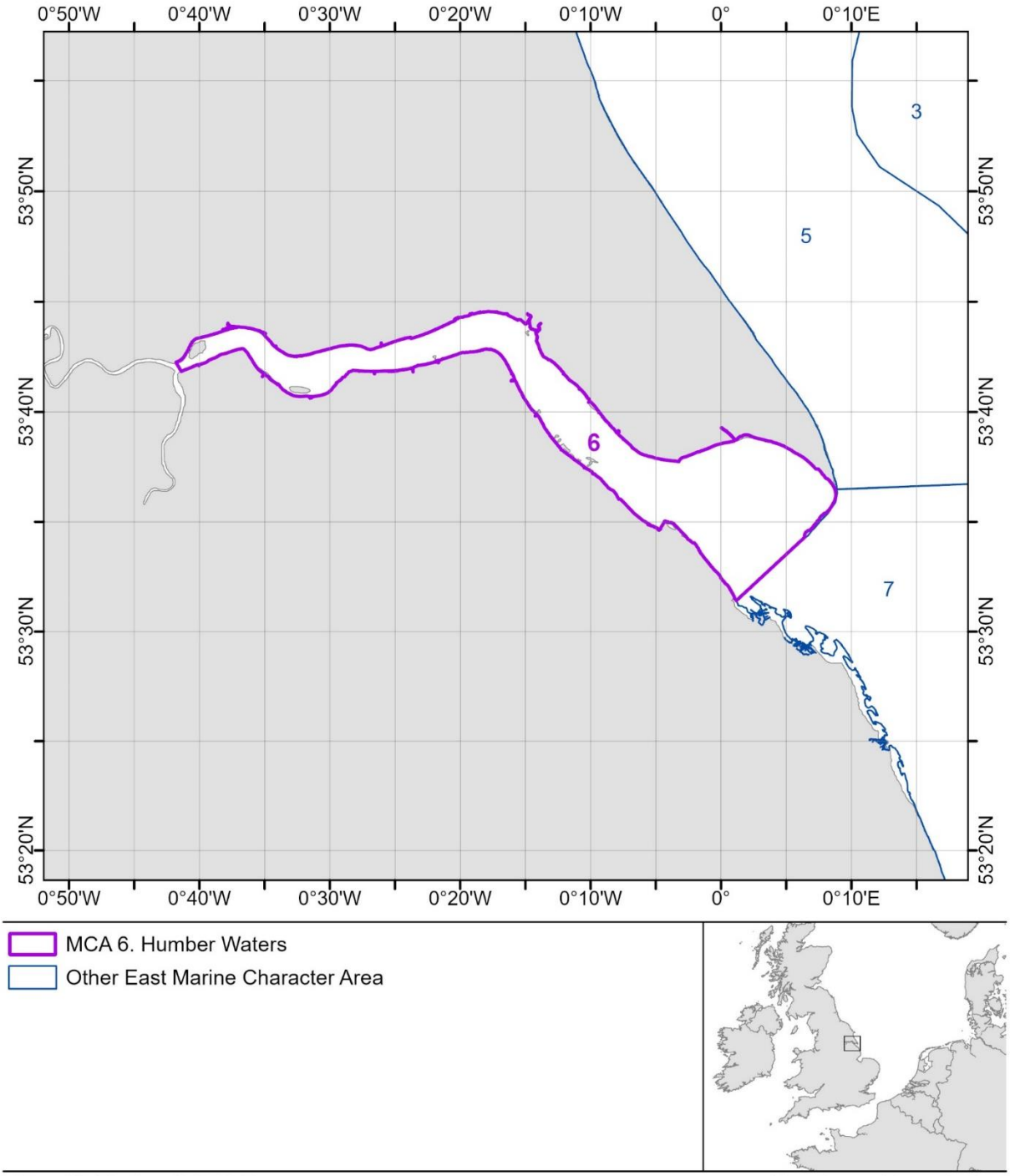
Sewerby), eroding at an approximate rate of 1.8m per year producing significant sediment outputs.

- Extensive soft glacial till cliffs emerge at Kilnsea, and slowly rise along the coastline extending for almost 60km with an exposed character.
- The Holderness coastline has retreated by around 2km over the last 1,000 years causing the loss of 26 villages listed in the Domesday survey of 1086. The vulnerability of the area is illustrated at the various caravan parks, with loss of pitches and infrastructure to the sea.
- Underlying chalk at Sewerby lifts the coastline to produce imposing vertical 30-50m chalk cliffs that extend east beyond the MCA to Flamborough Head.
- Beaches are generally narrow, seasonal and fragile, backed by low boulder till cliffs. The foreshore is characterised by sandy shingle.
- Cretaceous fine-grained limestones (Chalk Group) extend from north-east Norfolk to Flamborough Head (often referred to as the East Midlands Shelf). A significant chalk habitat exists in the coastal waters east of Bridlington, where a reef formation supports extensive kelp forests in exceptionally clear waters.
- The overlying sediment geology is predominantly sandy gravel with subtidal sand and gravel banks, such as Smithic Sands in Bridlington Bay and banks off the north Lincolnshire coast. Longshore sediment transport along the Holderness Coast is essential for maintaining Spurn Point.
- Bathymetry is relatively simple with shore-parallel bathymetric contours. The seabed remains shallow at approximately 5-15m deep between 12 and 15km offshore along much of the coastline, with very extensive areas of sublittoral sediment. This shallow nature coupled with tidal energy is generally sufficient to keep the water column well mixed through most of the year.
- The Flamborough Front, a tidal front of biological significance, usually rich in plankton which attracts fish, birds, cetaceans and other marine life, is present at the northern edge of the MCA. The MCA contains an important Marine Mammal Area supporting species including bottlenose dolphin (*Turciops truncates*), minke whale, grey (*Halichoerus grypus*) and harbour seal (*Phoca vitulina*).
- The Greater Wash SPA runs the length of the coastline, supporting important populations of over-wintering red throated diver. At Easington and Spurn Point, sandy shingle beach habitats form important nesting sites for ringed plover and little tern. The tide-line throughout the MCA supports a number of coastal birds such as oystercatchers (*Haematopus ostralegus*).
- The Holderness Inshore MCZ runs along the coastline from Skipsea to Spurn, extending out to 3 nautical miles (5.5km). The zone contains a mosaic of habitats which support a diverse range of organisms including the European eel (*Anguilla anguilla*), edible crab (*Cancer pagurus*) and encrusting fauna. The MCZ protects a number of features including high energy clay outcroppings and subtidal mud.
- Bridlington Harbour, once one of the most prolific fishing ports in the region, remains a popular angling, diving and recreational sailing centre.
- The entire stretch of coastline is designated as a Royal Yachting Association (RYA) Sailing Area with specified racing areas in the north and southern extents of the MCA.
- Renowned for its shellfish fisheries in particular lobster (*Homarus gammarus),* edible crab and whelks.

- Important spawning and nursery area for sand eels, an ecologically important species. For commercially fished species, the MCA is an important spawning area for plaice and Dover sole, and a nursery area for cod, whiting, plaice and herring.
- The cliffs along Withernsea and Kilnsea are valuable areas for paleontological research and educational importance, with erosion exposing land and sea fossils of the Lower Palaeolithic.
- Remnants of anti-tank blocks, beach lights, pillboxes and other historic structures associated with World War II can be found along the till cliffs. Many of these are at risk of erosion or have already collapsed onto the beaches.
- Military practice areas cover approximately half of the MCA, most notably the Flamborough Head submarine practice area.
- Gas pipelines underlay a significant proportion of the character area and arrive at Easington Gas Refinery from offshore gas platforms in the southern North Sea.
- Offshore (Westermost Rough Offshore and Humber Gateway) and onshore coastal wind farms (including Fraisthorpe) are a distinctive feature of the skyline and are visible along much of the MCA.
- Traditional seaside towns such as Bridlington, Withernsea and Hornsea are characterised by the sights and sounds of promenades, rides and tourist activities. Some more rural villages are now closer to the coastline due to ongoing erosion, including Mappleton.
- Caravan and holiday parks frequently dominate the coastline, with varying levels of structural damage according to levels of local erosion. Other than at towns, access to the beach is difficult.
- Outside of seaside towns and holiday parks, agriculture is the dominant characteristic of the onshore coastline. Farmsteads are scattered along the MCA, with high quality agricultural fields and infrastructure impacted by ongoing erosion.
- The exposed nature of the coastline, and soft and eroded shores, coupled with sea level rise and increased storminess, creates a typically fragile quality.
- Wide views due to the low-lying nature of the coastline and absence of intervening buildings and tree cover. Seaward views are over a large horizon, with offshore wind farms a dominant feature in the south of the MCA. Onshore and offshore wind farms are prominent in the skyline across much of the MCA.

3.7 MCA 6: Humber Waters

Figure 10: MCA 6: Humber Waters



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3.7.1 Location and boundaries

The Humber Waters MCA covers the wide expanse of the Humber from where the River Ouse and the River Trent converge in the west, to the mouth of the estuary at Spurn Point where it meets the North Sea. The boundary at the mouth of the estuary is shared with MCA 7: East Midlands Coastal Waters. The MCA is bordered by East Riding of Yorkshire to the north, and Lincolnshire to the south. The estuary includes the historic ports and fishing towns of Kingston upon Hull and Grimsby.

3.7.2 Overall character

The Humber is a highly variable seascape with strong contrasts across the area. The MCA is characterised by both open, unenclosed natural habitats such as mudflats and saltmarsh but also by large, busy settlements and industry that dominate large portions of the coast. The expansive coastal plain estuary supports large amounts of wildlife, particularly breeding and overwintering birds, and is recognised as an international Ramsar site, SAC and SPA. Rare and sensitive habitats such as saline lagoons can be found within the Humber Waters, and these support species such as tasselweeds and little terns. The MCA has a strong history of commercial fishing and industry, particularly in the port towns of Grimsby and Kingston upon Hull. Strong industrial and commercial links remain, with a busy and active atmosphere both on the coasts and within the dredged shipping channels. Recreation and tourism is a feature in the south-east of the area, with an expansive holiday park at Cleethorpes. The iconic Humber Bridge offers an important transport link and is a prominent feature visible across much of the Humber. There is a sense of safety within the estuary, with most of the MCA enclosed by the opposing banks of the river.

3.7.3 Adjacent National Character Areas (NCAs)

The adjacent estuary banks and coastline includes the following NCAs as defined by Natural England:

- 27: Yorkshire Wolds
- 41: Humber Estuary
- 42: Lincolnshire Coast and Marshes
- 44: Central Lincolnshire Vale
- 45: Northern Lincolnshire Edge with Coversands

3.7.4 Adjacent nationally protected landscapes

- Spurn, comprising the long headland that divides the estuary from the North Sea, is defined as a Heritage Coast.

3.7.5 Key Characteristics

- The second largest coastal plain estuary in the UK bounded by intertidal mud, sand flats and saltmarsh. Approximately one-fifth of England’s waterways flow out through the Humber Estuary.

- Upper Cretaceous fine-grained limestones underlie the estuary, part of a wider series which extends from north-east Norfolk to Flamborough Head. Hard wearing glacial deposits protect the mouth of the Humber from erosive processes.
- Influenced by strong tidal flows rather than waves, the flows partially block sediment transport preventing gravels and coarse sands from passing the estuary mouth, forming the spit at Spurn Point. Sediment accumulation creates a very shallow estuary in areas where dredging does not take place.
- Spurn Head is a distinctive natural feature marking the entrance to the Humber Estuary. This 5.5km long, very narrow sand and shingle spit extends from Kilnsea Warren and is a fragile and evolving entity which has a bleak, windblown and wild character.
- Strong wave and tidal energy are eroding the natural and man-made sea defences in some areas, including Sunk Island, and coastal squeeze[3] is prominent across the MCA, impacting habitats such as saltmarsh and dune systems.
- The Humber Estuary is a nationally and internationally important site, with Sites of Special Scientific Interest (SSSI), SACs, SPA and Ramsar designations. There are several National Nature Reserves (NNR) including the Lincolnshire Coronation Coast NNR.
- Diverse coastal habitats include seagrass, saline lagoons, salt marsh, sand flats, mud flats, sand dunes and shingle bars. These support breeding birds such as ringed plover, as well as feeding and overwintering areas for around 142,000 waders and wildfowl. Grey and harbour seal populations are supported by the Humber.
- The MCA supports saline lagoon habitats, a nationally rare habitat on which 1% of the British breeding little tern colony lives, as well as the nationally rare tasselweeds. The intertidal areas are rich in invertebrate communities. Throughout the MCA there is wetland habitat creation to mitigate for current coastal squeeze, as well as projects focussing on marine species and habitats such as seagrass.
- The Humber has a high level of ferry activity, with large numbers of people travelling to Europe through Hull.
- The estuary is a popular sailing area and the waters are designated as RYA sailing and racing areas.
- The shores of the Humber estuary play host to significant urban, commercial and industrial development as a result of the estuary's proximity to Europe and ready access to marine transportation routes.
- Urban and industrial development is expanding from existing hubs such as Killinghome and Grimsby, including infrastructure associated with carbon capture and storage, and renewable energy such as offshore wind.
- The estuary has been navigated for at least 3,500 years and has a significant concentration of shipwrecks, including many of medieval origin, as a result of the shifting mud and sand banks of the estuary. Medieval transportation

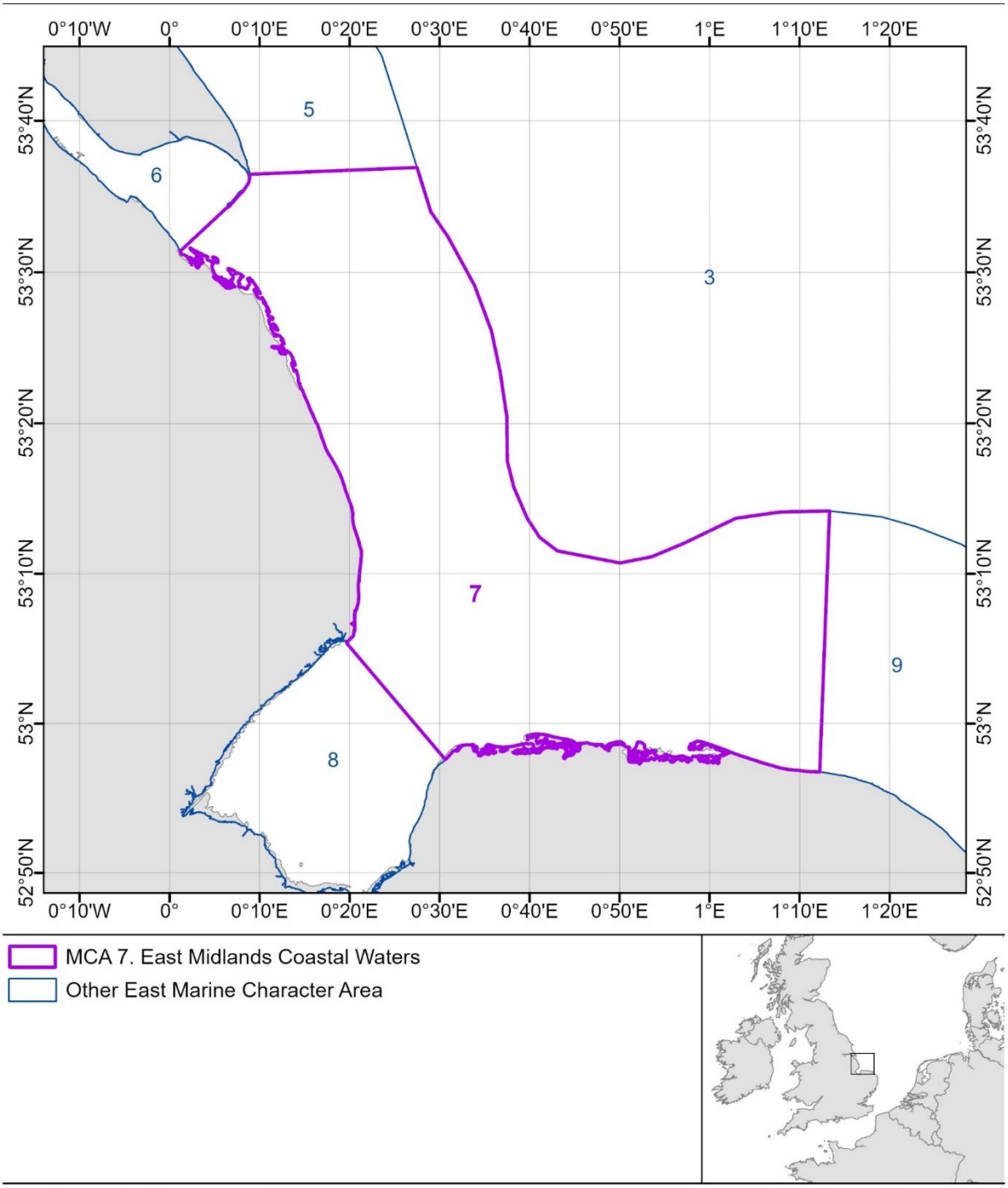
[3] Coastal squeeze is defined as "*the loss of natural habitats or deterioration of their quality arising from anthropogenic structures or actions, preventing the landward transgression of those habitats that would otherwise naturally occur in response to sea level rise in conjunction with other coastal processes. Coastal squeeze affects habitat on the seaward side of existing structures*." (Environment Agency, 2021b).

frequently used the Humber for navigation, and numerous ferries bridged the estuary.

- Historically constructed flood and coastal defences have created coastal areas of reclaimed land within the MCA. Early medieval sea banks historically known as ‘Sea Bank’ can be found south of Grimsby.
- The MCA has a number of important archaeological and historical features, with scheduled monuments strongly associated with maritime defence along the length of the estuary. These include World War II decoys for Hull docks and the Victorian coastal artillery Paull Point Battery.
- Significant landmarks exist in the form of the Humber Forts. Bull and Haile Sand Forts are large fortifications completed in 1919 which were constructed to protect the estuary from enemy attack and stand guard at the mouth of the Humber. The Humber Bridge is a more recent engineering achievement and was the longest suspension bridge in the world when opened in 1981.
- The North Sea is an important focus for fishing activity and the Humber is home to two of the most prolific fishing ports in the region, Kingston upon Hull and Grimsby. Grimsby, once the largest fishing port in the world, reduced significantly in capacity throughout the second half of the twentieth century. As a result, much of the former dock areas are now lying in a state of disrepair, with the landmark Dock Tower a reminder of past prosperity.
- The estuary is a major fish spawning area which supports commercial fisheries for sole species, herring, flounder, plaice and sprat.
- The Hawk Channel and Sunk Channels are regularly dredged navigation channels running along the southern edge of the mudflats and sand flats of Spurn Bight. These maintain navigation canals associated with large container and freight vessels.
- In the eastern section of the MCA onshore wind farms (including Out Newton and Bishopthorpe) are a distinctive feature in the skyline.
- The Humber Estuary creates the setting for recreation and tourism opportunities including an aquarium called ‘The Deep’, in Hull, as well as the many wildlife watching opportunities for overwintering birds along the coast.
- Cleethorpes is a popular seaside holiday town with long sandy beaches, a resort style frontage with a sea front promenade, pier and an expansive holiday park that dominates the local coastline.
- There is a powerful sense of place, with a mix of historic and modern developments, dynamic views, variable intertidal areas and busy marine activity.
- Relatively settled waters coupled with the intervisibility across the estuary and the sense of enclosure owing to the geography of the estuary contributes to a feeling of safety from shore.
- Extensive mud flats and sand banks outside of the dredged channels creates a sense of uncertainty, with the comparatively hazardous water evidenced by the proliferation of wrecks in the estuary.
- Strong contrasts within the landscape with large open, expansive long views in tranquil and remote places, in juxtaposition with large industrial, busy towns and plants such as Grimsby, Kingston upon Hull and Immingham.

3.8 MCA 7: East Midlands Coastal Waters

Figure 11: MCA 7: East Midlands Coastal Waters



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Basemap: Esri.

3.8.1 Location and boundaries

The East Midlands Coastal Waters MCA extends north to Spurn Point on the Humber Estuary, where it adjoins MCA 5 (Holderness Coastal Waters) and MCA 6 (Humber Estuary). To the south-west it borders MCA 8 (The Wash), which lies south of Gibraltar Point. To the south-east it extends to Sheringham in Norfolk where it adjoins MCA 8 (Norfolk Coastal Waters). The MCA extends 20 to 30km offshore, and its offshore boundary is shared with MCA 3 (East Midlands Offshore Gas Fields). Inland, the MCA borders Lincolnshire to the west and Norfolk to the south. The coastline includes historic seaside towns such as Skegness and Ingoldmells, alongside the Norfolk Coast National Landscape.

3.8.2 Overall character

The East Midlands Coastal Waters MCA is characterised by its wild, natural, and ever-changing seascape influenced by a range of dynamic coastal processes. It hosts a number of coastal and offshore habitats which support important wildlife from bird assemblages including ringed plover and little tern, to natterjack toad and grey seals. Much of this seascape is dominated by sand dunes and beaches, interspersed with seaside towns utilising the areas beauty and touristic appeal. The combination of settlement and natural processes has led to an abundance of sea defences to protect communities and livelihoods. This network of settlements and natural habitats can be seen from Mablethorpe to Gibraltar Point. This MCA has been an important fishing ground for cod, roker, Dover sole and brill for centuries, however historically it is most noted for its long association with leisure and tourism, with displays of Victorian influence seen along beach fronts. The MCA is now heavily influenced by energy infrastructure, with views from parts of the Lincolnshire coast dominated by offshore wind farms. The presence of human activity continues to compete with the feeling of wilderness and naturalness, which at times evokes feelings of loneliness and isolation.

3.8.3 Adjacent National Character Areas (NCAs)

The adjacent coastline includes the following NCAs as defined by Natural England:

- 42: Lincolnshire Coast and Marshes
- 77: North Norfolk Coast
- 78: Central North Norfolk

3.8.4 Adjacent nationally protected landscapes

- The section of the MCA coastline in Norfolk is included within the Norfolk Coast National Landscape.
- The majority of this coastline is also a Heritage Coast.

3.8.5 Key Characteristics

- A relatively shallow seabed, generally less than 20m in depth, with a 10m contour within 5-10km of the coastline.

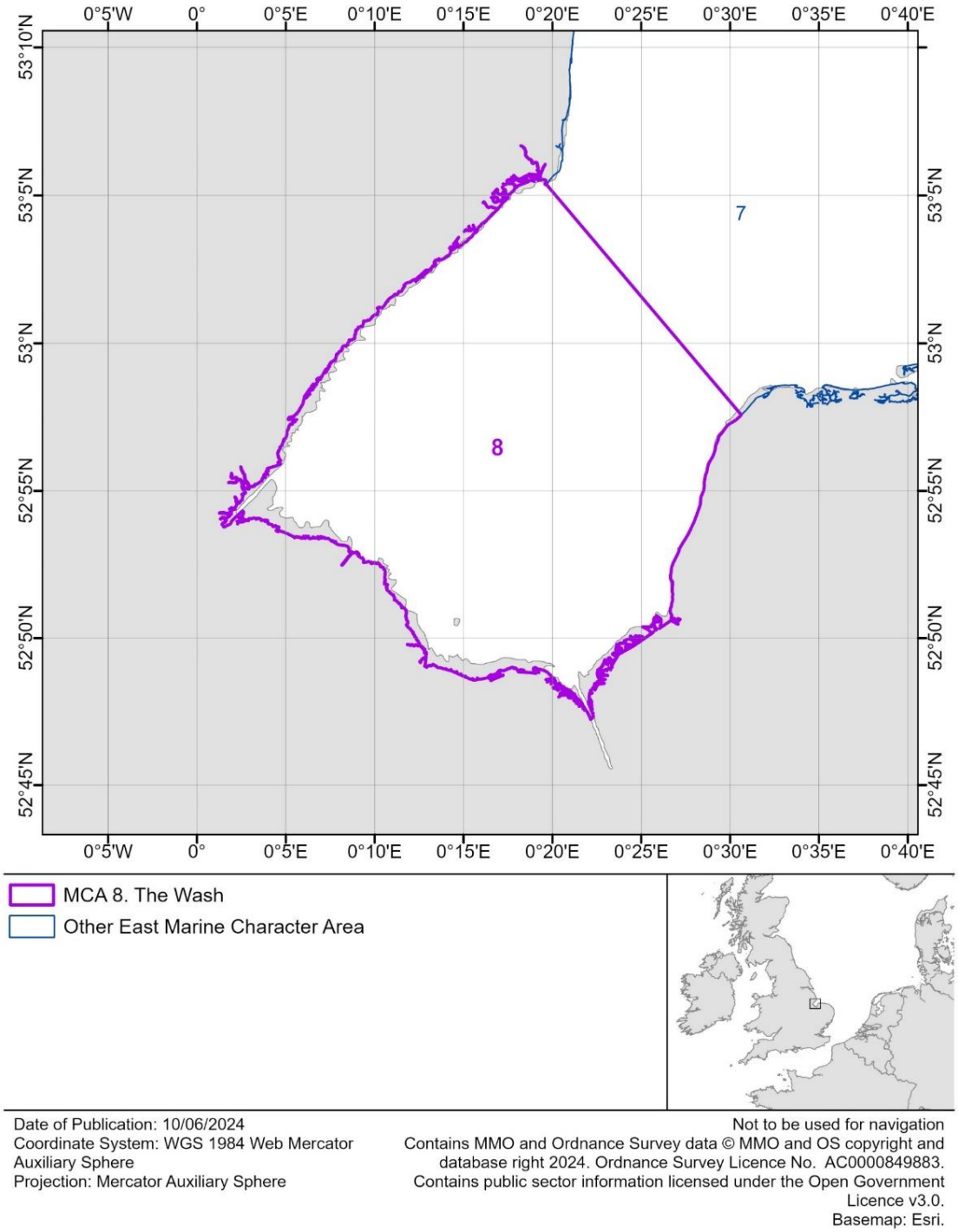
- Underlain by Upper Cretaceous fine-grained limestones (Chalk Group), which extend from north-east Norfolk to Flamborough Head.
- Bedrock topped with sandy gravel, giving rise to an offshore morphology which includes subtidal and gravel banks. Shallow waters and submerged morphology make navigation dangerous and give rise to hazards such as the Inner Dowsing overfalls, a prominent sandbank of the MCA.
- Important marine habitats such as Ross worm reefs and sand banks can be found at Inner Dowsing, Race Bank and North Ridge SAC supporting a variety of bryozoans, hydroids, sponges, and anemones, alongside common lobster and pink shrimp. Rugged chalk features off the North Norfolk Coast underpin the Cromer Shoal Chalk Beds MCA which are important for tompot blenny (*Parablennius gattorugine*), small-spotted cat shark (*Scyliorhinus canicular*), sea squirts, hermit crabs (*Pagurus spp*.), and pipefish (*Syngnathinae spp*.).
- Backed by a low-lying landscape of the Lincolnshire and North Norfolk coasts, with pronounced topography in the hinterlands such as the Lincolnshire Wolds and Cromer Ridge.
- Distinctive natural coastal features such as the red and white banding of Hunstanton cliffs, formed from contrasting chalk and sandstone, and the gently rolling dune systems of the Holme Dunes NNR. Though a seascape noted for swathes of attractive beaches, there are stretches of shingle and rocky intertidal shores.
- The dynamic nature of the coastline gives rise to a variety of habitats such as estuarine mudflats, salt marsh, sand dunes and shingle beach. Along the Lincolnshire Coast such habitats are known to support species such as grey seals and natterjack toads (*Epidalea calamita*), whilst harbour seals are found along the North Norfolk coast. The recent Greater Wash SPA designated in 2018 supports the UK's second largest aggregations of non-breeding red-throated diver, and the largest breeding populations of little tern.
- An important seascape for military practices, with RAF bombing ranges at Donna Nook. Donna Nook is also an important site for hauling and pupping of grey seals.
- The extraction of marine aggregates takes place at several licenced dredging areas off the coast of Saltfleet, Mablethorpe and Chapel St. Leonards.
- Fishing has long been a key industry of this seascape, with long-lining and netting for cod, roker, Dover sole and brill, trawling for demersal fish and shrimp, and potting for crabs and lobster. More recently, new sea-based activities are becoming more common including seaweed farming, with one located off the coast of Blakeney Point.
- A seascape heavily influenced by offshore wind farms, with views of infrastructure from popular tourist destinations such as Skegness. Currently the Lynn, Inner Dowsing, Lincs, Race Bank, Dudgeon, and Sheringham Shoal developments are operational and visible variably from the coast.
- Cables meet land at sites near to Weybourne, Anderby Creek and North Cotes.
- Long association of tourism with the swathes of beaches encouraging holidaymakers to the area. For the Lincolnshire Coast, holiday parks such as Butlins in Skegness make this a popular tourist destination in the summer.

Equally, holidaymakers are drawn to North Norfolk between Hunstanton and Wells.

- A seascape with high recreational value with the North Norfolk Coastal Path, RYA racing and sailing areas, and infrastructure promoting wildlife watching. This seascape is both nationally and internationally recognised for its important marsh habitats such as those found at Cley Marshes, attracting hundreds of thousands of visitors each year. Holkham, Titchwell and Blakeney are also important for wildlife watching.
- Sediment accretion influencing coastal economies and increasing the reliance upon coastal defences such as seawalls, and beach replenishment activities, particularly along the stretch between Saltfleet and Gibraltar Point.
- Strong Victorian influence in architecture, particularly along the fronts of Skegness, Chapel St. Leonards and Mablethorpe.
- Important archaeology including the excavated site of "Seahenge", a 4000-year-old Bronze Age timber circle, and the still present "Seahenge 2" which was discovered in 2014. More recent features of historic importance include coastal defence systems such as World War II pillboxes as seen at Frieston on the Lincolnshire coast.
- A wild, dynamic, and open seascape exposed to the powerful waves of the North Sea.
- The exposed and open coastline allows for changeable conditions, varying perceptions from tranquil and beautiful to unsettling and treacherous.
- Vast uninterrupted sand flats and dunes create a natural, wild and untamed character at times, with perceptions strongly influenced by climatic conditions.
- Feelings of remoteness and wilderness associated with sand flats and dunes are countered by concentrated human activity at holiday resorts, military training areas and offshore wind farms.

3.9 MCA 8: The Wash

Figure 12: MCA 8: The Wash



3.9.1 Location and boundaries

The Wash Marine Character Area (MCA) encompasses England's largest tidal embayment. It is fed by the Rivers Great Ouse, Nene, Steeping, Welland and Witham. The River Nene forms the boundary between Lincolnshire to the west and north, and Norfolk to the east. The MCA covers 615km^2. The outer boundary adjoins MCA 7(East Midlands Coastal Waters), where the Wash opens out to the North Sea. The boundary runs from Gibraltar Point in Lincolnshire to Hunstanton in Norfolk.

3.9.2 Overall character

The Wash, England's largest tidal embayment, covers 615km^2 of mudflats, sand flats, marshes, sand dunes and open waters. It is fed by multiple rivers including the Great Ouse, Nene, Steeping, Welland and Witham, connecting historic towns such as Boston and King's Lynn to the sea. It is an important seascape for many, offering opportunities for recreation with its RYA designated sailing areas and wildlife watching, and its multitudes of nature reserves and protected sites. Furthermore, it is an important area for shipping routes and fishing prospects for cockles (*Cardiidae spp.*), shrimp and whelks. The Wash, despite its wild character at times, is never far from human activity. Dredging is a frequent practice within the estuary to maintain safe travel routes, and the seascape is backed by agriculture, a practice which has led to much of the Wash historically being reclaimed and drained. The Wash is now further influenced by onshore and offshore energy, with views of wind turbines from Gibraltar Point. This MCA presents a vast and unbounded expanse, devoid of prominent landforms, creating a wild and remote character.

3.9.3 Adjacent National Character Areas (NCAs)

The adjacent coastline includes the following NCAs as defined by Natural England:

- 46: The Fens, which wraps around three sides of The Wash.
- 76: North West Norfolk, which includes a small area of the coast at Hunstanton.

3.9.4 Adjacent nationally protected landscapes

- Parts of the eastern coasts of The Wash are within the Norfolk Coast National Landscape.
- The northern part of the Norfolk Coast National Landscape is also designated as the North Norfolk Heritage Coast, but this is just outside the MCA boundary.

3.9.5 Key Characteristics

- England's largest tidal embayment, covering approximately 615km^2, fed by the Great Ouse, Nene, Steeping, Welland and Witham.
- Shallow waters, on average less than 10m in depth, though up to 30m in areas, underlain by a variety of Lower Cretaceous and Jurassic sediments. The underlying reddy-brown Carstone geology can be seen on the north-

eastern boundary at the exposed Hunstanton Cliffs, with bands of red Carstone (sandstone) and white chalk.

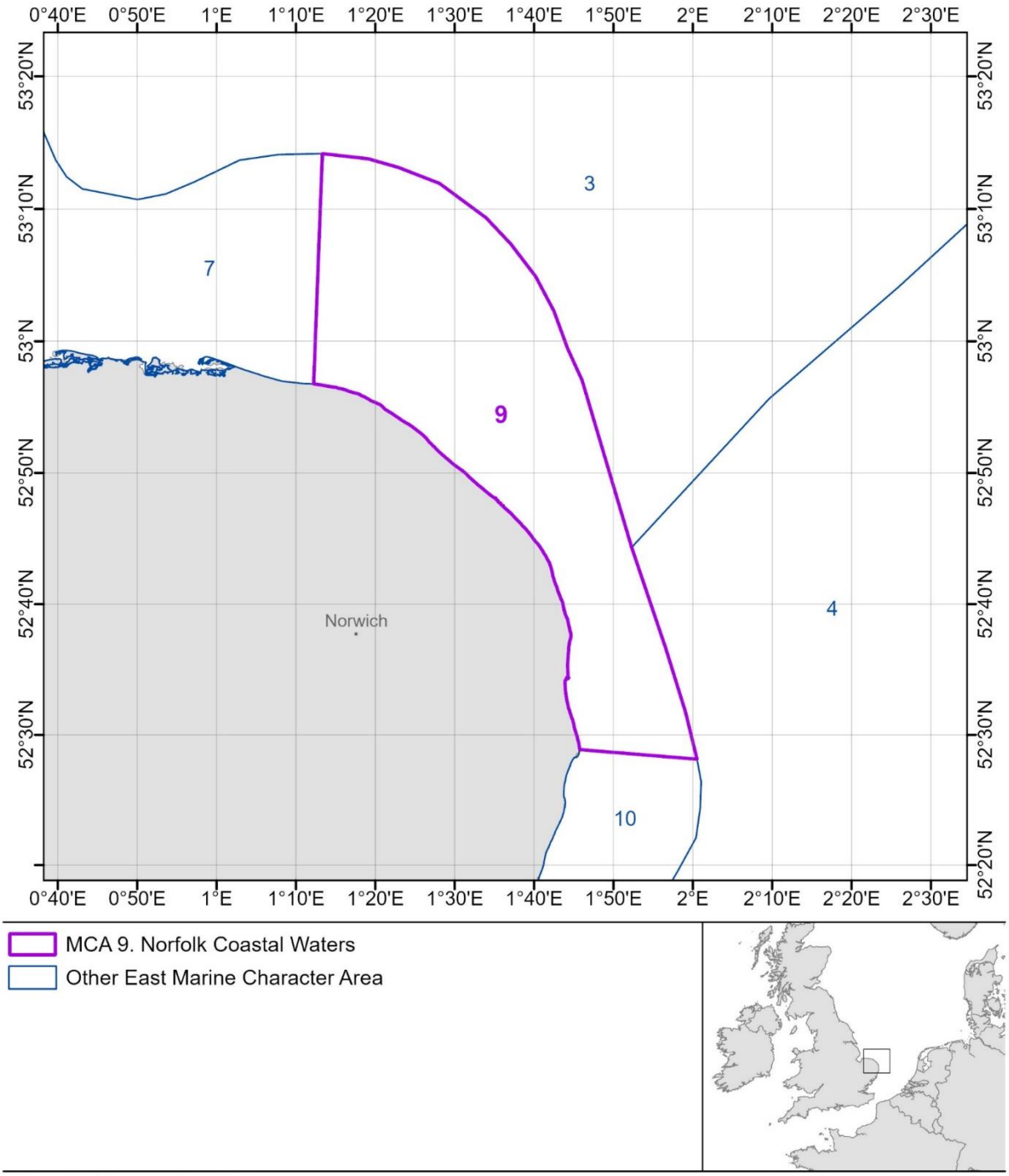
- Bedrock topped with fine sands and silts transported from the North Sea, with gravel at the mouth of the main channel, becoming finer with proximity to the shoreline where fine muddy sediments dominate, especially where the rivers Great Ouse and Welland meet the sea.
- A variety of important estuarine habitats are found here, including sea inlets, mud flats, sand flats, saline lagoons, saltmarsh, shingle structures and sand dune complexes. These support an outstanding breeding bird assemblage, alongside shellfish and mammals which has warranted multiple environmental designations with international importance: The Wash is a SPA, SSSI and Ramsar site, and also forms part of The Wash and North Norfolk Coast SAC. It is also a NNR and forms part of the Norfolk Coast National Landscape.
- A rich breeding ground for shellfish, providing valuable feeding opportunities for large populations of birds. The Wash supports the largest numbers of migrating wildfowl of any site in the UK and is an internationally important site for shelduck (*Tadorna tadorna*), red-knot (*Calidris canutus*) and black-tailed godwit (*Limosa limosa*) among others. The Wash SPA is an important site for non-breeding overwintering birds.
- The Wash supports the largest colony of harbour seals in England, which are notably viewed from Hunstanton where various ‘Sealife safaris’ are launched from. This population is supported by the important spawning and nursery grounds for plaice, Dover sole and cod.
- A hub for the fishing and aquaculture industries, connecting historic ports such as King’s Lynn. The Wash is important for hand-worked cockles, and potted shrimps and whelks. Historic fishing rights date back to the Magna Carter in areas.
- The shallow waters and various sand banks make navigation treacherous. This is evident in the number of navigation buoys and lightships present, with dredging frequent to maintain navigable channels leading to Boston and King’s Lynn.
- An important seascape for recreation, despite its general inaccessibility. The swathes of estuarine habitats supporting breeding and migrating birds encourages bird watchers in their masses. Equally the multitudes of wildfowl support a traditional practice of wildfowling in areas. On the open water charter fishing is a common activity, and at high tide the waters are a RYA designated sailing area.
- A seascape showcasing a constant flux between the land and sea. High rates of deposition and land reclamation has meant that historical coastal towns are now several miles inland, as is the case for King’s Lynn.
- The seascape is enclosed by a large-scale, flat and open landscape dominated by agriculture, relating to the extensively drained and reclaimed fens. More land has been reclaimed from The Wash than any other British estuary.
- An area noted for both historic and current military practices, with RAF Wainfleet now decommissioned and used as a holiday resort and nature reserve, whilst RAF Holbeach remains as a bombing range.
- The Wash is rich in historical perception and features, with shipwrecks found throughout, and views of prominent landmarks such as Botolph’s Church, also

known as the Boston Stump. There is also a famous myth associated with the Wash, suggesting that King John's Crown Jewels were lost there in 1216.

- A wild, dynamic and enclosed seascape, heavily influenced by the rising and falling tides and exposure and submergence of intertidal areas.
- The Wash, despite its natural enclosure, still exudes a vast and open character, void of prominent landforms. This enhances its wild and remote ambience, amplified by concentrations of birdlife and the dynamic intertidal formations.
- A seascape with natural habitats and wildlife for nature enthusiasts, and open waters supporting various industries.
- The perception of the seascape is strongly influenced by geographical orientation, with the horseshoe shape resulting in some aspects being enclosed by the varied shoreline, while other aspects are open to the North Sea.

3.10 MCA 9: East Norfolk Coastal Waters

Figure 13: MCA 9: Norfolk Coastal Waters



Date of Publication: 10/06/2024
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Projection: Mercator Auxiliary Sphere

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Basemap: Esri.

3.10.1 Location and boundaries

The Norfolk Coastal Waters MCA stretches from Sheringham in Norfolk south to Ness Point in Lowestoft, Suffolk. The western boundary is shared with MCA 7 (East Midlands Coastal Waters). The offshore boundary is between 12 and 30km offshore, and is adjacent to MCA 3 (East Midlands Offshore Gas Fields) to the north-east, and MCA 4 (East Anglian Shipping Waters) to the east. MCA 10 (Suffolk Coastal Waters) forms the southern boundary. The Norfolk Coast National Landscape intersects the western boundary of MCA. The southern boundary is marked by Ness Point, the most easterly point in the UK. The coastline includes several historic coastal towns such as Cromer and Great Yarmouth as well as numerous holiday resorts and caravan parks.

3.10.2 Overall character

The Norfolk Coastal Waters MCA is characterised by the varying coastal processes and adjoining landforms that occur within the area. From the western boundary of the MCA at Sheringham to Happisburgh the coast is dominated by soft glacial till cliffs, prone to slippage that are often unmanaged. From Walcott southwards there is a dramatic reduction in cliff height, whereby cliffs drop to beach level transitioning to a landmass that is very low and mostly consists of dune-backed beaches. Brown murky waves characterise the sea surface, highlighting the constant attrition and erosion of sediment. The erosion of the coastal zone can create an unsettling feel, with infrastructure such as caravans and roads being lost to the sea. Sea defences protect notable settlements along the coast, creating temporal stability but often creating issues elsewhere. The MCA includes the busy towns of Lowestoft and Great Yarmouth, areas with strong fishing and tourism heritage. Despite the busy seaside towns, the extensive sand dune habitat to the north of Great Yarmouth has a full range of vegetation, bird species and seal colonies for part of the year creating a feeling of remoteness and wilderness, while the Norfolk Broads National Park also abuts a section of the coastline. Energy infrastructure is a prominent feature of the coastline, the offshore windfarm of Scroby Sands is visible from the Great Yarmouth shoreline, whilst the Bacton Gas Terminal is one of the largest gas installations in the country. The powerful natural erosive processes along the coast define the character of the MCA.

3.10.3 Adjacent National Character Areas (NCAs)

The adjacent coastline includes the following NCAs as defined by Natural England:

- 78: Central North Norfolk
- 79: North East Norfolk and Flegg
- 80: The Broads
- 82: Suffolk Coast and Heath

3.10.4 Adjacent nationally protected landscapes

- A small section of the Norfolk Broads National Park abuts the coast south of Sea Palling. The rest of this National Park is inland but close to the coast further south.
- Large sections of the Norfolk Coast National Landscape border the coast or run just inland from the developed coastal edge. The main section runs from the western MCA boundary to Bacton Gas Terminal, and a separate section runs from Sea Palling to Winterton on Sea.

3.10.5 Key Characteristics

- A highly dynamic seascape exposed to the powerful coastal processes of the North Sea, historic maps show the rate of erosion has varied between 0.4 and 2.1m per year across the MCA.
- Seabed elevation is relatively gentle and uniform for the majority of the MCA, depths range between 0m and 20m within 5km of the coastline before reaching a maximum depth of 30m along the eastern boundaries of the MCA. Sandbanks that range in depth between 0m and 10m run parallel to the coastline to the north of Great Yarmouth and Happisburgh, contrasting with the otherwise uniform bathymetry of the seabed.
- The bedrock of the area is underlain by Upper Cretaceous fine-grained limestone, which extends from north-east Norfolk to Flamborough Head. The seafloor is composed predominantly of sand with patches of gravel, sandy mud and sandy gravel.
- Sandy shingle beaches backed by extensive dune systems to the south of the area change to dramatic elevated cliffs to the north between Happisburgh and Sheringham.
- Cliffs tend to be degraded and unstable and extend out towards the sea due to mass movement by landslips.
- The Cromer Ridge (reaching nearly 100m in areas) to the west of the MCA contrasts with the generally flat landscape of East Anglia further inland.
- Substantial chalk reef habitat to the north of Cromer, one of the most extensive in the world, is designated as a MCZ. This runs from the western boundary of the MCA at Sheringham to Happisburgh and supports a diverse range of benthic flora and fauna including crabs, lobsters, European eel and Parpal Dumplin (*Hymedesmia* sp.) – a new species of demosponge.
- Important marine habitats such as Haisborough Sand, Hammond Knoll and Winterton Ridge and the North Norfolk Sand Banks and Saturn Reef are present within Special Areas of Conservation (SAC). The sandbank habitats are known as important spawning grounds for sand eels, lemon sole and Dover sole, whilst also providing nursery grounds for cod and mackerel.
- Harbour seals and occasionally harbour porpoise may be viewed on boat trips to Haisborough Sands.
- North of Great Yarmouth key dune habitats with a variety of vegetation types exist. The dune systems attract a wide variety of wildlife to the area such as grey seals, grey geese (*Anser anser*) and common cranes (*Grus grus*). The area has two SSSI designations; Great Yarmouth North Denes and Winterton-Horsey dunes, with a small section of Winterton dunes classed as a NNR.

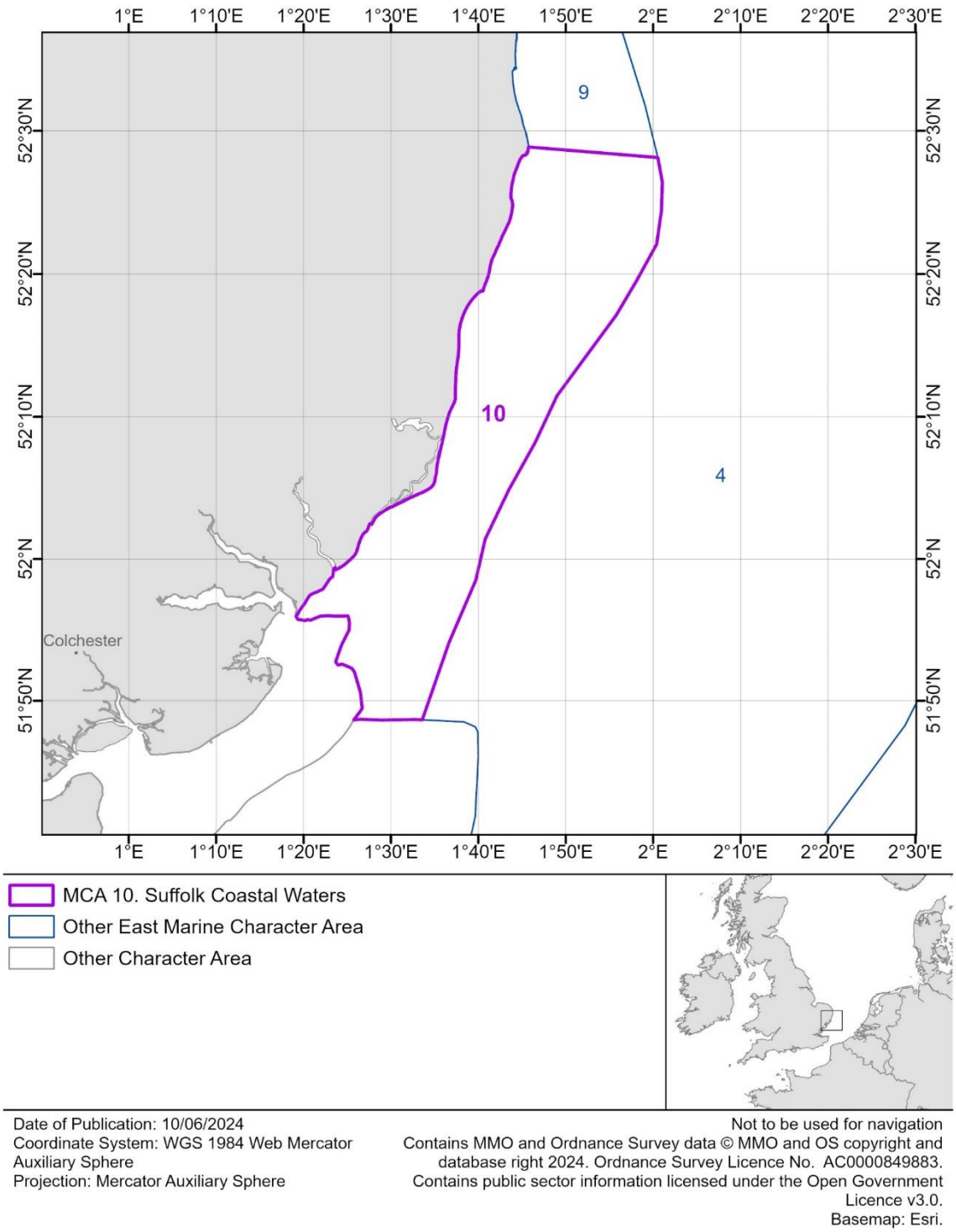
- Unstable cliff faces, degraded over time from mass movement and landslip between Sheringham and Mundesley characterise the north of the MCA.
- Archaeological records of the buried landscape near Happisburgh include implements associated with hunting, and the ‘Happisburgh Footprints’, made by humans over 800,000 years ago. This area of coastline is called the “Deep History Coast’’.
- Treacherous waters due to the lack of safe havens, the exposed nature of the shoreline and sand banks, create notorious wrecking sites, demonstrated by the high concentration of wrecks along the shoreline. Notable wrecks include the PS *Seagull* (built 1848) and the SS *Xanthe* (built 1862), both located to the north-east of Horsey Gap and designated as Protected Wrecks.
- Many of the coastal settlements have been founded on the fishing industry, Great Yarmouth has a long association with being a herring port as well as a ship-building hub. Despite the fishing industry declining, the creation of Great Yarmouth Outer Harbour has enabled a transition in industry towards processing and handling offshore wind turbines.
- Characteristic sandy beaches have enabled the area to thrive as a popular tourist destination. These areas have a full range of leisure facilities, including camp sites, holiday centres and funfairs, with Great Yarmouth and its adjoining coast being the most intensively developed.
- Offshore commercial activity includes vessels travelling to and from licenced aggregate dredging areas approximately 8km east of Great Yarmouth and Lowestoft.
- Breydon Water, the inland tidal estuary of the River Yare joins the sea via a thin channel at Great Yarmouth. There are a number of marinas at Yarmouth and at Burgh Castle and numerous pleasure boatyards in the rivers that serve the Broads. Great Yarmouth is a popular starting point for sea angling trips.
- Gas pipelines underlie a substantial proportion of the character area and arrive at Bacton Gas Terminal from the North Sea. The coastal interface between Bacton and Walcott has recently been transformed by the Bacton sandscaping scheme which has placed 1.8 million cubic metres of sand on the beaches near Bacton with an aim to naturally protect the gas terminal by substantially increasing beach height and width.
- The Norfolk Broads National Park brings visitors to the coastline and small sections of the Park directly connect to the coastal interface.
- Important historic features are present along the coastline, including the remains of World War II coastal battery structures and pillboxes. The coastal settlements of Happisburgh, Mundesley, Overstrand and Cromer are designated as historical Conservation Areas.
- Areas of the MCA are substantially influenced by offshore wind infrastructure, the Scroby Sands wind farm is a visually prominent feature of the resort town of Great Yarmouth. The Sheringham Shoal wind farm in the adjacent MCA is visible in long-distance views towards the north-west from Cromer.
- The rapid erosion along this coast has led to impacts on coastal settlements and communities, with responses including the installation of hard sea defences as well as a managed retreat in other areas. For example, historical records indicate that 250m of land was lost between 1600 and 1850 at Happisburgh. Winterton and Hemsby have also suffered from rapid coastal

erosion. Based on future erosion potential, the current shoreline management approach in many of these areas is managed realignment

- Feeling of tranquillity associated with the Norfolk Broads National Park and Norfolk Coast National Landscape evokes feelings of remoteness when facing both seawards and inland.
- The busy seaside towns such as Cromer and Great Yarmouth as well as areas of notable infrastructure including the Bacton Gas Terminal are often dominated by sea defences, highlighting the exposed and vulnerable nature of the coastline.
- The area is characterised by both large, slumped cliffs and low rolling dune systems, which contribute to the wild feel of the area.
- Long-distance views are afforded due to a combination of low land elevation and cliff faces.
- The exposed nature and the temperamental marine character of the area is emphasised by coastal settlements such as Happisburgh and Hemsby, where coastal erosion has led to people losing their houses and holiday homes.

3.11 MCA 10: Suffolk Coastal Waters

Figure 14: MCA 10: Suffolk Coastal Waters



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Projection: Mercator Auxiliary Sphere

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Basemap: Esri.

3.11.1 Location and boundaries

The Suffolk Coastal Waters Marine Character Area (MCA) stretches from the southern tip of Ness Point in Lowestoft to Landguard Point to the south of Felixstowe. To the north, it borders MCA 9 (Norfolk Coastal Waters), while the southern boundary is shared with MCA 19 (Essex/South Suffolk Estuaries and Coastal Waters) and MCA 20 (Thames Approaches). MCA 4 (East Anglian Shipping Waters) forms the eastern boundary, which lies between 9 and 20km offshore. The coastline of the MCA is part of Suffolk, and includes the large towns of Lowestoft and Felixstowe, as well as smaller seaside towns such as Southwold and Thorpeness.

3.11.2 Overall character

This dynamic seascape features coasts of predominantly low elevation. There are small, rapidly eroding cliffs with a soft glacial formation to the north of the MCA, between Kessingland and Southwold. These cliffs provide significant sediment output into the ocean, which is generally transported southwards to form steep beaches made of sand and shingle. The sea's surface is characterized by swirling, murky brown waves, caused by the constant movement of sediment throughout the water column. This area is home to a diverse range of coastal and marine wildlife and is designated as a National Landscape and SAC. Furthermore, the coastline has a rich military history, including 19th-century Napoleonic defences and World War II embankments. The MCA is closely linked with trade, with Felixstowe being Britain's busiest container port and the wider area hosting significant levels of offshore vessel movement. Views extend eastwards, and there is strong intervisibility along the coast due to the low elevation of the surrounding coastline. The coastline is also marked by energy infrastructure surrounding the Sizewell Nuclear Site.

3.11.3 Adjacent National Character Areas (NCAs)

The adjacent coastline includes the following NCAs as defined by Natural England:

- 82: Suffolk Coast and Heaths

3.11.4 Adjacent nationally protected landscapes

- The area between Kessingland to the north of Felixstowe is defined as the Suffolk Heritage Coast.
- The Suffolk and Essex Coast and Heaths National Landscape also extends along the same extent of coastline, as well as extending further inland.

3.11.5 Key Characteristics

- A dynamic, sweeping coastline of predominantly low elevation. Estuaries are an important influence, particularly those associated with the Rivers Alde, Ore and Deben.
- North of Sizewell, relatively small mobile cliffs define a receding coastline. Cliffs are composed of poorly consolidated glacial material and are relatively low (<20m), the cliff at Covehithe between Kessingland and Southwold is one

of the fastest eroding pieces of coastline in Britain, having eroded approximately 530m since 1883.

- Waves transport material southwards from the eroding cliffs providing substantial sediment supply to neighbouring beaches. These beaches tend to be shingle and steeply sloping and are often stepped.
- The bedrock of the MCA is predominantly formed of Pliocene-Pleistocene 'Red Crag' (an East Anglian name for shelly sand) that is topped by glacial till and sands of various thicknesses. Bedrock is rarely exposed on the seafloor.
- Bathymetry of the MCA is relatively simple. The seabed remains shallow for much of the coastline, typically ranging between 5-10m within 5km of the shoreline before deepening to 20-30m at the eastern extent of the MCA.
- Mobile sandbanks and shoals influence waves and currents within the MCA. The tidal current coupled with the relatively shallow seabed and the input of sediment ensures the water remains well-mixed along the coastline, giving a murky brown colour to the ocean.
- The diversity of habitats along the coastline supports a variety of wildlife and is exemplified by several SSSI sites, NNRs and the RSPB Minsmere Reserve which supports an array of birds, including avocets (*Recurvirostra spp*.), bearded tits (*Panurus biarmicusand*) and bitterns (*Botaurinae spp.*). Kittiwake Towers (artificial bird nests) have been built offshore of Lowestoft and Minsmere.
- The majority of the MCA is part of the Outer Thames Estuary SPA; the area supports the largest aggregation of wintering red-throated diver in the UK.
- The Orford Ness – Shingle Street SAC is located on the coast of the MCA between Aldeburgh and Bawdsey and has a range of coastal lagoons, stony banks and vegetated drift lines that provide refuge for animals such as barn owls and brown hares. A breach in the site caused by a tidal surge in 2013 altered the site significantly.
- Flint tools unearthed at Pakefield display evidence of early human activity dating back 700,000 years.
- Large sections of the coastline are designated by the RYA as General Boating Areas, the region is popular for recreational boating due to the long sections of inland navigable waters that extend from estuaries of major coastal rivers such as the River Deben to the coast.
- Lowestoft, a major coastal town that defines the northern boundary of the MCA, is characterised by sandy beaches backed by a long urban frontage. Lowestoft is a major port in the region and has a long historic association with the fishing industry, although fishing activity has decreased since its peak at the beginning of the 20th century.
- Productive waters support commercial fishing activity. Benthic habitats in this area provide large spawning and nursery grounds for a wide range of fish species, particularly Dover sole and shellfish species such as lobster and brown shrimp.
- The Port of Felixstowe has a long history, being a strategically important site since the medieval period. Today the town is host to Britain's largest container port.
- The MCA contains several busy shipping routes. Vessels predominantly travel north-south parallel to the coastline, whilst traffic includes cargo vessels,

tankers and passenger ships. The frequency of vessel movements is particularly high on the outer approach to Felixstowe.

- Colourful seafronts lined by brightly painted beach huts are characteristic of places such as Southwold and Pakefield.
- A historically heavily militarised coastline, with several remnant 19th century Martello towers and coastal defence batteries associated with World War II. Many of these features are derelict and at risk of further erosion.
- Roughs Tower, the most northerly of the World War II Maunsell Forts, is 11km offshore from Felixstowe. Built to guard the Thames approaches, more recently it has been used for pirate radio broadcasts.
- A series of concrete structures built by the Atomic Weapons Research Establishment on Orford Ness mark where Britain's first atomic weapon was developed and tested.
- Sizewell nuclear power station is a significant group of structures within the MCA that are a distinctive feature visible from large sections of the coast. The construction associated with the proposed new Sizewell C reactor is a hub of activity and is currently having a transformative effect on the coastal landscape.
- The MCA has a strong sense of identity associated with the extensive coastal processes and erosion that occur along the coast. Steep shingle beaches and low-receding cliffs give the area a feeling of exposure.
- Large sections of the coastline are designated as protected landscapes, the Suffolk and Essex Coast and Heaths National Landscape spans continuously from Kessingland, south along the coast to the north of Felixstowe, forming a naturalistic backdrop to the shoreline.
- The low cliffs formed of crag and glacial deposits provide scenic views across large sections of the MCA due to the surrounding low land influence but also provoke the feeling of vulnerability due to the rapid erosion rates.
- Busy shipping waters characterise the seascape further offshore, adding a varied character to the environment.

4. References

The accessed date refers to when the information was first considered and the character initially defined.

Association of Inshore Fisheries and Conservation Authority (IFCA) (2024). Inshore Fisheries and Conservation Authorities in England. Available at: https://association-ifca.org.uk/. Accessed February 2024.

Ashton N, Lewis SG, De Groote I, Duffy SM, Bates M, Bates R, et al. (2014) Hominin Footprints from Early Pleistocene Deposits at Happisburgh, UK. PLoS ONE 9(2): e88329. https://doi.org/10.1371/journal.pone.0088329

Bell, M. (1997). Environmental Archaeology in the Coastal Zone. In England's Coastal Heritage: a Survey for English Heritage and the RCHME. London: English Heritage.

Boyes, S. J., Barnard, S., and Elliott, M. (2016). The East Riding Coastline: Past, Present and Future. The University of Hull. Available at: https://urbanrim.org.uk/cache/East-Riding-Coastline-Past-Present-Future.pdf. Accessed February 2024.

Burden, A., Smeaton, C., Angus, S., Garbutt, A., Jones, L., Lewis, H., and Rees, S. (2020). Impacts of climate change on coastal habitats, relevant to the coastal and marine environment around the UK. MCCIP Science Review 2020.

Clipsham, V., Flikweert, J. J., Goodliffe, R., Courtnell, E., Fletcher, A., and Hesk, P. (2021). Bacton to Walcott sandscaping, UK: a softer approach to coastal management. In Proceedings of the Institution of Civil Engineers-Civil Engineering, 174(5), pp. 49-56. Thomas Telford Ltd.

Coastal Partnership East (2023). Coastal Adaptation, Supplementary Planning Document. Available at: https://www.broads-authority.gov.uk/__data/assets/pdf_file/0022/485401/Coastal-Adaptation-SPD-signatures-redacted.pdf. Accessed February 2024.

Cotton, I., Forster, J., Lorenzoni, I., and Tolhurst, T. J. (2022). Understanding perceived effectiveness of a novel coastal management project: The case of the Bacton-Walcott sandscaping scheme, UK. Frontiers in Marine Science, 9, p.1028819.

Defra and Environment Agency (2024). Shoreline Management Plans. Available at: https://environment.data.gov.uk/shoreline-planning#shorelineManagementPlans. Accessed January 2024.

Defra, Natural England and JNCC (2018). Marine Conservation Zone designations in England. Available online at https://www.gov.uk/government/collections/marine-conservation-zone-designations-in-england. Accessed February 2024.

East Suffolk Council (2020). Suffolk Coastal Local Plan. Available at: https://www.eastsuffolk.gov.uk/assets/Planning/Planning-Policy-and-Local-
Environment Agency (2021). What is coastal squeeze? GOV.UK. Available at: https://www.gov.uk/flood-and-coastal-erosion-risk-management-research-reports/what-is-coastal-squeeze. Accessed 16 July 2024.

East Suffolk Council (2020). Suffolk Coastal Local Plan. Available at: http://www.eastsuffolk.gov.uk/localplan. Accessed February 2024.

English Nature (1997). Natural Areas in the East Midlands Region. Cumbria Team, November 1997. Available at: https://publications.naturalengland.org.uk/file/118021. Accessed February 2024.

English Nature (1997). Natural Areas in the East of England Region. Cumbria Team, November 1997. Available at: https://publications.naturalengland.org.uk/file/114017. Accessed February 2024.

Heritage Gateway (2024). England's historic sites and buildings, including images of listed buildings. Available at: https://www.heritagegateway.org.uk/gateway/. Accessed February 2024.

Historic England (2024). National Heritage List for England. Available at: https://historicengland.org.uk/listing/the-list/ . Accessed January 2024.

HM Government (2011). UK Marine Policy Statement. London: The Stationary Office. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf. Accessed January 2024.

Hobbs, P. R. N., Jones, L. D., Kirkham, M. P., Pennington, C. V. L., Morgan, D. J. R., and Dashwood, C. (2020). Coastal landslide monitoring at Aldbrough, east riding of Yorkshire, UK. Quarterly Journal of Engineering Geology and Hydrogeology, 53(1), pp.101-116.

House of Commons (2023). Debate on coastal erosion in Suffolk and Norfolk. Debate Pack Number CDP 2023/0230. Available at: https://researchbriefings.files.parliament.uk/documents/CDP-2023-0230/CDP-2023-0230.pdf. Accessed February 2024.

Joint Nature Conservation Committee (1995). Coasts and seas of the United Kingdom, Region 6 Eastern England: Flamborough Head to Great Yarmouth. Available at: https://data.jncc.gov.uk/data/6473ed35-d1cb-428e-ad69-eb81d6c52045/pubs-csuk-region-06.pdf. Accessed February 2024.

Joint Nature Conservation Committee (1998). Coasts and seas of the United Kingdom, Region 7 South-east England: Lowestoft to Dungeness. Available at: https://data.jncc.gov.uk/data/6473ed35-d1cb-428e-ad69-eb81d6c52045/pubs-csuk-region-07.pdf. Accessed February 2024.

Joint Nature Conservation Committee (2015). The Marine Conservation Zone Project. Available at: https://jncc.gov.uk/our-work/marine-conservation-zones/. Accessed February 2024.

Joint Nature Conservation Committee (2015). UK Protected Sites. Available at: https://jncc.gov.uk/our-work/uk-protected-areas/. Accessed February 2024.

Joint Nature Conservation Committee (2020). Orford Inshore MPA. jncc.gov.uk. Available at: https://jncc.gov.uk/our-work/orford-inshore-mpa/. Accessed 12 July 2024.

Jones, L.A., Coyle, M.D., Evans, D., Gilliland, P.M., and Murray, A.R. Southern North Sea Marine Natural Area Profile: A contribution to regional planning and management of the seas around England. Peterborough: English Nature. Available at: https://publications.naturalengland.org.uk/file/60008. Accessed February 2024.

LUC (2015). National Seascape Assessment for Wales. Natural Resources Wales and Welsh Government. Available at https://naturalresources.wales/evidence-and-data/maps/marine-character-areas/?lang=en. Accessed February 2024.

Marine Management Organisation (2012). Seascape character assessment East Inshore and East Offshore marine plan areas: Technical Report. A report produced for the Marine Management Organisation. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/312481/east_seascape.pdf. Accessed January 2024.

Marine Management Organisation (2014). Seascape Assessment for the South Marine Plan Areas: Technical Report. A report produced for the Marine Management Organisation. Available at: https://www.gov.uk/government/publications/seascape-assessment-for-the-south-marine-plan-areas-mmo-1037. Accessed January 2024.

Marine Management Organisation (2019). An approach to seascape sensitivity assessment. A report produced for the Marine Management Organisation (MMO1204). Available at: MMO1204_An_Approach_to_seascape_sensitivity_assessment_for_publication_a.pdf. Accessed January 2024.

Marine Management Organisation (2018). Seascape Character Assessment for the North West Inshore and Offshore marine plan areas. MMO1134. Available at: https://www.gov.uk/government/publications/seascape-assessments-for-north-east-north-west-south-east-south-west-marine-plan-areas-mmo1134. Accessed February 2024.

Marine Management Organisation (2018). Seascape Character Assessment for the South West Inshore and Offshore marine plan areas. MMO1134. Available at: https://www.gov.uk/government/publications/seascape-assessments-for-north-east-north-west-south-east-south-west-marine-plan-areas-mmo1134. Accessed February 2024.

Marine Management Organisation (2018). Seascape Character Assessment for the South East Inshore and Offshore marine plan areas. MMO1134. Available at: https://www.gov.uk/government/publications/seascape-assessments-for-north-east-north-west-south-east-south-west-marine-plan-areas-mmo1134. Accessed February 2024.

Marine Management Organisation (2018). Seascape Character Assessment for the North East Inshore and Offshore marine plan areas. MMO1134. Available at: https://www.gov.uk/government/publications/seascape-assessments-for-north-east-north-west-south-east-south-west-marine-plan-areas-mmo1134. Accessed February 2024.

McGinlay, J., Jones, N., Clark, J. and Maguire-Rajpaul, V.A. (2021). Retreating coastline, retreating government? Managing sea level rise in an age of austerity. Ocean and coastal management, 204, p.105458.

Muñoz López, P., Payo, A., Ellis, M. A., Criado-Aldeanueva, F., and Owen Jenkins, G. (2020). A method to extract measurable indicators of coastal cliff erosion from topographical cliff and beach profiles: application to North Norfolk and Suffolk, East England, UK. Journal of Marine Science and Engineering, 8(1), p.20.

National Coastwatch (2015). Website. Available at http://www.nci.org.uk/stations/location. Accessed February 2024.

Natural England (2012). An Approach to Seascape Character Assessment. Available online at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/396177/seascape-character-assessment.pdf. Accessed January 2024.

Natural England (2016). National Character Area profiles. Available at: https://publications.naturalengland.org.uk/category/587130. Accessed December 2023.

Natural England (2018). Designated Sites View. Available at https://designatedsites.naturalengland.org.uk/. Accessed December 2023.

Natural Resources Wales (2023). Marine Character Areas. Available at: https://naturalresources.wales/evidence-and-data/maps/marine-character-areas/?lang=en. Accessed February 2024.

Office for National Statistics (2021). Exploring local income deprivation: A detailed picture of disparities within English local authorities to a neighbourhood level. Available at: https://www.ons.gov.uk/visualisations/dvc1371/#/E07000223. Accessed February 2024.

Oliver, S. (2024). Inventing the managed realignment of the coast: Trying ‘to live with nature not defeat her’. The Geographical Journal, 190(1), p.12529.
RenewableUK (2024). Wesbite. Available at: https://www.renewableuk.com/. Accessed February 2024.

The Crown Estate (2024) Regional dredging area charts. Available at: https://www.thecrownestate.co.uk/our-business/marine/regional-dredging-area-charts. Accessed February 2024.

The Planning Inspectorate (2024). National Infrastructure Planning. Available at: https://infrastructure.planninginspectorate.gov.uk/. Accessed February 2024.

Trinity House (2024). Lighthouses and lightvessels. Available at: https://www.trinityhouse.co.uk/lighthouses-and-lightvessels. Accessed February 2024.

UK Parliament POST (2017). Rising sea levels. POSTNOTE, 555. Available at: https://researchbriefings.files.parliament.uk/documents/POST-PN-0555/POST-PN-0555.pdf. Accessed February 2024.

UK Parliament POST (2021) Coastal Management. POSTNOTE, 647. Available at: https://researchbriefings.files.parliament.uk/documents/POST-PN-0647/POST-PN-0647.pdf. Accessed February 2024.

URS Scott Wilson (2012). Seascape Characterisation around the English Coast (Marine Plan Area 3 and 4 and Part of Area 6 Pilot Study). Natural England. Available at: Seascape Characterisation around the English Coast (Marine Plan Areas 3 and 4 and Part of Area 6 Pilot Study) - NECR106 (naturalengland.org.uk). Accessed January 2024.

VisitMyHarbour (2024). Website. Available at: https://www.visitmyharbour.com/. Accessed February 2024.

White Consultants (2023). Suffolk: Seascape sensitivity to offshore wind farms. Update addendum, final report for Suffolk County Council, East Suffolk Council and Suffolk Coast and Heaths AONB Partnership. Available at: https://coastandheaths-nl.org.uk/wp-content/uploads/2023/06/Suffolk-seascape-sensitivity-to-wind-farms-update-final-w-060623.pdf. Accessed February 2024.

Wreck Site (2024). Website. Available at: https://www.wrecksite.eu/Wrecksite.aspx. Accessed January 2024.

Annex 1: Overview maps

Figure 15: Study area

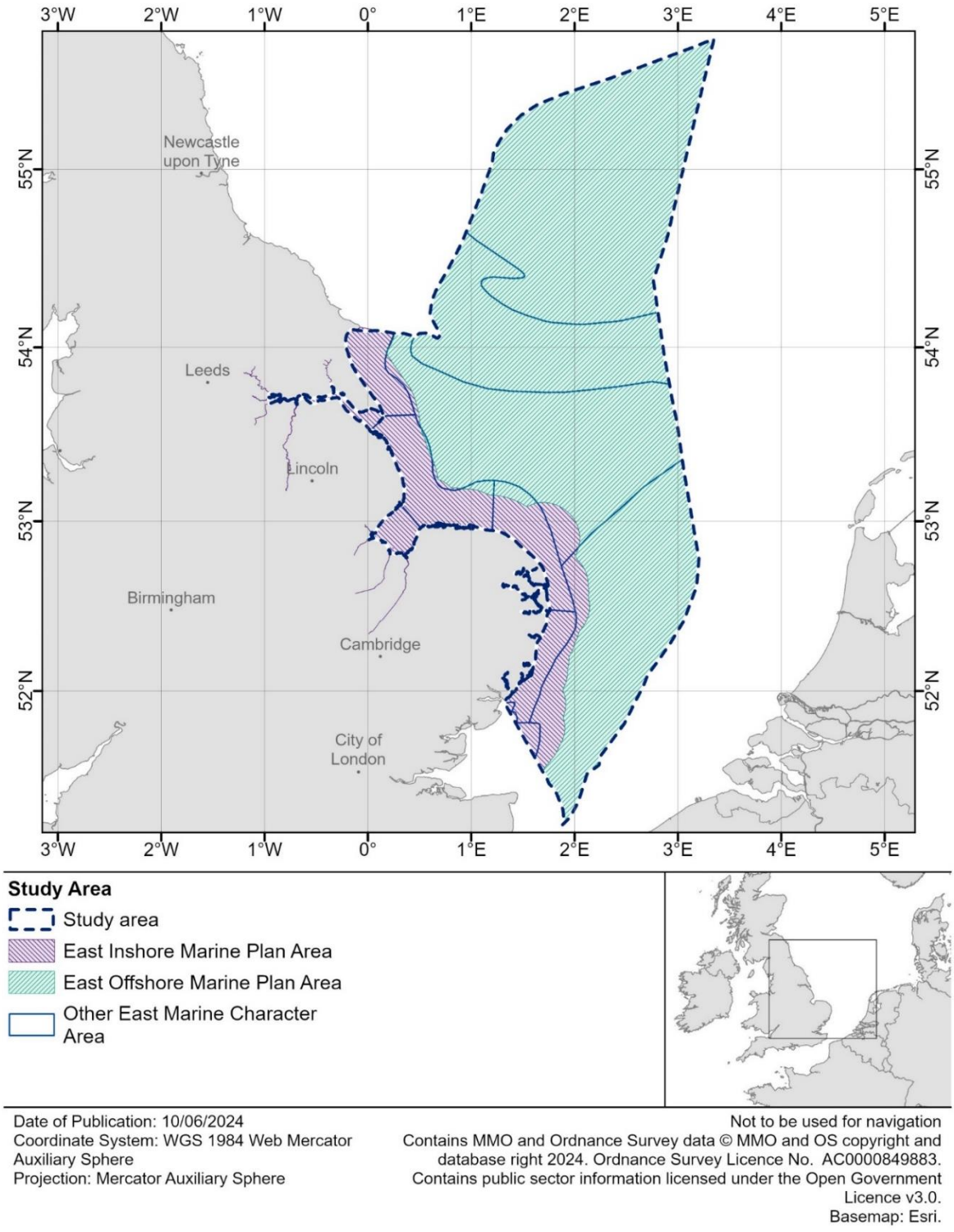
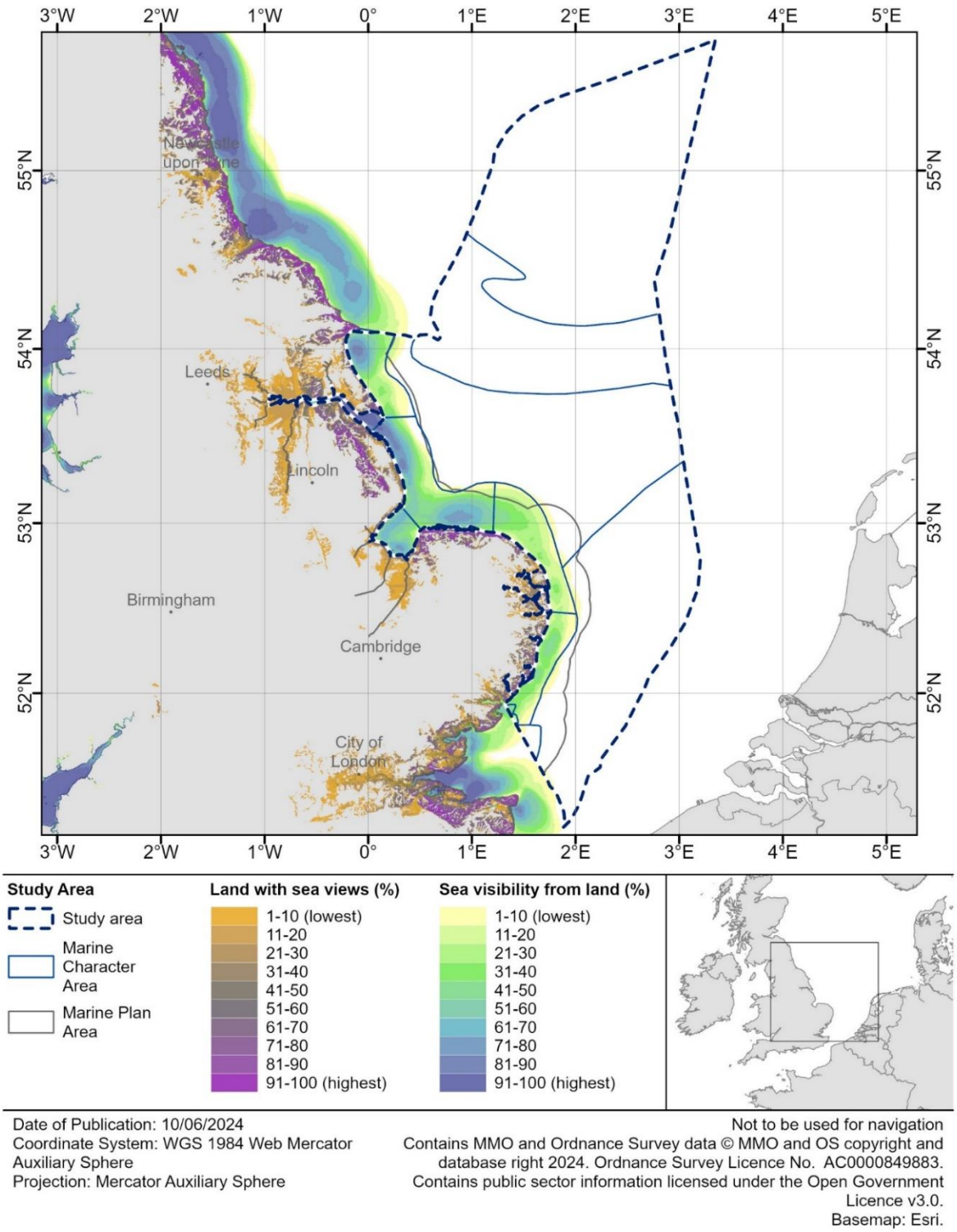


Figure 16: Visual resource mapping (VRM)



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Basemap: Esri.

Figure 17: National Character Areas and Marine Character Areas

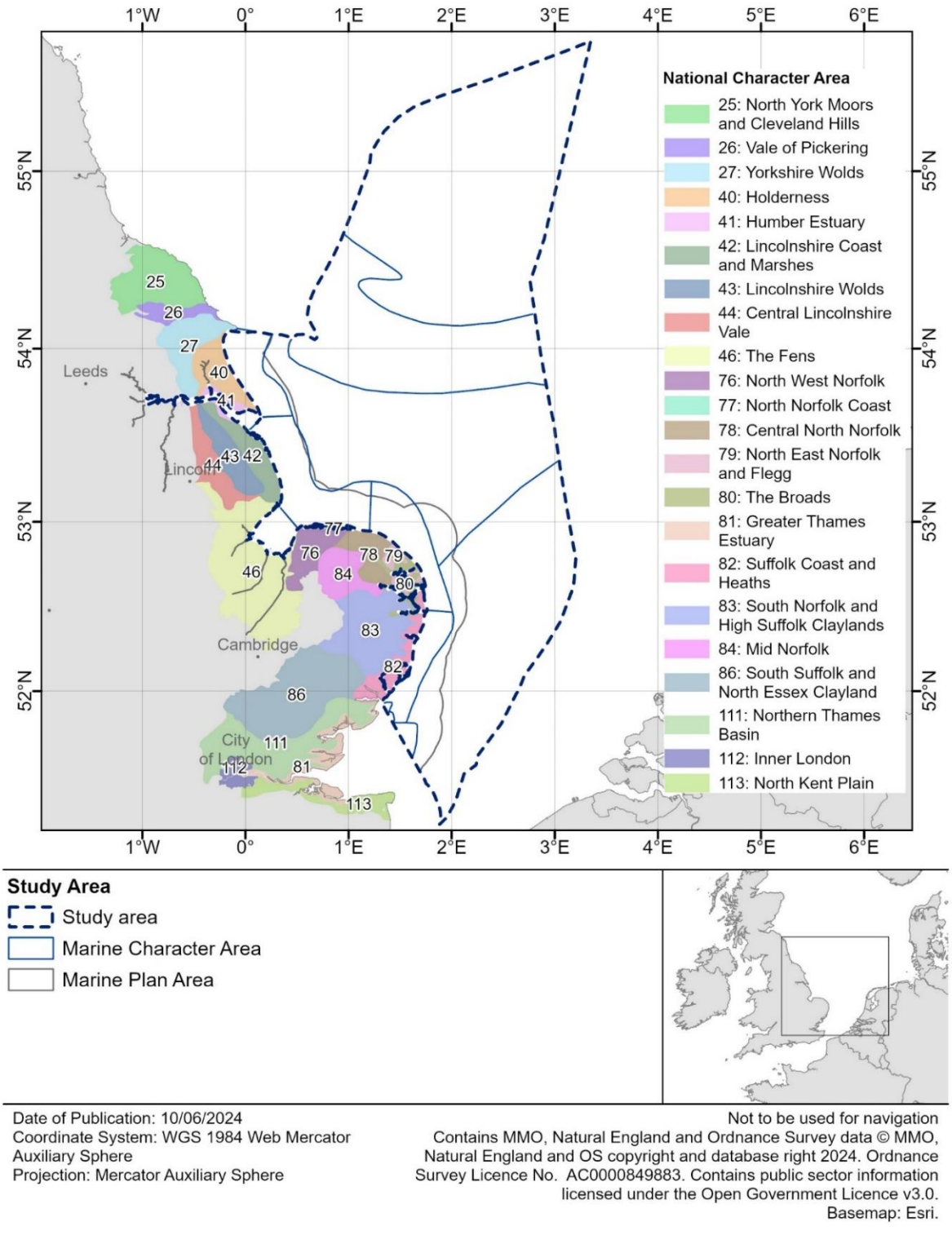

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Figure 18: Field survey locations – northern extent of study area

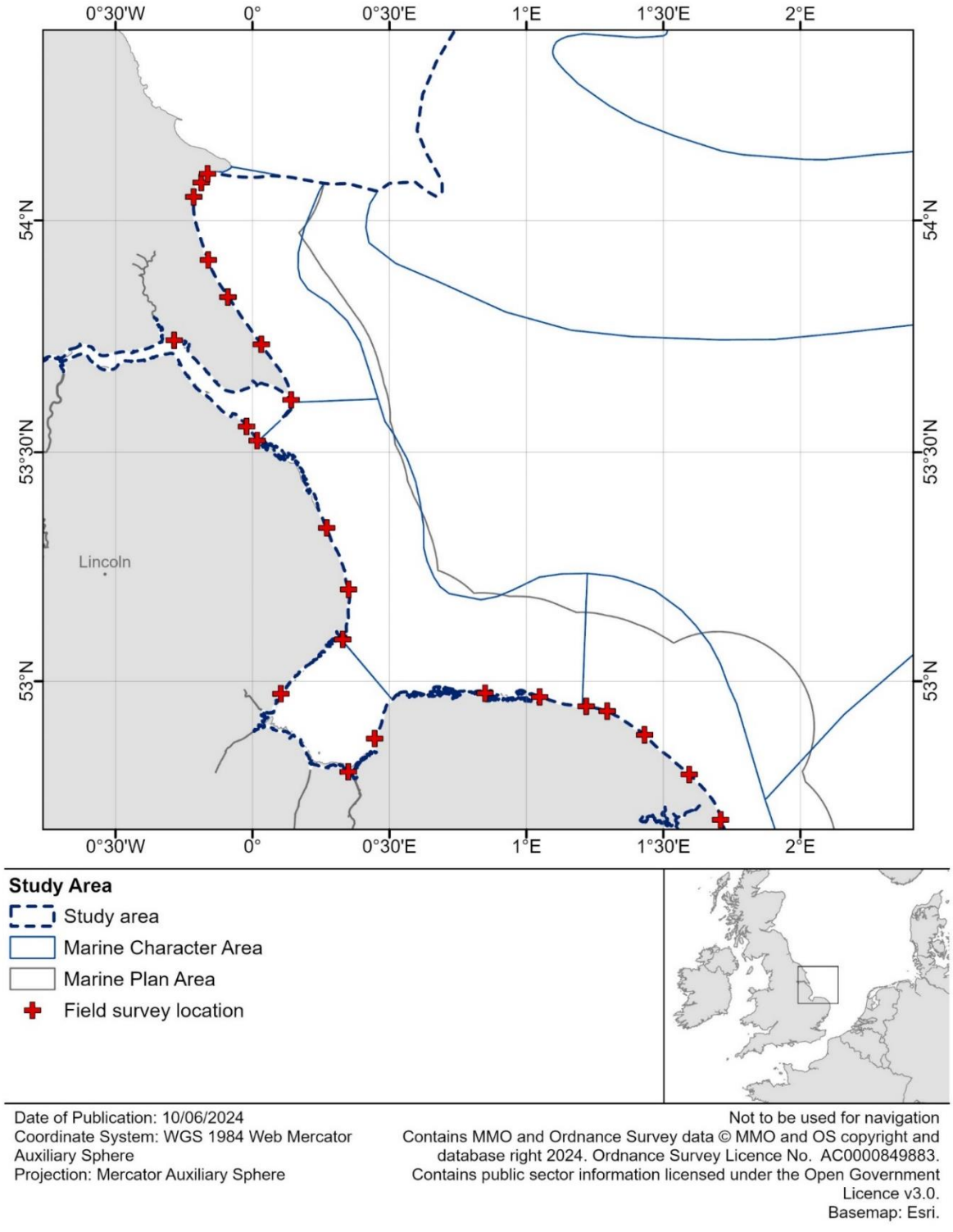

Figure 19: Field survey locations – southern extent of study area

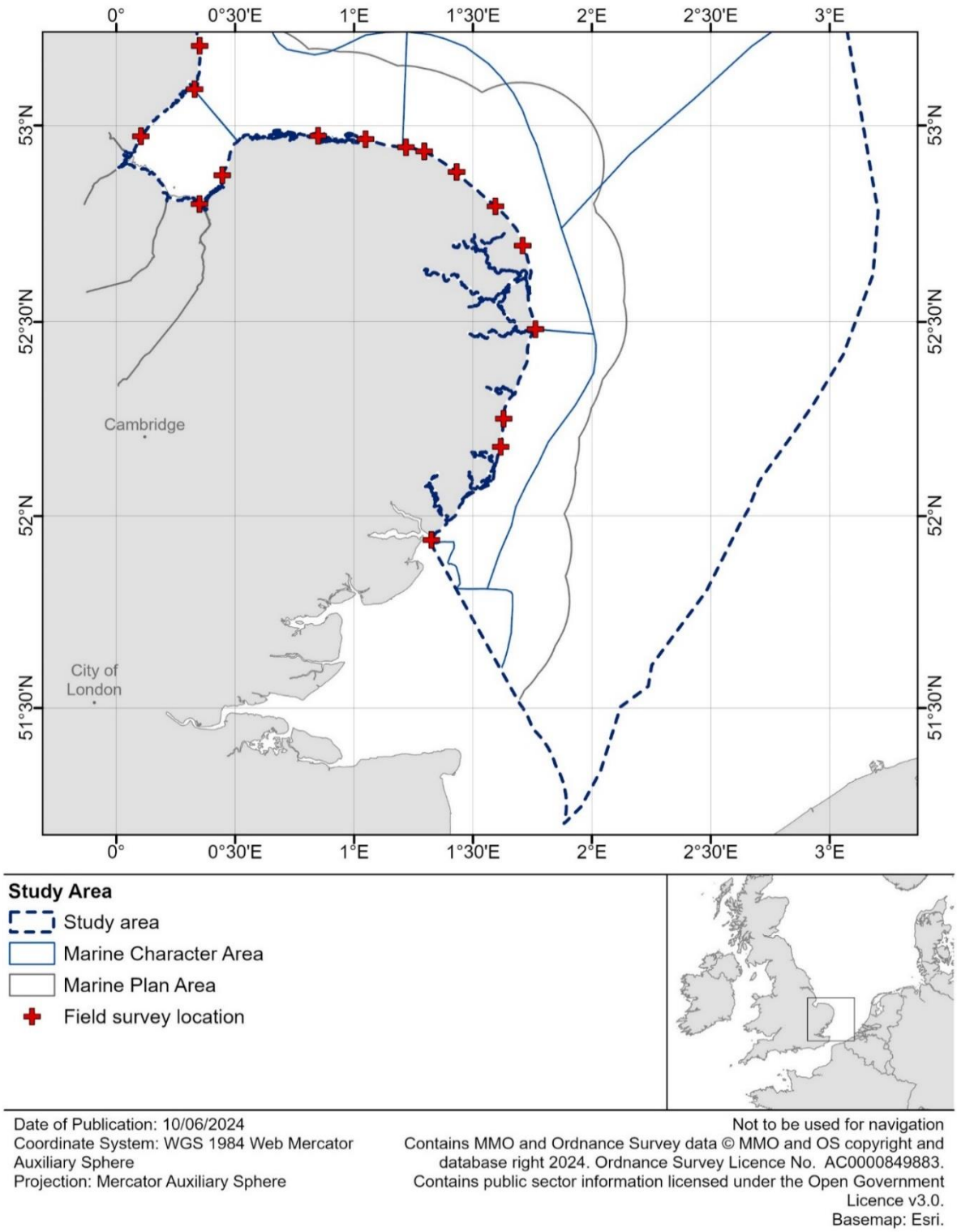

Figure 20: Bedrock and drift geology

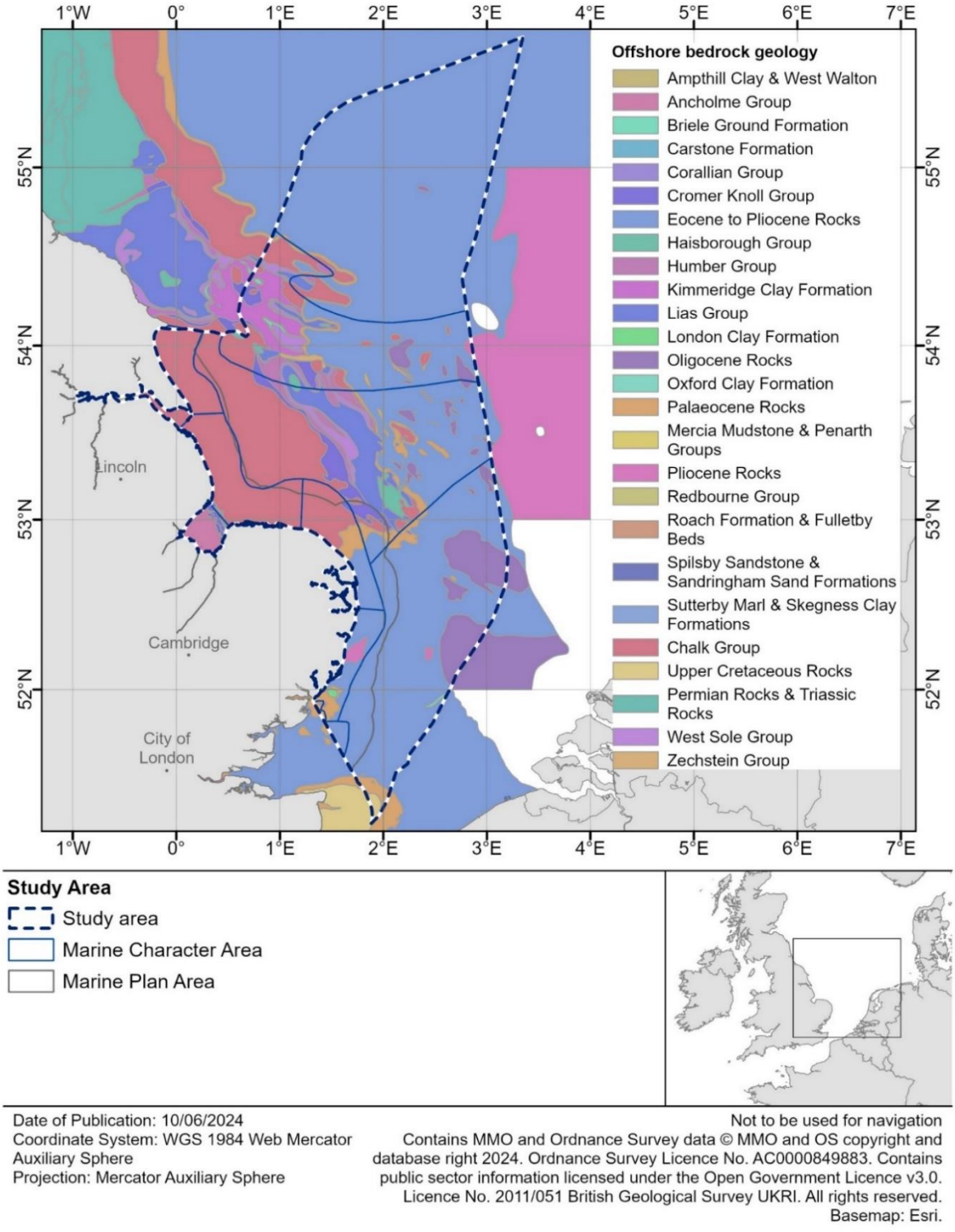

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Figure 21: Sediment geology

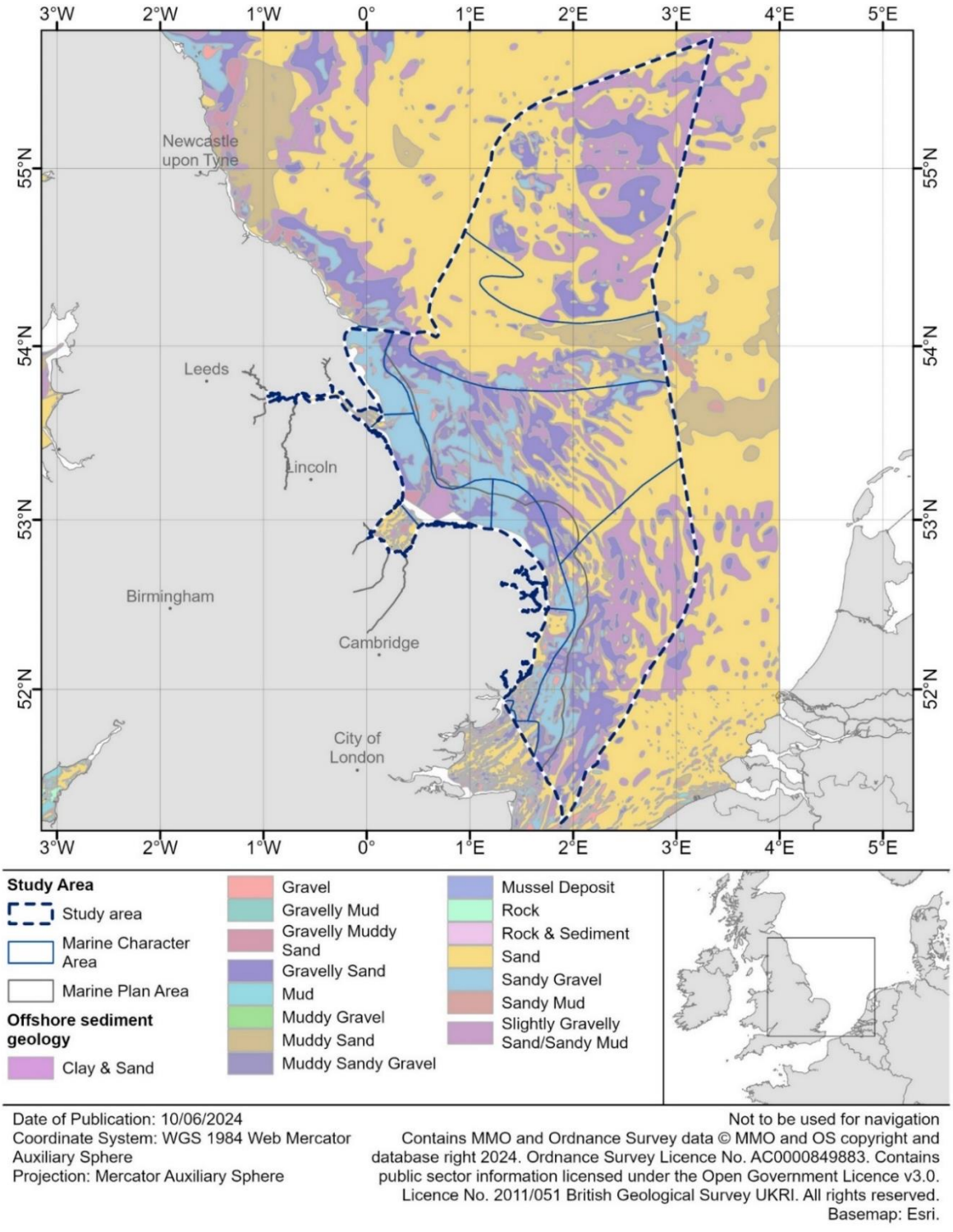

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Figure 22: Bathymetry

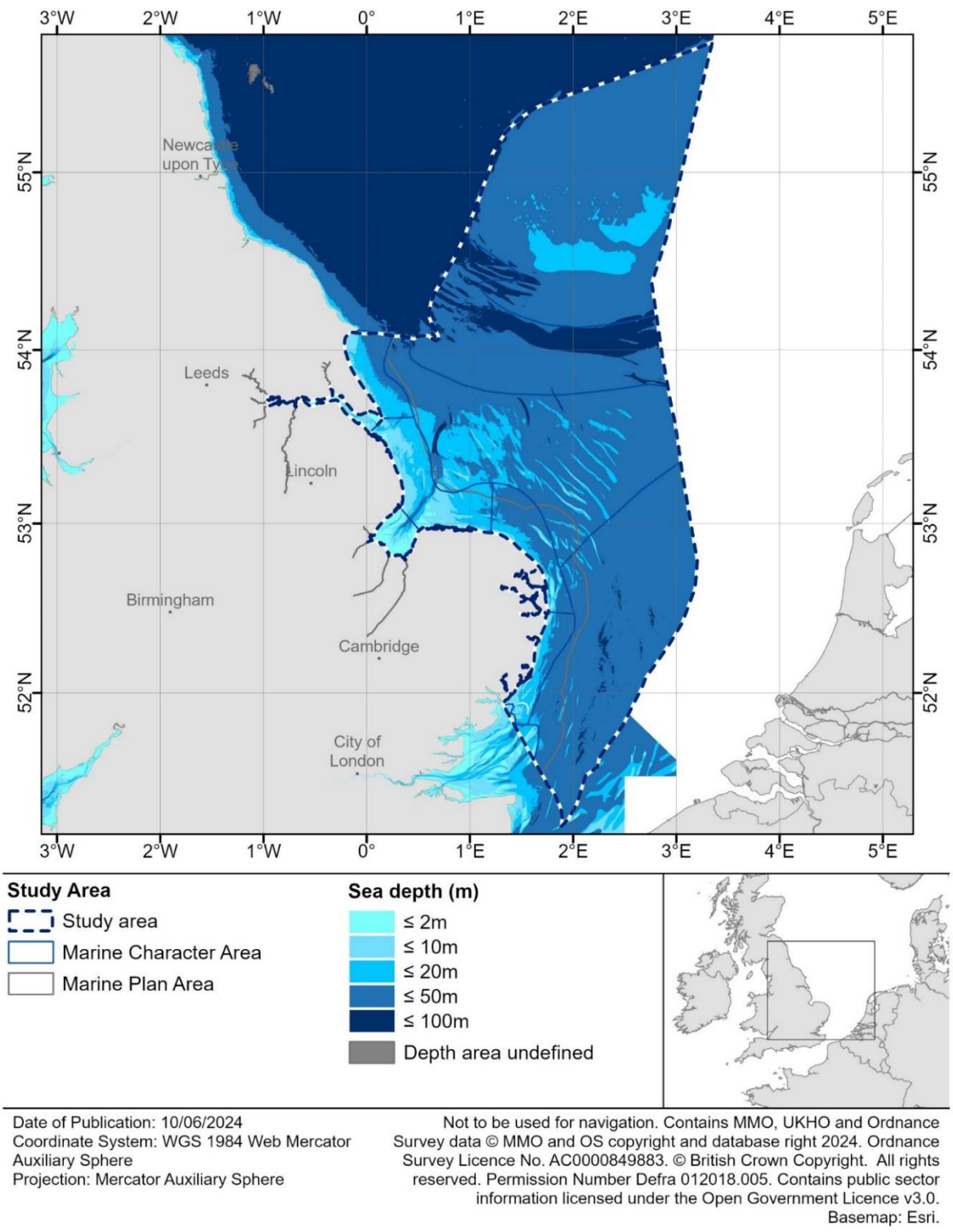

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Figure 23: Ecological designations

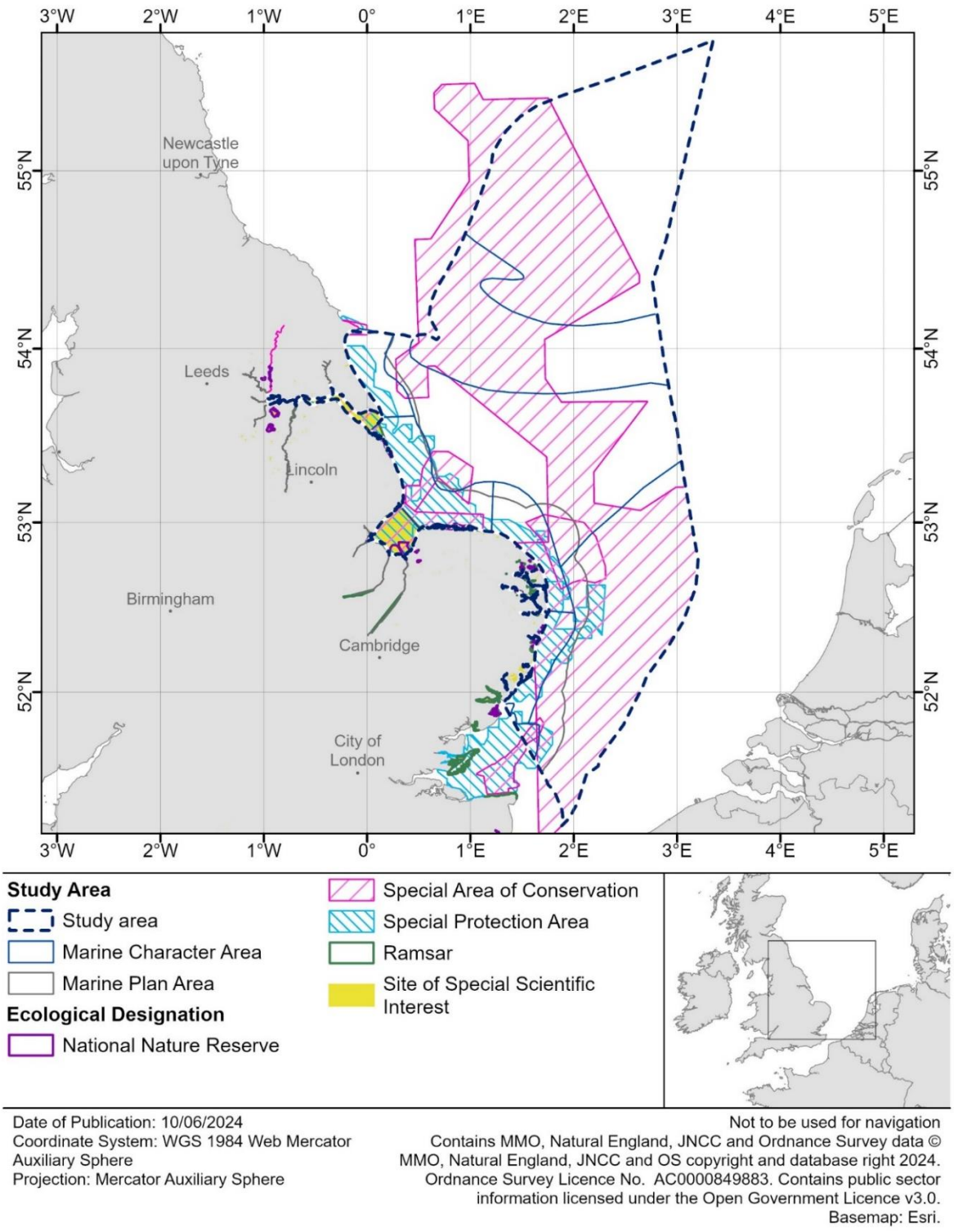

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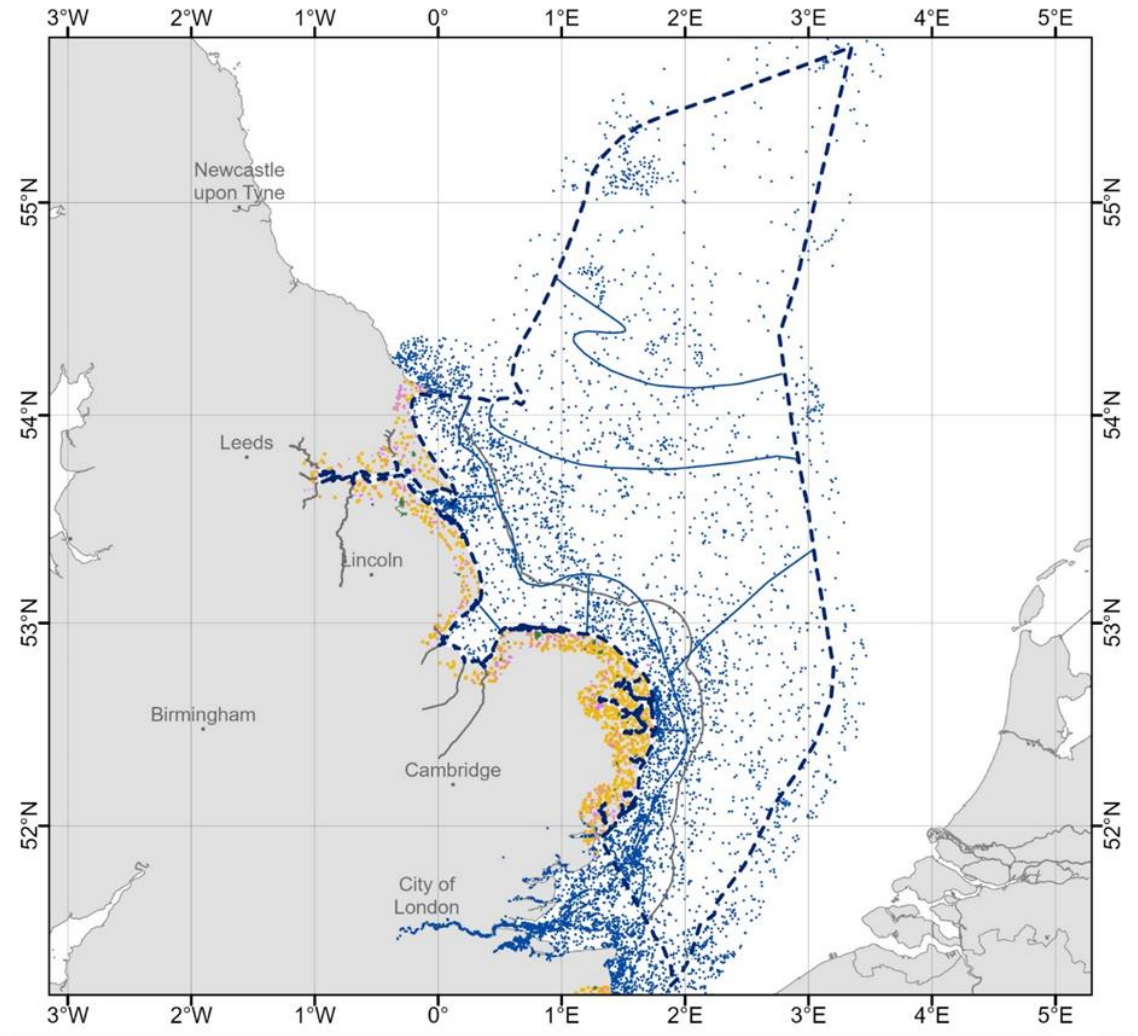
Figure 24: Heritage assets



Study Area

- Study area
- Marine Character Area
- Marine Plan Area

Heritage asset

- Scheduled Monument
- Registed Parks and Gardens
- Listed building
- Wreck

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Figure 25: Landscape designations

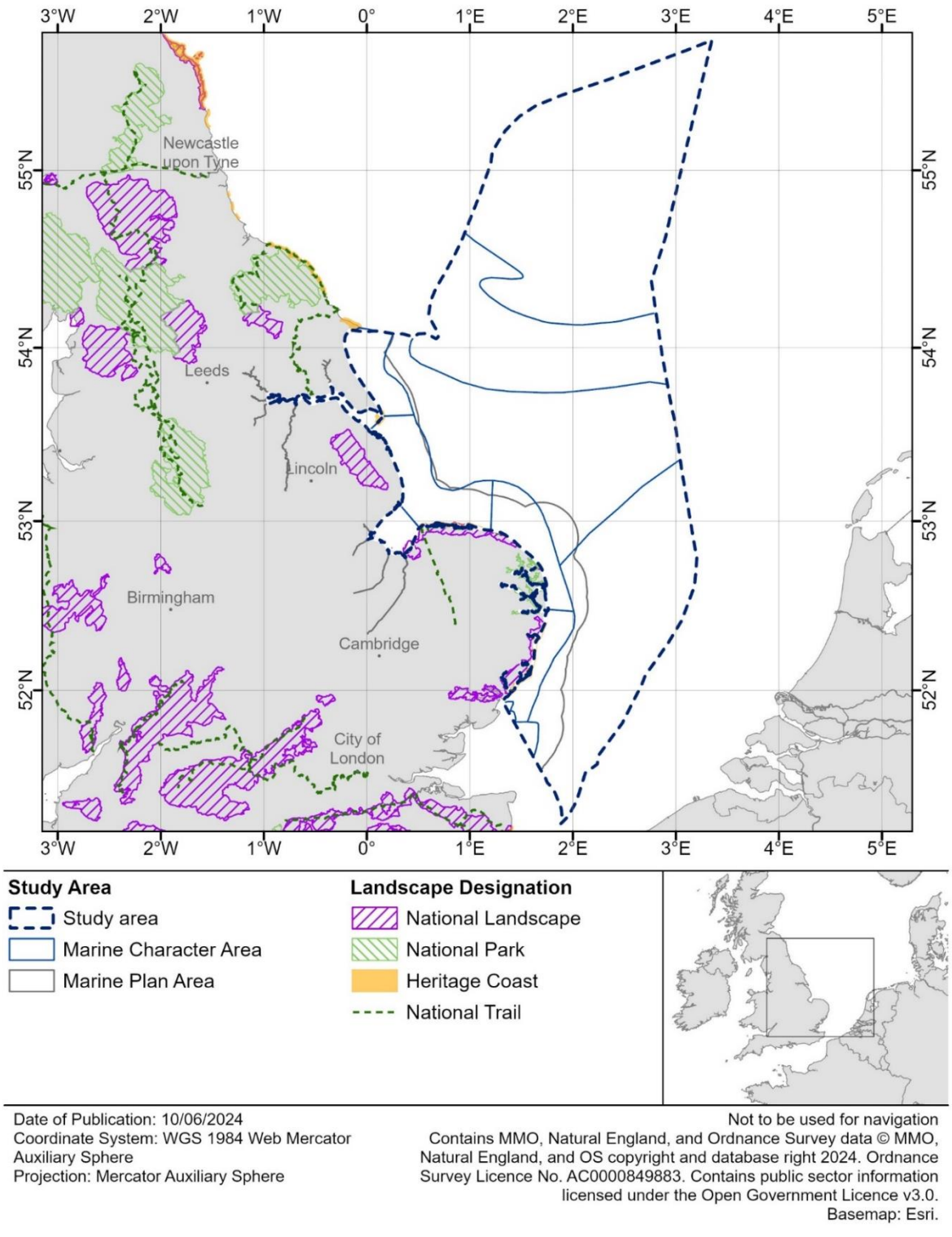

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Figure 26: Sea and coastal use – shipping, recreation, commercial and military activity

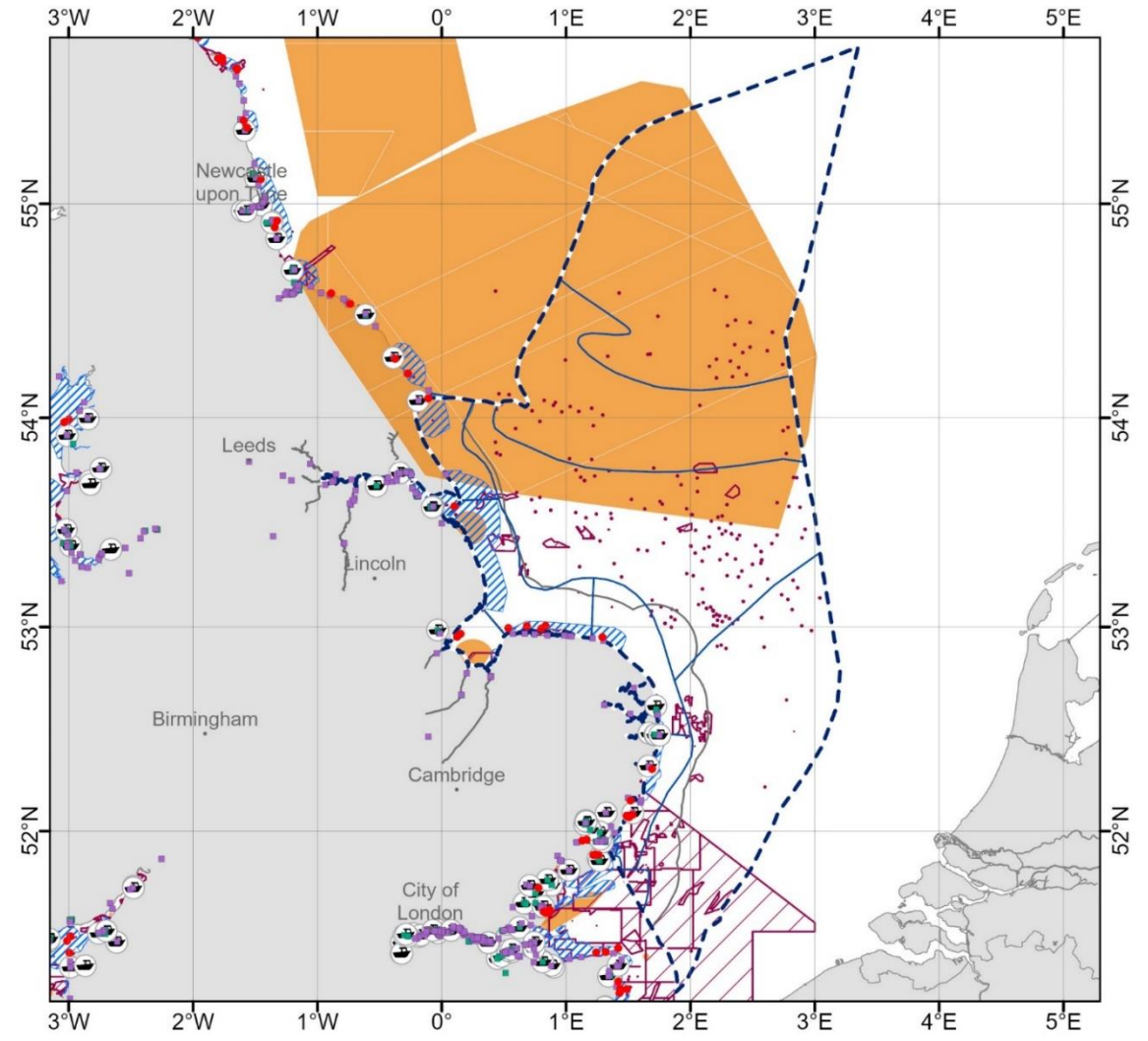

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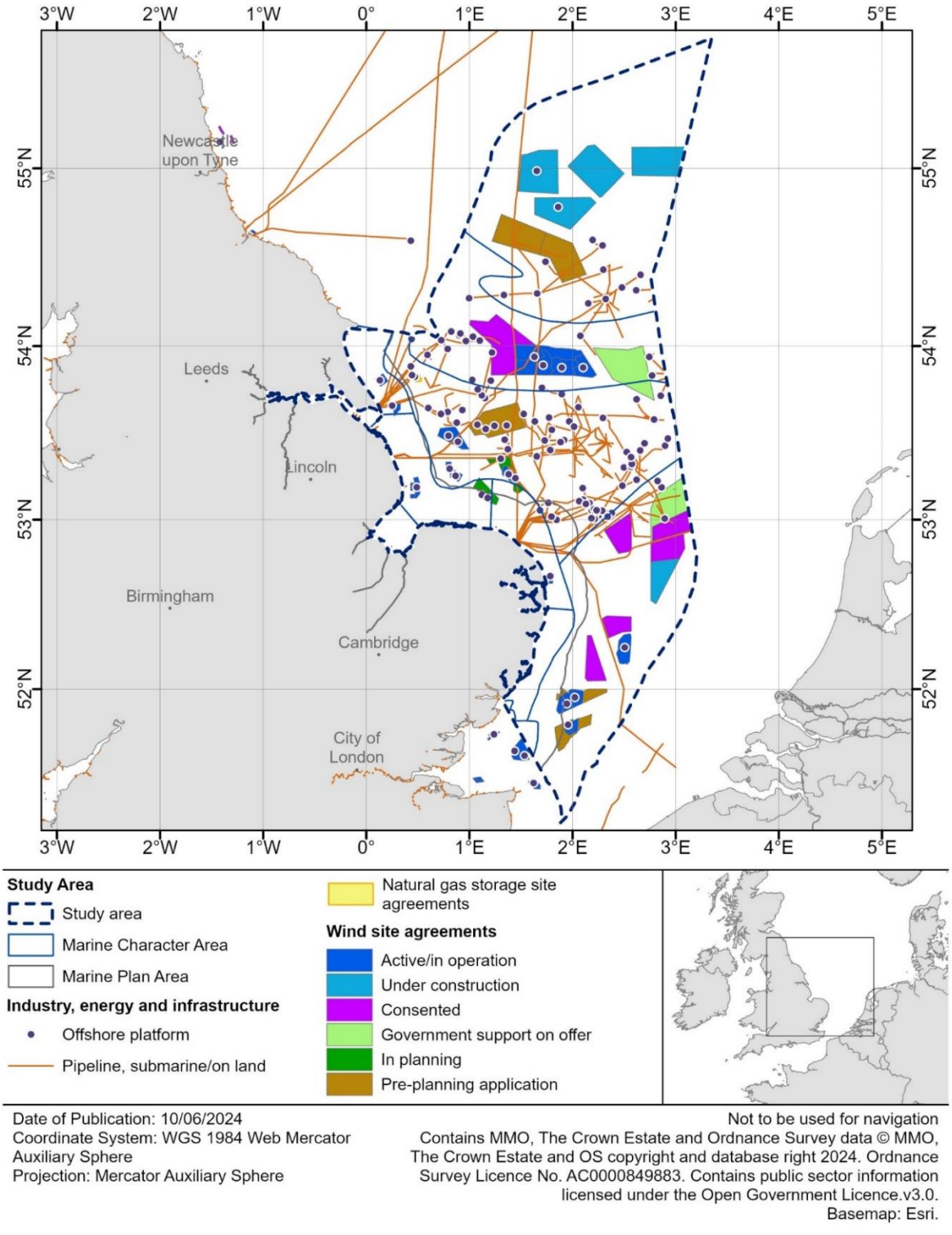
Figure 27: Sea and coastal use – resource exploitation



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Annex 2: Data list

Datasets that are included in Figures within this output report are listed in the table below.

Dataset	Source
Marine Character Areas (Wales)	Natural Resources Wales
Marine Character Areas (England)	Marine Management Organisation
Study area	Marine Management Organisation
Marine plan areas	Marine Management Organisation
Land with sea views	Marine Management Organisation
Sea visibility from land	Marine Management Organisation
National Character Area	Natural England
Field survey locations	LUC
Offshore bedrock geology	British Geological Survey
Offshore sediment geology	British Geological Survey
Sea depth	UK Hydrographic Office, provided to LUC by Marine Management Organisation
National Nature Reserve	Natural England
Special Area of Conservation	Natural England
Special Protection Area	Natural England
Site of Special Scientific Interest	Natural England
Ramsar	Natural England
Scheduled Monument	Historic England
Registered Parks and Gardens	Historic England
Listed Building	Historic England
Wreck	Historic England
National Park	Natural England
National Landscape	Natural England
Heritage Coast	Natural England
National Trails	Natural England
Anchorage area	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Harbour facility	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Ports	Marine Management Organisation
RYA Marina	Royal Yachting Association, provided to LUC by Marine Management Organisation
General boating area	Royal Yachting Association, provided to LUC by Marine Management Organisation
Military practice area	UK Hydrographic Office, provided to LUC by Marine Management Organisation

Dataset	Source
Restricted area	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Offshore platform	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Pipeline	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Natural gas storage site agreements	The Crown Estate
Wind site agreements	The Crown Estate
Basemapping	Esri

Additional datasets which were referred to during the course of the project, but which are not shown in the accompanying figures, are included in the following table.

Dataset	Source
Maritime limits	UK Hydrographic Office
Renewable energy zone	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Administrative and regulations boundaries	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Historic Seascape Characterisation	Historic England
Areas of Outstanding Natural Beauty	Natural England
Nursery Grounds	Centre for Environment Fisheries and Aquaculture Science
Marine Conservation Zone	Natural England
Priority Habitat Inventory	Natural England
Local Nature Reserves	Natural England
Harbour Seal Density	Marine Management Organisation
UK SeaMap	Joint Nature Conservation Committee
RYA clubs	RYA, provided to LUC by Marine Management Organisation
Bathing water monitoring locations	Environment Agency
Navigational aids	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Obstructions	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Transportation and routes	UK Hydrographic Office, provided to LUC by Marine Management Organisation
AIS Shipping density 2011 and 2012	Marine Management Organisation
The Crown Estate Aggregate Option Area	The Crown Estate
wind farm cable agreement	The Crown Estate
Shoreline Management plan	Environment Agency

Dataset	Source
3nm and 6nm limit of inshore fisheries conservation authorities boundaries in England	UK Hydrographic Office, provided to LUC by Marine Management Organisation
UK fishing limit	UK Hydrographic Office, provided to LUC by Marine Management Organisation
Tranquillity	CPRE
Night Blight	CPRE

Annex 3: Organisations attending the stakeholder validation workshops

The following organisations took part in the stakeholder validation exercise or attended the workshops (refer to Section 2.5).

- The Crown Estate
- Duncan Baker MP
- East Riding of Yorkshire Council
- East Suffolk Council
- Eastern Inshore Fisheries and Conservation Authority (EIFCA)
- Historic England
- Natural England
- Norfolk County Council
- Norfolk Seaweed
- Marine Management Organisation (MMO)
- National Federation of Fishermen's Organisations (NFFO)
- North Sea Transition Authority (NSTA)
- North Sea Wildlife Trusts
- Suffolk and Essex Coast and Heaths National Landscape
- Tarmac
- The Wash and North Norfolk Marine Partnership

Annex 4: Outputs from the stakeholder validation workshops

The following comments were made in relation to the draft MCA descriptions and key characteristics that were shared during the stakeholder validation exercise and workshops. These comments were posted on the Miro board, and the name of the stakeholder organisation is included where known (refer to Annex 3 for list of stakeholders).

MCA 1 Dogger Bank

- This area also supports large numbers of foraging seabirds from Flamborough and Filey Coast SPA. (Natural England)
- The Southern North Sea SAC protection for harbour porpoise is also due to its importance as a foraging area. (Natural England)
- Identified as Important Marine Mammal Area - key for harbour porpoise, Minke, grey seal. (North Sea Wildlife Trusts)
- Is it worth making reference to the fact this area is adjacent to a wider Dogger Bank area (i.e. its bigger than it appears on our maps) which is found in international waters and ecologically connected? (Need for international co-operation/shared space, etc.) (North Sea Wildlife Trusts)
- Basking sharks - very rare occurrence, wouldn't imagine that should be a characteristic species (seabirds and marine mammals probably more relevant here (albeit indirect relationship with the plankton)). (North Sea Wildlife Trusts)
- High resolution seabed survey for offshore wind farm developments will reveal the presence of presently unknown wreck of both vessels and aircraft which can generate considerable public interest. (Historic England)
- Considerable change in scientific knowledge and understanding about the prehistoric environments that existed throughout the Quaternary (glacial/interglacial). (Historic England)
- The MMO byelaw within the SAC and the sandeel closure will have significantly reduced fishing in the area. These closures are perhaps changing the perception of the area to a conservation area? There is also a new conflict perception of fisheries versus renewables. (Natural England)
- International interest in the public information that can be produced from industry-led studies that are showing what prehistoric conditions can be found exposed as well as buried in today's seabed: https://education.nationalgeographic.org/resource/doggerland/ (Historic England).
- The character of the North Sea is changing as it is seen as an industrial space to be used for renewable power generation and transfer between countries around the North Sea.
- Four windfarms are currently under construction here, with three more in the planning process. Whilst not visible from land, they will be a clear feature/visual cue when out at sea. (Natural England)

MCA 2 Dogger Deep Water Channel

- This sea area also supports large numbers of birds from Flamborough and Filey Coast SPA. (Natural England)
- An area of high reuse potential too for oil and gas infrastructure (e.g. for carbon storage and hydrogen transportation) + one of the early carbon storage licence focus areas. (NSTA)
- Hornsea 3 (constructing) and Hornsea 4 (consented) offshore wind farms. (Natural England)
- Major area of industrial change whereby it could have a clear association with one type of industry which has changed from other traditional perceptions of what occurred offshore. (Historic England)
- Another area of considerable academic interest in paleoenvironmental and geo-archaeological studies associated with former terrestrial character near Outer Silver Pit. (Historic England)
- Change in character as legacy of gas industry removed.
- Character area needs to consider different seabed use, some activities have occurred for decades (marine minerals dredging) and could continue long into the future while other spatial uses have emerged e.g. offshore wind farms or carbon capture and storage.

MCA 3 East Midlands Offshore Gas Fields

- Regarding MCA 3 title - Consider amending Gas to Energy
- Change in perception of character from former legacy of industrial activity associated with offshore gas industry as it is decommissioned and removed. (Historic England)
- Change name of character area and spatial extent to reflect new uses? (Historic England)
- Considerable change in character since first East marine plan due to the delivery and present operation of offshore wind farms, plus more are planned. (Historic England)
- As well as several petroleum licences area has multiple carbon storage licences (though no active storage yet). (NSTA)
- Major area of academic interest using seabed industry survey data to reveal new information about Quaternary climate and landscape change. (Historic England)
- For all stretches of the coastline, reference to heritage assets is welcomed. The methodology should be broadened to include all heritage assets and their settings, reflecting the National Planning Policy Framework (NPPF). Views to and from the seascape should also be fully considered. Our guidance relates to methodology, which can be applied to a wide scope of plans: https://historicengland.org.uk/images-books/publications/historic-environment-and-site-allocations-in-local-plans/

MCA 4 East Anglian Shipping Waters

- East Coast War Channels project provides more consideration of character https://historicengland.org.uk/research/results/reports/103-2014

- Also, EA1N and EA2 consented, Five Estuaries and North Falls about to go through application and examination.
- Consideration of interconnector cables e.g. Lion Link/Sea Link.
- Character of this area influenced by new archaeological discoveries (historic shipwreck as much as prehistoric evidence) for which there can be important local association e.g. https://www.visitnorwich.co.uk/event/the-last-voyage-of-the-gloucester-norfolks-royal-shipwreck-1682/.
- Considerable change in character due to new industrial use of marine space with offshore wind farm developments: under construction, operational and others for which construction is yet to start. (Historic England)
- Another seascape/character area that is of considerable academic interest for searching for evidence of Quaternary landscape and climate change and also evidence of early human activity. (Historic England)
- energy infrastructure also includes cabling off and onshore and kittiwake towers constructed off Lowestoft. (North Sea Wildlife Trusts)
- The North Sea is known as the Powerhouse of energy at the moment with both existing and planned energy project coming to this section of coastline. (MMO)
- More sensitivity and public knowledge about legacy of shipwreck for which there can be stronger association and identity in coastal communities.
- 'A monochrome and monotonous character' sounds unnecessarily negative when trying to promote people to value our oceans, especially given the known network of protected sites and features listed above. (Natural England)

MCA 5 Holderness Coastal Waters

- Is it possible to provide an overarching statement for the area, for each of the three elements (natural influences, cultural and social and perceptual and aesthetic? For example, people have noted the dynamic nature of the coastline? (The Crown Estate)
- MCA 5 does not extend up to Flamborough Head however references the Seascape character of Flamborough head in this area. Similar to other MCA areas, this does not align with marine plan areas therefore can we include character of the entire marine plan area if not covered by the actual MCA? (MMO)
- Generally low lying nature of the coastline with some notable exceptions e.g. Flamborough Head. (Historic England)
- Longshore sediment transport along the Holderness Coast is essential for maintaining Spurn Point. (Natural England)
- Greater Wash SPA runs the length of this coastline supporting important populations of over-wintering red throated diver (Natural England)
- In HI MCZ, the 'high energy circalittoral rock' is made of clay outcroppings rather than rock. (Natural England)
- Limited woodland/tree cover along Holderness coastline and inland helps with openness of views. (Historic England)
- Important Marine Mammal area recently identified which encompasses this area that specifically references: Bottlenose dolphin, minke whale, grey and

habour seal plus other species mentioned such as harbour porpoise Flamborough Head - now grey seal haul out site. (North Sea Wildlife Trusts)
- A number of subtidal wrecks https://historicengland.org.uk/advice/heritage-at-risk/protected-wreck-sites-at-risk/.
- Holderness (and Norfolk and Suffolk waters) contain 100s of 'historically significant wrecks' (North Sea Wildlife Trusts)
- High quality agricultural land along Holderness coast.
- Holderness coast is very rapidly eroding so a key aspect of character is constant change. (Historic England)
- Lost settlements of the Holderness coast. (Historic England)
- The presence of offshore wind farms off Holderness is now a factor in 'local' character therefore recognition in change in character in how coastal waters are used and what they provide. (Historic England)
- Periodic exposure of archaeology through seasonal shift in sands. (Historic England)
- The northern area of this block is a key site for offshore wind farm and interconnector cables making landfall. They should be buried and 'invisible' in the long run, but there will be a period of several years with a constant construction presence. Could affect character perception in the short term? (Natural England)
- Flamborough Head and Spurn defined as Heritage Coasts. (Historic England)
- Recreational activities of significance include walking (use of coastal path, recreational angling, water sports. (North Sea Wildlife Trusts)
- Erosion rates are for some threatening (houses falling off cliff!) with economic cost (amongst others). Also difficult to access beach, car parks lost and areas of the coastal path. (North Sea Wildlife Trusts)
- Spatial squeeze in the marine environment - perception that some industry prioritised over other sea users - this is applicable to wider east marine area not just this one. (North Sea Wildlife Trusts)

MCA 6 Humber Waters

- May need to clarify what exactly is meant by the second sentence in the first bullet point regarding draining. (The Crown Estate)
- coastal strip near spurn important for vulnerable bird species including ringed plover and little tern that both nest in the area. (North Sea Wildlife Trusts)
- I think it would be worth including the seal populations supported by the Humber. (Natural England)
- Seagrass bed also present within estuary (and restoration project). (North Sea Wildlife Trusts)
- The influence of agricultural development on the landscape, including 'warping', in the predominance of field boundaries formed by dykes, drains and embankments. (Historic England)
- Recognition that some locations, such as Grimsby, have new character linked to use of docks area for offshore wind farm Operations and Maintenance, which can allow for more investment and sustainable regeneration of older industrial area (the Kasbah conservation area). (Historic England)

- Character of the industrial use of the Humber estuary has changed with arrival of renewable energy and the infrastructure required, the use of available space and requirement for 'new' space. (Historic England)
- More of a social link between the Humber and the more adjacent southern North Sea e.g. https://greenporthull.co.uk/what-we-do/humber-offshore-wind-cluster which is perhaps a change in historic association from previous decades when fishing activity from the Humber was linked to fishing grounds in the wider north Atlantic. (Historic England)
- Following the change in industry to renewables convo, carbon capture and storage is also becoming a feature here and the Humber is the face of the East Coast Cluster/Zero Carbon Humber. This could change what the Humber is 'known for' in terms of industry.(Natural England)
  Dynamic views across Humber due to continuous marine activity and tidal nature. (Historic England)

MCA 7 East Midlands Coastal Waters

- The types of reef could be specified here, with S. spinulosa. (Natural England)
- Coastline primarily characterised by sandy beaches but areas of intertidal rocky shore also present (e.g. at West Runton). (North Sea Wildlife Trusts)
- Given harbour seals are the protected feature of the Wash and North Norfolk Coast SAC this may be the more appropriate species to mention. (Natural England)
- Description of shingle and rocky shoreline from Cley and towards West Runton in the intertidal area.
- As well as Inner Dowsing, Race Bank and North Ridge SAC, include features of Wash and North Norfolk Coast SAC, North Norfolk Coast SAC and Cromer Shoal MCZ if extends to Weybourne on North Norfolk Coast. (Natural England)
- Important Marine Mammal Area for harbour porpoise use of area, also seals at donna nook and gib point. https://www.marinemammalhabitat.org/imma-eatlas/ (North Sea Wildlife Trusts)
- Donna Nook NNR and Blakney plus Gibraltar Point important as seal haul and pupping sites (North Sea Wildlife Trusts)
- Shallow subtidal and intertidal chalk bed off the North Norfolk coast (within Cromer MCZ) that hosts significant biological communities of seaweeds, invertebrates, commercial fish and shellfish species. In areas the chalk is more structurally complex with ridges/outcropping etc. Refer to NEs Designated Sites Views for description (and National Biodiversity Network gateway for full datasets from Seasearch) and EIFCA for map of 'rugged chalk' areas (think this largely applicable to area 9 but not sure exactly where border of MCA/MCZs are from maps used). (North Sea Wildlife Trusts)
- Include SPA bird features more clearly e.g. Greater Wash SPA, North Norfolk Coast SPA including Sandwich Tern, red-throated diver, little tern, common scoter.
- Deep History Coast project, includes West Runton (West Runton elephant, Cromer Forest bed), Happisburgh (Lower Palaeolithic archaeology, inc. oldest human footprints in western Europe (900,000 BP), hand axes etc.) (Historic England)

- Is Butlins the best thing to highlight of tourism importance for this coastline, people go to these areas for the natural beauty/wildlife/beaches, especially in terms of seascape. Things like the seals at Donna Nook, Blakeney could be one more positive option. Could the current wording lead to encouragement of more coastline caravan parks? (Natural England)
- New sea-based activities requiring space, such as seaweed farming.
- Active academic research area to explore now submerged and buried landscape features: https://www.bradford.ac.uk/news/archive/2023/university-of-bradford-wins-7m-grant-to-hunt-for-lost-civilisations-beneath-baltic-and-north-sea.php.
- For all stretches of the coastline, reference to heritage assets is welcomed. The methodology should be broadened to include all heritage assets and their settings to reflect the NPPF. Views to and from the seascape should also be fully considered. Our guidance relates to methodology, which can be applied to a wide scope of plans: https://historicengland.org.uk/images-books/publications/historic-environment-and-site-allocations-in-local-plans/
- Also, Race Bank and Dudgeon OWF is visible from Lincolnshire and North Norfolk Coast. (Natural England)
- Seahenge 2 at Holme, still present. Revealed by shifting sands last Easter. (Historic England)
- Consideration of Holkham, Titchwell and Blakeney as wildlife watching as well as Cley. (Natural England)
- Hornsea windfarm - lands at Weybourne and W Runton, underground, beneath Cromer Forest Bed. (Historic England)
- As well as Lincs and Butlins focus, North Norfolk Hunstanton and Wells also popular holiday destinations.
- Link to joint statement on integrated management natural/historic as relevant to concept(s) of seascape as used within marine planning: https://historicengland.org.uk/content/docs/advice/joint-statement-naturalengland-historicengland-nlhf/. (Historic England)
- Roman town of Brancaster. (Historic England)
- Consideration of landfall pressures from multiple future projects: Outer Dowsing OWF, National Grid Energy transmission: Eastern Green Link 3 and 4, Ossian floating OWF from Scotland. (Natural England)
- A number of the region's designed landscapes have strong physical and visual connections to the sea, e.g. Grade I Holkham Hall (Holkham Beach, Lady Anne's Drive and the view from the Triumphal Arch), Grade II* Sheringham Hall (various designed views including the sea), Grade II The Pleasaunce Overstrand (clifftop coastal setting and views of the sea), and Grade II Happisburgh Manor (views east across the sea). (Historic England)
- Consider changing character area name? make it more North Sea related e.g. Inner Silver Pit/Dowsing etc? (Historic England)
- Consider how designation of 'highly protected marine areas' could change perception of seascape and accessibility and use.

MCA 8 The Wash

- Generally referred to as the largest embayment rather than estuary by JNNC, NE, The Wash and North Norfolk Marine Partnership (WNNMP) etc.

- The majority of the SPA is designated for its over-wintering non-breeding birds - worth a mention. (Natural England)
- There are five rivers that feed into The Wash - the list is missing the River Steeping. (WNNMP)
- The Wash is also a National Nature Reserve and part of the Norfolk Coast National Landscape (formerly AONB). (WNNMP)
- Recreational activities within The Wash include charter fishing (recreational sea angling) and seal trips (including from Hunstanton) where visitors are taken to see seal pups etc. (Eastern IFCA)
- The le Strange Estate is particularly important in Hunstanton - they have rights to land in the area including elements of the intertidal zone which include rights to the fisheries. The associated fishing family is prominent in the area and visible to beach goers when active providing a unique character. Hunstanton generally is a well-known sea-tide town with the 'usual' seas-side attractions and busy beaches. (Eastern IFCA)
- Plans for the East coastline to be a UNESCO world heritage site as a migratory bird highway https://community.rspb.org.uk/ourwork/b/rspb-england/posts/a-bid-to-make-the-uk-s-wild-bird-superhighway-a-new-world-heritage-site
- Preference is to refer to harbour seals (as opposed to common seals). (WNNMP)
- The character of the Wash will be influenced by archaeological materials that can be exposed and discovered and how that information is made available to the public. (Historic England)
- Not confident there are a 'multitude' of shipwrecks in The Wash, don't believe there are any Protected Wrecks. May still be the odd small one and/or those use for target practice at the RAF.
- Wildfowling is also particularly important in The Wash (Eastern IFCA)
- Particular mention to the ports may be useful to highlight the significance of the fishing industry - Kings Lynn, Boston. The Wash is really the 'hub' of fishing and aquaculture, it doesn't quite come across that way in this card. (MMO)
- Summary of fishing activity is not accurate - crab and Lobster potting is not 'heavy' within the Wash. Key fisheries include cockles (but not by dredging - hand-worked fishery), shrimps and whelk fisheries (potting). The historic fishing activity is important culturally in King's Lynn in particular, with the re-development of the South Quay area drawing on this heritage. (Eastern IFCA)
- There are areas of centrally in The Wash that are 20, 30m in depth. Would consider being careful when suggesting shallowness, or specify the margins specifically are shallow. The shallow areas are dangerous anyway due to the tidal nature and soft sediment of The Wash - want to be careful not to encourage people to go out onto the mud/sand. (Natural England)
- Referring to The Wash as an enclosed seascape might need rewording, same sentence highlights how it is certainly open to and influenced by the wider area/ocean - seems contradictory. (Natural England)
- I think a lot of local people would suggest the vast mudflats, saltmarsh and range/abundance of birds may be the greatest aesthetic appeal to the area. (Natural England)

- Kings Lynn was one of England's most important ports since the 12th Century. A Hanseatic Port, the town's maritime past is evident in many of the spectacular historic buildings including merchants' houses, the Guildhall, Minster and the beautiful Custom House overlooking the medieval harbour. The Wash forms an important part of the setting and raison d'etre of the town. Greyfriars Tower was a prominent aid to navigation in the Wash. Other key landmarks in the Wash include the Grain Store at Kings Lynn and Sutton Bridge Power Station. (Historic England)
- Needs to be careful rather than emotive writing, how everyone views this perceptually is going to be different, plus safety concerns in a Wash need to be factored in. How people view features is going to be different so making overall statements on the way they make you feel is inaccurate for multiple people.

MCA 9 East Norfolk Coastal Waters

- Crabs and Lobsters are the key fished species of Cromer but could be worth mentioning the unique and rare species found here. E.g. the European Eel (Critically endangered) and the Parpal Dumplin (Endemic). (Natural England)
- The Chalk Reef is not just north of Cromer, it extents generally from Weybourne to Happisburgh. If you were trying to specific just the rugged chalk area, this still exists south of Cromer too. (Natural England)
- Horsey Gap an important haul out and pupping site for grey seals in the region. (North Sea Wildlife Trusts)
- Chalk reef extends from the intertidal area our several miles in places, its not just offshore
- Cromer MCZ extends from Weyboune in the west . It extends from 200m from the coast to between 5km and 10km seaward. (Natural England)
  See https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UKMCZ0031&SiteName=Cromer%20Shoal&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=.
- These specific areas are not designated as SACs. They are areas present within SACs - needs tweaked wording. (Natural England)
- Include SPA features: Greater Wash SPA , Great Yarmouth North Denes SPA for little terns, characteristically nesting at Winterton.
- Generally refer to common seal as harbour seal. (Natural England)
- Seeing a live harbour porpoise from the coastline is a very very rare occurrence across the whole east coast. (Natural England)
- Unstable cliffs are having greater community/seascape impact at Winterton/Hemsby than these areas. Worth at least adding to the list. (Natural England)
- Cromer crab/lobster a noteworthy fishery to include here, especially with the famed Cromer Crab being a well-known aspect/draw of this section of coast. (Natural England)
- Ensure mention of Great Yarmouth Outer Harbour.
- Industrial use of port space reflecting new economic opportunities and therefore changing character. (Historic England)
- Mention is given to tourism but the beaches in Norfolk play such a huge role in tourism, it would be good if this could be brought out a bit more. In the

summer months they are heaving with activity and a buzzing atmosphere. The seaside towns in Norfolk (Great Yarmouth) are one of the top tourist destinations in England. (MMO)

- May not change character right now but Bacton Hub undergoing a big project for future hydrogen and carbon storage use. (NSTA) https://www.nstauthority.co.uk/the-move-to-net-zero/energy-integration/bacton-energy-hub/
- I wouldn't say Great Yarmouth has 'transitioned' to industry as Great Yarmouth Port is still busy with industry (major transition to renewables).
- Deep History Coast project, includes West Runton (West Runton elephant, Cromer Forest bed), Happisburgh (Lower Palaeolithic archaeology, inc. oldest human footprints in western Europe (900,000 BP), hand axes etc.). (Historic England)
- Point about OWF infrastructure - worth making reference to the landfall points too, changes not just at sea. (North Sea Wildlife Trusts)
- An important area for established seabed industries such as marine minerals which are spatially restricted to certain locations, such as off Great Yarmouth
- Great Yarmouth and Lowestoft - High Street Heritage Action Zones. (Historic England)
- Bacton Gas Terminal is to be developed for carbon capture and hydrogen storage.
- This section is specifically known as The Deep History coast. Fossils would be important to add to the history line as a results. https://www.north-norfolk.gov.uk/tasks/your-community/find-out-about-norfolks-deep-history-coast/ (Natural England)
- Dudgeon OWF and Race Bank OWF are also visible from Overstrand westwards. Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension project (DEP) in consenting phase is likely to extend the lateral view of OWF on this stretch of coast. (Natural England)
- Area includes its share of C19/C20 seaside gardens and esplanades which make a unique contribution to the character of coastal towns, with Felixstowe's Grade II Cliffs Gardens and Town Hall Garden, and Great Yarmouth's Grade II Venetian Waterways. (Historic England)
- Winterton/Hemsby area again worth noting for loss to coastal erosion. (Natural England)
- Change in perception of this area as (exclusively) associated with particular activities such as renewable energy production. (Historic England)
- Is the Norfolk Broads the best focus here given the boundary and 'sea'scape. (Natural England)

MCA 10 Suffolk Coastal Waters

- Presence of seagrass beds in Deben and Orwell estuaries (think EA has this mapped here). (North Sea Wildlife Trusts)
- Addition of Kittiwake towers offshore Minsmere and at Lowestoft, these are visible from shore. (Natural England)

- Coastal erosion processes not only leading to shrinking saltmarshes but threat to brackish and freshwater habitats behind due to coastal squeeze. (North Sea Wildlife Trusts)
- Kittiwake hotels installed off coast at Lowestoft and Minsmere Sluice. (East Suffolk Council)
- Can you add anything about benthic character / habitats? some information on communities supported provided in Orford Inshore MCZ description. Limited data on National Biodiversity Network gateway for inshore sites like Aldeburgh region also available. (North Sea Wildlife Trusts)
- Orford Inshore MCZ here but no mention of it within the text (might cross with MCA 4 but hard to tell). Important spawning ground due to be well protected by impending byelaws for bottom towed gear. (Natural England)
- Breaches in coastal lagoons sites, Benacre SAC also included, can happen fairly regularly. These saline lagoon systems are ephemeral and prone to natural change. Both sites seem to have stabilised since, See Designated Site Views Conservation Advice/Condition Assessments recently completed for both sites. (Natural England)
- High potential for new shipwreck discovery and very high public interest.
- The area is witnessing some of the most rapid coastal change and there will be numerous examples of designated heritage assets threatened by rising sea levels and coastal erosion; issues at Grade II listed building Bawdsey Manor, where the Grade II listed Pulhamite Cliff Garden is already succumbing with some elements undermined and collapsed onto the beach. (Historic England)
- 40% of UK container traffic passes through Harwich Haven. (North Sea Wildlife Trusts)
- A location of international importance for prehistoric archaeology (on the coast e.g. Pakefield and offshore on the courses of prehistoric river systems) : https://researchframeworks.org/nsprmf/ which is a key component of its character. (Historic England)
- EA2 OWF is consented and once constructed will be visible from the coastline. (Natural England)
- The area includes its share of C19/C20 seaside gardens and esplanades which make a unique contribution to the character of coastal towns, including Felixstowe's GII Cliffs Gardens and Town Hall Garden, and the recently registered GII Thorpeness Meare, forming a focus for the UK's first purpose built holiday village (itself a conservation area with numerous listed buildings), adds to this tradition. (Historic England)
- Include Lowestoft Port as well as Felixstowe.
- Palaeolithic archaeology at Pakefield and Easton Bavents. (Historic England)
- Suggest changing 'importance has diminished' to 'reduce fishing activity / industry' given the representation of fisheries in the East. (MMO)
- Colourful beach huts also found on Pakefield beach, Felixstowe beach.
- Includes Cold War archaeology at Orford Ness. (Historic England)
- Numerous energy projects along coastline changing the aesthetic of the coast. (East Suffolk Council)
- Could mention the Kittiwake Hotels in Lowestoft changing the aesthetics of the area. (MMO)