



Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas

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Introduction

In Natural England's and JNCC's experience to date, consenting and installation issues relating to offshore wind farm cabling have largely been due to their impacts on habitat features, which may be protected either in their own right or as supporting habitats for species¹. Therefore, Natural England and JNCC have produced the following document containing high level advice in relation to potential cable routes associated with the Round 4 seabed leasing for offshore wind offered by The Crown Estate. The document specifically includes advice relating to marine features and Marine Protected Areas (MPAs) that are likely to be highly sensitive to pressures associated with offshore windfarm cabling. Aspects of the advice can be equally applicable to windfarm turbine locations, whilst noting that turbine installation will provide additional pressures for consideration.

The advice contained within this document:

- Is based on Natural England² and JNCC's³ current advice on cabling activities;
- Has a focus on benthic habitat sensitivity;
- Does not give advice on individual species sensitivity (birds, fish, mammals and benthic species);
- Contains MPA-specific advice concentrating on MPAs with potential to interact with The Crown Estate's Round 4 offshore windfarm seabed leasing.

This document draws upon on work that was developed as part of the marine conservation advice packages (covering Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Marine Conservation Zones (MCZ)) to provide information on the condition and sensitivity of protected features within MPAs. Therefore, this document does not take into account coastal/ terrestrial designations, Sites of Special Scientific Interest (SSSI) or Ramsar sites unless these sites are covered by an MPA⁴. Where specific MPAs in an area are known to be sensitive to cabling activities they are included in section 5 (including SSSI and SPAs where relevant). This advice note also does not account for onshore cable routes therefore, additional thought needs to be given to the landside route and nature conservation constraints of any cable landfall as part of the overall cable route selection process⁵.

The following advice is provided to help highlight locations and features of highest sensitivity to windfarm cabling activities and therefore inform of areas with the greatest associated potential environmental risk. However, if a pressure, MPA or feature is not identified within this document as highly sensitive, it **does not** imply that cabling would result in no significant impact. In all cases due process must be followed, and the impacts and suitable mitigation must be considered on a site by site basis. This advice within this document is non-binding and provided without prejudice to the consideration of any statutory consultation response or

¹ e.g. potential impacts to Belted Beauty moths from Walney extension cables which were mitigated by use of horizontal directional drilling (HDD)

² <https://www.gov.uk/government/collections/conservation-advice-packages-for-marine-protected-areas>

³ <http://jncc.defra.gov.uk/page-6849>

⁴ SSSI and Ramsar sites below mean high water are usually also covered by MPA designations, although they may have different features which warrant further assessment that are not considered in this note. For example, Humber Estuary SSSI.

⁵ Some habitats which could be considered terrestrial e.g. protected dunes and vegetation of stony banks and drift lines have been included as they are designated features of some MPAs.

decision which may be made by Natural England and JNCC in due course. The final advice on any proposals by Natural England and JNCC is reserved until a relevant consent application is made, and advice will be provided on the information then available, including any modifications to the proposal. Natural England and JNCC recommend developers engage in early discussions with ourselves when considering potential cable route options in order to help refine or highlight additional areas of risk and sensitivity and allow time for discussion of potential plans in more detail.

As part of the plan level Habitat Regulation Assessment for the 2017 offshore wind extensions projects The Crown Estate has published a cable route protocol⁶ on the [Marine Data Exchange](#). In addition to the advice provide in this note Natural England and JNCC recommend that this protocol is adhered to for projects in Round 4, along with any future updates to the protocol.

Further recommendations and consideration of potential issues associated with cabling activities can be found in Natural England: Offshore windfarm cabling: ten years experience and recommendations 2018⁷.

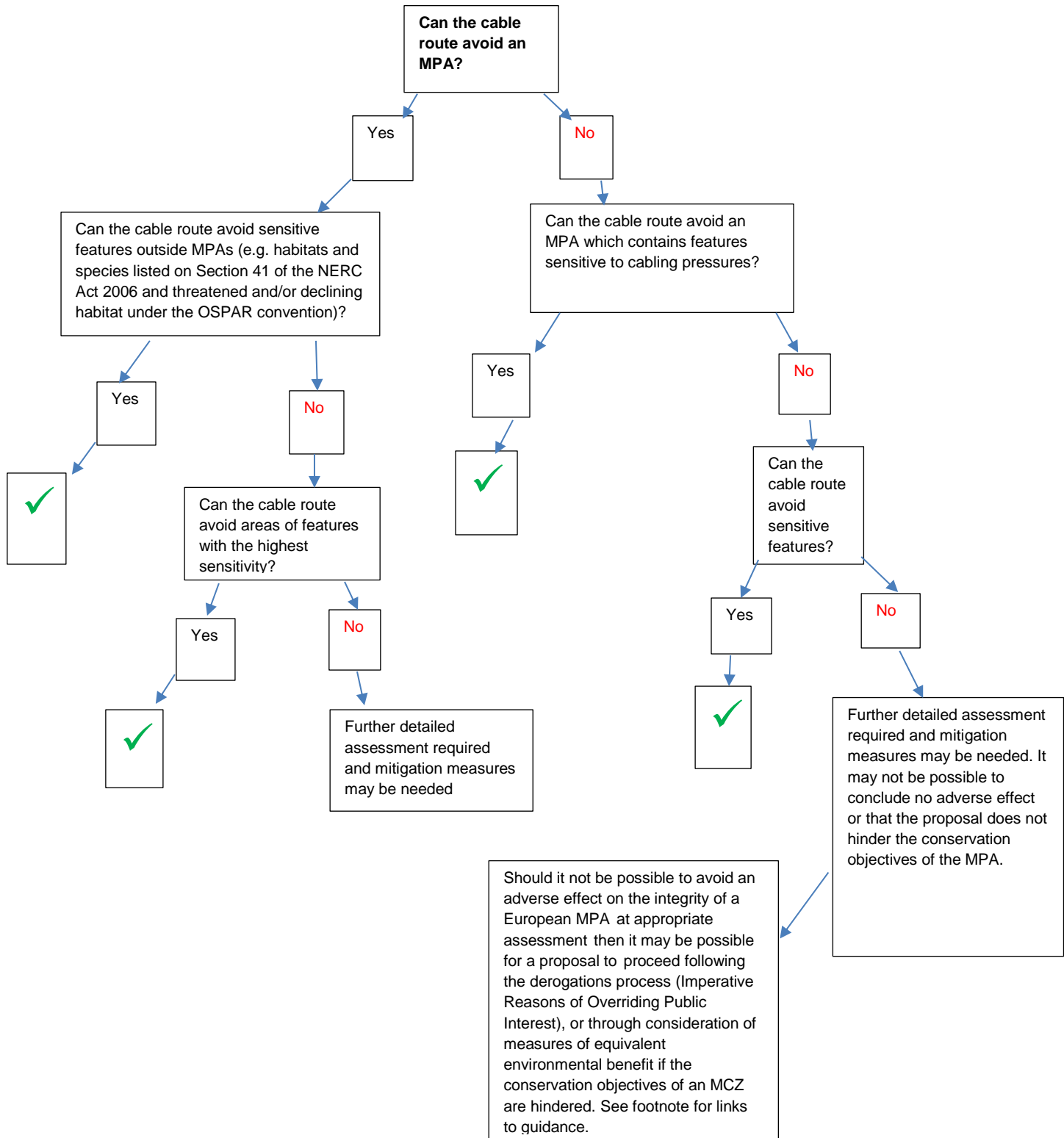
⁶ 2019, The Crown Estate, Plan-level Habitats Regulations Assessment For The 2017 Offshore Wind Farm Extensions, Cable Route Protocol

⁷ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-001240-Natural%20England%20-%20Offshore%20Cabling%20paper%20July%202018.pdf>

1. Overarching advice:

When selecting a cable route or turbine location the following approach should be used to minimise impacts according to the **avoid, reduce, mitigate** hierarchy⁸:-

Hierarchy of approach:



⁸ [MMO Overview of the Derogation Provisions under the Habitats Regulations](#)

2. Note on pressures with the potential to impact mobile features in SPAs, Ramsar sites and SACs:

As a high-level principle for cable installation, there may be fewer issues concerning pressures exerted on SPA supporting habitats than habitat features of SACs and MCZs. However, it is important to recognise that there could be significant impact to habitats that birds are dependent on for feeding or roosting within SPA and Ramsar sites. For example, mussel beds are critical to Scoter for feeding and therefore impacts to this feature in a MPA designated for Scoter could be a significant issue.

Where SPAs are designated for bird species which are sensitive to disturbance (e.g. red throated diver), these MPAs are likely to be more sensitive to activities associated with cable installation including vessel traffic and noise.

Similarly, several SACs have been designated for the protection of harbour porpoises. Although cabling operations are unlikely to directly impact the harbour porpoises there could be several potential impacts to the conservation objective⁹ for the species; which is that the condition of supporting habitats and processes and the availability of prey is maintained. Therefore, as with the SPA and Ramsar sites, a change of seabed habitat within a harbour porpoise SAC could lead to impacts on supporting habitats and foraging grounds.

There are also possible pressures on harbour porpoise SACs from noise resulting from clearance of unexploded ordnance along a cable route. This carries the risk of auditory injury and disturbance for the species within a SAC, thus potentially impacting conservation objectives for the species. Therefore, it may be necessary for operators to apply for European Protected Species licence in order to cover the risk of injury/disturbance¹⁰.

The issues discussed above are not covered further in this document. Pressures leading to the loss of any habitat, whether it is a supporting feature of an SPA or Ramsar site or designated feature of an SAC, MCZ or SSSI, would need to be fully assessed further to determine the significance of the loss.

3. Impacts from cabling activities:

The following table of pressures¹¹ (as used by Natural England and JNCC in their advice on operations¹²), that form part of conservation advice packages for each MPA, are those which we consider to be the key pressures associated with cable installation, operation and maintenance.

Pressures occur either as part of the suite of activities pre and post cable installation (i.e. seabed preparation, sandwave clearance/pre-sweeping¹³ and cable protection) or from cable

⁹ <http://jncc.defra.gov.uk/page-7243>

¹⁰ <https://www.gov.uk/government/publications/european-protected-species-apply-for-a-mitigation-licence>

¹¹ <https://www.marlin.ac.uk/sensitivity/SNCB-benchmarks>

¹² The advice on operations identifies pressures associated with the most commonly occurring marine activities, and provides a detailed assessment of the feature/subfeature or supporting habitat sensitivity to these pressures.

¹³ Seabed preparation/ pre sweeping/ sandwave clearance is the removal of sandwaves to enable burial of cables below the mobile layer and ensure the seabed is flat enough for cable installation

installation / maintenance itself. It is important that the full range of pressures associated with cabling activity at a given location are considered. This includes, the nature of the pressure and subsequent pressures; the magnitude in terms of area impacted and the temporal scale (short term, one off, persistent or repeated) and the sensitivity of the feature (its resilience and resistance to the pressure).

The worst-case scenario should always be considered for cabling activities, unless the activity is not permitted by the licence. For example, as planned cable burial depth is not always guaranteed, cable protection should be assumed to be required, and therefore we would expect a reasonable estimate of amount, area impacted, and the pressure exerted on the feature(s) within an MPA should be considered.

Table 1. Key pressures associated with pre and post cable installation activities, cable installation and maintenance.

Pressure ¹⁴
Habitat structure changes - removal of substratum (extraction)
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
Changes in suspended solids (water clarity)
Smothering and siltation rate changes (heavy) seabed p
Smothering and siltation rate changes (light)
Abrasion/disturbance of the substrate on the surface of the seabed
Water flow (tidal current) changes, including sediment transport considerations
Physical change (to another seabed type)
Physical change (to another sediment type)

4. Features with high sensitivity to cabling pressures or where known impacts exist:

The following features are considered highly sensitive to a range of pressures listed in the Table 1. All features are highly sensitive¹⁵ to the *physical change to another seabed type* and *physical change to another sediment type* pressures, which are associated with cable protection.

Where available, the links provided under each feature link to online maps illustrating the location of UK MPAs designated for the feature or further descriptions of the feature.

Note, there are a number of highly sensitive features for which it may be possible to micro-route around, therefore avoiding impact to the feature. However, detailed site and feature specific information would be needed to determine if micro-routing is possible in order for it to

tools to operate effectively. This is usually through the use of dredging techniques, jetting tools or mass flow excavators, although small sandwaves or ripples may be flattened using other tools. Deposition of the material is usually associated with this activity unless the material is removed to shore.

¹⁴ <https://jncc.gov.uk/our-work/marine-activities-and-pressures-evidence/>

¹⁵ Sensitivity is defined as whether the evidence base suggests the feature is sensitive to the pressure at the benchmark. More information on sensitivity assessment and pressure benchmarks can be found within Natural England and JNCC's advice on operations for each individual site or at https://www.marlin.ac.uk/sensitivity/sensitivity_rationale

be acceptable mitigation. Our advice would depend on the extent of the highly sensitive feature within the MPA, the sensitivities of the surrounding features and whether the surrounding features are more tolerant to, and likely to recover from, cabling pressures.

4.1. Annual vegetation of drift lines: impacts on this feature should be avoided.

For more information on: [Annual vegetation of drift lines](#)

4.2. Chalk (as subtidal chalk feature in MCZ and reef feature in SACs): chalk habitats are a relatively scarce resource. Britain has the greatest proportion of coastal chalk in Europe, despite this, chalk forms only 0.6% of the British coastline. Due to its scarce nature and inability to recover morphologically from physical impacts, cabling through chalk features should be avoided. As per other highly sensitive features, there may be instances where it is possible to cable within the site but only on other less sensitive habitats, avoiding impacting the chalk, however with the number of cables associated with windfarm developments this is becoming increasingly challenging.

For more information on: [Chalk](#)

4.3. Circalittoral rock (high and moderate energy): does not recover from morphological damage caused by cabling laying and impacts should be avoided.

For more information on:

[Moderate energy circalittoral rock](#)

[High energy circalittoral rock](#)

4.4. Coastal lagoons: these are a scarce habitat in the UK and impacts on this feature of these sites should be avoided.

For more information on: [Coastal lagoons](#)

4.5. Estuarine Rocky Habitats: estuaries are usually comprised of soft sediment, therefore rock habitats are rare, forming a small proportion of the area but contributing a large amount to the richness of life in the area. For this reason, impacts to this feature should be avoided.

For more information on: [Estuarine Rocky Habitats](#)

4.6. Intertidal sand and muddy sand: these habitats are relatively widespread and whilst highly sensitive to cable impacts are more likely to recover than other highly sensitive habitats. As only one out of the eleven biotopes that these habitats comprise of, has high sensitivity to penetration (*Limecola balthica* and *Arenicola marina* in littoral muddy sand), it may be possible reduce the severity of the impact by routing cabling through this habitat without impacting this biotope.

For more information on: [Intertidal sand and muddy sand](#)

4.7. Maerl Beds: maerl is fragile and therefore susceptible to damage from physical impacts, and its slow regeneration meaning it is unlikely to recover. Depending on the MPA and extent of the beds, mitigation may include routing cables round the maerl beds or avoiding them by the use of Horizontal Directional Drilling (HDD).

For more information on: [Maerl Beds](#)

4.8. Peat and clay exposures: these are unique and fragile habitats which are unlikely to recover or regenerate from damage to or loss of the substrate. These exposures tend to be fairly localised and therefore there is a reasonable likelihood that they can be avoided by micro-routing dependent on the nature and sensitivity of the surrounding habitat and available space.

For more information on: [Peat and clay exposures](#)

4.9. Perennial vegetation of stony banks: impacts on this feature should be avoided.

For more information on: [Perennial vegetation of stony banks](#)

4.10. Protected dunes: cabling through these features within sites is likely to be challenging to achieve without adversely affecting the feature, based on previous experience of projects looking to cable through dune sites, and is therefore best avoided. Impacts from trenching would be expected to take a long time to recover and risks destabilising dune systems.

For more information on:

- [Shifting dunes along the shoreline with *Ammophila arenaria*](#),
- [Fixed dunes with herbaceous vegetation](#)
- [Dunes with *Salix repens* ssp. *argentea*](#)
- [Humid dune slacks](#)

4.11. Rocky Reefs (intertidal and subtidal, high, moderate and low energy rock): are widespread through UK seas, although particular types are more restricted in their distribution. Cabling through MPAs designated for rocky reef is likely to lead to damage to the substrate, which is unable to recover or regenerate. In some cases, inshore, it has been possible to put cables or pipes through these MPAs if it is possible to avoid the main area of feature i.e. cut through the reef at the narrowest point or follow gaps through the reef itself. It may also be possible to surface lay, collar and pin cables to reduce the impact, however there is little evidence of where this has been implemented to date and therefore MPAs designated for these features are best avoided.

For more information on: [Rocky Reefs](#)

(Please note that the sites on this link include biogenic reef sites)

4.12. Saltmarsh: whilst in some areas saltmarsh has been successfully cabled through and recovery has occurred, in other areas there have been significant ongoing impacts due to cable installation through saltmarsh. Saltmarsh habitats should therefore be avoided. Saltmarsh site sensitivities are assessed through the following component features: Salicornia and other annuals colonising mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*), Spartina swards (*Spartinion maritimae*), Coastal saltmarshes and saline reedbeds.

For more information on:

- [Coastal saltmarshes and saline reedbeds](#)
- [Atlantic salt meadows](#)

4.13. Seagrass Beds (intertidal and subtidal): these are susceptible to physical change and increase in suspended sediment and therefore both direct and indirect impacts should be avoided. Depending on the MPA and extent of the beds, mitigation may mean that cables can be routed round the seagrass beds or avoided by the use of Horizontal Directional Drilling (HDD).

For more information on: [Seagrass Beds](#)

4.14. Seapens and burrowing megafauna: a relatively wide-spread, low energy, subtidal mud habitat. Disturbance caused by cable installation, particularly from smothering, can have a large impact on the seapens and burrowing megafauna present. This feature should be avoided.

For more information on: [Seapens and burrowing megafauna](#)

4.15. Sheltered muddy gravels: the low energy nature of this habitat means that it is likely to be slow to recover from impacts related to cable installation and therefore should be avoided. This habitat is scarce around Britain.

For more information on: [Sheltered muddy gravels](#)

4.16. Stony reef (intertidal and subtidal): stony reef does not morphologically recover from cabling impacts and therefore the biodiversity does not return to that found before impact. Impacts to this feature should be avoided. This is particularly pertinent for boulder clearance as preparation work for cable installation.

For more information on: [Stony reef](#)

4.17. Submarine structures made by leaking gases: impacts on this feature should be avoided. If sufficiently recent high quality and abundant survey data are available, it may be possible to micro-route around the features at a MPA-specific level.

For more information on: [Submarine structures made by leaking gases](#)

4.18. Submerged or partly submerged sea caves: whilst it is unlikely that developers would want to cable through sea cave features, these are a relatively scarce habitat and highly sensitive to impacts from cable installation and should be avoided.

For more information on: [Submerged or partly submerged sea caves](#)

4.19. Subtidal biogenic reefs including mussel beds and *Sabellaria* spp.: whilst tolerant to a certain amount of smothering, biogenic reefs are highly sensitive to damage by abrasion and penetration (although if the area of impact is limited there is potential for the reef to reform over time). Due to their biogenic nature and potential to move in location through time, these features can sometimes be avoided by micro-routing if sufficiently recent high quality and abundant survey data are available and there is enough confidence that there will be space within the cable corridor for this routing to take place, without impacting on other highly sensitive features.

For more information on: [Subtidal biogenic reefs including mussel beds and *Sabellaria* spp.](#)

4.20. Subtidal macrophyte dominated sediment: this feature is highly sensitive due to the communities growing on the sediment and therefore impacts to the feature should be avoided. This may be possible by micro-routing. The feature is largely found in the south west and on west coasts of the UK.

For more information on: [Subtidal macrophyte dominated sediment](#)

4.21. Subtidal sediments:

Subtidal mud: although mud has communities with the potential to recover from cable installation, mud habitats in low energy environments such as in deep water or at the top of estuaries may be slow to recover and should be avoided.

For more information on: [Subtidal mud](#)

Subtidal sand: these habitats (including sandbank habitats) are often found in high – medium energy environments and have the potential to recover from cabling activities pressures relatively quickly. However, where features are dynamic, the introduction of hard substrate (such as cable protection) is often required causing the pressures *physical change to another seabed or sediment type* and therefore likely loss of extent of the existing habitat. It is particularly important in MPAs designated for sandbank features to consider these pressures in the context of other operations within the site, as many sandbank MPAs are already impacted by these pressures therefore reducing their capacity to withstand further impacts.

For more information on: [Subtidal sand](#)

Subtidal coarse sediment: these are varied habitats formed of coarse sand, gravel or shell. Recovery of these habitats may be relatively slow, therefore whilst the habitat is widespread, physical impacts should be limited.

For more information on: [Subtidal coarse sediment](#)

Subtidal mixed sediment: these are varied habitats based on a mix of substrate sizes or mosaics. Recovery of these habitats may be relatively slow, therefore whilst the habitat is widespread, physical impacts should be limited.

For more information on: [Subtidal mixed sediments](#)

5. Region specific advice – MPAs with the highest risk:

The advice below is aimed at highlighting the MPAs in each leasing area, in relation to the proposed Round 4 offshore wind seabed leasing areas offered by The Crown Estate, that pose the highest risk of significant impact from cabling activities. It also includes MPAs likely to be impacted by cable routes, or where the MPA has existing pressures from historic cabling.

It **does not** infer that there would not be significant impacts within other MPAs within the regions. Advice was composed using Natural England and JNCC's conservation advice packages, which collate MPA-specific evidence on feature condition and sensitivity, additional evidence as referenced throughout, and Natural England and JNCC's expert opinion. The MPAs discussed below are illustrated in the map found in Appendix A.

Note that conservation advice packages have yet to be produced for MPAs designated in 2019 as part of the third tranche of MCZ designations. The sensitivities of the designated features within these MPAs have been evaluated based on assessments of the same feature within previously designated MPAs with conservation advice packages available, alongside expert judgement.

5.1. Region 1 Durham Coast

Whilst The Crown Estate do not propose to make the Durham Coast region seabed available for lease for offshore wind farm locations as part of Round 4¹⁶ there is the potential for cables from other regions to go into this area and therefore sensitive MPAs have been highlighted.

The North Northumberland Dunes SAC:

North Northumberland Dunes SAC is designated for five dune features and related species. Any activity affecting changes in hydrology should be avoided.

Site information: [The North Northumberland Dunes SAC](#)

Berwickshire and North Northumberland Coast SAC:

This SAC is designated for reef, subtidal sand and mudflat and sea cave features. The reef habitats, seagrass beds, and sea caves protected in the SAC would be highly sensitive to cable installation pressures and unlikely or slow to recover and should be avoided. The area around Lindisfarne within this SAC is highly sensitive.

Site information: [Berwickshire and North Northumberland Coast SAC](#)

Farne Islands and Coquet Island and Lindisfarne SPA (encompassed within Northumberland Marine SPA):

Areas around this SPA are of significant interest for breeding seabird populations as well as non-breeding seabird and waterbird populations and would be highly sensitive to disturbance from offshore cabling/activities near to breeding, roosting and feeding areas.

Site information:

- [Northumberland Marine SPA](#)
- [Lindisfarne SPA](#)

Coquet to St Mary's MCZ:

This MCZ is designated for a mosaic of sediment and hard substrate benthic habitats, which in turn support a wide range of diverse communities. Rare exposures of intertidal peat and clay are found along patches of the coastline, including fossilised tree roots from millions of years ago. Whilst it may be possible to cable through less sensitive sediment features in this MCZ through route choice and micro-routing, there are sensitive rock and reef habitats as well as peat and clay exposures in the MCZ that should be avoided. Use of rock dump or other

¹⁶ The Crown Estate, 2018. Round 4, Resource and Constraint Assessment for Offshore Wind-Refinement Report and Annex. <http://www.marinedataexchange.co.uk/ItemDetails.aspx?id=11050>

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cable protection leading to change in seabed/ sediment type within this MCZ should be avoided.

Site information: [Coquet to St Mary's MCZ](#)

Berwick to St Mary's MCZ:

This MCZ is designated for breeding and non-breeding eiders and covers the whole of the Northumberland Coastline. Eiders can be sensitive to disturbance from activities associated with cabling near to breeding and crèche areas (such as near the Aln and Coquet Estuaries).

Site information: [Berwick to St Mary's MCZ](#)

Runswick Bay MCZ:

This MCZ has been designated for a matrix of broad scale habitats each supporting diverse and unique communities. These habitats include subtidal sand, subtidal mud, mixed sediment, coarse sediments, as well as rocky intertidal and subtidal features. It is also designated for the presence of Ocean Quahog (*Arctica islandica*), a bivalve noted for its extreme longevity. There is limited available information on this MCZ, however it is likely to have some sensitive reef habitat that should be avoided. This area has been a prohibited trawl area for decades and has little/no infrastructure so it is likely to be in a fairly well recovered state, and therefore impacts from cabling activities should be avoided.

Site information: [Runswick Bay MCZ](#)

Flamborough Head SAC:

This SAC is designated for its unique chalk reef habitats (representing the most northern outcrop of chalk in the UK), sea caves and vegetated sea cliffs all of which have high sensitivity to impacts associated with cable installation. Cable routes should avoid this SAC as it is unlikely installation would be feasible without some form of levelling/boulder clearance, or cable protection.

Site information: [Flamborough Head SAC](#)

5.2 Region 2 Dogger Bank

Dogger Bank SAC:

This SAC is designated for sandbanks which are slightly covered by seawater at all times (includes subtidal coarse sediment, subtidal mixed sediments, subtidal mud and subtidal sand).

The designated feature has a restore objective for extent and distribution and structure and function of the sandbanks, whilst supporting processes have a maintain objective. Within the SAC the sandbanks are already impacted from large-scale infrastructure associated with cabling activities and offshore oil and gas, which has resulted in changes to the substratum of the site and functionality of the features. These changes in substratum are both from direct placement of infrastructure and associated protection (i.e. rockdump and mattressing).

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Cable laying, cable laying with associated protection and sandwave levelling are incompatible with the achievement of the conservation objectives advised for the SAC and would impede restoration of the sandbanks which are slightly covered by seawater all the time.

Site information: [Dogger Bank SAC](#)

5.3 Region 3 Yorkshire Coast

Flamborough Head SAC:

This SAC is designated for its unique chalk reef habitats (representing the most northern outcrop of chalk in the UK), sea caves and vegetated sea cliffs all of which have high sensitivity to impacts associated with cable installation. Cable routes should avoid this SAC as it is unlikely installation would be feasible without some form of levelling/boulder clearance, or cable protection.

Site information: [Flamborough Head SAC](#)

Holderness Inshore MCZ:

The highly sensitive features within this MCZ are intertidal sand and muddy sand, subtidal coarse sediment, subtidal mixed sediments, subtidal mud, subtidal sand, high energy circalittoral rock and moderate energy circalittoral rock. There is one geomorphological feature; Spurn Head (subtidal). All the protected features above are highly sensitive to abrasion/disturbance of the substrate on the surface of the seabed and penetration and/or disturbance of substratum below the surface of the seabed, including abrasion, except high energy circalittoral rock for which penetration was not deemed relevant. The identified features are all highly sensitive to the other cabling pressures to various extents.

There are existing impacts on this MCZ due to offshore wind cables and potential oil and gas pipelines. The moderate energy circalittoral rock feature comprises areas of stiff clay exposure as well as more standard stony reef. These clay areas can run parallel to the Holderness coast for considerable lengths, particularly towards the southern portion, meaning that in some areas they are hard to avoid when installing linear infrastructure. The existing offshore windfarm cable route through Holderness Inshore MCZ (which was consented and installed pre-designation) has also demonstrated that the impacts of boulder clearance/cable burial have been found to be more long term than was anticipated on certain biotopes/features¹⁷ (stony reef and clay ridges) and therefore further impacts should be avoided.

Spurn Point geological feature has been designated as part of Holderness Inshore MCZ and also forms a component of the Humber Estuary SSSI. Ensuring geomorphological processes are maintained in the near shore area is therefore essential, and Natural England will always advise that mitigation is required to ensure this.

¹⁷ Humber Gateway Offshore Wind Farm: Annex I Post Construction Survey Final Report Date: April 2016 Report to E.ON Climate and Renewables UK Limited

Site information: [Holderness Inshore MCZ](#)

Holderness Offshore MCZ:

The highly sensitive features of this MCZ are subtidal coarse sediment, subtidal mixed sediments and subtidal sand. The features all have a recover to favourable condition objective. The protected features are sensitive to all cabling pressures identified except smothering and siltation rates.

Site information: [Holderness Offshore MCZ](#)

Humber Estuary SAC:

This estuary SAC is designated for its dune, saltmarsh and sediment habitats. Potential impacts on this SAC need to be carefully considered. The maintenance of coastal/nearshore geomorphology along the Holderness Coast is critical for sediment supply into the Humber. Mitigation may be required to ensure these processes are maintained. Continuation of the sediment supply is also important for the supporting habitats of the Humber SPA. It should also be noted that the Spurn Point geological feature has been designated as part of Holderness Inshore MCZ and also forms a component of the Humber Estuary SSSI. Ensuring geomorphological processes are maintained in the near shore area is therefore essential, and Natural England will always advise mitigation is required to ensure this.

Site information: [Humber Estuary SAC](#)

5.4 Region 4 The Wash

The Wash and North Norfolk Coast SAC:

This SAC encompasses the largest embayment in the UK designated for its saltmarsh features, coastal lagoons, large shallow inlets and bays, mudflats and sandflats and sandbanks, as well as harbour seals and otters. There are existing impacts on the SAC due to cable installation associated with offshore windfarms, with an additional offshore windfarm application currently in the consenting process which also proposes to cable through the SAC. Previous impacts to saltmarsh have resulted in a significant impact which has not recovered 6-7 years post-installation¹⁸. More recent cable installations have failed to reach optimum cable burial and required extra works with significant impacts including use of dredging, mass flow excavators and potentially cable protection.¹⁹ As some of the features and subfeatures of this SAC are considered to be in unfavourable condition, adding further pressure to the SAC with cable laying and associated cable protection would be likely to have a significant impact on the conservation objectives of the SAC and may impede restoration of the features.

Site information: [The Wash and North Norfolk Coast SAC](#)

Inner Dowsing, Race Bank and North Ridge SAC

This SAC is designated for its sandbank feature (including subtidal coarse sediment, subtidal mixed sediment, subtidal sand) and subtidal biogenic reefs: *Sabellaria* spp. The sandbank feature is in an unfavourable condition. The site is under pressure from ongoing activities from

¹⁸ NE review of Lincs OWF saltmarsh recovery July 2016

¹⁹ Marine license application reference MLA/2017/00277/4

a number of industries including aggregate extraction and impacts associated with an existing offshore windfarm (where sandwave clearance was necessary and achieving cable burial was an issue). Fishing activities are resulting in the implementation of management measures for biogenic reef features (often located on mixed sediment in the sandbanks troughs) in the form of byelaws. We therefore advise that other activities should not impede restoration of the SAC features. This includes direct and indirect impacts from the depositing of sandwave levelling sediment.

Cabling activities in sandbank MPAs has been shown to be challenging due to impacts associated with cable installation such as sandwave clearance and use of hard substrate as cable protection. It may be possible to avoid an adverse effect from cabling through sandbank features of this SAC if sufficient evidence is provided that impacts are short-lived and the feature will recover. Consideration would need to be given as to how sufficient cable burial is achieved without the need for cable protection. Should sandwave clearance be necessary to achieve burial depth and avoid the use of cable protection then, as above, it would need to be demonstrated that impacts are short-lived, the feature can recover, and extracted material is retained in the system and can be deposited on material of the same grain size to avoid changes in habitat.

Site information:

- [Inner Dowsing, Race Bank and North Ridge SAC](#) - JNCC
- [Inner Dowsing, Race Bank and North Ridge SAC](#) - NE

Cromer Shoals Chalk Beds MCZ:

This MCZ is designated for its rock and sediment features. The MCZ encloses important geological features including the best examples of subtidal chalk beds in the North Sea as well as subtidal exposures of clay and peat both of which are highly sensitive to cable installation. There are existing impacts to the site due to offshore windfarm cables and pipelines. It is considered unlikely that a route for the number of cables likely to be associated with an offshore windfarm could be found through the site without significant impacts on the conservation objectives and therefore the MCZ should be avoided.

Site information: [Cromer Shoals Chalk Beds MCZ](#)

North Norfolk Sandbanks and Saturn Reef SAC:

The sensitive features within this SAC are sandbanks (includes subtidal coarse sediment, subtidal mixed sediments and subtidal sand), and subtidal biogenic reefs: *Sabellaria spinulosa*. All designated features have a restore objective. Subtidal sand, subtidal coarse sediment and subtidal mixed sediments are sensitive to all cabling pressures identified. *Sabellaria spinulosa* reefs are sensitive to all pressures identified except changes in suspended solids. The site is under pressure from ongoing activities from a number of industries including aggregate extraction, fishing, telecommunication cables and a considerable amount of oil and gas extraction. Much of the oil and gas infrastructure is now being decommissioned.

Cable laying, cable laying with associated protection and sandwave levelling are, in our view, incompatible with the achievement of the conservation objectives advised for the SAC and would impede restoration of the sandbanks which are slightly covered by seawater all the time.

Site information: [North Norfolk Sandbanks and Saturn Reef SAC](#)

Haisborough, Hammond and Winterton SAC:

This SAC is designated for sandbanks (including subtidal coarse sediment, subtidal sand) and subtidal biogenic reefs: *Sabellaria* spp.. All features of the SAC are currently in unfavourable condition. Subtidal sand is sensitive to all cabling pressures identified except changes in water flow. Subtidal coarse sediments are sensitive to all cabling pressures identified except changes in water flow and changes in suspended solids. *Sabellaria* reefs are sensitive to all cabling pressures except changes in water flow, changes in suspended solids, smothering and siltation rate changes (light) and physical change (to another seabed type).

The SAC is under pressure from historic and ongoing activities from offshore windfarm cables in the consenting system, further proposed offshore windfarm cables plus existing oil and gas pipelines and associated pipeline protection, aggregates extraction and fishing activities. Fishing activities are resulting in the implementation of management measures for the biogenic reef features (often located on mixed sediment in the sandbanks troughs) in the form of byelaws. We therefore advise that other activities should not hinder any management measures designed to restore site features. This includes direct and indirect impacts from the depositing of sandwave levelling sediment.

Cabling activities in sandbank MPAs has been shown to be challenging due to impacts associated with cable installation such as sandwave clearance and use of hard substrate as cable protection. It may be possible to avoid an adverse effect from cabling through sandbank features of this SAC if sufficient evidence is provided that impacts are short-lived and the feature will recover. Consideration would need to be given as to how sufficient cable burial is achieved without the need for cable protection. Should sandwave clearance be necessary to achieve burial depth and avoid the use of cable protection then, as above, it would need to be demonstrated that impacts are short-lived, the feature can recover, and extracted material is retained in the system and can be deposited on material of the same grain size to avoid changes in habitat.

Site information:

- [Haisborough, Hammond and Winterton SAC - JNCC](#)
- [Haisborough, Hammond and Winterton SAC - NE](#)

5.5 Region 5 Southern North Sea

Markham's Triangle MCZ

The sensitive features of this MCZ are subtidal coarse sediment, subtidal mixed sediments, subtidal mud and subtidal sand. All features have a recover to favourable condition objective. The features in the site are sensitive to all the cabling pressures identified, except physical change (to another sediment type) and smothering and siltation rate changes (light) for subtidal mud.

Site information: [Markham's Triangle MCZ](#)

North Norfolk Sandbanks and Saturn Reef SAC:

The sensitive features within this SAC are subtidal coarse sediment, subtidal mixed sediments, subtidal sand and subtidal biogenic reefs: *Sabellaria* spp. Subtidal sand, subtidal coarse sediment and subtidal mixed sediments are sensitive to all cabling pressures identified. Subtidal biogenic reefs: *Sabellaria* spp. is sensitive to all pressures identified except changes in suspended solids.

The SAC is under pressure from ongoing activities from a number of industries including aggregate extraction, fishing, telecommunication cables and a considerable amount of oil & gas extraction. In particular, much of the oil & gas infrastructure is now being decommissioned creating a wider problem with long term deposition of protection material (rock dump) and infrastructure being left in-situ, and alteration of sediments (cabling and drill cuttings) which are impacting the extent and functioning of the protected features.

Cable laying, cable laying with associated protection and sandwave levelling are incompatible with the achievement of the conservation objectives advised for the SAC and would impede restoration of the sandbanks which are slightly covered by seawater all the time.

Site information: [North Norfolk Sandbanks and Saturn Reef SAC](#)

5.6 Region 6 East Anglia

Haisborough, Hammond and Winterton SAC:

This SAC is designated for sandbanks (including subtidal coarse sediment, subtidal sand) and subtidal biogenic reefs: *Sabellaria* spp.. All features of the SAC are currently in unfavourable condition. Subtidal sand is sensitive to all cabling pressures identified except changes in water flow. Subtidal coarse sediments are sensitive to all cabling pressures identified except changes in water flow and changes in suspended solids. Biogenic *Sabellaria* reefs are sensitive to all cabling pressures except changes in water flow, changes in suspended solids, smothering and siltation rate changes (light) and physical change (to another seabed type).

The SAC is under pressure from historic and ongoing activities from offshore windfarm cables in the consenting system, further proposed offshore windfarm cables plus existing oil and gas pipelines and associated pipeline protection, aggregates extraction and fishing activities. Fishing activities are resulting in the implementation of management measures for the biogenic reef features (often located on mixed sediment in the sandbanks troughs) in the form of byelaws. We therefore advise that other activities should not hinder any management measures designed to restore site features. This includes direct and indirect impacts from the depositing of sandwave levelling sediment.

Cabling activities in sandbank MPAs has been shown to be challenging due to impacts associated with cable installation such as sandwave clearance and use of hard substrate as cable protection. It may be possible to avoid an adverse effect from cabling through sandbank features of this SAC if sufficient evidence is provided that impacts are short-lived and the feature will recover. Consideration would need to be given as to how sufficient cable burial is

achieved without the need for cable protection. Should sandwave clearance be necessary to achieve burial depth and avoid the use of cable protection then, as above, it would need to be demonstrated that impacts are short-lived, the feature can recover, and extracted material is retained in the system and can be deposited on material of the same grain size to avoid changes in habitat.

Site information: [Haisborough, Hammond and Winterton SAC](#)

Orford Inshore MCZ

The MCZ is designated for subtidal mixed sediment, which provides an important nursery and spawning grounds for fish including several nationally important shark species. The rich biodiversity within the MCZ also provide a prey resource for Annex I bird species and Harbour Porpoise. The feature has a recover conservation objective. It is therefore important that any proposed cable installation (and associated activities) do not impact the form and function of the mixed sediment, with the potential to hinder the conservation objectives for the site. Cable protection should not be used within this MCZ unless it could replicate natural sediment. Natural England are working with regulators to determine if further management measures are required for other industries.

Site information: [Orford Inshore MCZ](#)

5.7 Region 7 Thames Approaches

Whilst The Crown Estate do not propose to make the Thames Approaches region seabed available for lease for offshore wind farm locations as part of Round 4²⁰ there is the potential for cables from other regions to go into this area and therefore sensitive MPAs have been highlighted.

Margate and Long Sands SAC:

This SAC is designated for subtidal sandbanks. There are existing pressures on this SAC due to offshore windfarm turbines and cabling, interconnector cables and aggregate extraction and therefore adding any further pressure to the SAC with cable laying and associated cable protection has the potential to have an impact on the conservation objectives.

Cabling activities in sandbank MPAs has been shown to be challenging due to impacts associated with cable installation such as sandwave clearance and use of hard substrate as cable protection. It may be possible to avoid an adverse effect from cabling through sandbank features of this SAC if sufficient evidence is provided that impacts are short-lived and the feature will recover. Consideration would need to be given as to how sufficient cable burial is achieved without the need for cable protection. Where this is not considered possible then alternatives to deposition of hard substrate as cable protection should be considered. Should sandwave clearance be necessary to achieve burial depth and avoid the use of cable protection then, as above, it would need to be demonstrated that impacts are short-lived, the feature can recover, and extracted material is retained in the system and can be deposited on material of the same grain size to avoid changes in habitat.

Site information: [Margate and Long Sands SAC](#)

²⁰ The Crown Estate, 2018. Round 4, Resource and Constraint Assessment for Offshore Wind-Refinement Report and Annex. <http://www.marinedataexchange.co.uk/ItemDetails.aspx?id=11050>

Kentish Knock East MCZ

This MCZ is designated for subtidal sand, mixed and coarse sediment. The sediment features have a recover conservation objective. Given the location of this MCZ it may be a very mobile feature and therefore may pose issues with cable burial and create the need for cable protection which should be given sufficient consideration.

Site information: [Kentish Knock East MCZ](#)

5.8 Region 8 Kent Coast

Whilst The Crown Estate do not propose to make the Kent Coast region seabed available for lease for offshore wind farm locations as part of Round 4²¹ there is the potential for cables from other regions to go into this area and therefore sensitive sites have been highlighted.

Blackwater, Crouch, Roach and Colne Estuaries MCZ

This MCZ is designated for intertidal mixed sediments, a geological cliff feature and native oyster beds (the only MPA currently designated for native oyster as a habitat rather than species) and impacts on these features should be avoided. The oyster features have a recover conservation objective. Oyster beds are highly sensitive to abrasion, penetration and siltation pressures associated with cable installation, whilst the Pleistocene geology of the geological cliff feature is internationally important for its notable stratigraphy (rock strata), Palaeolithic animal and plant fossils, and for providing an insight into the area's environmental past.

Site information: [Blackwater, Crouch, Roach and Colne Estuaries MCZ](#)

Margate and Long Sands SAC

This SAC is designated for subtidal sandbanks. There are existing pressures on this SAC due to offshore windfarm turbines and cabling, interconnector cables and aggregate extraction and therefore adding any further pressure to the SAC with cable laying and associated cable protection has the potential to have an impact on the conservation objectives.

Cabling activities in sandbank MPAs has been shown to be challenging due to impacts associated with cable installation such as sandwave clearance and use of hard substrate as cable protection. It may be possible to avoid an adverse effect from cabling through sandbank features of this SAC if sufficient evidence is provided that impacts are short-lived and the feature will recover. Consideration would need to be given as to how sufficient cable burial is achieved without the need for cable protection. Where this is not considered possible then alternatives to deposition of hard substrate as cable protection should be considered. Should sandwave clearance be necessary to achieve burial depth and avoid the use of cable protection then, as above, it would need to be demonstrated that impacts are short-lived, the feature can recover, and extracted material is retained in the system and can be deposited on material of the same grain size to avoid changes in habitat.

Site information: [Margate and Long Sands SAC](#)

Thanet Coast SAC and Thanet Coast MCZ

²¹ The Crown Estate, 2018. Round 4, Resource and Constraint Assessment for Offshore Wind-Refinement Report and Annex. <http://www.marinedataexchange.co.uk/ItemDetails.aspx?id=11050>

Thanet Coast SAC is designated for reef and sea cave features. Thanet Coast MCZ includes sediment and rock features as well as peat and clay exposures, *Sabellaria spinulosa* and blue mussel reef. The *Sabellaria spinulosa* reef feature has a recover conservation objective. The chalk at Thanet is unusual amongst coastal exposures because it is of upper Cretaceous chalk which is softer than other types of chalk and more easily eroded and bored by animals. As described in section 4.2, subtidal chalk and reef are highly sensitive to impacts from cable installation and unable to recover morphologically. Therefore, impacts to chalk and other rock habitats designated within these MPAs should be avoided. Additionally peat and clay exposures, *Sabellaria spinulosa* and blue mussel reef at Thanet Coast MCZ should be avoided through cable routing where sufficient space exists around other sensitive features.

Site information:

- [Thanet Coast SAC](#)
- [Thanet Coast MCZ](#)

Goodwin Sands MCZ

This MCZ is designated for its dynamic sand and coarse sediment features as well as rock features (likely chalk) and biogenic reefs. The rock and biogenic reefs features have a recover conservation objective and impacts to these should be avoided through choice of cable route. The mobile nature of the sediments in the MCZ may pose issues with cable burial and create the need for sandwave clearance and cable protection. There is an existing interconnector cable in the MCZ which has required rock protection as well as an offshore windfarm cable in the consenting system which proposes to cable through the MCZ. Any further need for cable protection in the MCZ should be avoided.

Site information: [Goodwin Sands MCZ](#)

Dover to Deal MCZ

This MCZ is designated for 16 features including subtidal sediments, subtidal chalk and rock habitats and blue mussel and *Sabellaria spinulosa* reefs. The rock, mussel bed and *Sabellaria spinulosa* features have a recover conservation objective. Subtidal chalk and reef are highly sensitive to impacts from cable installation and unable to recover morphologically and therefore impacts on designated chalk and other rock habitats at these sites should be avoided. Impacts on blue mussel beds and *Sabellaria spinulosa* reefs should also be avoided.

Site information: [Dover to Deal MCZ](#)

Foreland MCZ

This MCZ is designated for its rock features (likely chalk) which have a recover conservation objective as well as sediments, including sand and coarse sediment. The MCZ also protects the very northern section of the English Channel outburst flood feature. This geomorphological feature was formed at the end of the last glaciation by the collapse of ice sheets or glaciers. Impacts to the rock and geomorphological features should be avoided due to their inability to morphologically recover. Given the location of the site, the sediments may be a very mobile feature and therefore may pose issues with cable burial and create the need for sandwave clearance and cable protection which should be given sufficient consideration.

Site information: [Foreland MCZ](#)

5.9 Region 9 South East

Dover to Folkestone MCZ

This MCZ is designated for 14 features including subtidal sediments, subtidal chalk and rock habitats, native oyster and a geological feature. Subtidal chalk and reef are highly sensitive to impacts from cable installation and unable to recover morphologically and therefore impacts on designated chalk and other rock habitats at this MCZ should be avoided. This advice also applies to the geological feature.

Site information: [Dover to Folkestone MCZ](#)

Folkestone Pomerania MCZ

Folkestone Pomerania MCZ is composed of high energy circalittoral rock with extensive areas of subtidal sand and coarse sediment. The MCZ is also designated for two types of biogenic reefs, ross worm reef (*Sabellaria spinulosa*) and the honeycomb worm reef (*Sabellaria alveolata*) as well as fragile sponge and anthozoan communities. All features except the sediment features have a recover conservation objective. The outcropping rock present throughout the area is one of the MCZ's unusual features composed of greensand, an unusually hard sandstone unique to south-east England which would be unable to recover morphologically from impacts associated with cable laying. Impacts to rock features should be avoided. This MCZ also supports fragile sponges and anthozoan communities. Biogenic *Sabellaria* reefs are sensitive to all cabling pressures except changes in water flow, changes in suspended solids, smothering and siltation rate changes (light) and physical change (to another seabed type). Where there is sufficient data and space within the site for the number of proposed cables impacts to *Sabellaria* reef could be avoided through cable routing.

Site information: [Folkestone Pomerania MCZ](#)

Dungeness SAC

This SAC is designated for perennial vegetation of stony banks. The geomorphology is very important in this coastal site with shingle built up into sensitive ridges. Shingle on the beach will get remoulded by storms but moving inland the shingle ridges become vegetated and are very vulnerable to damage – use of vehicles tracking over the shingle or abrasion and penetration pressures associated with cable installation would potentially cause lasting damage to the feature.

Site information: [Dungeness SAC](#)

Inner Bank MCZ

This MCZ is designated for subtidal coarse sediment, subtidal mixed sediments and subtidal sand. All three features have a recover to favourable condition objective. The features are sensitive to all cabling pressures identified except physical change (to another sediment type) and smothering and siltation rates (heavy).

Site information: [Inner Bank MCZ](#)

Bassurelle Sandbank SAC

This SAC is designated for sandbanks which are slightly covered by seawater all the time (includes subtidal coarse sediment, subtidal mixed sediment and subtidal sand). The feature is sensitive to all the cabling pressures identified. Currently the sensitive features of the SAC are not under pressure from existing human activities. However, like other MPAs with subtidal coarse sediment and sand features, the potential loss of feature through direct placement of infrastructure and associated protection material could negatively affect the conservation objectives of the SAC.

Site information: [Bassurelle Sandbank SAC](#)

Beachy Head East MCZ

Beachy Head East has a sandstone / chalk reef system which provides a home for a wide range of species. The MCZ is designated for its sediment, rock and chalk features as well as peat and clay exposures and *Sabellaria spinulosa* reef. The rock, chalk, peat and clay exposures and *Sabellaria spinulosa* reef have a recover conservation objective. Subtidal chalk and reef are highly sensitive to impacts from cable installation and unable to recover morphologically and therefore impacts on designated chalk and other rock habitats at this MCZ should be avoided. Impacts on peat and clay exposures and *Sabellaria spinulosa* reef should be avoided by micro-routing where there is sufficient space while avoiding other sensitive features.

Site information: [Beachy Head East MCZ](#)

Beachy Head West MCZ

This MCZ is designated for 14 features including subtidal chalk, rock and sediment habitats as well as blue mussel beds, native oyster and short snouted seahorse (*Hippocampus hippocampus*). The extensive intertidal wave cut chalk platforms and subtidal chalk ridges present are considered to be among the best examples of chalk habitat in the south east region. The rock features and chalk communities have a recover conservation objective. Subtidal chalk and reef are highly sensitive to impacts from cable installation and unable to recover morphologically and therefore impacts on designated chalk and other rock habitats at this MCZ should be avoided.

Site information: [Beachy Head West MCZ](#)

Kingmere MCZ

This MCZ is designated for Black bream (*Spondyllosoma cantharus*), infralittoral rock and thin mixed sediment, and subtidal chalk. All features have a recover conservation objective. Cabling impacts to this MCZ should be avoided on the basis of impacts to nesting black bream and their breeding habitat which is rock covered in a thin layer of sediment. Impacts to the rock habitat are not able to recover morphologically. The breeding season is currently understood to be April 1st to June/July; during which time there is high sensitivity to smothering and siltation rate changes. Consideration should also be given to avoiding noise impacts out with the MCZ during nesting periods for black bream. It is considered that there is little space in the MCZ to micro-route around these sensitive habitats given existing aggregates licence areas within the sites and the need to also avoid impacts on sensitive chalk habitat.

Site information: [Kingmere MCZ](#)

Utopia MCZ

This MCZ is designated for subtidal sediment and rock features as well as fragile sponge and anthozoan communities. The Utopia reef consists of an area of bedrock and large boulders that host rich communities of sponges and anthozoans, surrounded by sediment made up mostly of gravel and sand. All features have a recover objective. Impacts to rock features, which would be unable to recover morphologically from impacts associated with cable laying, should be avoided at this MCZ.

Site information: [Utopia MCZ](#)

Offshore Overfalls MCZ

The sensitive features of this MCZ are subtidal coarse sediment, subtidal mixed sediment and subtidal sand. Currently, there is only a small amount of industry activity (fishing and low-level military) within the MCZ. Although human activity is low, the MCZ has been given a recover objective, therefore new disturbance and infrastructure should be avoided if possible.

Site information: [Offshore Overfalls MCZ](#)

Offshore Brighton MCZ

The sensitive features of this MCZ are high energy circalittoral rock, subtidal coarse sediment and subtidal mixed sediment. Both subtidal coarse sediment and subtidal mixed sediment are sensitive to all the cabling pressures identified. High energy circalittoral rock is sensitive to all pressures identified except changes in suspended solids and water flow where there is insufficient evidence to conclude sensitivity.

This MCZ currently has some industries operating within it, including fisheries, telecommunication, other cables and low-level military activity. Although human activity is low, the site has been given a recover objective, therefore new disturbance and infrastructure should be avoided if possible.

Offshore Brighton: [Offshore Brighton MCZ](#)

Pagham Harbour MCZ

This MCZ is designated for Defolin's lagoon snail (*Caecum armoricum*), Lagoon sand shrimp (*Gammarus insensibilis*) and seagrass beds as well as having overlapping SSSI and SPA designations for features including the geomorphology and breeding little and common tern. Natural England consider that it would be challenging to cable through the MCZ due to impacts on the geomorphology of the shingle spit and the natural physical processes associated with the sites that enable it to support the features. These processes would be particularly vulnerable to pressures associated with cable burial or protection.

Site information: [Pagham Harbour MCZ](#)

Selsey Bay and The Hounds MCZ

This MCZ is designated for a wide range of rock and sediment features including geological features at Bracklesham Bay. These rock features, known locally as "The Hounds", consist of

outcrops of limestone and clay exposures and are representative of a coherent rock system stretching across the MCZ from the northwest corner to the southeast. The MCZ also protects one of the best examples of peat and clay exposures on the southeast coast. Within the southeast of the site is the Mixon Hole, a dramatic 20 m drop in the seafloor exposing clay cliffs capped with limestone. The rock and peat and clay exposure features in this site have a recover objective. All of the features are highly sensitive to pressures associated with cable installation and are likely to be very slow or morphologically unable to recover therefore impacts to them should be avoided.

The landward boundary of the MCZ is at Mean Low Water and the site adjoins the Bracklesham Bay SSSI, which has geological exposures on the beach between West Wittering and Selsey, where cable installation should be avoided.

Site information: [Selsey Bay and The Hounds MCZ](#)

Bembridge MCZ

This MCZ overlaps with the South Wight Maritime SAC (which protects the reef habitat) and has been designated for a variety of habitats and species. The 13 protected features include particularly sensitive habitats of conservation interest such as: maerl beds; seagrass beds; sea-pens and burrowing megafauna; and sheltered muddy gravels. Seven of these features have a recover conservation objective. In addition, the MCZ protects potentially sensitive broadscale habitats: subtidal mud; subtidal mixed sediments; subtidal sand and subtidal coarse sediment.

All of these features listed are potentially sensitive to the cabling pressures identified and most have an associated recover objective, therefore further disturbance and impacts should be avoided. Between the reef protected by the SAC and the MCZ features, Natural England advise that there is little space in the MCZ to micro-route around these sensitive habitats.

Site information: [Bembridge MCZ](#)

South Wight Maritime SAC

This SAC was designated to protect the reefs, sea caves and vegetated sea cliffs present. Any cabling should avoid the SAC to prevent lasting impacts on the reef feature and associated communities. Subtidal chalk and reef are highly sensitive to impacts from cable installation and unable to recover morphologically and therefore impacts on designated chalk habitats should be avoided. In exceptional circumstances, where there are no other options, surface lay and pin of cabling may be considered or other micro-routing options to avoid or minimise the impact to reef features.

Site information: [South Wight Maritime SAC](#)

Solent Maritime SAC

This SAC is designated for 11 features including seagrass beds (*Spartina* swards (*Spartinion maritimae*) and sandbanks which are slightly covered by seawater at all times. Impacts to seagrass beds should be avoided either through route choice, use of HDD or micro-routing. Seagrass beds are considered nationally scarce and provide many functions including as an important food source for wildfowl, nursery and protection area for young fish, seahorses whilst the roots catch sediment and reduce coastal erosion. Seagrass beds are very slow to recover

Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas

once disturbed and are declining and facing many threats from disturbance, pollution, sedimentation, disease.

Site information: [Solent Maritime SAC](#)

5.10 Region 17 Irish Sea

Solway Firth SAC

This SAC is designated for a wide range of features including subtidal sediments, reef, dune and saltmarsh features. It is a highly dynamic site with extensive areas of subtidal sandbanks, and some mudflats and saltmarsh in the upper estuary. There are also a number of rocky areas in the south that support mussel and honeycomb worm reefs, so any cabling would have to avoid impacting these areas due to their sensitivity. The Solway does not have a large amount of human activity but does support some locally important fisheries.

Site information: [Solway Firth SAC](#)

West of Copeland MCZ

The designated sensitive features of this MCZ are subtidal sand, subtidal coarse sediment and subtidal mixed sediments. Subtidal sand has a maintain in favourable condition objective, whilst subtidal coarse and mixed sediments have a recover to favourable condition. The features are sensitive to all cabling pressures identified except for smothering and siltation rates (light and heavy).

Site information: [West of Copeland MCZ](#)

West of Walney MCZ

The sensitive features of this MCZ are subtidal mud, subtidal sand and seapens and burrowing megafauna communities. Subtidal sand and subtidal mud are sensitive to all the cabling pressures identified. Seapens and burrowing megafauna communities are sensitive to all the changes identified except changes in suspended solids (water clarity) and smothering and siltation rates changes which it is not sensitive to at this MCZ. The conservation objectives of the site are restore, due to fishing activity which exerts pressures through the use of bottom towed gear.

This MCZ already has a number of industries operating within it, including oil & gas, fisheries, offshore windfarms and telecommunication cables. Further impacts caused by further development within the MCZ, including cabling, would slow or stop the progress to restore the sensitive features of this MCZ.

Site information:

- [West of Walney MCZ](#) – JNCC
- [West of Walney MCZ](#) – NE

Morecambe Bay SAC

This SAC is designated for a wide range of features including subtidal sediments, coastal lagoon, reef, dune and saltmarsh features. There are site existing impacts on this SAC from previous cable installation in addition to sensitive saltmarsh, intertidal and subtidal features.

Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas

Before cables are considered detailed analysis of the cumulative residual effects of existing cables on the subtidal environment are required. In particular, there is a large amount of cable protection already installed in this SAC which would need to be taken into consideration.

Site information: [Morecambe Bay SAC](#)

Shell Flat and Lune Deep SAC

This SAC is designated for its reef and sandbank features. Whilst it may be possible to micro-route to find a way to cable through this SAC there are already impacts from existing offshore windfarm cables on sandbank features which may mean that the capacity of the SAC to withstand any further pressures is reduced. Impacts on sensitive stony reef features such as Lune Deep itself should be avoided through survey and appropriate cable routing. Shell Flat and Lune Deep SAC is different from other MPAs as it comprises boulder reef and bedrock set in an unusual steep topographic slope feature.

Site information: [Shell Flat and Lune Deep SAC](#)

Ribble Estuary SPA

The Ribble supports large numbers of bird species that use the extensive areas of sensitive saltmarsh and mudflats. Part of the southern edge near the mouth of the estuary has undergone managed realignment to create additional healthy supporting habitat. Cabling through any of these areas would risk extensive damage to these supporting habitats. The SPA has some important cockle fisheries, and military activity as well as some industry.

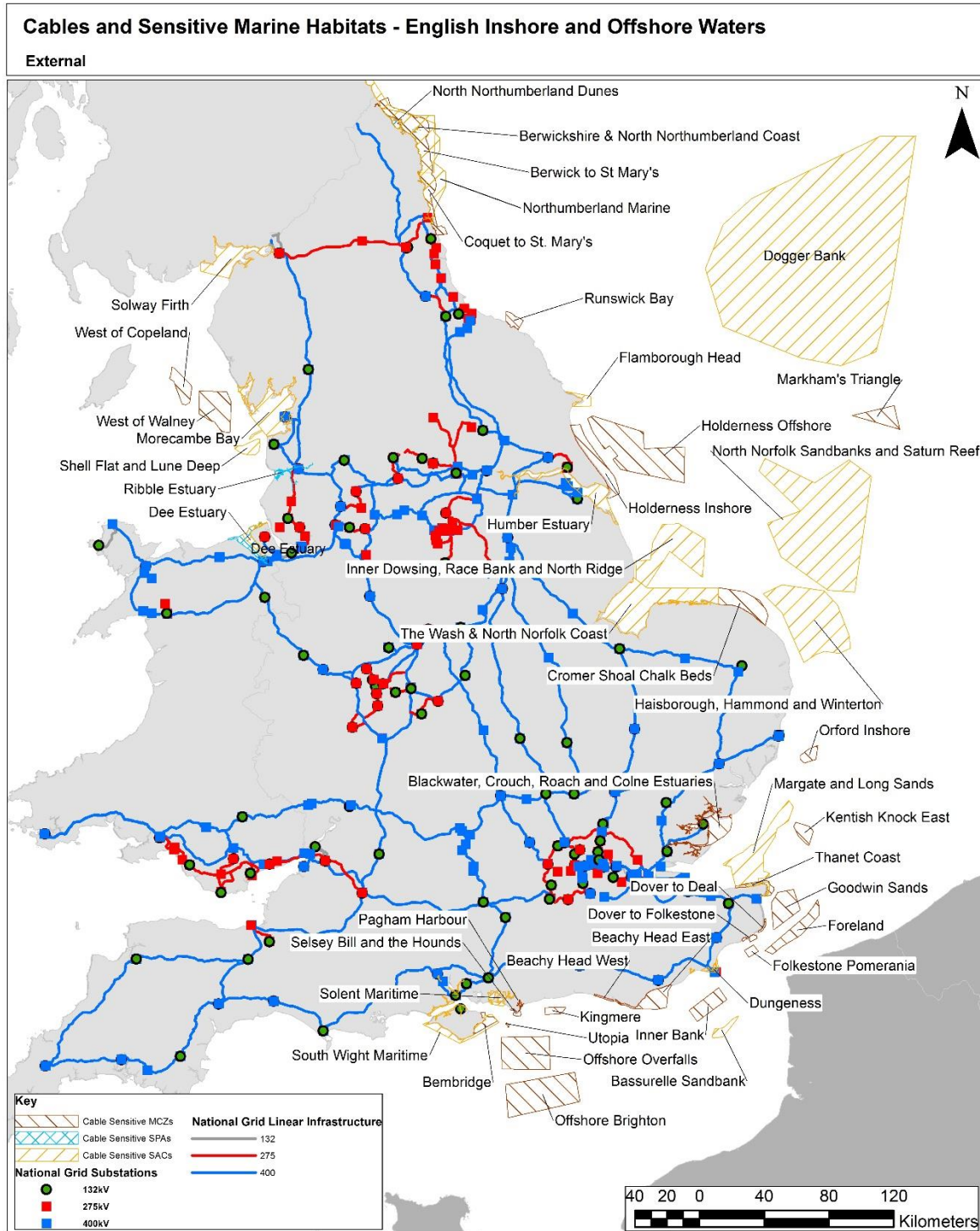
Site information: [Ribble Estuary SPA](#)

Dee Estuary SAC/SPA

This SAC/SPA was primarily designated for its extensive saltmarsh and intertidal mud and sand flats. As the highly sensitive saltmarsh extends across most of the SAC/SPA it would be difficult to micro-site cables around this and HDD could also be difficult to achieve due to the extent of the feature. Additionally, these areas support large numbers of overwintering and some breeding bird species which would be highly sensitive to disturbance. Currently the majority of activity is on the coastal fringe of the SAC/SPA, with some industry and small amount of fisheries. There is also an important haul-out site for grey seals at the mouth of the estuary which would be sensitive to activity.

Site information: [Dee Estuary SAC/SPA](#)

Appendix A – Map of Marine Protected Areas included in this advice



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 SPECIFY DATA SOURCES OF MPAs
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Appendix B – Links to evidence used

Habitat	URL
Rocky Reefs (intertidal and subtidal, high, moderate and low energy rock)	http://jncc.defra.gov.uk/protectedsites/sacselection/habitat.asp?FeatureIntCode=H1170
Chalk (as subtidal chalk feature in MCZ and reef feature in SACs)	http://jncc.defra.gov.uk/page-6030
Seagrass Beds (intertidal and subtidal):	http://jncc.defra.gov.uk/page-5540
Maerl Beds	http://jncc.defra.gov.uk/page-6023
Subtidal mud:	http://jncc.defra.gov.uk/page-5802
Subtidal sand	http://jncc.defra.gov.uk/page-5803
Subtidal coarse sediment	http://jncc.defra.gov.uk/page-5801
Subtidal mixed sediment	http://jncc.defra.gov.uk/page-5800
Peat and clay exposures	http://jncc.defra.gov.uk/page-6026
Sheltered muddy gravels	http://archive.jncc.gov.uk/default.aspx?page=6029
Submerged or partly submerged sea caves	http://jncc.defra.gov.uk/protectedsites/sacselection/habitat.asp?FeatureIntCode=H8330
Stony reef (intertidal and subtidal – under reef)	http://jncc.defra.gov.uk/page-1448
Subtidal biogenic reefs including mussel beds and <i>Sabellaria</i> spp.:	http://jncc.defra.gov.uk/page-5805
Saltmarsh	http://jncc.defra.gov.uk/page-5792
	http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H11330
Estuarine Rocky Habitats	http://jncc.defra.gov.uk/page-6016
Intertidal sand and muddy sand:	http://jncc.defra.gov.uk/page-5789
Subtidal macrophyte dominated sediment:	http://jncc.defra.gov.uk/page-5804
Protected Dunes	http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H2120
	http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H2130
	http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H2170
	http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H2190

Perennial vegetation of stony banks:	http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H1220
Annual vegetation of drift lines:	http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=h1150
Coastal lagoons	http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=h1150
<u>Circolittoral rock (high and moderate energy</u>	http://jncc.defra.gov.uk/page-5798 , http://jncc.defra.gov.uk/page-5797
<u>Seapens and burrowing megafauna</u>	http://jncc.defra.gov.uk/page-6028
<u>Submarine structures made by leaking gases:</u>	http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H1180

Marine Protected Areas

Region 1 Durham Coast	
The North Northumberland Dunes SAC	https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0017097&SiteName=northumberland&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Berwickshire and North Northumberland Coast SAC	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0017072&SiteName=berwickshire and north northumberlandcoast&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Farne Islands and Coquet Island and Lindisfarne SPA (encompassed within Northumberland Marine SPA):	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9020325&SiteName=northumberland&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9006011&SiteName=lindisfarne&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=#adviceonops
Coquet to St Mary's MCZ	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0030&SiteName=coquet&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Berwick to St Mary's MCZ:	https://www.gov.uk/government/publications/marine-conservation-zones-berwick-to-st-marys

Runswick Bay MCZ	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0039&SiteName=runswick&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Flamborough Head SAC	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0013036&SiteName=flambor&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

Region 2 Dogger Bank	
Dogger Bank SAC	http://jncc.defra.gov.uk/page-6508

Region 3 Yorkshire Coast	
Flamborough Head SAC	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0013036&SiteName=flambor&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Holderness Inshore MCZ	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0035&SiteName=holderness&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Holderness Offshore MCZ:	https://www.gov.uk/government/publications/marine-conservation-zones-holderness-offshore
Humber Estuary SAC	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030170&SiteName=humber&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

Region 4 The Wash	
The Wash and North Norfolk Coast SAC	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0017075&SiteName=the%20wash%20and&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Inner Dowsing, Race Bank and North Ridge SAC	http://jncc.defra.gov.uk/page-6536
	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030370&SiteName=inner%20dows&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Cromer Shoals Chalk Beds MCZ:	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0031&SiteName=cromer&countyCo

	de=&responsiblePerson=&SeaArea=&IFCA Area=
North Norfolk Sandbanks and Saturn Reef SAC:	http://jncc.defra.gov.uk/page-6537
Haisborough, Hammond and Winterton SAC:	http://jncc.defra.gov.uk/page-6534
	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030369&SiteName=hais&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

Region 5 Southern North Sea

Markham's Triangle MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-markhams-triangle
North Norfolk Sandbanks and Saturn Reef SAC:	http://jncc.defra.gov.uk/page-6537

Region 6 East Anglia

Haisborough, Hammond and Winterton SAC:	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030369&SiteName=hais&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Orford Inshore MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-orford-inshore

Region 7 Thames Approaches

Margate and Long Sands SAC	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030371&SiteName=margate&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Kentish Knock East MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-kentish-knock-east

Region 8 Kent Coast

Blackwater, Crouch, Roach and Colne Estuaries MCZ	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0003&SiteName=blackwater&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Margate and Long Sands SAC:	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030371&SiteName=margate&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Thanet Coast SAC and Thanet Coast MCZ	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=

	UK0013107&SiteName=thanet&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=
	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0017&SiteName=thanet&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=
Goodwin Sands MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-goodwin-sands
Dover to Deal MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-dover-to-deal
Foreland MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-foreland

Region 9 South East	
Dover to Folkestone MCZ	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/492368/mcz-dover-folkestone-factsheet.pdf
Folkestone Pomerania MCZ:	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0006&SiteName=folkestone%20pomerania&countyCode=&responsiblePerson=
Dungeness SAC	http://publications.naturalengland.org.uk/publication/5252874560864256
Inner Bank T3 MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-inner-bank
Bassurelle Sandbank SAC:	http://jncc.defra.gov.uk/page-6528
Beachy Head East MCZ:	https://www.gov.uk/government/publications/marine-conservation-zones-beachy-head-east
Beachy Head West MCZ	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0002&SiteName=beachy%20head%20west&countyCode=&responsiblePerson=
Kingmere MCZ:	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0009&SiteName=kingmere&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=

Utopia MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-utopia
Offshore Overfalls MCZ:	http://jncc.defra.gov.uk/page-6776
Offshore Brighton MCZ:	http://jncc.defra.gov.uk/page-6775
Pagham Harbour MCZ:	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0013&SiteName=pagham%20&countyCode=&responsiblePerson=
Selsey Bay and The Hounds T3 MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-selsey-bill-and-the-hounds
Bembridge MCZ:	https://www.gov.uk/government/publications/marine-conservation-zones-bembridge
South Wight Maritime SAC:	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030061&SiteName=solent&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=
Solent Maritime SAC:	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030059&SiteName=solent&countyCode=&responsiblePerson=

Region 17 Irish Sea	
Solway Firth SAC	http://publications.naturalengland.org.uk/publication/3189597?category=3212324
West of Copeland MCZ	https://www.gov.uk/government/publications/marine-conservation-zones-west-of-copeland
West of Walney MCZ:	http://jncc.defra.gov.uk/page-7137
	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0045&SiteName=walney&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=
Morecambe Bay SAC	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0013027&SiteName=morecambe&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=

Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas

Shell Flat and Lune Deep SAC:	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030376&SiteName=shell%20flat&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=
Ribble Estuary SPA	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9005103&SiteName=ribble&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=
Dee Estuary SAC/SPA	http://publications.naturalengland.org.uk/publication/2986296