# Inner Dowsing, Race Bank and North Ridge Site of Community Interest MMO Fisheries Assessment

## 1. Summary

Table 1 shows a summary of the outcomes of this assessment of the impact of fishing in the portion of the Inner Dowsing, Race Bank and North Ridge Site of Community Interest (SCI) inshore of 12 nautical miles (nm). The impacts of fishing using demersal towed gear on *Sabellaria spinulosa* reefs were not considered as this interaction is categorised as red in the Fisheries in European Marine Sites Matrix and is subject to management without the need for a site specific assessment.

**Table 1a: Summary of assessment for sandbanks**

| Features | Activity/gear | Part A outcome | Part B outcome | In-combination assessment |
|---|---|---|---|---|
| Sandbank | Beam trawl (whitefish) | LSE | No adverse effect | No adverse effect |
| | Beam trawl (shrimp) | | | |
| | Beam trawl (pulse/wing) | | | |
| | Heavy otter trawl | | | |
| | Multi-rig trawls | | | |
| | Light otter trawl | | | |
| | Towed gear (demersal/pelagic) | | | |
| | Scallops | | | |
| | Mussels, clams, oysters | | | |
| | Pump scoop (cockles, clams) | | | |
| | Suction (cockles) | | | |
| | Pots/creels (crustacea/gastropods) | | | |
| | Cuttle pots | | | |
| | Fish traps | | | |
| | Gill nets | | | |
| | Trammel nets | | | |
| | Entangling nets | | | |
| | Demersal drift nets | | | |
| | Anchor seine | No LSE | n/a | |
| | Scottish/fly seine | | | |
| | Beach seines/ring nets | | | |
| | Shrimp push nets | | | |
| | Fyke and stake nets | | | |
| | Bait dragging | | | |

**Table 1b: Summary of assessment for *Sabellaria spinulosa* reefs**

| Features (subfeature) | Activity/gear | Part A outcome | Part B outcome | In-combination assessment |
|---|---|---|---|---|
| Reef (*Sabellaria spinulosa* reefs) | Pots/creels | LSE | No adverse effect | No adverse effect |
| | Gill nets | | | |
| | Trammel nets | | | |
| | Entangling nets | | | |
| | Cuttle pots | No LSE | n/a | |
| | Fish traps | | | |
| | Demersal drift nets | | | |
| | Demersal longlines | | | |
| | Beach seines/ring nets | | | |
| | Fyke and stake nets | | | |
| | Bait Dragging | | | |
| | Commercial diving | | | |

# 2. Introduction

Table 2 shows the name and legal status of the site.

**Table 2: Details of Area**

| Name and legal status of site: | Name of site(s) | Legal status |
|---|---|---|
| | Inner Dowsing, Race Bank and North Ridge | SCI |

The Inner Dowsing, Race Bank and North Ridge SCI is located off the south Lincolnshire coast in the vicinity of Skegness, extending eastwards and north from Burnham Flats on the North Norfolk coast, occupying the Wash Approaches. Water depths are generally shallow and mostly less than 30m below chart datum. The area encompasses a wide range of sandbank types (banks bordering channels, linear relict banks, sinusoidal banks with distinctive 'comb-like' subsidiary banks) and biogenic reef of the worm *Sabellaria spinulosa*. These features lie almost entirely on the glacial till of the Bolders Bank Formation which is responsible for much of the evident surface topography, especially glacial mounds, channels and hollows. The group of banks within the Wash Approaches are generally between 15 to 20 km long and 1.5 to 3 km wide. They arise from the basal layers by 7 to 12 metres with crest heights generally less than 5m below chart datum. The sedimentary component of the banks is fine to medium sands, predominantly being derived from coastal erosional processes over the last 5,000 years following the last glacial retreat and marine inundation.

The site is exposed to wave and tidal streams and will therefore be naturally adapted to certain levels of natural disturbance. Areas of high mobility are more tolerant to certain pressures and recoverability is generally quicker.

This site is considered to be relatively stable, however due to the natural dynamism of sandbanks, the potential oscillation of sandbanks as a result of hydrodynamic processes, tolerance and recoverability of species will vary.

Abundant *S. spinulosa* agglomerations have consistently been recorded within the boundary. Survey data indicate that reef structures are concentrated in certain areas of the site, with a patchy

distribution of crust-forming aggregations across the site. The main areas of *S. spinulosa* reef are found along the Lincolnshire coast south of Skegness at Lynn Knock and Skegness Middle Ground (south-east part of the site); just north of Docking Shoal bank; and associated with the southern edge of Silver Pit (in the northern part of the site).

This site lies across three administrative areas: 0 to 6 nm offshore, 6 to 12 nm offshore and offshore of 12 nm.

Table 3 shows the high level conservation objective for the site's features and subfeatures.

**Table 3: Designated features and conservation objectives**

| Feature | Subfeature | Fisheries matrix sub feature | Conservation objective |
|---|---|---|---|
| 1110 Sandbanks which are slightly covered by sea water at all times | Low diversity dynamic sand communities | Subtidal sand/subtidal coarse sediment | Maintain or restore to favourable condition |
| | Moderate diversity gravelly muddy sand communities | Subtidal mixed sediments | |
| 1170 Reef | *Sabellaria spinulosa* reefs | *Sabellaria* spp. reef | Maintain or restore to favourable condition |

## 2.1 Sandbanks

Two areas of sandbanks which are slightly covered by water at all times (hereafter 'sandbanks') feature in this site occur inshore of 12 nm. These are the Inner Dowsing sandbank and part of the Race Bank sandbank.

As a result of the potential migration and oscillation of sandbanks over time, Natural England have incorporated within the feature extent a 500 metre margin to ensure that the entire feature is included these margins are displayed in figure 1.

The Natural England and JNCC conservation advice package for this site notes that sandbanks feature consists of two subfeatures:

- Low diversity dynamic sand communities
- Moderate diversity gravelly muddy sand communities

Much of the benthic community on the crest area of sandbanks found within the site is typical of a stressed, mobile sediment area. Communities are characterised by being largely impoverished, with low species abundance and diversity. They tend to be characterised by a few polychaete species (*Nepthys* sp, *Spio* sp, *Glycera* sp, *Eteone* sp and *Phloe* sp) and nemertean worms. Representative communities equate to a number of biotopes including SS.SSa.IFiSa.NcirBat (*Nephtys cirrosa* and *Bathyporeia* spp in infralittoral sand) and SS.SSa.IFiSa.IMoSa (infralittoral mobile clean sand with sparse fauna) (Entec, 2008b).

Examples of gravelly muddy sand communities can be found in the troughs between sand banks. In more gravelly areas a diverse attached epifauna is present, including bryozoans (for example

*Flustra foliacea*, *Conopeum reticulum* and *Electra pilosa*), sponges, hydroids (*Hydrallmania falcata*, *Tubularia indivisa*) and tube building worms (*Pomatoceros* sp). The tube building amphipod *Ampelisca diadema* is also abundant in some areas. Mobile epifauna include a variety of brittle stars and small crabs as well as pink shrimp (*Pandalus montagui*) and lobster (*Homarus gammarus*). In a number of places mussel (*Mytilus edulis*) density is reasonably high (Entec, 2008b).

Understanding of the precise distribution of the sandbank subfeatures is limited by a lack of data. Natural England has advised that the distribution of EUNIS[1] level 3 subtidal sediments can be used to inform subfeature distribution. The following EUNIS level 3 subtidal sediments exist within the sandbank feature inshore of 12 nm:

- subtidal sand;
- subtidal mixed sediments;
- subtidal coarse sediment.

In particular areas of subtidal mixed sediment within the boundary of the sandbank feature and associated margin may indicate the presence of the 'moderate diversity gravelly muddy sand communities' subfeature.

Biotopes associated with the sandbank sub-features in this site are listed in table 4

**Table 4. Biotopes associated with the sandbank subfeatures**

| Biotope code | Biotope name |
|---|---|
| **Dynamic sand communities** | |
| SS.SSa.IFiSa.NcirBat | *Nephtys cirrosa* and *Bathyporeia* spp. in infralittoral sand |
| SS.SSa.IFISa.IMoSa | Infralittoral mobile clean sand with sparse fauna |
| SS.SCS.ICS.Glap | *Glycera lapidum* in impoverished infralittoral mobile gravel and sand |
| SS.SCS.CCS.PomB | *Pomatoceros triqueter*, *Balanus crenatus* and bryozoan crusts on mobile circalittoral cobbles and pebbles |
| SS.SCS.CCS.MedLumVen | Venerid bivalves in circalittoral coarse sand or gravel |
| SS.Ssa.IMuSa.EcorEns | *Echinocardium cordatum* and *Ensis* spp. in lower shore or shallow sublittoral muddy fine sand |
| SS.Ssa.IFISa.ScupHyd | *Sertularia cupressina* and *Hydrallmania falcata* on tideswept sublittoral sand with cobbles or pebbles |
| SS.SCS.ICS.SLan | Dense *Lanice conchilega* and other polychaetes in tide-swept infralittoral sand and mixed gravelly sand |
| **Gravelly muddy sand communities** | |
| SS.SCS.ICS.SLan | Dense *Lanice conchilega* and other polychaetes in tideswept infralittoral sand and mixed gravelly sand |

[1] The European Nature Information System (EUNIS) habitat classification system is a comprehensive pan-European system to facilitate the harmonised description and collection of data across Europe through the use of criteria for habitat identification. http://eunis.eea.europa.eu/about

| | |
|---|---|
| SS.SCS.ICS.HeloMsim | *Hesionura elongata* and *Microphthalmus similis* with other interstitial polychaetes in infralittoral mobile coarse sand |

## 2.2 Reefs

*S. spinulosa* reefs are an ephemeral subfeature which is subject to constant creation and destruction across its possible range. Identified areas of *S. spinulosa* reef are therefore subject to a higher level of uncertainty than many other habitat features.

In 2013 three areas of *S. spinulosa* reef were identified, which are currently subject to management through an MMO byelaw prohibiting bottom towed gears over these areas. One of these areas lies between the 6-12 nm boundaries and the remaining two areas lie inshore of 6 nm[2].

In July 2015, updated advice from Natural England and the Joint Nature Conservation Committee (JNCC) confirmed areas of additional *S. spinulosa* reef within the site, a significant expansion of the Lynn Knock reef and a new area known as Silver Pit reef (see chart 4). The Lynn Knock area includes areas of mosaic habitat characterised by patchy *S. spinulosa* reef with areas of high and medium reefiness distributed throughout. Natural England and JNCC advised that the area of mosaic habitat is managed in the same manner as the delineated (non-mosaic) *S. spinulosa* reef. This assessment therefore treats both the delineated and mosaic areas of reef as *S. spinulosa* reef.

## 2.3 Scope of this assessment

The geographic scope of this assessment is the portion of the site inshore of 12 nm, except for the portion of the Silver Pit reef inshore of 12 nm.

Assessment of the need for management of fisheries in the site offshore of 12 nm, and over the whole of the Silver Pit reef[3] will be determined in a joint management recommendation in accordance with article 11 of Regulation (EU) 1380/2013[4]. Defra are leading on the development of this joint recommendation in collaboration with the other relevant Member States.

All fishing activity-feature interactions at this site identified as ‘amber’ in the matrix of fisheries gear types and European marine site protected features (hereafter ‘the Matrix’) were considered for inclusion in this assessment. Fishing activity-feature interactions identified as ‘green’ are also assessed if there are in-combination effects with other activities.

Fishing activity-feature interactions identified as ‘red’, for example between demersal towed gear and *S. spinulosa* reef is not considered within this assessment as the Revised Approach to the

[2] The MMO Inner Dowsing, Race Bank and North Ridge European Marine Site (Specified Areas) Bottom Towed Fishing Gear Byelaw www.gov.uk/government/publications/inner-dowsing-race-bank-and-north-ridge-european-marine-site-specified-areas-bottom-towed-fishing-gear-byelaw

[3] The 12 nm limit in this area is subject to movement. As the Silver Pit reef straddles the current 12 nm limit, and MMO byelaws cannot apply offshore of the 12 nm limit, the need for fisheries management for the entire reef will be determined through the offshore process.

[4] Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32013R1380

Management of Commercial Fishing in European Marine Sites[5] indicates that management of this interaction is required as a priority without site level assessment.

Tables 5a and 5b show the fishing activities with amber interactions assessed in the portion of the site inshore of 12 nm. The 'matrix gear type' column shows the categories used in the Matrix. These are matched to the 'aggregated method' categories used in Natural England conservation advice.

**Table 5a: Fishing activities assessed for sandbanks**

| Feature | Matrix Gear Type | Natural England Aggregated Method |
|---|---|---|
| **Sandbanks** | Beam trawl (whitefish) | Demersal trawls |
| | Beam trawl (shrimp) | |
| | Beam trawl (pulse/wing) | |
| | Heavy otter trawl | |
| | Multi-rig trawls | |
| | Light otter trawl | |
| | Pair trawl | |
| | Towed gear (demersal/pelagic) | |
| | Anchor seine | Demersal seine |
| | Scottish/fly seine | |
| | Scallops | Dredges |
| | Mussels, clams, oysters | |
| | Pump scoop (cockles, clams) | |
| | Suction (cockles) | Hydraulic dredges |
| | Pots/creels (crustacea/gastropods) | Traps |
| | Cuttle pots | |
| | Fish traps | |
| | Gill nets | Anchored nets[6] |
| | Trammels | |
| | Entangling | |
| | Drift nets (demersal) | |
| | Beach seines/ring nets | Shore-based activities |
| | Shrimp push nets | |
| | Fyke and stake nets | |
| | Bait dragging | |

**Table 5b: Fishing activities assessed for *Sabellaria spinulosa* reef**

| Subfeature | Matrix Gear Type | Natural England Aggregated Method |
|---|---|---|
| ***S. spinulosa* reefs** | Gill nets | Anchored nets and lines |
| | Trammels | |

[5]www.gov.uk/government/uploads/system/uploads/attachment_data/file/345970/REVISED_APPROACH_Policy_and_Delivery.pdf

[6] Natural England aggregated method is 'anchored nets and lines' however, as the interactions between lines and sediment sub-features are categorised in the Matrix as either blue or green for sedimentary features, the term 'anchored nets' is used when considering gears impacting the sandbank feature. Green interactions are considered in the in-combination assessment in section 4.6.

| | | |
|---|---|---|
| | Entangling | |
| | Drift nets (demersal) | |
| | Longlines (demersal) | |
| | Pots/creels (crustacea/gastropods) | Traps |
| | Cuttle pots | |
| | Fish traps | |
| | Beach seines/ring nets | Shore-based activities |
| | Shrimp push nets | |
| | Fyke and stake nets | |
| | Bait dragging | |
| | Hand working (access from vessel) | |
| | Hand work (access from land) | |
| | Crab tiling | |
| | Digging with forks | |
| | Commercial diving | Diving |

Commercial sea fishing has the potential to vary in nature and intensity over time. This assessment considers a particular range of recent and likely future activity based on activity levels and type as identified in section 4.1.

To ensure that the conservation objectives of the site are not hindered should future activity occur outside of this range, MMO will monitor activity at this site, and will review this assessment should certain conditions be triggered. See section 8 for more information on ongoing monitoring and control at this site.

**Chart 1. Inner Dowsing, Race Bank and North Ridge SCI**

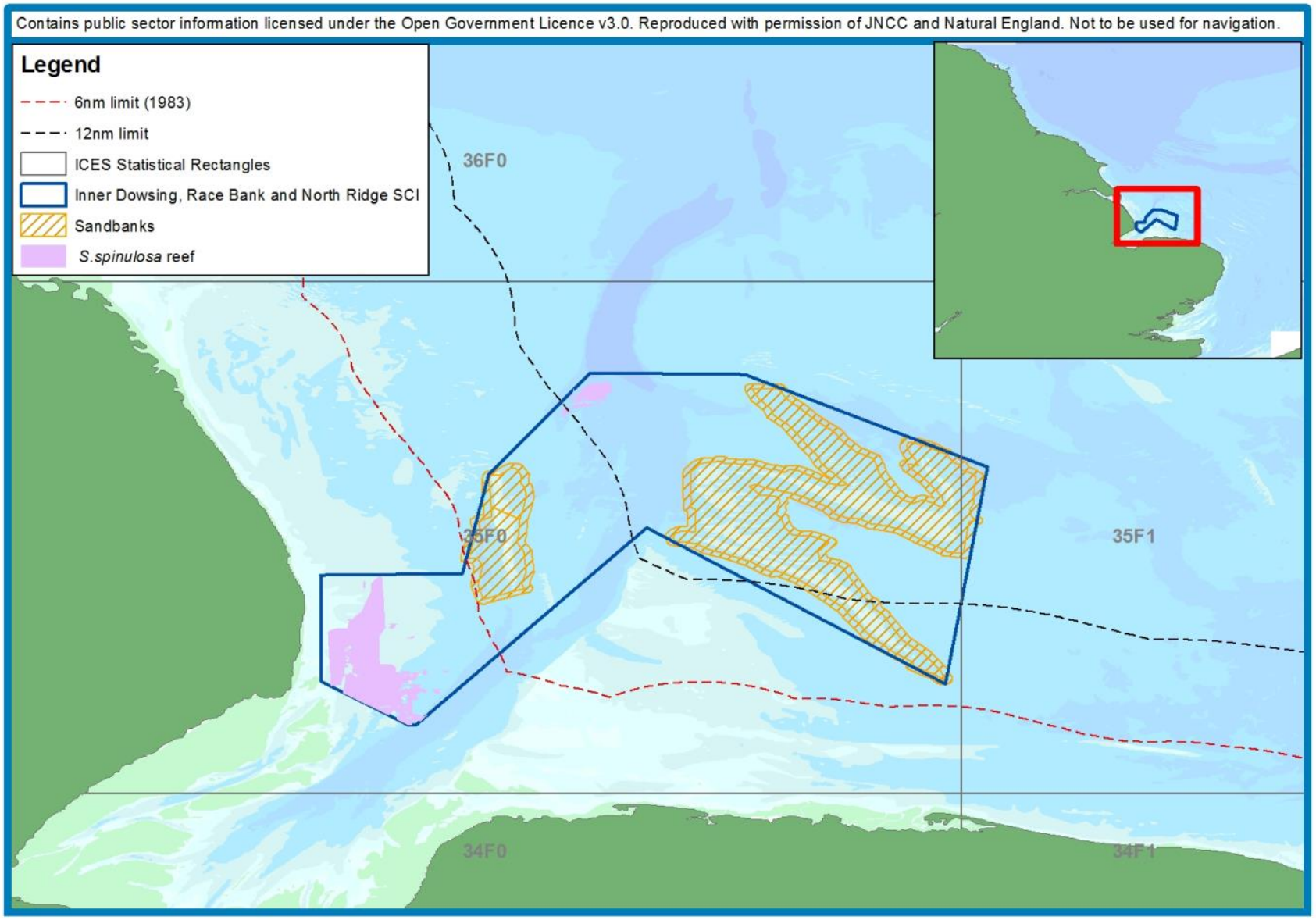


**Chart 2. Inner Dowsing, Race Bank and North Ridge SCI: Sandbanks**

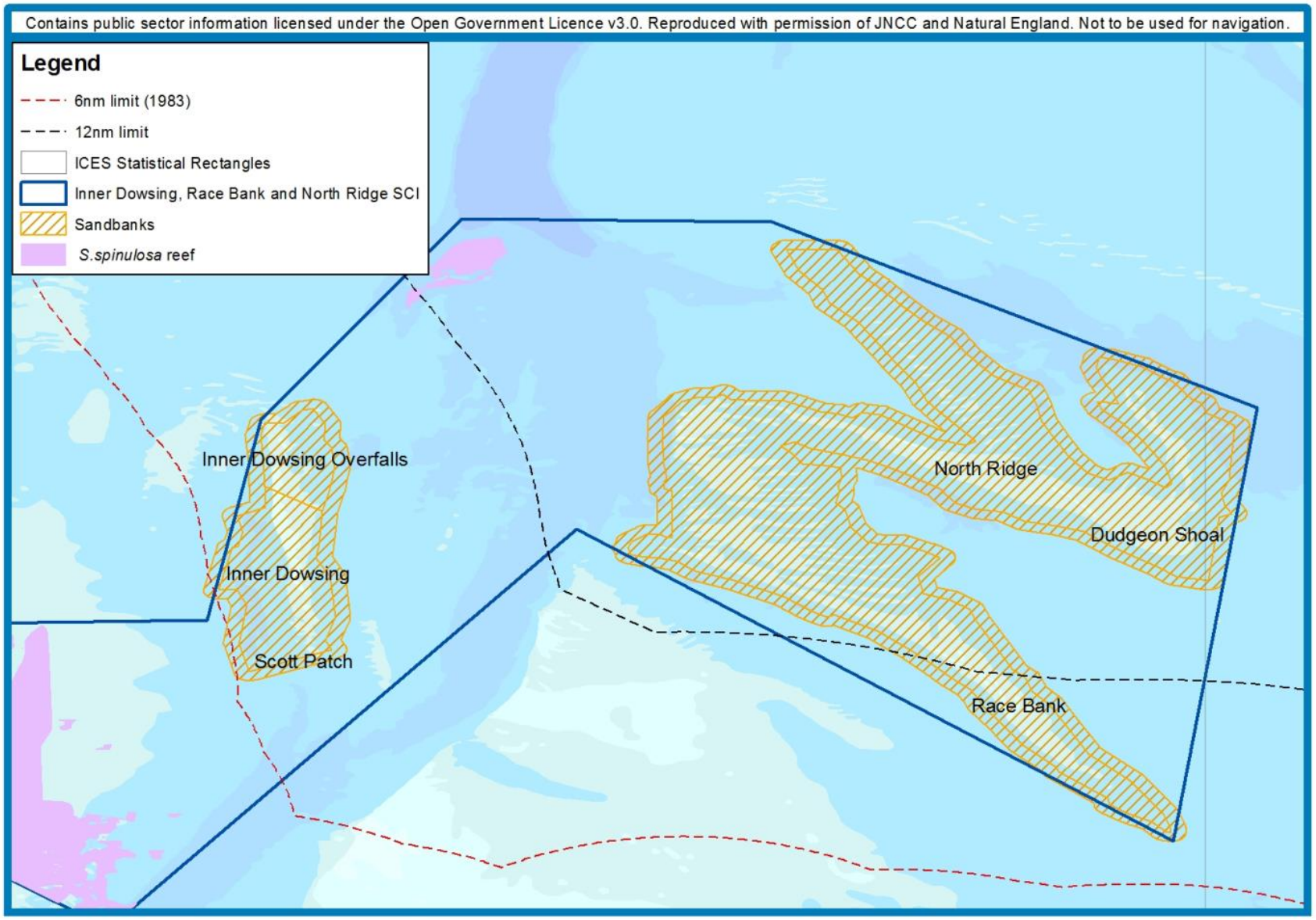


**Chart 3. Inner Dowsing, Race Bank and North Ridge SCI: Sandbank sediments**

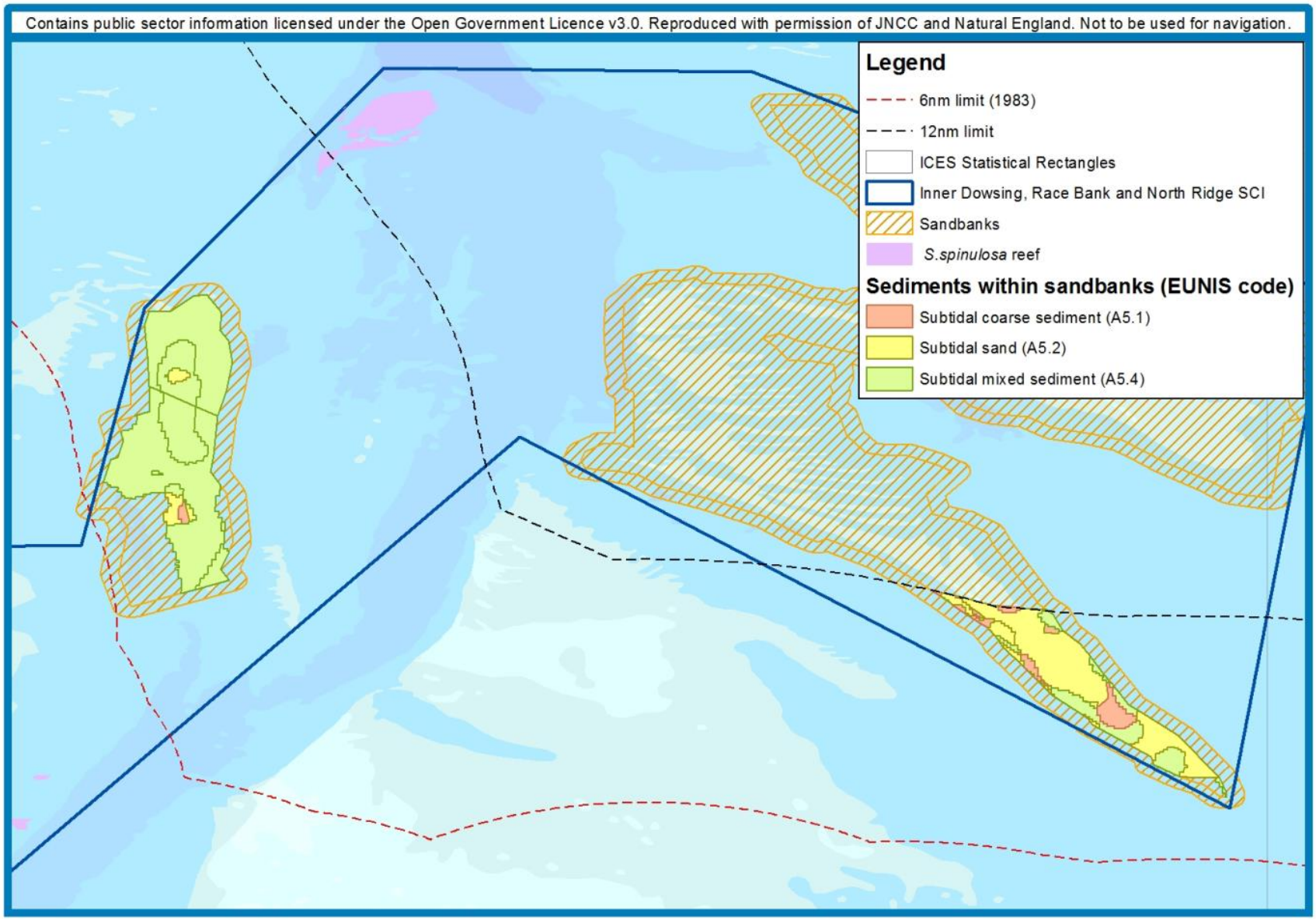
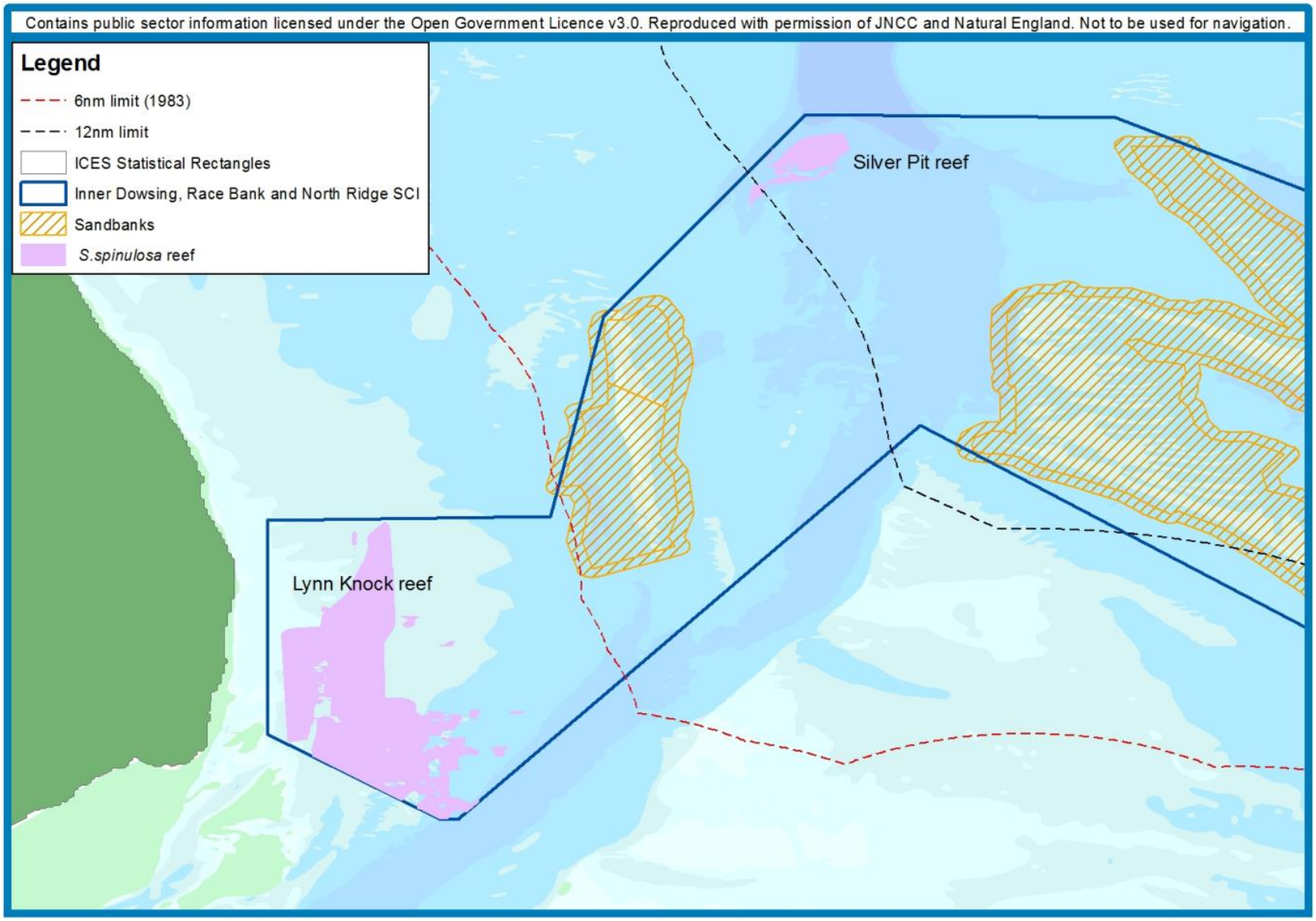


**Chart 4. Inner Dowsing, Race Bank and North Ridge SCI: *Sabellaria spinulosa* reefs**



# 3. Part A Assessment

The most up to date conservation advice package for this site was published in January 2013. To ensure the most up to date information is incorporated into this assessment, conservation advice packages for sites with the same features and more recent conservation advice packages were also used. Table 6 shows the Joint Nature Conservation Committee and Natural England conservation advice package used to inform this assessment.

**Table 6: Advice packages used for assessment**

| Feature | Package | Link |
|---|---|---|
| Sandbanks **and** reef | SCI: Inner Dowsing, Race Bank and North Ridge | http://jncc.defra.gov.uk/pdf/IDRBNR_Reg%2035_Conservation%20Advice_v4.0.pdf |
| Sandbanks | SAC: Essex Estuaries | www.gov.uk/government/publications/marine-conservation-advice-for-special-area-of-conservation-essex-estuaries-uk0013690 |
| | SCI: Margate and Long Sands | www.gov.uk/government/publications/marine-conservation-advice-for-site-of-community-importance-margate-and-long-sands-uk0030371 |
| Reef (*S. spinulosa* reefs) | MCZ: Folkestone Pomerania | www.gov.uk/government/publications/conservation-advice-for-marine-conservation-zone-folkestone-pomerania-bs114 |

Part A of this assessment was carried out in a manner that is consistent with the likely significant effect test required by article 6(3) of the Habitats Directive[7].

For each fishing activity, a series of questions were asked[8]:

1. Does the activity take place, or is it likely to take place in the future?
2. What are the potential pressures exerted by the activity on the feature?
3. Are the effects/impacts of the pressures likely to be significant?

For each activity assessed in Part A, there were two possible outcomes for each identified pressure-feature interaction:

The pressure-feature interactions were not included for assessment in Part B if:

1. the feature is not exposed to the pressure, and is not likely to be in the future; or
2. the effect/impact of the pressure is not likely to be significant.

The pressure-feature interactions were included for assessment in Part B if:

1. the feature is exposed to the pressure, or is likely to be in the future; and
2. the potential scale or magnitude of any effect is likely to be significant; or
3. it is not possible to determine whether the magnitude of any effect is likely to be significant.

[7] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN

[8] The test for likely significant effect under article 6(3) of the Habitats Directive is not required for activities which are directly connected to or necessary to the management of the site. Fishing activities are considered to be not directly connected to or necessary to the management of the site unless otherwise indicated.

## 3.1 Activities not taking place

Table 7 shows activities which are excluded from further assessment as they do not take place and are not likely to take place in the future.

**Table 7: Activities not taking place and not likely to take place in the future**

| Feature | Matrix activity | Justification |
|---|---|---|
| Sandbanks **and** reef | Pair trawl | Does not occur at this site – there are no landings recorded for these gear types in ICES rectangle 35F0 (2009-2014) |
| | Anchor seine | |
| | Scottish/fly seine | |
| | Cuttle pots | Does not occur at this site |
| | Fish traps | Does not occur at this site |
| | Beach seine/ring nets | Inner dowsing is at least 1 km off shore and not subject to shore based activities. |
| | Shrimp push nets | |
| | Fyke and stake nets | |
| | Handworking (vessel/ land access) | |
| | Crab tiling | |
| | Digging with forks | |
| | Bait dragging | Bait dragging does not take place in the UK outside of Poole Harbour. |
| | Heavy otter trawl | Ground conditions are not suitable for heavy otter trawling |
| | Pump scoop (cockles, clams) | Does not occur at this site |
| | Suction (cockles) | Does not occur at this site |
| | Commercial diving | Does not occur at this site |

## 3.2 Potential pressures exerted by the activities on the feature

For the remaining activities, potential pressures were identified using the Natural England conservation advice packages identified in tables 5a and 5b and associated advice on operations tables. All pressures identified other than those categorised as ‘not relevant’ were included.

Tables 8a and 8b show the potential pressures identified.

**Table 8a: Potential pressures on sandbank**

| Feature | Aggregated method | Potential pressures |
|---|---|---|
| Sandbanks | Traps **and** anchored nets | Abrasion/disturbance of the substrate on the surface of the seabed |
| | | Deoxygenation |
| | | Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC. |
| | | Introduction or spread of non-indigenous species |
| | | Litter |
| | | Organic enrichment |
| | | Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion |

| | | |
|---|---|---|
| | | Removal of target species |
| | | Removal of non-target species |
| | | Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC. |
| | | Transition elements & organo-metal (eg TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC. |
| | Demersal trawls **and** dredges | Abrasion/disturbance of the substrate on the surface of the seabed |
| | | Changes in suspended solids (water clarity) |
| | | Deoxygenation |
| | | Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC. |
| | | Introduction or spread of non-indigenous species |
| | | Litter |
| | | Nutrient enrichment |
| | | Organic enrichment |
| | | Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion |
| | | Physical change (to another seabed type) |
| | | Removal of target species |
| | | Removal of non-target species |
| | | Siltation rate changes (Low), including smothering (depth of vertical sediment overburden) |
| | | Synthetic compound contamination (including pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC. |
| | | Transition elements & organo-metal (eg TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC. |
| | Dredges | Introduction of microbial pathogens |

**Table 8b: Potential pressures on *Sabellaria spinulosa* reef**

| Feature | Aggregated method | Potential pressures |
|---|---|---|
| ***Sabellaria spinulosa* reef** | Traps **and** anchored nets/lines | Abrasion/disturbance of the substrate on the surface of the seabed |
| | | Deoxygenation |
| | | Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC. |
| | | Introduction or spread of non-indigenous species |
| | | Litter |
| | | Organic enrichment |
| | | Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion |

| | | |
|---|---|---|
| | | Removal of non-target species |
| | | Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC. |
| | | Transition elements & organo-metal (eg TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC. |

## 3.3 Significance of effects/impacts

To determine whether each potential effect or impact is likely to be significant, the sensitivity assessments and risk profiling of pressures from the advice on operations section of the Natural England conservation advice packages were used.

Tables 9a and 9b identify the pressures from particular gears which are likely to have a significant effect on each feature. Where a pressure from a particular gear is identified as not likely to have a significant effect, justification is provided. Features with similar sensitivities have been considered together.

To ensure the effects of fishing activities in-combination with other activities (including other fishing activities) are fully assessed the pressures from amber activities which are not likely to cause a significant effect but which do interact with the feature are identified in table 17.

These pressures are considered in the in-combination aspect of the part B assessment (section 4.4).

**Table 9a: Summary of pressures from specific activities on sandbank taken to Part B**

| Potential pressures | Demersal Trawl | | | | | Dredges | | Traps | Anchored nets | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TBB | TBS | TBP | MRT | OTL | SD | SMD | FPO | GN | GTR | EN | GND |
| Abrasion/disturbance of seabed surface substrate | LSE - The pressure can result from surface disturbance caused by contact between the gear/anchors and the sea bed. | | | | | | | | | | | |
| Changes in suspended solids (water clarity) | LSE - may result from physical disturbance of the sediment with hydrodynamic action caused by the passage of towed gear, leading to entrainment and suspension of substrate around gear components. | | | | | | | No LSE – interaction with the seabed is minor and will create localised changes in sediment which will disperse quickly. | | | | |
| Deoxygenation | No LSE – Discards are not spatially concentrated at this site and it is not an area of low flow so the conditions for localised hypoxia and anoxia of the sea bed are not present. | | | | | | | | | | | |
| Hydrocarbon & PAH contamination | No LSE – Deliberate releases are already prohibited. Accidental discharges from fishing vessels leading to significant releases are extremely rare. | | | | | | | | | | | |
| Introduction or spread of non-indigenous species | No LSE – Ballast water is the principle source of invasive species in coastal freshwater and marine ecosystems[9]. Fishing vessels less than 45 metres length must have permanent ballast and thus this vector is not available.[10] | | | | | | | | | | | |
| Litter | No LSE – There are no restrictions on water movement so litter will not accumulate at the site, instead will move out of the site with the prevailing currents. | | | | | | | | | | | |
| Nutrient enrichment | No LSE – Inner dowsing is subject to strong tides and currents and nutrients will be moved out of the area quickly. | | | | | | | | | | | |
| Organic enrichment | | | | | | | | | | | | |
| Penetration/ abrasion/ disturbance of seabed sub-surface substrate | LSE - Gears are designed to interact with the seabed. | | | | | | | LSE – Anchors may penetrate the seabed. | | | | |
| Physical change (to another seabed type) | No LSE – These gears are used on sandbank which will remain as sandy substrates after fishing has occurred. | | | | | | | | | | | |
| Removal of target species | LSE – Fishing gears will removal target and non-target species. | | | | | | | | | | | |

[9] Drake & Lodge 2004
[10] www.gov.uk/government/uploads/system/uploads/attachment_data/file/441098/MGN_501_Combined.pdf

<table>
<tr><td>Potential pressures</td><td colspan="5">Demersal Trawl</td><td colspan="2">Dredges</td><td>Traps</td><td colspan="4">Anchored nets</td></tr>
<tr><td></td><td>TBB</td><td>TBS</td><td>TBP</td><td>MRT</td><td>OTL</td><td>SD</td><td>SMD</td><td>FPO</td><td>GN</td><td>GTR</td><td>EN</td><td>GND</td></tr>
<tr><td>Removal of non-target species</td><td colspan="12"></td></tr>
<tr><td>Siltation rate changes (low), including smothering</td><td colspan="7">LSE - may result from physical disturbance of the sediment with hydrodynamic action caused by the passage of towed gear, leading to entrainment and suspension of substrate around gear components.</td><td colspan="5">No LSE – interaction with the seabed is minor and will create localised changes in sediment which will disperse quickly.</td></tr>
<tr><td>Synthetic compound contamination</td><td colspan="12" rowspan="2">No LSE – Potential source is from vessel hull antifouling treatments. TBT has been banned on vessels under 25m since 1987. Copper wash can enter the marine environment but due to the strong tidal currents at this site, they are not likely to accumulate here.</td></tr>
<tr><td>Transition elements & organo-metal (eg TBT) contamination</td></tr>
<tr><td>Introduction of microbial pathogens</td><td colspan="12">No LSE – This is not a shellfish production area.</td></tr>
</table>

Legend: TBB – Beam trawl (whitefish), TBS – Beam trawl (shrimp), TBP – Beam trawl (pulse), MRT – Multi rig trawl, OTL – Light otter trawl, SD – Scallop dredge, SMD – Seed mussel dredge, FPO – Pots/creels (crustacean/gastropods), GN – Gill nets, GTR – Trammel nets, EN – Entangling nets, GND – Drift nets (demersal)

**Table 9b: Summary of pressures from specific activities on *Sabellaria spinulosa* reefs taken to Part B**

| Potential pressures | Traps | Anchored nets/lines | | | | |
|---|---|---|---|---|---|---|
| | Pots/creels (crustacean/gastropods) | Gill nets | Trammels | Entangling | Drift nets (demersal) | Longlines (demersal) |
| Abrasion/disturbance of seabed surface substrate | LSE - The pressure can result from surface disturbance caused by contact between the gear/anchors and the sea bed. | | | | | |
| Deoxygenation | No LSE – Discards are not spatially concentrated at this site and it is not an area of low flow so the conditions for localised hypoxia and anoxia of the sea bed are not present. | | | | | |
| Hydrocarbon & PAH contamination. | No LSE – Deliberate releases are already prohibited. Accidental discharges from fishing vessels leading to significant releases are extremely rare. | | | | | |
| Introduction or spread of non-indigenous species | No LSE – Ballast water is the principle source of invasive species in coastal freshwater and marine ecosystems[11]. Fishing vessels less than 45 metres length must have permanent ballast and thus this vector is not available.[12] | | | | | |
| Litter | No LSE – There are no restrictions on water movement so litter will not accumulate at the site, instead will move out of the site with the prevailing currents. | | | | | |
| Organic enrichment | No LSE – Inner dowsing is subject to strong tides and currents and nutrients will be moved out of the area quickly. | | | | | |
| Penetration, abrasion or disturbance of seabed sub-surface substrate | No LSE - The risk of this is primarily from vessel anchors, but due to the size of vessels fishing in Inner Dowsing a significant impact is not likely | | | | | |
| Removal of non-target species | LSE - All gears have the potential to catch non-target species | | | | | |
| Synthetic compound contamination | No LSE – Potential source is from vessel hull antifouling treatments. TBT has been banned on vessels under 25m since 1987. Copper wash can enter the marine environment but due to the strong tidal currents at this site, they are not likely to accumulate here. | | | | | |
| Transition elements & organo-metal (eg TBT) contamination | | | | | | |

[11] Drake & Lodge 2004
[12] www.gov.uk/government/uploads/system/uploads/attachment_data/file/441098/MGN_501_Combined.pdf

# 4. Part B Assessment

Part B of this assessment was carried out in a manner that is consistent with the appropriate assessment required by article 6(3) of the Habitats Directive.

Tables 10a and 10b show the fishing activities and pressures included for assessment in part B. Pressures with similar potential impacts to a particular feature were grouped to save repetition during this assessment.

**Table 10a: Fishing activities and pressures included for Part B for sandbank**

| Natural England Aggregated Method | Fishing gear type | Pressures |
|---|---|---|
| Traps | Pots/creels (crustacean/gastropods) | • Abrasion/disturbance of seabed surface substrate<br>• Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion<br>• Removal of target species<br>• Removal of non-target species |
| Anchored nets | Gill nets | |
| | Trammel nets | |
| | Entangling nets | |
| | Drift nets (demersal) | |
| Demersal Trawl | Beam trawl (whitefish) | • Abrasion/disturbance of seabed surface substrate<br>• Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion<br>• Removal of target species<br>• Removal of non-target species<br>• Changes in suspended solids (water clarity)<br>• Siltation rate changes (low), including smothering. |
| | Beam trawl (shrimp) | |
| | Beam trawl (pulse/wing) | |
| | Multi-rig trawls | |
| | Light otter trawl | |
| Dredges | Scallop dredge | |
| | Seed mussel dredge | |

**Table 10b: Fishing activities and pressures included for Part B for *S. spinulosa* reefs**

| Natural England Aggregated Method | Fishing gear type | Pressures |
|---|---|---|
| Traps | Pots/creels (crustacean/gastropods) | • Abrasion/disturbance of seabed surface substrate<br>• Removal of non-target species |
| Anchored nets/lines | Gill nets | |
| | Trammel nets | |
| | Entangling nets | |
| | Drift nets (demersal) | |
| | Longlines (demersal) | |

The important targets for favourable condition were identified within the Natural England conservation advice package for this site. ‘Important’ in this context means only those targets

relating to attributes that will most efficiently and directly help to define condition. These attributes should be clearly capable of identifying a change in condition.

Tables 11a and 11b show which targets were identified as important. The impacts of pressures on features were assessed against these targets to determine whether the activities causing the pressures are compatible with the site's conservation objectives.

**Table 11a: Favourable condition targets for identified pressures for sandbanks**

| Attribute | Target | Importance/justification |
|---|---|---|
| Extent of sandbanks | No decrease in extent from established baseline, subject to natural change. | Pressures identified in Part A Assessment will not affect the extent of the sandbank. |
| Topography of sandbanks | No alteration in topography of the sandbanks, subject to natural change. | Pressures identified in Part A Assessment will not affect the topography. |
| Sedimentary character | Maintain distribution of dynamic and stable sand and mixed sediments subject to natural change. Average particle size analysis parameters should not deviate significantly from the baseline established for the sites, subject to natural change. | Pressures identified in Part A Assessment will not affect sedimentary character. |
| Distribution of subfeatures and biotopes | Maintain the distribution of subtidal sandbank communities, subject to natural change. | Pressures identified in Part A Assessment could affect the distribution of communities. |
| Species composition of representative or notable biotopes | No decline in biotope quality as a result of reduction in species richness or loss of species of ecological importance, subject to natural change. | Pressures identified in Part A Assessment could affect the composition of biotopes. |
| Species population measures | Maintain age/size class structure of individual species | Species are not yet specified. |

**Table 11b: Favourable condition targets for identified pressures for reefs**

| Attribute | Target | Importance/justification |
|---|---|---|
| Extent of reef | No reduction in extent of reef, subject to natural change. | Extent of *S. spinulosa* reef could be affected by abrasion/disturbance of seabed surface substrate. |
| Species composition of representative or notable biotopes/Age structure | Reef shows no significant decline in community with different growth phases present, subject to natural change. | Pressures identified in Part A Assessment could affect species composition or age structure of representative/notable biotopes. |
| Presence and/or abundance of individual species | No decline in abundance of specified species from an established baseline, subject to natural change. | Suitable species list yet to be established. |
| Species population methods | Maintain age/size class structure of individual species, subject to natural change. | Pressures identified in Part A Assessment could affect age size/class of *S. spinulosa* worms. |

## 4.1 Existing and ongoing fisheries management

### 4.1.1 Fisheries access/existing management

**Fisheries access**

UK vessels operate throughout the site. There is no access for vessels from other Member States within the portion of the site inshore of 12 nm.

**MMO byelaws**

The use of bottom towed fishing gear over several areas of *S. spinulosa* reef has been prohibited since January 2013 by the MMO Inner Dowsing, Race Bank and North Ridge European Marine Site (Specified Area) Bottom Towed Fishing Gear Byelaw[13] (see chart 5).

**Eastern IFCA byelaws**

Several Eastern IFCA byelaws apply to the portion of the site inshore of 6 nm:

Byelaw 3 – Molluscan Shellfish Methods of Fishing
Byelaw 4 – Mussels (*Mytilus edulis*) – minimum sizes
Byelaw 5 – Prohibition on use of edible crab (*Cancer pagurus*) for bait
Byelaw 6 – Berried (egg-bearing) or soft shelled crab (*Cancer pagurus*) or Lobster (*Homarus gammarus*)
Byelaw 7 – Parts of shellfish
Byelaw 8 – Temporary closure of shellfish fisheries[14]
Byelaw 9 – Redepositing of shellfish
Byelaw 10 – Whitefooted edible crab (*Cancer pagurus*)
Byelaw 11 – Development of shellfish fisheries
Byelaw 14 – Prohibition on the removal of tope or part(s) thereof
Byelaw 15 – Towed Gear restrictions for bivalve molluscs

The most relevant Eastern IFCA byelaw to this assessment is 'Byelaw 15 - Towed Gear restrictions for bivalve molluscs' which prohibits the use of vessels over 14 metres length to dredge for bivalve molluscs throughout the Eastern IFC District (including the portion of this site inshore of 6 nm).

### 4.1.2 Proposed management offshore of 12 nm

Management of fishing required in the part of the site offshore of 12 nm, and over the whole of the Silver Pit reef will be implemented through a joint recommendation in accordance with article 11 of Regulation (EU) 1380/2013[15]. Defra are leading on the development of this joint recommendation

[13] www.gov.uk/government/publications/inner-dowsing-race-bank-and-north-ridge-european-marine-site-specified-areas-bottom-towed-fishing-gear-byelaw
[14] Eastern IFCA does not currently have any closures in place within the site at present
[15] Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32013R1380

in collaboration with the other relevant Member States and plan to submit a joint recommendation to the European Commission in 2017.

## 4.2 Fishing activity description

### 4.2.1 Fisheries evidence sources

To determine the levels of fishing activity, the following evidence sources were used:

- vessel monitoring system (VMS) data
- fisheries landings data (logbooks and sales records)
- Fishermap data (Natural England 2012)
- collated fisheries sightings data from MMO and IFCA compliance monitoring (Vanstaed & Breen 2014, Defra project MB0117)
- expert opinion from MMO marine officers and inshore fisheries and conservation officers
- stakeholder mapping arranged by Eastern IFCA

Table 12 summarises the description, strengths and limitations of some of the evidence sources used. For more information about the evidence sources used, please see appendix 1: MMO methodology.

## Chart 5. MMO 2013 prohibition of bottom towed gear byelaw areas

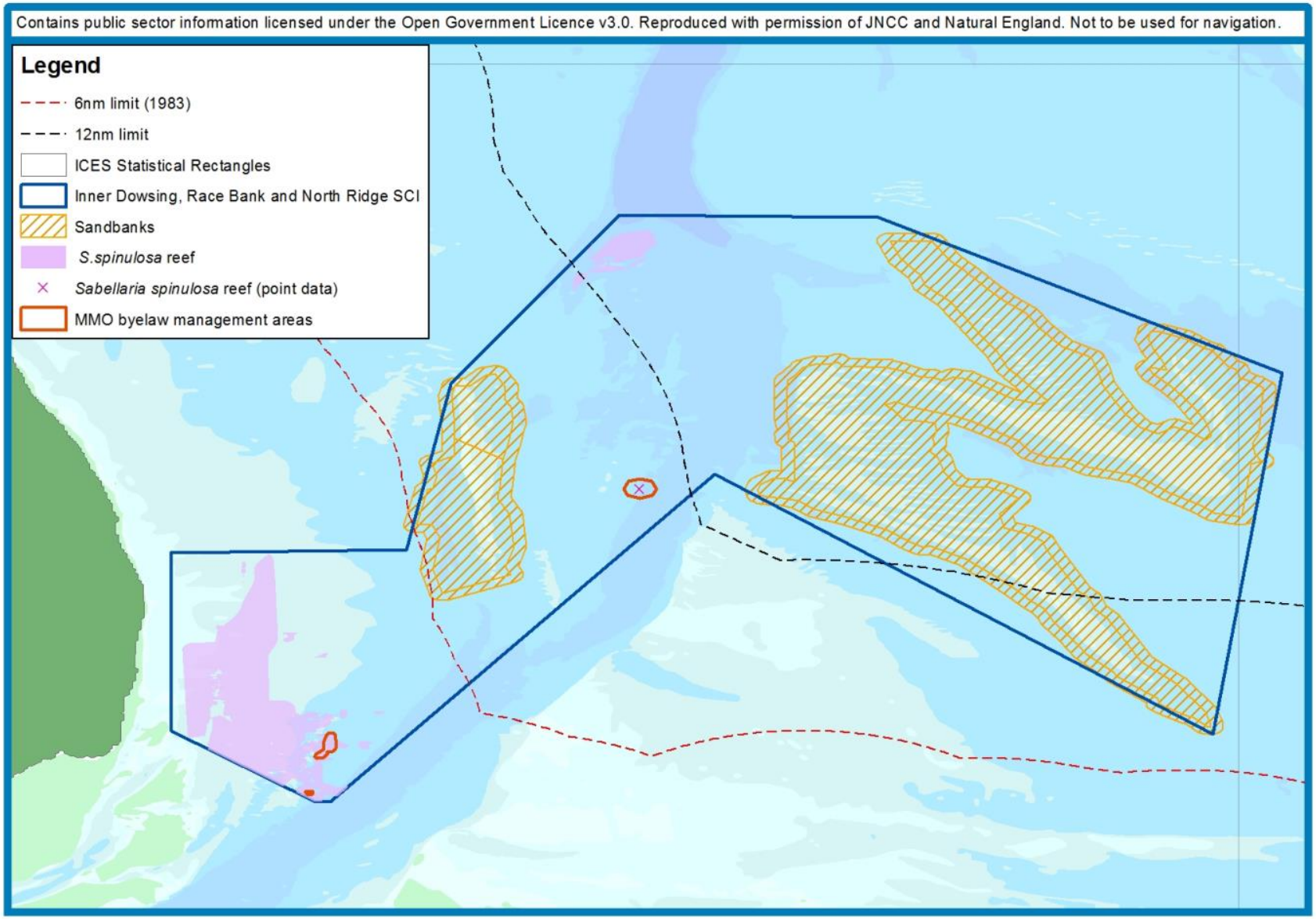


**Table 12: Summary of generic confidence associated with fishing activity evidence**

| Evidence source | Confidence | Description, strengths and limitation |
|---|---|---|
| VMS data | High / Moderate | • Confidence in VMS is high for describing activity relating to larger vessels (>15m). But VMS information was not developed specifically for management of MPAs, and does not describe activity in smaller vessels.<br>• There are assumptions in the processing that speed of greater than 0 knots and less than or equal to 6 knots is indicative of fishing.<br>• VMS records the location, date, time, speed and course of the vessel. Fishing gear information has to be linked to the VMS data itself by matching its logbook information where possible, using the fleet register which may not be up to date or local marine officer knowledge of the said vessel. |
| Fishermap | Low | • The data were collected in 2012 and are therefore relatively dated.<br>• A condition of the research was that only those interviewees who explicitly gave permission for their data to be shared would have their own mapping represented in the final product shared with third parties. This equated to approximately 50% of responses. |
| Sightings data (MB0117) | Moderate | • Based on recent work to describe fishing activity, but are limited by raw data and other limitations highlighted in the report. |
| Stakeholder mapping | Moderate | • Developed at Eastern IFCA workshops. A potential weakness is that fishers may not always accurately report areas fished. |
| Expert judgement | Low / Moderate | • This depends on the area, and the knowledge of the area from MMO and IFCA staff. |

Vessels which carry VMS in this site accounted for on average 7% of the quantity of landings from this ICES rectangle from 2009 to 2014, meaning that VMS data do not represent the majority of the activity at the site. Other data sources including Fishermap data, collated sightings data, stakeholder maps and expert judgement have therefore been used to understand the activity of non-VMS vessels.

Landings data used in this assessment are from the years 2009 to 2014 from ICES rectangle 35F0 (see chart 1). Data from ICES rectangle 35F1 were excluded because this rectangle accounts for a very small proportion of the site and does not include any of the areas of feature subject to this assessment.

Inner Dowsing, Race Bank and North Ridge SCI covers 84.5 $km^2$ constituting 31.24 % of the sea area of ICES rectangle 35F0 and a minimal portion of the area of ICES rectangle 35F1.

### 4.2.2 Description of fishing gears used

The main fishing gears used in the site are traps, anchored nets and lines, demersal trawls and dredges. Information on the type of fishing activities and gears used in the site were derived from expert opinion from Eastern IFCA and MMO officers unless otherwise indicated.

**Traps**

The main pots used for crab and lobster in this area are parlour pots and for whelks are inkwell pots. An anchor is fixed to each end of a string of pots to ensure contact with the seabed. A back rope connects the pots (Grieve et al 2014). Potting in this area targets crab, lobster and whelks. Vessels potting in this area predominantly land into Wells-next-the-Sea.

**Anchored nets and lines: Gill nets, entangling nets, trammel nets, demersal drift nets**

These nets are set on the seabed by either weights or anchors and are generally heavier than those set on longlines. The gill net has a leadline in order to hold it on the seabed and is held vertical by a floatline. These nets are generally set up to 2 kilometres wide (Grieve et al 2014).

**Anchored nets and lines: Demersal longlines**

The main lines of demersal longlines are attached to 2 buoys and can be up to a few miles long (Grieve et al 2014). Attached to the mainline are anchors at each end and snood lines every few metres or so, with a baited hook.

**Demersal trawls**

Beam trawl nets are kept open by a beam which varies in length from 4 to 12 metres depending on the size of the vessel. Trawl heads support the beam and are fitted with sole plates which are constantly in touch with the seabed during fishing. Tickler chains or chain matrices are used depending on the ground; therefore the weight of the gear varies (Grieve et al 2014). The main beam trawling fishery that occurs in this area is for brown (*Crangon crangon*) and pink (*Pandalus montagui*) shrimp. The gear used tends to be lighter than other beam trawlers with light rollers and no tickler chains with a variety of single and twin beamed vessels.

**Pulse trawls**

Pulse trawls are a semi-pelagic beam trawl which uses electric currents to flush target species out of the benthos. Since 2007 up to 5 % of a Member State's beam trawl fleet can register to use pulse trawls in parts of the Southern North Sea including the Inner Dowsing, Race Bank and North Ridge SCI. Twelve UK vessels registered to use pulse gear in 2011. None of these vessels fish within this site.

**Dredges**

The only fishing dredging activity taking place in this area is mussel seed dredging, most commonly using the "Baird" dredge design, consisting of a steel frame, supporting a bag made from chain links, wire mesh or heavy netting and fitted with a scraper blade or a row of teeth attached to the front of the frame. Mussel seed dredging takes place within the site infrequently, due to the transient nature of mussel seed beds, and occurs around one week per year.

**4.2.3 VMS data**

VMS data (annex 2a-f) indicate very low volumes of fishing activity over the sandbanks. The majority of the UK VMS data in the site is derived from the portions of the site inshore of 6 nm or offshore of 12 nm. However, the majority of fishing effort is unlikely to be represented by VMS data at this site.

VMS data do not show any potting or netting activity around the *S. spinulosa* reef point data within the 6 to 12 nm section of the site, although there were some VMS reports which could not be associated with a particular fishing gear.

There is VMS activity on the Lynn Knock reef area inshore of 6 nm. MMO and Eastern IFCA expert opinion and information from the fishing industry indicate that this is likely to be shrimp beam trawlers. Landings records indicate that 18 of the 19 vessels which pot in the area are less than 15 metres in length therefore are not required to use VMS. This is also predominantly the case for netting and longline fishing. Other evidence sources (Fishermap data, collated sightings data, expert opinion and stakeholder mapping) have therefore been used to understand the distribution and levels of fishing within the site.

### 4.2.4 Landings

The majority of vessels fishing within ICES rectangle 35F0 land into four ports: Grimsby, Boston, Kings Lynn and Wells-next-the-Sea. Tables 13 and 14 show summaries of the live weight of landings reported from ICES rectangle 35F0. Given the low proportion of landings in this site attributable to VMS vessels, the heterogeneity of the fisheries within ICES rectangle 35F0 (including northern parts of the Wash, inshore shallow sediment habitats and deeper offshore areas), and the relatively small areas of feature, landings data have not been estimated for the features. Based on expert opinion, stakeholder information and ICES level landings date, the majority landings from demersal towed gears within the site are believed to be from shrimp trawls.

**Table 13. Landings by gear group from ICES 35F0**

| | Gear group | Within ICES Rectangle 35F0 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Annual average |
| Quantity landed (tonnes) | Demersal towed | 618 | 556 | 746 | 1358 | 974 | 1,040 | 882 |
| | Nets | 0 | 0.6 | 0.4 | 0 | 0 | 0.2 | 0.2 |
| | Pots | 577 | 689 | 513 | 488 | 630 | 689 | 597 |
| | Lines | 5 | 7 | 1.2 | 1.3 | 1.6 | 7 | 3.8 |
| | Pelagic | 0 | 0 | 0 | 0 | 42 | 0 | 7 |
| | Misc | 0 | 1,944 | 0 | 0 | 1643 | 1829 | 579 |
| | Total | 1,200 | 1,255 | 1,261 | 1,847 | 3,290 | 3,565 | 2,069 |

**Table 14. Landings by species group from ICES 35F0**

| | Species group | Within ICES Rectangle 35F0 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Annual average |
| Quantity landed (tonnes) | Crustacean | 905 | 869 | 501 | 648 | 667 | 389 | 663 |
| | Demersal | 40 | 11 | 20 | 3.3 | 2.2 | 12 | 15 |
| | Mollusc | 255 | 375 | 741 | 1,195 | 2,579 | 3,164 | 1,385 |
| | Pelagic | <0.1 | <0.1 | <0.1 | <0.1 | 42 | <0.1 | 7.1 |
| | Total | 1,200 | 1,255 | 1,261 | 1,847 | 3,290 | 3,565 | 2069 |

### 4.2.5 Sightings

The collated sightings data show very little overlap between any sighted fishing activity and the sandbanks or *S. spinulosa* reefs (annexes 2l-o). This could be because there was no fishing activity, or because of low levels of sampling effort in these areas.

### 4.2.6 Fishermap

Fishermap data indicates that the majority of the demersal towed gear fishing activity takes place inshore of 6 nm limit (annex 2g) and an area to the south east of the Inner Dowsing sandbank.

There is some demersal towed gear activity on the sandbanks inshore of 12 nm; the number of demersal towed gear fishing vessel visits for the various sandbank areas is shown in table 15.

**Table 15: Number of fishing vessel visits per year over each of the sandbank areas within the 6 - 12nm limit by gear type**[16]

| Sandbank | Number of fishing vessel visits per year by gear type | |
|---|---|---|
| | Demersal trawls | Dredges |
| Inner Dowsing Overfalls | 31 - 70 | 11 - 30 |
| Inner Dowsing | 41 – 100 | 21 - 90 |
| Scott Patch | 51 – 150 | 21 - 90 |
| Race Bank | 41 – 50 | 0 |

The potting Fishermap data (annex 2i) indicate that potting operates throughout the whole site, with the most intensive potting occurring in three areas: inshore of 6nm, adjacent and south east of the Lynn Knock *S. spinulosa* reef; an area east of the Inner Dowsing sandbank; around the portion of the Race Bank sandbank inshore of 12 nm. Potting activity occurs predominantly from April to September.

The netting Fishermap data (annex 2j) indicate that netting takes place predominantly in two areas: throughout the area inshore of 6 nm; and another patch straddling the 12nm limit to the east of the Inner Dowsing sandbank. The ranges indicated show low levels of visits by netting vessels. Activity is generally evenly spread throughout the year.

The lining Fishermap data (annex 2k) indicate that use of lined gears takes place predominantly in three areas: to the east of, and possibly including the eastern edges of, the Inner Dowsing sandbank; the Race Bank sandbank and the western part of the Lynn Knock reef. Activity is spread evenly throughout the year.

Table 16 shows the number of static gear visits over the areas of *S. spinulosa* reef.

**Table 16: Number of under 15 metre fishing vessel visits per year over each of the reef areas by gear type and Fishermap grid cell**[17]

| *S. spinulosa* reef | Number of fishing vessel visits per year by gear type | | |
|---|---|---|---|
| | Pots | Lines | Nets |

[16] As these areas fall over a number of grid cells the highest number of visits has been recorded.
[17] As these areas fall over a number of grid cells the highest number of visits has been recorded..

| | | | |
|---|---|---|---|
| Lynn Knock (inshore of 6 nm) | 71-80 | 31-40 | 1-20 |
| Reef point data (between 6 and 12 nm) | 41-80 | 11-30 | 11-30 |

### 4.2.7 Expert Opinion

Expert opinion indicated that the only shellfish dredging taking place within the site is occasional mussel seed prospecting, which can occur sporadically around the optimal period for relaying mussel seed in late summer. This fishery is small scale and generally will only occur one week of the year. The mussel seed beds if not fished will naturally be lost through predation or storm damage. This fishery resource has not been found in this site since 2012.

Expert opinion also indicated that there is limited whitefish beam trawling between the 6 nm and 12 nm limits. There is the potential for this activity to increase in the future due to implementation of the demersal landings obligation which may result in fishermen with a category C fishing vessel licence to diversify into bottom towed gears. This option is currently being considered and changes are not expected until 2017 at the earliest. Changes to fishing vessel licence conditions, or fisheries legislation, that result in changes to fishing activity relevant to this assessment will trigger a review of this assessment.

Eastern IFCA expert opinion also indicated that there are 7 under 10 metre beam trawlers targeting brown shrimp (*C. crangon*) which occasionally fish within this site and 4 vessels that prospect for mussel seed, however this takes place very rarely due to the several years' absence of mussel seed. Fishing activity within this site has also been limited by the development of the Inner Dowsing, Lynn and Lincs windfarms within the part of the site inshore of 6 nm [map of windfarms to be added].

Expert opinion indicated that within the site there are no more than 6 under 10 metre potting vessels which regularly pot for crab and lobster on and around the 6 nm limit adjacent to the Inner Dowsing sandbank and 4 additional vessels which fish occasionally. There are 7 whelk potters which fish regularly and 7 occasionally.

Expert opinion indicated that that potters do not target areas of *S. spinulosa* reefs. However, interaction may occur either through storm movement of pots or unintentional interaction due to the ephemeral nature of the feature.

Expert opinion indicated that the main netting fishery is gill netting which occurs occasionally in winter (depending on weather). There are six under 10 metre vessels fishing with long lines which work around the Inner Dowsing sandbank area in winter targeting cod.

### 4.2.8 Stakeholder mapping

Eastern IFCA has undertaken several fisheries stakeholder mapping workshops to determine the location and nature of key fisheries within and around the Eastern IFC District[18].

[18] www.eastern-ifca.gov.uk/index.php?option=com_content&view=article&id=130&Itemid=199

The outputs of the mapping workshops indicated that crustacea (crab or lobster) potting does not occur on the Inner Dowsing sandbank, but takes place all year round on the Race Bank sandbank.

Crustacea potting may also take place on the south eastern tip of the Lynn Knock reef, and over the reef area between 6 and 12 nm identified by point data (annex 2p).

Outputs from whelk fishery stakeholder mapping indicated that whelk potting did not appear to interact with the sandbank or reef areas, although it may interact with the reef area between the 6 and 12 nm area identified by point data (annex 2q). Eastern IFCA manages the whelk fishery inshore of 6 nm through a permit system. Approximately 20% of fishers who fish in the Eastern IFC District contributed the data used to create these maps therefore they are of limited confidence. However the maps created are corroborated by expert opinion from Eastern IFCA and MMO officers.

Beam trawling for shrimp tends to be seasonal, although some vessels work shrimp all year round depending on stock availability. From 2009-2014 there were fewer than 10 shrimp beam trawl vessels working in ICES rectangle 35F0, with the majority of fishing effort occurring inshore of 6 nm (mainly for brown shrimp).

The brown shrimp (*C. crangon*) fishery does not appear to overlap with any of the site features (annex 2r). The pink shrimp (*P. montagui*) overlaps with the Lynn Knock reef (this interaction is not subject to assessment – see section 2.3) and potentially with the southern fringes of the Inner Dowsing sandbank. The pink shrimp fishery has declined since 2011 and the current fishing effort is low and restricted to areas of deeper water outside of the sandbank areas. The shrimp fisheries in this area use light beam trawl gear which has a lower impact on seabed features than whitefish beam trawls.

### 4.2.9 Spatial footprint

Analysis was undertaken of the total spatial footprint of fishing gear used each year. The total spatial footprint of a particular gear group was then compared to the total area of the feature, producing a ratio (p). A p value of less than 1 means that the total spatial footprint of the gear in a given year was smaller than the total area of the feature. A p value of more than one means that the total spatial footprint of the gear in a given year was greater than the total area of the feature. The spatial footprint analysis used in this assessment is based on report commissioned by Defra's Impact Evidence Group on the feasibility of using a spatial footprint method in appropriate assessments[19] (report reference: MMO1108).

Estimates of the p values for VMS vessels using relevant fishing gears over sandbanks within 12 nm are displayed in table 17. Not enough information was available about non-VMS vessels to generate p values. The assumptions used when calculating footprints are displayed in annex 3.

**Table 17: Spatial footprint values for VMS vessels on sandbank**

[19] MARG Ltd in association with Envision Mapping Ltd, 2015

| | Dredges | Demersal trawls | Pots | Anchored nets |
|---|---|---|---|---|
| 2009 | 0 | 0.0377 | 0 | 0 |
| 2010 | 0 | 0.2619 | 0 | 0 |
| 2011 | 0.01 | 0.0415 | <0.0001 | 0.0001 |
| 2012 | 0 | 0.0639 | 0 | 0 |
| 2013 | 0 | 0.0087 | 0 | 0 |
| 2014 | 0 | 0.1561 | 0 | 0 |

The range of p values for demersal trawls over sandbank (0.0087-0.2619) indicate that if fishing were distributed homogenously throughout the feature, each part of sandbank would interact with demersal trawls fishing gear between approximately once every 4 to 100 years. Interactions between the other gears would occur less frequently.

Estimates of p values for static gears over *S. spinulosa* reef resulted in p values of less than 0.001 in each year.

It is likely to that certain parts of the site are likely to be subject to more frequent levels of fishing. It also should be noted that this only represents the activity of vessels with VMS which are likely to represent a small proportion of the fishing activity at the site. P values must also be treated with a high degree of caution as they rely on numerous assumptions about size and behaviour of gear, and frequency of use.

## 4.3 Summary of fishing activity on features

Individually, the fisheries evidence sources used in this assessment each suffer from limitations for example in terms of fleet coverage, confidence and age. However, when considered together they provide a consistent picture of mostly low levels of fishing activity in and around the sandbanks and *S. spinulosa* reefs of the Inner Dowsing, Race Bank and North Ridge SCI.

The main interaction between fishing activities and the features of the site appears to be bottom towed gears over the Lynn Knock *S. spinulosa* reef, as shown by VMS data (annex 2a-f), Fishermap data (annex 2x) and stakeholder mapping of shrimp grounds (annex 2x). This is not considered within this assessment as the Revised Approach to the Management of Commercial Fishing in European Marine Sites[20] indicates that management of this interaction is required as a priority without site level assessment.

Other interactions indicated by the evidence sources available include low levels of demersal towed gear activity on Inner Dowsing and Race Bank sandbanks indicated by VMS and Fishermap data, and netting and potting on Lynn Knock indicated by Fishermap data.

## 4.4 Assessment of impacts of fishing on sandbanks

[20]www.gov.uk/government/uploads/system/uploads/attachment_data/file/345970/REVISED_APPROACH_Policy_and_Delivery.pdf

### 4.4.1 Sensitivity of subfeatures

Natural England and JNCC have advised that the two sandbank subfeatures vary in terms of relative sensitivity. The ‘moderate diversity gravelly muddy sand communities’ (represented by the mixed sediments EUNIS habitat), containing a wider diversity of epifauna and being more sensitive to pressures associated with fishing than ‘low diversity dynamic sand communities’ (represented by the more mobile ‘subtidal sand’ and ‘subtidal coarse sediment’ EUNIS habitats) (see Appendix 2: Advice to the MMO on the use of the Joint Nature Conservation Committee’s and Natural England's evidence and conservation advice for protecting designated features in Inner Dowsing, Race Bank and North Ridge cSAC.).

The subtidal sediments in this site are either of low or moderate species richness. One of the biotopes present contains venerid bivalves (SS.SCS.CCS.MedLumVen: venerid bivalves in circalittoral coarse sand or gravel), which may indicate a higher sensitivity to abrasion and physical disturbance (Hall et al 2008) as the venerid family is large and contains some long-lived species. However, at this site the biotope is found within areas of dynamic sand communities, and therefore is likely to contain more robust and recoverable species of the venerid family. The Marine Life Information Network (MarLIN) has assessed this habitat as having a low level of sensitivity to abrasion and physical disturbance due to high recovery rates (Rayment 2001).

Chart 3 identifies that the Inner Dowsing sandbank consists predominantly of mixed sediments and the section of the Race Bank sandbank between the 6 and 12nm limits consists predominantly of subtidal sands. It should be noted that due to the use of habitat proxies to indicate subfeatures, confidence in actual sub-feature extent is low.

### 4.4.2 Physical damage (abrasion/disturbance and penetration)

The pressures ‘abrasion/disturbance of seabed surface substrate’ and ‘penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion’ are considered together here due to the similarities in the nature of the pressures, and the evidence available to assess impacts.

Abrasion/disturbance and penetration of seabed surface substrate can damage sedimentary habitats by direct damage to infauna and epifauna, particularly in more stable sediments where organisms tend to be more adapted to a lower energy environment and therefore longer-lived, less resilient to sediment movement and direct abrasion and have lower rates of recoverability (Tilin et al 2010).

**Traps and anchored nets**

Abrasion from static gears (traps and anchored nets) is possible through the interaction between the seabed and the gear itself (ie pots and nets) and associated lines and anchors. This is particularly during hauling of gear or when the gear is subject to strong tides, currents or storm activity, although these environmental considerations will also tend to increase the background ‘natural’ level of disturbance which may decrease the relative impact of the fishing activities.

There is limited direct evidence of the impacts of static gears on subtidal sediments. However Hall et al (2008) reported that all static gears are not considered to be a ‘major concern’ for subtidal

sediments and estimated no or low sensitivity to all but heavy[21] levels of fishing intensity on stable species rich sediments or sand and gravel with long-lived bivalves.

Given the low levels of sensitivity of subtidal sandbanks at this site to abrasion and disturbance, and the low levels of static gear fishing activity on the sandbank features, MMO has ascertained that traps and anchored nets are not causing an adverse effect on the integrity of the site.

**Demersal trawls**

As it is pulled across the seabed, various parts of demersal trawl can cause abrasion or disturbance of the seabed surface substrate. For beam trawlers the main effects are from the 'shoes' or 'sleds', which in the largest vessels can penetrate the seabed up to 6 cm. For otter trawls the otter boards/doors can penetrate the sediment between 0.7 – 1.9cm depending on the width of gear), and the footrope, ground rope and bridles may also come into contact with the seabed (Grieve et al 2011.

If rockhoppers (wheels attached to the front of the trawl to help it bounce over obstacles) or tickler chains (chains which flush organisms out of the sediment into the trawl) are used, these can also impact the seabed, penetrating up to 2.2cm (Tilin et al 2010, Grieve et al 2011).

The effects of demersal trawling on sedimentary habitats can vary depending on site conditions (eg wave/tidal energy) with low mobility sediments being more sensitive due to the more developed epifauna and infauna (Hall et al 2008, Lambert et al 2014). Evidence on the impacts of towed gears varies depending on the gear type. Demersal trawling in the site is predominantly beam trawling for shrimp, which uses lighter gear than whitefish beam trawls and does not use tickler chains.

Hall et al (2008) determined sensitivies of different sediment types to types of demersal towed gears at different levels of activity. Based on the available evidence, it is demersal towed gear activity on the sandbank features falls into the 'low' level.

At this low level of activity, both unstable coarse sediments with robust fauna and species rich mixed sediments had low levels of sensitivity to shrimp trawling. Unstable coarse sediments with robust fauna were also reported to have low sensitivity to other kinds of demersal towed gear, however species rich mixed sediment were reported to have medium sensitivity to other demersal towed gear. Given that the more sensitive sandbank sub-feature at this site is classed as having moderate diversity, it is likely that its sensitivity falls between these two.

Kaiser et al (2006) undertook a meta-analysis of 101 fishing impact manipulations and reported that beam trawling resulted in an immediate 70% reduction on benthic fauna of subtidal sand (based on 2 studies providing 53 data points). However by 2 to 7 days after the fishing event, no change was detectable (based on one study with 8 data points). Similarly, muddy sand was found to experience a 35% reduction in benthic fauna immediately following beam trawling (based on two studies providing 61 data points), although this effect had disappeared after one week (based

[21] Quantitative fishing intensity levels used are published in Hall et al 2008. Heavy potting intensity was defined as 'more than 5 pots lifted per hectare per day'.

on one study providing 2 data points). An immediate reduction in benthic fauna in gravel sediments of around 40% was also reported (two studies providing 28 data points), although this was not statistically significant. There were no longer-term studies available for gravel sediments.

Kaiser et al (1998) reported that beam trawling on high mobility sand in greater than 30 metres depth was found to have no detectable effect on benthic infauna 24 hours after fishing or when the feature was assessed 6 months later.

**Dredges**

The potential for abrasion and disturbance from dredging is due to mussel prospecting for seed mussel (*Mytilus edulis*). Mussel seed beds are ephemeral therefore mussel prospecting can occur sporadically around the optimal period for relaying in late summer. This fishery is small scale and generally will only occur one week of the year. If not fished, the mussel seed beds will naturally be lost through predation or storm damage.

Dredging for molluscs can impact suspended sediment and result in surface and shallow abrasion. Mussel prospecting is a non-licensable activity and will only require a consent to land the fishery or to relay the mussel seed on to prospective aquaculture beds. The potential for this fishery to occur is limited to late summer as this is the optimal time for successful transportation of seed. It is not envisaged that this scale or magnitude of this potential fishery will have a significant effect on the site however; this potential activity will be monitored in the site. Mussel seed prospecting depends on the recruitment of mussel seed and tends to be less of an impact than scallop dredging (Hall et al 2008).

**Summary of abrasion/disturbance and penetration assessment**

Demersal towed gears (trawls and dredges) clearly have the potential to affect the distribution and ecological richness of subtidal sediments. These effects appear to be significant only at higher levels of activity or in relatively stable and species rich habitats. At this site, the levels of this type of fishing activity on the sandbank feature are low (as assessed by VMS data, sightings and stakeholder derived data) and the sandbank feature is characterised by mobile sediments and low or moderate species richness. Therefore, abrasion/disturbance and penetration from traps, nets, demersal trawling or dredging is not having an adverse effect at this site.

**Table 18: Abrasion/disturbance and penetration assessment**

| Pressure | Feature | Favourable condition target | Activity | Capable of affecting the feature? | Will the conservation objectives be hindered? |
|---|---|---|---|---|---|
| Abrasion/ disturbance of the substrate on the surface of the seabed<br><br>and | Sandbank | Maintain the distribution of subtidal sandbank communities, subject to natural change. | Traps | Yes | No |
| | | | Nets | Yes | No |
| | | | Demersal Trawl | Yes | No |
| | | | Dredges | Yes | No |
| | | No decline in | Traps | Yes | No |

| | | | | | |
|---|---|---|---|---|---|
| penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion | | biotope quality as a result of reduction in species richness or loss of species of ecological importance, subject to natural change. | Nets | Yes | No |
| | | | Demersal Trawl | Yes | No |
| | | | Dredges | Yes | No |

### 4.4.3 Removal of target and non-target species

The pressures 'removal of target species' and 'removal of non-target species' have been assessed together here. Fishing gears are designed to remove (target) species from the marine environment, and may also remove by-catch (non-target) species, depending on the gear, methods used and ecological makeup of the fishery.

**Traps and anchored nets**

Traps in this area target crustacea (the species with the largest quantities of landings for ICES rectangle 35F0 from 2009 to 2014 were lobsters and crabs) and gastropod molluscs (predominantly whelks). By-catch from crab and lobster pots around the UK is low, with a Marine Stewardship Council report finding that only 1% of total catch (excluding undersize and berried individuals returned to the sea before landing) was made up of by-catch in the crab potting fishery around the Shetland Islands (Hervás et al, 2012).

Anchored nets in this area target bass, cod, pollock, sole and anglerfish. By-catch from anchored nets can include diving seabirds, elasmobranchs (sharks and rays) and cetaceans (Gubbay and Knapman 1999), although this will depend on the type of net, the area used, and the use of acoustic deterrents.

**Demersal trawls and dredges**

The target species for demersal trawls tend to be whitefish (the species with the largest quantities of landings for ICES rectangle 35F0 from 2009 to 2014 were plaice, anglerfish, boarfish, haddock, sandeels, whiting), and nephrops. By-catch from demersal trawls may also remove crabs, lobsters, molluscs and sessile epifauna as by-catch.

Dredges in this area target cockles, mussels and scallops, but also have the potential to remove a variety of infauna (eg venerid bivalves) and epifauna as by-catch.

Much of the evidence and rationale used to assess physical damage (abrasion/disturbance and penetration) by demersal trawls and dredges (section 4.4.2) also applies to removal of non-target species. Most of the studies used to assess the physical damage impacts of these gears assessed changes in species composition and abundance at different levels of activity. None of the evidence sources used reported whether changes observed were as a result of physical damage (ie the organisms were damaged or killed) or removal of non-target species (ie the organisms were taken as by-catch). Therefore this assessment reaches the same conclusions for both pressures.

**Summary of removal of non-target species assessment**

As the species by-caught by traps and anchored nets do not correspond with the infauna and epifauna communities which characterise the sandbank feature at this site, there is no adverse effect on the site.

As described in section 4.4.2, demersal towed gears (trawls and dredges) have the potential to affect the distribution and ecological richness of subtidal sediments. These effects appear to be significant only at higher levels of activity or in relatively stable and species rich habitats. At this site, the levels of this type of fishing activity on the sandbank feature are low (as assessed by VMS data, sightings and stakeholder derived data) and the sandbank feature is characterised by mobile sediments and low or moderate species richness. Therefore, removal of non-target species from traps, anchored nets, demersal trawling or dredging is not having an adverse effect at this site.

**Table 19: Removal of target and non-target species assessment**

| Pressure | Feature | Favourable condition target | Activity | Capable of affecting the feature? | Will the conservation objectives be hindered? |
|---|---|---|---|---|---|
| Removal of target species<br><br>and<br><br>removal of non-target species | Sandbank | Maintain the distribution of subtidal sandbank communities, subject to natural change. | Traps | Yes | No |
| | | | Nets | Yes | No |
| | | | Demersal Trawl | Yes | No |
| | | | Dredges | Yes | No |
| | | No decline in biotope quality as a result of reduction in species richness or loss of species of ecological importance, subject to natural change. | Traps | Yes | No |
| | | | Nets | Yes | No |
| | | | Demersal Trawl | Yes | No |
| | | | Dredges | Yes | No |

### 4.4.4 Siltation rate changes (low) including smothering and changes in suspended solids (water clarity)

Mobile demersal fishing gear (demersal trawls and dredges) are pulled along or through the seabed and can disturb sediments, potentially resulting in increases suspended solids and siltation rates as sediment resettles.

High suspended sediment loads would be unlikely to affect the communities in this area as they are evolved to exist in waters with a high sediment load (JNCC and NE 2013), however increased siltation rates could affect sandbank communities by smothering organisms.

**Demersal trawl and dredges**

The amount of material suspended by demersal towed gear is dependent on the gear being used and the makeup of the sea bed. O'Neill and Summerbell (2011) reported that use of demersal towed gears over coarser sediments may produce a plume similar to background levels of sedimentation.

ABPmer and Ichthys Marine (2015, 2015a) modelled sedimentation levels resulting from the use of demersal towed gears over sedimentary habitats in two sites in the Southern North Sea and estimated that for a sandy sediments with a 20% silt fraction, the amount of sediment mobilised by a beam trawl through hydrodynamic drag equates to a sediment depth of between 3.4 mm and 9.7 mm (average across the gear footprint).

While demersal dredges may mobile more sediment due to increased penetration of the seabed, this will be partly offset but by significantly smaller area of the dredge and slower speed compared to demersal trawls.

Given the very low level of demersal towed fishing activity over the sandbank features, this level of increase in sediment deposition will not affect the sandbank communities at this site, which are already adapted to high levels of sediment deposition.

**Summary of siltation rate and changes in suspended solids assessment**

Dynamic sand communities and gravelly muddy sand communities are relatively high energy habitats, meaning that species will be adapted to high levels of sediment disturbance (JNCC and NE 2013). Given the low levels of fishing using demersal towed gears over the sandbank features in this site, and the estimated levels of sediment suspended by these gears, the effects on the communities will be negligible. Therefore, changes to the siltation rate and suspended sediment levels from demersal trawls and dredges are not having an adverse effect on the site.

**Table 20: Siltation rate changes (low) and water clarity assessment**

| Pressure | Interest feature | Favourable condition target | Activity | Capable of affecting the feature? | Will the conservation objectives be hindered? |
|---|---|---|---|---|---|
| Siltation rate changes (low), including smothering (depth of vertical sediment overburden)<br><br>and<br><br>changes in suspended solids (water clarity) | Sandbank | Maintain the distribution of subtidal sandbank communities, subject to natural change. | Demersal Trawl | Yes | No |
| | | | Dredges | Yes | No |
| | | No decline in biotope quality as a result of reduction in species richness or loss of species of ecological importance, subject to natural change. | Demersal Trawl | Yes | No |
| | | | Dredges | Yes | No |

## 4.5 Assessment of impacts of fishing on *Sabellaria spinulosa* reef

The assessment of sensitivity of S. spinulosa reef draws on several key sources, most importantly Gibb et al (2014), who undertook a review of available evidence to assess the sensitivity of *S.*

*spinulosa* reef to a range of pressures and Walmsley et al (2015) who summarised available evidence for the management of potting impacts on designated features.

### 4.5.1 Abrasion/disturbance of seabed surface substrate

Abrasion/disturbance of the seabed can impact *S. spinulosa* reefs in a number of ways. Physical abrasion can break off or damage parts of the reef, reducing its extent and reducing growth rates. This pressure includes unintentional removal of *S. spinulosa* reef by fishing gears targeting other species.

Abrasion/disturbance of seabed surface substrate may also result in higher sediment loads, which could affect reef formation. However high suspended sediment loads would be unlikely to affect *S. spinulosa* reef as they are evolved to exist in, and are dependent on such conditions to promote reef growth. Therefore, the reef is not considered to be sensitive to changes (increases) in suspended sediments loads (JNCC and NE 2013).

**Traps and anchored nets and lines**

Static gears can damage *S. spinulosa* reef through gear (pots, nets or associated anchors or lines) striking or becoming entangled with the reef. This is most likely on deployment, through movement of gear on the benthos due to tide, current and storm activity, and as the gear is dragged along the seafloor on retrieval (Coleman et al 2013, Grieve 2014).

Walmsley et al (2015) noted that there is no primary evidence on the impact of potting on *S. spinulosa* reef. However sensitivity assessments based on expert knowledge are available. Table 21 shows a summary of the several sensitivity assessments which have considered the sensitivity of *S. spinulosa* to impacts from static gears.

**Table 21. Summary of sensitivity assessments for potting impacts on *S. spinulosa* reef**

| Reference | Summary | Notes |
|---|---|---|
| Eno et al (2013) | Honeycomb-worm (*Sabellaria alveolata*) reefs have medium sensitivity to all levels of potting and to high levels of netting or lining. These reefs have low or no sensitivity to all other levels of netting or lining. | Sensitivity was not assessed for *S. spinulosa* reef. Sensitivity was generated by combining semi-quantitative scores for resilience and recoverability. Quantitative fishing intensity levels were not published. Intensity levels were based on fishing practices around Wales. |
| Hall et al (2008) | Biogenic reef on sediment habitats have medium sensitivity to heavy levels of potting and low sensitivity to all other levels of potting. | Sensitivity was assessed in terms of various factors including degree of physical disturbance, size of area damaged, effect on fauna and community makeup. Fishing intensity levels are quantified in Appendix 3 of the report. |
| Roberts et al (2010) | *S. spinulosa* reefs may be affected by the use of static and | Assessment was based on existing literature. Sensitivity is |

| | | |
|---|---|---|
| | towed fishing gears. | assessed as a combination of resistance and resilience. |
| Tilin et al (2010) | *S. spinulosa* reefs have a low sensitivity to surface abrasion. | Sensitivity assessments were based on a combination of resistance (tolerance) and resilience (recovery). Sensitivities were assessed in terms of pressure benchmarks rather than particular activities. The pressure benchmark for surface abrasion was “damage to seabed surface features”. |

Gibb et al (2014) reviewed the sensitivity of *S. spinulosa* reef to various pressures, including abrasion/disturbance of seabed sediment, however this pressure was not linked directly to static fishing gears. Gibb et al cites studies which show *Sabellaria alveolata* reefs recovered within 23 days from trampling, walking and stamping (Cunningham et al 1984) and within 5 days following being fished over by a shrimp trawl (Voberg 2000).

The impacts of static gears are likely to be less than those of demersal towed gears (even relatively light towed gears such as shrimp beam trawls) and trampling, indicating that recovery from possible damage from pots or nets is likely to take place even more quickly.

However Cunningham et al (1984) also reported that more severe damage caused by kicking and jumping on the reef was still not fully repaired 23 days later. *S. alveolata* reefs may also be less fragile than *S. spinulosa* reefs, meaning the impacts of abrasion/disturbance may be greater to the later.

A variety of fishing activity evidence sources indicated that there is limited use of static gear over the areas of *S. spinulosa* reef at this site (see the charts in annex 2). Expert opinion from Eastern IFCA also indicated that potters are unlikely to target *S. spinulosa* reef areas.

**Summary of abrasion/disturbance of seabed substrate**

Direct evidence for the physical effects of static fishing gear on *S. spinulosa* reef is extremely limited. However sensitivity assessments tend to apply a medium to low sensitivity rating to damage from static fishing gears, although it should be noted that it is not always clear exactly what the implications these different sensitivity ratings are.

Given the assessed sensitivity of *S. spinulosa* reef, the apparent rapid recovery from physical damage from other activities, and the relatively low levels of static gear fishing activity around the reef areas, abrasion/disturbance of seabed substrate from static gears is not having an adverse effect at this site.

**Table 22: Abrasion/disturbance of the substrate on the surface of the seabed**

| Pressure | Feature | Favourable condition target | Gear type | Capable of affecting the | Compatible with the conservation |
|---|---|---|---|---|---|

| | | | | feature? | objectives? |
|---|---|---|---|---|---|
| Abrasion/disturbance of the substrate on the surface of the seabed | Reef (*S. spinulosa reef*) | No reduction in extent of reef, subject to natural change. | Pots | Y | N |
| | | | Nets | Y | N |
| | | | Lines | Y | N |
| | | Reef shows no significant decline in community with different growth phases present, subject to natural change. | Pots | Y | N |
| | | | Nets | Y | N |
| | | | Lines | Y | N |
| | | Maintain age/size class structure of individual species, subject to natural change. | Pots | Y | N |
| | | | Nets | Y | N |
| | | | Lines | Y | N |

### 4.5.2 Removal of non-target species

Removal of non-target species refers to the removal of organisms associated with, and important to, *S. spinulosa* reef, and does not include the direct removal of *S. spinulosa* reef by fishing gears. Direct impacts from fishing gears on *S. spinulosa* reef are assessed in section 4.5.1.

**Traps and anchored nets and lines**

Gibb et al (2014) reported that although evidence for ecological interaction between *S. spinulosa* and other species was limited, there was “no evidence for significant biological effects from the removal of non-target species associated with *S. spinulosa* reef was identified”. There is some evidence that the stabilisation of sediments by the sand mason worm *Lanice conchilega* may facilitate formation of *S. alveolata* reefs. However, *L. conchilega* is very unlikely to be removed by static gears.

Removal of non-target species may in fact be beneficial through removal of predators such as the butterfish *Pholis gunnelis* and dragonet *Asterias rubens* or competitors such as the brittlestar *Ophiothrix gragilis*.

As static fishing gears do not appear to remove species on which are important to *S. spinulosa* reef, Gibb et al (2014) classified *S. spinulosa* reef as not sensitive to removal of non-target species.

**Summary of removal of non-target species assessment**

There is no evidence that the removal of non-target species by static fishing gears has any impact on the condition of *S. spinulosa* reefs. Therefore removal of non-target species by traps and nets is not having an adverse effect on the site.

**Table 23: Removal of non-target species assessment**

| Pressure | Feature | Favourable condition target | Gear type | Capable of affecting the feature? | Will the conservation objectives be hindered? |
|---|---|---|---|---|---|
| Removal of | Reef (*S.* | No reduction in extent of | Pots | Y | N |

| | | | | | |
|---|---|---|---|---|---|
| non-target species | *spinulosa* reef*)* | reef, subject to natural change. | Nets | Y | N |
| | | | Lines | Y | N |
| | | Reef shows no significant decline in community with different growth phases present, subject to natural change. | Pots | Y | N |
| | | | Nets | Y | N |
| | | | Lines | Y | N |
| | | Maintain age/size class structure of individual species, subject to natural change. | Pots | Y | N |
| | | | Nets | Y | N |
| | | | Lines | Y | N |

## 4.6 In combination impacts of other known or potential activities

The effects of activities considered to be compatible with the conservation objectives of the site were also assessed in combination with other relevant activities taking place.

To determine which other activities should be included in this assessment, a 5 square kilometre buffer was applied to the site boundary. Any activities including other fishing activities, marine works licensed by MMO and recreational activities within this area were identified and are detailed in table 24.

**Table 24: Activities considered in combination with fishing activities included in this assessment.**

| Relevant activity | Description | Potential Pressure |
|---|---|---|
| Lincs Wind Farm Ltd | Permit to repair or replacement of inter-array, collector (Lincs only) | A licence condition requires the applicants to undertakedrop-down video monitoring to ensure that these works will not impact on the reef feature.<br><br>Impacts on sandbank features were screened out.<br><br>Low risk of physical loss, damage or biological disturbance. |
| Lincs, Lynn and Inner Dowsing Wind Farms Ltd | Application MLA/2014/00291 and MLA/2014/00292 to permit export cables. | |
| Recreational fishing/angling | Activity levels unknown | Low risk of physical loss, damage or biological disturbance. |
| Scuba diving | Activity levels unknown | Low risk of physical loss, damage or biological disturbance. |
| Demersal longline fishing and commercial diving on sandbank | Low sensitivity of the feature to the activities. | Low risk of physical loss, damage or biological disturbance. |

# 5. Assessment result

## 5.1 Fishing on sandbanks alone

The activities identified as likely to have a significant effect on the sandbank feature of the Inner Dowsing, Race Bank and North Ridge SCI inshore of 12 nautical miles are abrasion/disturbance and penetration to sandbanks from demersal trawls and dredges; removal of non-target species by demersal trawls and dredges, traps and anchored nets; and, changes in siltation rate and suspended sediments by anchored trawls and dredges.

The evidence considered includes a range of empirical evidence on the impacts of fishing activities on comparable marine sediments, as well as a range of fishing activity evidence including several evidence sources for smaller fishing vessels which do not carry VMS.

Several key factors, emerged, most notably the relatively high mobility/instability of sandbank sediments, the moderate/low ecological richness of the sandbank, and the low levels of fishing activity over the sandbanks. Consequently we have concluded that, within the scope of the assessment as outlined in section 2.1, fishing activities on sandbank are not, alone, having an adverse effect on the integrity of the Inner Dowsing, Race Bank and North Ridge SCI in light of the site's conservation objectives.

## 5.2 Fishing on *Sabellaria spinulosa* reef alone

The activities identified as likely to have a significant effect on the *S. spinulosa* reef feature of the Inner Dowsing, Race Bank and North Ridge SCI inshore of 12 nautical miles are abrasion/disturbance of seabed sediment and removal of non-target species from traps and anchored nets.

The evidence considered includes some empirical evidence on the impacts of fishing activities on *S. spinulosa* and other similar (ie *S. alveolata*) reefs and a range of sensitivity assessments on the sensitivity of *S. spinulosa* reefs to relevant fishing activities and pressures. Evidence on impacts of fishing gear on *S. spinulosa* reef is limited, however the evidence available indicates the ability to recover quickly from a certain level physical damage, although recovery to major physical damage may take longer.

Given that *S. spinulosa* reef has been observed to recover quickly from the impacts of light demersal trawling (likely to have a more serious physical impact than static gears), and the picture of limited static gear activity over the *S. spinulosa* reefs in this site, it is likely that S. spinulosa reefs would recover very quickly from physical impacts from static gears. The effect of removal of non-target species by static gears has been excluded as there is no evidence that there is any negative link.

Consequently we have concluded that, within the scope of the assessment as outlined in section 2.1, fishing activities on *S. spinulosa* reef are not, alone, having an adverse effect on the integrity of the Inner Dowsing, Race Bank and North Ridge SCI in light of the site's conservation objectives.

## 5.3 Assessment result in combination

As a result of the limited activity occurring on the sandbank feature and limited sensitivity of the feature to both static and recreational activity, and the nature of other relevant activities, it is concluded that the activities in combination will not adversely affect the site.

# 6. Proposed Management

As no adverse effect is occurring, no management is currently required.

# 7. Review of this assessment

The MMO has concluded that within the scope of the assessment as outlined in section 2.1, the activities assessed are not causing an adverse effect on the integrity of the site.

MMO will review this assessment every 2 years or earlier if significant new information is received. Such information could include:

- updated conservation advice;
- updated advice on the condition of the feature;
- significant increase in activity levels.

To coordinate the collection and analysis of information regarding activity levels, and to ensure that any required management is implemented in a timely manner, a monitoring and control plan will be implemented for this site. This plan will be developed in line with the MMO Monitoring and Control Plan framework.

Monitoring of activity levels will occur through a combination of surface surveillance and ongoing monitoring of VMS and landings data. Should activity levels increase significantly or in a manner that could affect the site features, this will trigger further investigation into the level and distribution of the activity, including consultation with Natural England regarding current site condition. Any subsequent evidence gathered would be used to assess the need for further management measures.

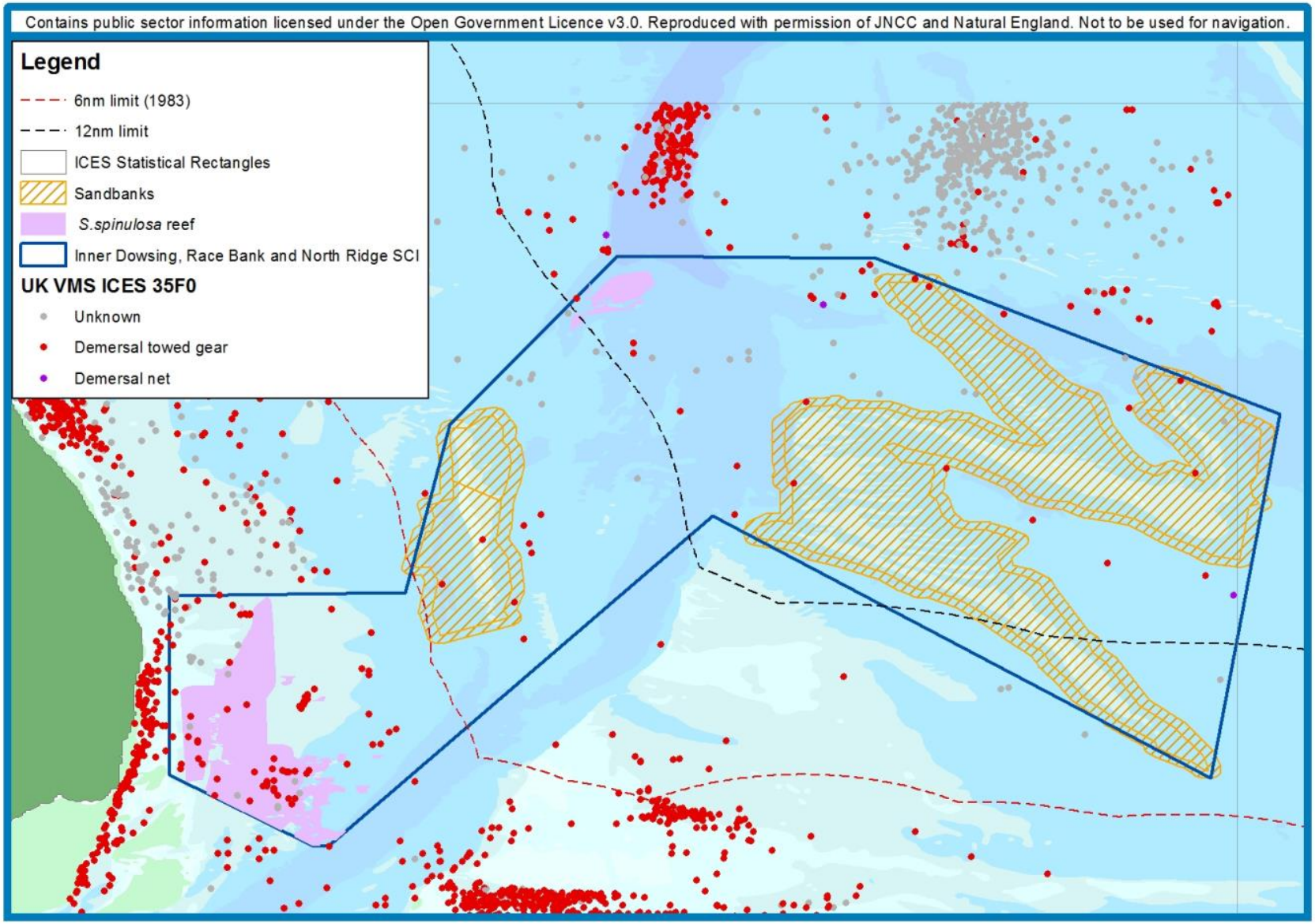
Possible management measures include an MMO emergency byelaw, which can be implemented immediately for up to 12 months, or a (non-emergency) MMO byelaw which would be subject to public consultation before implementation.

An overview of the monitoring and control process is illustrated in Annex 4.

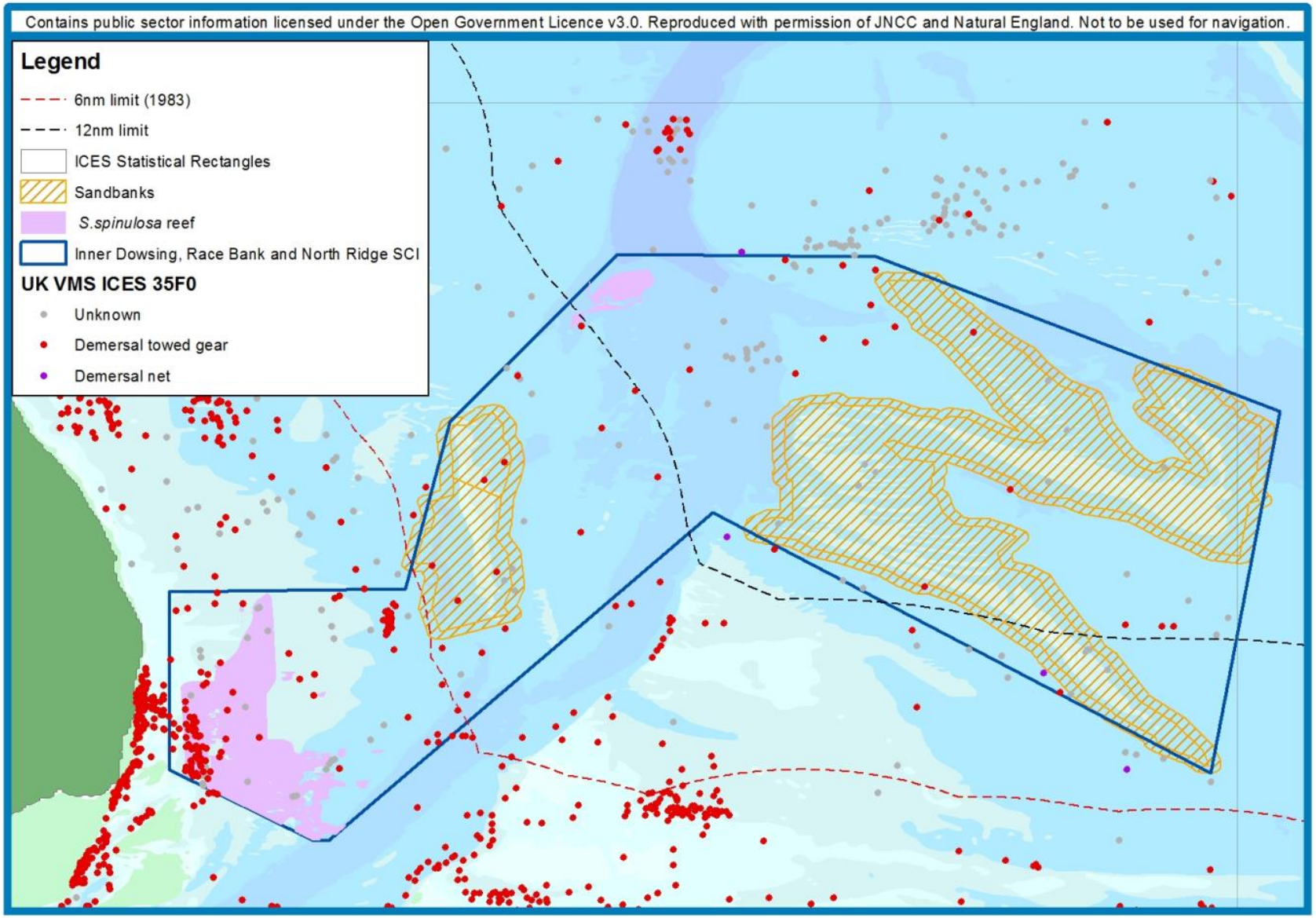
# 8. Conclusion

With having regard to best available evidence and through consultation with relevant advisors, the MMO conclude that the activities assessed are, alone and in-combination, compatible with the conservation objectives of this marine protected area.

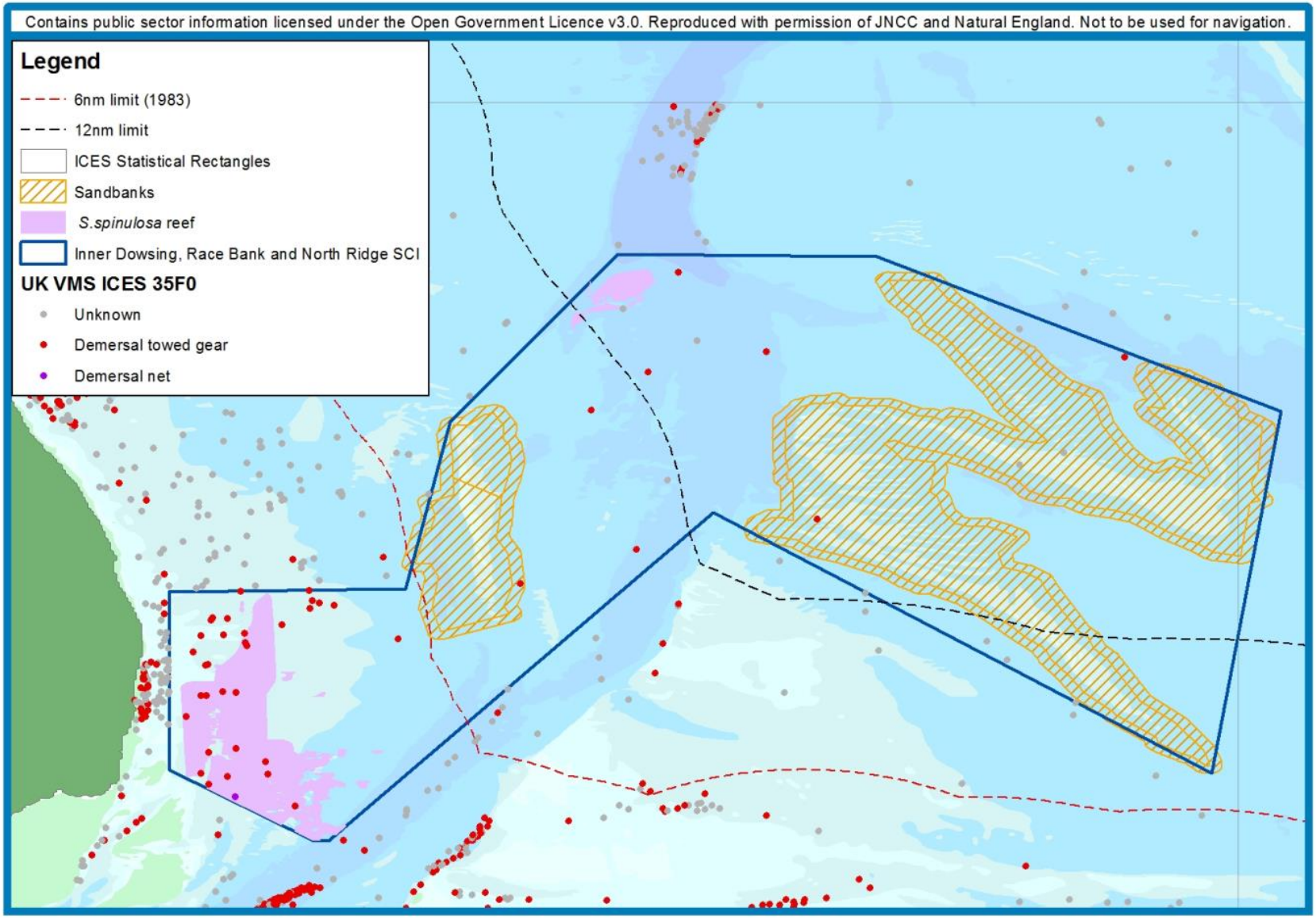
# Annex 2a. Fishing activity data: UK VMS 2009



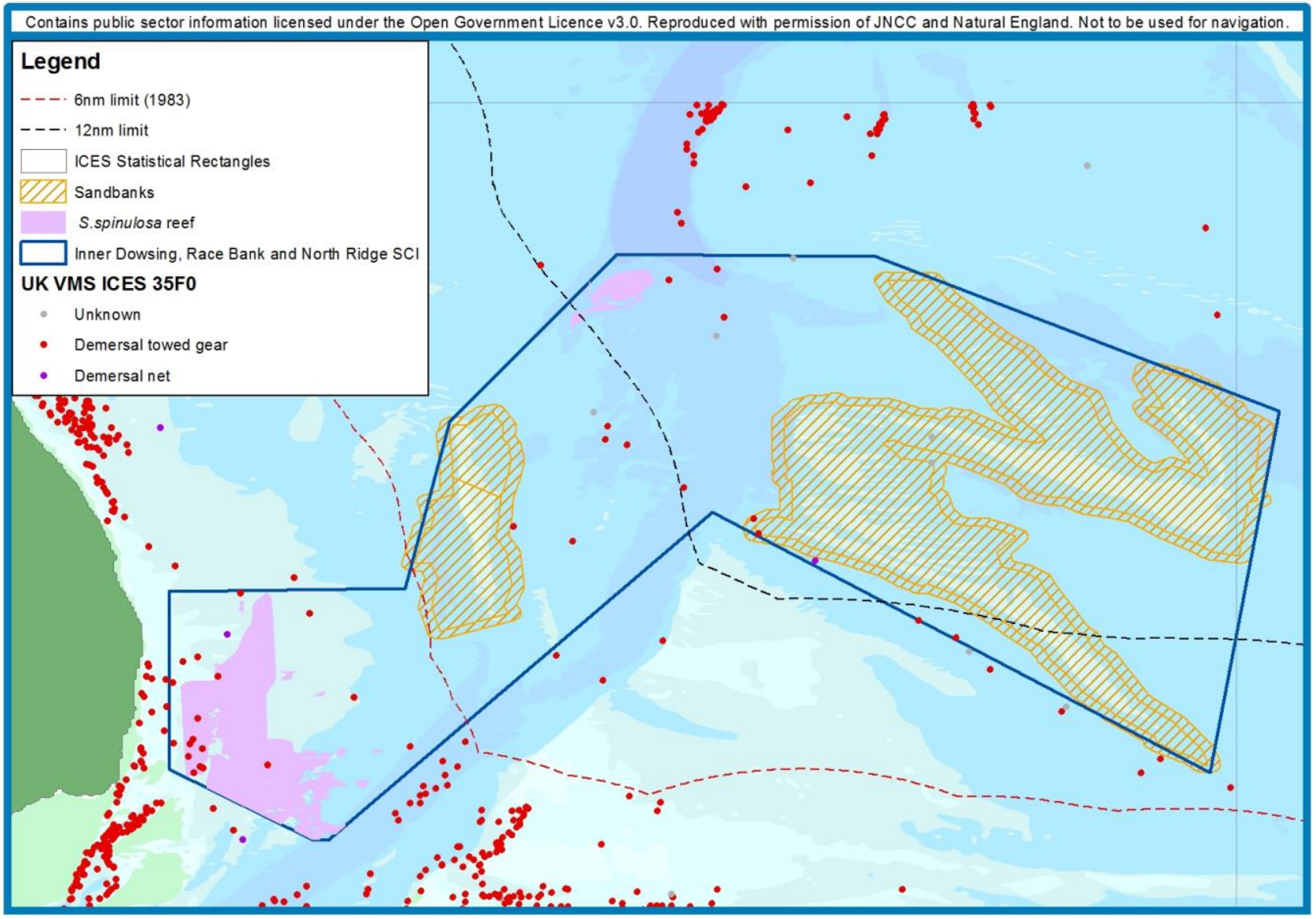
# Annex 2b. Fishing activity data: UK VMS 2010



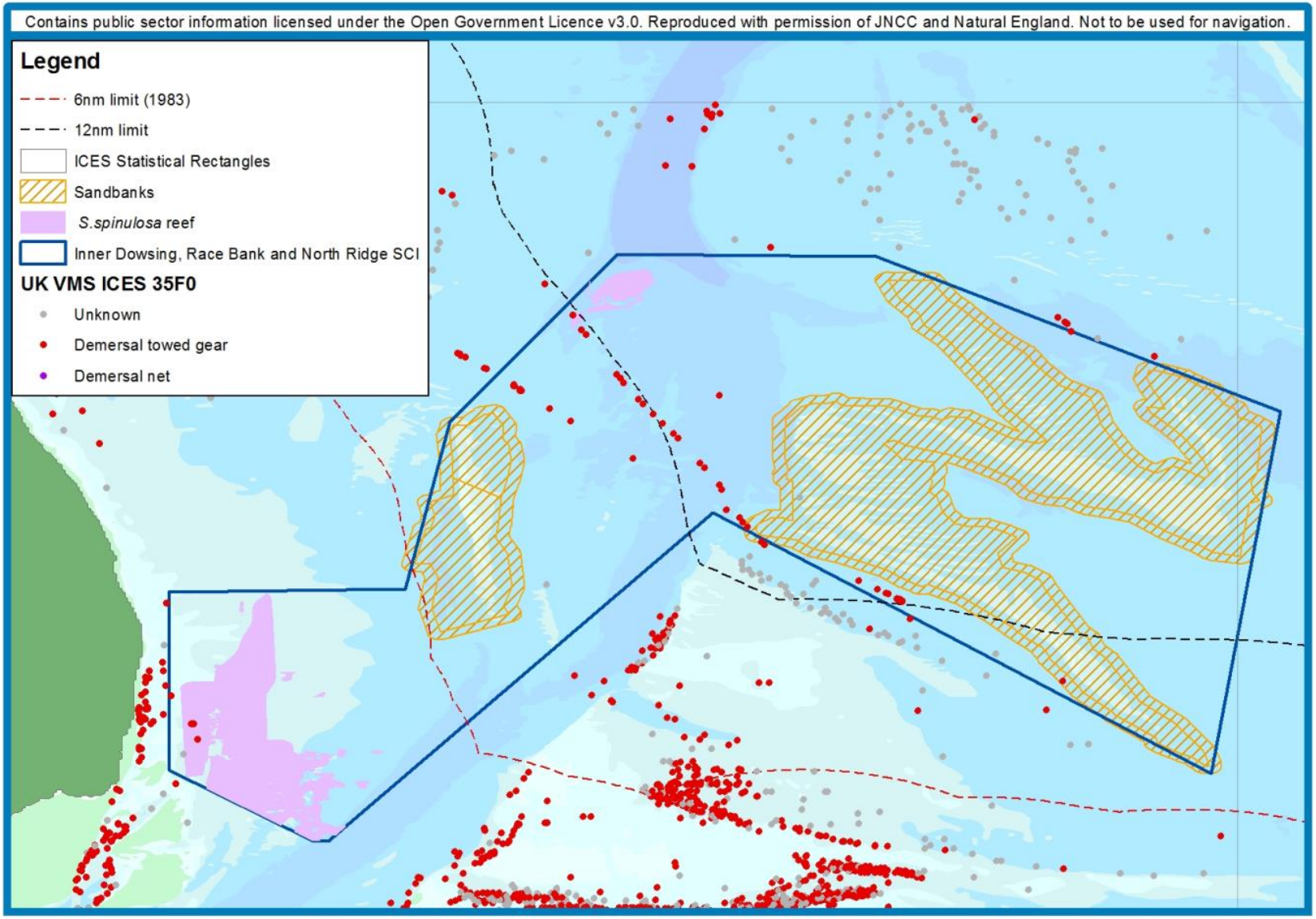
# Annex 2c. Fishing activity data: UK VMS 2011



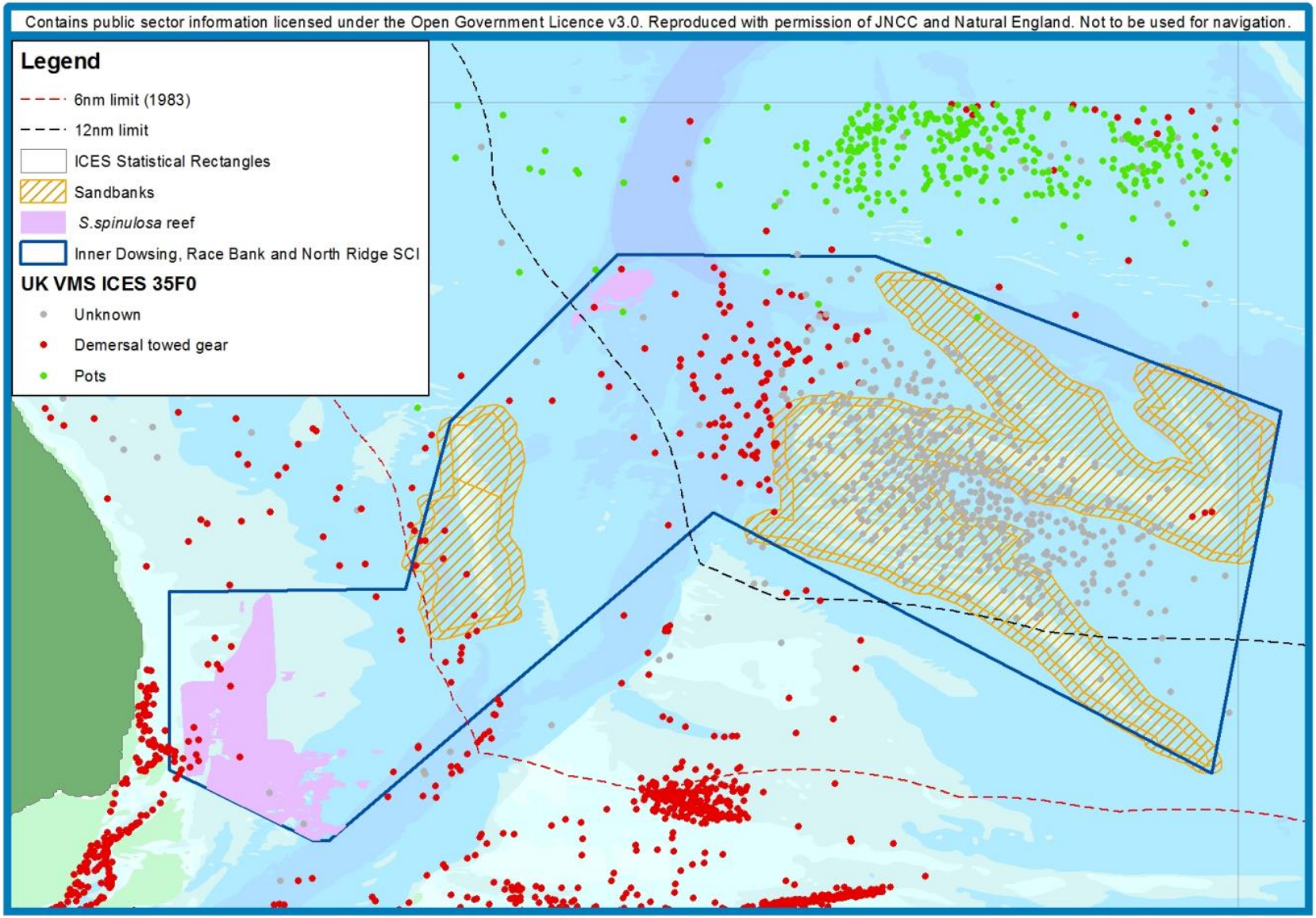
# Annex 2d. Fishing activity data: UK VMS 2012



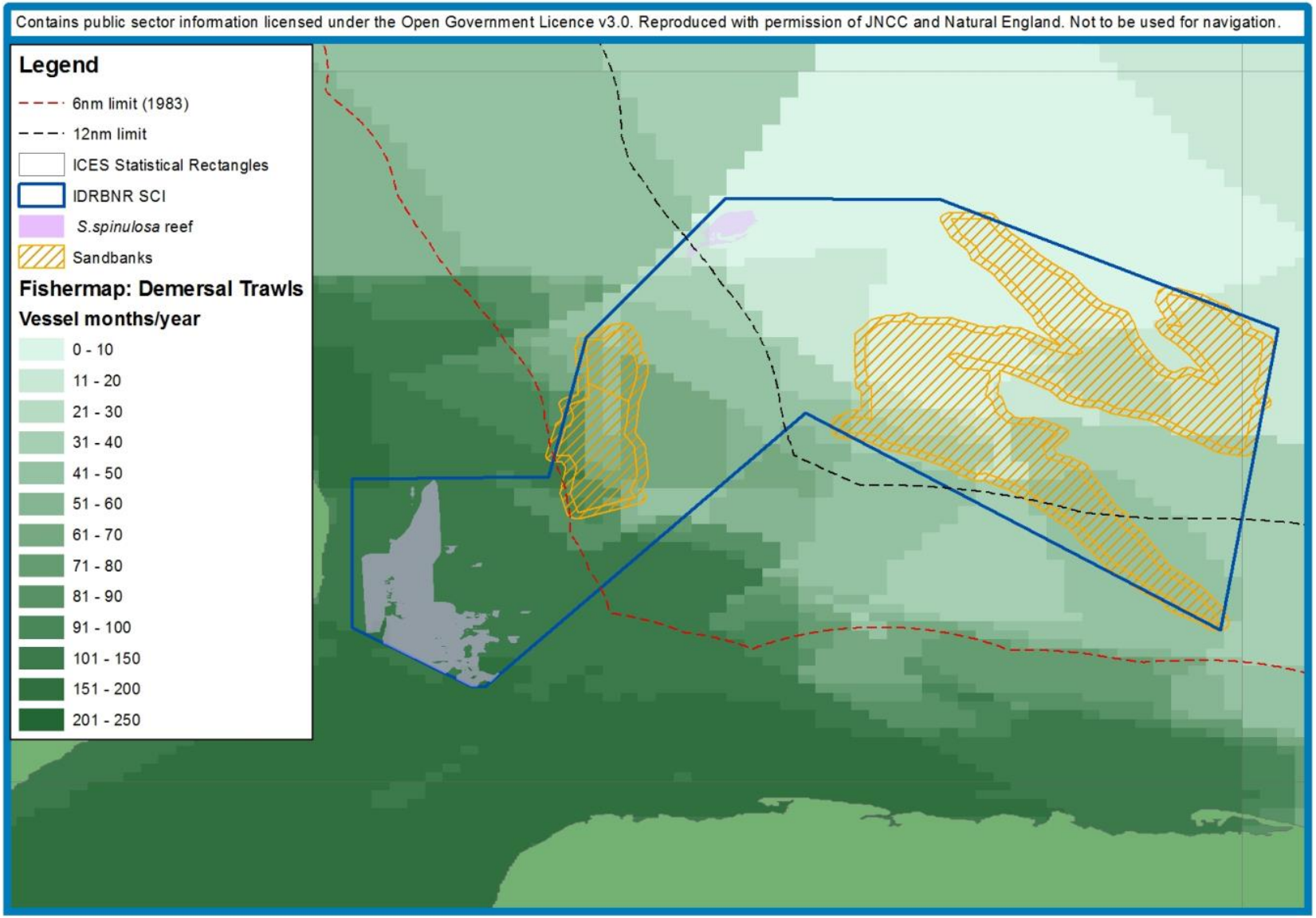
# Annex 2e. Fishing activity data: UK VMS 2013



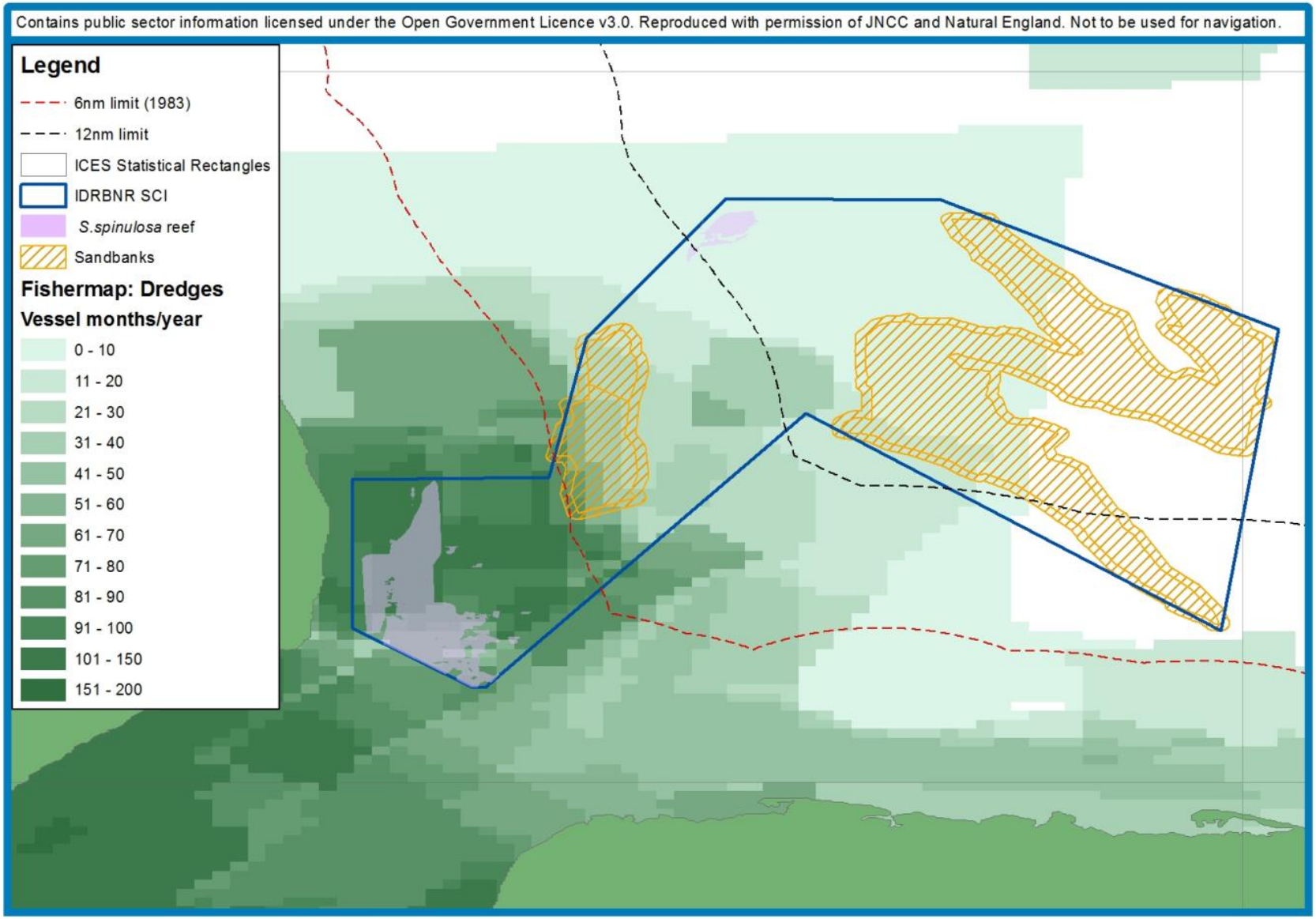
# Annex 2f. Fishing activity data: UK VMS 2014



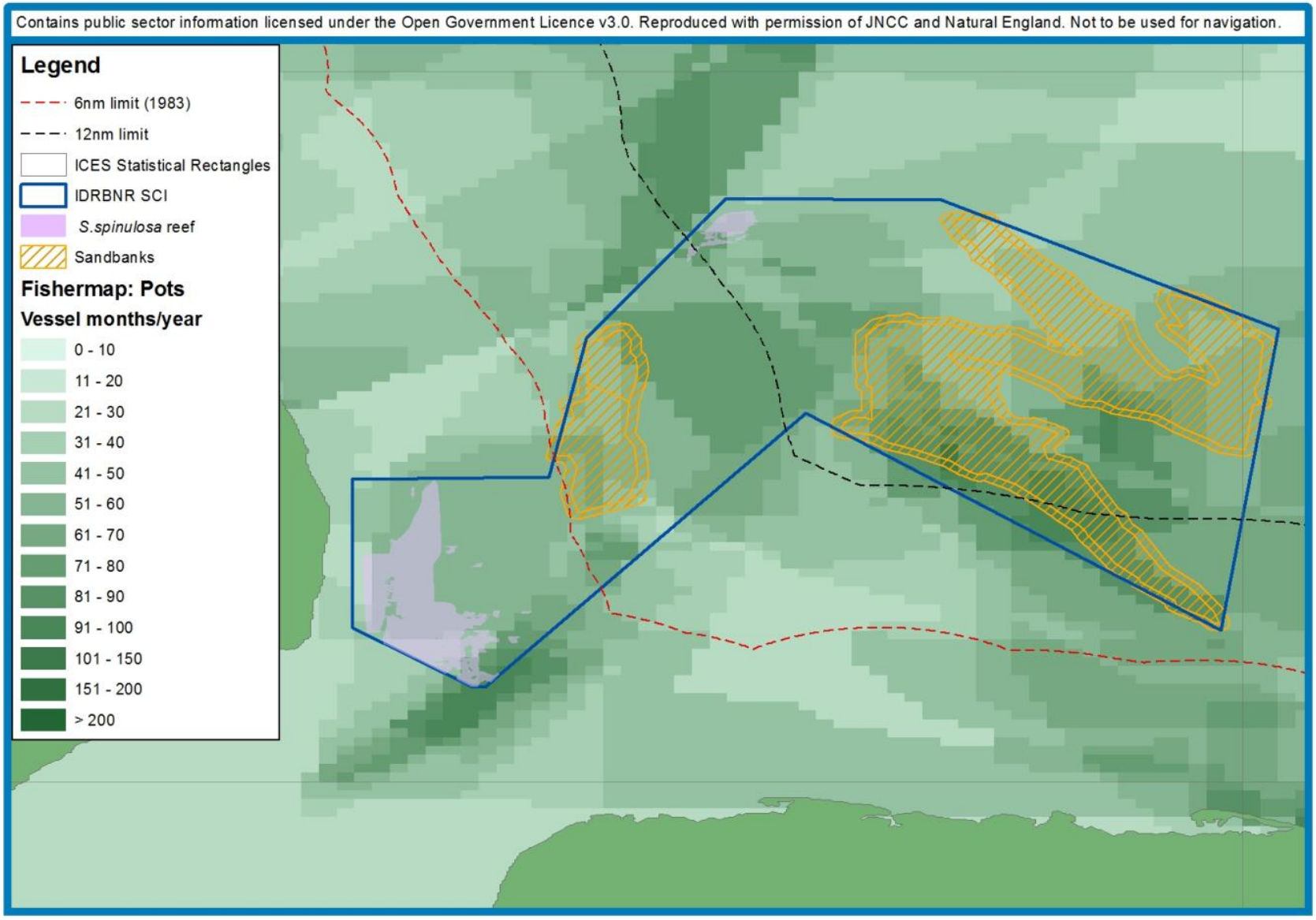
# Annex 2g. Fishermap data: Demersal trawls



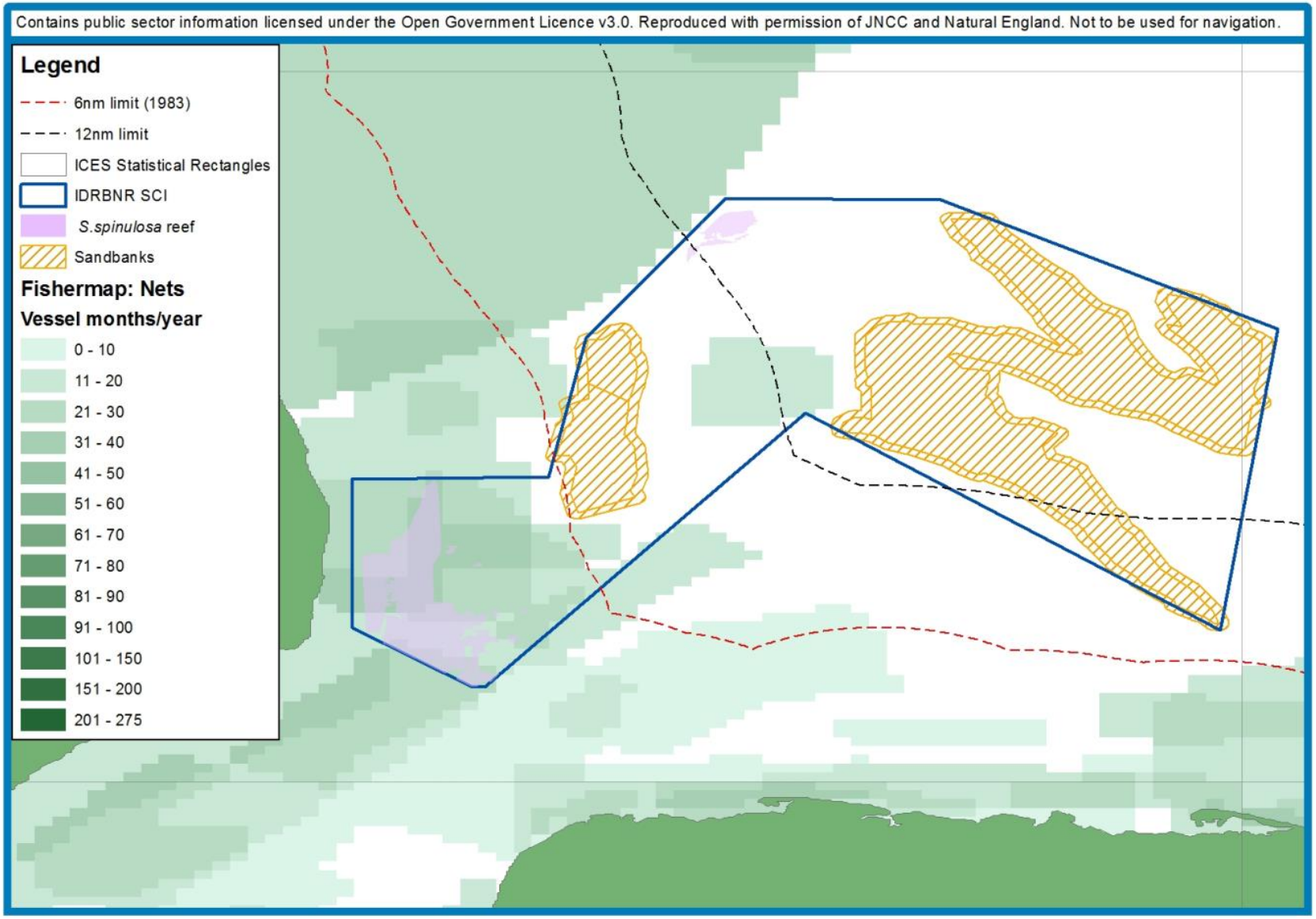
# Annex 2h. Fishermap data: Dredges



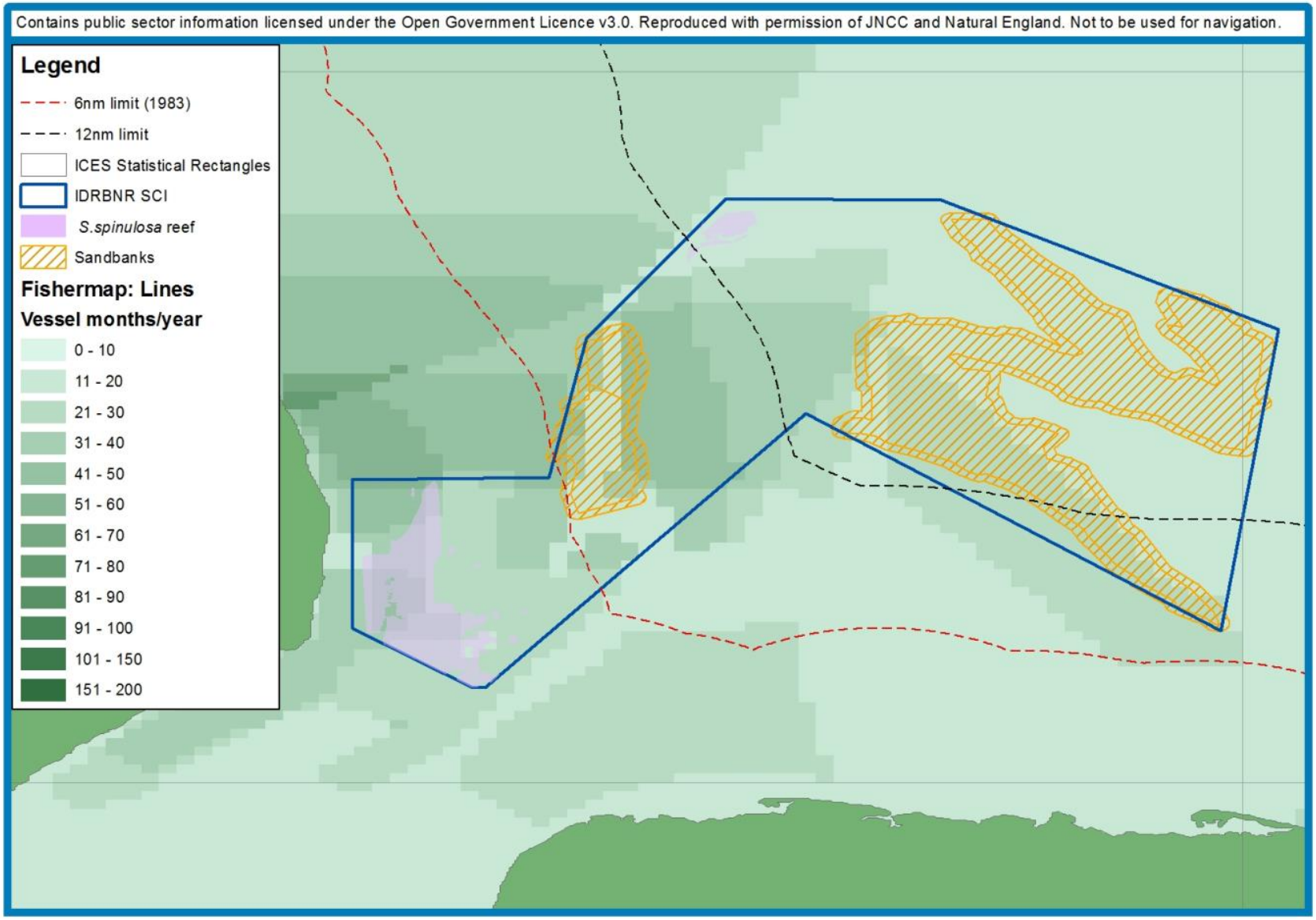
# Annex 2i. Fishermap data: Pots



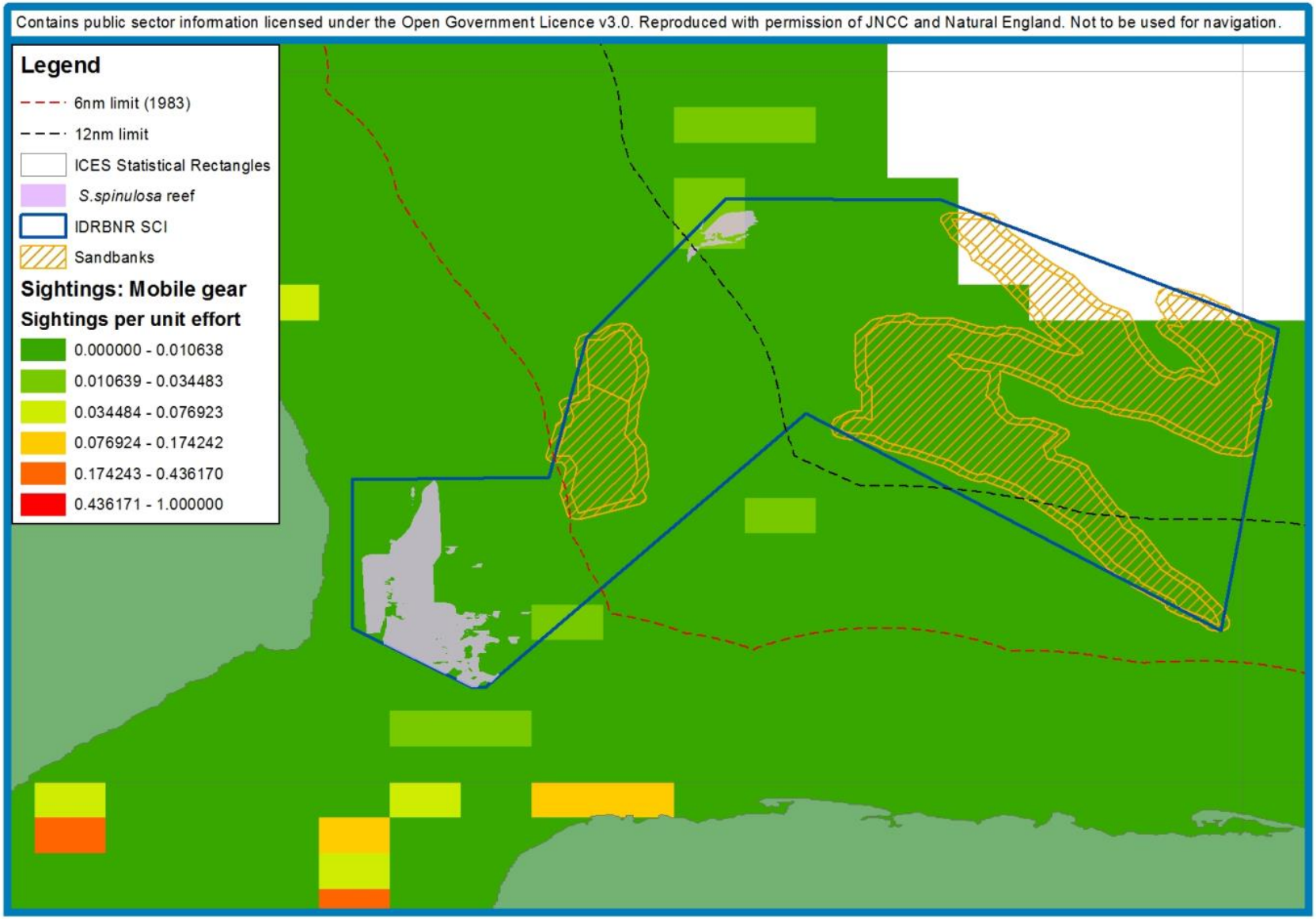
# Annex 2j. Fishermap data: Nets



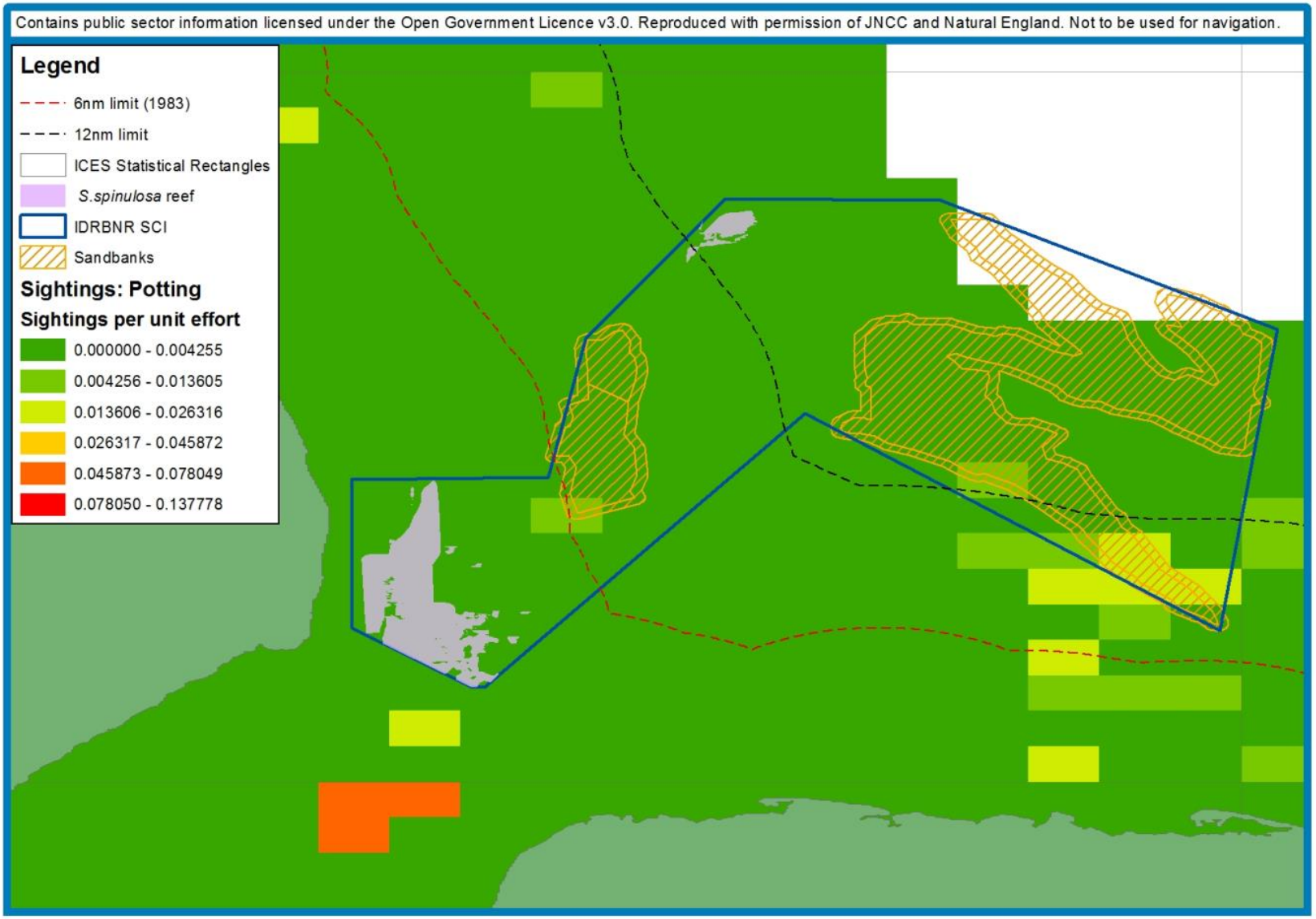
# Annex 2k. Fishermap data: Lines



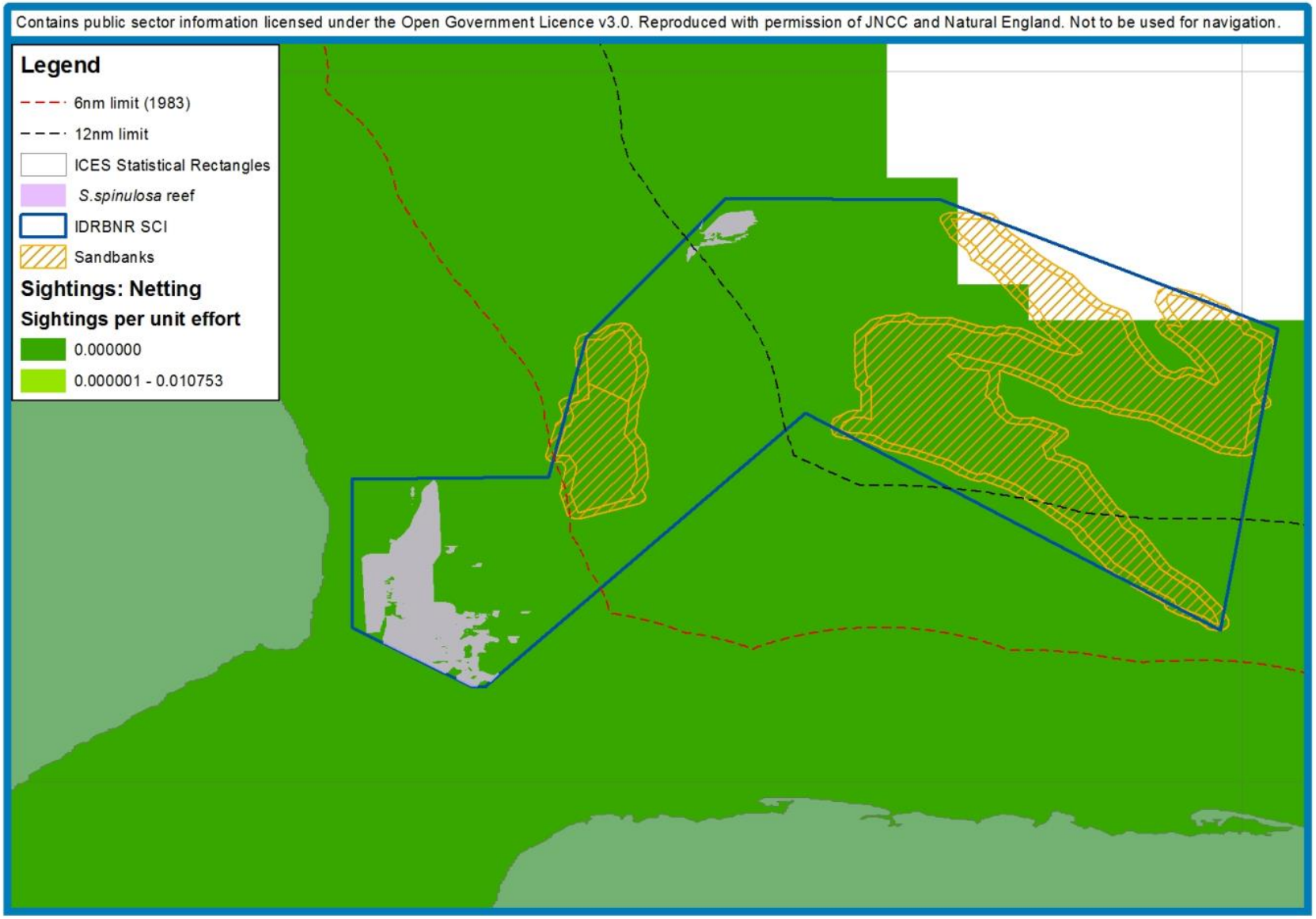
# Annex 2l. Sightings data (MB0117): Mobile gear



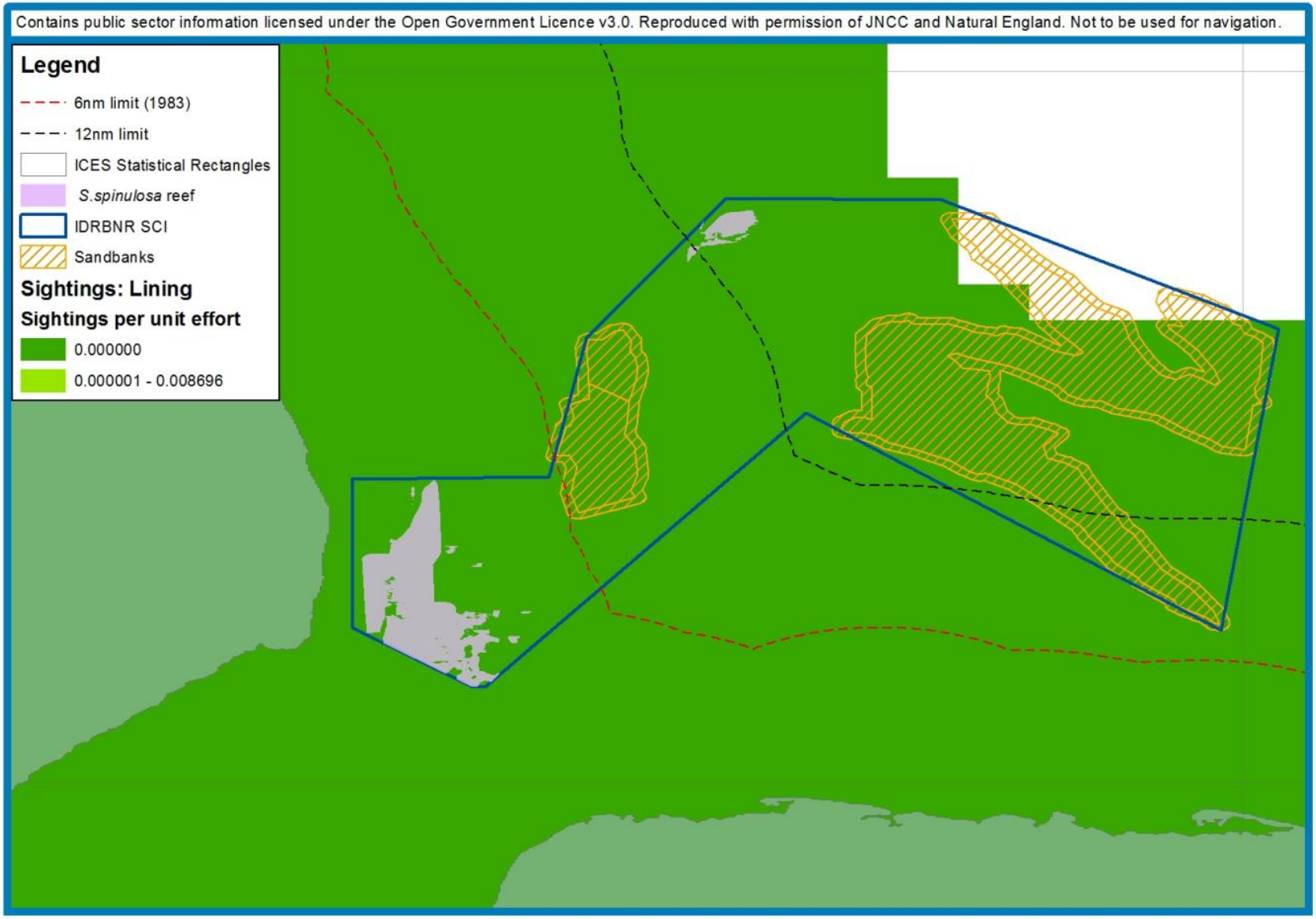
# Annex 2m. Sightings data (MB0117): Potting



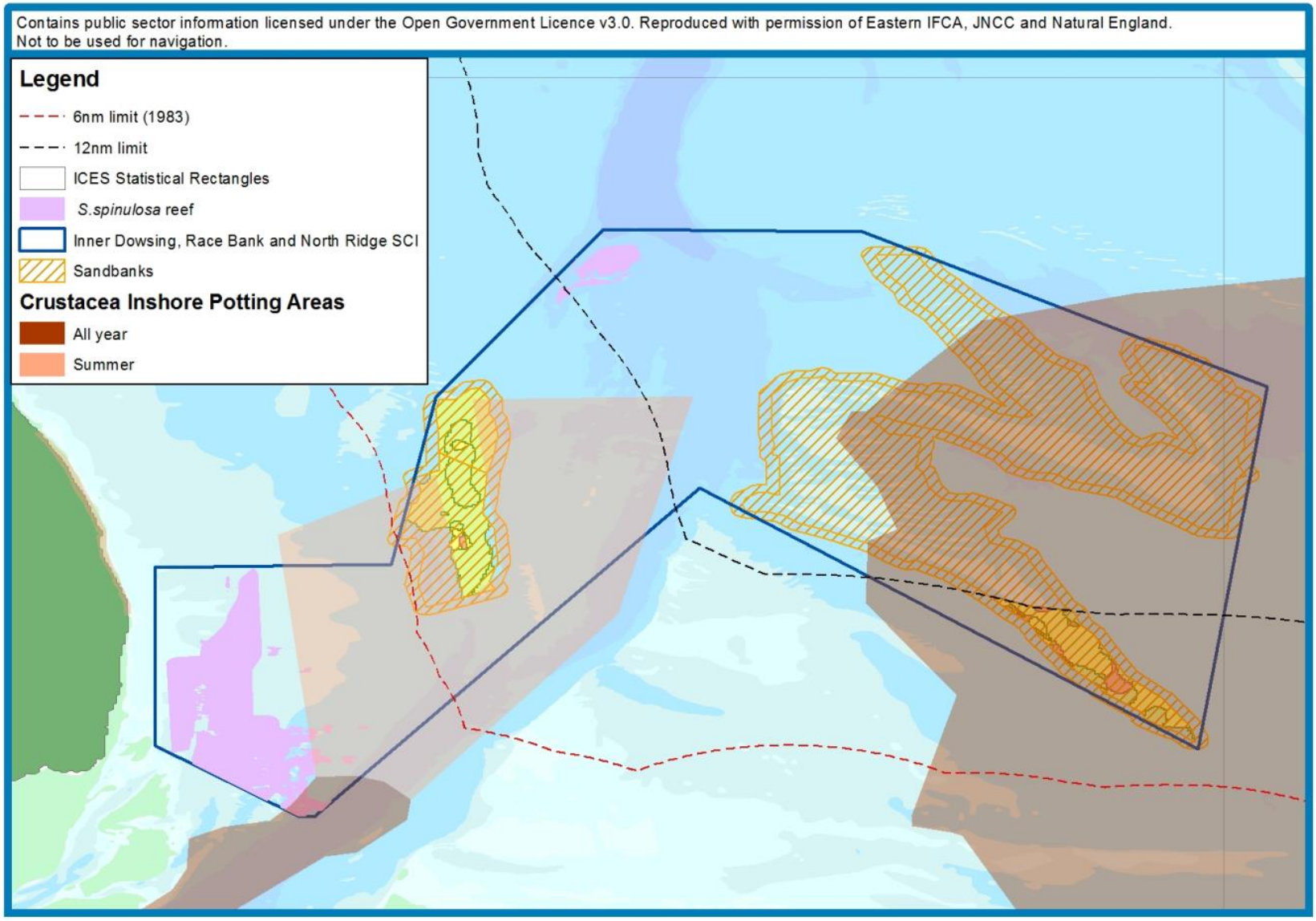
# Annex 2n. Sightings data (MB0117): Netting



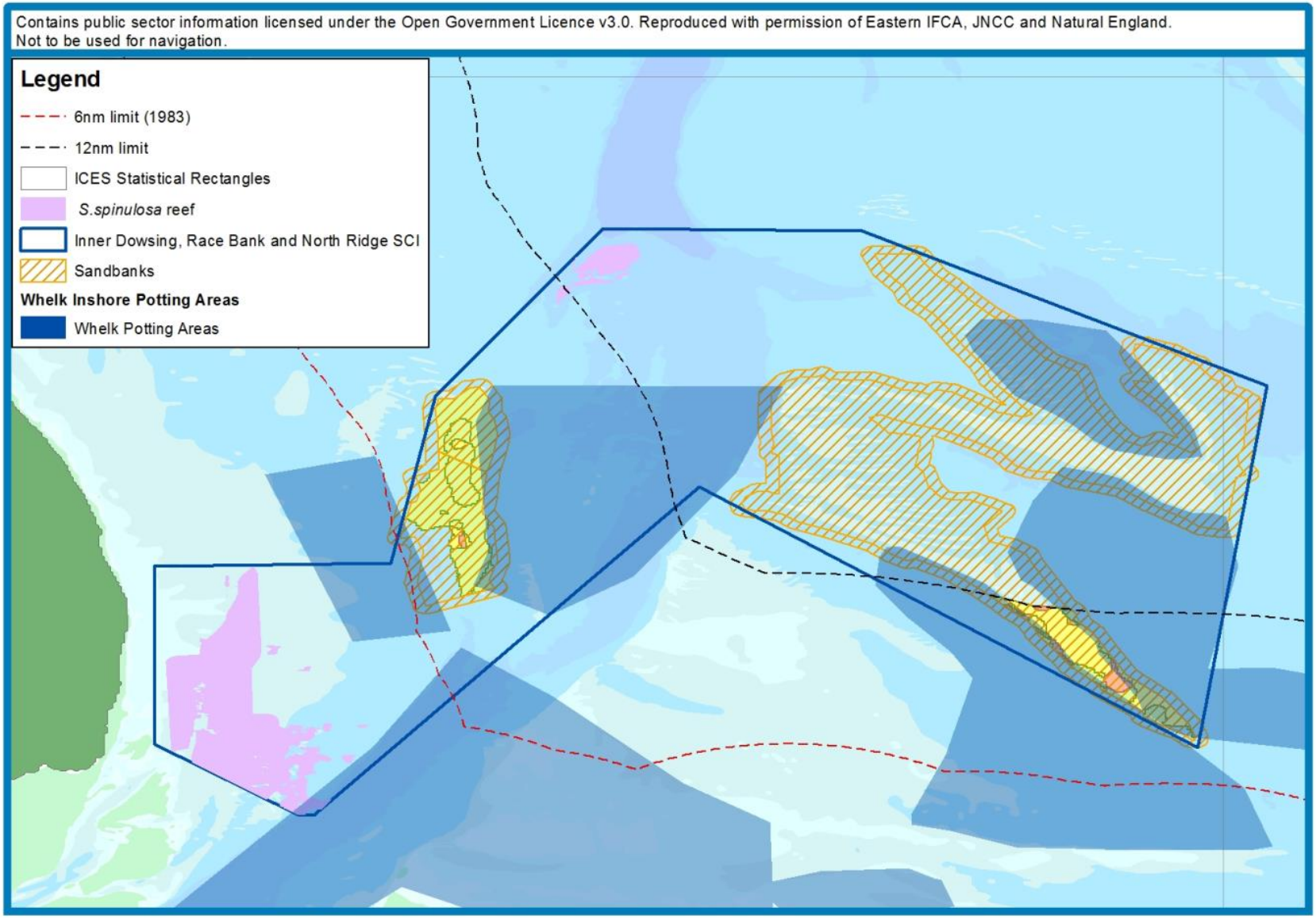
# Annex 2o. Sightings data (MB0117): Lining



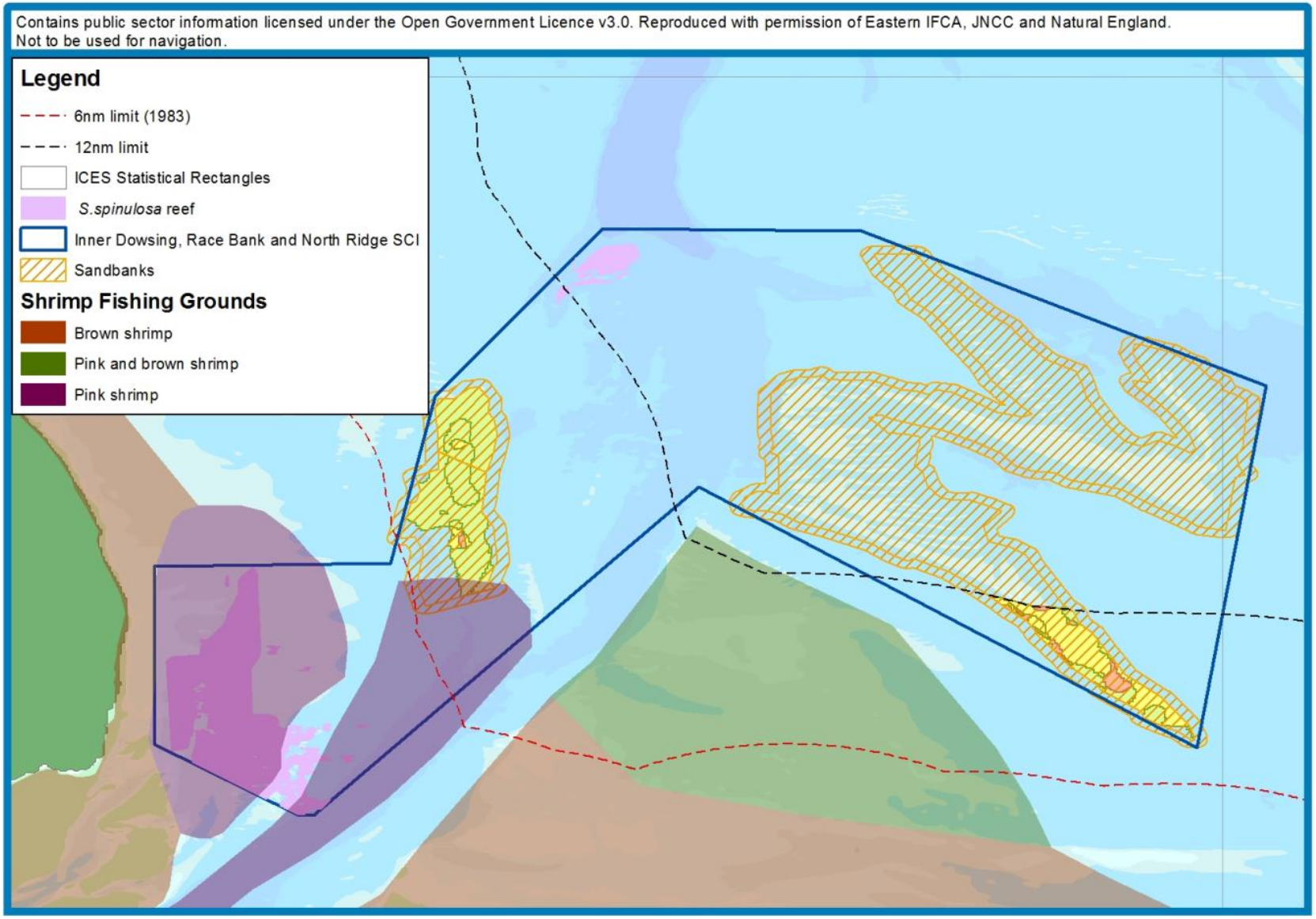
# Annex 2p. Stakeholder mapped crustacea potting areas



# Annex 2q. Stakeholder mapped whelk potting areas



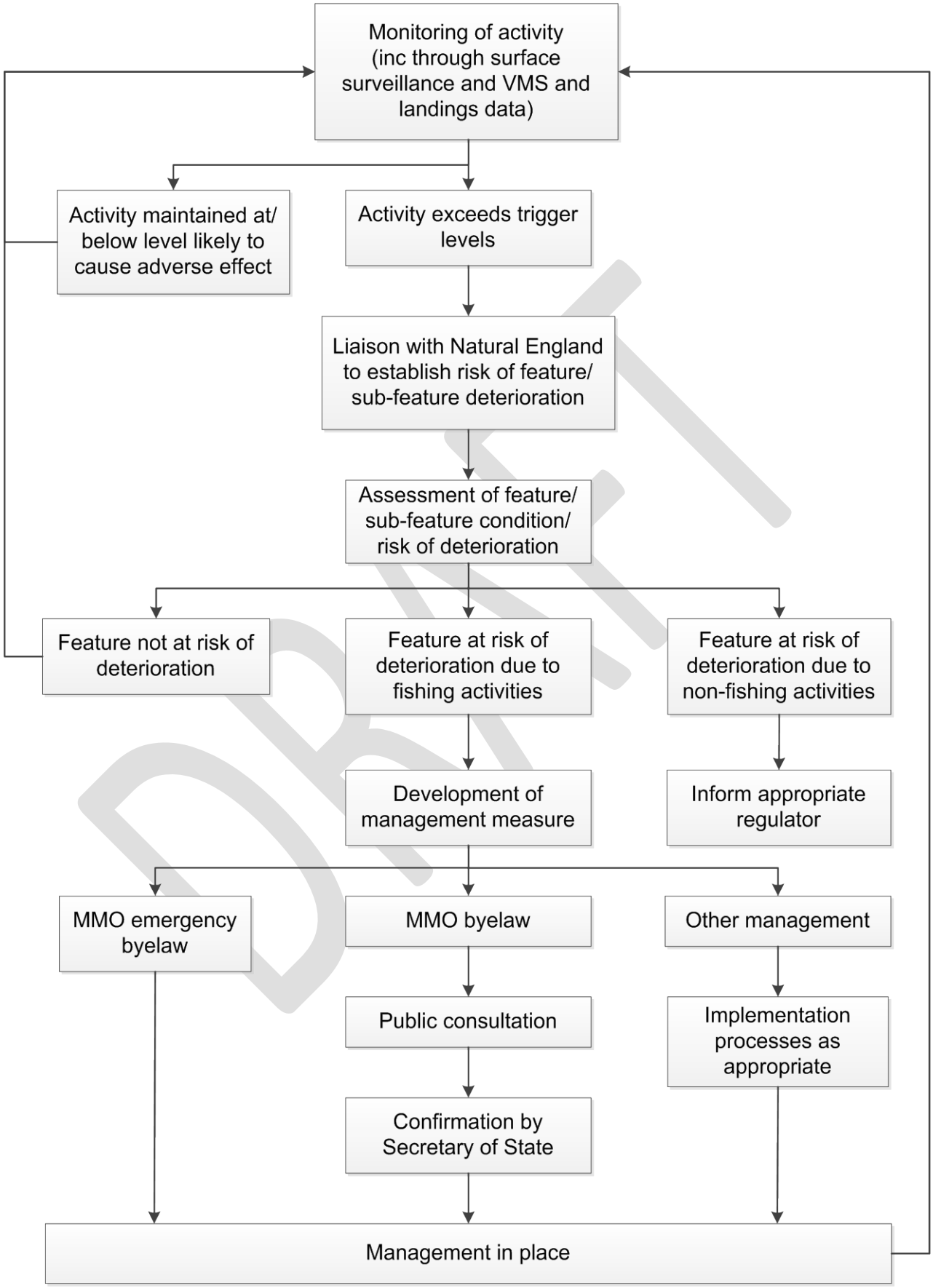
# Annex 2r. Stakeholder mapped shrimp trawling grounds



# Annex 3: Assumptions used to calculate spatial footprint (p) values

[To be completed]

# Annex 4: Monitoring and Control Process



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