
# Environmental Impact Assessment Report Volume 3, Appendix 14.1: Commercial Fisheries Technical Report

# MarramWind Offshore Wind Farm

December 2025

MarramWind

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# Contents

# 1. Introduction and Study Area

## 1.1 Introduction

1.1.1.1 MarramWind Offshore Wind Farm (hereafter referred to as 'the Project') is wholly owned by ScottishPower Renewables UK Limited (SPR). MarramWind Limited, a subsidiary of SPR, is the Applicant for the Project.

1.1.1.2 The Project is made up of both offshore and onshore components. The subject of this offshore Environmental Impact Assessment (EIA) Report is the offshore infrastructure of the Project seaward of Mean High-Water Springs. The MarramWind Option Agreement Area (OAA) covers an area of approximately 684 kilometres squared ($km^2$) and is located approximately 78km north-east of Peterhead on the east coast of Scotland. The offshore infrastructure of the Project includes:

- within the OAA: wind turbine generators (WTGs) and associated floating units, moorings and anchors; offshore substation(s) and associated foundations; and array cables, including dynamic cabling; and
- within the offshore export cable corridor: offshore export cables, reactive compensation platform(s) (if required), and landfall(s).

1.1.1.3 This Appendix provides a detailed characterisation of the commercial fisheries in operation across the Project.

1.1.1.4 The information on commercial fisheries activity presented in this report is intended to inform the EIA by providing a detailed understanding of the commercial fisheries baseline with an extended timeline of 12 years (2012 to 2023), against which the potential impacts of the Project can be assessed.

1.1.1.5 Commercial fisheries activity described in this report, is defined as fishing activity legally undertaken where the catch is sold for taxable profit.

1.1.1.6 This Appendix is intended to inform and support the following EIA Report Chapter:

- **Volume 1, Chapter 14: Commercial Fisheries**.

## 1.2 Study area

1.2.1.1 The Project is located within the south-west portion of the International Council for the Exploration of the Sea (ICES) Division 4a (north North Sea) statistical area; within the United Kingdom (UK) Exclusive Economic Zone (EEZ) waters. The OAA is located outside the UK territorial waters 12 nautical miles (nm) boundary and the export cable corridor extends outside and inside the 12nm boundary to shore at landfall. For the purpose of statistical analysis, ICES Division 4a is divided into statistical rectangles, which are consistent across all Member States operating in the North Sea. Each ICES statistical rectangle is '30 min latitude and 1 degree longitude' in size, which equates to approximately $30nm^2$.

1.2.1.2 The OAA is located within ICES rectangle 45E9; and while not overlapping ICES rectangle 44E9, it is located very close to the north boundary of 44E9. The offshore export cable corridor extends across ICES rectangles 44E8, 44E9, 45E8 and 45E9. These four ICES rectangles form the commercial fisheries local study area for the purposes of the EIA (**Volume 2, Figure 14.1: Commercial fisheries regional and local study area**).

1.2.1.3 In order to understand fishing activity in waters adjacent to the Project, a commercial fisheries regional study area has been defined to include the commercial fisheries local study area together with adjacent ICES rectangles. Due to the position of the Project, this regional study area is relatively large. Analysis of data at the scale of the commercial fisheries regional study area takes into consideration that most commercial fish and shellfish receptor populations are distributed at a wider spatial scale, ensuring that potential implications of displacement of fishing activity can be adequately understood.

1.2.1.4 To summarise, there are two scales of commercial fisheries study areas as follows:

- commercial fisheries local study area: 44E8-E9 and 45E8-E9; and
- commercial fisheries regional fisheries study area: 43E8-E9, 44E7-F0, 45E8-F0 and 46E8-F0.

# 2. Methodology

## 2.1 Approach

2.1.1.1 This Appendix has been developed through an extensive and thorough analysis of data and literature, sources of which are fully referenced at the end of this document. The assessment encompasses both publicly available data sets and data obtained through specific requests. Landings statistics have been analysed using Microsoft Excel, while vessel monitoring system (VMS) data and automatic identification system (AIS) data have been evaluated using ArcMap Geographic Information System (GIS) software.

2.1.1.2 In addition to quantitative data, qualitative insights have been gathered through direct engagement with the fishing industry.

2.1.1.3 This analysis has been through a desktop study, with no specific commercial fisheries survey undertaken.

## 2.2 Desktop study

2.2.1.1 A detailed desktop review of existing studies and datasets was undertaken to gather information on commercial fisheries within the commercial fisheries local and regional study areas. **Table 2.1** summarises the studies and datasets used.

2.2.1.2 Data has been sourced from ICES, the European Union (EU) Data Collection Framework (DCF), the Marine Directorate National Marine Plan interactive (NMPi), the UK Marine Management Organisation (MMO) and the European Maritime Safety Agency (EMSA).

2.2.1.3 Engagement and discussion with the fishing industry organisations has provided vital insight into the location and importance of specific fishing grounds for a range of different fisheries. In particular, a series of plotter data screenshots from different sample of organisations' member fishing vessels has provided clarity on the spatial distribution of fishing grounds within the area. This data has been included in the Technical Report for pelagic trawl, with the permission from the Scottish Pelagic Fishermen's Association (SPFA), representing activity by Scottish pelagic trawl member vessels. Plotter data from other associations and for other gear types is considered confidential and not provided in this report.

2.2.1.4 Where data sources allow, a 5 to 12-year trend analysis has been undertaken, using the most recent annual datasets available at the time of writing. The temporal extent of this time period is dependent on each data source analysed, for example, 2012 to 2016; 2016 to 2020; or 2012 to 2023, as annotated in **Table 2.1**.

2.2.1.5 Relevant literature from a number of sources has also been reviewed in the preparation of this report. A full list of references is provided at the end of this report and are cited within the text where appropriate.

### Table 2.1 Summary of key data sources

| Title | Source | Year | Reference |
|---|---|---|---|
| **Landings statistics data for UK-registered vessels, with data query attributes for: landing year; landing month; vessel length category; ICES** | MMO | 2012-2023 | MMO, 2022a; MMO, 2024a |

| Title | Source | Year | Reference |
|---|---|---|---|
| **rectangle; vessel / gear type; port of landing; species; live weight (tonnes); and value (£)** | | | |
| **Landings statistics for EU registered vessels with data query attributes for: landing year; landing quarter; ICES rectangle; vessel length; gear type; species; and, landed weight (tonnes)** | EU DCF database | 2012-2016 | EU DCF, 2023 |
| **Fisheries Sensitivity Mapping and Displacement Modelling (FiSMaDiM) dataset, which employs vessel positional tracking data (from VMS and AIS) to map both fishing activity and its economic sensitivity within the UK EEZ. Note that while VMS data is mandated for UK vessels ≥12m and AIS for some larger vessels, FiSMaDiM uniquely combines and interpolates both data types to produce high-resolution, gridded estimates of fishing effort - typically every 20 minutes - across eight gear groups, covering both UK and non-UK flagged vessels where data allow. To preserve commercial sensitivity, grid cells with activity from three or fewer vessels are masked** | Centre for Environment, Fisheries and Aquaculture Science (Cefas) | 2012-2021 | Cefas, 2025 |
| **VMS data for UK registered vessels ≥15m length. Note that UK vessels ≥12m in length have VMS on board, however, to date, the MMO provide amalgamated VMS datasets for ≥15m vessels only. VMS data sourced from MMO displays the first sales value (£) of catches** | MMO | 2016-2020 | MMO, 2022b |
| **VMS data for EU registered vessels ≥12m length VMS data sourced from ICES displays the surface Swept Area Ratio (SAR) of catches by different gear types and covers EU (including UK) registered vessels 12m and over in length. Surface SAR indicates the number of times in an annual period that a demersal fishing gear makes contact with (or sweeps) the seabed surface. Surface SAR provides a proxy for fishing intensity** | ICES | 2016-2020 | ICES, 2022 |
| **Fishing vessel route density, based on vessel AIS positional data. AIS is required to be fitted on fishing vessels ≥15m length** | EMSA | 2019-2023 | EMSA, 2024. |
| **Surveillance data indicating vessel nationality and gear type for actively fishing vessels** | MMO | 2017-2022 | MMO, 2023b |
| **Scottish fishing vessel VMS data indicating fishing intensity by gear type** | Marine Directorate | 2009-2013 | Marine Directorate, 2023 |
| **SPFA VMS data for Scottish pelagic trawl member vessels for 2013-2021** | SPFA | 2013-2021 | SPFA, 2024a |
| **SPFA plotter data for Scottish pelagic trawl member vessels indicating location of fishing** | SPFA | Long term | SPFA, 2024b |

| Title | Source | Year | Reference |
|---|---|---|---|
| | | data series*. | |
| **Scottish Fishermen's Federation (SFF) vessel plotter data indicating location of fishing** | SFF | Long term data series*. | SFF, 2024 [Confidential] |
| **Scottish White Fish Producers Association (SWFPA) identified fishing grounds** | SWFPA | Long term data series*. | SWFPA, 2024 [Confidential] |
| *Long term data series is collated across several years (for example, up to ten) for an undefined period and from a sample of vessels that are members of each specified association. | | | |

## 2.3 Data limitations and uncertainties

2.3.1.1 A range of different data limitations and uncertainty exist for all of the commercial fisheries datasets assessed within this report. The level of uncertainty and confidence of each data set is defined in **Table 2.2** based on expert judgement of the assessment team.

2.3.1.2 Limitations of landings data include the spatial size of ICES rectangles, which can misrepresent actual activity across the site boundary. Care is therefore required when interpreting these data.

2.3.1.3 It is noted that all commercial landings by UK registered vessels are subject to the Register of Buyers and Sellers (RBS) legislation and therefore landings by UK vessels of all lengths are recorded within the MMO iFish database. While it is recognised that there is no statutory requirement for owners of vessels 10m and under to declare their catches, registered buyers are legally required to provide sales notes of all commercially sold fish and shellfish due to the 2005 Registration of Buyers and Sellers of First-Sale Fish Scheme (RBS legislation) (MMO, 2022a; MMO, 2024a). The RBS legislation is applicable to licenced fishing vessels of all lengths and requires name and port letters and numbers of the vessel that landed the fish to be recorded in relation to each purchase. For the 10m and under sector, landing statistics are recorded on sales notes provided by the registered buyers (MMO, 2022a; MMO, 2024a). Information that may not be formally recorded on the sales note, such as gear and fishing area, is added by coastal staff based on local knowledge of the vessels they administer - for example, from observations of the vessel during inspections at ports or from air and sea surveillance activities as well as discussions with the owner and / or operator of the vessel (MMO, 2022a; MMO, 2024a).

2.3.1.4 Lack of recent landings statistics for EU (non-UK) fleets is also recognised as a data limitation; based on the most recent European Commission data call, more recent landings data (2017 to 2022) is no longer available by ICES rectangle. Data at a scale of ICES division (for instance, the whole of the northern North Sea) is less useful to understand fishing activity specific to the Project.

2.3.1.5 Limitations of VMS data are primarily focused on the coverage being limited to larger vessels 15m and over for UK fishing vessels. It is important to be aware that where mapped VMS data may appear to show inshore areas as having lower (or no) fishing activity compared with offshore areas, this is not necessarily the case because VMS data do not include vessels typically operating in inshore area (for instance, which typically comprises vessels <15m in length). To assist in mitigating the risk of under-representing smaller inshore vessels, site-specific marine traffic survey data comprising information on vessel movements gathered by both AIS and radar has been analysed alongside publicly sourced VMS and AIS data.

2.3.1.6 MMO fisheries patrol vessels and surveillance aircraft operate in coordination with the Royal Navy's Fisheries Protection Squadron. UK surveillance aircraft are used to construct an on-going picture of fishing activity within the UK EEZ and to make effective use of patrol vessel activity by coordinated use of surveillance data. These data cannot be considered to give an accurate picture of the actual level of activity and have a number of limitations, including:

- Patrol effort by the Marine Directorate, Royal Navy Fisheries Patrol Vessels and patrol aircraft are optimised for enforcement purposes and not collection of sightings data. Areas with fewer fisheries enforcement issues are therefore likely to be visited less often and result in lower data confidence.
- Surveillance data are only indicative of areas where fishing activities occur, as there is no continuous monitoring of activities.
- Surveillance data present a snapshot of activity in an area and it cannot be assumed that if no vessels have been sighted then no fishing takes place.
- Vessels fishing at night would likely remain undetected.

**Table 2.2 Data limitations and uncertainty (the uncertainty and confidence levels are defined based on judgement and are intended to inform the appropriateness of data used to inform the EIA)**

| Source | Type of data | Limitation and uncertainty |
|---|---|---|
| **MMO (2022a), MMO (2024a)** | Landings statistics (2016 to 2022) data for UK-registered vessels. | The data are recorded from sales notes and landing declarations for all vessel lengths. Due to the UK legislation of RBS, data is considered accurate and verifiable.<br>Data assessed with low uncertainty and high confidence. |
| **EU DCF** | Landings statistics (2012 to 2016) data for EU landings from the local and regional study area by country, species and gear type. | The data is submitted by individual member states and therefore limitations vary per country. Vessels under 10m may be omitted or mis-represented by the data. Accuracy is likely to be greater for landings from larger vessels.<br>For UK vessels under 10m length data is assessed with high uncertainty and low confidence.<br>For all other EU vessels data is assessed with low uncertainty and high confidence. |
| **Cefas (2025)** | FiSMaDiM (VMS and AIS) data for UK and non-UK vessels. | This data combines VMS and AIS data, is representative for 12m and over vessels, and may provide information for vessels less than 12m that carry AIS. Data assessed with medium uncertainty and medium confidence. |
| **MMO (2022b)** | UK VMS data for vessels ≥15m length. | The data is only available for 15m and over vessels, so is not representative of <15m vessels. Data assessed with medium uncertainty and medium confidence. |
| **ICES** | EU SAR data for vessels ≥12m length. | The data is only available for 12m and over vessels, so is not representative of <12m vessels. Data assessed with medium uncertainty and medium confidence. |

| Source | Type of data | Limitation and uncertainty |
|---|---|---|
| **EMSA** | AIS data for fishing vessels ≥15m length. | The data is only available for 15m and over vessels, so is not representative of <15m vessels. Data assessed with medium uncertainty and medium confidence. |
| **Anatec** | Marine traffic (AIS and radar) survey data (2023). | An assessment undertaken into fishing vessel activity within the Navigational Risk Assessment (NRA) (**Appendix 15.1, Navigational Risk Assessment**) undertaken for array. Data assessed with low uncertainty and high confidence. |
| **MMO (2023b)** | Surveillance data (2017 to 2022). | The data is for all vessel lengths and UN and non-UK vessels. Data presents a snap-shot of activity at time of surveillance and is not routinely collected. Data assessed with medium uncertainty and medium confidence. |
| **Fishing industry** | Plotter data. | The data is for a selection of representative vessels that are members of specific organisations and therefore does not represent all fishing activity. Plotter data is available across a long-term basis, expected to be approximately 10 years, however the time period is unknown and therefore does not allow identification of changes in fishing activity over time. Data is assessed with medium uncertainty and high confidence. |

# 3. Key Species

## 3.1 Introduction

3.1.1.1 The key commercial species caught across the commercial fisheries local and regional study areas are discussed in this Section in terms of biological characteristics, seasonal trends and relevant fisheries management.

## 3.2 Demersal finfish

### 3.2.1 Haddock

3.2.1.1 Haddock (*Melanogrammus aeglefinus*) are a demersal bottom feeding round fish that occur mainly in waters from 40m to 200m deep. Haddock mature at around two to three years of age and feed mainly on small bottom-living organisms including crustaceans, molluscs, echinoderms, worms and fishes.

3.2.1.2 In the North Sea, haddock are caught as part of a mixed whitefish fishery and are also taken as bycatch in the trawl fishery for Norway lobster (*Nephrops norvegicus*), which is also commonly referred to as Nephrops, prawn, and langoustine (hereon referred to as Nephrops). Landings occur throughout the year and on average peak during Autumn.

3.2.1.3 The haddock stock across ICES Subarea 4 (North Sea), Division 6.a (West of Scotland), and Subdivision 20 (Skagerrak) is managed and assessed as a single, wide stock unit. This reflects the biological connectivity and migratory behaviour of haddock within the northern North Sea and adjacent waters, where fish mix and move across administrative boundaries. As such, advice and management measures apply across the full stock distribution range, encompassing a broad spatial footprint that supports multiple fleet segments and national fisheries.

3.2.1.4 The most recent ICES assessment for haddock in the North Sea, West of Scotland and Skagerrak indicates that the stock remains in good biological condition. Spawning Stock Biomass (SSB) for 2026 is forecast at approximately 608,000 tonnes, which is well above all reference points, including Maximum Sustainable Yield (MSY) $B_{trigger}$, $B_{lim}$, and $B_{PA}$ (**Plate** 3.1). Fishing mortality is currently below $F_{MSY}$, with the 2025 estimate (F = 0.060) significantly below the reference level of 0.167. These indicators confirm that the stock is being fished sustainably under the current exploitation rates (ICES, 2025a).

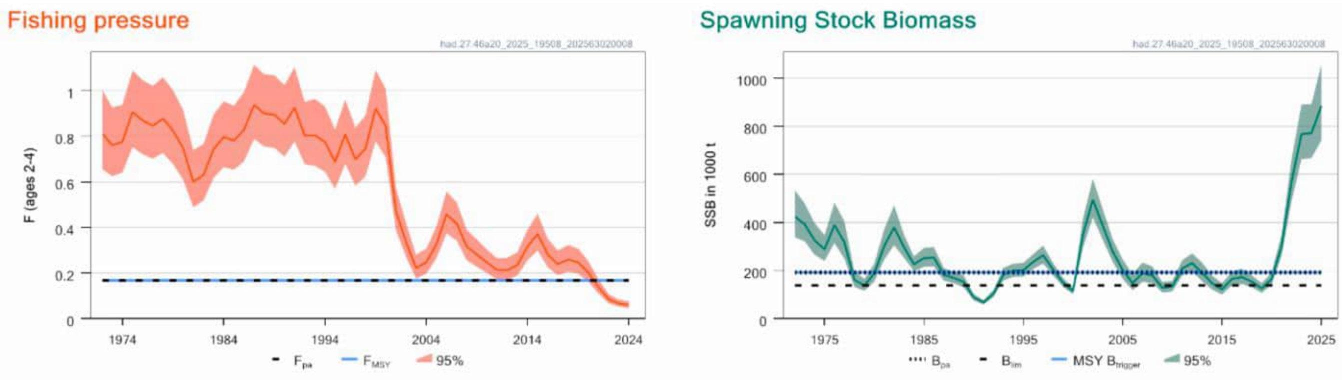
3.2.1.5 Despite the overall healthy status, the assessment highlights a projected decline in SSB in the coming years, primarily due to a return to average recruitment levels following strong year classes in 2019 and 2020. If recruitment remains average or below, the stock is expected to decline by approximately 23% by 2027 under fishing at $F_{MSY}$. This trend suggests that while the stock is currently robust, precautionary management should be maintained to ensure sustainability if recruitment fails to improve.

3.2.1.6 For 2026, ICES advises a Total Allowable Catch (TAC) of 108,301 tonnes under the MSY approach. This includes an estimated 91,316 tonnes of landings and 16,985 tonnes of discards and bycatch. The advised catch represents a 3.7% reduction from the 2025 advice, influenced by the updated $F_{MSY}$ reference point and revised model inputs. Discards remain substantial, accounting for around 21% of total catch in 2024, indicating ongoing challenges with selectivity and compliance despite the landing obligation.

3.2.1.7 The 2025 stock assessment incorporated updated survey data and model refinements, resulting in upward revisions of SSB and downward revisions in fishing mortality. These changes also improved retrospective patterns, contributing to increased confidence in the assessment outputs. ICES considers the advice to be precautionary, given the current high SSB levels and sustainable fishing pressure.

3.2.1.8 Overall, haddock across Subarea 4 and Division 6.a remains in a healthy state, with spawning stock biomass well above reference points, though recruitment is weakening.

**Plate 3.1 Haddock North Sea, West of Scotland, Skagerrak stock assessment indicating fishing pressure and stock size (ICES, 2025a)**

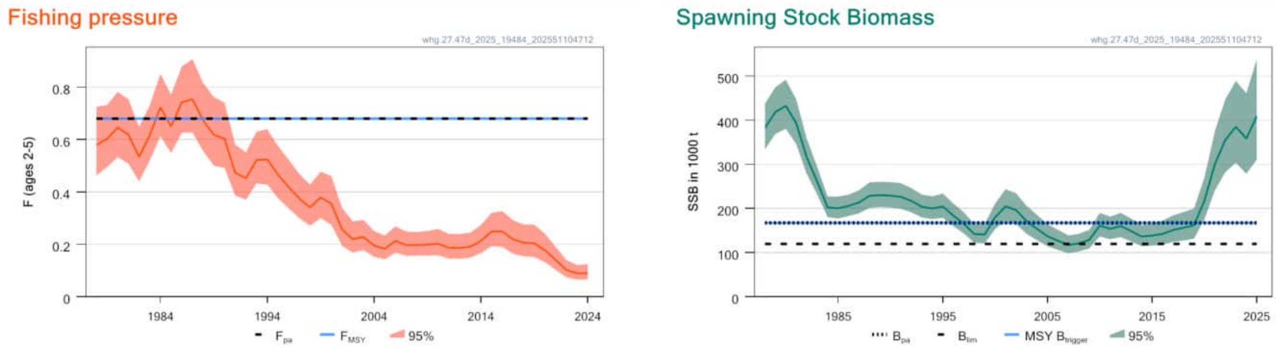



## 3.2.2 Whiting

3.2.2.1 Whiting (*Merlangius merlangus*) are commonly found on mud and gravel bottoms, but also on sand and rock. Whiting migrate to the open sea after the first year of life (Cohen *et al*., 1990). Whiting are targeted by demersal otter trawlers as part of targeted and mixed demersal fisheries.

3.2.2.2 The North Sea and eastern English Channel whiting stock is currently in good condition, with fishing pressure below $F_{MSY}$ and SSB above MSY $B_{trigger}$, $B_{pa}$, and $B_{lim}$ (**Plate 3.2**). ICES advises that catches in 2026 should not exceed 198,609 tonnes, reflecting a 5.6 per cent increase relative to 2025 advice. This change is linked to a rising stock trend despite continued discarding (2024 discards were 20,980 tonnes, about 60% of the human consumption catch). The revised reference points ($B_{lim}$ = 119,585 t, $B_{pa}$ = 167,419 t, $F_{MSY}$ = 0.68) remain precautionary following updated natural mortality estimates. Recruitment is assumed at a long-term mean of 10.7 billion age-0 fish. Management is complicated by high discard levels and the need for mixed-fisheries considerations, but the stock overall is stable and resilient under MSY exploitation.

**Plate 3.2 Whiting North Sea and eastern English Channel stock assessment indicating fishing pressure and stock size (ICES, 2025b)**




## 3.2.3 Monkfish

3.2.3.1 There are two closely related species of monkfish; white monkfish (*Lophius piscatoriusi)* and black monkfish (*L. budegassa*). White monkfish occur throughout the North-east Atlantic and are more abundant than black monkfish in northern areas. It is a very distinctive fish, recognizable by having its head and body depressed, a wide mouth, broad head and a fleshy 'lure' at the end of its first dorsal spine, which is used to attract prey. They can live up to 24 years and reach 200 centimetres (cm) in length, reaching maturity at four to five years at a length of 35cm.

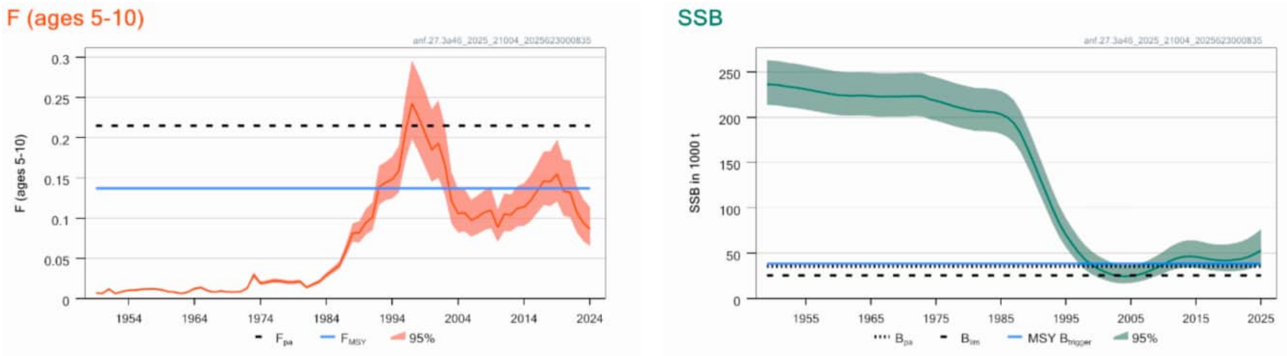
3.2.3.2 Both species are most abundant from 200m to 500m, with white monkfish also occurring down to 800m. It is found mostly on sandy or muddy bottoms but is also present on shell, gravel and occasionally rocky areas.

3.2.3.3 A minimum marketing weight is in place (EC 2406/96) of 500 grams (g) gutted or 200g tail per individual. A single TAC applies to both species of monkfish as they are often not separated in the landings.

3.2.3.4 Monkfish are a highly valuable demersal fish species, caught almost exclusively by demersal otter trawls.

3.2.3.5 Monkfish in the northern shelf are managed as a combined stock (white and black species). ICES advises that 2025 catches should not exceed 32,449 tonnes, a reduction from 2024 due to downward revisions in stock perception. The stock shows fluctuating recruitment but remains above $B_{lim}$ (**Plate 3.3**), with fishing mortality close to $F_{MSY}$. Landings are dominated by mixed trawl fisheries, particularly targeting demersal species. Spatial distribution includes shelf edge and deeper offshore waters, with seasonal movements linked to feeding and spawning. Despite uncertainties in survey coverage and species-specific data, the assessment indicates the stock is being exploited sustainably, though reliance on combined-species management remains a precautionary weakness.

**Plate 3.3 Monkfish Greater North Sea and West of Scotland stock assessment indicating fishing pressure and stock size (ICES, 2025c)**




## 3.3 Cephalopods

### 3.3.1 Squid

3.3.1.1 Squid (*Loligo forbesi*) is the most important fished cephalopod in Scottish waters and the only cephalopod for which there is a reliable market, although other squid species (for example, *Todarodes sagittatus*) and octopus (*Eledone cirrhos*) are frequently caught and landed as ‘mixed squid and octupi’.

3.3.1.2 The squid fishery occurs in coastal waters, peaking in September and October, corresponding to the occurrence of pre-breeding squid (Young *et al.*, 2006). In the UK squid is normally taken as a bycatch from the mixed demersal otter trawl fishery. However, in the Moray Firth there is a squid directed fishery. Demersal otter trawl vessels may carry two sets of gear, fishing for Nephrops at night and changing to squid gear during the day. Other vessels exclusively target squid during the season.

3.3.1.3 It is postulated that squid move from the West Coast of Scotland to the North Sea to spawn and that there may be squid spawning grounds located in the Moray Firth (Young *et al.*, 2006).

3.3.1.4 The UK fishery for squid in the North Sea is not subject to management regulations for a TAC or quota or any other limits.

3.3.1.5 Squid are normally associated with the water column, above sandy or hard substrate. Squid require presence of substrata for the attachment of egg strings during the spawning period.

## 3.4 Pelagic finfish

### 3.4.1 Herring

3.4.1.1 The North Sea herring (*Clupea harengus*) stock, which collapsed in the 1970s and was closed to fishing for several years, subsequently recovered, and although it fell back in the mid-1990s, it has again been rehabilitated. Since 1998 spawning stock biomass has been above MSY and fishing pressure has remained below the MSY benchmark (ICES, 2022), though there are concerns that future low recruitment could alter this trend. Applicable to directed herring fisheries in the North Sea there is a Minimum Conservation Reference Size (MCRS) of 20cm (3cm above the size of maturity). Catches below this size must be landed but cannot be sold for human consumption and so are less valuable.

3.4.1.2 Herring shoals move between spawning and wintering grounds in coastal areas and feeding grounds in open water. Herring populations are known to use traditional spawning grounds, many of which are along shallow coastal areas (15m to 40m depth), or on offshore banks down to 200m. Spawning usually occurs on gravel or rock bottoms. Spawning is highly associated with benthic habitat type.

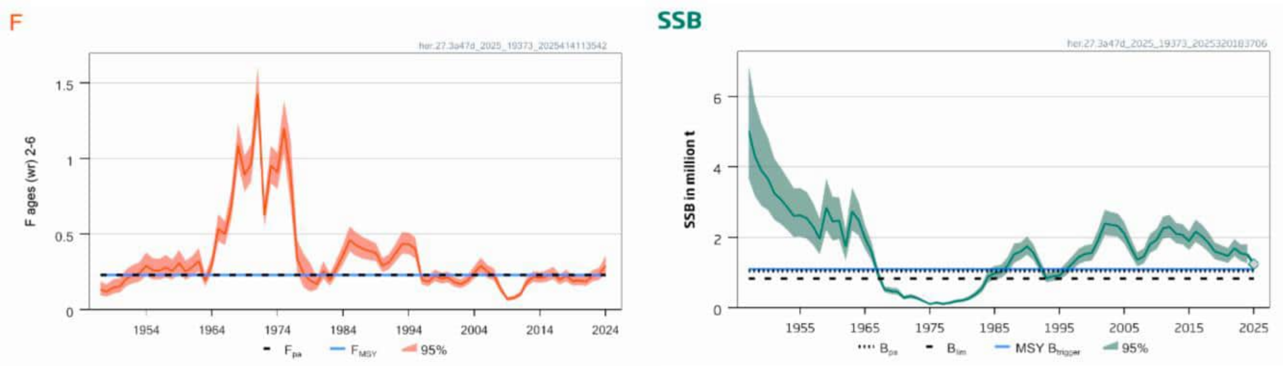
3.4.1.3 The North Sea Autumn-spawning (NSAS) herring stock is distributed across a wide geographic area encompassing ICES Subarea 4 (North Sea), Division 3.a (Skagerrak and Kattegat), and Division 7.d (eastern English Channel). This constitutes one of the largest and most commercially important herring stocks in Europe. The stock supports mixed and directed fisheries across multiple national fleets and is managed as a single biological unit.

3.4.1.4 The NSAS herring stock continues to face challenges despite a SSB that remains above precautionary limits. The 2026 catch advice is 287,772 tonnes, a substantial 30.2% reduction compared to 2025, reflecting both revised biological reference points and record-low recruitment in recent years (ICES, 2025d).

3.4.1.5 The SSB for 2025 is estimated at 1.25 million tonnes (**Plate 3.4**), remaining well above $B_{lim}$ (828,874 tonnes) and $B_{pa}$ (1.05 million tonnes). However, fishing mortality (F = 0.286) is above the newly revised $F_{MSY}$ (0.23), triggering the reduction under the MSY approach. These changes follow an ICES Management Strategy Evaluation, which found the previous reference points to be non-precautionary. As a result, $F_{MSY}$ was revised downward from 0.32 to 0.23, and MSY $B_{trigger}$ was adjusted to 1.1 million tonnes, slightly above $B_{pa}$.

3.4.1.6 The stock remains in a low productivity regime, with recruitment for 2025 predicted to be the lowest since the late 1970s. Recruitment has been weak since 2002, severely limiting stock recovery and making it more vulnerable to fishing pressure. This underlines the need for conservative management despite the relatively high current SSB. Overall, herring in the North Sea is experiencing persistently low recruitment and has undergone downward revision of biological reference points, placing greater emphasis on precautionary management and potential cumulative stressors.

**Plate 3.4 Herring Autumn spawners (North Sea, Skagerrak and Kattegat, eastern English Channel stock assessment indicating fishing pressure and stock size (ICES, 2025d)**



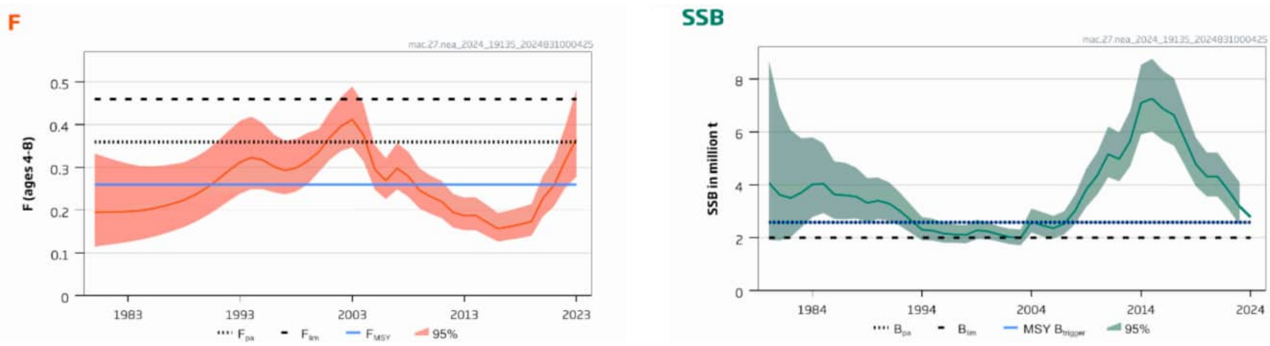

### 3.4.2 Mackerel

3.4.2.1 Mackerel (*Scomber scombrus*) are a pelagic species that live near the surface of the sea in large shoals. North Sea mackerel overwinter in the deep water, to the east and north of Shetland and on the edge of the Norwegian Deep. In the Springtime, they migrate south to spawn in the central part of the North Sea from May until July.

3.4.2.2 In terms of fisheries management measures, a TAC is in place that covers all North-east Atlantic fisheries. A MCRS of 30cm is in place.

3.4.2.3 The North-east Atlantic mackerel stock is one of the largest and most valuable pelagic resources in Europe, widely distributed across the Norwegian Sea, North Sea, and western waters. ICES advises that 2025 catches should be no more than 739,386 tonnes, a 5% reduction from 2024 advice. The SSB in 2024 was estimated at 3.9 million tonnes (**Plate 3.5**), above MSY $B_{trigger}$ (2.24 million tonnes), while fishing mortality (F = 0.27) is at the upper end of $F_{MSY}$ (0.26). Recruitment has been moderate since 2016, with no exceptionally strong year classes. The stock is managed jointly by multiple coastal states, though lack of agreement on quota sharing continues to undermine management. Despite strong biomass, cumulative pressures, high exploitation, and governance challenges maintain uncertainty. The stock remains productive but requires continued conservative management.

**Plate 3.5 Mackerel stock assessment indicating fishing pressure and stock size (ICES, 2025e)**




## 3.5 Shellfish

### 3.5.1 Nephrops

3.5.1.1 Nephrops is a small lobster, pale orange in colour. It grows to a maximum total length of 25cm (including the tail and clawed legs), although individuals are normally between 18cm to 20cm. Nephrops do not reach sexual maturity until two to three years. Life span in the North Sea is understood to be eight to nine years.

3.5.1.2 They are found in soft sediment, commonly at depths of between 200m and 800m, although considerable populations exist at depths <200m. They live in shallow burrows and are common on grounds with fine cohesive mud which is stable enough to support their unlined burrows.

3.5.1.3 Nephrops stock assessments are conducted by ICES. Stock assessments are produced for 33 areas across the North-east Atlantic, called Functional Units (FUs). However, management is applied to 18 areas, called management units. The commercial fisheries local study area is not located within a Nephrops FU. Management is applied via a TAC set for the whole of the North Sea (ICES Division 4).

3.5.1.4 There is a MCRS of 85 millimetres (mm) total length (25mm carapace length and 46mm tail) for Nephrops in the North Sea. The landing obligation requires target species to be landed and therefore prohibits the discarding of quota species. In UK waters, the landing obligation is implemented via the Fisheries Act 2020. For the Nephrops trawl fishery in the

North Sea, there is a de minimis exemption from the landing obligation consisting of a 6% discard rate by weight.

3.5.1.5 Under the Fisheries Act 2020, the Marine Directorate is currently developing a Nephrops Fisheries Management Plan for the North Sea.

3.5.1.6 The Project OAA overlaps with the Nephrops Fladen Ground FU and the offshore export cable corridor overlaps with the Fladen Ground and Moray Firth FUs. The location of fishing grounds and spatial fishing activity is provided in **Section 6.2**.

3.5.1.7 Nephrops, Fladen Ground (FU 7) (**Plate 3.6**): the Fladen Ground stock remains one of the largest Nephrops resources in the North Sea. Fishing pressure is below $F_{MSY}$ and stock size is above MSY $B_{trigger}$, but ICES advises that 2025 catches should not exceed 9,149 tonnes, a sharp 26% reduction from 2024 due to declining survey abundance. Historically, catches have been well below advice, and if unused catch is transferred to other FUs, this risks non-precautionary exploitation. The stock is assessed via underwater television surveys, with an abundance estimate of 3.7 billion individuals in 2024. Discards are low (~2.8% by number, 25% survival). The stock supports mixed demersal trawl fisheries, but management must remain at the FU level to reflect spatial dynamics. Overall, Fladen Nephrops is stable but trending downwards in abundance.

3.5.1.8 Nephrops, Moray Firth (FU 9) (**Plate 3.7**): in the Moray Firth, Nephrops abundance has declined, and ICES advises that 2025 catches should be capped at 884 tonnes, a 50% reduction compared with 2024. Fishing mortality is below $F_{MSY}$ and stock size above MSY Btrigger, but survey estimates indicate lower abundance (266 million individuals in 2024). The fishery is mainly prosecuted by Nephrops-directed trawls (62%), with some mixed trawl (37%) and a small creel component (1%). Discards are modest (3.9% by number, 25% survival). Recruitment remains variable, with signs of weaker productivity compared to historical highs. Given the small size of this FU relative to Fladen, its vulnerability to overexploitation is greater, requiring strict adherence to FU-level management.

#### Plate 3.6 Nephrops Fladen Ground FU stock assessment indicating fishing pressure and stock size (ICES, 2025f)

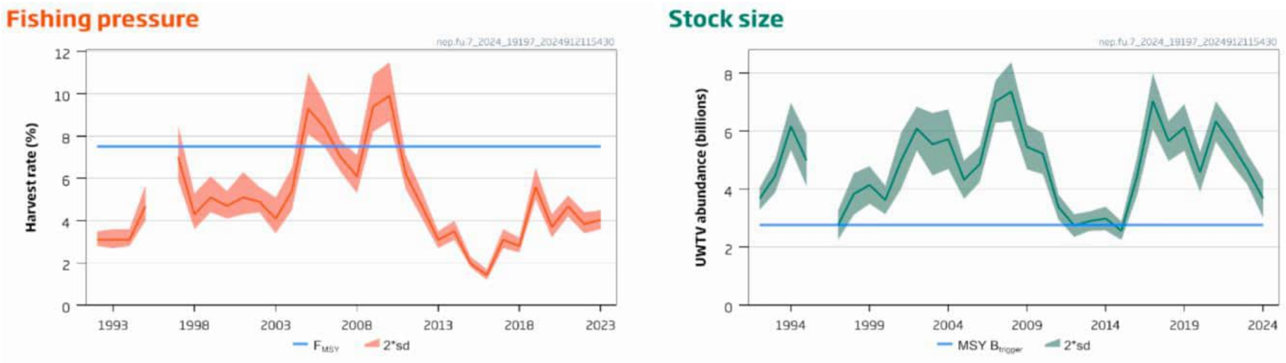
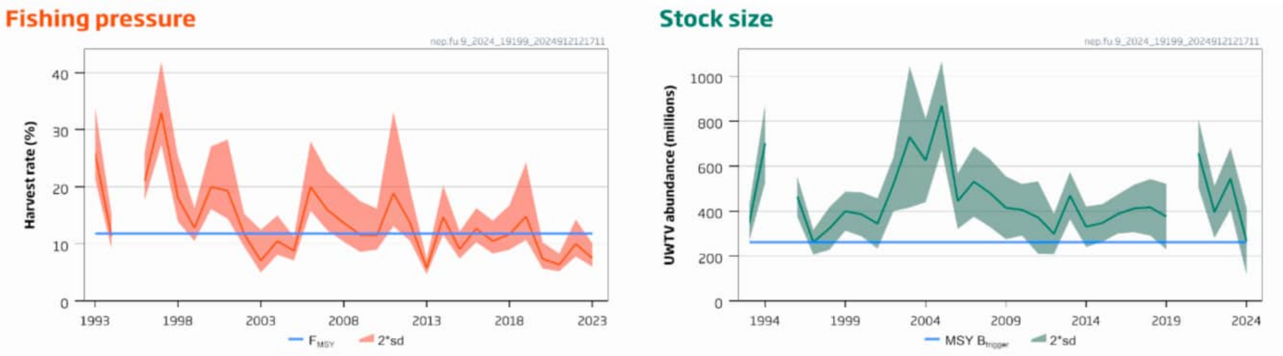


**Plate 3.7 Nephrops Moray Firth FU stock assessment indicating fishing pressure and stock size (ICES, 2025g)**




### 3.5.2 King scallop

3.5.2.1 King scallop (*Pecten maximus*) are most common in water depths of 20m to 70m, in areas of clean firm sand and fine gravel exposed to water currents, which provide good feeding conditions for this bivalve mollusc. Adults are largely sedentary and usually found recessed in sediment. King scallop live for ten to 15 years and reach reproductive maturity between three to five years, at a size of 60mm; the average maximum size is 160mm. Recruitment is usually unpredictable as it depends not only on successful spawning and larval production but also on if larvae are retained or transported to areas suitable for larval settlement. Larvae are pelagic making settlement in a particular area somewhat unpredictable, which leads to an unstable age structure within stocks. As a consequence of this, scallop beds frequently show a regional separation of year classes and spatial variability in age structure.

3.5.2.2 Whilst annual assessments of king scallop stock status in English waters are undertaken by the Cefas, the latest analytical assessment of stock status in Scottish waters was undertaken in 2016.

3.5.2.3 There are no TACs (for instance, catch limits) or quotas in place for this species; instead, UK scallop fisheries are controlled predominantly through the use of minimum legal landing sizes, gear restrictions, seasonal closures and some effort controls on the largest boats. An EU MCRS exists of 100mm (Council Regulation 850/98).

### 3.5.3 Lobster

3.5.3.1 Lobster is a long-lived decapod crustacean. Lobster breed once per year in the Summer and newly berried females begin to appear from September to December. Lobsters do not undertake any significant migrations and juveniles in the first three to four years of life may be particularly sedentary. From hatching it takes approximately five years for a lobster to recruit to the fishery. Lobsters typically inhabit rocky reef and rough ground, sheltering in crevices between rocks and boulders. The availability of suitable habitat is considered to influence the carrying capacity and size structure of lobster populations (Seitz *et al.*, 2014).

3.5.3.2 There are no TACs or quotas in place for lobster. Primary management is by the technical measure of a MCRS of 87mm (Council Regulation 850/98).

3.5.3.3 Lobster is one of the highest value per kilogram, commercially exploited shellfish species found in UK waters. Fishing activity typically peaks across Summer months, with a second peak in December associated with supplying the Christmas-time market.

### 3.5.4 Brown crab

3.5.4.1 Brown crab is a long-lived, large decapod crustacean. Brown crabs are very productive animals and each female can hatch between one and four million eggs. Post larvae are known to settle inshore and juvenile crabs are more common in shallow waters. Adult crabs undertake extensive migrations, which may be associated with their reproductive cycle. Brown crab is found across a wide range of habitat types, ranging from rocky reefs to soft mud and sand.

3.5.4.2 As with lobster, brown crab are caught by pots and have no TACs or quotas in place. Primary management is by the technical measure of a MCRS of 140mm carapace width inside 6nm and 130mm outside 6nm (Council Regulation 850/98).

# 4. Key Fishing Gears

## 4.1 Introduction

4.1.1.1 There are three descriptive units used for defining fisheries (Marchal, 2008):

- Fishery – a group of vessel voyages which target the same species or use the same gear.
- Fleet – a physical group of vessels sharing similar characteristics (for example, nationality).
- Métier – a homogenous subdivision, either of a fishery by vessel type or a fleet by voyage type.

4.1.1.2 A range of fleets target different fisheries across the commercial fisheries local and regional study areas which are described on a fleet basis within this Section.

## 4.2 Demersal otter trawl

4.2.1.1 **Plate 4.1** shows a typical UK demersal trawler and associated gear in a pair trawl formation and **Table 4.1** describes the profile of demersal otter trawling vessels active across the commercial fisheries regional study area. Otter trawls typically catch gadoids (including haddock, cod, whiting), squid, plaice, and Nephrops; however, the species composition of the catch depends on the area and depth fished, and the gear design.

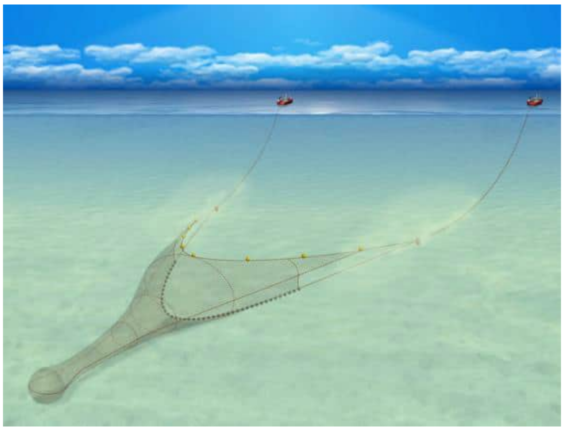
4.2.1.2 Vessel numbers vary, and their presence is dependent upon the success of demersal and / or Nephrops catches elsewhere.

4.2.1.3 Demersal trawlers operating across the commercial fisheries regional study area tend to tow in directions which are in line with natural seabed contours.

### Table 4.1 Profile of typical demersal otter trawling vessels

| Parameter | Indicative details |
|---|---|
| **Main target species** | Haddock, whiting, Nephrops, squid, monkfish. |
| **Nationality** | Scottish, English. |
| **Vessel length** | 16m to 35m. |
| **Horsepower (hp)** | 300hp to 850hp. |
| **Typical towing speed** | 2 knots to 6 knots. |
| **Typical gear** | Possible twin or multi-rig bottom trawl. Two trawl doors (‘otter boards’) approximately 1 tonne each hold the net open.<br>Various forms of ground gear depending on target species. |

**Plate 4.1 Profile of typical demersal otter trawler vessel (NiMa) and pair trawl gear diagram (Montgomerie, 2022).**



## 4.3 Dredge

4.3.1.1 A typical scallop dredging vessel is shown in **Plate 4.2** and **Table 4.2** describes the profile of scallop dredging vessels active across the commercial fisheries regional study area.

4.3.1.2 Dredges are rigid structures that are towed along the seabed to target various species of shellfish. Scallop dredgers fish as the tooth bar of each dredge rakes through the sediment lifting out scallops and the spring-loaded tooth bar swings back, allowing the dredge to clear obstacles on the seabed. The dredges are held in a series on two beams, which are fished on each side of the vessel.

4.3.1.3 UK scallop dredgers operate around the entire coastline of the UK. Scallop dredging takes place year-round. The UK scallop fleet has two main components: a fleet of larger boats (> 20m in length), which range in a nomadic fashion exploiting both inshore and offshore scallop stocks around the UK; and smaller inshore boats (< 15m in length) that are restricted in range to inshore waters. Larger nomadic vessels tend to fish intensely in an area until harvesting scallops becomes unprofitable. They will then move on to new areas but will return a number of years later when the scallop stocks have returned to a level where dredging for them has once again become viable. Due to this fishing pattern a large scallop dredger may operate in four or five, or even more, areas and rotate around them over a period of several years. In this way, most of the suitable grounds around the UK are fished. At the other end of the spectrum are the smaller, inshore vessels, including some who will only fish for scallops on a part time basis, and others who rely on scallops for the majority of their income. These vessels are restricted, primarily by their size, in the areas and weather that they can fish meaning that they are likely to dredge for scallops only in their local area. The catching capacity of these vessels is significantly lower than the large vessels due to the lower number of dredges they can tow.

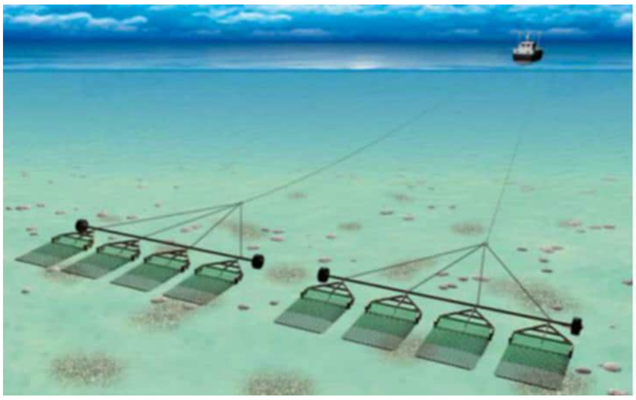
4.3.1.4 Scallop dredging is an activity which is generally engaged by larger (>10m vessel length) vessels due to the engine capacity required to tow this heavy fishing gear.

4.3.1.5 Not all scallops in the path of the dredge are retained by the dredges and efficiency of the Newhaven dredge (commonly used in the UK commercial scallop fishery) can vary between <10% on soft ground to 51% on hard ground. Dredge efficiency is affected by ground type (for example, soft sand, gravel or cobble), towing speed, warp length, tide strength and direction and the experience of the skipper.

### Table 4.2 Profile of typical dredging vessels

| Parameter | Indicative details |
|---|---|
| **Main target species** | King scallop |
| **Nationality** | Scottish, English |
| **Vessel length** | 10m to 25m |
| **Horsepower** | 200hp to 400hp |
| **Typical towing speed** | 2 knots to 6 knots |
| **Typical gear** | Up to 16 dredges per side of vessel.<br><br>Each dredge consists of a triangular frame leading to an opening, a tooth bar with spring-loaded teeth, and a bag of steel rings and netting back. |

### Plate 4.2 Profile of typical scallop dredging gear and vessel (Montgomerie, 2022; Fishing News, 2020)



## 4.4 Potting

4.4.1.1 **Plate 4.3** shows typical potting vessels, gear and the configuration of set pots and **Table 4.3** describes the profile of potting vessels active across the commercial fisheries regional study area.

4.4.1.2 Creels or pots used for the capture of lobsters and crabs, including brown crab (*Cancer pagurus*) and velvet crab (*Necora puber*). Pots are typically rigged in ‘fleets’ or ‘strings’ of between 15 pots to 60 pots, depending upon vessel size and area fished. Hundreds of pots can be deployed across a fishing location. Lengths of fleets may range from 100m to over 1nm, anchored at each end with anchors or chain clump weights. A variety of surface markers are used, including flagged ‘dhans’, buoys and cans. Soak times, the time between emptying and re-baiting the pots, can vary between six and 168 hours, but would typically be 24 hours. All pots are worked on a rotational basis; after hauling and emptying, pots are baited and re-set. Creel design is typically D-shaped in section and made from steel rods covered in netting and protected or “bumpered” with rope or rubber strips. Pots are usually deployed on rocky substrate, though may less frequently be found on other softer substrates.

4.4.1.3 Larger potters working further offshore make fishing trips lasting around two days. Smaller potters under 10m in length operate as day boats, returning to port after hauling, emptying, baiting and re-setting fleets of pots. Potting vessels may target a single or multiple shellfish species.

**Table 4.3 Profile of typical potting vessels**

| Parameter | Indicative details |
|---|---|
| **Main target species** | Brown crab, lobster |
| **Nationality** | Scottish |
| **Vessel length** | Over 10m and under 10m. |
| **Horsepower** | 60hp to 350hp |
| **Typical towing speed** | 0 knots to 9 knots |
| **Typical gear** | Fleets of baited pots placed on the seabed.<br>Pots typically hauled daily but may be left a number of days.<br>Generally, day boats that return to port daily. |

**Plate 4.3 Profile of typical potting gear and vessel (Montgomerie, 2022; Fishing News, 2016)**

## 4.5 Pelagic trawl

4.5.1.1 **Plate 4.4** shows a typical pelagic trawl vessel and **Table 4.4** describes the profile of pelagic trawl vessels active across the commercial fisheries local and regional study areas.

4.5.1.2 Pelagic or mid-water trawls are towed at the appropriate level in the water column to intercept shoaling fish such as herring and mackerel. The location of the shoals is determined by sonar or vertical sounder echoes. Pelagic vessels typically require up to 2nm to position their nets, undertake a tow and then haul nets.

4.5.1.3 Catches with pelagic trawl form a significant portion of the annual landings (21% by landed value) from the commercial fisheries regional study area. Landings are made by vessel greater than 15m in length, across a number of countries, including the UK and Norway.

**Table 4.4 Profile of typical pelagic trawl vessels**

| Parameter | Indicative details |
|---|---|
| **Main target species** | Mackerel, herring |
| **Nationality** | Scottish |
| **Vessel length** | 30m to 50m |
| **Horsepower** | 500hp to 1,200hp |
| **Typical towing speed** | 2.5 knots to 5 knots |
| **Typical gear** | Pair or single trawls.<br>Net depth changed by altering either warp (rope) length or towing speed. |

**Plate 4.4 Profile of typical pelagic trawling gear and vessel (Montgomerie, 2022; NiMa)**

## 4.6 Hook and line

4.6.1.1 Small inshore vessels of under 10m length use hook and line methods to primarily target mackerel, though a variety of other species may be taken. Details of typical gear operational attributes are provided in **Table 4.5,** with gear configuration illustrated in **Plate 4.5**.

4.6.1.2 Mackerel handlining is typically deployed seasonally by vessels that also deploy pots. In this fishery, a fisher uses a single line with a weight and multiple hooks, often as many as 20 or 30. The hooks are typically equipped with small feathers or pieces of coloured plastic to serve as lures, although sometimes the fish will bite a bare, shiny hook without any added attractants. The lines are hauled by hand, and the fish are shaken off as they come aboard. Alternatively, the line may be wound onto a large reel, known as a 'gurdy.' In this case, the line is often passed through a device called a 'stripper,' which removes the fish from the hooks as the line is brought in. This system allows the line to be re-shot immediately after the last hook passes through the stripper. Fish are landed on a daily basis.

### Table 4.5 Profile of typical handlining vessels

| Parameter | Indicative details |
|---|---|
| **Main target species** | Mackerel |
| **Nationality** | Scottish |
| **Vessel length** | Majority under 10 m. |
| **Seasonality of activity** | Summer / Autumn peak |
| **Typical gear** | Single line with a weight and multiple hooks with small feathers or pieces of coloured plastic to serve as lures. |

### Plate 4.5 Typical line-fishing gear depicting rod and line (left) and set long lines (right) (Montgomerie, 2022)

# 5. Overview of Landing Statistics

## 5.1 Commercial fisheries local study area

5.1.1.1 Commercial fisheries statistics for the annual first sales value and landed weight by UK vessels landing into UK and non-UK ports and non-UK vessels landing into UK ports operating within the specified commercial fisheries local study area (44E8-E9 and 45E8-E9) are shown in **Plate 5.1** and **Plate 5.2** respectively. An annual average value of £24.2 million was landed for the years 2019 to 2023 from the commercial fisheries local study area by all UK vessels landing into UK and non-UK ports and non-UK vessels landing into UK ports. The timeseries considers landings from 2012 to 2023 to explore long term trends in catches from the local study area.

### Landings by species

5.1.1.2 **Plate 5.1** is a clustered bar chart showing the first sales value (Great Britain Pound (GBP) - £) for different commercial fish and shellfish species in the local study area from 2012 to 2023, together with the average across the period.

5.1.1.3 Nephrops is the highest-value species locally, averaging £6.3 million per year. Mackerel (£3.9m) and haddock (£2.6m) follow as other major contributors. Monkfish (£1.8m), brown crab (£1.1m), and herring (£1.0m) provide mid-tier contributions, while whiting (£0.9m), king scallop (£0.8m), and cod (£0.5m) add moderate value. Smaller contributions come from lobster (£0.4m), squid (£0.3m), lemon sole (£0.1m), halibut (£0.1m), saithe (£0.1m), and velvet crab (£0.1m).

5.1.1.4 Nephrops and mackerel display the greatest inter-annual variability, while lower-value species such as lemon sole, saithe, and velvet crab are more stable but contribute marginally to overall revenue.

5.1.1.5 **Plate 5.2** presents the landed weight (tonnes) of commercial species in the local study area across the same period. Mackerel dominates by volume, with average landings of 3,800 tonnes, followed by haddock (2,600 tonnes), herring (2,100 tonnes), and Nephrops (1,300 tonnes). Whiting (800 tonnes), monkfish (500 tonnes), brown crab (500 tonnes), and king scallop (400 tonnes) form the next tier. Cod (180 tonnes) and saithe (100 tonnes) contribute relatively little by volume, while other species such as witch, squid, plaice, gurnards, and velvet crab each land below 100 tonnes per year.

5.1.1.6 The local study area reflects a mixed fishery with different dynamics across species. Nephrops stands out as the most economically valuable species, generating £6.3m annually from relatively modest landings of 1,300 tonnes, highlighting its high price per tonne. Mackerel dominates by landings (3,800 tonnes) and also provides significant revenue (£3.9m), though with lower unit value than Nephrops. Herring shows the reverse trend, with substantial landings (2,100 tonnes) but low value (£1.0m), reflecting its bulk, low-price nature. Monkfish and lobster achieve high value from low landings, sustained by premium export markets, while brown crab, king scallop, and cod contribute moderately in both landings and value. Overall, pelagic species (mackerel, herring) underpin landings by weight, while demersal and shellfish species (Nephrops, monkfish, cod, lobster) sustain high-value returns from lower volumes.

5.1.1.7 The following species-specific trends are noted:

- Nephrops is the single most valuable species, consistently generating £6.3m annually from modest landings, reflecting strong market demand and high prices.

- Mackerel dominates by weight (3,800 tonnes) and remains a key contributor by value (£3.9m), with some year-to-year variability linked to quota and stock dynamics.
- Haddock is stable and important, with landings of 2,600 tonnes and value of £2.6m.
- Herring delivers high landings (2,100 tonnes) but relatively low value (£1.0m), reflecting low unit prices.
- Monkfish achieves £1.8m in value from 500 tonnes, reflecting premium pricing.
- Brown crab and king scallop contribute moderate volumes and values (£1.1m and £0.8m, respectively).
- Cod and lobster generate relatively high unit values despite low landings, maintaining niche importance.
- Other species (whiting, squid, lemon sole, saithe, velvet crab, halibut, plaice) contribute modestly to both landings and value.

### Landings by nationality and gear type

5.1.1.8 **Plate 5.3** presents first sales value (GBP - £) of landings from the local study area from 2012 to 2023, broken down by country of vessel origin (for instance, where commercial fishing vessel has been registered).

5.1.1.9 Landings into the local study area are overwhelmingly dominated by Scottish vessels, which account for the vast majority of first sales value, averaging £18.0 million annually and ranging from around £12 million to nearly £30 million across the time series. England provides a smaller but steady contribution, averaging £1.5 million per year, while Northern Ireland also plays a minor role with average annual values of £0.8 million. Among foreign fleets, Norway contributes on average £1.1 million, and Sweden £0.8 million, while Denmark provides just £0.3 million annually. Landings from Welsh vessels are negligible, averaging only £5,000 per year. This distribution highlights the strong dependence of the local fishery on Scottish vessels, with all other fleets representing only a small proportion of overall landings value.

5.1.1.10 **Plate 5.4** shows the first sales value (GBP) of landings into the local study area by gear type, disaggregated by vessel origin (Scotland, England, Northern Ireland, Norway, Sweden, Denmark, and Wales).

5.1.1.11 Fishing activity in the local study area is strongly dominated by trawling. Demersal trawls are by far the most valuable gear type, generating over £14 million annually, the majority from Scottish vessels with a small contribution from England. Pelagic trawls represent the second most important gear, worth just over £4 million, again primarily from Scotland but with minor input from England and Northern Ireland. Pots and traps, reflecting shellfish fisheries, contribute around £2 million, almost entirely from Scottish vessels. Pelagic seine adds approximately £1.5 million, with Scotland dominant and some activity from Norway. Other gears such as demersal seine and dredges provide modest contributions of £0.5 million to £0.7 million each, while handlines account for only a small fraction (<£0.2 million). Gears such as longlines, beam trawls, and drift or fixed nets make negligible contributions. Overall, the gear profile of the local study area is heavily trawl-based, with demersal trawling underpinning economic value, supplemented by pelagic trawling and shellfish gears, while more specialised methods play only a limited role.

## Landings by International Council for the Exploration of the Sea rectangle

5.1.1.12 **Plate 5.5** shows first sales value (GBP) of landings from the local study area by ICES rectangle (44E8, 44E9, 45E8, and 45E9) between 2012 and 2023, with the average for each rectangle marked by a black horizontal line. Key findings by ICES rectangle include:

- 44E8: Average value of £5.4 million annually. Values are relatively stable across the time period, mostly in the £4m to £6m range, with occasional peaks above £7m.
- 44E9: Average annual value of £4.6 million. Shows moderate variability, with some years around £3m to £4m and peaks above £6m.
- 45E8: Lowest average among the four rectangles at £4.2 million. More pronounced fluctuations, with some years closer to £2m to £3m and peaks approaching £9m.
- 45E9 (OAA overlaps 32 per cent of this ICES rectangle): Highest average annual value at £6.3 million. Displays the greatest variability, with annual landings values ranging widely from ~£3m to over £13m in peak years.

5.1.1.13 The distribution of value across rectangles indicates that 45E9 is the most economically important ICES rectangle in the local study area, despite its high variability. 44E8 and 44E9 provide steady and reliable contributions to the fishery, while 45E8 generates the lowest average value but occasionally shows strong peaks. Together, the four rectangles highlight spatial variability in fishing activity and value generation within the local area, with some grounds providing consistent returns and others showing more intermittent but occasionally high-value contributions.

5.1.1.14 **Plate 5.6** shows first sales value (GBP - £) by ICES rectangle (44E8, 44E9, 45E8, and 45E9) and gear type in the local study area. Key findings by rectangle and gear include:

- 44E8: Total value of £6.4 million. Mixed contributions: demersal trawls (£2.2m) are important, but pots and traps (£2m), pelagic trawls, pelagic seines, demersal seines, and dredges all contribute significantly. This rectangle has the most diverse gear profile.
- 44E9: Total value of £5.0 million. Almost entirely dominated by demersal trawls (~£4.8m), with very minor contributions from pelagic trawls and pelagic seines.
- 45E8: Total value of £4.5 million. Demersal trawls (~£2.6m) remain the largest contributor, but pelagic trawls, pots and traps, pelagic seines, and demersal seines also add value. This shows a more balanced but lower-value mix compared to 44E8.
- 45E9: Highest total value at £8.3 million. Dominated by demersal trawls (~£4.7m) and pelagic trawls (~£2.5m), with additional contributions from pelagic seines. This rectangle is the most economically important overall.

5.1.1.15 The spatial distribution of gear types shows that demersal trawls underpin value across all rectangles, but the role of other gears varies. 44E8 and 45E8 demonstrate more mixed fishing activity, with notable contributions from pots, pelagic trawls, and seines, while 44E9 is heavily reliant on demersal trawls alone. 45E9 stands out as the most valuable rectangle, driven by strong contributions from both demersal and pelagic trawling. This pattern reflects how certain grounds support specialised trawl activity, while others sustain a broader mix of fishing gears, diversifying the economic base of the local fishery.

**Plate 5.1 Key species by annual landed value (GBP) (2012 to 2023) from the commercial fisheries local study area (MMO, 2022a; MMO, 2024a)**

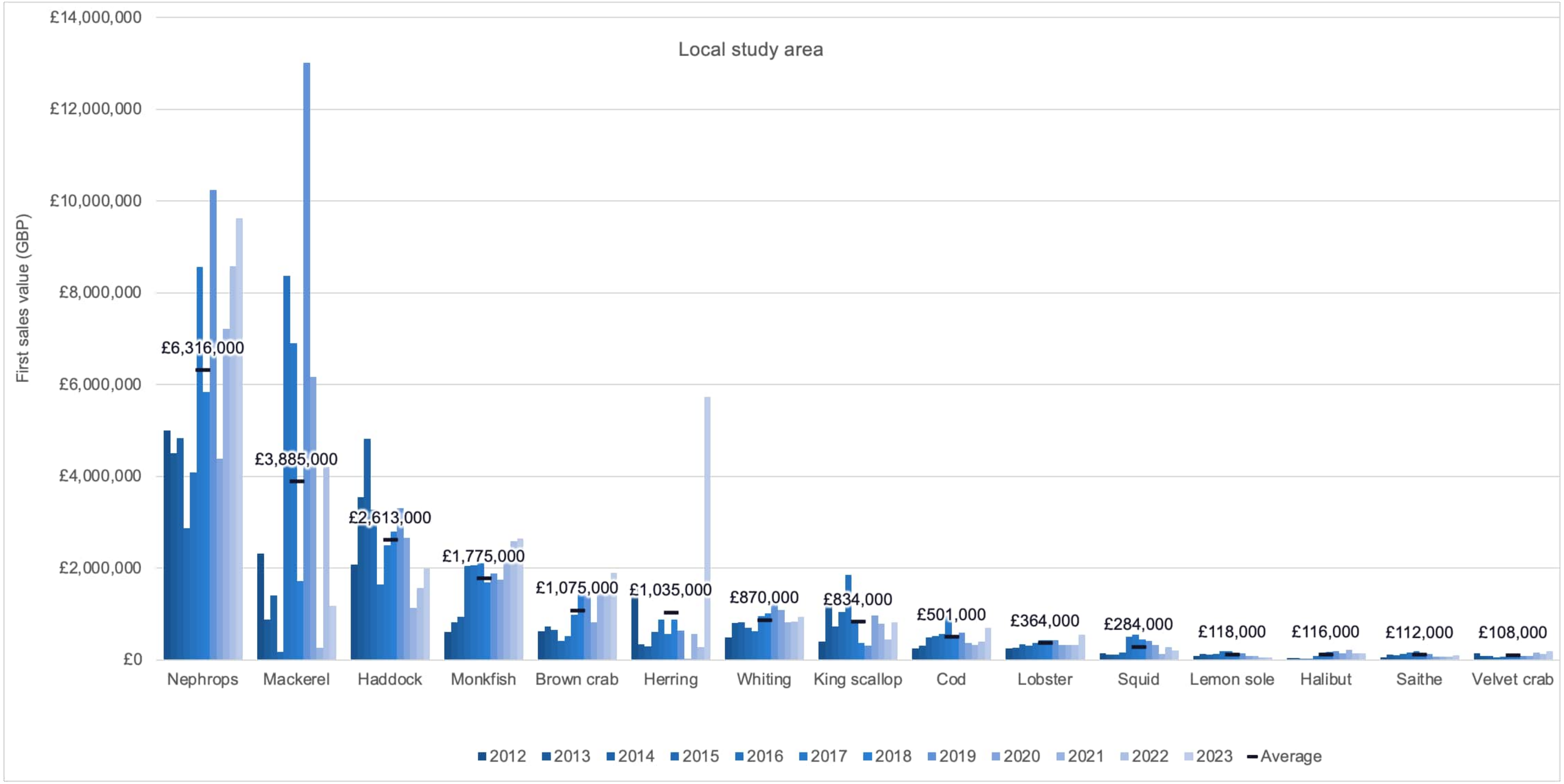


**Plate 5.2 Key Species by annual landed weight (tonnes) (2012 to 2023) from the commercial fisheries local study area (MMO, 2022a; MMO, 2024a)**

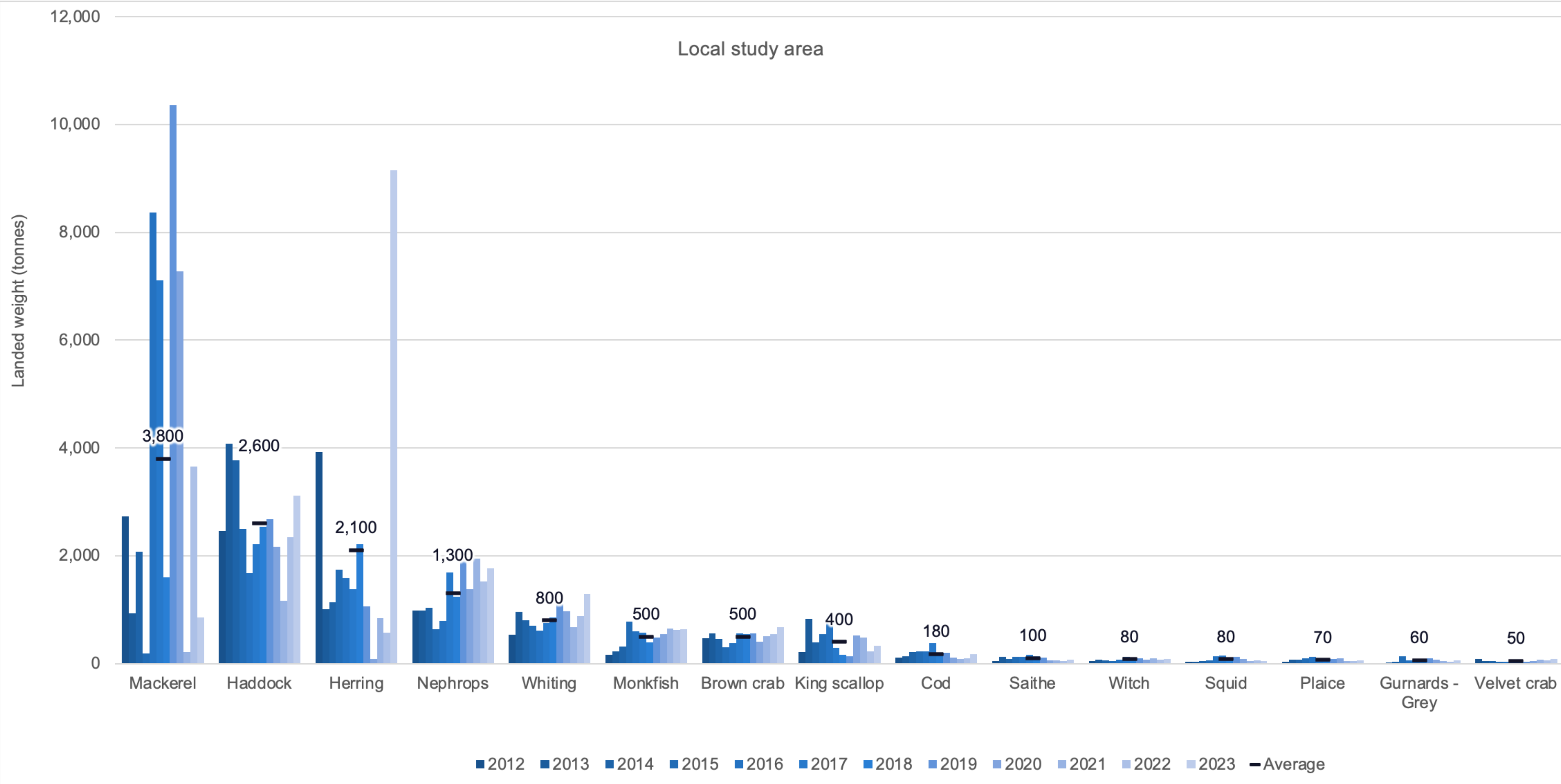


**Plate 5.3 Annual landed value (GBP) (2012 to 2023) by vessel nationality from the commercial fisheries local study area (MMO, 2022a; MMO, 2024a)**

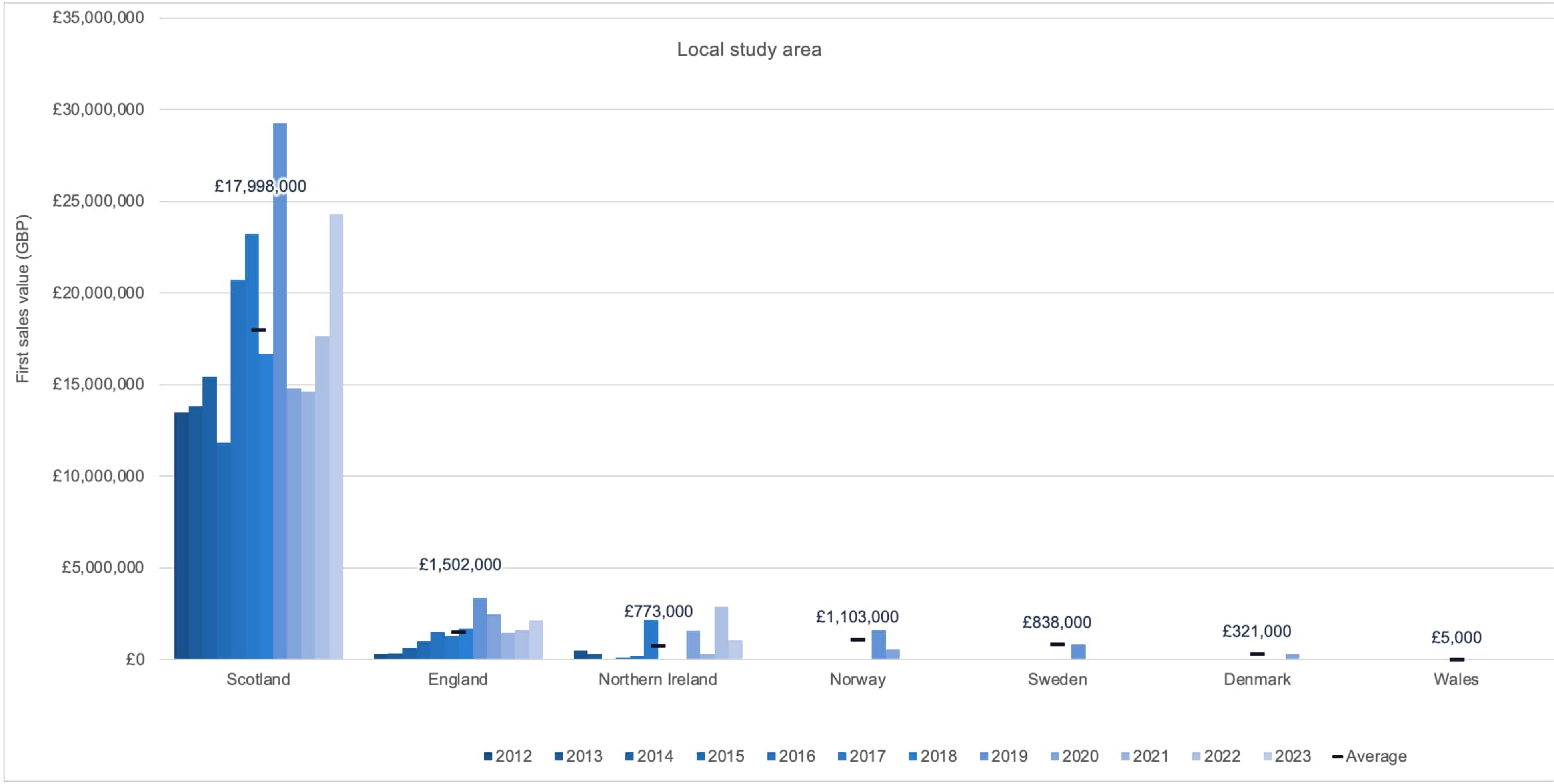


**Plate 5.4 Average annual landed value (GBP) (2019 to 2023) by gear type and vessel nationality from the commercial fisheries local study area (MMO, 2022a; MMO, 2024a)**

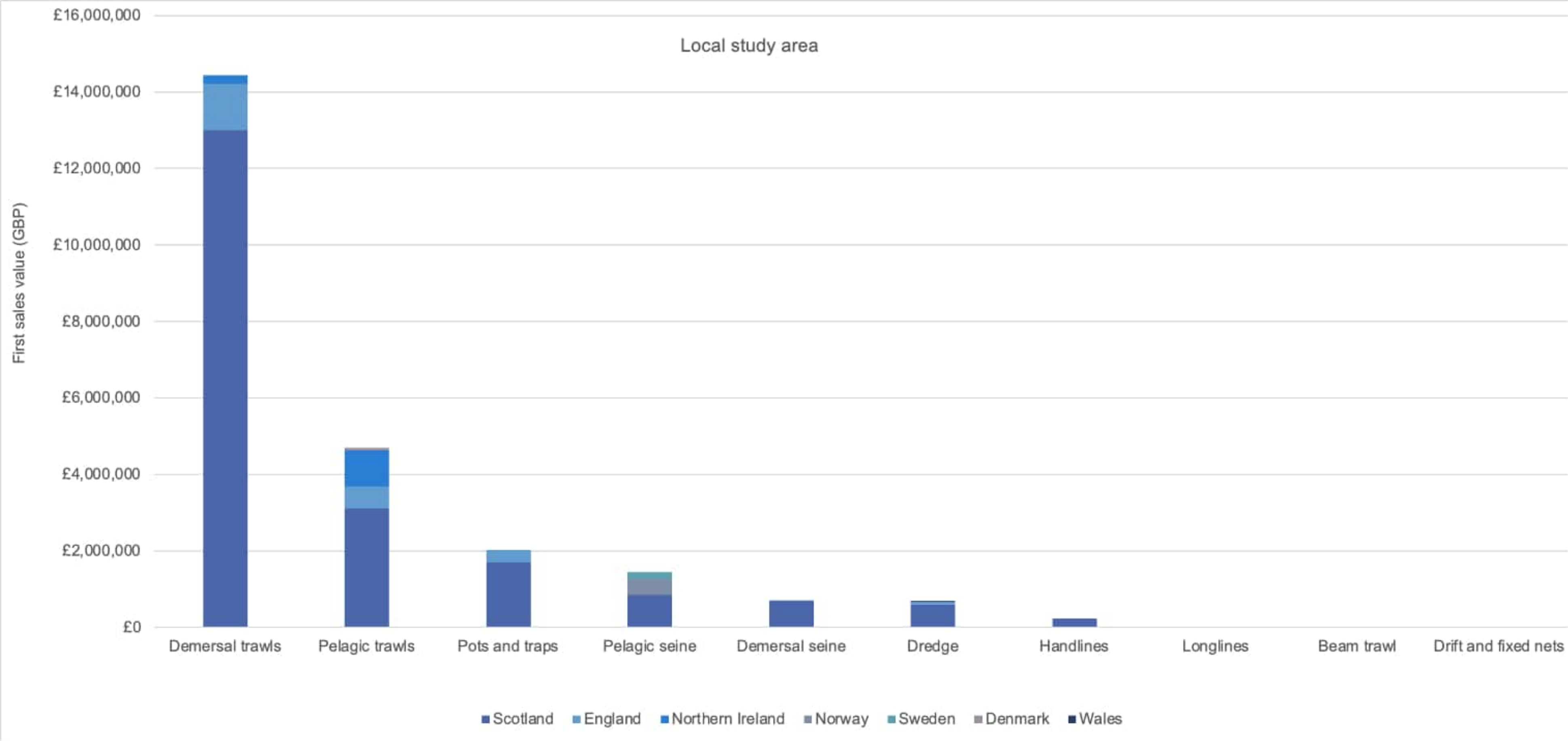


**Plate 5.5 Annual landed value (GBP) (2012 to 2023) by ICES rectangle from the commercial fisheries local study area (MMO, 2022a; MMO, 2024a)**

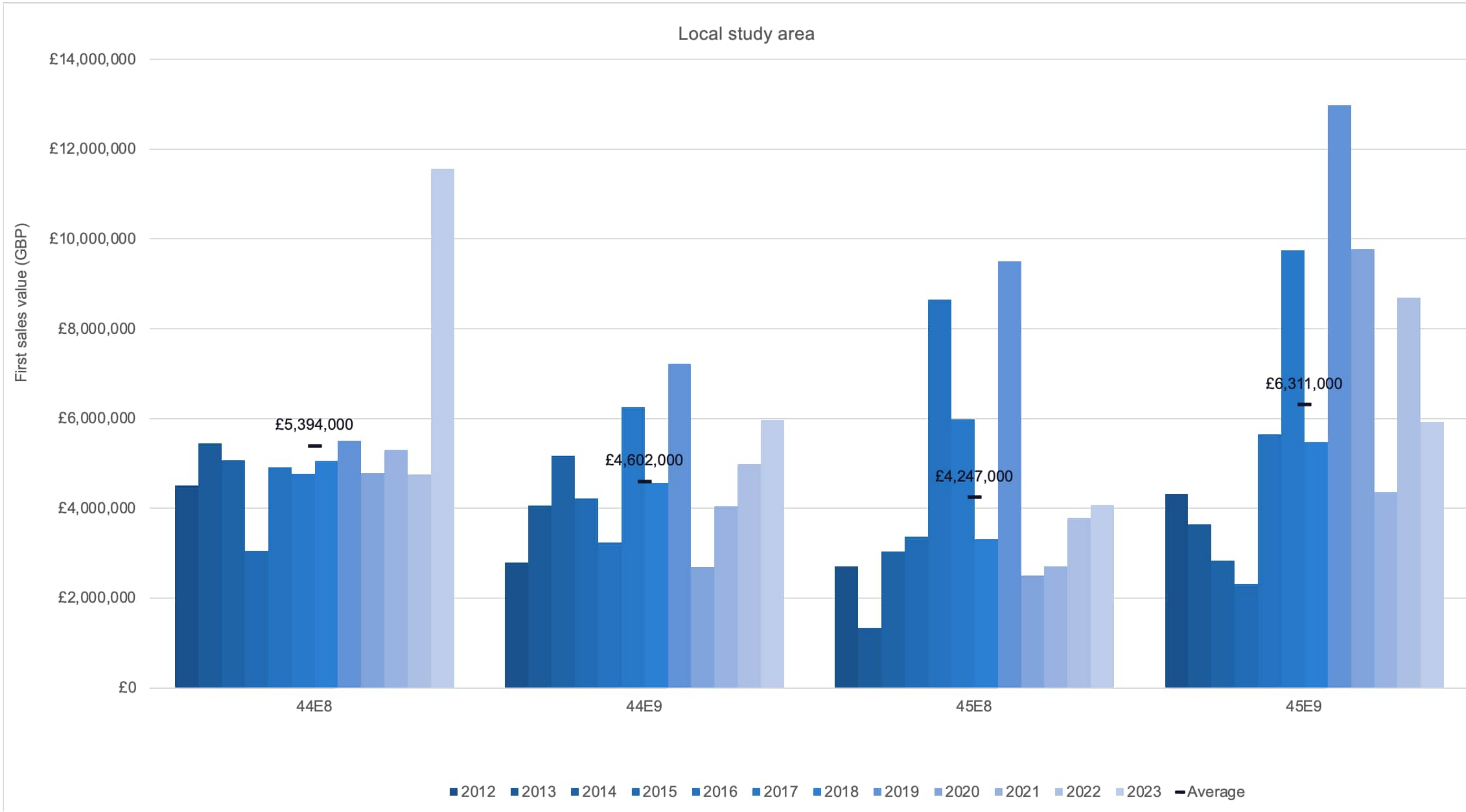
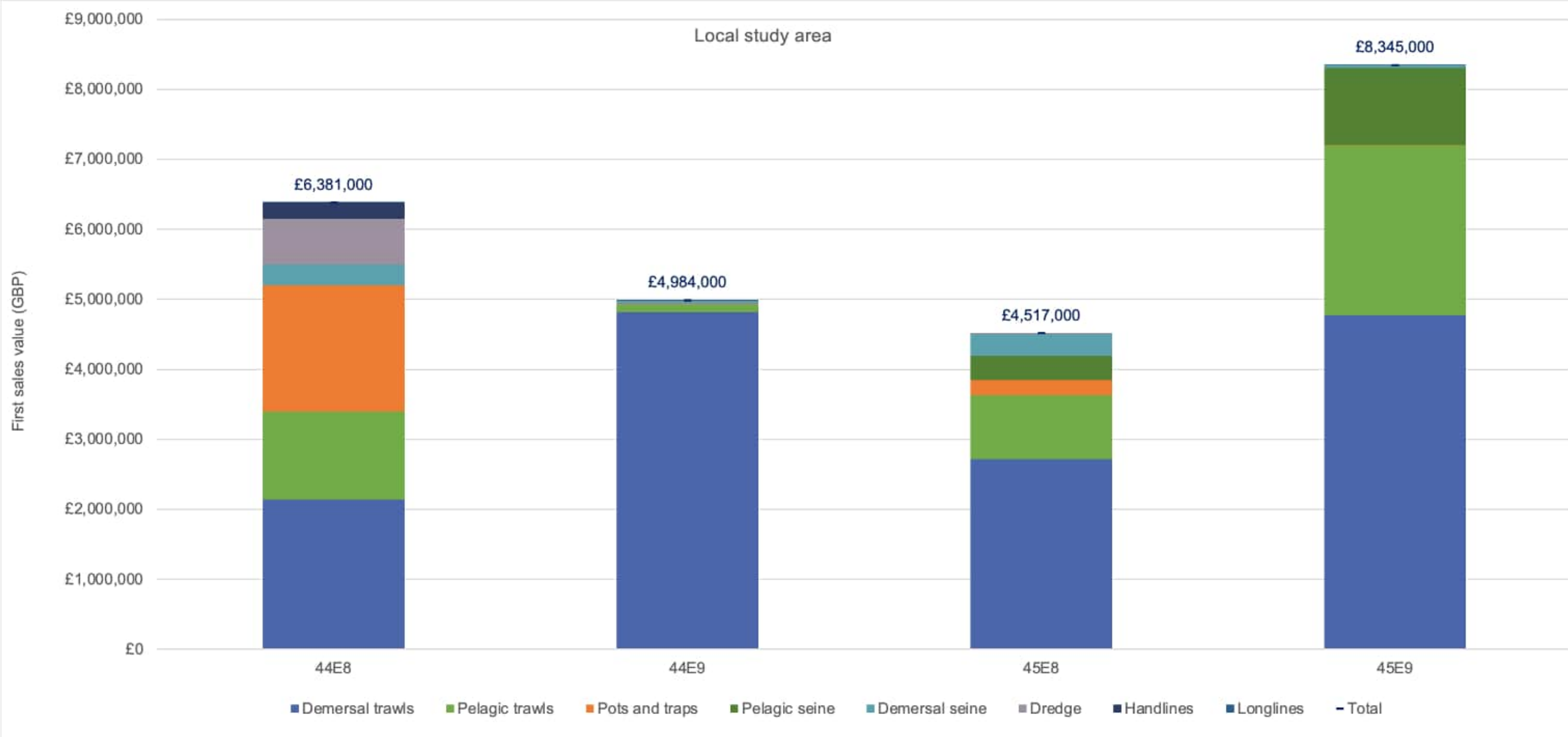


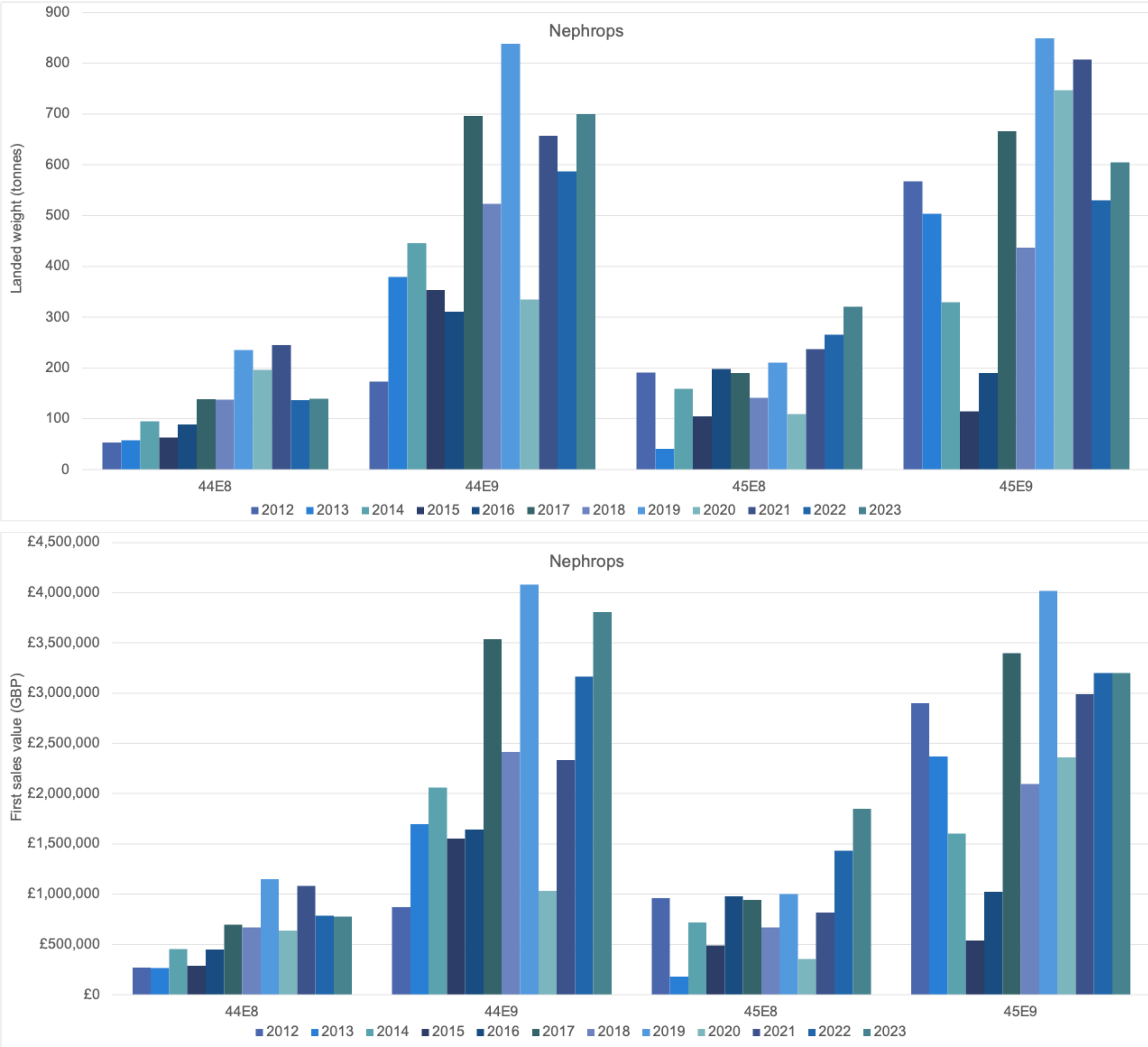
**Plate 5.6 Average annual landed value (GBP) (2019 to 2023) by gear type and ICES rectangle from the commercial fisheries local study area (MMO, 2022a; MMO, 2024a)**



## Long term trends for key species

5.1.1.16 Long term landings data is analysed for the top four species from the commercial fisheries local study area indicating the landed weight and first sales value by ICES rectangle from 2012 to 2023 for Nephrops (**Plate 5.7**), mackerel (**Plate 5.8**), haddock (**Plate 5.9**) and monkfish (**Plate 5.10**).

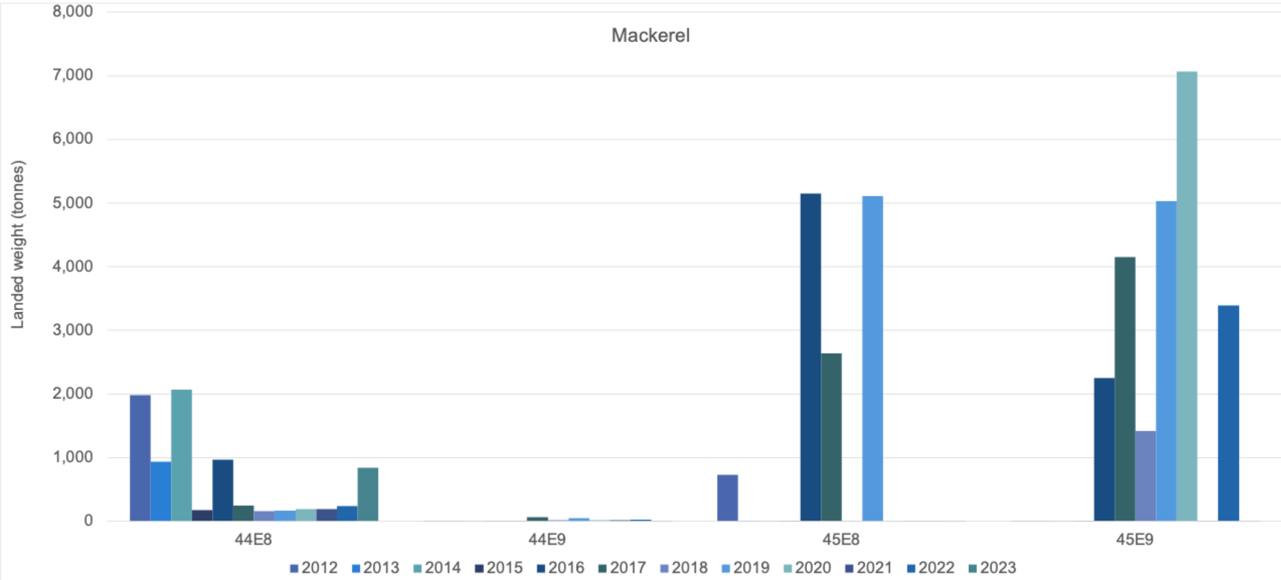
**Plate 5.7 Long term landing trends for Nephrops from the commercial fisheries local study area by weight (top) and value (bottom) (MMO, 2022a; MMO, 2024a)**

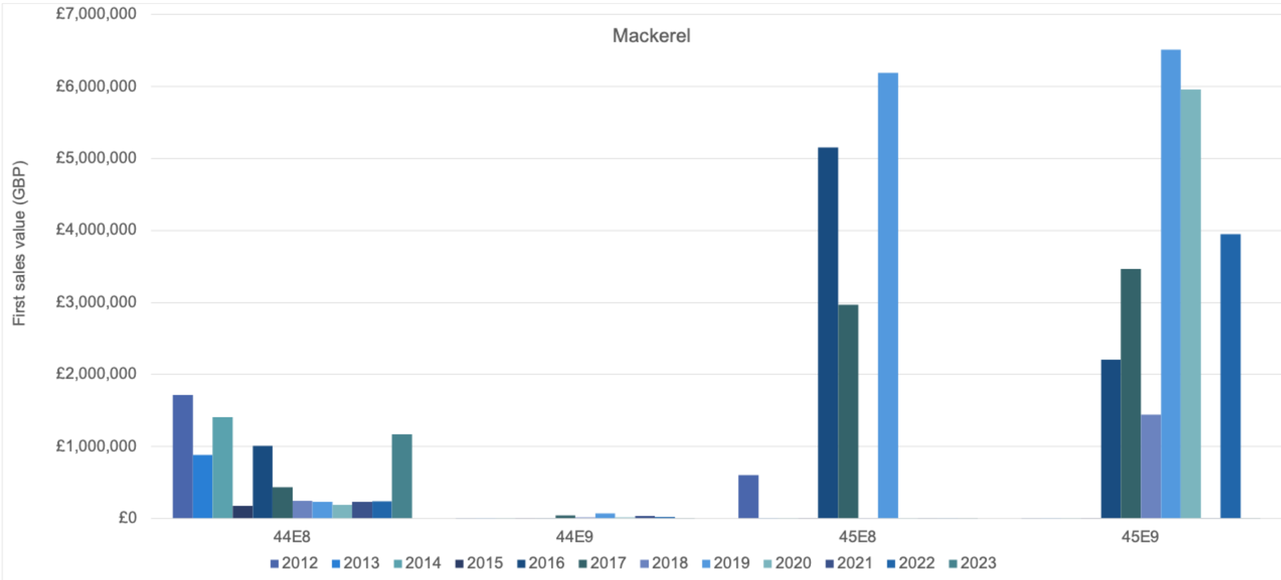



5.1.1.17 Nephrops landings in the local study area have shown an overall increasing trend over the period 2012 to 2023, with landed weights rising from around 1,000 tonnes at the start of the period to peaks of over 2,000 tonnes in 2019 and 2023. First sales value followed a similar trajectory, reaching over £10 million in 2019 and 2023, reflecting both increased landings and sustained strong market demand. Spatially, landings are dominated by rectangles 45E9 and 45E8, highlighting the importance of these grounds. The increase across the time period is consistent with reported increase in fishing pressure in the Fladen Ground FU

(ICES, 2025f), combined with stable market demand in domestic and European markets, maintaining high per-tonne value.

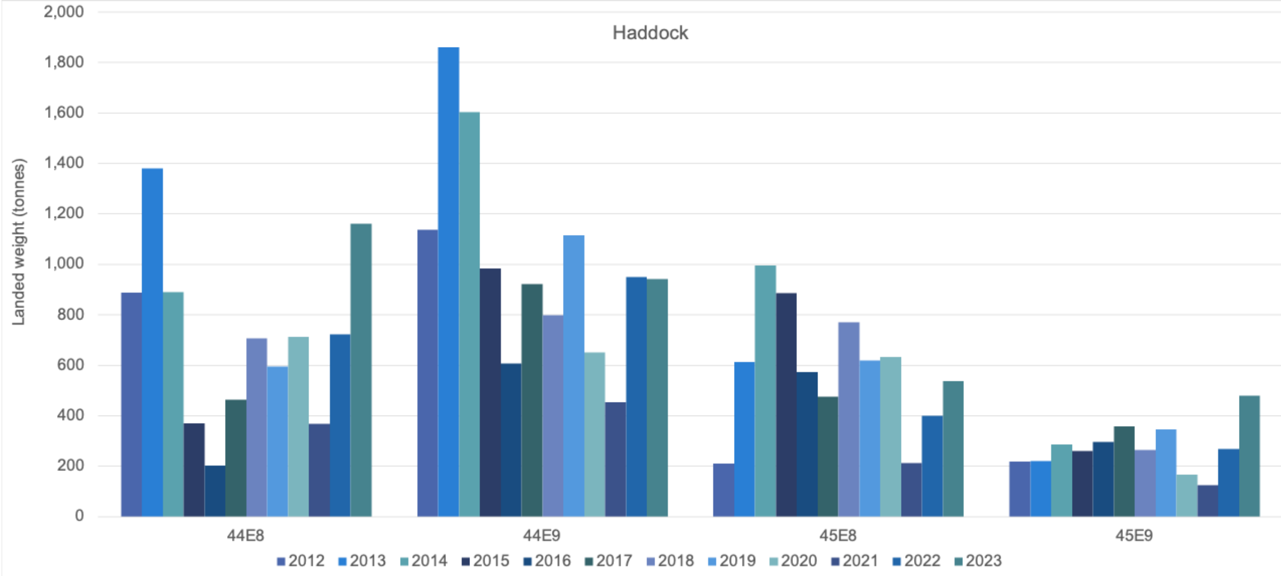
**Plate 5.8 Long term landing trends for mackerel from the commercial fisheries local study area by weight (top) and value (bottom) (MMO, 2022a; MMO, 2024a)**

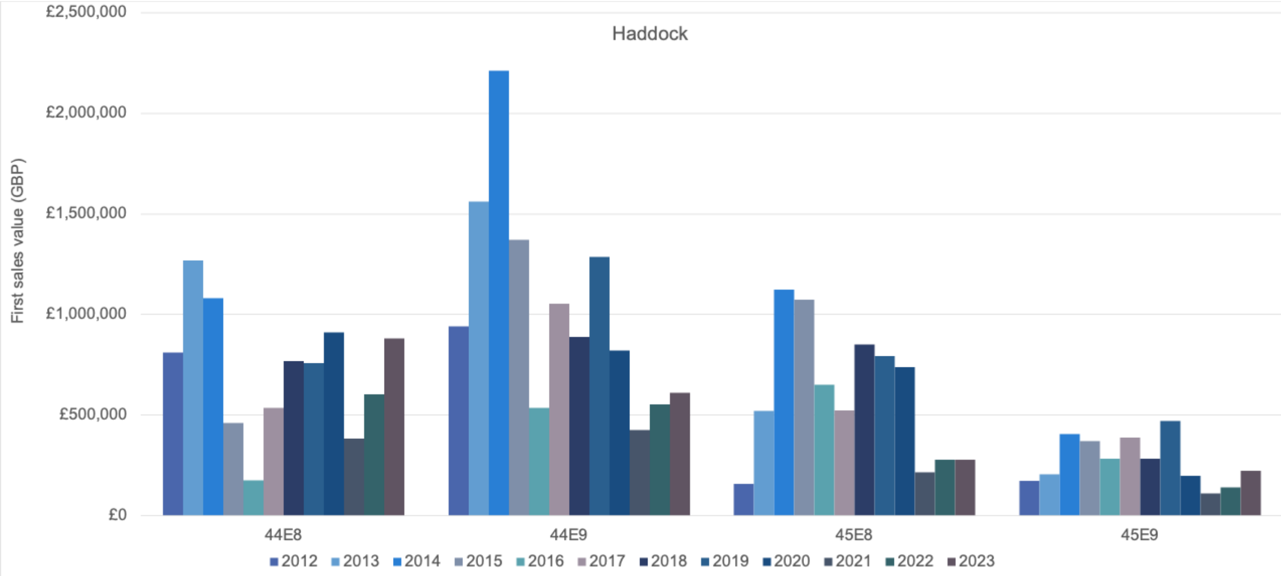



5.1.1.18 Mackerel landings have been highly variable across the time series, reflecting the quota-driven and migratory nature of this pelagic fishery. Peak landings occurred in 2016 and 2019, when landed weight exceeded 10,000 tonnes in some rectangles, generating values of over £13 million. However, in other years landings dropped to much lower levels, under 2,000 tonnes, resulting in corresponding reductions in value. Landings and value are concentrated in 45E9, with occasional contributions from 44E9. This volatility is characteristic of mackerel fisheries, which are influenced by international quota allocations, stock distribution shifts, and variable targeting effort.

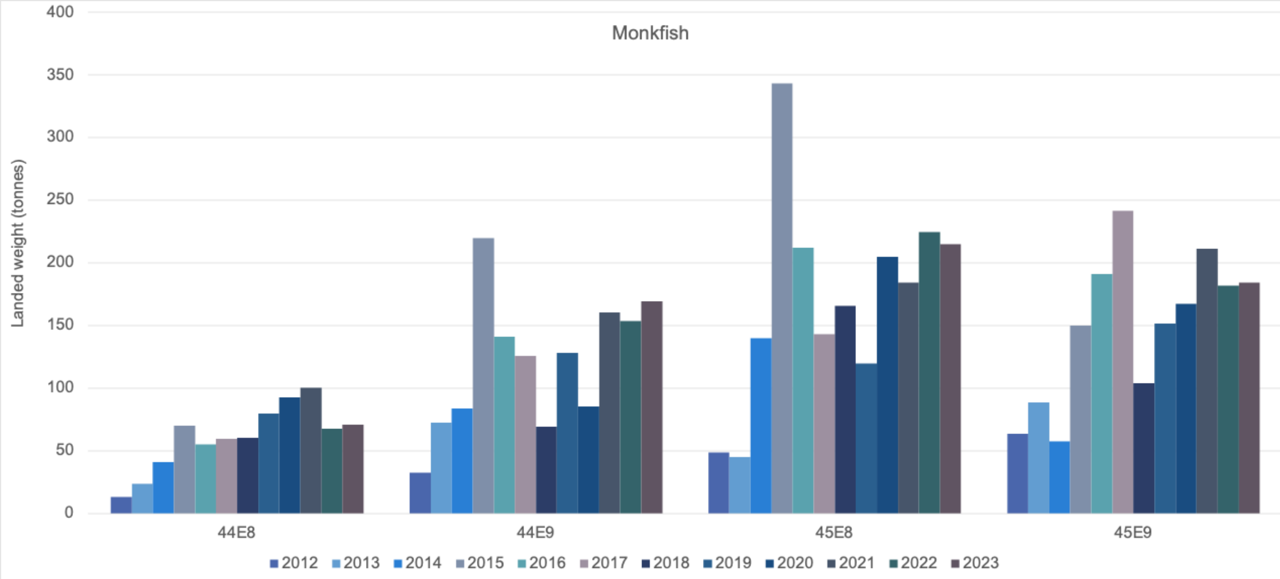
**Plate 5.9 Long term landing trends for haddock from the commercial fisheries local study area by weight (top) and value (bottom) (MMO, 2022a; MMO, 2024a)**

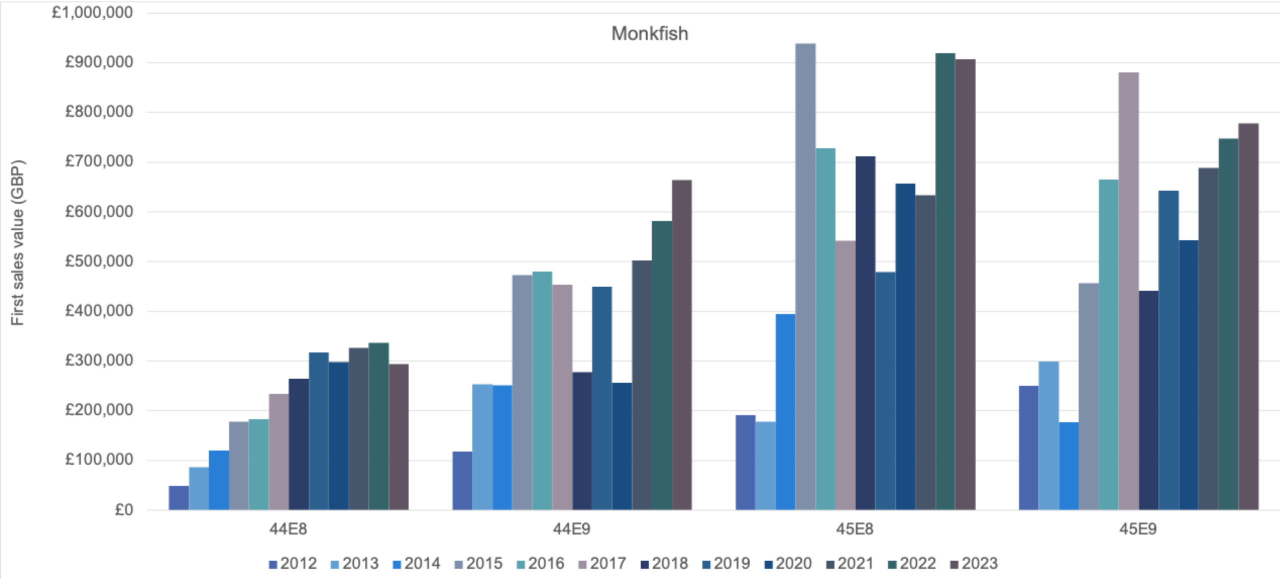



5.1.1.19 Haddock shows a declining trend in landings and value across the period 2012 to 2023. Landed weight fell from over 4,000 tonnes in 2013 to 2014 to around 2,000 tonnes or less in recent years. First sales values followed this downward trajectory, decreasing from peaks near £5 million to closer to £2 million annually by 2023. The reduction is evident across all rectangles but particularly marked in 44E9 and 45E8, which historically contributed the largest shares.

**Plate 5.10 Long term landing trends for monkfish from the commercial fisheries local study area by weight (top) and value (bottom) (MMO, 2022a; MMO, 2024a)**




5.1.1.20 Monkfish landings have shown a steady increase across the time period, with weights rising from under 300 tonnes in 2012 to over 700 tonnes by 2023. First sales values more than doubled, from around £1 million at the start of the period to nearly £3 million in recent years, reflecting both higher landings and strong market prices. Landings are spatially distributed across all four rectangles, though 45E9 and 44E9 contribute the largest proportions. The upward trend likely reflects stable or improving stock conditions, increased targeting due to high market value, and strong European demand, supporting its role as an economically important demersal species.

## 5.2 Commercial fisheries regional study area

5.2.1.1 Commercial fisheries statistics for the annual first sales value and landed weight by UK vessels landing into UK and non-UK ports and non-UK vessels landing into UK ports operating within the specified commercial fisheries local study area (43E8-E9, 44E7-F0, 45E8-F0 and 46E8-F0) are shown in **Plate 5.11** and **Plate 5.12** respectively. An annual average value of £71.1 million was landed for the years 2019 to 2023 from the commercial fisheries regional study area by all UK vessels landing into UK and non-UK ports and non-UK vessels landing into UK ports. The timeseries considers landings from 2012 to 2023 to explore long term trends in catches from the regional study area.

### Landings by species

5.2.1.2 **Plate 5.11** shows the first sales value (GBP) for different commercial fish and shellfish species from 2012 to 2023, along with the average value across this period.

5.2.1.3 Mackerel is by far the highest-value species, with an average first sales value of £43.1 million. Annual values often exceed £30 million to £40 million, peaking above all other species. Nephrops is the second most valuable, with an average of £16.4 million, showing consistent sales above £15 million in most years.

5.2.1.4 Haddock (£7.1m), herring (£5.3m), monkfish (£4.6m), and cod (£3.1m) form the next tier of important species, each ranging from ~£3m to 7m average sales annually. Whiting (£2.7m), king scallop (£1.9m), squid (£1.9m), and brown crab (£1.6m) also make moderate contributions. Other species such as lobster (£0.8m), saithe (£0.7m), hake (£0.4m), squid and octopi (£0.6m), and lemon sole (£0.3m) contribute less than £1m on average per year.

5.2.1.5 Each species displays multiple bars showing annual fluctuations over the period. Mackerel and Nephrops show the greatest inter-annual variability, while lower-value species appear relatively stable. Overall, economic reliance in the regional study area is heavily dependent on pelagic species (mackerel, herring) and demersal/shellfish species (Nephrops, haddock, monkfish). There is a clear dominance of mackerel, which is several times more valuable than any other species.

5.2.1.6 **Plate 5.12** presents the landed weight of commercial species for the same time period. Mackerel (13,100 tonnes average) and herring (11,600 tonnes average) dominate by volume, far exceeding other species. Haddock (6,600 tonnes) and Nephrops (3,400 tonnes) are the next most significant. Other species such as whiting (2,500 tonnes), monkfish (1,300 tonnes), cod (1,200 tonnes), and king scallop (900 tonnes) contribute moderate volumes. The remaining species (brown crab, saithe, squid, witch, plaice, hake, ling) contribute less than 1,000 tonnes each on average per year.

5.2.1.7 Comparing weight and value highlights different economic dynamics. Herring landings are very high, second only to mackerel, but its average sales value is relatively low (£5.3m), indicating a low unit price. By contrast, Nephrops landings are moderate but generate extremely high value (£16.4m) due to very high unit prices, making them economically significant despite lower volumes. Monkfish and lobster similarly achieve relatively high value per tonne. Mackerel stands out as both the largest in quantity (13,100 tonnes) and by far the most valuable (£43.1m), making it central to both landed volume and economic return for the fishery. These trends demonstrate that pelagic species (mackerel, herring) are characterised by very high landings but differing economic importance, while demersal and shellfish species (Nephrops, monkfish, cod, lobster) deliver lower landed weights but disproportionately high value. This underscores the need to consider not only biomass landed but also economic reliance on high-value, low-volume species alongside the dominant mackerel fishery.

5.2.1.8 The following species-specific trends are noted:

- Mackerel dominates both landings and value. Landings exceeded 13,000 tonnes annually, with first sale values averaging £43.1m. Despite year-to-year volatility caused by quota changes, stock distribution shifts, and export market fluctuations, mackerel remains the most important species for both volume and revenue.
- Nephrops is the most valuable shellfish species, averaging £16.4m annually from relatively modest landings of 3,400 tonnes. Stable catches and consistently high prices highlight its role as a premium product, with value derived more from high unit prices than large volumes.
- Herring consistently delivers large landings (~11,600 tonnes) but lower average value (£5.3m). As a bulk species used for processing and export, it generates modest economic returns despite high biomass contribution.
- Haddock maintains moderate, stable landings (6,600 tonnes) and value (£7.1m). Domestic demand, particularly in UK foodservice and retail, sustains its importance as a reliable demersal species.
- Monkfish contributes relatively little by weight (1,300 tonnes) but commands high value (£4.6m annually), reflecting strong European demand and premium pricing.
- Cod plays a modest but notable role, with landings of 1,200 tonnes valued at £3.1m. Declining catches reflect long-term stock pressures and restrictive quotas, but its high per-tonne price sustains its economic significance.
- Brown crab and lobster add economic diversity, with low volumes but disproportionately high returns. Brown crab contributes £1.6m and lobster £0.8m annually, both supported by premium export markets in Europe and Asia.
- King scallop contributes 900 tonnes on average, worth £1.9m annually. Though moderate in scale, its value is supported by seasonal dynamics and high per-tonne pricing.

## Landings by nationality and gear type

5.2.1.9 Landings into the regional study area are overwhelmingly dominated by Scottish vessels (**Plate 5.13**), which account for the clear majority of first sales value, averaging £53.7 million annually, with inter-annual peaks exceeding £80 million in some years. England contributes the next largest share, averaging £6.6 million, while Northern Ireland also provides a notable though smaller contribution of £2.3 million per year. Among foreign fleets, Norway is the largest contributor, with an average of £2.4 million annually, while Sweden (£1.1m), Ireland (£0.1m), Denmark (£0.1m), and the Netherlands (£20,000) provide only minor inputs. Welsh vessels contribute negligible amounts (£5,000 annually). This distribution shows that, as in the local study area, the fishery is heavily reliant on Scottish vessels, but the regional scale also reflects a wider mix of fleet origins, particularly contributions from England, Northern Ireland, and Norway.

5.2.1.10 Fishing activity in the regional study area is dominated by trawling (**Plate 5.14**). Demersal trawls are the most valuable gear type by a considerable margin, generating over £40 million annually, the majority landed by Scottish vessels. Pelagic trawls are the second most significant, contributing around £17 million to £18 million per year, with Scotland again dominant but with additional landings from England, Northern Ireland, and some foreign fleets. Other gears make much smaller contributions: pelagic seines generate around £5 million annually, pots and traps and demersal seines each add about £3 million to £4 million , and dredges account for less than £2 million. Handlines, drift and fixed nets, beam trawls, longlines, and other mobile gears contribute negligible amounts. Overall, the regional gear profile is strongly skewed towards trawling, with demersal and pelagic trawls together accounting for the vast majority of landed value, supplemented by smaller but diverse contributions from other gear types.

## Landings by International Council for the Exploration of the Sea rectangle

5.2.1.11 **Plate 5.15** presents first sales value (GBP - £) by ICES rectangle in the regional study area from 2012 to 2023, with average values indicated and the following key findings:

- Values vary substantially between rectangles, ranging from around £1.8m (43E8) to peaks above £10m (46E8).
- The highest average values are in 46E8 (£10.1m) and 46E9 (£9.7m), reflecting the importance of offshore grounds for high-value trawl fisheries.
- Mid-range rectangles include 44E7 (£5.6m), 44E8 (£5.4m), and 45E9 (£6.3m), showing consistent contributions.
- Lower-value rectangles such as 43E8 (£1.8m) and 43E9 (£2.5m) contribute relatively little by comparison.
- Many rectangles show strong inter-annual variability, with peaks in some years reaching double or more their long-term averages (for example, 46E8).

5.2.1.12 This demonstrates that while fishing value is distributed across many ICES rectangles in the regional study area, the highest-value activity is concentrated further offshore (46E8 and 46E9). In contrast, inshore rectangles contribute lower and more stable values. Importantly, while different absolute values are shown, the ICES rectangles also support different types of fisheries: the inshore rectangles are targeted by a larger number of smaller vessels and therefore support more individual businesses, whereas the offshore rectangles are fished predominantly by larger offshore fleets that operate across wider grounds and seas in the North-east Atlantic.

5.2.1.13 **Plate 5.16** presents first sales value (GBP) by ICES rectangle (43E8, 43E9, 44E7, 44E8, 44E9, 44F0, 45E8, 45E9, 45F0, 46E8, 46E9, 46F0) for the regional study area, disaggregated by gear type, with following observations:

- 43E8 and 43E9: Lower-value rectangles, averaging £2.1m and £3.0m, respectively, with contributions from demersal trawls, pelagic trawls, and dredges;
- 44E7 and 44E8: Mid-value grounds, generating £5.1m and £6.4m, respectively, with demersal trawls dominant but supplemented by pelagic trawls, seines, and dredges;
- 44E9 and 44F0: Similar totals of around £5.0m, almost entirely from demersal trawls;
- 45E8: £4.5m, with a mixed profile including demersal trawls, pelagic trawls, and smaller contributions from pots and seines;
- 45E9: A key rectangle with £8.3m, driven largely by demersal and pelagic trawl;
- 45F0: £5.9m, again dominated by demersal trawls;
- 46E8 and 46E9: High-value rectangles, generating £8.9m and the highest at £11.9m, dominated by pelagic trawls with additional demersal input; and
- 46F0: Moderate, with £5.2m, primarily demersal trawls with some pelagic input.

5.2.1.14 Across the regional study area, demersal trawls underpin value in nearly every rectangle, but pelagic trawls become increasingly significant in the outer grounds (46E8 and 46E9), driving the highest values.

5.2.1.15 Local ICES rectangles (44E8, 44E9, 45E8, 45E9) are also dominated by demersal trawls, but show greater diversity of gears, especially in 44E8, where pots, pelagic trawls, and dredges add substantial value.

5.2.1.16 In the local area, 45E9 is the highest-value rectangle (£8.3m), whereas in the regional area, value peaks much further offshore in 46E9 (£11.9m), where pelagic trawling dominates.

5.2.1.17 Local grounds show stronger dependence on shellfish gears (pots and traps, dredges), particularly in 44E8, reflecting the importance of Nephrops and scallops. By contrast, the regional grounds reflect a stronger pelagic component, with high-value rectangles like 46E8 and 46E9 largely driven by mackerel and herring fisheries.

5.2.1.18 Overall, the local fishery is more mixed, with demersal trawls supplemented by shellfish and small-scale gears, while the regional fishery is characterised by large-scale trawl dominance (demersal and pelagic) and higher total values further offshore.

## Seasonality of landings by species

5.2.1.19 The average monthly landings of species from the regional study area is presented in **Plate 5.17** by species, based on an average from 2019 to 2023.

5.2.1.20 Seasonal patterns in landings differ markedly between species groups in the regional study area. Demersal species such as haddock, whiting, and monkfish show broad availability throughout the year, with peaks typically in Spring and early Summer, though monkfish is landed more steadily with a slight Autumn increase. Shellfish species display stronger seasonality: Nephrops and brown crab peak in Summer, while king scallop is heavily concentrated in Spring, reflecting biological cycles and market-driven targeting. In contrast, pelagic species are highly seasonal and concentrated in short windows, with herring peaking in late Summer to early Autumn and mackerel almost exclusively landed in Autumn, when large migratory shoals are targeted. Together, these patterns highlight the interplay of stock behaviour, migrations, and market demand in shaping seasonal fishing activity. A summary by species is provided in **Table 5.1**.

### Table 5.1 Seasonality of landings in regional study area

| Species | Seasonal trend |
|---|---|
| **Mackerel** | Landings show a pronounced Autumn peak (October), with landings exceeding 14,000 tonnes. Outside this period, landings are minimal. This highly concentrated season reflects the migratory nature of the stock and targeted pelagic trawl fisheries. |
| **Herring** | Trend shows a Summer to Autumn peak (July to September), with landings around 5,500 tonnes in August. Very little is landed outside this period, reflecting seasonal migrations and spawning aggregations that define the fishery. |
| **Haddock** | Highest landings occur in Spring and early Summer (March to June), peaking in May at over 700 tonnes. Landings then decline gradually through Autumn and are lowest in the Winter months (November to February). This reflects seasonal targeting aligned with availability and possibly market demand. |
| **Nephrops** | Landings are strongly seasonal, peaking in the Summer months (June to August) at over 500 tonnes per month. Lower landings occur in Winter, particularly January and February. This pattern reflects both biological availability and targeted fishing during peak market periods. |

| Species | Seasonal trend |
|---|---|
| **Whiting** | Trend shows a peak in Spring and early Summer (April to June) with landings exceeding 300 tonnes, followed by a decline through Autumn and lower activity in Winter. |
| **Monkfish** | Landings are less sharply seasonal, with relatively consistent catches across most months. There is a slight increase in Autumn (September to November), with landings around 150 tonnes, compared with lower levels in early Spring (February to March). |
| **Brown crab** | Trend shows a clear Summer peak (June to August), with landings exceeding 100 tonnes per month, before declining in Autumn and Winter. This reflects seasonal fishing patterns and strong Summer demand in export markets. |
| **Cod** | Landings remain relatively steady throughout the year, with only slight increases in late Summer and early Autumn (August to October). |
| **King scallop** | Landings are highly seasonal, with a strong peak in Spring (March to May), reaching nearly 200 tonnes in May. Landings then drop sharply for the rest of the year, with very low activity in late Autumn and Winter. |
| **Saithe** | Trend shows a distinct Autumn to Winter peak (September to December), with landings rising steadily through the year to reach over 80 tonnes in December. |

**Plate 5.11 Key species by annual landed value (GBP) (2012 to 2023) from the commercial fisheries regional study area (MMO, 2022a; MMO, 2024a)**

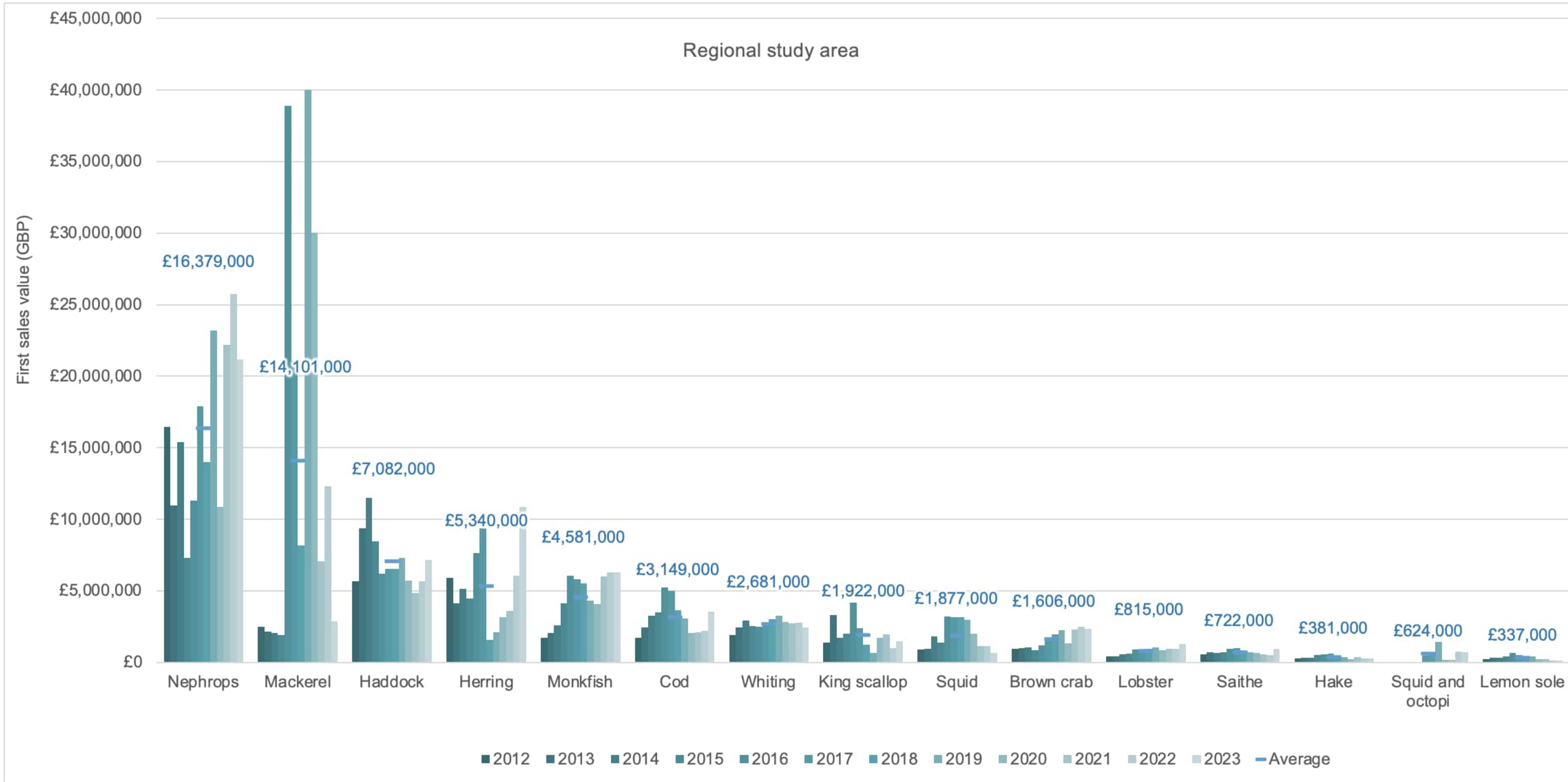


**Plate 5.12 Key Species by annual landed weight (tonnes) (2012 to 2023) from the commercial fisheries regional study area (MMO, 2022a; MMO, 2024a)**

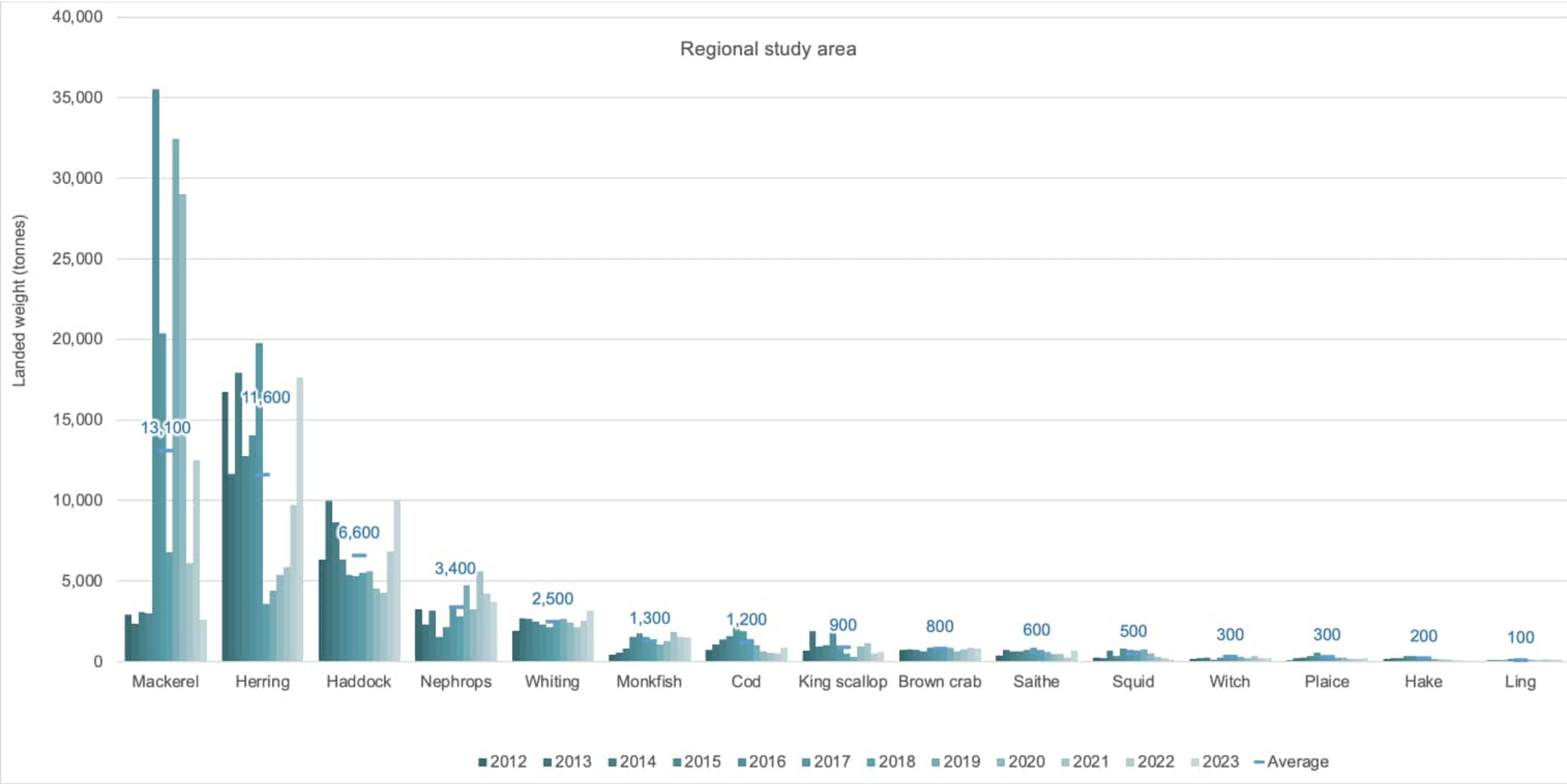


**Plate 5.13 Annual landed value (GBP) (2012 to 2023) by vessel nationality from the commercial fisheries regional study area (MMO, 2022a; MMO, 2024a)**

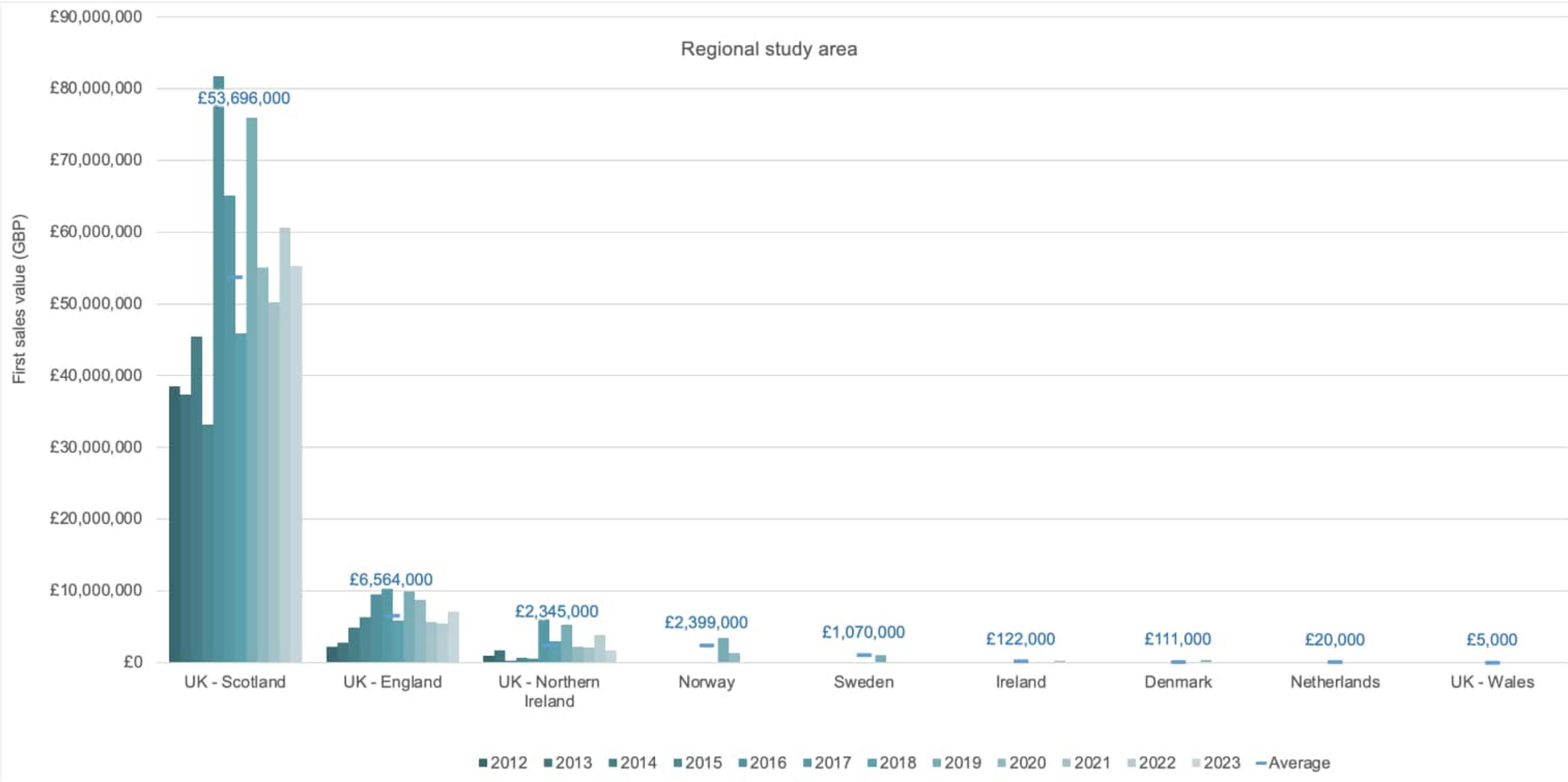


**Plate 5.14 Average annual landed value (GBP) (2019 to 2023) by gear type and vessel nationality from the commercial fisheries regional study area (MMO, 2022a; MMO, 2024a)**

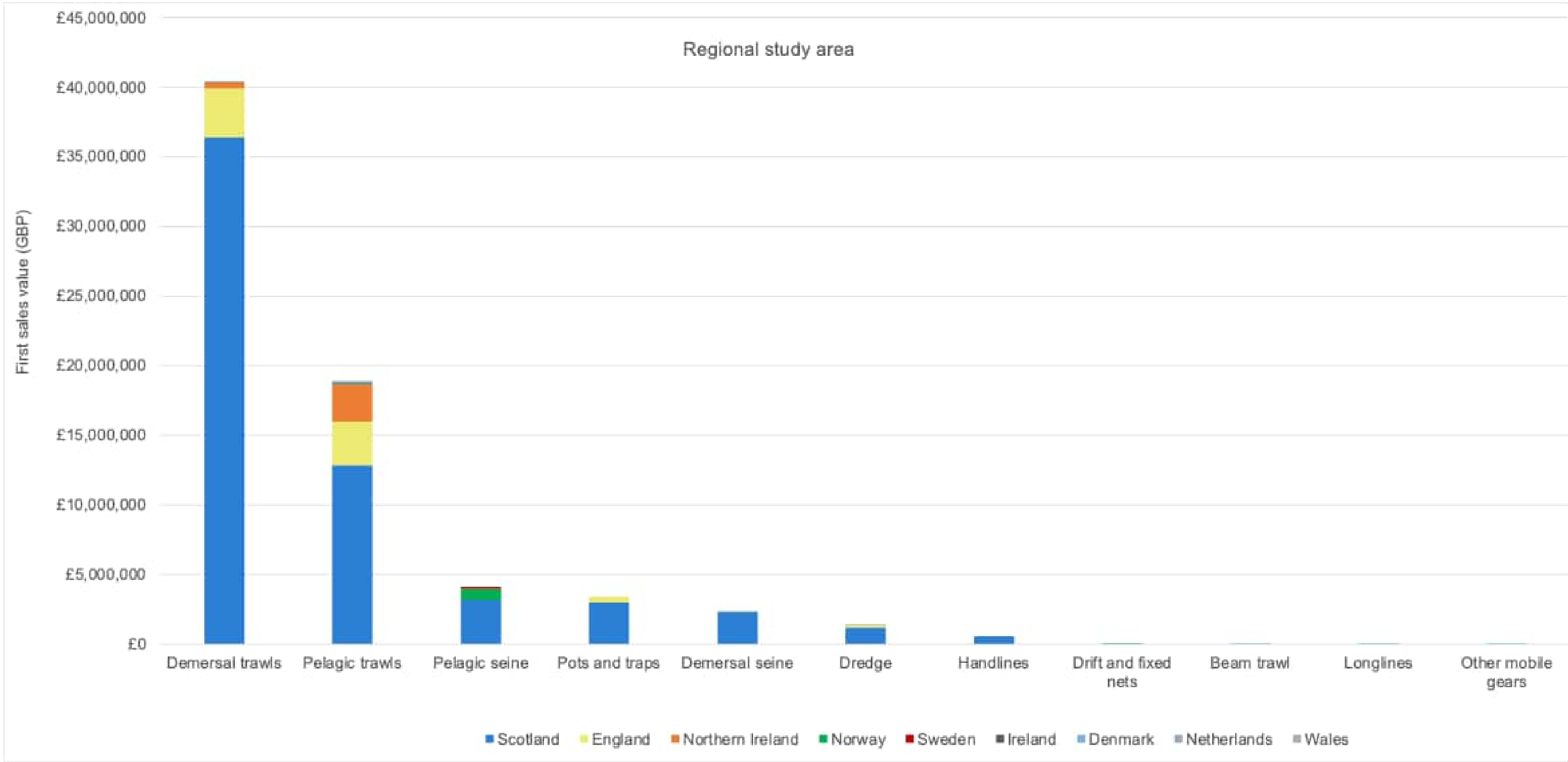


**Plate 5.15 Annual landed value (GBP) (2012 to 2023) by ICES rectangle from the commercial fisheries regional study area (MMO, 2022a; MMO, 2024a)**

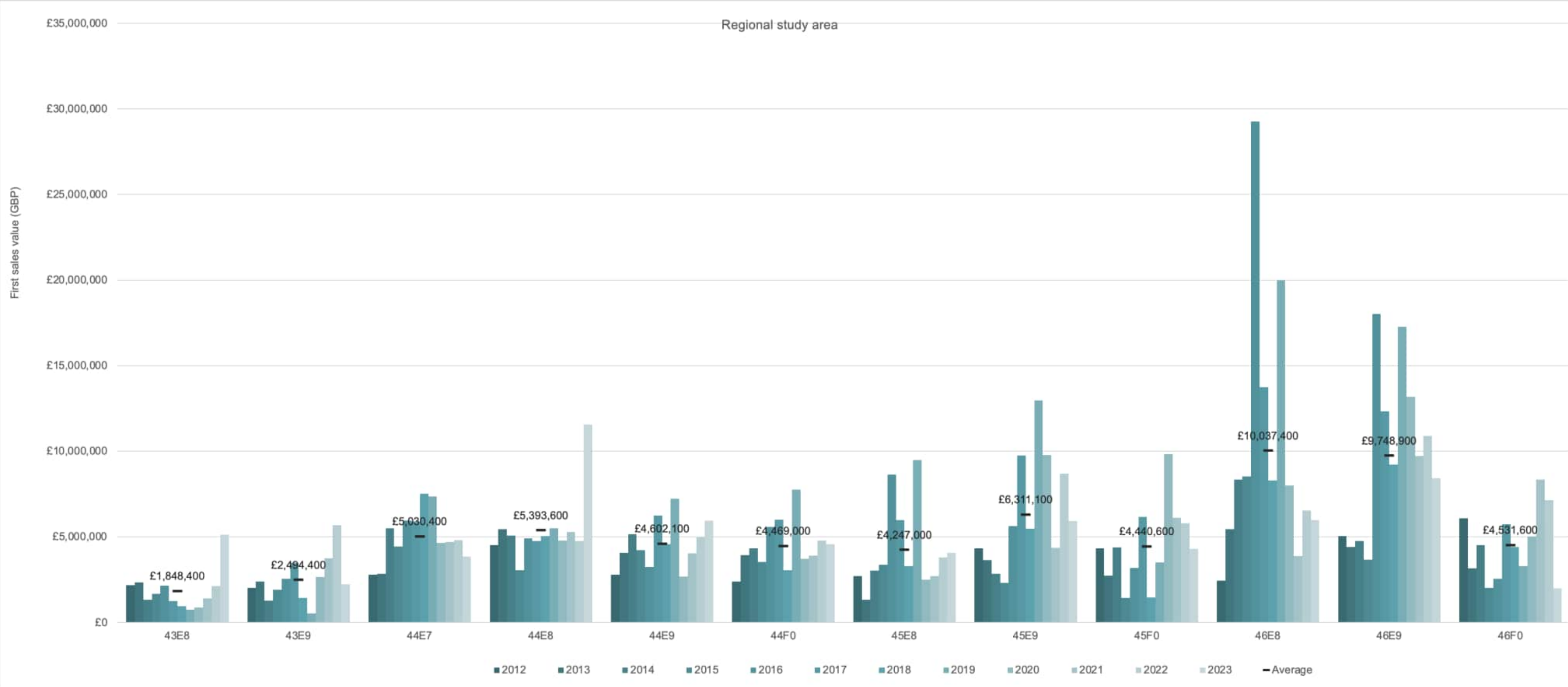


**Plate 5.16 Average annual landed value (GBP) (2019 to 2023) by gear type and ICES rectangle from the commercial fisheries regional study area (MMO, 2022a; MMO, 2024a)**

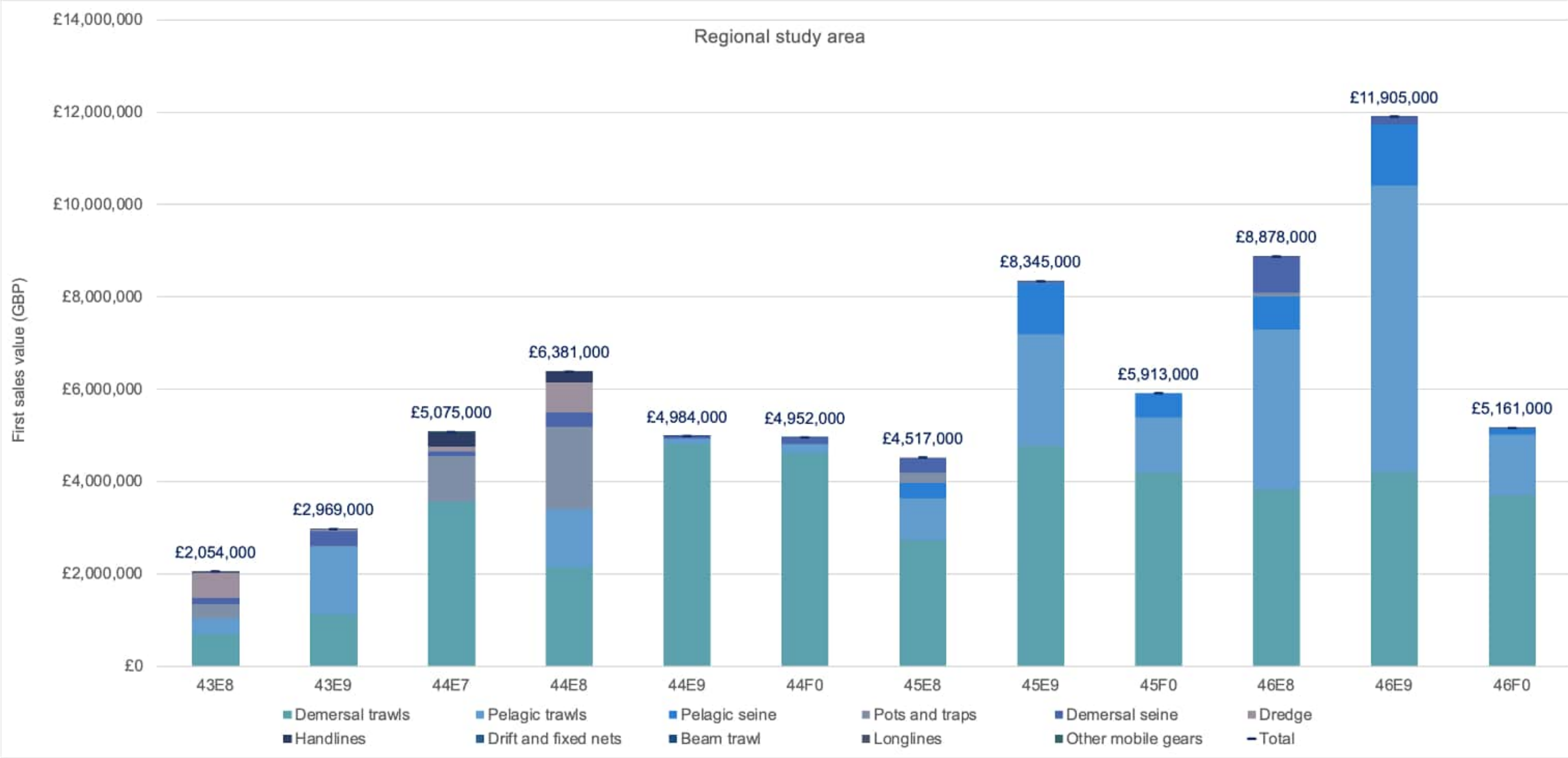
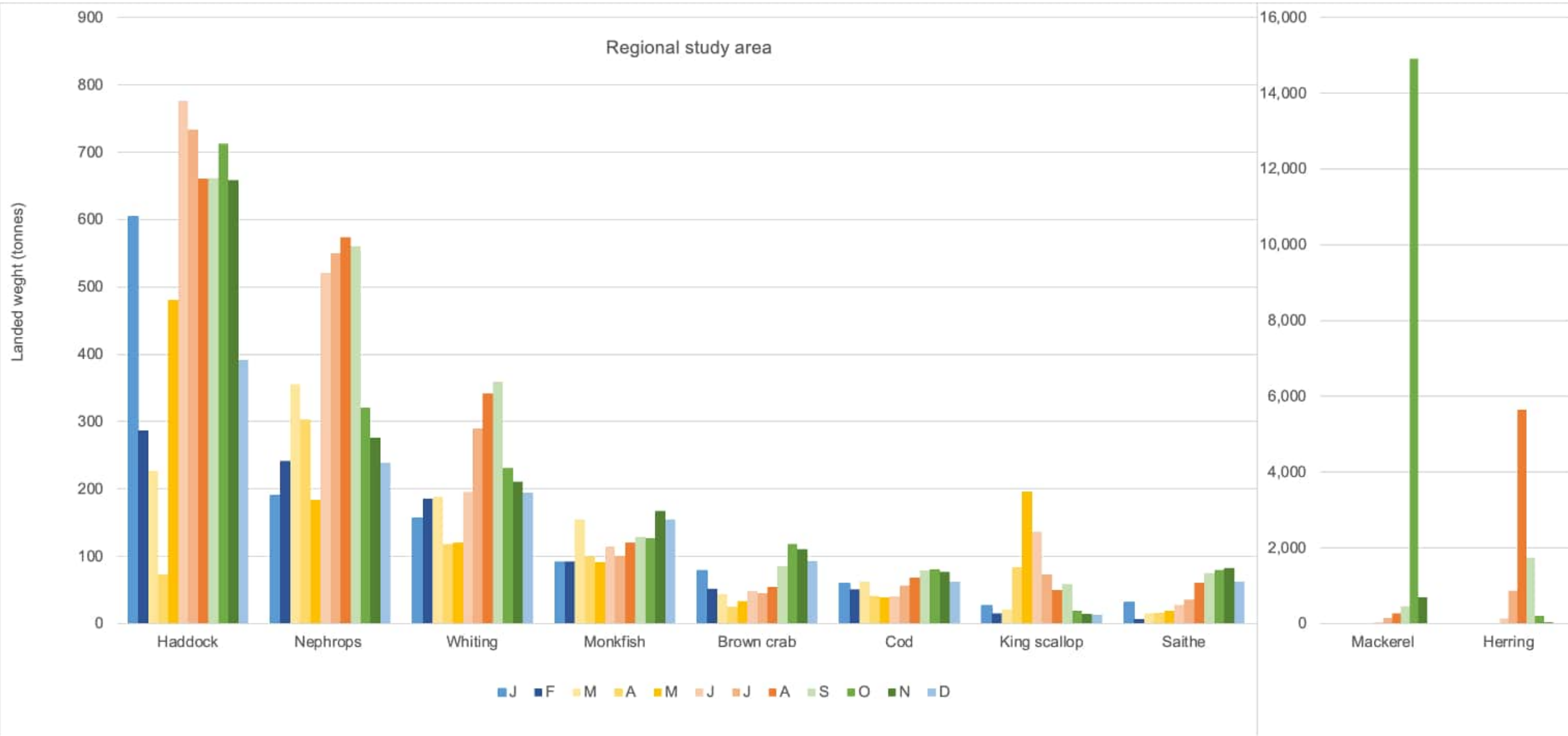


**Plate 5.17 Average landed weight (tonnes) (2019 to 2023) by speacies and month from the commercial fisheries regional study area (MMO, 2022a; MMO, 2024a)**



# 6. Spatial Fishing Activity

## 6.1 Types of commercial fisheries spatial data

### 6.1.1 Fisheries sensitivity mapping and displacement mapping

6.1.1.1 The Fisheries Sensitivity Mapping and Displacement Modelling (FiSMaDiM) project has been funded by The Crown Estate and led by Cefas, in collaboration with University of St Andrews and Scottish Government. Its aim has been to fill key evidence gaps, including identification of fishing activities at a high-spatial resolution in potential offshore wind farm areas and improvement of methods to estimate fishing intensity of fishing vessels in UK waters (Mendo *et al*., 2024).

6.1.1.2 The FiSMaDiM Public Web App was published in 2025 (Cefas, 2025), with mapping, based on merged AIS and VMS data, obtained from the App.

6.1.1.3 The FiSMaDiM data provides one of the most robust and detailed dataset available for mapping the spatial distribution of fishing activity across the UK EEZ and includes the following features:

- Cumulative, long-term coverage (2012 to 2021):
  - FiSMaDiM integrates a full decade of fishing activity, allowing both inter-annual and seasonal variation to be captured; and
  - this long time series makes it possible to distinguish persistent fishing grounds from areas of more variable or opportunistic effort.
- Integration of VMS and AIS data:
  - the dataset combines VMS (mandatory for most vessels >12m) and AIS data (carried by a wider range of vessels, including smaller ones);
  - this dual-source approach ensures more complete coverage of fishing fleets; and
  - the use of both systems provides a finer temporal and spatial resolution (~20 minutes, gridded across the UK EEZ), improving the accuracy of activity estimates.
- Inclusion of smaller vessels:
  - previous mapping efforts were biased towards larger vessels required to carry VMS;
  - FiSMaDiM addresses this gap by incorporating AIS signals from smaller vessels, including many under 12m that account for a significant share of inshore and nearshore activity; and
  - this provides better (although not comprehensive) representation of inshore static gear fisheries (for example, creeling, potting) that are particularly important in Scotland and other coastal regions.

### 6.1.2 Vessel monitoring system data

6.1.2.1 Vessel monitoring system (VMS) data has been obtained from five different sources, with varying details as follows:

- ICES VMS data displays the surface SAR of catches by different gear types and covers EU (including UK) registered vessels 12m and over in length. Surface SAR indicates the number of times in an annual period that a demersal fishing gear makes contact with (or sweeps) the seabed surface. Surface SAR provides a proxy for fishing intensity and has been analysed to determine an average annual SAR based on data from 2016 to 2020.

- Marine Directorate Scottish vessel VMS data sourced from the NMPi data catalogue indicating fishery effort data by gear type.
- MMO VMS data displaying the first sales value (£) of catches and covers UK registered vessels 15m and over in length from 2016 to 2020.
- MMO VMS data displays the total quantity (tonnes) of landings by all gears deployed by UK registered vessels 15m and over in length from 2011 to 2015.
- SPFA VMS data for their Scottish pelagic trawl member vessels for 2013 to 2021.

### 6.1.3 Automatic Identification System data

6.1.3.1 Fishing vessel route density, based on vessel AIS positional data has been sources for 2019 to 2023 and seasonally for 2023 depicting activity in Spring, Summer, Autumn and Winter. AIS is required to be fitted on fishing vessels ≥15m length and vessels under 15m may also voluntarily carry AIS. The data is specific to fishing vessels and indicated the route density per square kilometre (km±) per year. This data does not distinguish between transiting vessels and active fishing, but does provide a useful source to corroborate fishing grounds.

### 6.1.4 Marine traffic survey data

6.1.4.1 Project-specific marine traffic surveys were undertaken across the OAA over 14 days during the following dates:

- 28 July to 15 August 2022;
- 10 to 24 January 2023;
- 19 July to 2 August 2024; and
- 6 to 12 November 2024.

6.1.4.2 The surveys used AIS and radar tracking and visual observations to record vessel activity across the OAA. In addition, 12-months of AIS data for 2024 has been interrogated to inform a NRA presented in **Appendix 15.1**.

### 6.1.5 Surveillance data

6.1.5.1 Fisheries surveillance data from 2017 to 2022 has been sourced from the MMO and has been analysed by speed (by the MMO) to remove transiting and only include active fishing.

### 6.1.6 Regional Inshore Fishery Group mapping

6.1.6.1 The North and East Coast Regional Inshore Fishery Group (N&EC RIFG) commissioned the North Atlantic Fisheries College Marine Centre to undertake a mapping exercise for all fisheries activity (Shelmerdine and Mouat, 2021).

6.1.6.2 The mapping produced as part of the N&EC RIFG fishery assessment is presented in this Section and georeferenced to include the location of the Project.

6.1.6.3 Mapping is provided for the following fishery assessments indicating fishery likelihood/occurrence on a scale of high to low as undertaken by Shelmerdine and Mouat (2021): demersal otter trawl targeting haddock, cod and mixed demersal species, creel for crab and lobster, scallop dredging and hook and line fisheries.

### 6.1.7 Fishing vessel plotter data

6.1.7.1 A representative sample of fishing vessel plotter data for the Project has been provided in confidence to the Applicant by the SFF. The plotter data depicts the activity of SFF member vessels and indicates the presence of fishing activity across the OAA and offshore export cable corridor. This plotter data is not presented in this report due to confidentiality.

6.1.7.2 Plotter data for 21 of SPFA's pelagic vessel members has been provided and approved by the SPFA for publication in this report. This plotter data shows pelagic activity colour coded for target species and indicates locations of fish hauls and/or evidence of fish shoals through presence of a fish icon.

## 6.2 Description of commercial fisheries spatial data

### 6.2.1 Demersal otter trawl

6.2.1.1 Demersal otter trawling represents a key component of fishing activity within the northern North Sea, with several datasets providing insight into the spatial distribution, scale, and intensity of activity (**Figure 1** to **Figure 11**). Cumulative effort data from FiSMaDiM for the period 2012 to 2021 (**Figure 1**) show that demersal otter trawling is widespread, with effort concentrated along established fishing corridors extending north-east from the Scottish coast into offshore grounds. Within the OAA, effort hotspots exceed 1,000 hours per grid cell, indicating persistent use of these grounds over the past decade. Vessel density mapping for the same period confirms that these areas are exploited by a relatively large number of vessels, with more than 100 vessels recorded in some offshore rectangles (**Figure 2**), suggesting that effort is distributed across multiple operators rather than being limited to a small number of vessels.

6.2.1.2 Economic data for UK vessels ≥15m in 2020 (**Figure 3**) show that demersal otter trawling generated landed values exceeding £75,000 per grid cell, with peak values approaching £600,000 in some offshore rectangles. This illustrates the economic contribution of trawling grounds that overlap with the OAA and aligns with long-term patterns of sustained effort. Seabed interaction is reflected in the surface SAR for EU (including UK) vessels ≥12m between 2016 and 2020 (**Figure 6**), which indicates moderate to high levels of seabed contact in the region, with SAR values above 8.0 in some areas. This confirms that demersal otter trawling forms a significant component of benthic pressure within the North Sea.

6.2.1.3 Historic datasets also provide evidence of longer-term reliance on these grounds. Mapping of Nephrops fishery intensity (2009 to 2013) shows persistent hotspots on muddy sediment habitats across the North Sea (**Figure 8**), with high-intensity activity overlapping OAA. Taken together, these datasets demonstrate that demersal otter trawling activity in the regional study area has been consistent over more than a decade, involving a relatively large number of vessels, generating significant landed value, and contributing to cumulative seabed pressure, particularly where effort overlaps with Nephrops grounds.

### 6.2.2 Demersal seine

6.2.2.1 Demersal seine activity is present within the northern North Sea (**Figure 12** to Figure 16) but at a lower intensity and involving fewer vessels compared with otter trawling. Cumulative effort data from FiSMaDiM for the period 2012 to 2021 show localised hotspots of activity, generally ranging between ten and 250 hours per grid cell, with isolated areas exceeding 500 hours. The highest effort is concentrated to the west and north-west of the OAA, with only limited activity recorded within the OAA boundary itself. Vessel density mapping for the same period indicates that demersal seine fishing is undertaken by a relatively small number of vessels, with most areas supporting between four and 12 vessels, and up to 28 vessels in certain offshore rectangles. Within the OAA, vessel numbers are at the lower end of this range. These patterns indicate that while demersal seining contributes to overall fishing activity in the regional study area, it represents a smaller proportion of demersal effort and economic reliance than otter trawling.

### 6.2.3 Dredge

6.2.3.1 Dredge fishing activity in the northern North Sea is primarily associated with the king scallop fishery and is more spatially restricted than either demersal otter trawling or seining (**Figure** 17 to **Figure 24**). Cumulative effort data from FiSMaDiM for 2012 to 2021 show localised activity, generally ranging between one and 100 hours per grid cell, with isolated hotspots exceeding 500 hours concentrated closer to the Scottish coast (**Figure 17**).

6.2.3.2 Vessel density mapping indicates that dredging is carried out by a relatively small number of vessels compared to trawl fleets, with most areas recording fewer than ten vessels, and peaks of up to 20 vessels in some coastal rectangles (**Figure 18**).

6.2.3.3 Historic mapping of scallop fishery intensity (2009 to 2013) (**Figure 23**) further demonstrates that the highest levels of activity occur within established inshore scallop grounds to the west and south of the OAA, with little direct overlap recorded within the OAA. This evidence suggests that while dredge fishing contributes to overall demersal activity in the wider regional study area, it represents a more limited component in terms of spatial extent, vessel participation, and overlap with offshore development areas when compared with otter trawl and seine fisheries.

### 6.2.4 Pelagic trawl

6.2.4.1 Pelagic trawl activity in the northern North Sea (**Figure 25** to **Figure 29**) is focused on targeting species such as mackerel and herring and shows a more offshore distribution compared with demersal gears. Cumulative effort data from FiSMaDiM for 2012 to 2021 indicate fishing intensity ranging from one to over 300 hours per grid cell (**Figure 25**), with the highest activity concentrated to the north and north-west of the OAA. Within the OAA, recorded effort is relatively limited compared with the surrounding offshore rectangles, reflecting the spatial targeting of pelagic species along their seasonal migration routes. Vessel density mapping for the same period shows between four and 27 vessels operating pelagic trawl gear across the wider region, with the highest concentrations located further offshore to the north and west.

6.2.4.2 These results indicate that while pelagic trawling is an important activity in the northern North Sea, particularly in offshore waters, the direct overlap with the OAA is limited.

### 6.2.5 Potting

6.2.5.1 Potting activity in the northern North Sea (**Figure 30** to **Figure 34**) is primarily associated with shellfish fisheries such as brown crab and lobster and is concentrated in inshore and nearshore areas. Cumulative fishing effort data from FiSMaDiM for 2012 to 2021 show the highest intensity within coastal rectangles close to the Scottish mainland, where potting effort exceeds 1,500 hours per grid cell in some locations. Effort decreases with distance offshore, with very limited activity recorded within OAA.

6.2.5.2 Vessel density mapping for the same period shows that potting is carried out by relatively small vessels operating at higher numbers inshore, with most coastal rectangles supporting between ten and 20 vessels, and peaks of up to 28 vessels. This data is likely to under-represent the potting fleet based on the input data to the FiSMaDiM modelling which is not fully comprehensive for under 12m vessels.

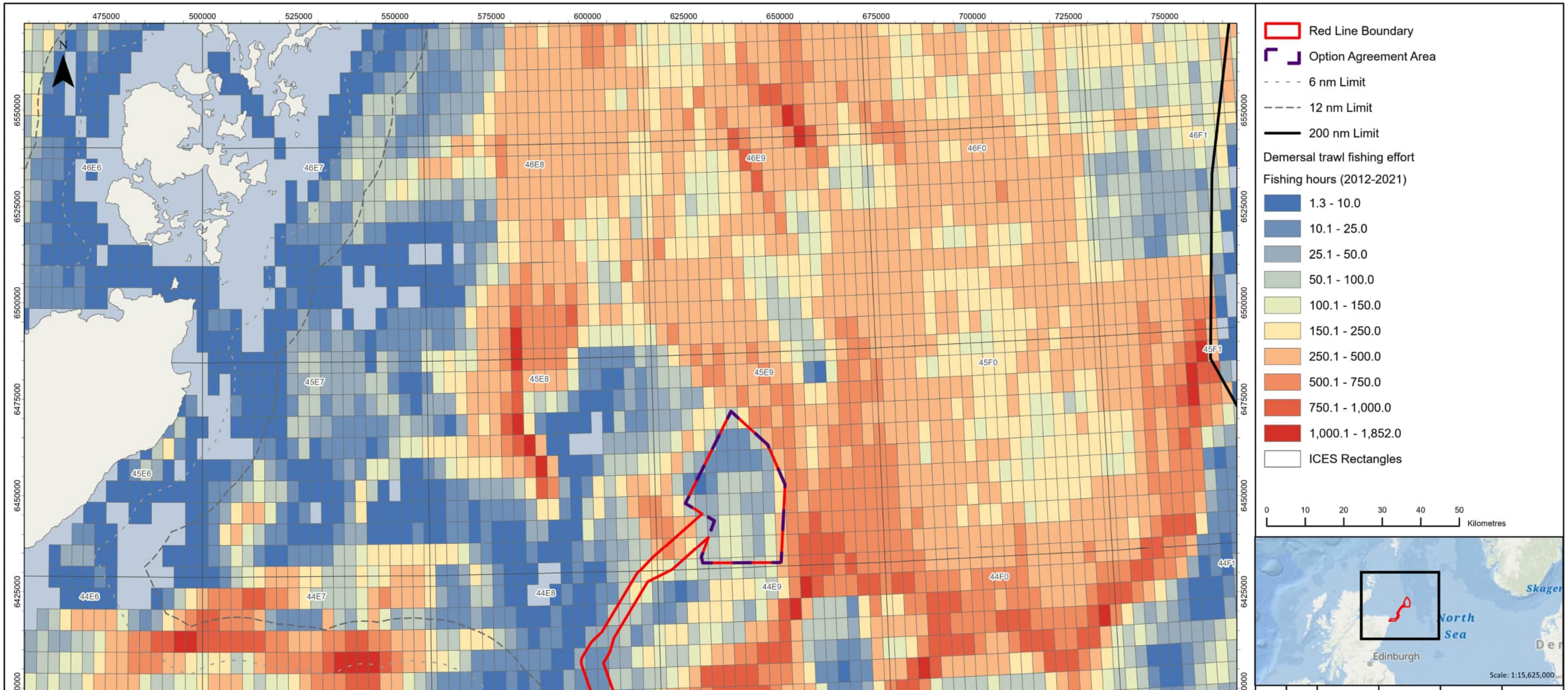
6.2.5.3 Offshore rectangles, where larger vessels would operate and therefore be reflected in the data, show very low vessel presence including overlapping the OAA, confirming that potting is a predominantly inshore activity with minimal overlap with offshore development areas.

### 6.2.6 Hook and line

6.2.6.1 Hook and line gear is operated seasonally by vessels that also deploy pots. Spatial data indicates limited activity in the very inshore area (**Figure 36**).

### 6.2.7 Other

6.2.7.1 Beam trawl activity is negligible in the region (**Figure 37**).

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MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000520

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Figure 1 Demersal trawl fishing effort based on FiSMaDiM data (cumulative 2012 to 2021)

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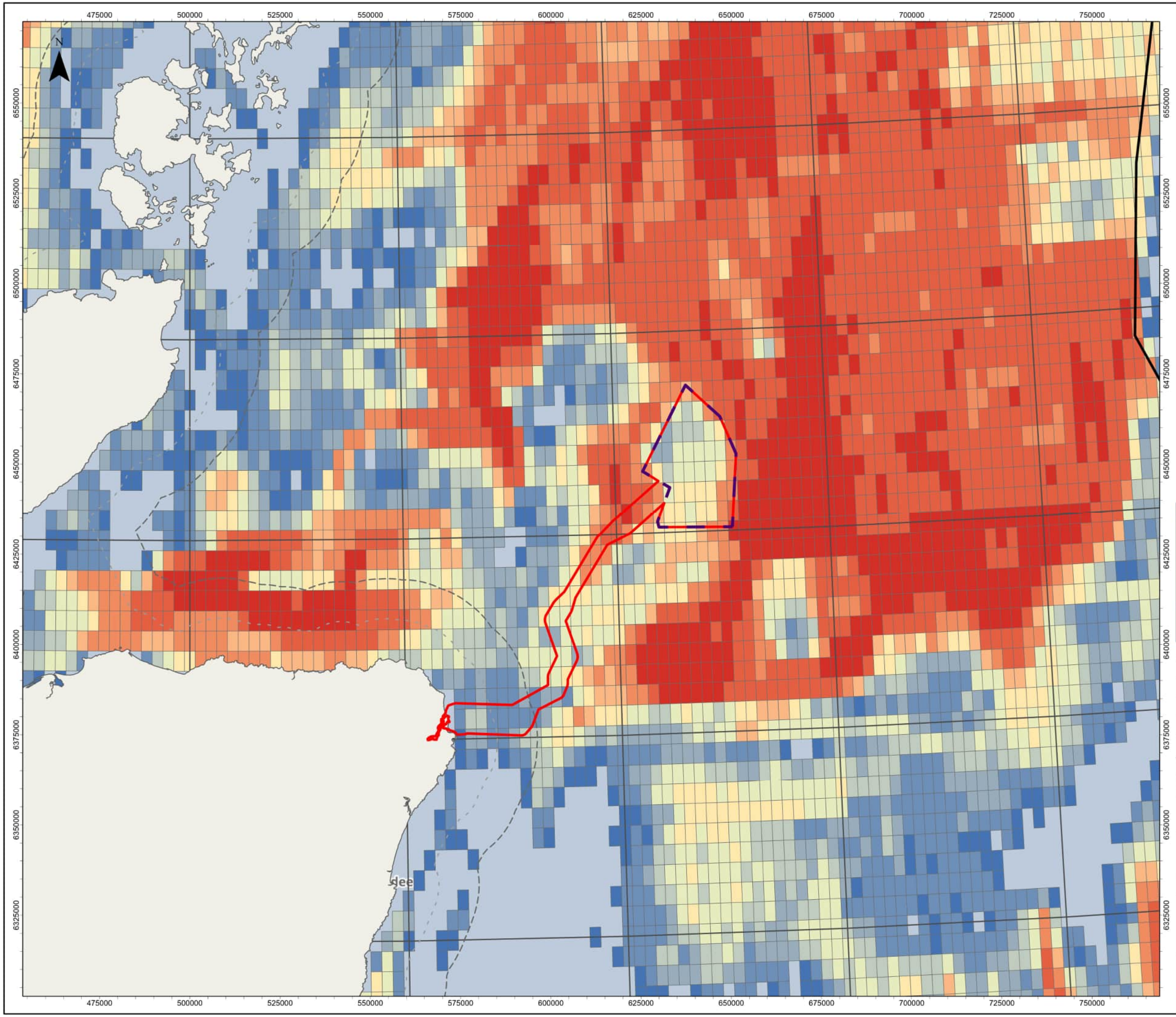



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PROJECT TITLE

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Figure 2 Number of vessels deploying demersal trawl gear based on FiSMaDiM data (cumulative 2012 to 2021)

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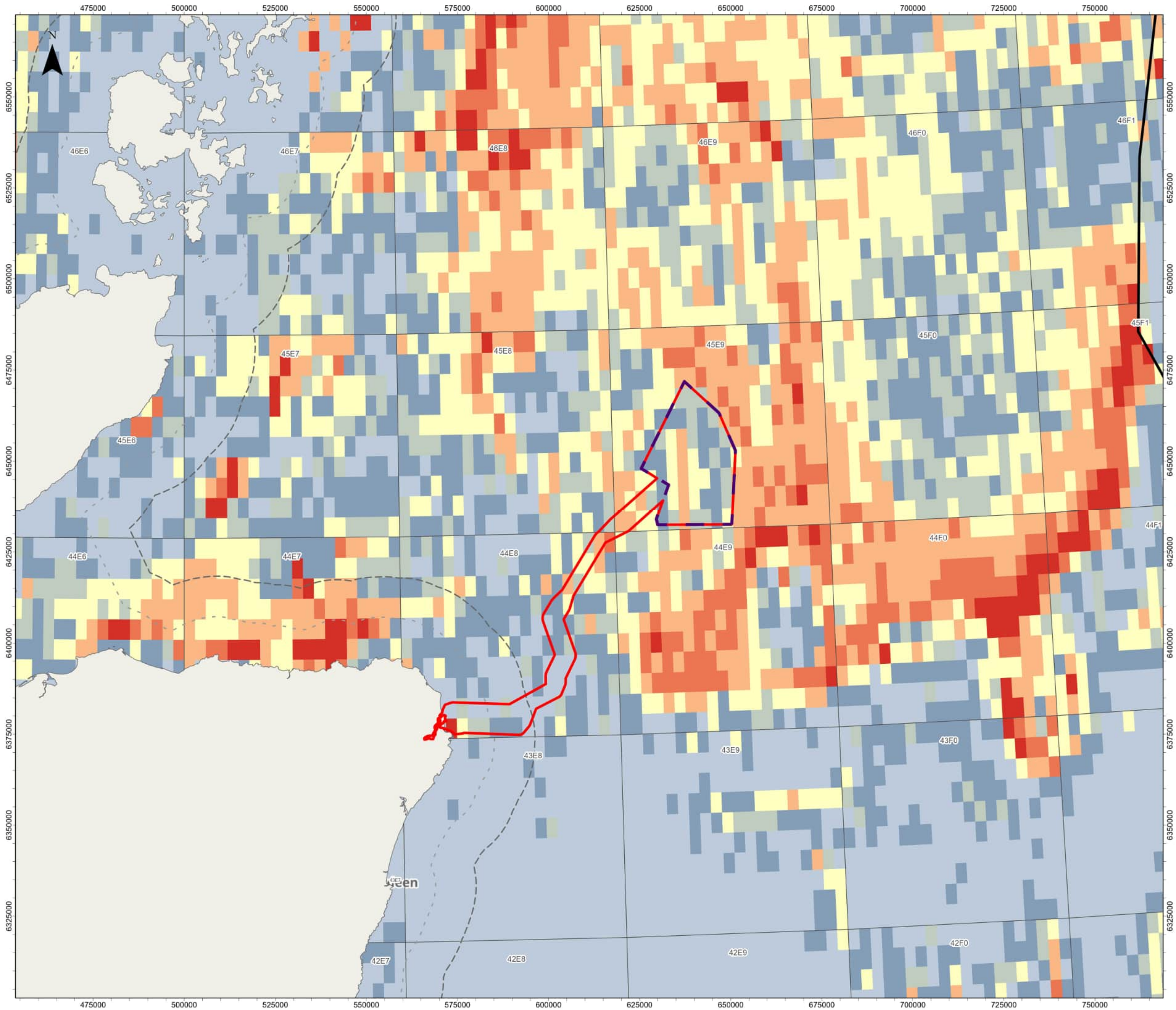


Red Line Boundary

Option Agreement Area

ICES Rectangles

6 nm Limit

12 nm Limit

200 nm Limit

Demersal Otter Trawl 2020 (UK vessels ≥15m)

Total value, £

£0.02 - £5,000.00

£5,000.01 - £10,000.00

£10,000.01 - £25,000.00

£25,000.01 - £50,000.00

£50,000.01 - £75,000.00

£75,000.01 - £595,000.00

0 10 20 30 40 50 Kilometres


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Figure 3 UK vessels ≥ 15m length actively fishing using demersal otter trawls in 2020

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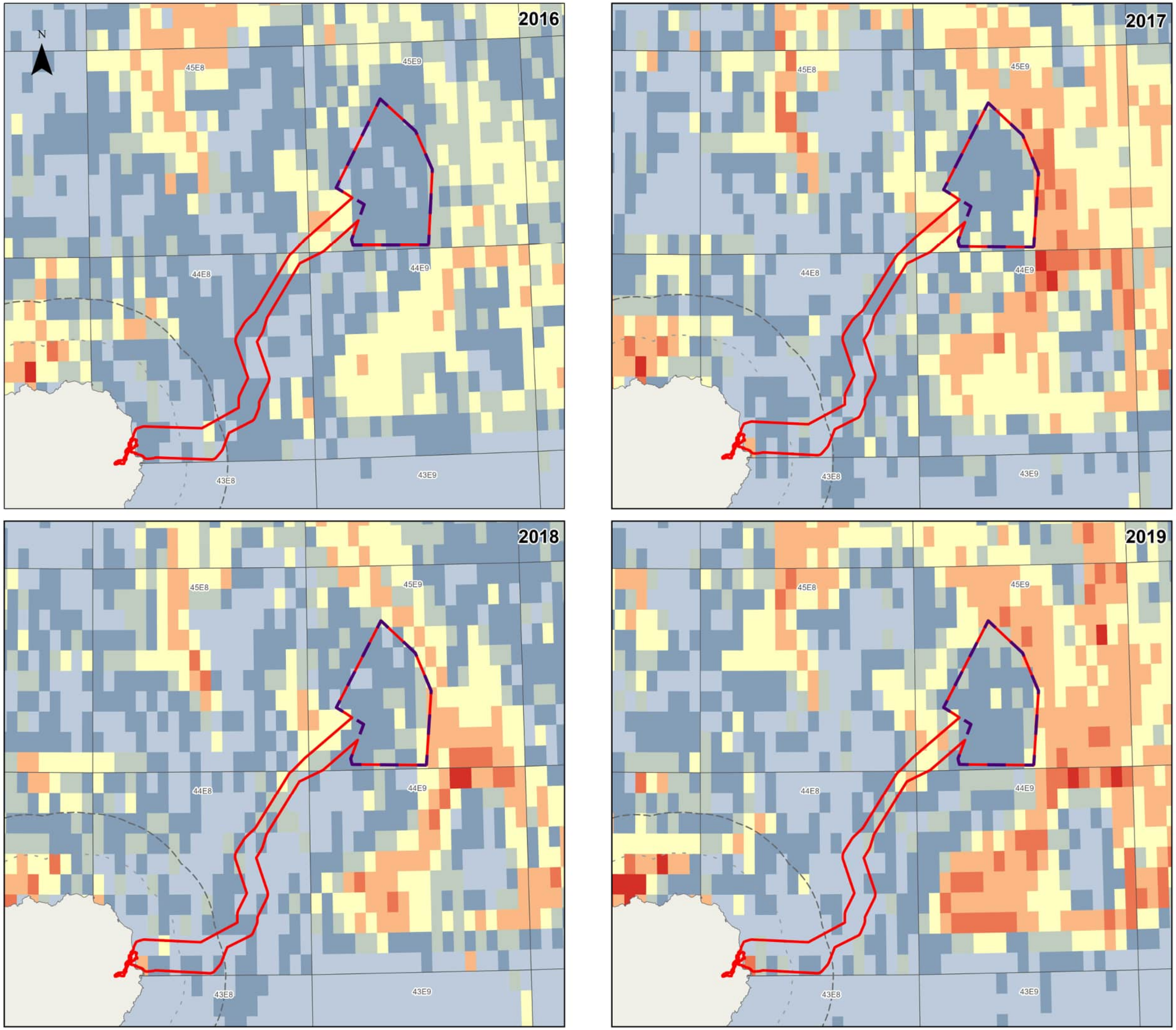


Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Demersal Otter Trawl (UK vessels ≥15m)

Total value, £

- £0.02 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £100,000.00

0 10 20 30 40 50 Kilometres


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Figure 4 UK vessels ≥ 15m length actively fishing using demersal otter trawls from 2016 to 2019

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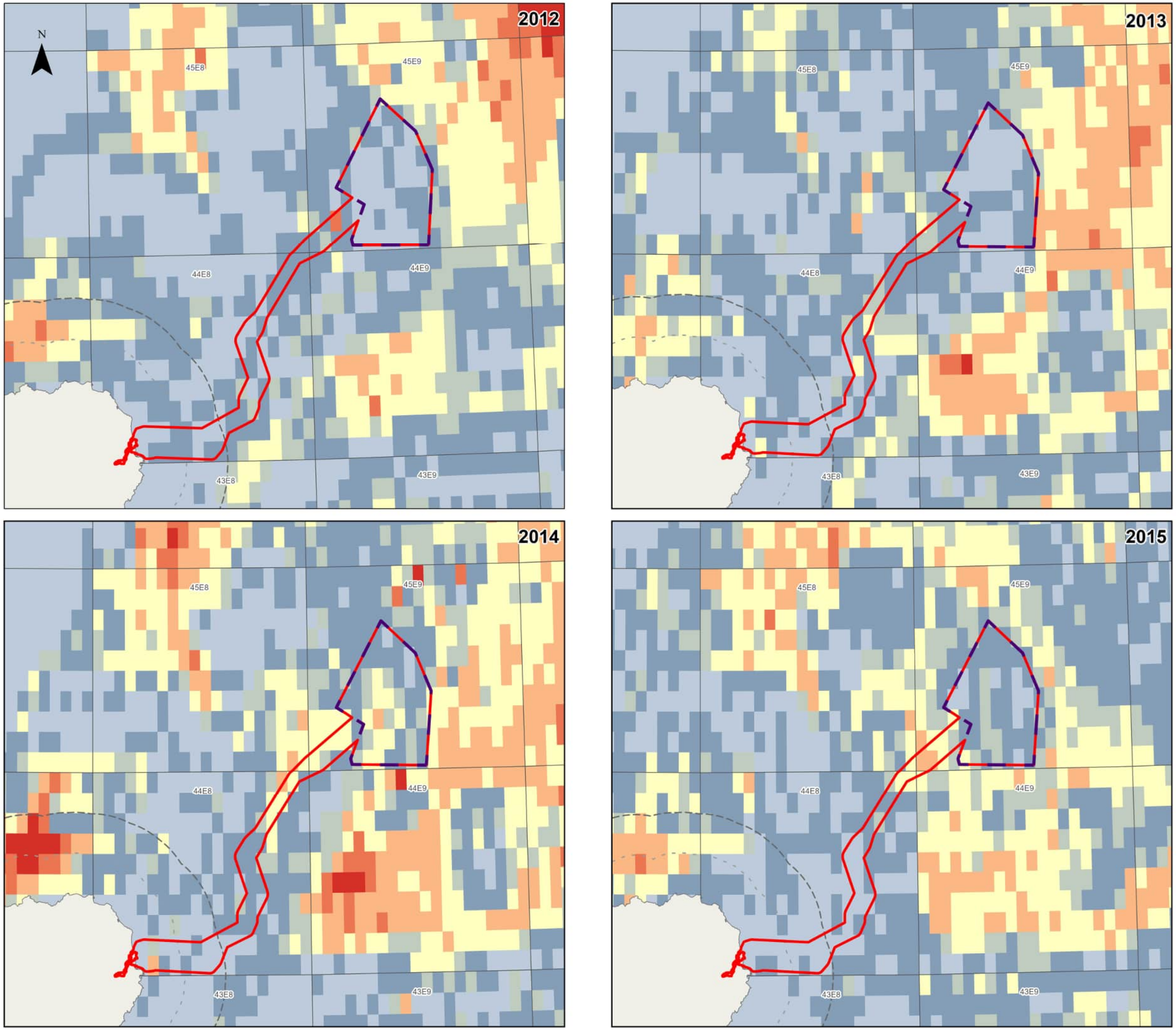


Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

**Demersal Otter Trawl (EU and UK vessels ≥12m)**

Total Value, Euro

- 0.03 - 5,000
- 5,000.01 - 10,000
- 10,000.01 - 25,000
- 25,000.01 - 50,000
- 50,000.01 - 75,000
- 75,000.01 - 452,906.82

0 10 20 30 40 50 Kilometres


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PROJECT TITLE

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Figure 5 UK vessels ≥ 15m length actively fishing using demersal otter trawls from 2012 to 2015

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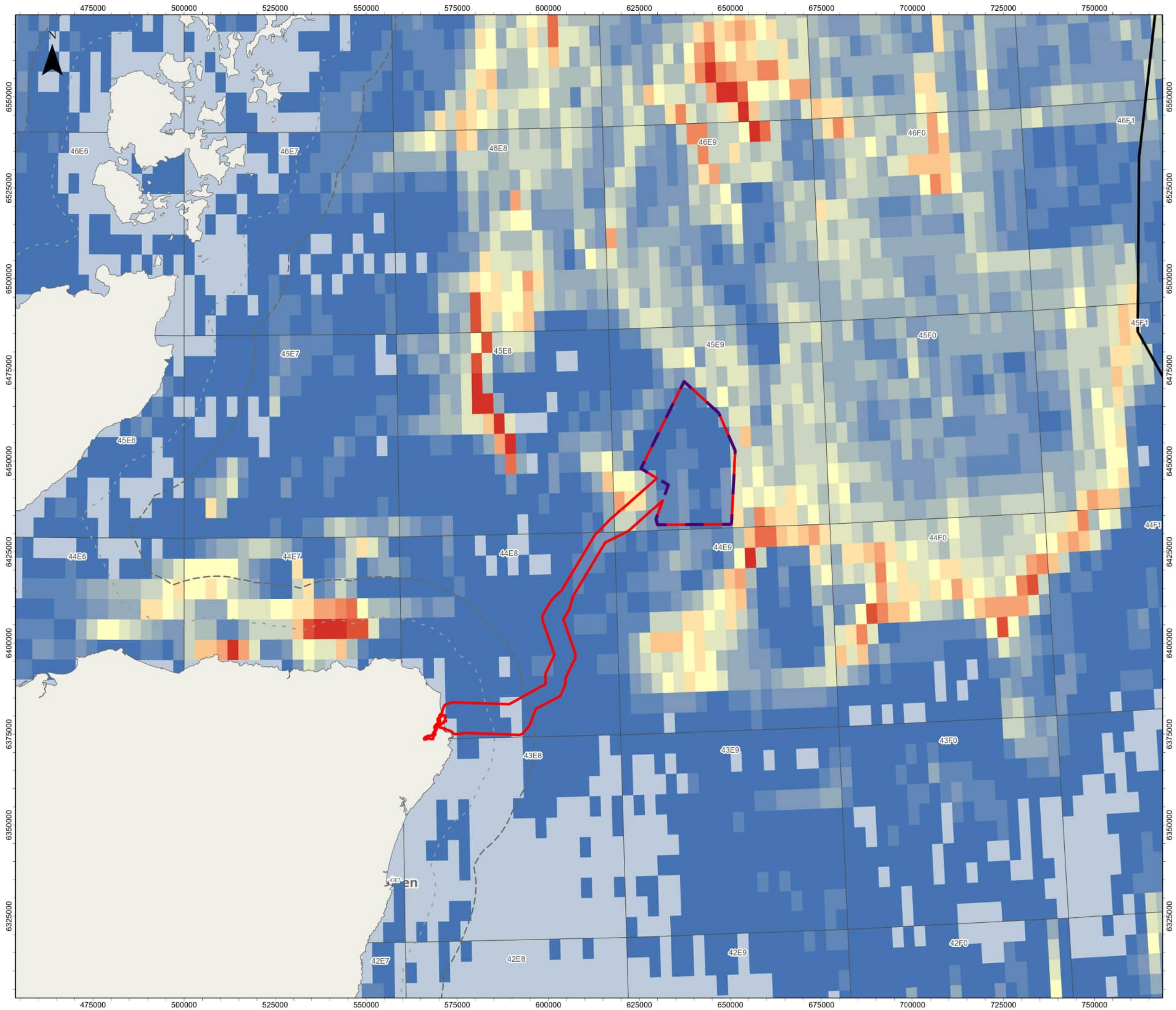


Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Demersal Otter Trawl (EU and UK vessels ≥12m)

0.0 - 0.6
0.7 - 1.3
1.4 - 1.9
2.0 - 2.6
2.7 - 3.2
3.3 - 3.9
4.0 - 4.5
4.6 - 5.1
5.2 - 5.8
5.9 - 6.4
6.5 - 7.1
7.2 - 7.7
7.8 - 8.4
8.5 - 9.0
9.1 - 23.2

0 10 20 30 40 50 Kilometres


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Figure 6 Surface swept area ratio 2016 to 2020 for EU (including UK) vessels ≥ 12m length using demersal otter trawl gear

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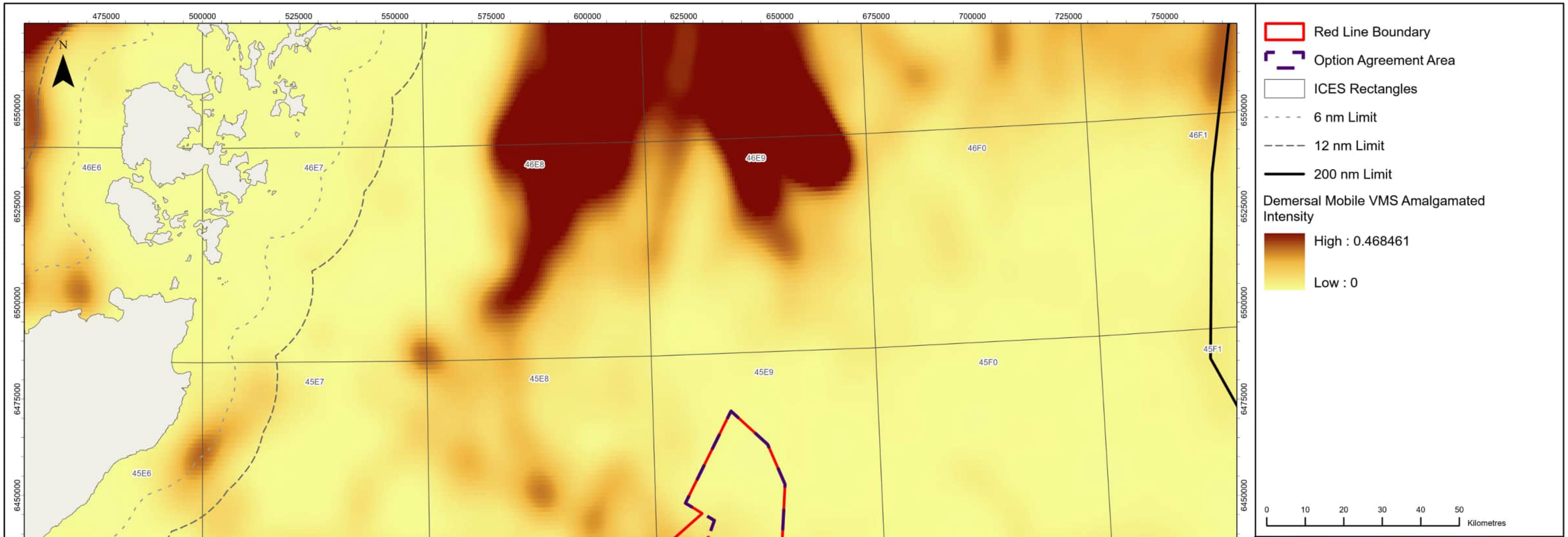



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Figure 7 Demersal fishery (all species) intensity mapping based on amalgamated vessel positional data 2009 to 2013

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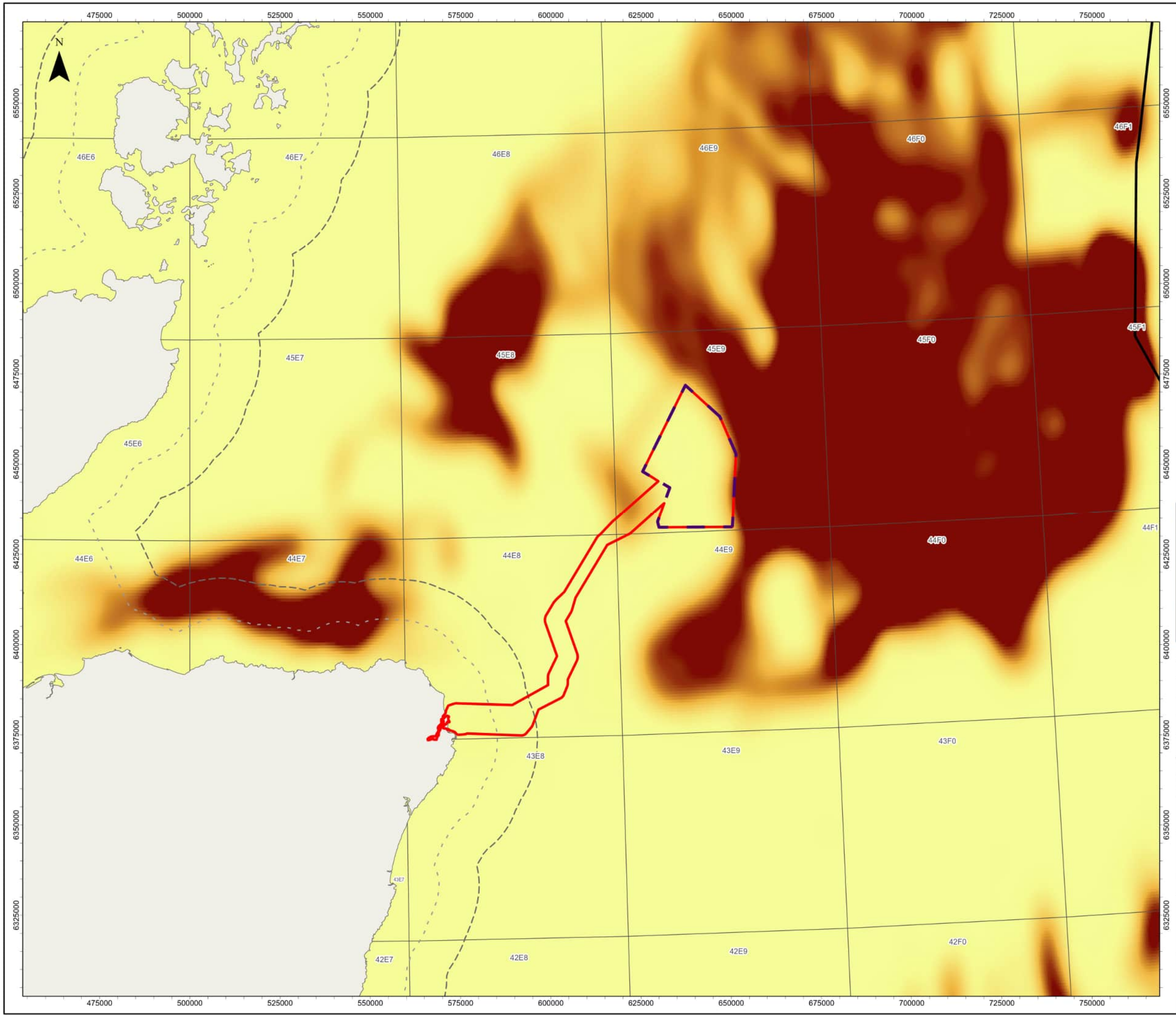


Red Line Boundary

Option Agreement Area

ICES Rectangles

6 nm Limit

12 nm Limit

200 nm Limit

Nephrops mobile 2009-2013 amalgamated VMS intensity

High : 0.617172

Low : 0

0 10 20 30 40 50 Kilometres


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Figure 8 Nephrops fishery intensity mapping based on amalgamated vessel positional data 2009 to 2013

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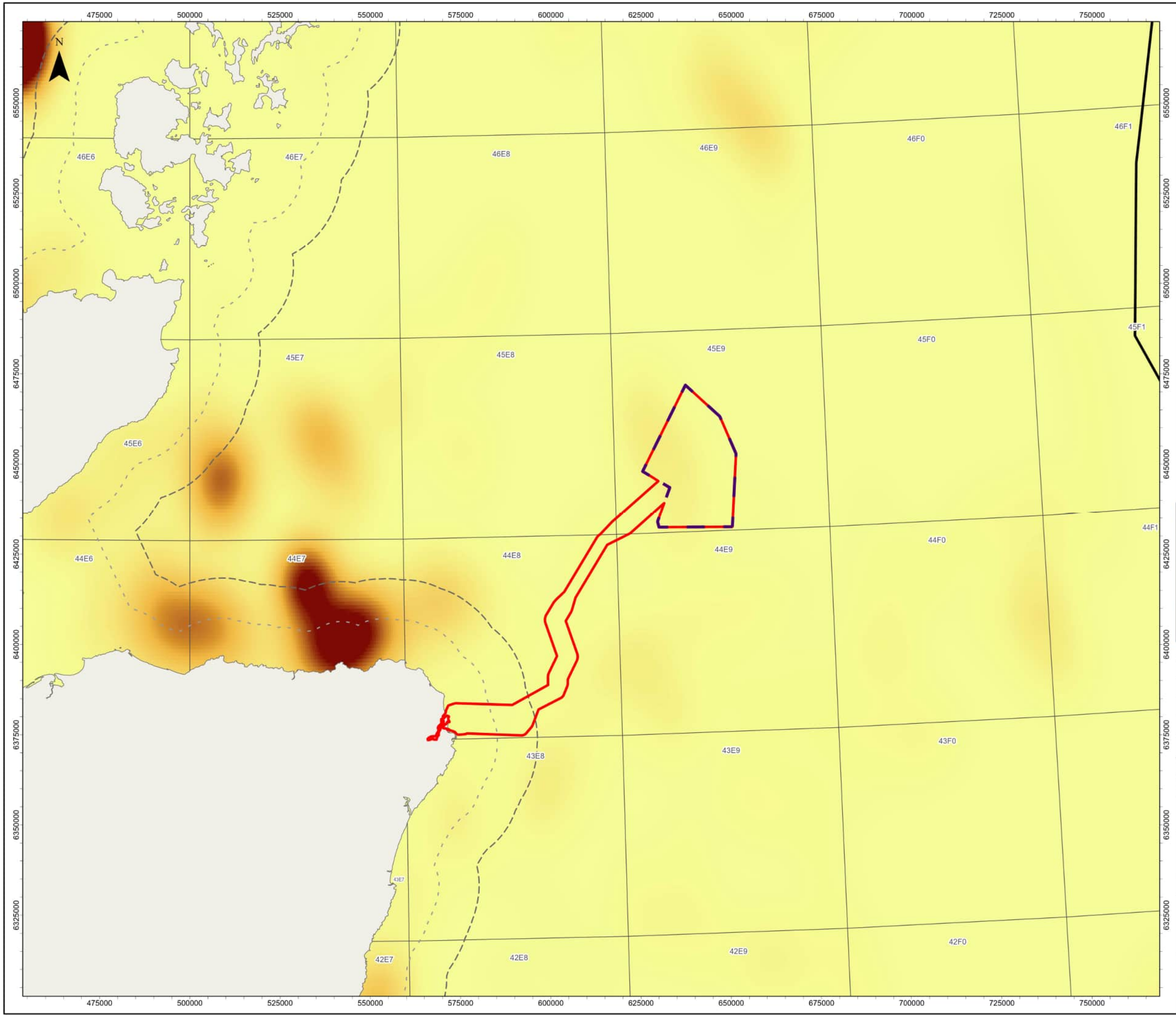



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Figure 9 Squid fishery intensity mapping based on amalgamated vessel positional data 2009 to 2013

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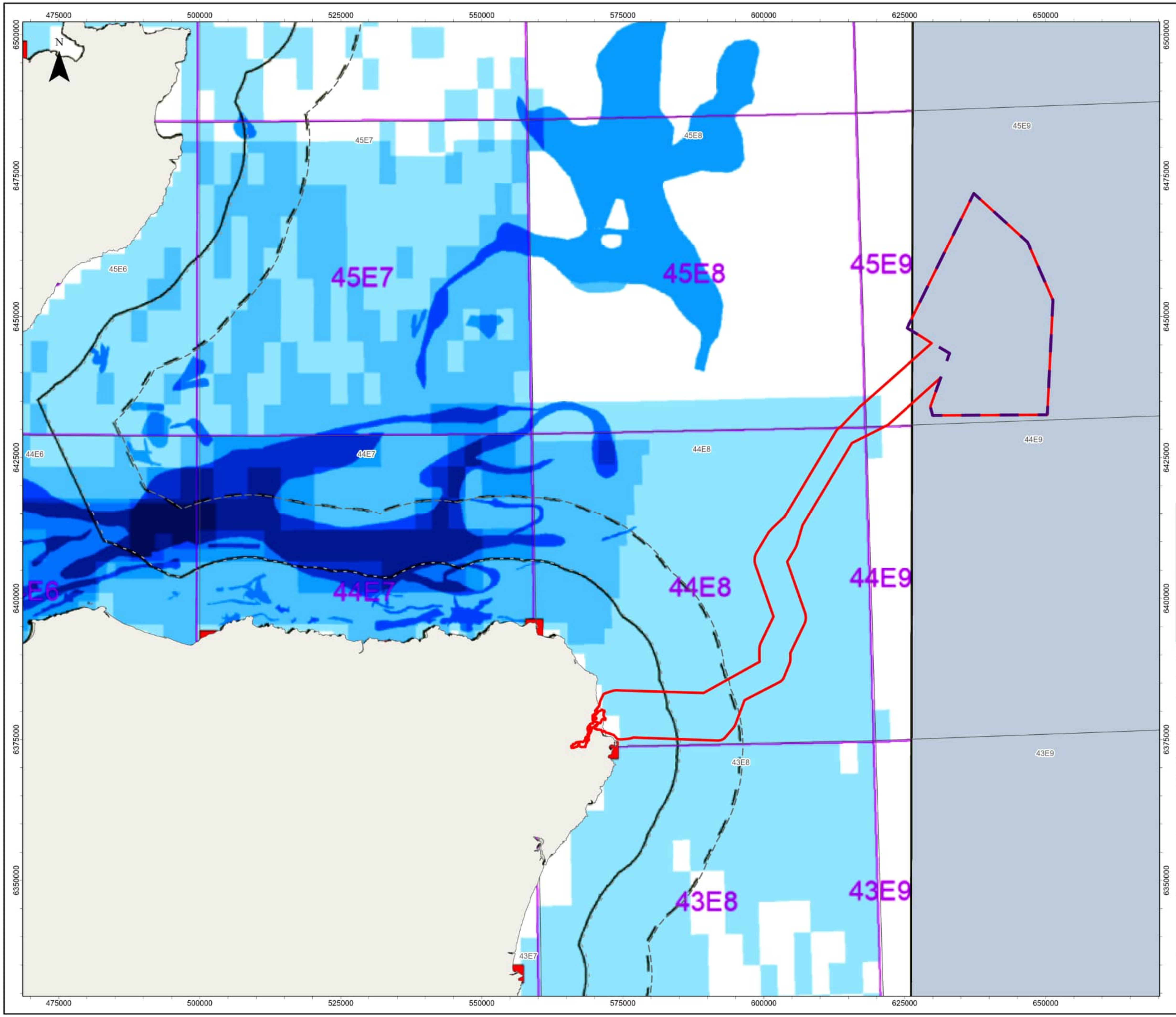


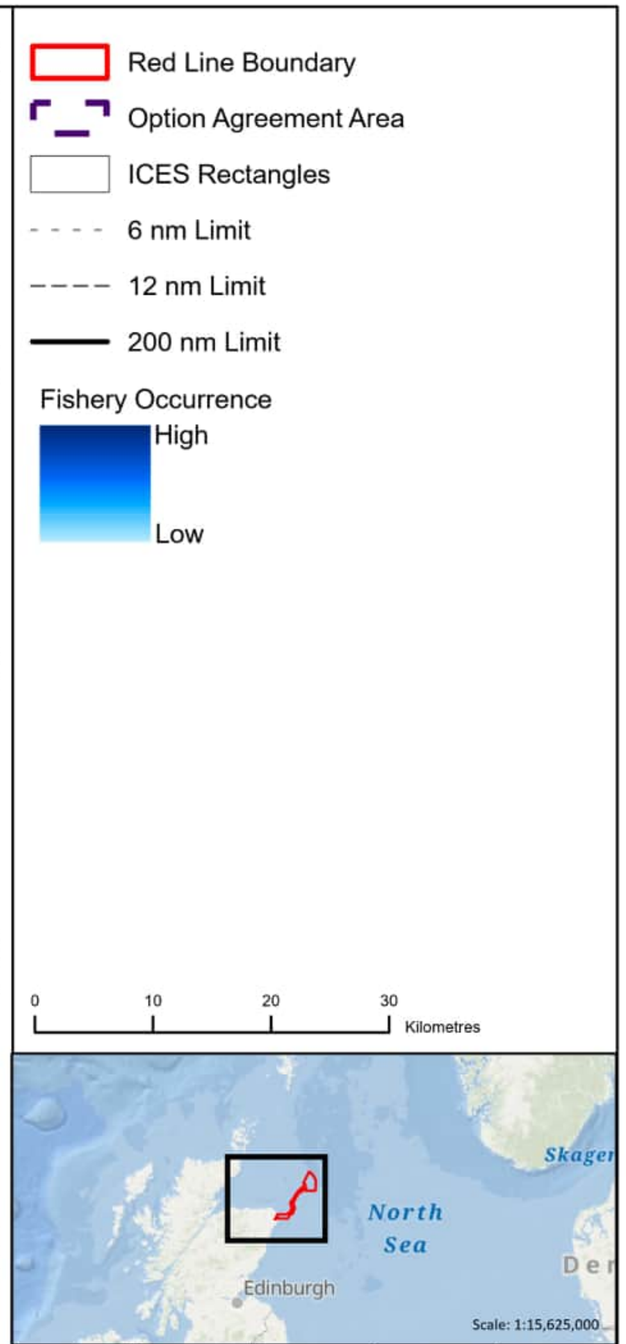


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Figure 10 Likelihood or occurrence of demersal otter trawl fishery targeting nephrops

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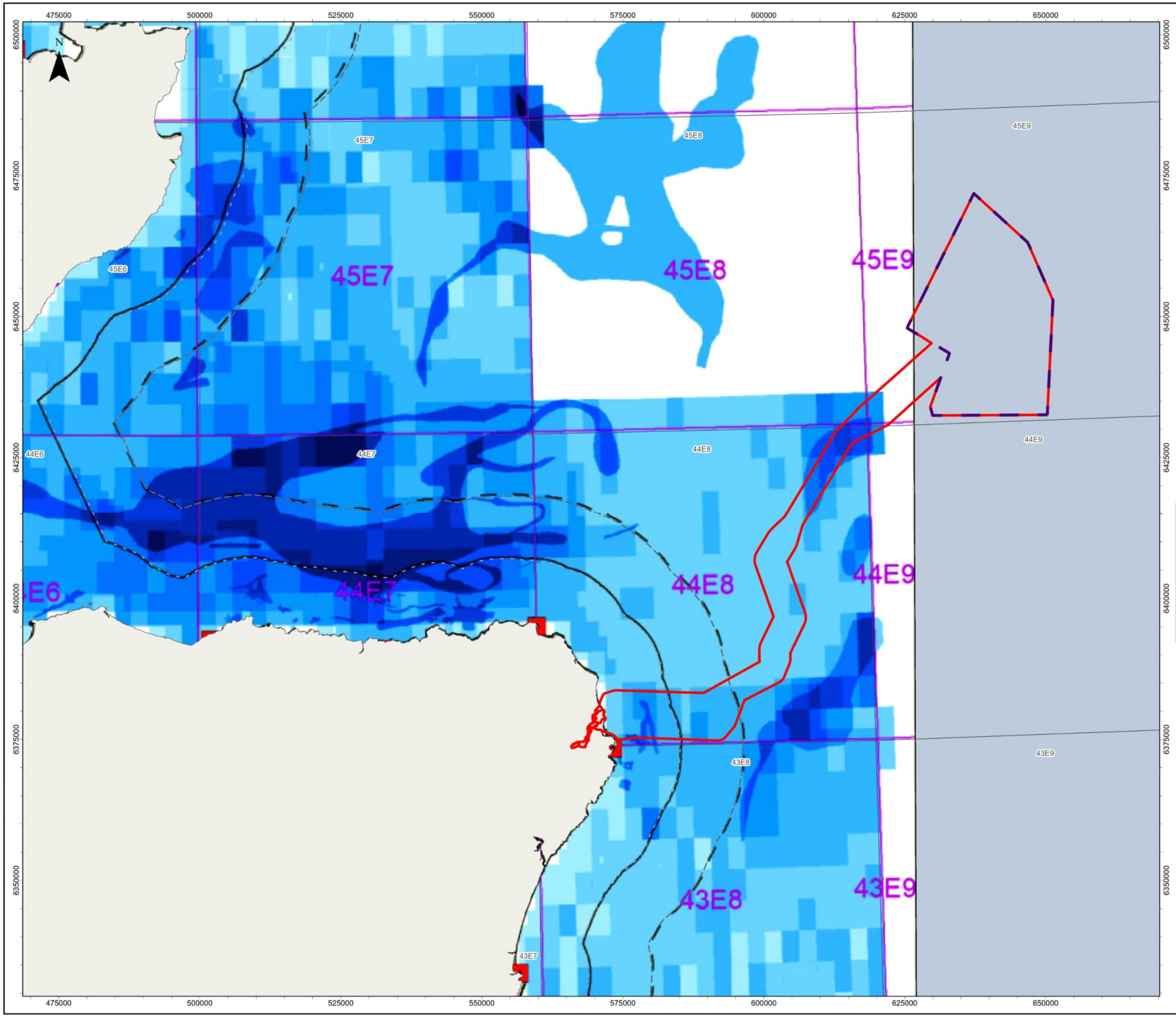


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Figure 11 Likelihood or occurrence of demersal otter trawl fishery targeting haddock, cod and mixed demersal species

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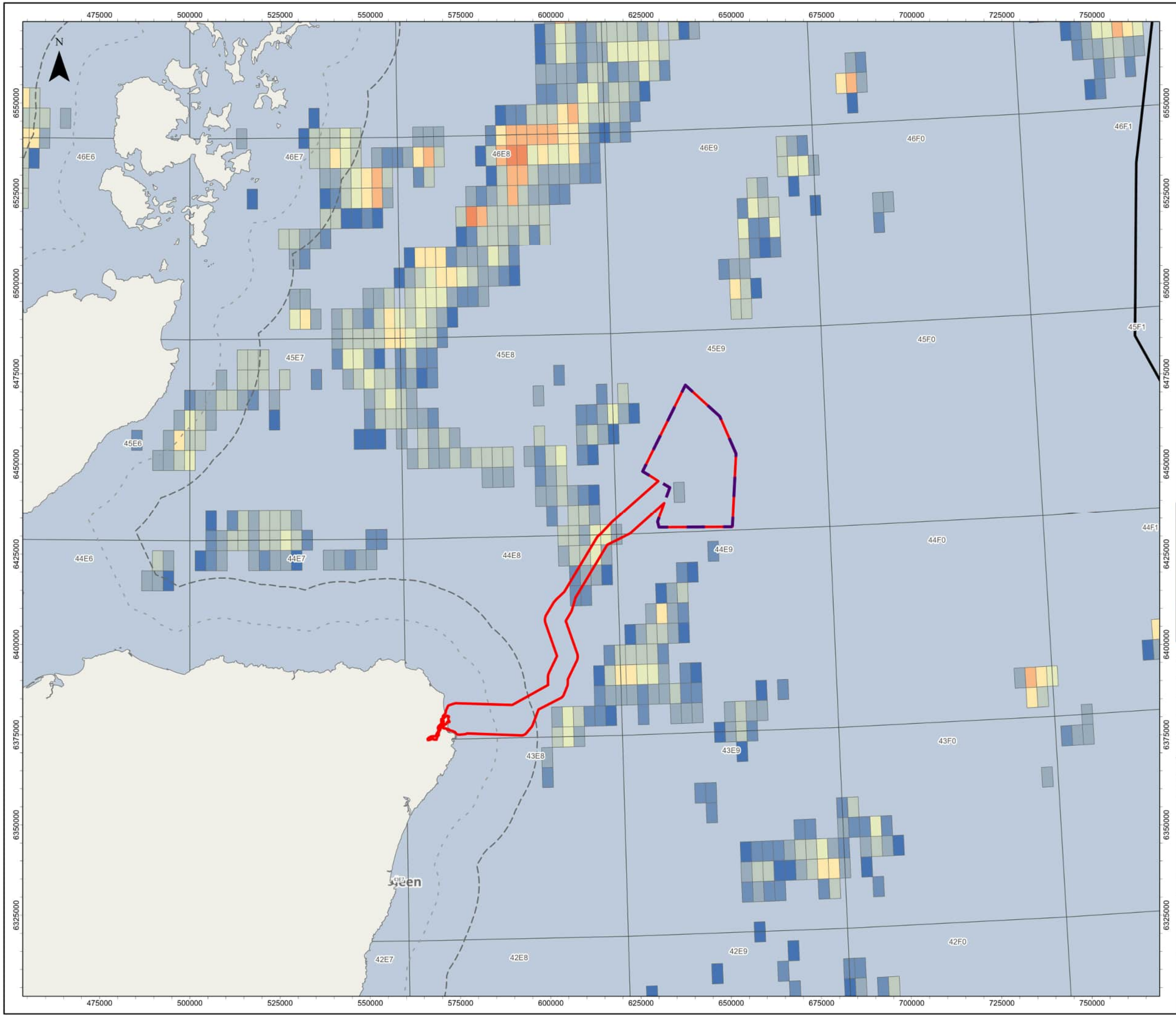


Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Demersal seine fishing effort
Fishing hours (2012-2021)

- 1.3 - 10.0
- 10.1 - 25.0
- 25.1 - 50.0
- 50.1 - 100.0
- 100.1 - 150.0
- 150.1 - 250.0
- 250.1 - 500.0
- 500.1 - 750.0
- 750.1 - 1,000.0
- 1,000.1 - 1,408

0 10 20 30 40 50 Kilometres


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Figure 12 Demersal seine fishing effort based on FiSMaDiM data (cumulative 2012 to 2021)

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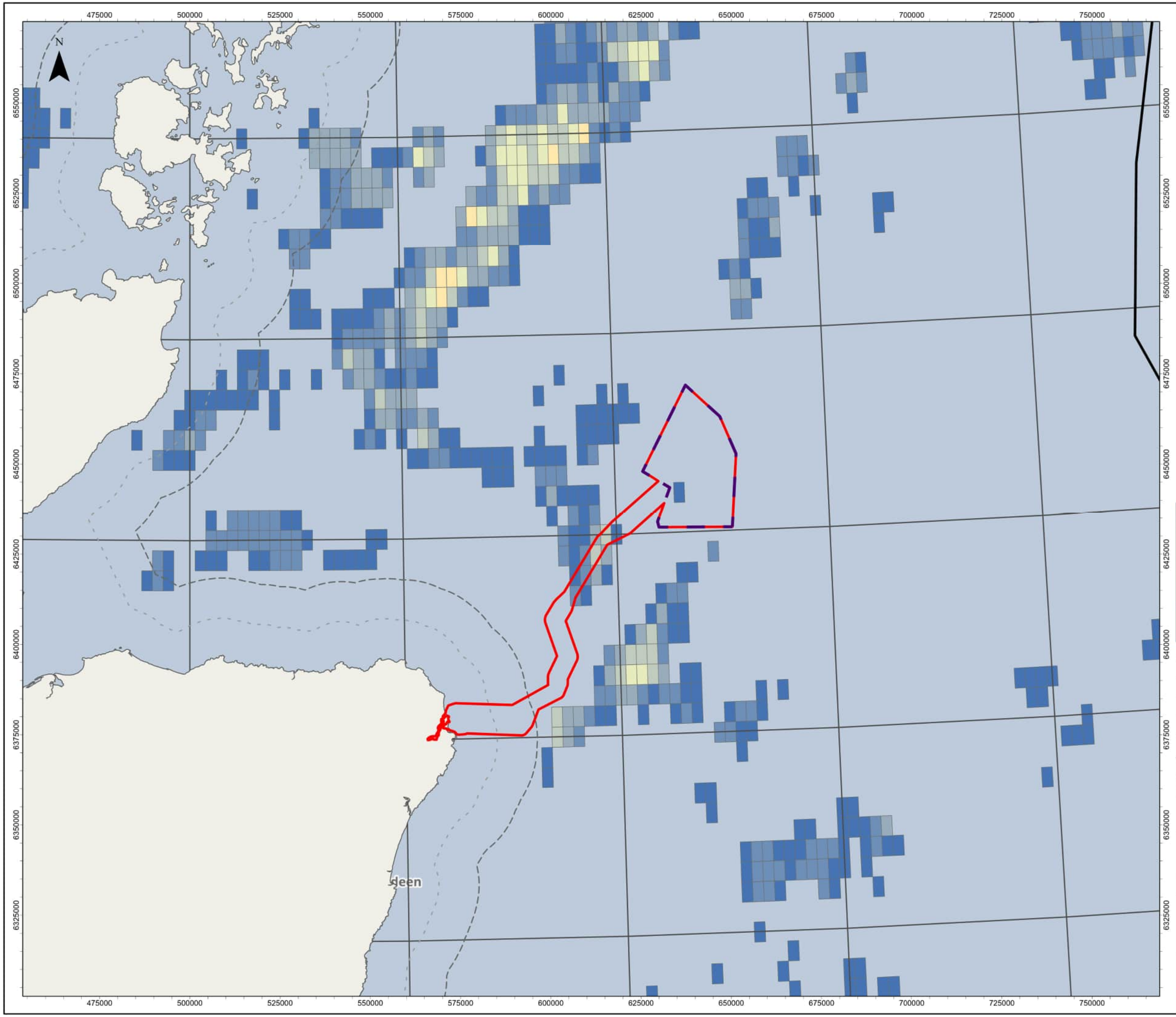


Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Demersal seine vessels

Number of vessels

- 4 - 5
- 6 - 7
- 8 - 9
- 10 - 11
- 12 - 13
- 14 - 15
- 16 - 17
- 18 - 20
- 21 - 25
- 26 - 28

0 10 20 30 40 50 Kilometres


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Figure 13 Number of vessels deploying demersal seine gear based on FiSMaDiM data (cumulative 2012 to 2021)

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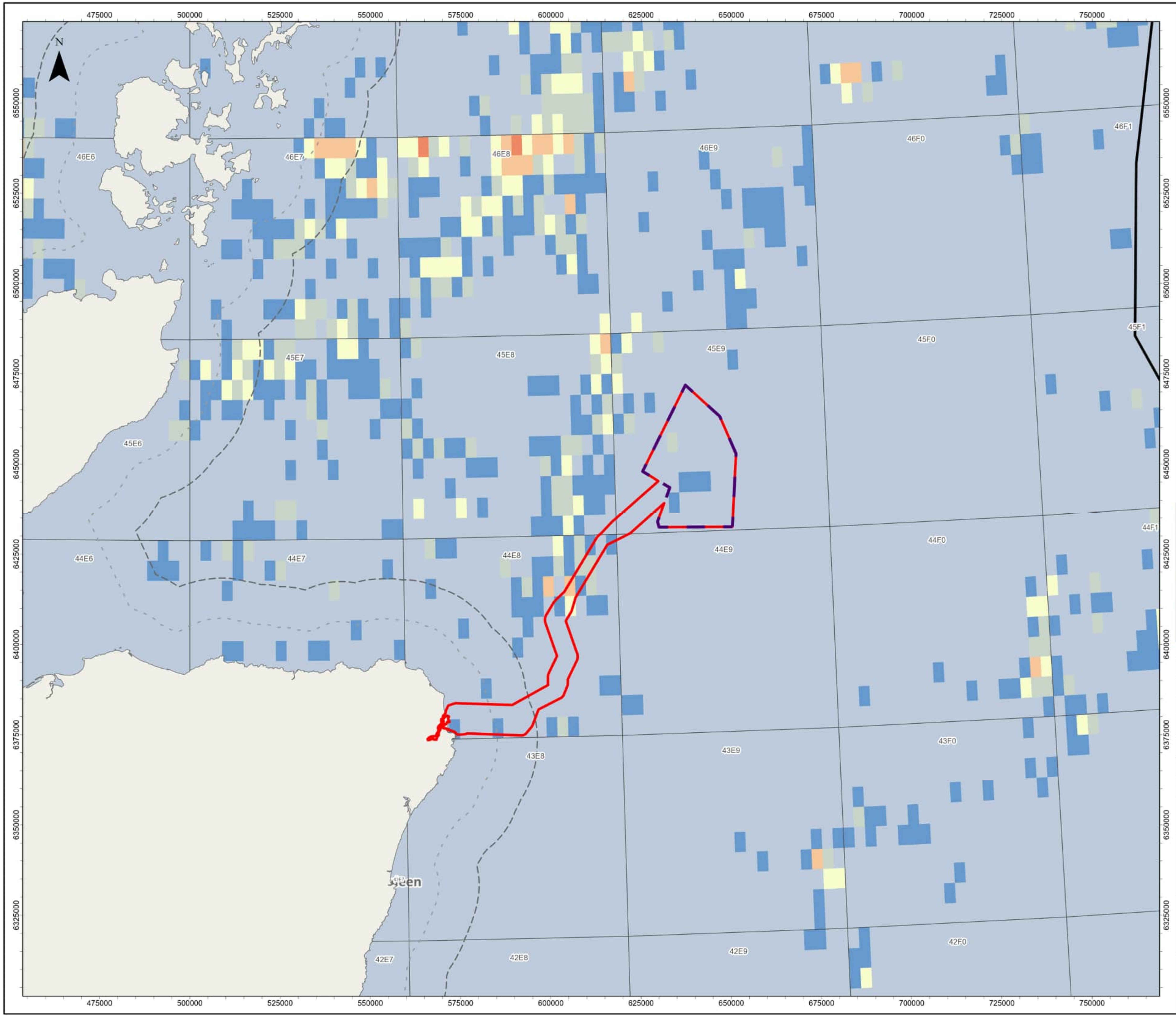
NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Demersal Seine 2020 (UK vessels ≥15m)

Total value, £

- £0.02 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £132,154.33

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

WSP DRAWING NUMBER 808368-WEIS-IA-E5-FG-CF-29815

MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000526

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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 14 UK vessels ≥ 15m length actively fishing using demersal seine trawls in 2020

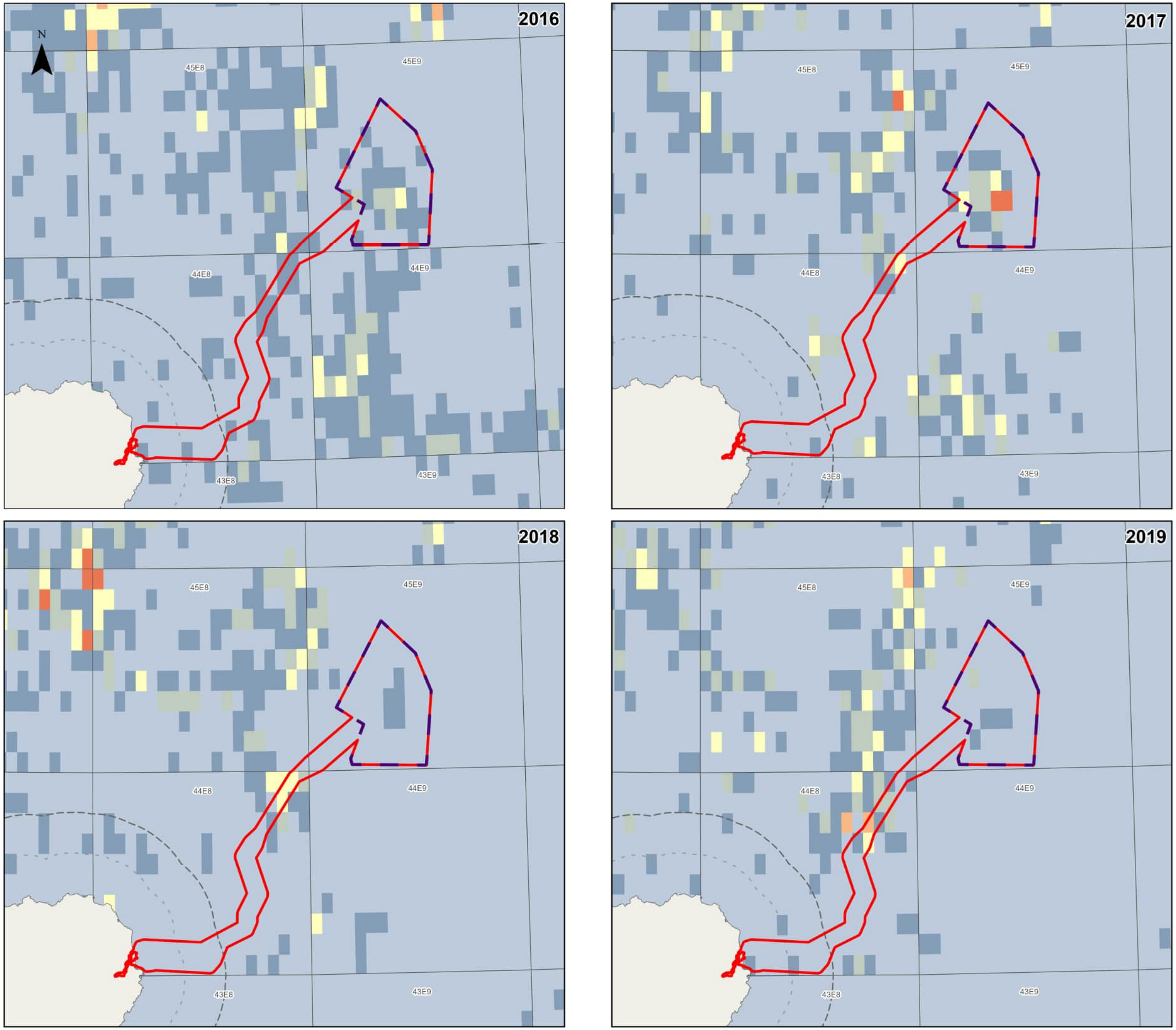
**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Demersal Seine (UK vessels ≥15m)

Total Value, £

£0.02 - £5,000.00
£5,000.01 - £10,000.00
£10,000.01 - £25,000.00
£25,000.01 - £50,000.00
£50,000.01 - £75,000.00
£75,000.01 - £80,001.43

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

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| WSP DRAWING NUMBER | 808368-WEIS-IA-E5-FG-CF-2443 |
| MarramWind DRAWING NUMBER | MAR-GEN-ENV-MAP-WSP-000527 |

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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 15 UK vessels ≥ 15m length actively fishing using demersal seine from 2016 to 2019 (MMO, 2022)

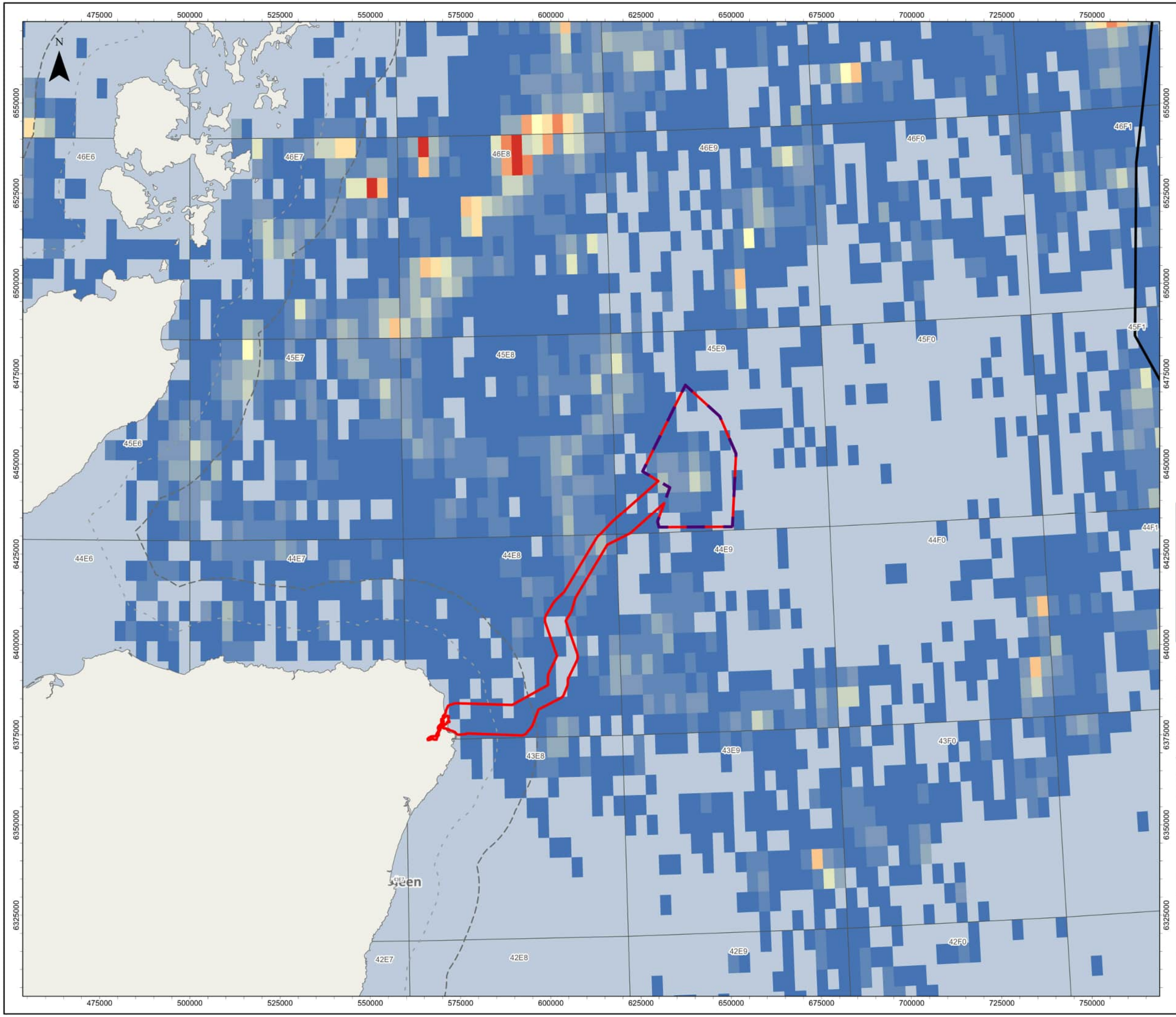
**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Demersal Seine (EU and UK vessels ≥12m)

- 0.0 - 0.6
- 0.7 - 1.3
- 1.4 - 1.9
- 2.0 - 2.6
- 2.7 3.2
- 3.3 - 3.9
- 4.0 - 4.5
- 4.6 - 5.1
- 5.2 - 5.8
- 5.9 - 6.4
- 6.5 - 7.1
- 7.2 - 7.7
- 7.8 - 8.4
- 8.5 - 9.0
- 9.1 - 46.8

0 10 20 30 40 50 Kilometres


| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |
|---|---|---|---|---|---|
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| | dd/mm/yyyy | -- | -- | -- | -- |
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| MarramWind DRAWING NUMBER | MAR-GEN-ENV-MAP-WSP-000528 |

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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 16 Surface swept area ratio 2016 to 2020 for EU (including UK) vessels ≥ 12m length using demersal seine gear

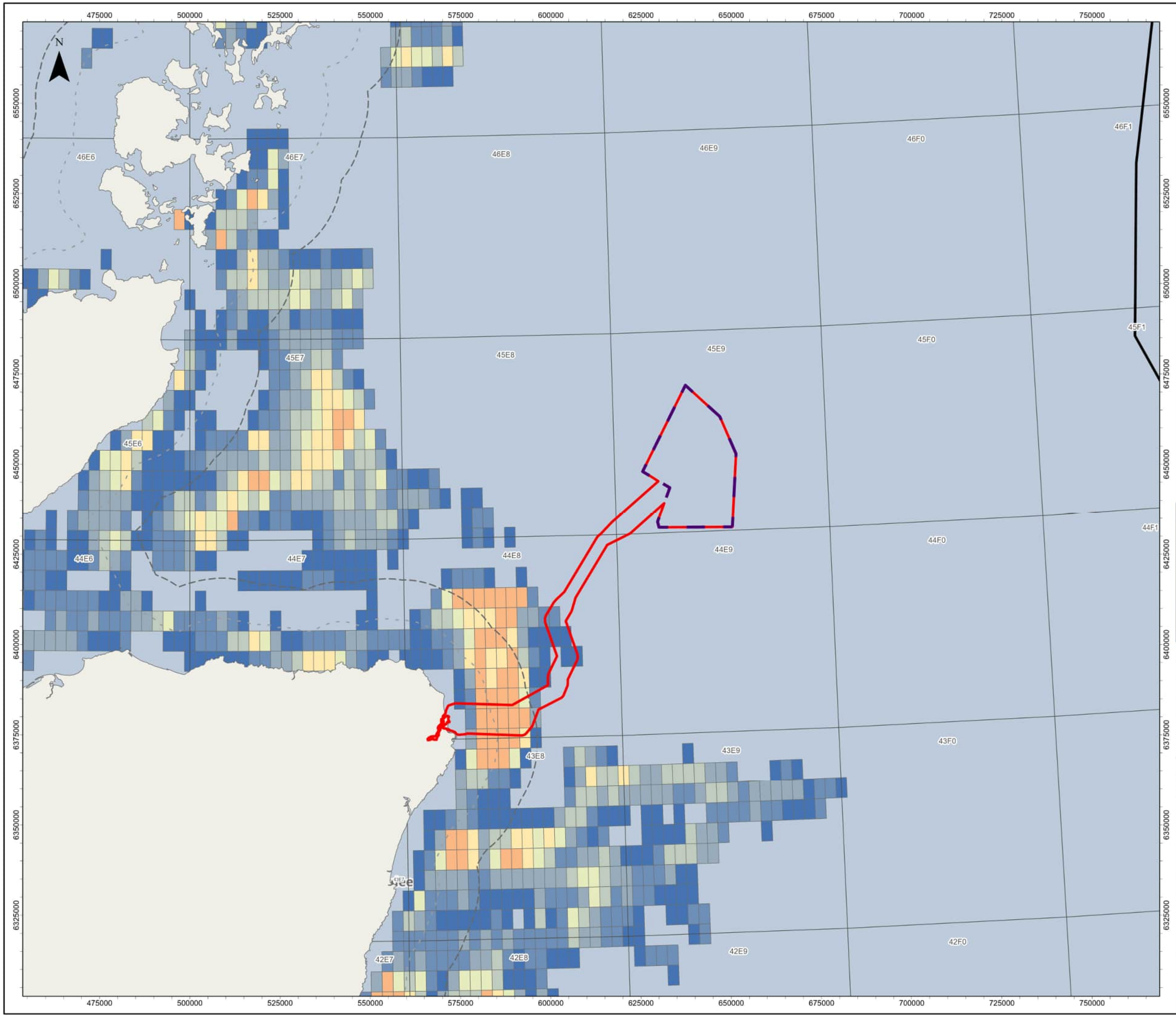
**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Dredge fishing effort

Fishing hours (2012-2021)

- 1.3 - 10.0
- 10.1 - 25.0
- 25.1 - 50.0
- 50.1 - 75.0
- 75.1 - 100.0
- 100.1 - 150.0
- 150.1 - 500.0
- 500.1 - 1,000.0
- 1,000.1 - 2,000.0
- 2,000.1 - 3,089.0

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

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| MarramWind DRAWING NUMBER | MAR-GEN-ENV-MAP-WSP-000529 | | |
| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 17 Dredge fishing effort based on FiSMaDiM data (cumulative 2012 to 2021)

**Environmental Impact Assessment Report**

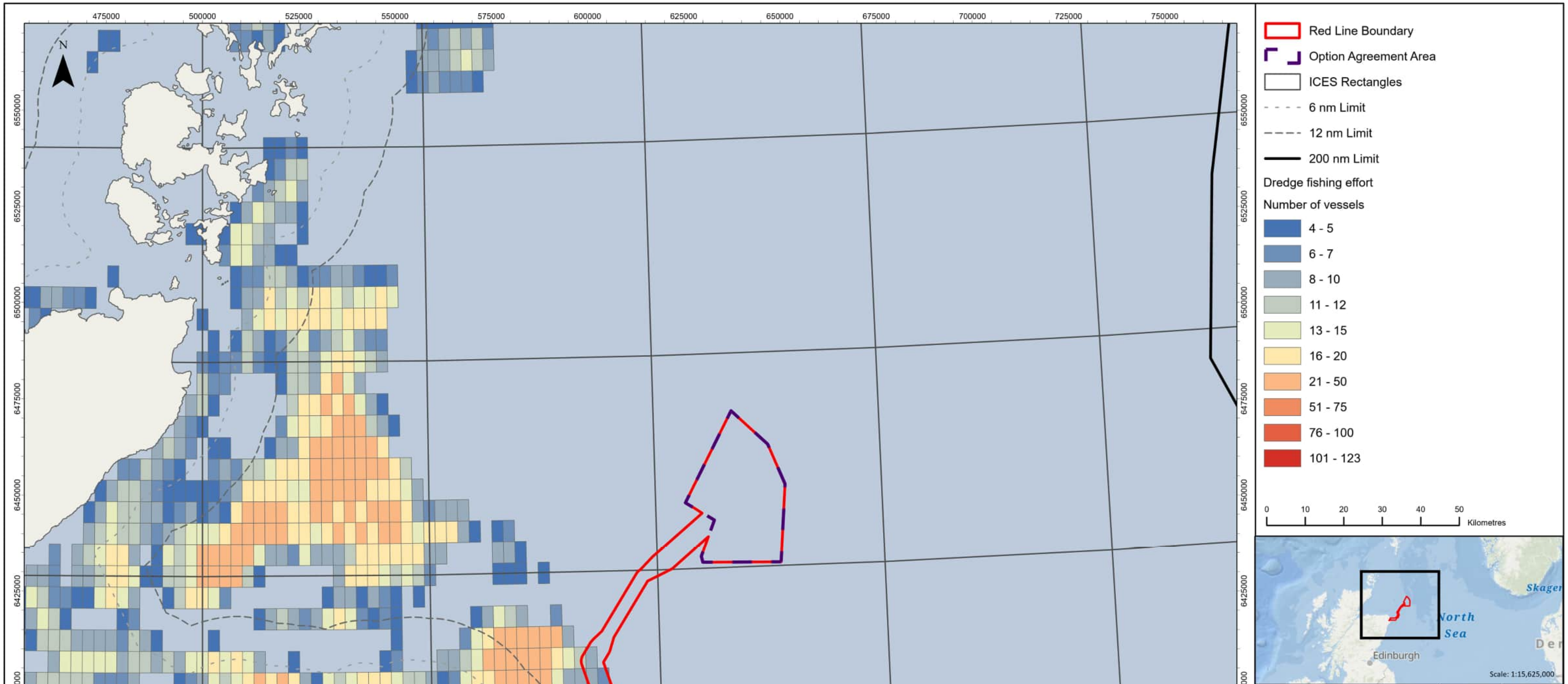
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp

MarramWind

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|---|---|---|---|---|---|
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| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

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| MarramWind DRAWING NUMBER | MAR-GEN-ENV-MAP-WSP-000530 | | |
| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 18 Number of vessels deploying dredge gear based on FiSMaDiM data (cumulative 2012 to 2021)

**Environmental Impact Assessment Report**

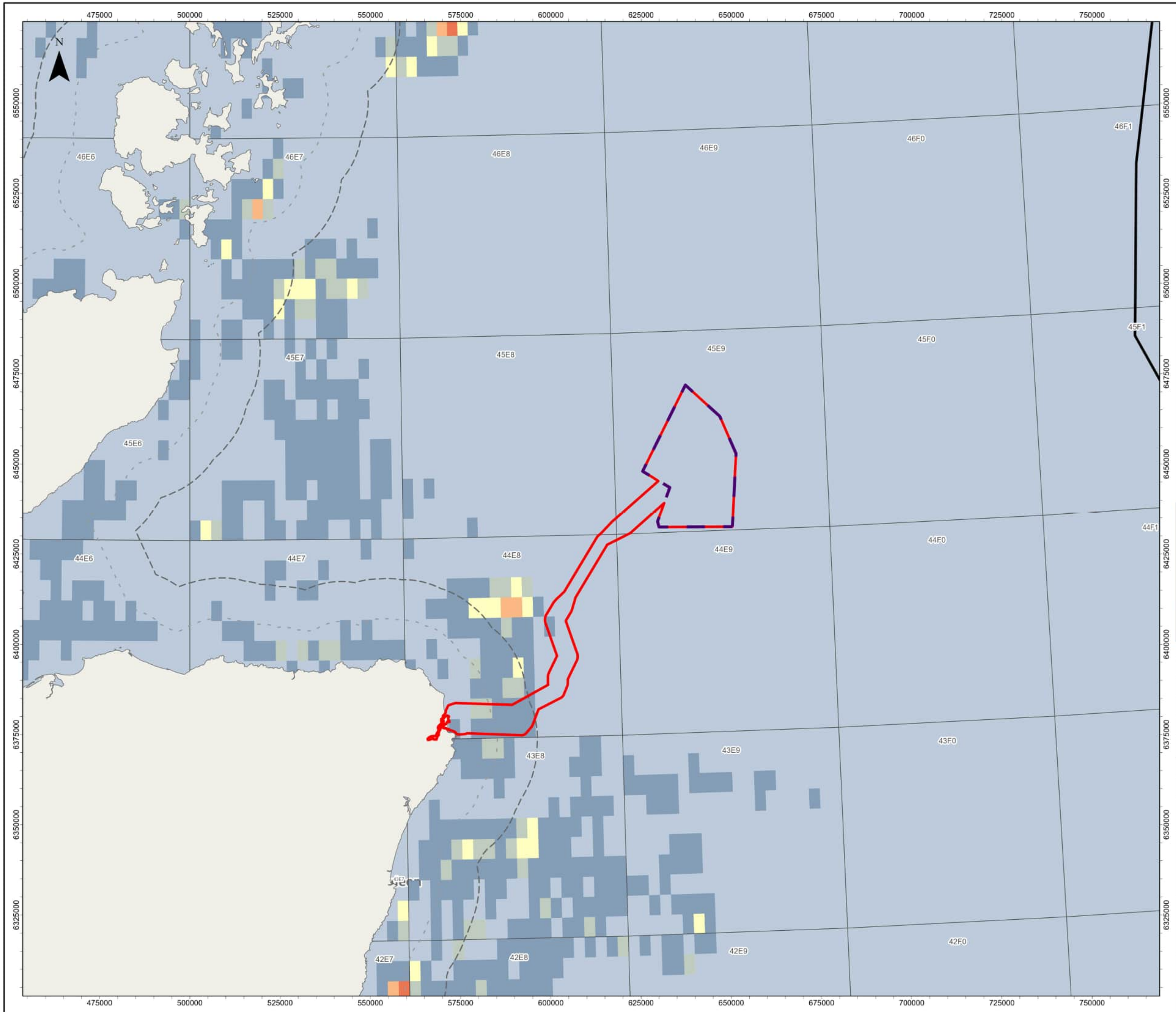
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp

MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Dredge 2020 (UK vessels ≥15m)

Total value, £

- £0.02 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £232,000.00

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

WSP DRAWING NUMBER 808368-WEIS-IA-E5-FG-CF-17361

MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000531

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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

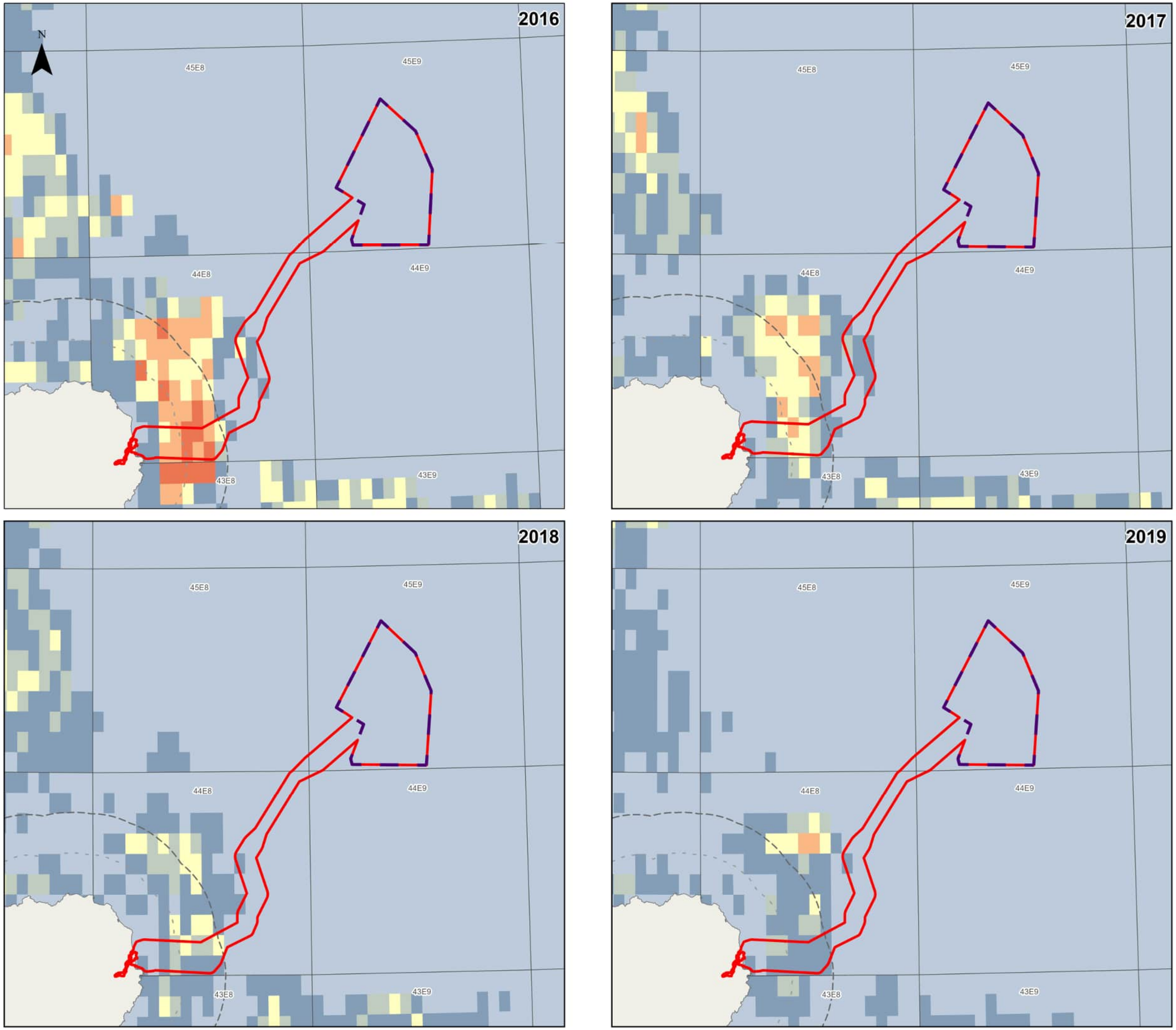
Figure 19 UK vessels ≥ 15m length actively fishing using dredge in 2020

**Environmental Impact Assessment Report**
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Dredge (UK vessels ≥15m)

Total value, £

- £0.91 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £280,000.00

0 10 20 30 40 50 Kilometres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|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

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| WSP DRAWING NUMBER | 808368-WEIS-IA-E5-FG-CF-31326 |
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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 20 UK vessels ≥ 15m length actively fishing using dredges from 2016 to 2019 (MMO, 2022)

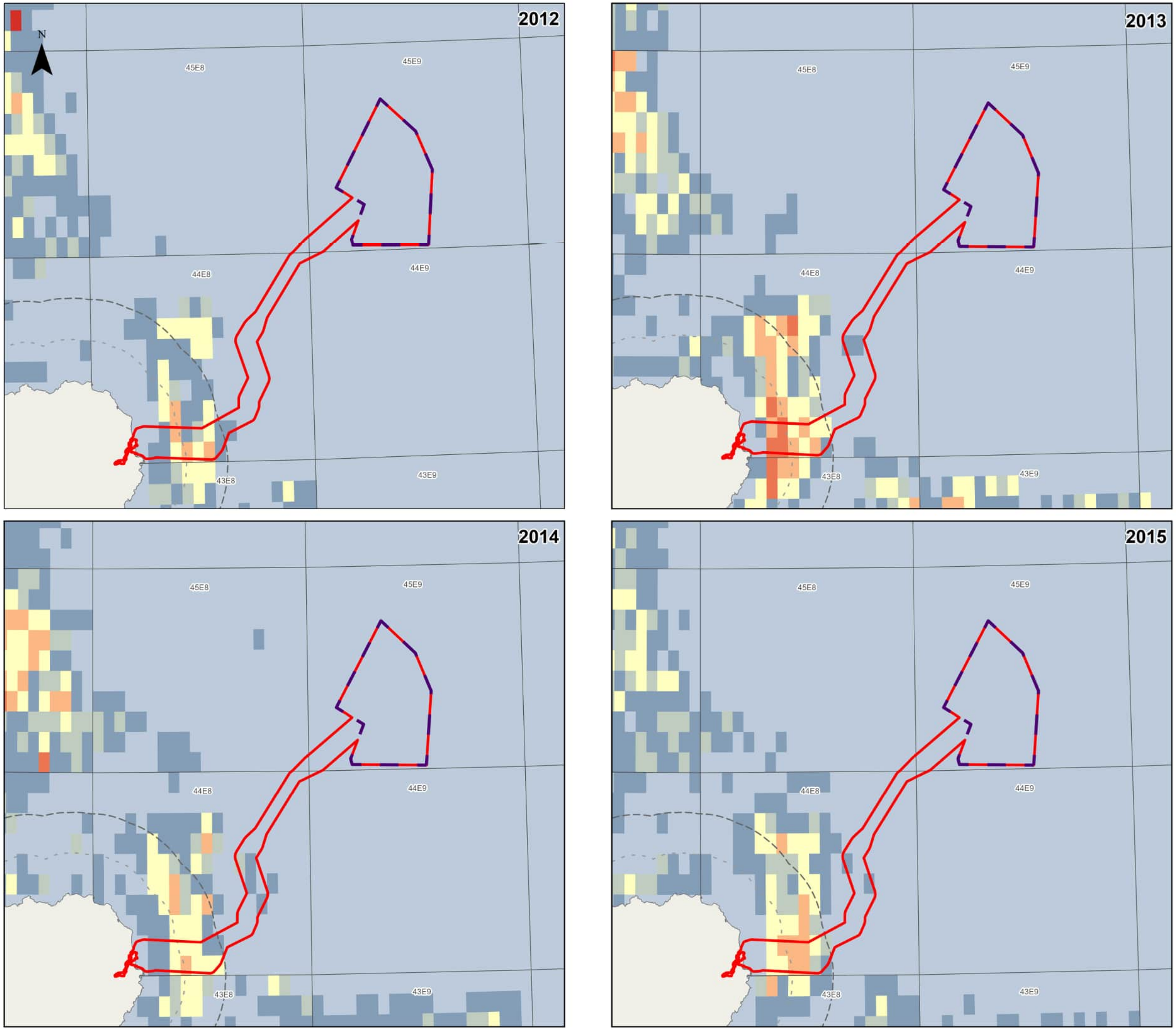
**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Dredge (EU and UK vessels ≥12m)

Total Value, Euro

- 0.03 - 5,000
- 5,000.01 - 10,000
- 10,000.01 - 25,000
- 25,000.01 - 50,000
- 50,000.01 - 75,000
- 75,000.01 - 452,906.82

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

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| WSP DRAWING NUMBER | 808368-WEIS-IA-E5-FG-CF-16923 |
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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 21 UK vessels ≥ 15m length actively fishing using dredges from 2012 to 2015

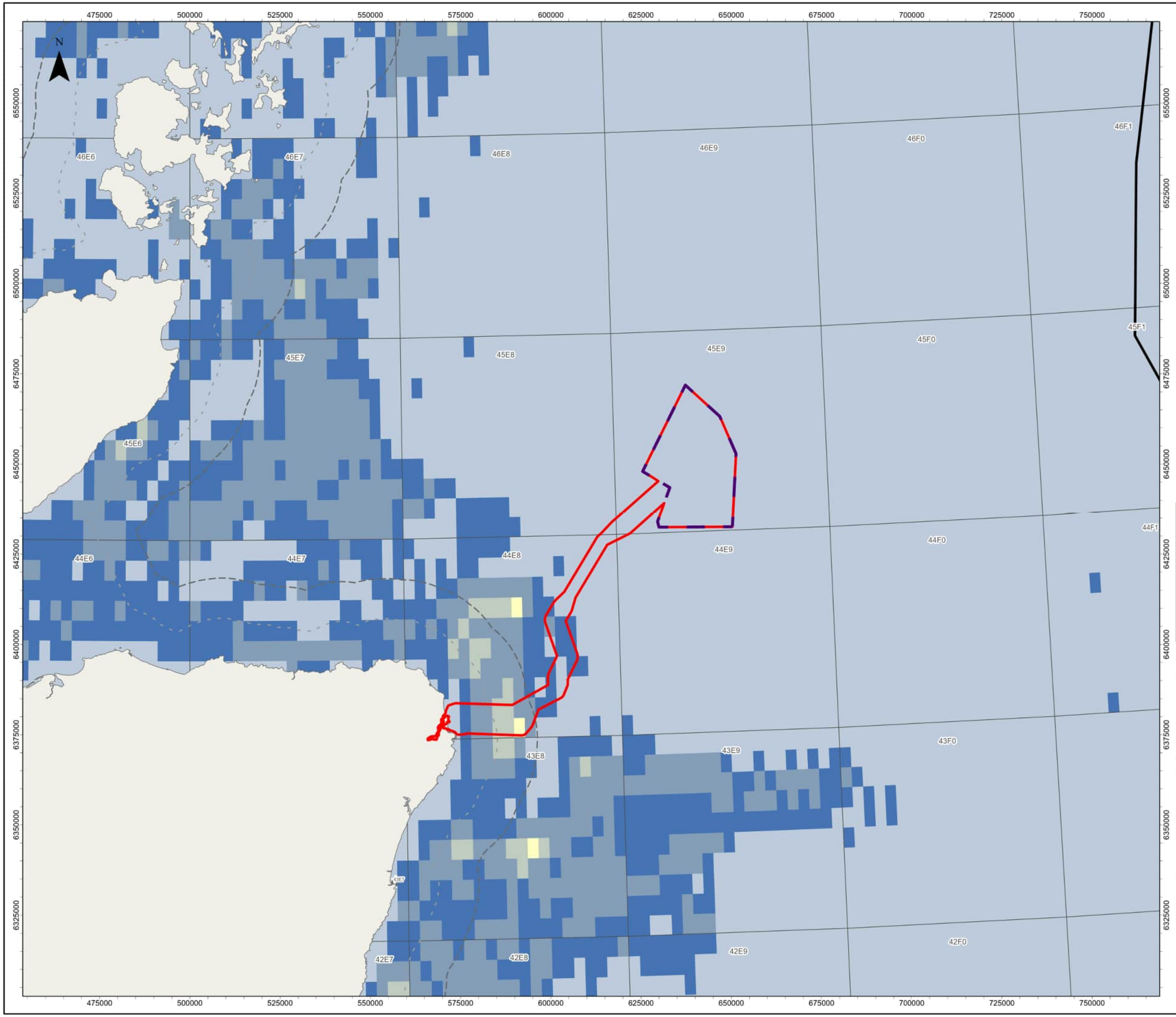
**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp | MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Dredge (EU and UK vessels ≥12m)

- 0.0 - 0.1
- 0.2 - 0.5
- 0.6 - 0.8
- 0.8 - 1.0
- 1.1 - 2.0
- 2.1 - 2.5
- 2.6 - 3.8

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

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| MarramWind DRAWING NUMBER | MAR-GEN-ENV-MAP-WSP-000535 | | |
| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE
MarramWind Offshore Wind Farm

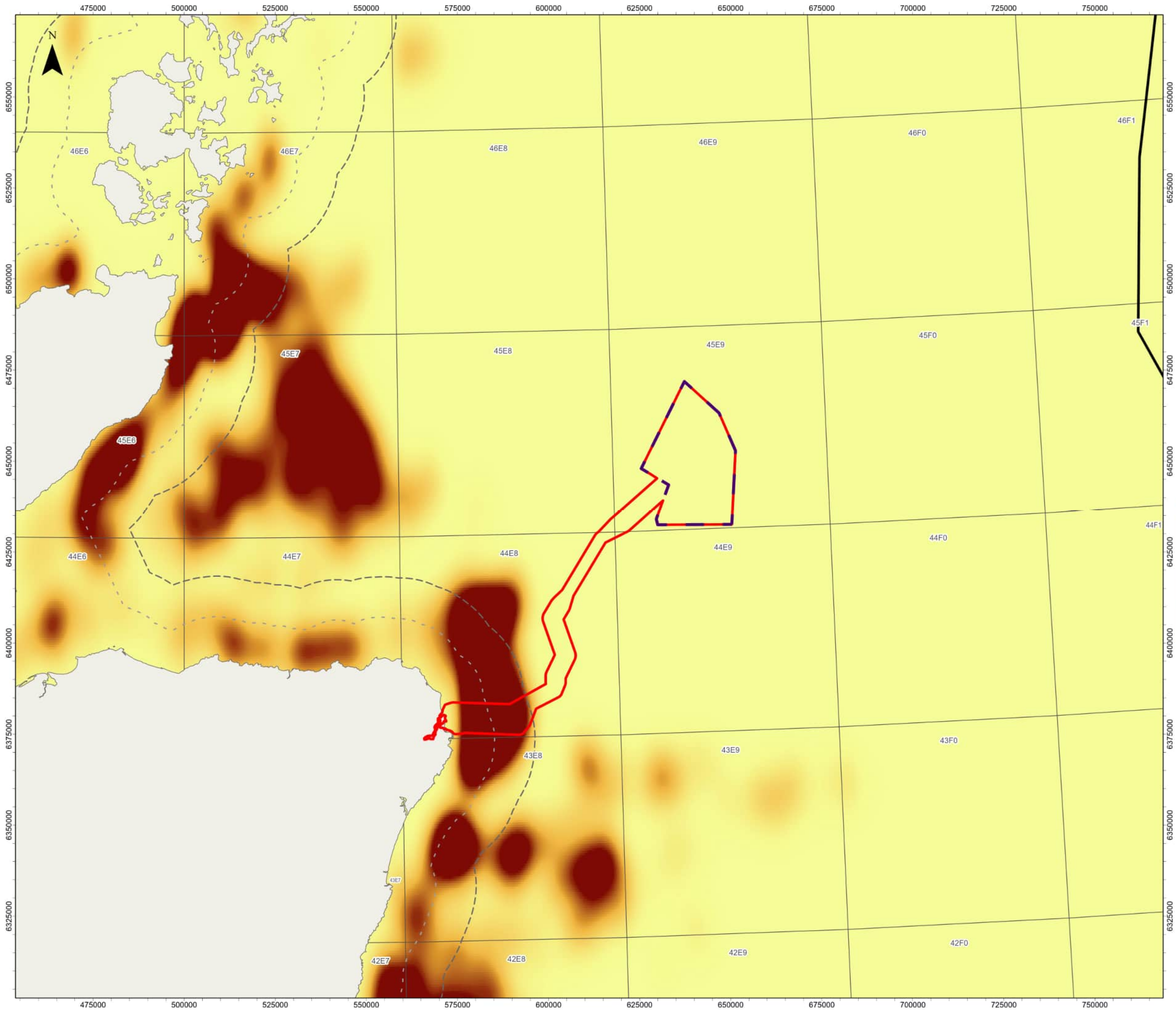
DRAWING TITLE
Figure 22 Surface swept area ratio 2016 to 2020 for EU (including UK) vessels ≥ 12m length using dredge gear

**Environmental Impact Assessment Report**
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Scallop VMS Amalgamated Intensity
High : 0.805605
Low : 0

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

WSP DRAWING NUMBER 808368-WEIS-IA-E5-FG-CF-14183

MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000536

DATUM ETRS 89 | PROJECTION UTM Zone 30N

SCALE 1:1,000,000 | PAGE SIZE A3

PROJECT TITLE
MarramWind Offshore Wind Farm

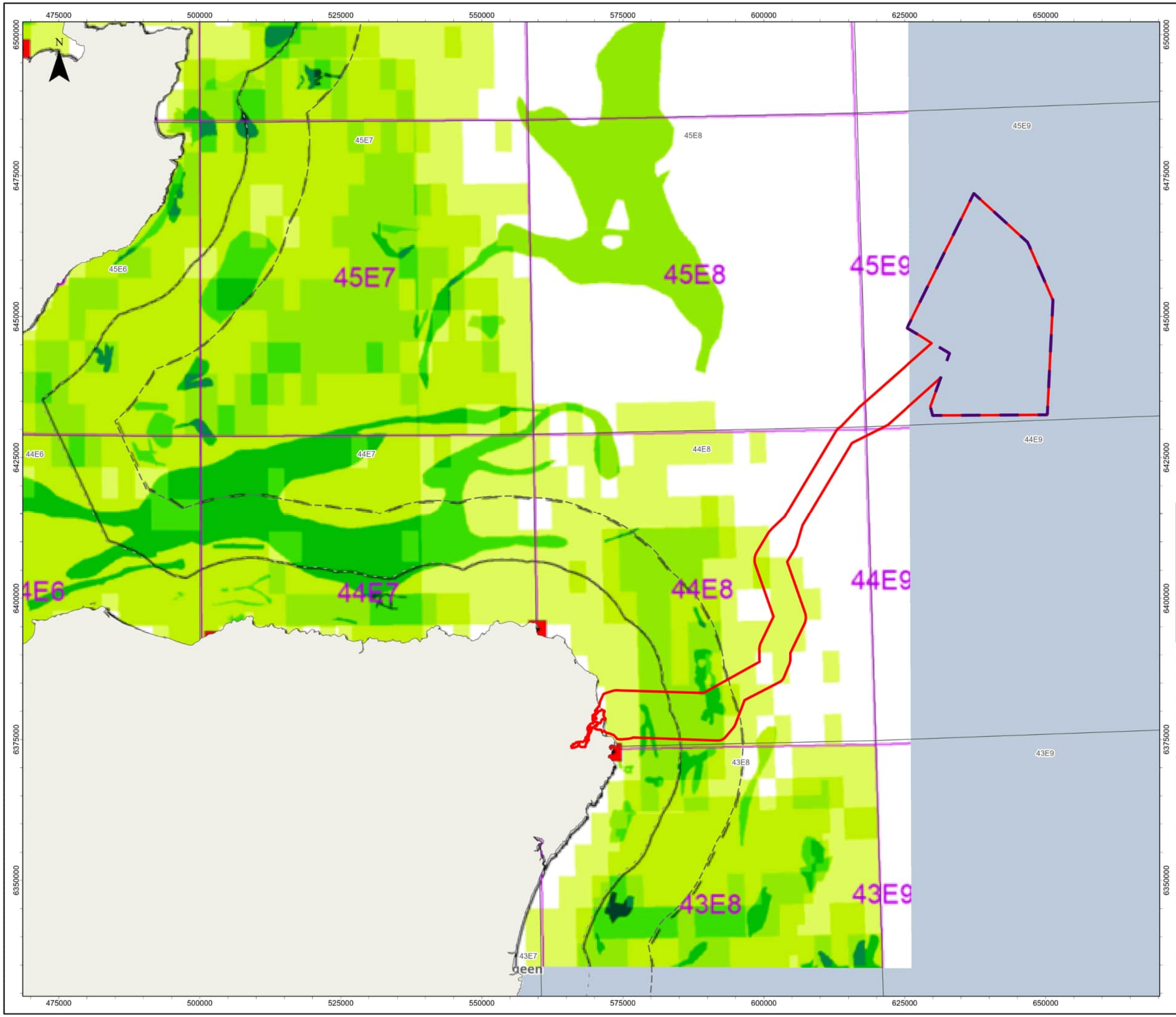
DRAWING TITLE
Figure 23 King scallop fishery intensity mapping based on amalgamated vessel positional data 2009 to 2013

**Environmental Impact Assessment Report**
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp
MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Fishery Occurrence
High
Low

0 10 20 30 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

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| MarramWind DRAWING NUMBER | MAR-GEN-ENV-MAP-WSP-000537 |

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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:640,000 | PAGE SIZE | A3 |

PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE

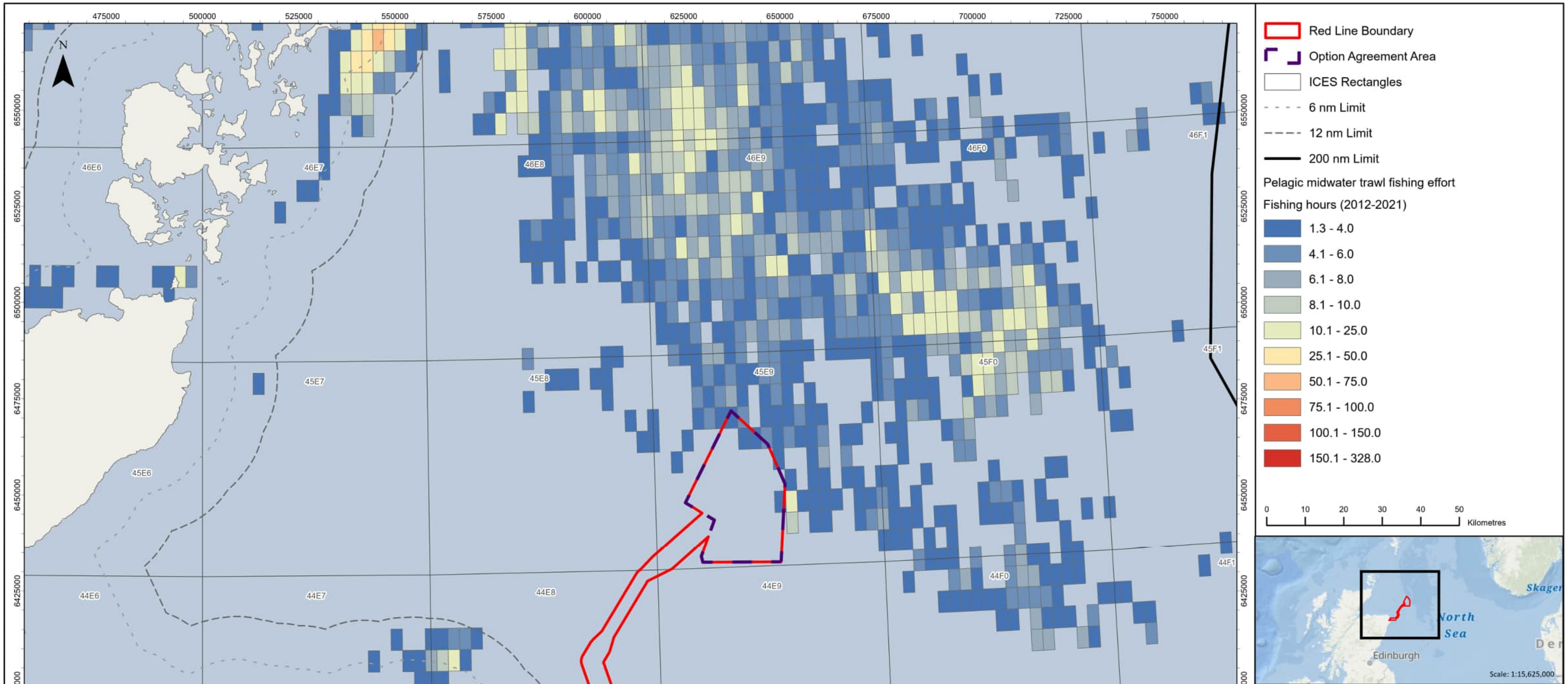
Figure 24 Likelihood or occurrence of dredge fishery targeting king scallop

**Environmental Impact Assessment Report**
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind

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| | dd/mm/yyyy | -- | -- | -- | -- |
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MarramWind DRAWING NUMBER: MAR-GEN-ENV-MAP-WSP-000538

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|---|---|---|---|
| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE: MarramWind Offshore Wind Farm

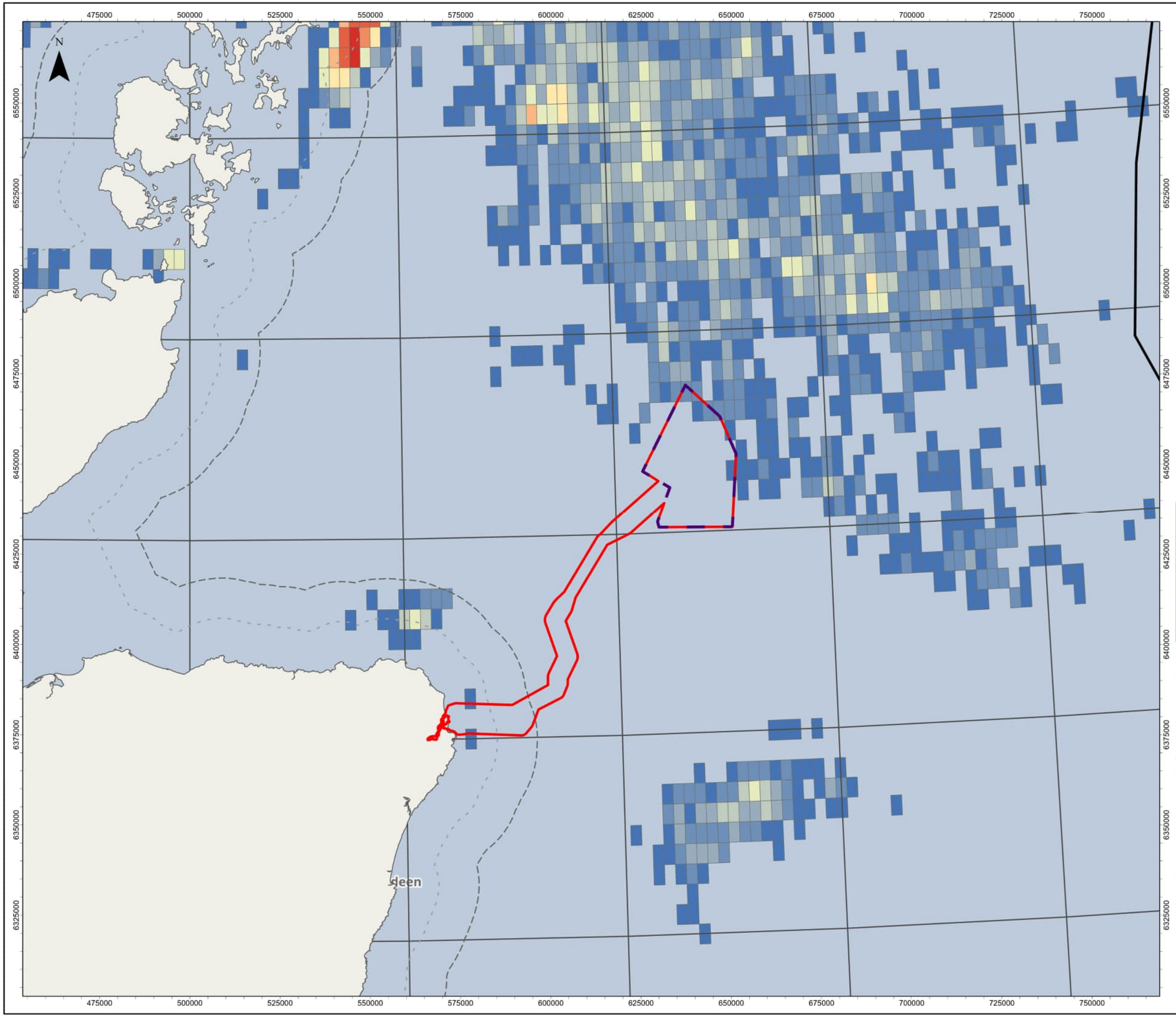
DRAWING TITLE: Figure 25 Pelagic mid-water trawl fishing effort based on FiSMaDiM data (cumulative 2012 to 2021)

**Environmental Impact Assessment Report**
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind





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|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
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| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

WSP DRAWING NUMBER 808368-WEIS-IA-E5-FG-CF-79998

MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000539

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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 26 Number of vessels deploying pelagic trawl gear based on FiSMaDiM data (cumulative 2012 to 2021)

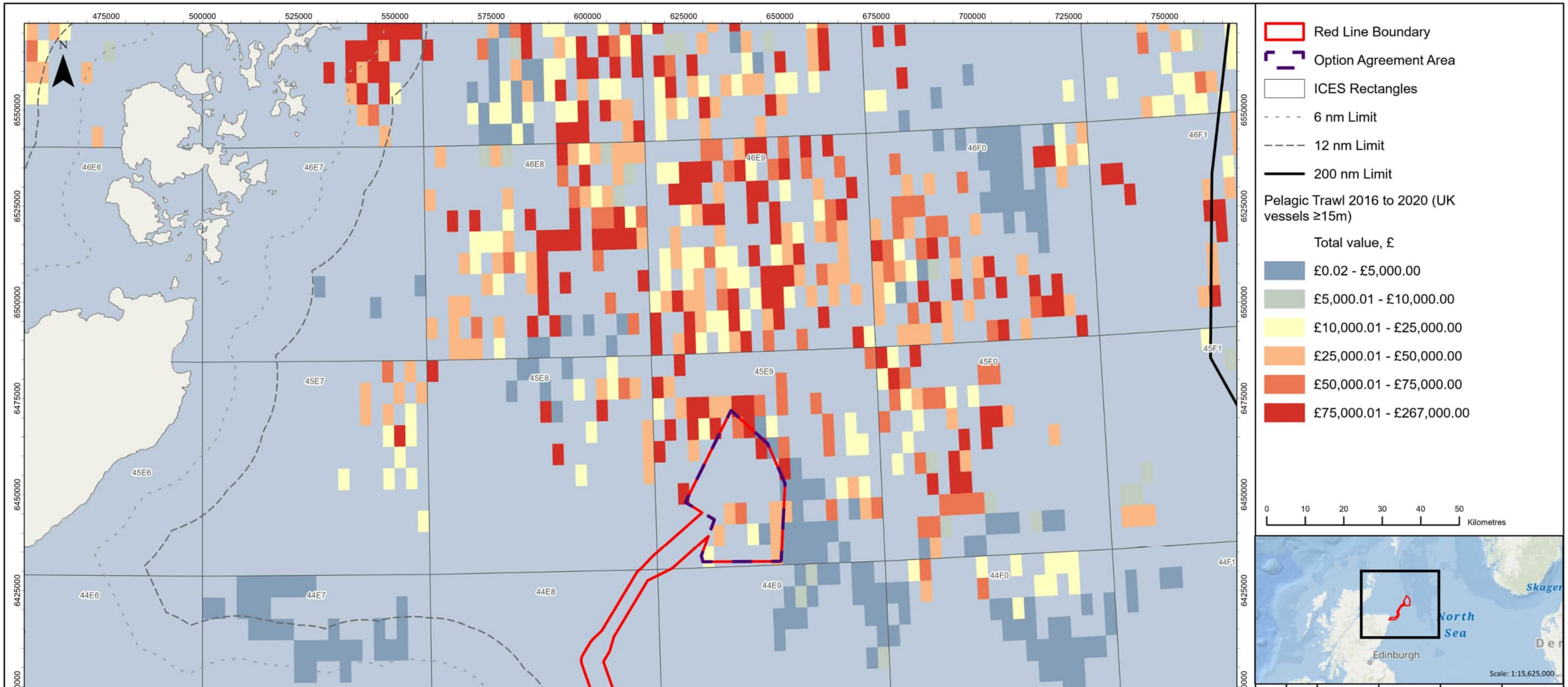
**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind

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MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000540

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|---|---|---|---|
| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE
MarramWind Offshore Wind Farm

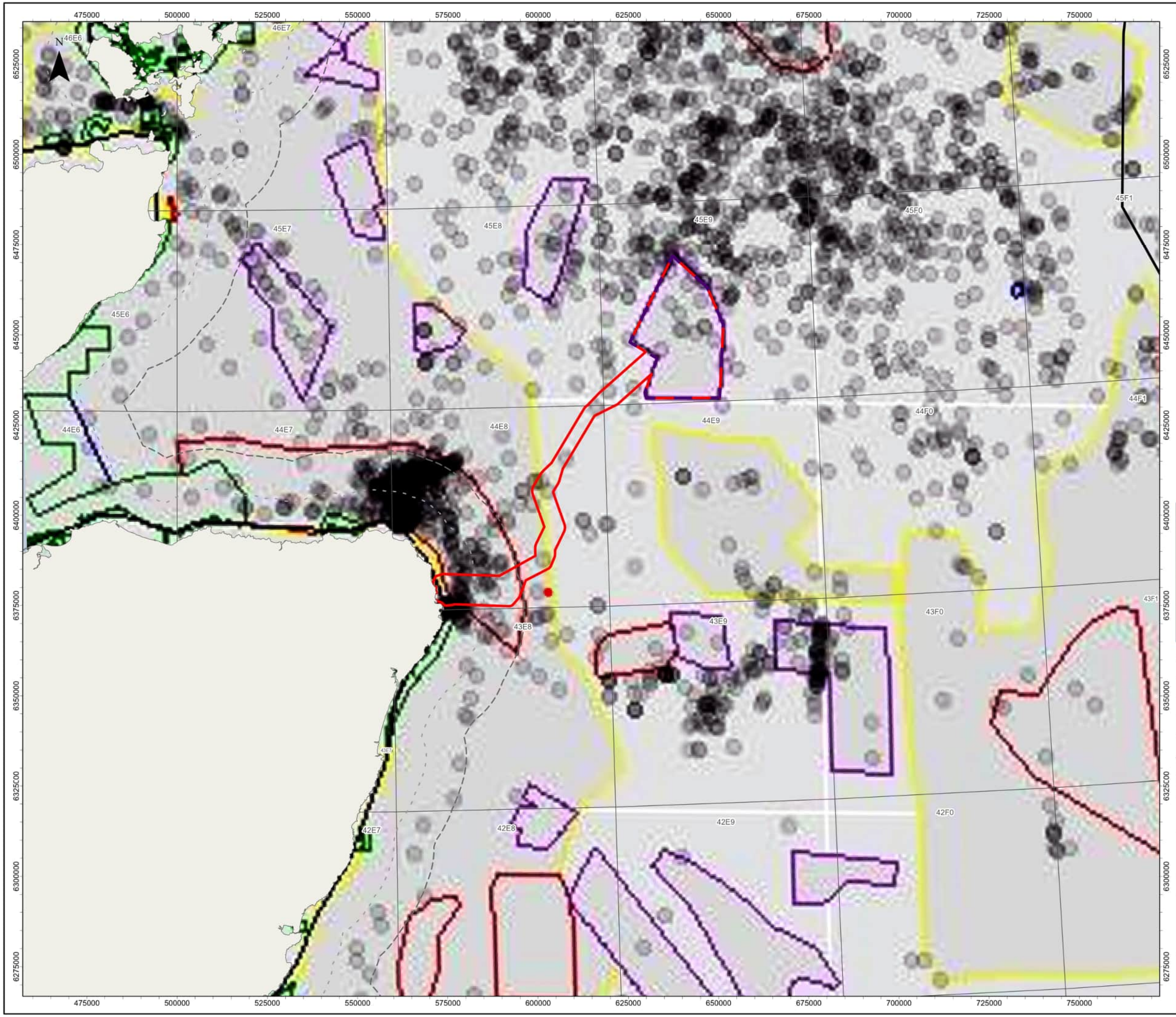
DRAWING TITLE
Figure 27 UK vessels ≥ 15m length actively fishing using pelagic trawl from 2016 to 2020

**Environmental Impact Assessment Report**
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit
Special Protected Area
Marine Protected Area
INTOG
Other ScotWind
Scottish Pelagic Active Fishing 2013-2021

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

WSP DRAWING NUMBER 808368-WEIS-IA-E5-FG-CF-53531

MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000541

| | | | |
|---|---|---|---|
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| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 28 Scottish pelagic active fishing operations 2013 to 2021

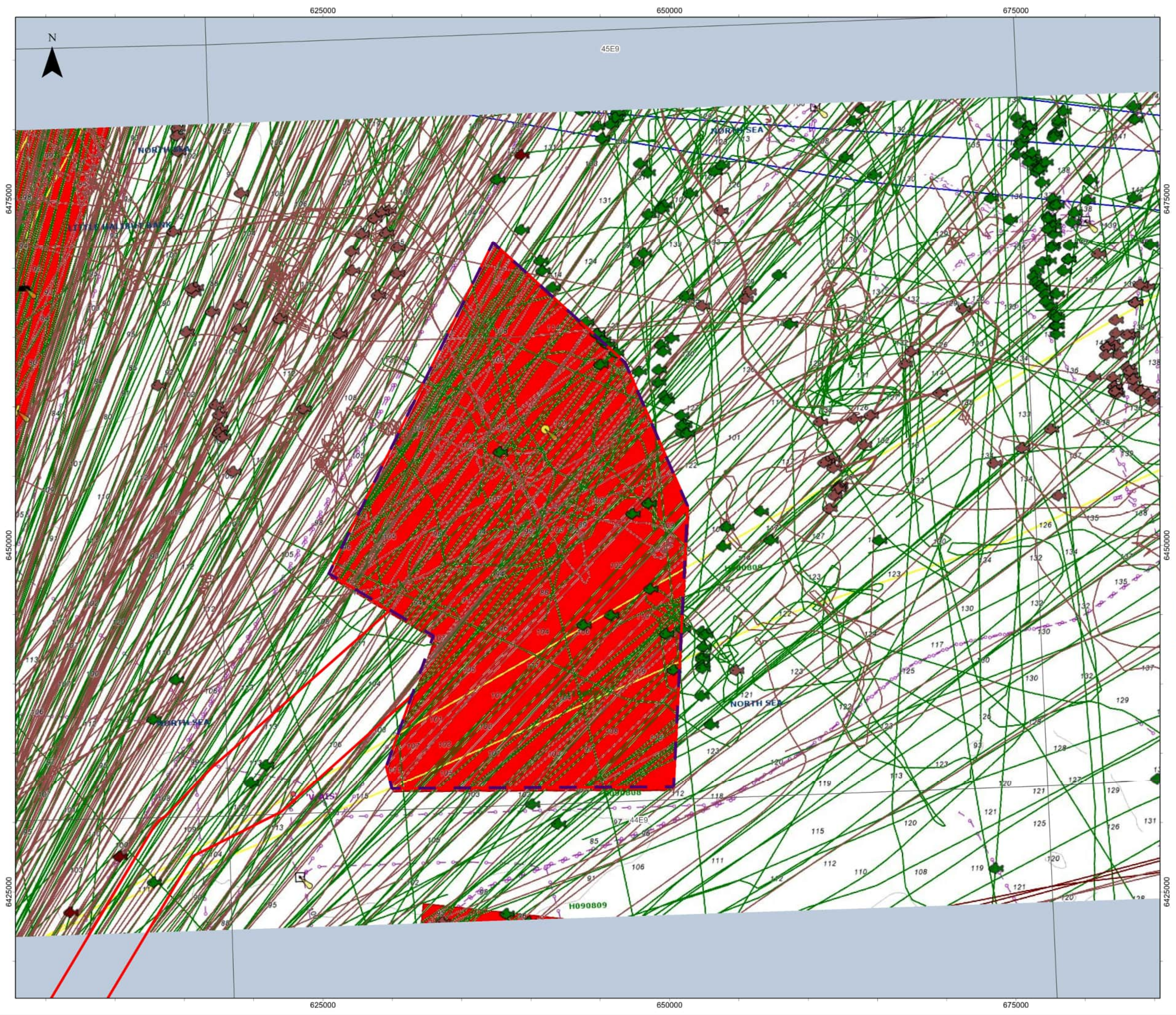
**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
Herring pelagic vessel transiting
Mackerel pelagic vessel transiting
Fish icon Herring caught / shoal sighted
Fish icon Mackerel caught / shoal sighted

Published with permission from the Scottish Pelagic Fishermen's Association

0 10 Kilometres


| | | | | | |
|---|---|---|---|---|---|
| | dd/mm/yyyy | -- | -- | -- | -- |
| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

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PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE

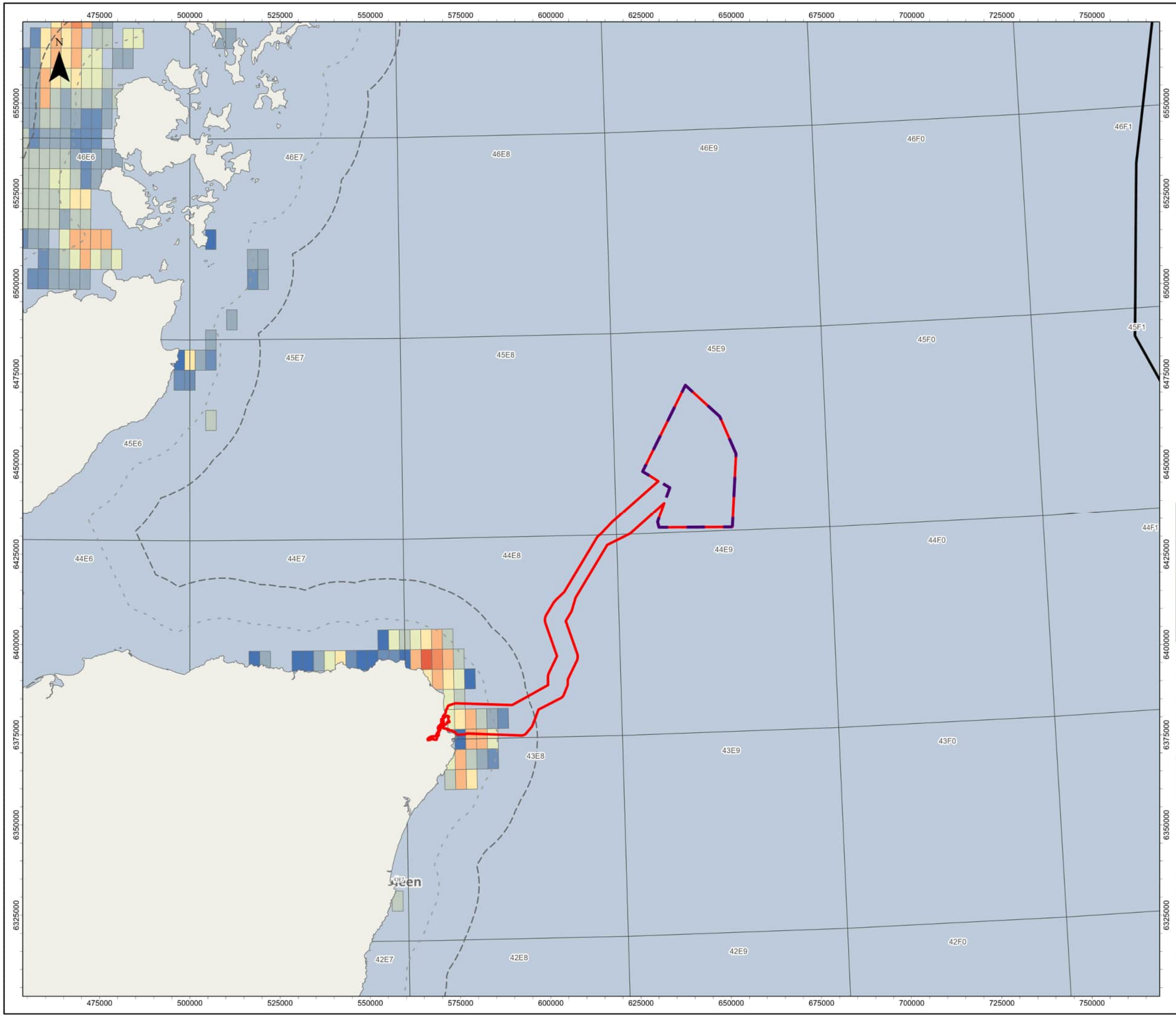
Figure 29 Pelagic plotter data

**Environmental Impact Assessment Report**
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Potting fishing effort

Fishing hours (2012-2021)

1.3 - 10.0
10.1 - 25.0
25.1 - 50.0
50.1 - 100.0
100.1 - 150.0
150.1 - 250.0
250.1 - 500.0
500.1 - 750.0
750.1 - 1500.0
1500.1 - 3311.7

0 10 20 30 40 50 Kilometres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WSP DRAWING NUMBER 808368-WEIS-IA-E5-FG-CF-74990

MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000544

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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 30 Potting fishing effort based on FiSMaDiM data (cumulative 2012 to 2021)

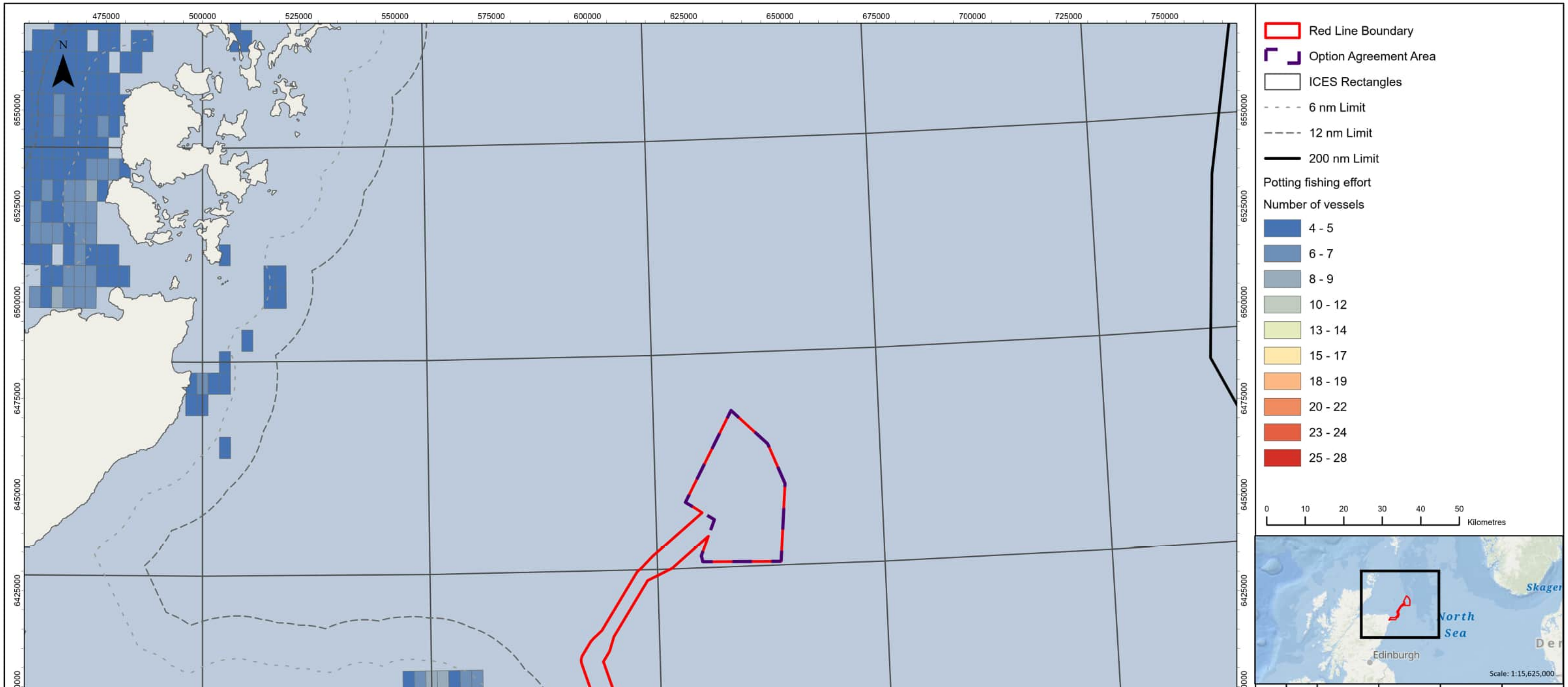
**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind

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| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 31 Number of vessels deploying potting gear based on FiSMaDiM data (cumulative 2012 to 2021)

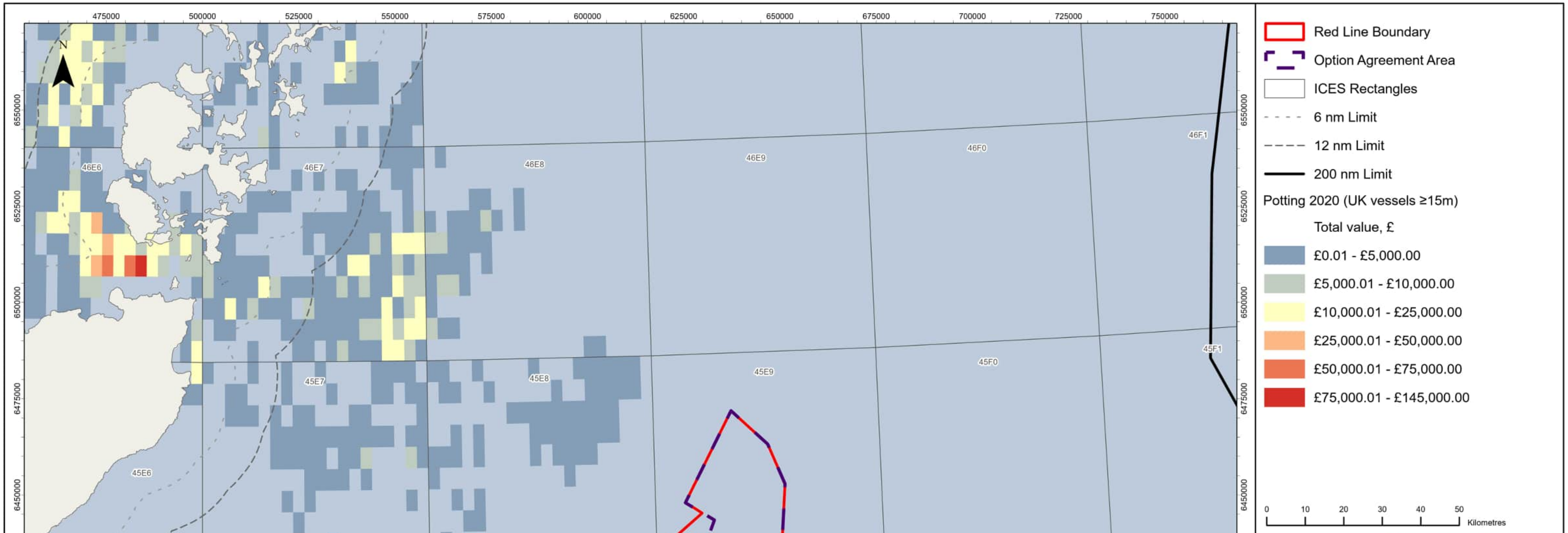
**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind





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| MarramWind DRAWING NUMBER | MAR-GEN-ENV-MAP-WSP-000546 |

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PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 32 UK vessels ≥ 15m length actively fishing using pots in 2020

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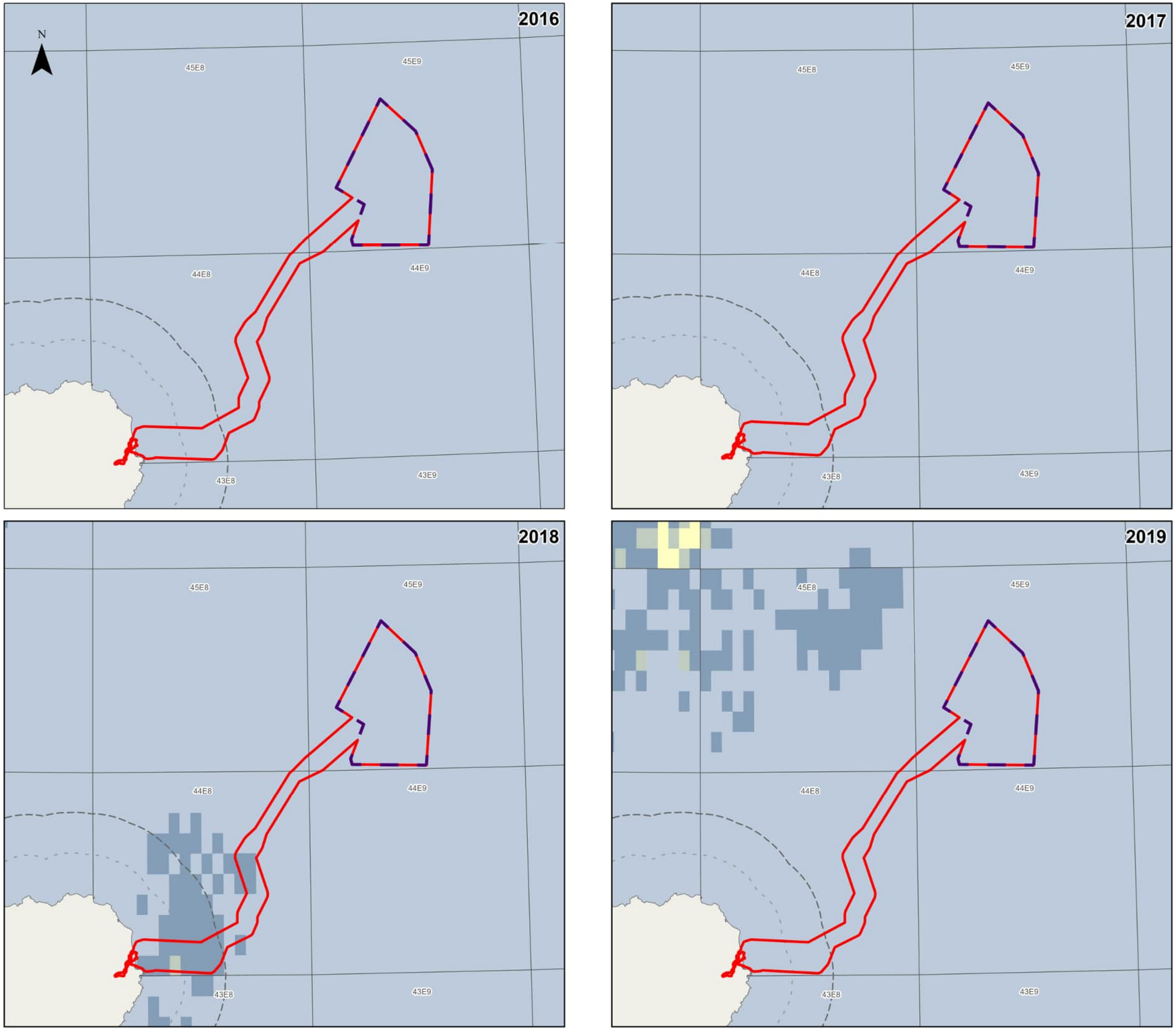
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION




- Red Line Boundary
- Option Agreement Area
- ICES Rectangles
- 6 nm Limit
- 12 nm Limit
- 200 nm Limit

Potting (UK vessels ≥15m)

Total value, £

- £0.01 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £101,000.00

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
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| 1 | 30/09/2025 | FN | LT | MR | LG |
| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

WSP DRAWING NUMBER 808368-WEIS-IA-E5-FG-CF-16566

MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000547

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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 33 UK vessels ≥ 15m length actively fishing using pots from 2016 to 2019 (MMO, 2022

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**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

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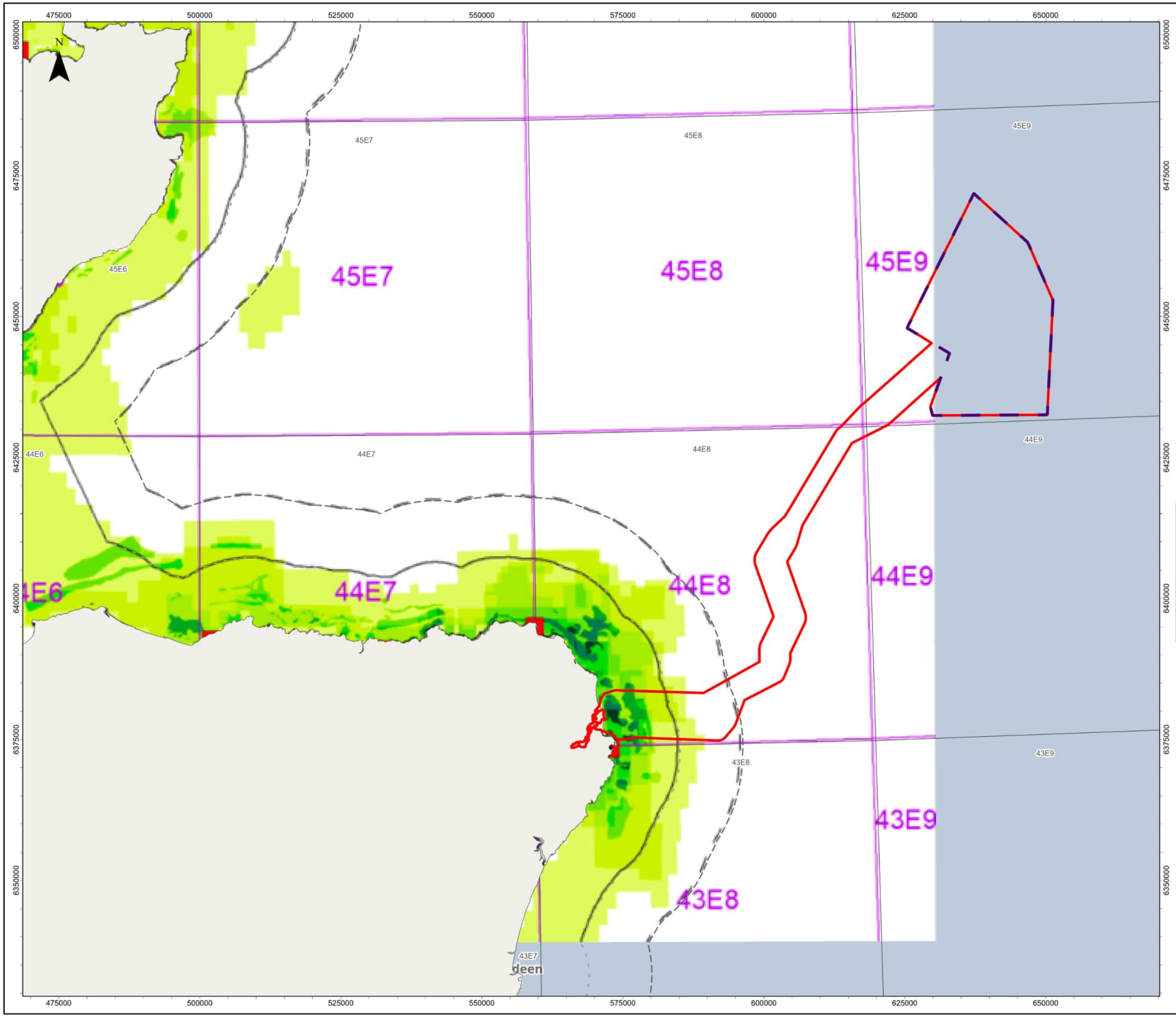
MarramWind





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| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |

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|---|---|---|---|
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| MarramWind DRAWING NUMBER | MAR-GEN-ENV-MAP-WSP-000537 | | |
| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:640,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

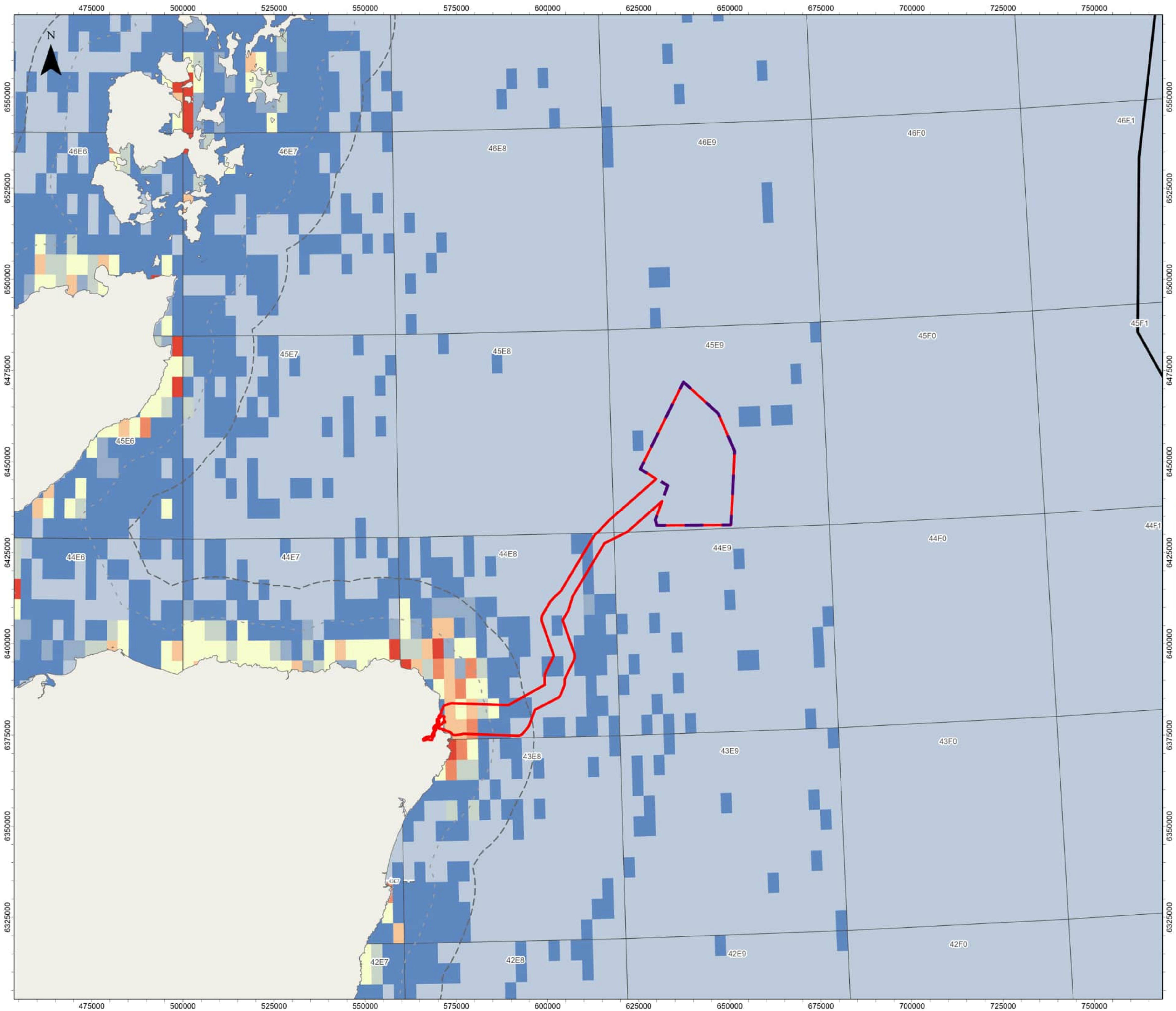
Figure 34 Likelihood or occurrence of creel fishery targeting crab and lobster

**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION




Red Line Boundary

Option Agreement Area

ICES Rectangles

6 nm Limit

12 nm Limit

200 nm Limit

Scottish vessels under 12m, 2017-2021

Total value

£0.01 - £5,000.00

£5,000.01 - £10,000.00

£10,000.01 - £25,000.00

£25,000.01 - £50,000.00

£50,000.01 - £75,000.00

£75,000.01 - £508,000.00

0 10 20 30 40 50 Kilometres


| | | | | | |
|---|---|---|---|---|---|
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| 1 | 30/09/2025 | FN | LT | MR | LG |
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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 35 Scottish vessels under 12m in length operating all gear types

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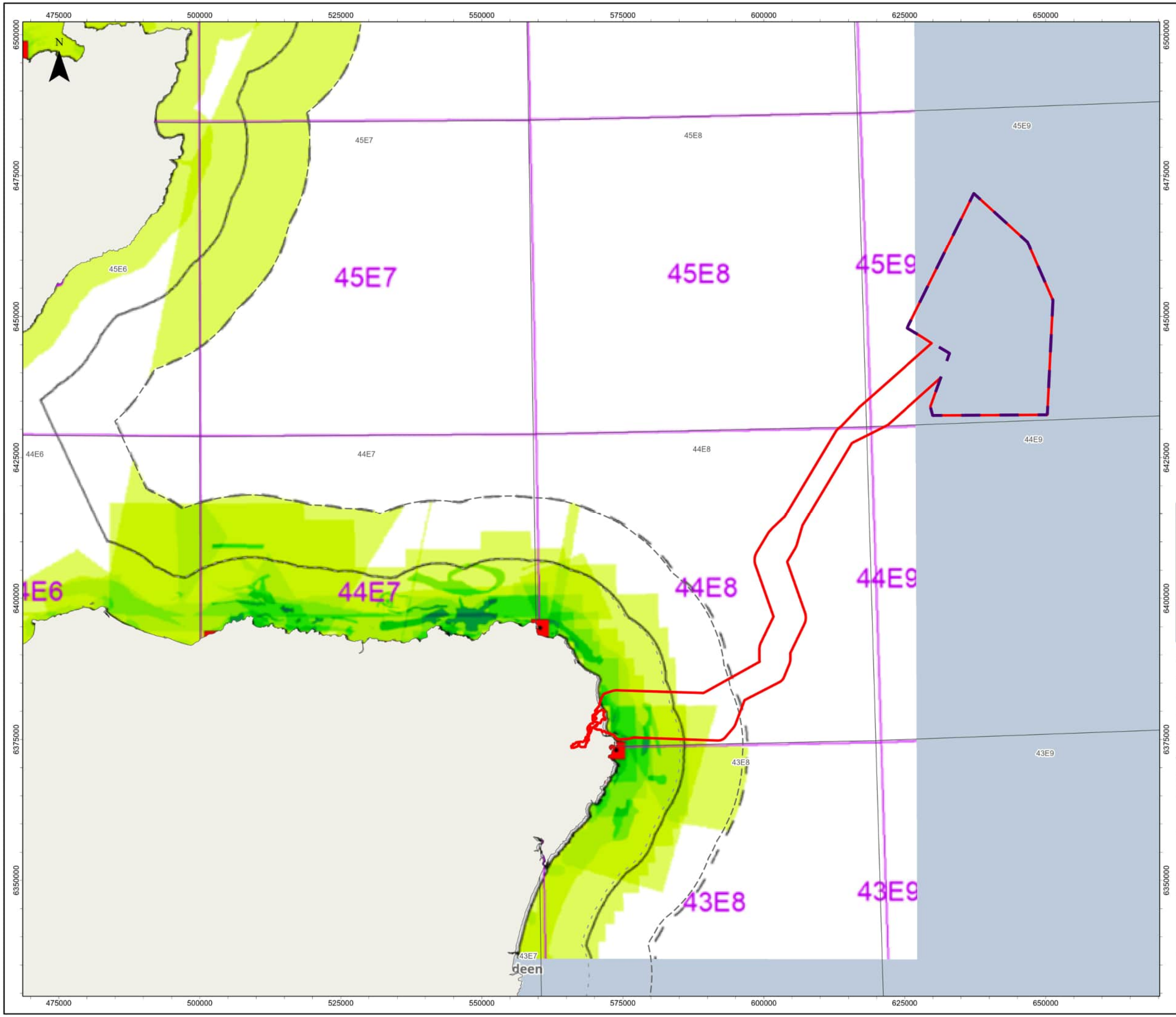
NOT TO BE USED FOR NAVIGATION




Red Line Boundary

Option Agreement Area

ICES Rectangles

6 nm Limit

12 nm Limit

200 nm Limit

Fishery Occurrence

High

Low

0 10 20 30 Kilometres



| | | | | | |
|---|---|---|---|---|---|
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| | dd/mm/yyyy | -- | -- | -- | -- |
| 1 | 30/09/2025 | FN | LT | MR | LG |
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| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
| SCALE | 1:640,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 36 Likelihood or occurrence of fishery deploying lines

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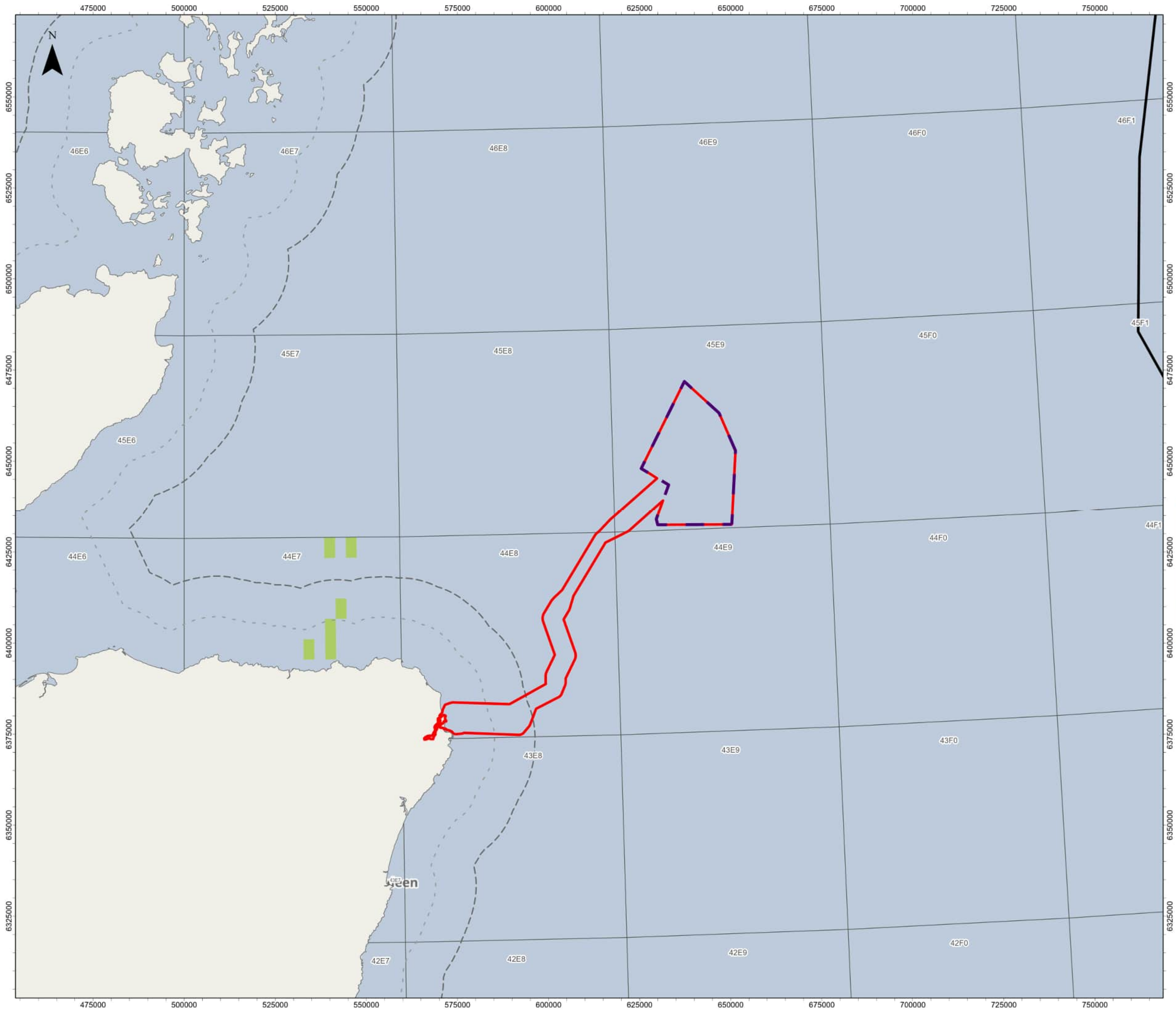
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

**Beam Trawl 2016 to 2020 (UK vessels ≥15m)**

Total value, £

- £0.02 - £1,000.00
- £1,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £45,987.96

0 10 20 30 40 50 Kilometres


| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |
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WSP DRAWING NUMBER 808368-WEIS-IA-E5-FG-CF-75462

MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000551

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| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 37 UK vessels ≥ 15m length actively fishing using beam trawls from 2016 to 2020

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**Appendix 14.1**



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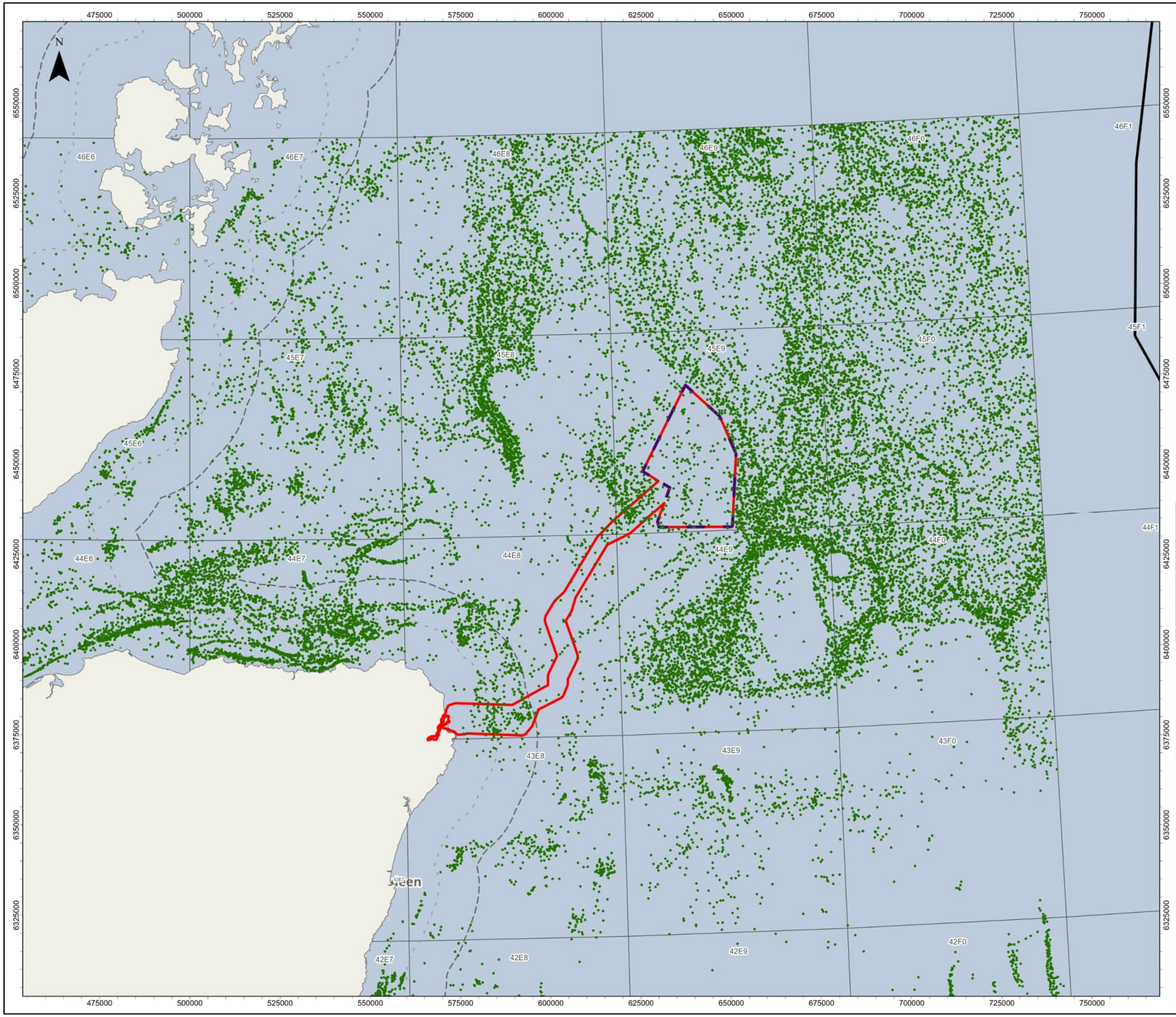
wsp MarramWind





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PROJECT TITLE

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DRAWING TITLE

Figure 38 Surveillance sightings data for vessels actively fishing from 2017 to 2022

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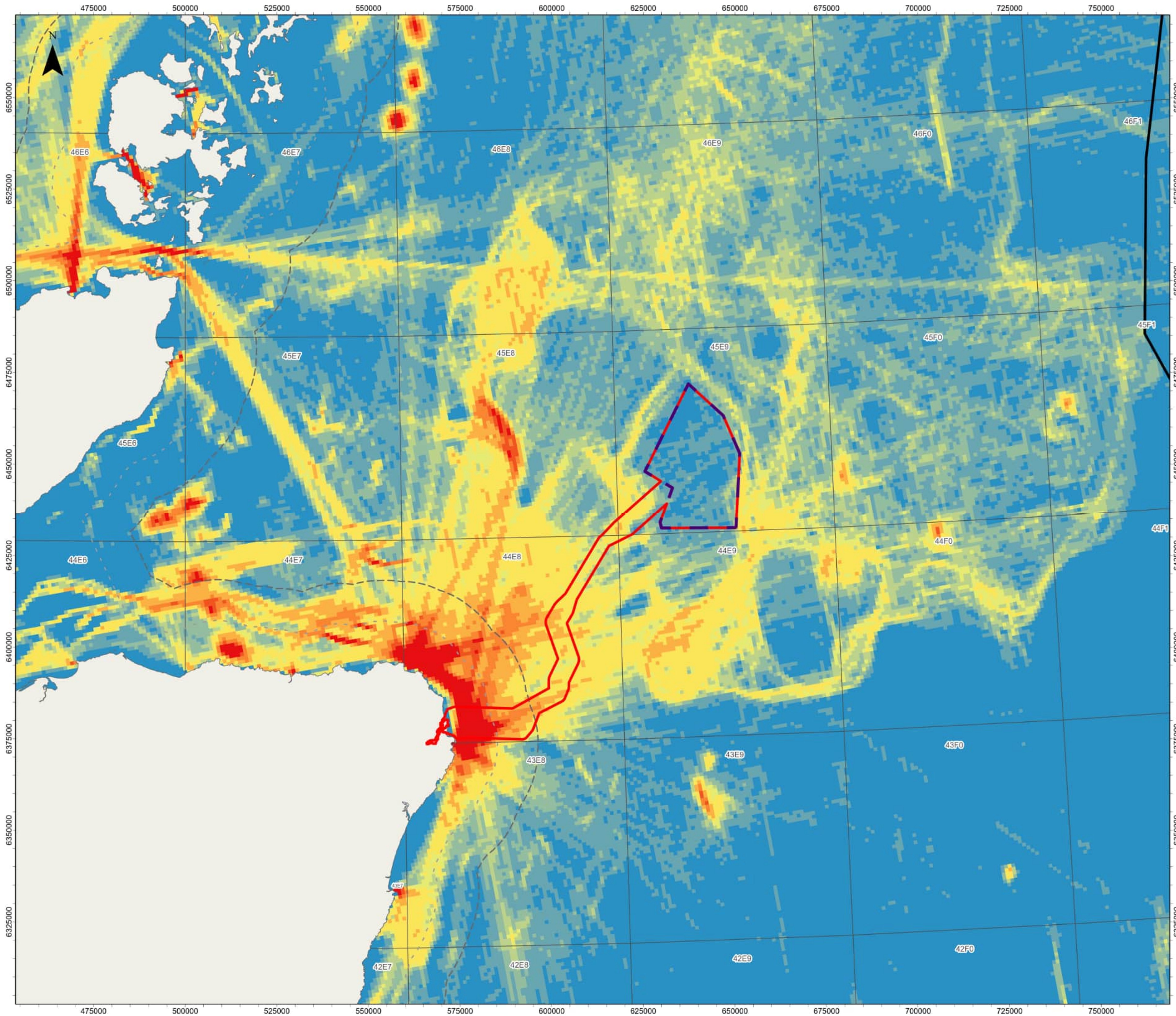
NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Fishing Vessel Route Density (2023)

- 0 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 100
- 101 - 150
- 151 - 200
- 201 - 250
- 251 - 16,363

0 10 20 30 40 50 Kilometres


| REV | REV DATE | GIS CREATOR | GIS REVIEWER | TECHNICAL CHECKER | TECHNICAL APPROVER |
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| 1 | 30/09/2025 | FN | LT | MR | LG |

WSP DRAWING NUMBER 808368-WEIS-IA-E5-FG-CF-7701

MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000553

| DATUM | ETRS 89 | PROJECTION | UTM Zone 30N |
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| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 39 AIS fishing vessel route density for 2023

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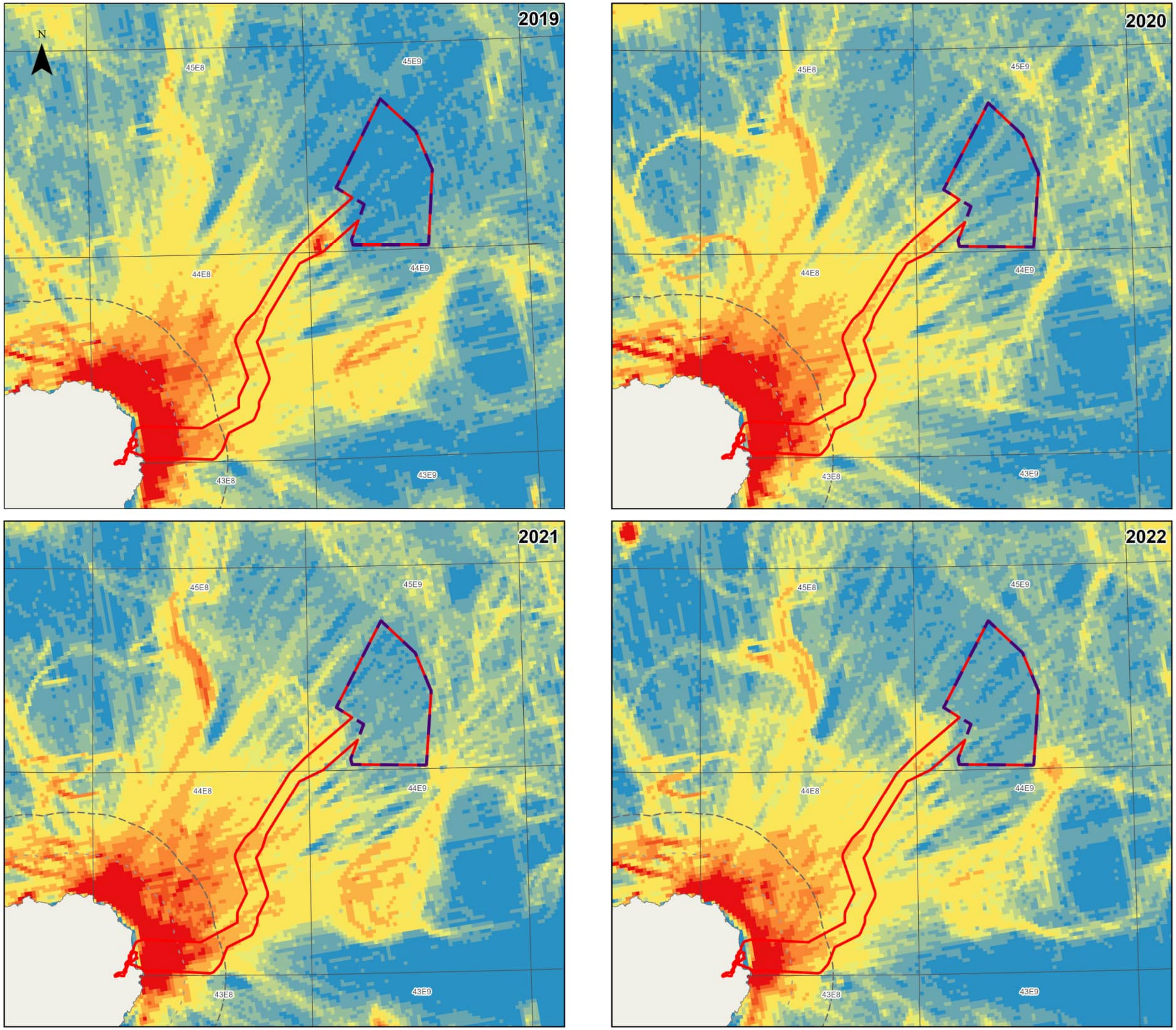
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Fishing Vessel Route Density (2019)

- 0 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 100
- 101 - 150
- 151 - 200
- 201 - 250
- 251 - 15,661

0 10 20 30 40 50 Kilometres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| SCALE | 1:1,000,000 | PAGE SIZE | A3 |

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 40 AIS fishing vessel route density for 2019 to 2022

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**Appendix 14.1**



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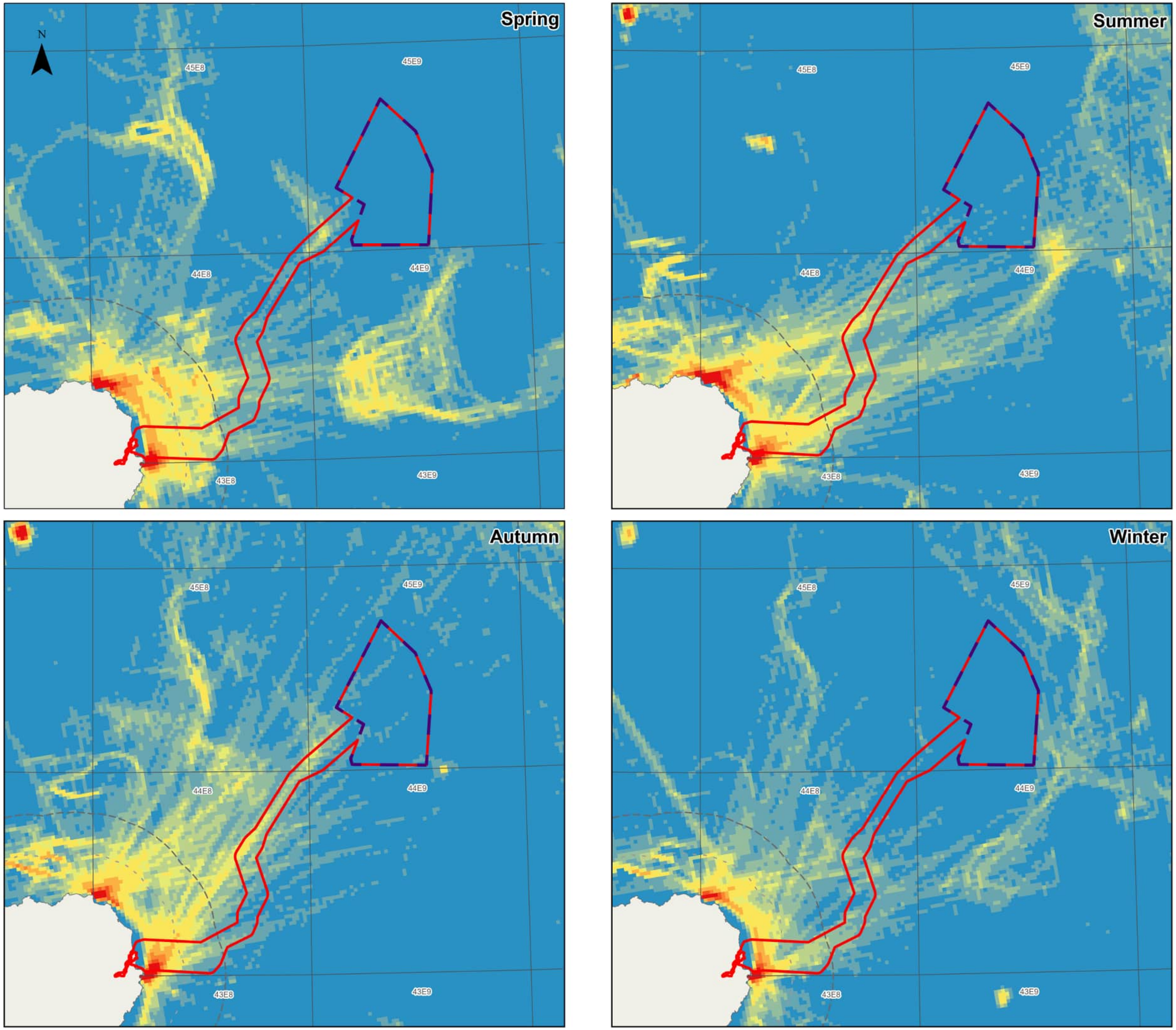
wsp MarramWind




Red Line Boundary
Option Agreement Area
ICES Rectangles
6 nm Limit
12 nm Limit
200 nm Limit

Fishing Vessel Route Density
(Routes per Square km per season)

- 0 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 100
- 101 - 150
- 151 - 200
- 201 - 250
- 251 - 16,363

0 10 20 30 40 50 Kilometres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PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

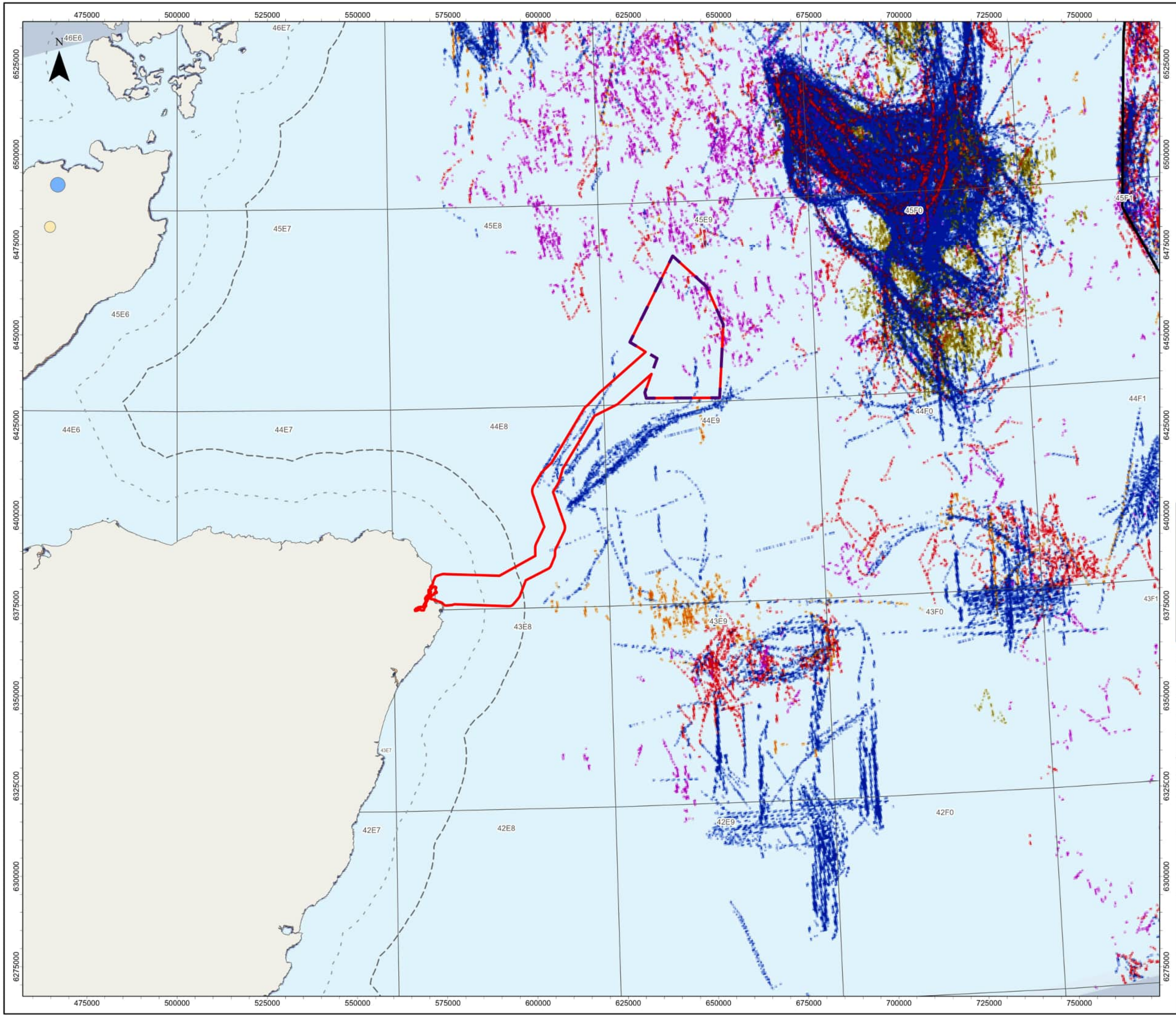
Figure 41 AIS fishing vessel route density presented seasonally for 2022 (Distinct High Intensity Red Hotspots in Summer and Autumn are Expected to Represent Fishing Vessel[s] Acting in a Guard Vessel Capacity)

**Environmental Impact Assessment Report**

**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION





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MarramWind DRAWING NUMBER MAR-GEN-ENV-MAP-WSP-000557

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PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 42 Norwegian vessels over 15m in length VMS data by gear type from 2011 to 2023

**Environmental Impact Assessment Report**
**Appendix 14.1**



NOT TO BE USED FOR NAVIGATION

wsp MarramWind

# 7. Future Baseline

7.1.1.1 Commercial fisheries patterns remain dynamic and fluctuate in response to environmental, economic, and management drivers. Key factors relevant to the regional and local study areas include:

- Market demand: Fleets adjust activity in line with consumer demand. The COVID-19 pandemic (2020 to 2021) highlighted vulnerabilities in high-value export markets, particularly for shellfish such as brown crab and lobster, while demand for demersal staples (for example, haddock) remained relatively stable.
- Market prices: Price signals continue to shape effort distribution. Species such as Nephrops retain consistently high unit values and are targeted even at modest volumes, whereas pelagic species such as herring generate large landings but contribute less economic value per tonne.
- Stock abundance: Recent evidence shows contrasting trajectories between species. Haddock, once under stock pressure, has experienced a marked recovery, with fishing mortality falling well below precautionary and sustainable reference points and SSB rising steeply since 2020 to historically high levels (close to 1 million tonnes by 2025). This contrasts with species such as monkfish, which show steady but moderate stock improvements, and mackerel, which remain highly variable due to quota management and distribution shifts across the North-east Atlantic. These dynamics shape landings availability and targeting decisions.
- Fisheries management: Management interventions continue to drive change, from quota adjustments in pelagic fisheries (for example, mackerel and herring) to spatial restrictions in shellfish (for example, restrictions on high-capacity creel vessels in inshore waters). For haddock, restrictive management in the 2000s and 2010s underpinned stock recovery, suggesting future opportunities may expand if quota allocations reflect improved stock status.
- Environmental management: Fisheries may be affected by environmental management measures designed to protect sensitive habitats (for example, burrowed mud within Marine Protected Areas). This could lead to restrictions on mobile gears in Nephrops and / or scallop dredging areas, causing a range of potential effects for these fisheries including: loss of grounds, effort displacement and wider economic consequences.
- Efficiency and technology: Fleets continue to adopt more efficient gears such as demersal seines over beam trawls, reducing fuel costs and environmental footprint.
- Sustainability drivers: Increasing demand for certified seafood (for example, Marine Stewardship Council certification for Nephrops, haddock and mackerel) is reshaping market access and incentivising improved management practices.

7.1.1.2 These variations and trends provide the basis of the baseline assessment. Using up to ten years of data helps account for short-term fluctuations while capturing representative conditions. In this context, the future baseline is likely to align closely with the current baseline, with recognition that recovering stocks (for example, haddock) may create new opportunities, while shellfish and pelagic dynamics will continue to reflect both market and regulatory variability.

7.1.1.3 The UK–EU Trade and Cooperation Agreement, effective from 1 January 2021, provides reciprocal access to waters between 12nm to 200nm until June 2026, with limited EU access in UK waters between 6nm to 12nm.

7.1.1.4 During the transition, 25% of the EU quota share in UK waters is being reallocated to the UK, most of which has already been distributed across the four devolved administrations. Beyond June 2026, annual negotiations will set fishing opportunities. In the regional study area, where fleets primarily target non-quota shellfish (Nephrops, crab, lobster, scallops), direct impacts from quota transfers are expected to be limited. However, the recovery of haddock may create scope for increased opportunities, provided quota access and market conditions allow. Quota allocations for flatfish such as plaice and sole, mainly targeted by non-UK beam trawlers, remain largely unchanged.

7.1.1.5 Market access will remain a critical factor. A large share of shellfish landings, particularly brown crab and lobster, are exported to EU markets. Potential tariff and non-tariff barriers could influence which species are targeted, with fleets adapting to prioritise stable domestic markets (for example, haddock, Nephrops) or high-value export species if access remains secure.

# 8. Summary

8.1.1.1 This Technical Report has presented commercial fisheries activity data for the following countries: UK, Norway, Denmark, the Netherlands and France. Based on quota allocations and landing statistics it is understood that vessels registered to other countries do not operate across the commercial fisheries local and regional study areas.

8.1.1.2 The key fleet métiers operating across the commercial fisheries local and regional study areas include (in no particular order):

- UK demersal otter trawlers targeting Nephrops, haddock and mixed demersal species;
- UK, Norwegian, Irish, Danish, Dutch and German pelagic trawlers targeting mackerel and herring;
- UK demersal seine targeting haddock and mixed demersal species;
- UK scallop dredgers targeting king scallop;
- UK potting vessels targeting brown crab and lobster; and
- UK vessels using line to target mackerel.

8.1.1.3 This Technical Report reviewed all datasets available to characterise the commercial fisheries activity across the commercial fisheries local and regional study areas and wider North Sea.

8.1.1.4 Given the range of datasets assessed and the comprehensive analysis undertaken, it is considered that this Technical Report is adequate for the purposes of an EIA.

# 9. References

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# 10. Glossary of Terms and Abbreviations

## 10.1 Abbreviations

| Term | Definition |
|---|---|
| **AIS** | Automatic Identification System |
| **CEFAS** | Centre for Environment, Fisheries and Aquaculture Science |
| **cm** | centimetres |
| **DCF** | Data Collection Framework |
| **EEZ** | Exclusive Economic Zone |
| **EIA** | Environmental Impact Assessment |
| **EMSA** | European Maritime Safety Agency |
| **EU** | European Union |
| **FU** | Functional Unit |
| **GBP** | Great Britain Pound (i.e. UK currency) |
| **GIS** | Geographic Information System |
| **ICES** | International Council for the Exploration of the Sea |
| **km** | kilometres |
| **MCRS** | Minimum Conservation Reference Size |
| **mm** | millimetres |
| **MMO** | Marine Management Organisation |
| **MSY** | Maximum Sustainable Yield |
| **N&EC RIFG** | North and East Coast Regional Inshore Fishery Group |
| **NMPi** | National Marine Plan interactive |
| **NRA** | Navigational Risk Assessment |
| **RBS** | Register of Buyers and Sellers |
| **SAR** | Swept Area Ratio |
| **SFF** | Scottish Fishermen’s Federation |
| **SPFA** | Scottish Pelagic Fishermen’s Association |
| **SSB** | Spawning Stock Biomass |

| Term | Definition |
|---|---|
| **SWFPA** | Scottish White Fish Producers Association |
| **TAC** | Total Allowable Catch |
| **UK** | United Kingdom |
| **VMS** | Vessel monitoring system |

## 10.2 Glossary of terms

| Term | Definition |
|---|---|
| **Beam trawl** | A method of bottom trawling with a net that is held open by a beam, which is generally a heavy steel tube supported by steel trawl heads at each end. Tickler chains or chain mats, attached between the beam and the ground rope of the net, are used to disturb fish and crustaceans that rise up and fall back into the attached net. |
| **Bycatch** | Catch which is retained and sold but is not the target species for the fishery. |
| **Carapace** | The hard upper shell of a crustacean. |
| **COVID-19 pandemic** | The COVID-19 pandemic was a global outbreak of coronavirus, an infectious disease caused by the severe acute respiratory syndrome coronavirus, first identified in 2019. |
| **Demersal** | Living on or near the seabed. |
| **Demersal trawl** | A fishing net used by towing the trawl along or close to the seabed. |
| **Dhan** | A marker flag made of very hard wearing material located on a pole or buoy to mark location of fishing gear. |
| **Fish stock** | Any natural population of fish which an isolated and self-perpetuating group of the same species. |
| **Fishery** | A group of vessel voyages which target the same species or use the same gear. |
| **Fishing ground** | An area of water or seabed targeted by fishing activity. |
| **Fishing mortality** | Mortality due to fishing; death or removal of fish from a population due to fishing. |
| **Fleet** | A physical group of vessels sharing similar characteristics (for example, nationality). |
| **Floating foundations** | The floating structures on which the wind turbine generators are installed. |
| **Gadoids** | From the Gadidae family of marine fish, included in the order Gadiformes, known as the cods, codfishes, or true cods, including cod, haddock, whiting, and pollock. |

| Term | Definition |
|---|---|
| **Gear type** | The method/equipment used for fishing. |
| **Gear type TR1** | A classification of gear type that includes bottom trawls, Danish seines and similar towed gear, excluding beam trawls, of mesh size greater than or equal to 100 millimetres (mm). Gears of this type are typically used to target whitefish, including cod. |
| **Gear type TR2** | A classification of gear type that includes bottom trawls, Danish seines and similar towed gear, excluding beam trawls, of mesh size greater than or equal to 70mm and less than 100mm. Gears of this type are typically used to target Nephrops, but may also catch significant amounts of cod. |
| **iFish database** | The Marine Management Organisation (MMO) fisheries database of commercial fisheries landings statistics for vessels registered in the UK. |
| **Industrial fishery** | Highly mechanised commercial fishing operations whose ultimate products are principally fish meal and fish oil. |
| **International Council for the Exploration of the Seas statistical rectangles** | ICES standardise the division of sea areas to enable statistical analysis of data. Each ICES statistical rectangle is ‘30 minutes latitude by 1 degree longitude' in size (approximately 30 nautical miles x 30 nautical miles). A number of rectangles are amalgamated to create ICES statistical areas. |
| **Landing obligation** | A regulation first introduced in 2015 and fully in force since January 2019 meaning that no commercial fishing vessel can return any quota species of any size to the sea once caught. This includes slipping or discarding the catch. Once caught, all quota species must be landed and counted against quota. This applies to all UK vessels of all lengths, unless an exemption has been granted for example, based on species survivability. |
| **Landings** | Quantitative description of amount of fish returned to port for sale, in terms of value or weight. |
| **Maximum sustainable yield** | Maximum sustainable yield (MSY) is the largest yield (catch, in tonnes) that can be taken from a specific fish stock over an indefinite period under constant environmental conditions. Fishing at MSY levels should ensure the capacity of the stock to continue to produce this level in the long term. |
| **Métier** | A homogenous subdivision, either of a fishery by vessel type or a fleet by voyage type. |
| **Minimum conservation reference size** | A technical measure that limits the size of fish or shellfish species that can be legally landed and sold. The MCRS varies per species. |
| **Otter trawl** | A net with large rectangular boards (otter boards) which are used to keep the mouth of the trawl net open. Otter boards are made of timber or steel and are positioned in such a way that the hydrodynamic forces, acting on them when the net is towed along the seabed, pushes them outwards and prevents the mouth of the net from closing. |
| **Pelagic** | Of or relating to the open sea. |
| **Pelagic trawl** | A net used to target fish species in the mid water column. |
| **Quota** | A proportion of the Total Allowable Catch for a fish stock. |

| Term | Definition |
|---|---|
| **Recruitment** | Recruitment can be defined as the number of fish surviving to enter the fishery or to some life history stage such as settlement or maturity. |
| **Scallop dredge** | A method to catch scallop using steel dredges with a leading bar fitted with a set of spring loaded, downward pointing teeth. Behind this toothed bar (sword), a mat of steel rings is fitted. A heavy net cover (back) is laced to the frame, sides and after end of the mat to form a bag. |
| **Spawning** | The act of releasing or depositing eggs (fish). |
| **Spawning stock biomass** | The combined weight (in tonnes) of all the fish of one specific stock that are old enough to spawn. It provides an indication of the status of the stock and the reproductive capacity of the stock. |
| **Stock assessment** | An assessment of the biological stock of a species and its status in relation to defined references points for biomass and fishing mortality. |
| **Total allowable catch** | TACs are catch limits, expressed in tonnes or numbers, that are set for some commercial fish stocks. |
| **Vessel monitoring system** | A system used in commercial fishing to allow environmental and fisheries regulatory organizations to monitor, minimally, the position, time at a position, and course and speed of fishing vessels. |

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