Offshore Wind Power Limited

West of Orkney Windfarm Offshore EIA Report

Volume 2, Supporting Study 13: Commercial Fisheries Baseline Report

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CONTENTS

1 INTRODUCTION

The Applicant, Offshore Wind Power Limited (OWPL) is proposing the development of the West of Orkney Windfarm ('the Project'), an Offshore Wind Farm (OWF), located approximately 23 kilometres (km) from the north coast of Scotland and 28 km from the west coast of Hoy, Orkney. Crown Estate Scotland (CES) awarded OWPL the Option Agreement Area (OAA) in January 2022 for the development of the proposed Project following the ScotWind leasing round which launched in June 2020.

The OAA lies wholly within the "N1" Plan Option (PO), which is one of 15 PO areas around Scotland which the Scottish Government considered suitable for the development of commercial scale OWFs. The Scottish Government published the Sectoral Marine Plan for Offshore Wind Energy in October 2020 following over 2 years of extensive analysis, consideration, and engagement with a wide range of stakeholders.

The purpose of this commercial fisheries baseline report ('this Report') is to provide a detailed review of publicly available data sources to describe the commercial fisheries fleets that operate within and adjacent to the offshore Project[1]. This Report will then feed into the Offshore Environmental Impact Assessment (EIA) Report, chapter 14: Commercial fisheries.

[1] *The 'offshore Project' encompasses all offshore components seaward of Mean High Water Springs (MHWS) (Wind Turbine Generators (WTGs), cables, foundations, Offshore Substation Platforms (OSPs) and all other associated infrastructure) and all Project stages from development to decommissioning.*

2 STUDY AREA

The commercial fisheries offshore study area is defined by the International Council of the Exploration of the Sea (ICES) rectangles within which the offshore Project resides, including 46E5, 46E6 and 47E5 (Figure 2-1). ICES rectangle 47E6 is also considered as part of the commercial fisheries offshore study area due to its close proximity to the OAA and this also provides a regional context for certain fisheries. Each ICES rectangle boundary extends over 1 degree (1°) longitude by 30 minutes (30') latitude.

Reference is also made to waters outside of the four ICES rectangles within the commercial fisheries offshore study area, where appropriate, in order to provide contextual information on fishing activity at a regional basis or for the consideration of potential cumulative effects.

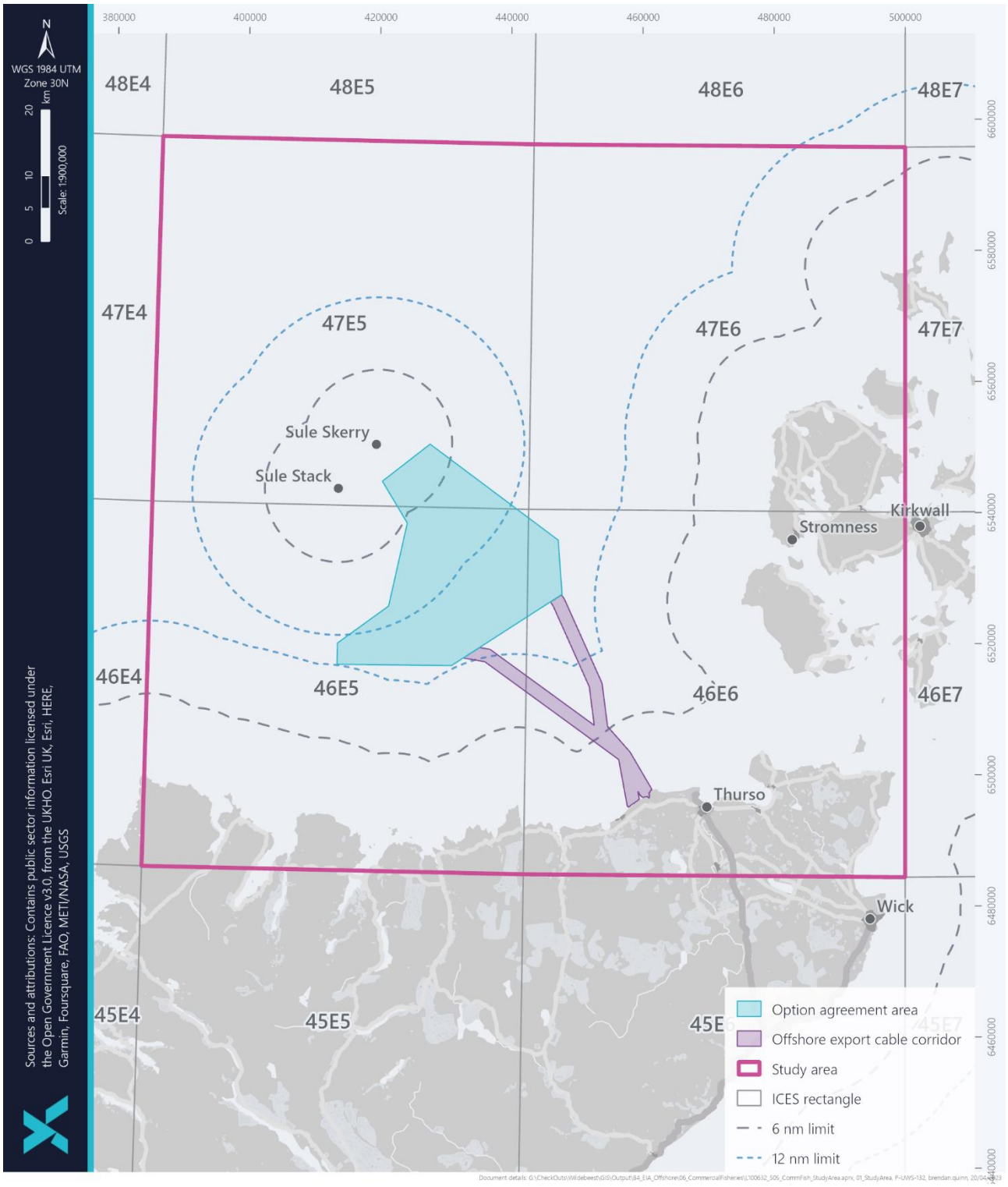


Figure 2-1 Commercial fisheries offshore study area

3 DATA SOURCES AND LIMITATIONS

The key data sources to inform this Report and their limitations are outlined in Table 3-1.

Table 3-1 Summary of all used data sources for the commercial fishing industry

DATA	DESCRIPTION	LIMITATIONS	SOURCE
Marine Management Organisation (MMO) and Marine Scotland Surveillance Sightings (2017-2021)	Sightings (visual observations) of fishing vessels recorded from aerial and vessel surveillance vessels in United Kingdom (UK) territorial waters. Provides an indication of the distribution of fishing activity, fishing methods and nationality, but cannot be used to provide a quantitative assessment of fishing activity.	• Data is subject to survey effort (typically weekly and during daylight hours). There are also temporal gaps in sightings; and • Fishing method and nationality is assigned by sight, and is not confirmed, due to the similarities of fishing vessels when gear is in operation (especially mobile gears), it should be assumed that they are indicative only.	Access via request under the Freedom of Information Act (FOIA).
MMO[2] Fisheries Statistics (2017-2021)	Landings by value (£), effort (days) and weight (tonnes) sourced from logbooks, dockside inspections, landings declarations. Provides fisheries statistics by vessel size, fishing method and species at ICES rectangle scale and can be analysed to determine annual and seasonal variation. These data do not provide any indication of the spatial distribution of fishing value or effort within each ICES rectangle. The Registered Buyers and Sellers (RBS) Regulation should mean that all registered buyers have to provide sales notes and these data are incorporated into this dataset. These data will not be included if fishermen sell direct to the public and / or at quantities under the excepted limit within the RBS.	• Although data covers the under-10 metre (m) fleet within Scottish and north-England waters, the monitoring systems for under-10 m vessels are not mandatory and so may not be representative of all activity; and • Data may misrepresent the fishing activity, depending on the size of the development / project, given the large spatial scale of the landings data.	Landings value and weight by ICES rectangle was downloaded from the MMO UK sea fisheries annual statistics report webpage at https://www.gov.uk/government/statistics/uk-sea-fisheries-annual-statistics-report-2021. Landings value and effort by port and effort by ICES rectangles was access via request under the Freedom of Information Act (FOIA) via the MMO master data register: accesstoinformation@marinemanagement.org.uk.
MMO Vessel Monitoring System (VMS) (2017-2020)	Provides fishing effort (kilowatt (kW) per hour) and value (£) for UK vessels (see limitations) through satellite tracking equipment which is cross-referenced with landings,	• Rectangles with < 5 transmissions are not included within the dataset; • Vessels of < 15 m in length are not represented in the dataset;	As above.

[2] *Marine Scotland publish fisheries statistics annually (Marine Scotland, 2022a) but these do not provide values or effort by fishing method and are for the ICES areas 24.7a, 27.4.b , 27.6.a , 27.6.b , 27.2.a and 27.7.a.*

DATA	DESCRIPTION	LIMITATIONS	SOURCE
	engine power, and logbook data. The data is anonymised and presented in a 0.05° by 0.05° grid. VMS data provides quantitative information on the spatial distribution of fishing activity.	• There is generally two or more years delay in data being published; and • These data do not differentiate between vessels that are fishing or stationary / steaming (although it is filtered to include vessels travelling between 1 and 6 knots to limit the effect this has on the data).	
Marine Scotland VMS (2022)	VMS data for demersal trawling, *Nephrops* trawling and dredging. The Marine Scotland VMS data is valuable for developments which overlap with *Nephrops* fishing grounds as there is a dedicated VMS dataset for *Nephrops* trawling, which is a subset of the bottom trawling dataset. This dataset is a processed version of ICES / OSPAR gridded VMS data.	• Dataset includes three fishing methods only and is not updated annually; • The data is provided in a web layer and so processing is limited and covers a relatively long time period (2010 – 2020); and • The limitations that apply to the MMO VMS data are similar to those for the Marine Scotland VMS data. This data includes coverage of vessels >15 m in length from 2010 – 2013 and from thereon, vessels >12 m in length.	Downloaded via National Marine Plan Interactive (NMPi) (Marine Scotland, 2022b) at: • https://marine.gov.scot/maps/1680; • https://marine.gov.scot/maps/1832; and • https://marine.gov.scot/maps/1679.
Information of fishing grounds from consultation with fishing vessel operators / owners	Consultation is of paramount importance in development of a robust commercial fisheries baseline, in particular for the under-10 m fleets which are not consistently represented through other data sources. Consultation data has included annotations of printed charts, photographs of on-board GPS plotters (taken or sent to the Fisheries Liaison Officer (FLO) or Fisheries Industry Representative (FIR)). These data have been anonymised and with permission granted prior to the use of the data. These data provide further information on the distribution of fishing activity by fishing method, key species, seasonal trends and also offers an opportunity to receive early concerns and feedback from fisheries stakeholders.	• Inaccuracies may arise, as the data may be subject to human error.	Obtained by the FLO, further information in section 6.4

DATA	DESCRIPTION	LIMITATIONS	SOURCE
Automatic Identification System (AIS) data (various sources) (2015-2019)	All European Union (EU) vessels > 15 m in length are required to have an AIS transponder which transmits details of the vessel's position, speed, and course. These data provide an indication of the spatial distribution of fishing activity.	• Vessels of < 15 m in length may not be represented in the dataset; and • AIS data does not typically provide information on fishing method, and some errors in fishing vessel categorisation may be present.	Available via EMODnet (without the parameters needed to filter for speed) or via private AIS data holders (may incur a cost). AIS tracks and gridded AIS data are also available from the MMO.
EU Data Collection Framework Database landings statistics (2014 – 2020)	Landings statistics (2014 – 2020), including fishing effort (hours fished) and landings weights (tonnes) provided by EU Member States. Data is derived from official logbook databases which are categorised by ICES rectangle, gear, and vessel length for fishing vessels from participating member states.	• Similar limitations for fisheries statistics as described above, depending on the source; and • Some EU member states provide statistics for vessels over 10 m only.	Landings data for most EU member states are publicly available through the Scientific, Technical and Economic Committee for Fisheries (STECF)[3].
Amalgamated VMS intensity layers (2009-2013)	Amalgamated VMS intensity layers for the period 2009-2013 showing VMS data for all UK registered commercial fishing vessels (>15m length). The data covers *Nephrops* (mobile and static), demersal (mobile and static), pelagic (mackerel and herring), crab, lobster, scallop, and squid fisheries.	• Data is over 10 years old, however, it provides valuable VMS data to consider historic fishing activity.	Available via https://data.marine.gov.scot/dataset/2009-2013-amalgamated-vms-intensity-layers.
ScotMap – Inshore fisheries mapping Project in Scotland (2007 - 2011)	Spatial information on relative value and usage (number of fishing vessels and crew) for vessels under-15 m in length and was collected through face-to-face interviews with vessel owners and operators between 2007 and 2011.	• Dataset is over 10 years old based on a subset of fishers that agreed to be interviewed. However, it is the most comprehensive and detailed data presently available, and consultation with the fishing industry confirmed that the ScotMap data is generally consistent with current fishing practices for under 15 m vessels.	Available via https://marine.gov.scot/information/scotmap-inshore-fisheries-mapping-project-scotland.

[3] https://stecf.jrc.ec.europa.eu/.

4 CONSULTATION

4.1 Fisheries Working Group

OWPL has set up a Fisheries Working Group to ensure a good working relationship with the fishing industry, discuss any issues arising and consult the fishing industry on relevant matters. The aim for the Fisheries Working Group is to meet thrice a year. As agreed within the Terms of Reference, the group aims to ensure to represent all appropriate fishing activities within the region, facilitate dialogue and promote communication, collaborative working, evaluate data sources and identify data gaps, participate in published OWPL documents, and discuss potential mitigation options.

Table 4-1 shows the points discussed at each working group.

Table 4-1 Summary of the key discussion points at the fisheries working group.

FISHERIES WORKING GROUP	DATE HELD	KEY POINTS DISCUSSED
Fisheries Working Group 1	5th May 2022	Key points discussed: • Importance of early engagement with the local fishing community; • Key data sources to inform the EIA (including their relevance to the offshore Project); • Fishing patterns and key fishing grounds in the vicinity of the offshore Project (including discrete areas beyond the shallow banks in deep waters and the area east of the 4-degree line (see chapter 4: Site selection and alternatives); and • Potential impacts from subsea cables (e.g. Electromagnetic Field (EMF) effects) on migratory brown crab and their larval developments (see chapter 11: Fish and shellfish ecology).
Fisheries Working Group 2	8th September 2022	Key points discussed: • Use of site specific data to inform the assessment of effects on fish and shellfish (e.g. the benthic survey and eDNA, see chapter 11: Fish and shellfish ecology); • The availability of inshore fisheries data (i.e. for vessels 10 m and under); – OWPL organised a separate meeting on the 25th October 2022 (see section 4.3) to discuss inshore fisheries data; • Potential socio-economic impacts on the fishing industry, including impacts on onshore fish and shellfish processing industry, considered in chapter 14: Commercial fisheries and chapter 19: Socio-economics[4]; and • Potential impacts on brown crab (e.g. EMF) in the context of the general decline of brown crab in the UK. It was raised that fishing effort in the region has increased without a corresponding increase in catch and potential causes of the decline were discussed, such as climate change.
Fisheries Working Group 3	10th January 2023	Key points discussed: • The Project team shared the Project Design Envelope and the worst case scenarios that form the basis of the commercial fisheries impact assessment; and

[4] *A recommendation to use the soon-to-be published Scottish Government guidance on Community Benefits for Offshore Windfarms was made. However, at time of writing, this guidance has not been published.*

FISHERIES WORKING GROUP	DATE HELD	KEY POINTS DISCUSSED
		• The initial findings of the EIA were presented and any feedback from the Fisheries Working Group was discussed. The comments made by the Fisheries Working Group have informed the assessment of effects presented in chapter 14: Commercial fisheries.

4.2 Consultation on the proposed cable route

OWPL consulted the fishing industry on the proposed cable route within the second Fisheries Working Group. The site selection and offshore Export Cable Corridor (ECC) routing process was discussed, including the environmental and technical constraints mapping (e.g. bathymetry, waves, tides, currents, seabed features, other sea users, third-party cables, environmental designated sites, fish and shellfish spawning grounds, technical and installation risks, and commercial fishing and shipping activity).

Input from the Fisheries Working Group was requested, such as information on the potential overlap with key fishing grounds. It was agreed by the Fisheries Working Group that the offshore ECC options presented were appropriate for the Project based on the grid connection location and no immediate concerns were raised. It was agreed by the local fishing industry that the cable could not land anywhere else. The fishing industry representative confirmed post-meeting that there were no immediate concerns about the proposed cable route. However, the following points were raised for consideration, either for the EIA or future Project decisions:

- The potential for cable exposure within the banks of the OAA, which will be considered as part of the Cable Burial Risk Assessment (CBRA);
- The presence of squid spawning grounds off Whitten Head, approximately 25 km west of the landfall;
- The presence of scallop dredging in the nearshore area and the potential effects of cable protection on this fishery, and the preference for the use of rock protection over concrete mattresses; and
- The importance of the area to the east of the 4-degree line.

4.3 Inshore fisheries data consultation

A discussion around the ScotMap inshore fisheries data took place on the 25th October 2022. The aim of the meeting was to discuss the suitability of the ScotMap data as a representation of the 10 m and under vessel fishing grounds with the Orkney Fisheries Association (OFA) and North and East Coast Regional Inshore Fisheries Group (NECRIFG).

It was agreed in the meeting that ScotMap is the most comprehensive and detailed data presently available for 10 m and under fishing vessels. It was confirmed that the data should be used for the Offshore EIA Report. The OFA confirmed that their members fishing locations were consistent with the ScotMap data (Figure 6-13 and Figure 6-14).

5 LEGISLATION AND POLICY

5.1 Legislation

- Fisheries Act (2020): The UK left the EU in January 2021. As a result, EU regulations and policies which apply to EU Member States are no longer applicable in UK waters (within 370 km (200 nautical miles (nm)) of the coast); however, a number of EU regulations and policies have been retained (termed 'retained EU law'). The reformed Common Fisheries Policy (EC, 2014) is no longer applicable to UK waters, including Scottish waters (out to 370 km (200 nm) from the Scottish mainland). The UK is now a sovereign independent coastal state with the right to manage the resources in its waters, which was established through the Fisheries Act 2020 as amended. As an independent coastal state, the UK Government is responsible for managing the UK's territorial waters (out to 22 km (12 nm)) and the Exclusive Economic Zone (out to 370 km (200 nm) or the median line with other states). Following its departure from the EU, the UK can now regulate the access of non-UK fishing vessels to UK waters. Non-UK vessels now require licences to fish in UK waters, as per Section 16 of the Fisheries Act 2020 and the Trade and Cooperation Agreement, which came into force on 1st January 2021. During a transition period up to 2026, licenced EU vessels have access to fish specific Total Allowable Catch (TAC) and non-quota stocks in UK waters between the 220 km and 370 km (12 nm and 200 nm) limit and in areas where vessels have historic fishing rights between the 11 km and 22 km (6 nm and 12 nm) limit. Gradual changes to quota shares and TACs will also occur between 2021 and 2026, including a gradual reduction of EU quota shares within UK waters and the transfer of 25% of EU's fishing rights in UK waters to UK fleets (European Commission, 2020; European Council, 2021). Following the transition period, annual consultations will take place to determine access for EU vessels in UK waters and quota shares.

5.2 Policy

- Scotland's National Marine Plan (Marine Scotland, 2015): Sets out policies and objectives requiring marine planners and decision-makers to consider the potential impacts of development on fisheries interests and is useful to identify some of the key concerns and issues that should be addressed in any impact assessment. Policies under Chapter 6 Sea Fisheries and General Policies GEN 1, GEN2, GEN3, GEN 4, and GEN 17 are considered relevant to commercial fisheries:
  - GEN 1 General planning principle: There is a presumption in favour of sustainable development and use of the marine environment when consistent with the policies and objectives of this Plan;
  - GEN 2 Economic benefit: Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan;
  - GEN 3 Social benefit: Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan;
  - GEN 4 Co-existence: Proposals which enable coexistence with other development sectors and activities within the Scottish marine area are encouraged in planning and decision making processes, when consistent with policies and objectives of this Plan; and
  - GEN 17 Fairness: All marine interests will be treated with fairness and in a transparent manner when decisions are being made in the marine environment.
- National Islands Plan (Scottish Government, 2019): Sets out 13 objectives to address crucial sectors within island communities. Under Strategic Objective 2: to improve and promote sustainable economic development, there is

a commitment to build on the Scotland's National Marine Plan to ensure that fishing and other economic activities stemming from the sea provide increased opportunities for island communities, but at the same time are pursued in a sustainable manner. During the consultation of the plan, participants highlighted many economic drivers, including the fishing industry, as important for sustainable economic development.

- Pentland Firth and Orkney Waters Pilot Marine Spatial Plan (Marine Scotland, 2016): Sets out an integrated planning policy framework to guide marine development and activities and management decisions, whilst ensuring the quality of the marine environment is protected.
- Orkney Islands Regional Marine Plan: Consultation Draft (Orkney Islands Council, 2022): This plan is currently being reviewed by Scottish Ministers. The plan will be an integrated guide to marine development and activities within the Orkney Islands marine region to assist public authorities, including regulators, decision makers and planners.

5.3 Guidance

- Best practice guidance for fishing industry financial and economic impact assessments (UKFEN, 2012): The guidance provides information on the impacts to the fishing industry as a result of areas that are closed or restricted to normal fishing operations.
- Options and opportunities for marine fisheries mitigation associated with wind farms (Blyth-Skyrme, 2010): The guidance provides useful measures to reduce the impacts for offshore floating wind and included fisheries representatives in the process.
- Fishing and Submarine Cables - Working Together (ICPC, 2009) provides information that promotes high standards of reliability and safety in the submarine cable environment.
- Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison (FLOWW, 2014): This guidance was developed to inform developers within the offshore renewable energy sector and the commercial fisheries community on the need for effective communication at all stages in the development and operation of offshore renewable energy installation.
- FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendation for Fisheries Disruption Settlements and Community Funds (FLOWW, 2015): This guidance complements the above FLOWW document and is to be used to inform discussions in conjunction with this document.
- Good Practice Guidance for Assessing Fisheries Displacement by Other Licensed Marine Activities: Literature Review (Scottish Government and Xodus Group Limited, 2022): This document provides good practice guidance for assessing fisheries displacement by other licensed marine activities.
- Guidance on preparing a Fisheries Management and Mitigation Strategy (Draft) (Marine Scotland, 2020): This draft guidance document outlines the key considerations for the preparation of a Project-specific Fisheries Management and Mitigation Strategy ("FMMS") that should aim to facilitate effective coexistence between the offshore wind and commercial fisheries sectors.

6 COMMERCIAL FISHERIES BASELINE

6.1 Overview

An initial desk-based review of literature and available data sources (see Table 3-1) has been undertaken to support this Report. The findings of this research are presented below in order to provide an understanding of the offshore Project environment and inform the EIA process.

The following sections provide information on:

- Fisheries restricted areas;
- Surveillance sightings; and
- Fisheries statistics.

6.1.1 Fisheries restricted areas

Restricted areas for various fishing activities within the commercial fisheries study area are summarised in Table 6-1 and shown in Figure 6-1.

The Dounreay Food and Environment Protection Area (FEPA) Order Zone is closed to all fishing year-round due to potential hazards to human health from any fish or shellfish which are caught in that area (Marine Scotland, 2022c). The presence of the closed area, located approximately 150 m west of the offshore ECC, does not allow fishing activity in this particular area. There are also seasonal restrictions (from 1st May to 30th September) on the use of mobile or active gear (encompassing dredges and trawls) along sections of the western coastline of Orkney at (The Berry to Costa Head restricted area) located approximately 21 km to the east of the offshore Project, and a permanent restriction for these gear types at Thurso and Dunnet Bay, which lies approximately 6.7 km to the east of the offshore ECC (Kingfisher Information Service, 2022).

Table 6-1 Restricted areas for various fishing activities around the Project (Kingfisher Information Service, 2022)

RESTRICTED AREA	RESTRICTION	APPLICABLE DATES
The Berry to Costa Head	Fishing for sea fish with mobile gear or active gear prohibited.	1st May to 30th September.
Thurso and Dunnet Bay	Fishing for sea fish with mobile gear or active gear prohibited.	Applicable at all times
Wyre and Rousay Sounds protected area	Dredge, beam trawl, demersal trawl or demersal seine net are prohibited.	Applicable at all times.
Noss Head and Sinclair Bay protected area	Fishing for sea fish with a dredge, beam trawl, demersal trawl or demersal seine net is prohibited in the Noss Head and Sinclair Bay Protected Area. Fishing for horse mussels is prohibited.	Applicable at all times.

RESTRICTED AREA	RESTRICTION	APPLICABLE DATES
North Sea: United Kingdom waters of 4a, 200-600m depth	It shall be prohibited to deploy any bottom set gillnet, entangling net and trammel net at any position where the charted depth is greater than 200 m.	Applicable at all times.
Dounreay FEPA Order Zone	Closed to all fishing year-round due to potential hazards to human health from any fish or shellfish which are caught in that area (Marine Scotland, 2022c).	Applicable at all times.

In addition to the fisheries restricted areas listed above, the number of dredges that can be deployed within and outwith the 12 nm is dictated by the Regulation of Scallop Fishing (Scotland) Order 2017. Under these regulations, in order to operate a scallop dredge within 12 nm of the Scottish coast, the vessel must either:

- Ensure that any tow bar deployed is no longer than 7.5 m in length; no more than 2 two bars are deployed at any time; and no more than 8 dredges are towed per side at any time; or
- Ensure the vessel is equipped with a fully functioning Remote Electronic Monitoring (REM) system (GPS, winch sensors & cameras) that allows analysts in Marine Scotland Compliance to verify the number of dredges being deployed at sea. Vessels with an appropriate REM system can fish with up to 8 dredges per side in the 0-6 nm zone, and with up to 10 dredges per side in the 6-12 nm zone.

These dredge restrictions are currently in force to help control and monitor dredge effort in the 0-12 nm zone (Marine Scotland, 2022c).

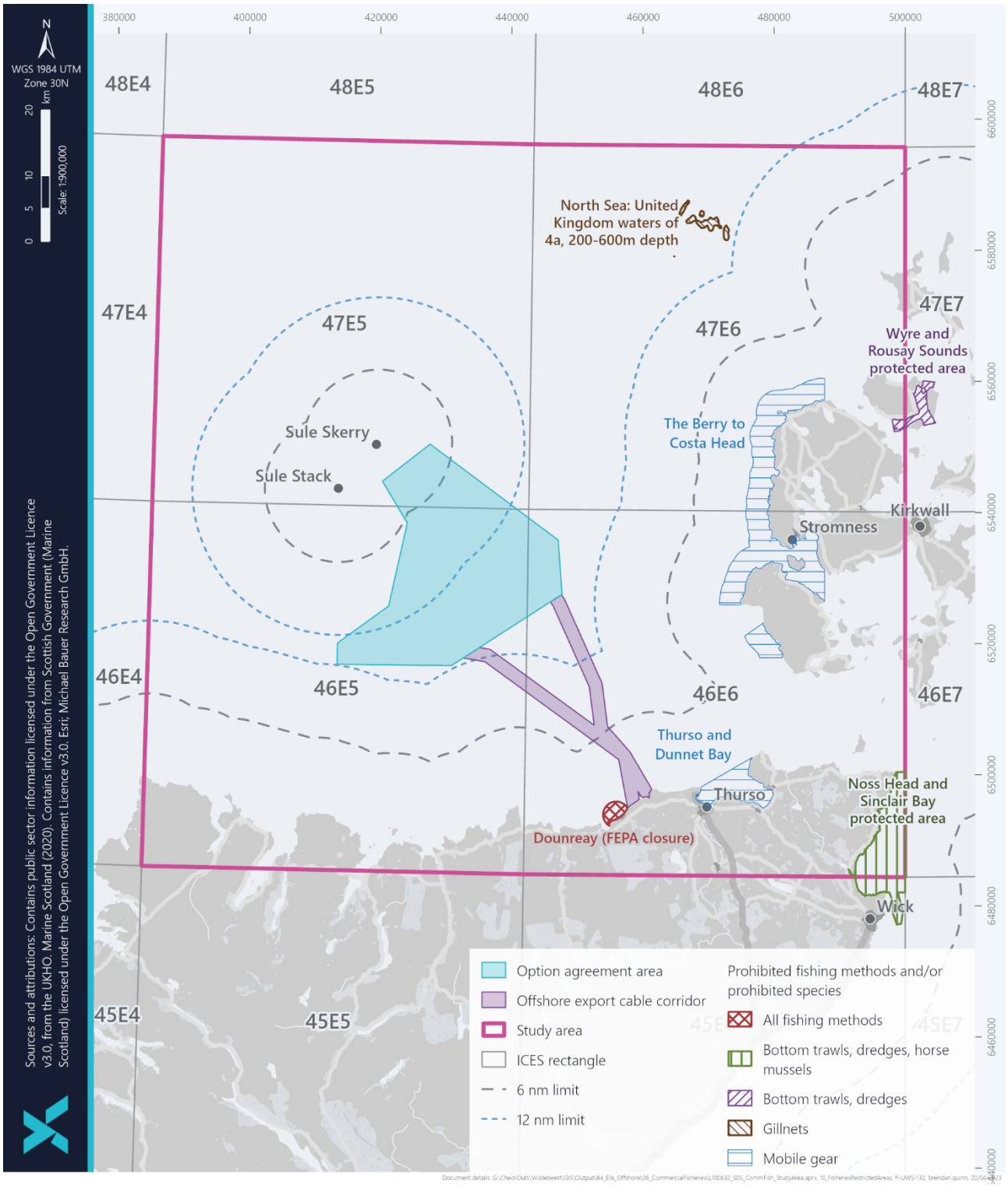


Figure 6-1 Fisheries restricted areas within the commercial fisheries offshore study area

6.1.2 Surveillance sightings

Surveillance sightings data by fishing method and nationality provide a general overview of the fishing activity across the commercial fisheries offshore study area. It should be noted, however, that due to the limitations relating to potentially uneven survey effort, these data cannot be used to provide a quantitative assessment of fishing effort and can only be interpreted to provide an indication of the general distribution of fishing activity by method and nationality.

Surveillance sightings data by vessel nationality between 2015 and 2019 are displayed in Figure 6-2. Across the commercial fisheries offshore study area, the majority of sightings are of UK vessels, with a limited number of sightings for Danish, Dutch, French, German, and Irish vessels.

Surveillance sightings data by fishing method between 2015 and 2019 are shown in Figure 6-3. Within ICES rectangles 46E5 and 46E6, sightings are concentrated towards the northern coastline of Caithness, within the 12 nm limit. The majority of sightings are of UK demersal stern trawlers and scallop dredgers, as well as UK potters / whelkers, which are predominantly recorded towards the east of ICES rectangle 46E6 outwith the offshore ECC. Sightings of potters / whelkers are located within the offshore Project area, predominantly to the north of the OAA. In addition, information gained through consultation confirmed that creelers are present. Other fishing vessels sighted in this area include other trawler vessels (trawler (all), stern trawler (pelagic / demersal)), gill netters and bottom (i.e. demersal) seiners. Sightings in the east of ICES rectangle 47E6 within the 12 nm limit along the west of the Orkney Islands are dominated by UK potters / whelkers and demersal stern trawlers. As described in section 6.1.3, pelagic trawling is generally recorded at low effort levels for the commercial fisheries offshore study area. Therefore, it is assumed that the majority of stern trawlers (pelagic / demersal) are demersal. Furthermore, as whelks do not form a large proportion of the landings statistics in the commercial fisheries offshore study area, the majority of these sightings are expected to be potters, targeting lobster (*Homarus gammarus*) and crab (i.e. creelers).

Further offshore, towards the north of ICES rectangles 46E5 and 46E6 and in the offshore waters of ICES rectangles 47E5 and 47E6, UK demersal stern trawlers and potter / whelkers account for the majority of sightings. Sightings of potters / whelkers are fairly evenly spread across these two ICES rectangles and sightings of demersal stern trawler are concentrated towards the northwest of ICES rectangle 47E6. Minimal demersal stern trawler activity takes place within the OAA in comparison to the wider ICES rectangles. Other trawler vessels are also recorded within these ICES rectangles, as well as demersal seiners, which are concentrated along the west of ICES rectangle 47E6 located outwith of the OAA.

Surveillance sightings available through Marine Scotland is displayed in Figure 6-4 which categorises fishing vessels as 'fishing', 'steaming' or 'laid' (e.g. in the case of pots and traps). The vast majority of the sightings in the southern half of the commercial fisheries offshore study area indicate that vessels are either steaming or fishing gear that has been laid. Within the northern half of the commercial fisheries offshore study area, a higher proportion of sightings are associated with vessels actively fishing. The sightings by fishing methods displayed in Figure 6-3 suggests that the majority of these vessels are demersal trawlers. Within the OAA, the majority of activity taking place is steaming, with some fishing activity taking place towards the centre of the OAA. Again, within the offshore ECC, the majority of activity taking place is steaming (Figure 6-4).

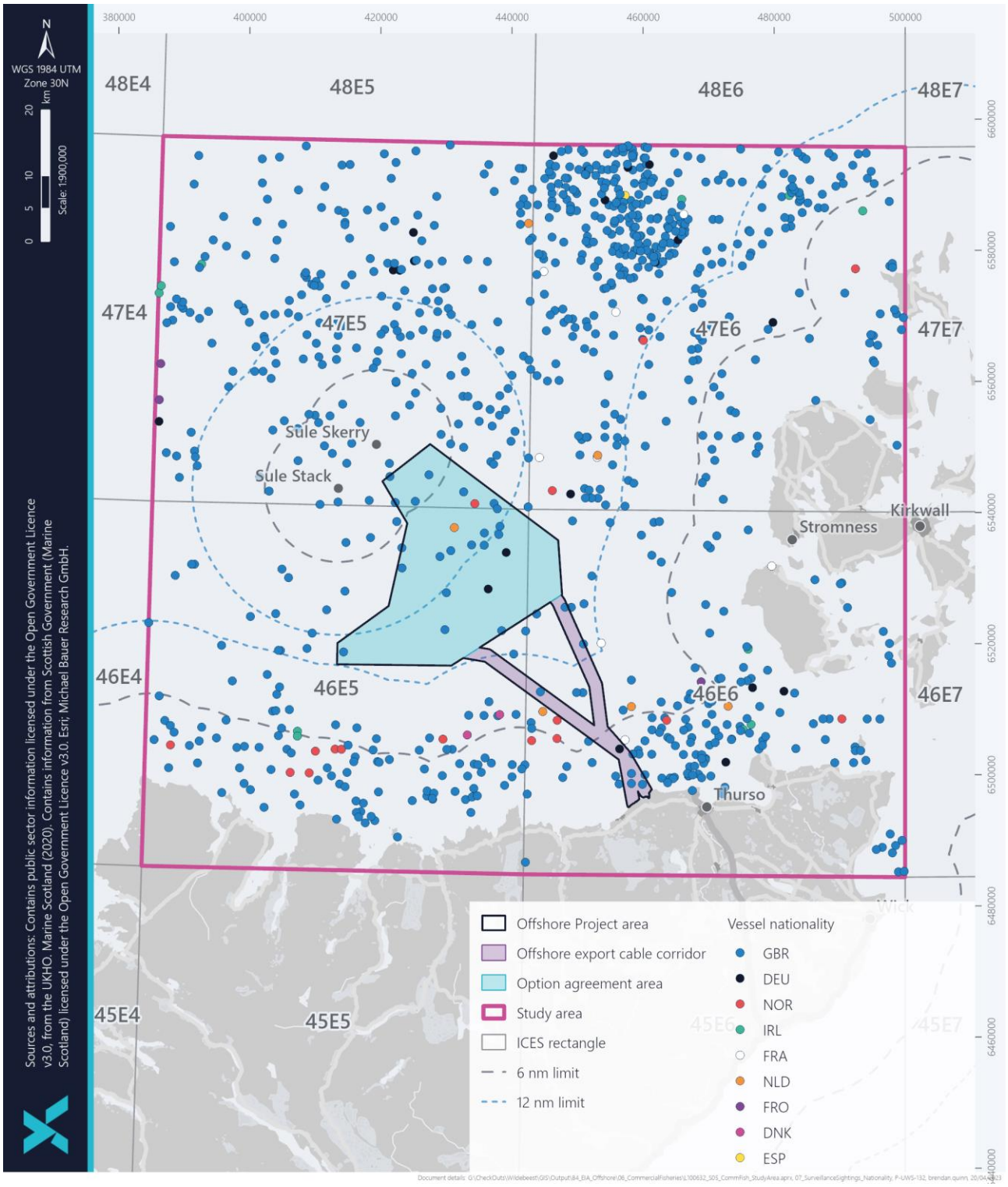


Figure 6-2 Fishing vessel sightings by nationality (2015 – 2019) (MMO, 2020a)

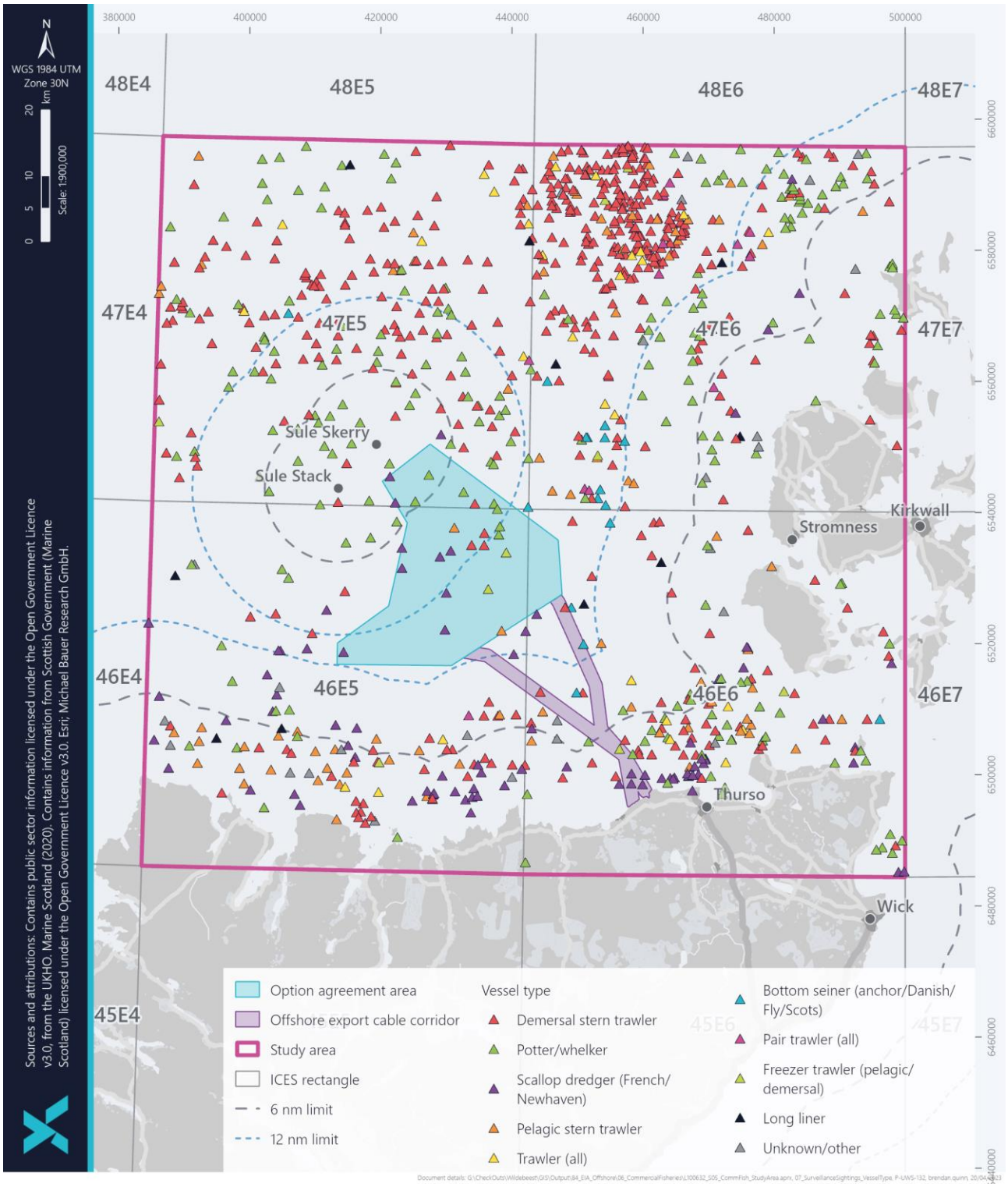


Figure 6-3 Fishing vessel sightings by fishing method (2015 – 2019) (MMO, 2020a)

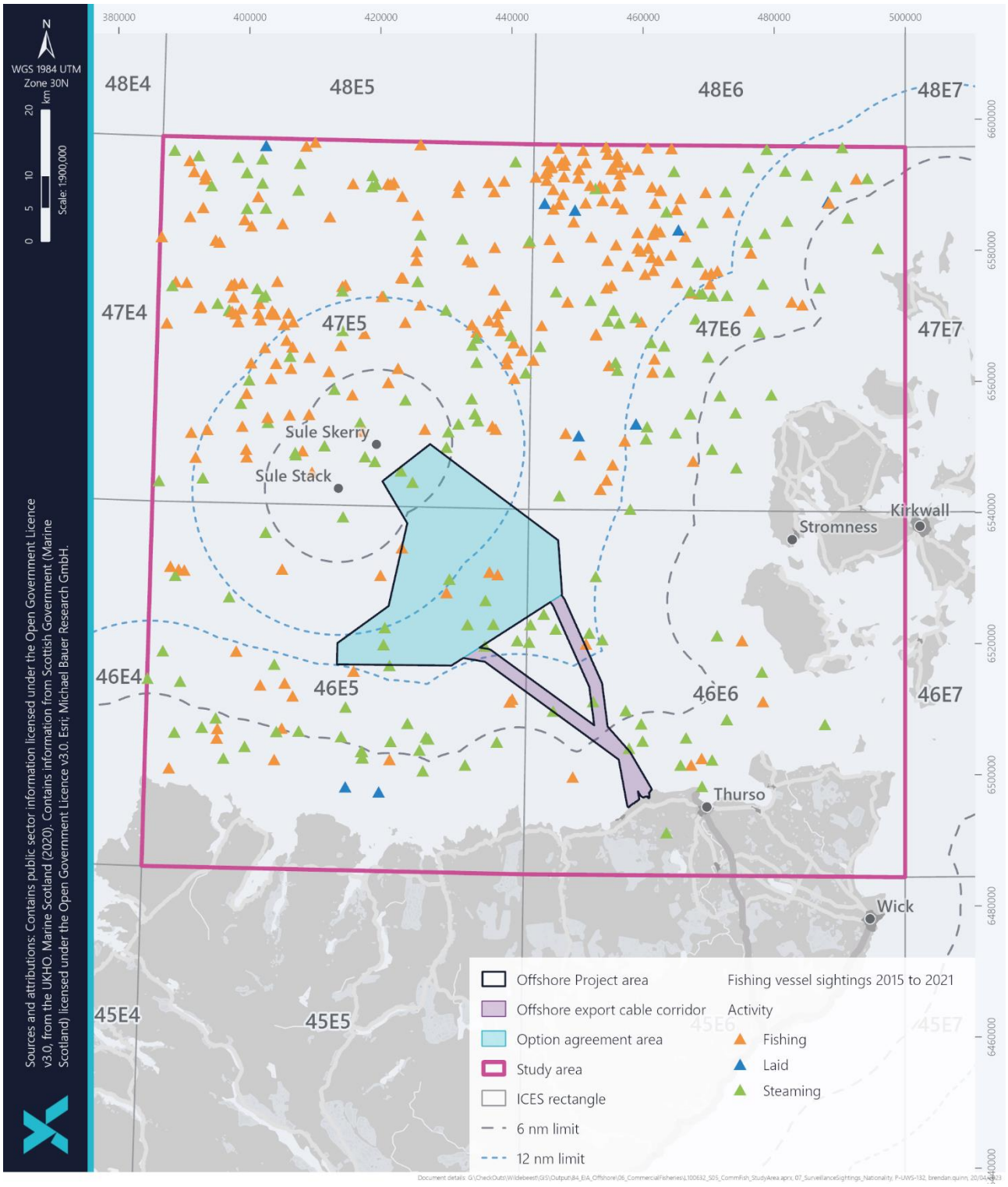


Figure 6-4 Fishing vessel sightings (2015 – 2021) (Marine Scotland, 2021)

6.1.3 Fisheries statistics

MMO landings and effort by ICES rectangle

Fisheries statistics can be used to understand the primary fishing methods and key commercial species relevant to the commercial fisheries offshore study area. For this data set, it is likely that under-10 m vessels are underrepresented due to the lack of electronic reporting for smaller vessels. As described in section 3, landings values by ICES rectangle between 2016 and 2021 were downloaded from the MMO annual UK sea fisheries annual statistics report 2021 webpage[5]. Separate datasets are available to download for 2016 to 2020 and 2021. The format of these two datasets differs, mainly in relation to gear categorisation and vessel length and it was not possible to combine these datasets within the timeframe needed for this assessment. Therefore, due to the inconsistencies between the 2016 to 2020 and 2021 dataset, the landings values for 2021 have been presented separately, as it was not considered appropriate to combine this with the 2016 to 2020 data.

Landings values by ICES rectangle from 2016 to 2020 have been used to calculate the annual average by vessel length, fishing method, and species; these data are presented in Figure 6-5. The landings values for 2021 have been presented in Figure 6-6. Between 2016 and 2020, landings values are highest in ICES rectangle 47E6 (which lies outwith the OAA and offshore ECC), northeast of the commercial fisheries offshore study area and the lowest landings values are recorded in ICES rectangle 46E5, southwest of the commercial fisheries offshore study area. In 2021, landings values were highest in ICES rectangle 47E6 and 46E6. The majority of landings across the commercial fisheries offshore study area are associated with vessels over 10m. A greater proportion of the landings values in the coastal ICES rectangles 46E6, 46E5, and 47E6 are attributed to vessels that are 10 m and under, which is consistent with smaller vessels generally having smaller operational ranges.

The landings data also generally corroborates the sightings data, indicating that demersal otter trawlers and pots and traps account for the vast majority of fishing activity in the commercial fisheries offshore study area. Average landings values in the north of the commercial fisheries offshore study area in ICES rectangles 47E5 and 47E6 are dominated by otter trawls with proportionally lower landings values recorded for pots and traps compared with ICES rectangles 46E6 and 46E5. Landings data also shows that the 2021 landings values in ICES rectangle 47E5 are dominated by pelagic trawls. Further analysis of the data indicates that 67% of these landings are landed into non-UK ports in the Netherlands and Norway, with the remaining being landed into Peterhead.

Demersal trawls continue to contribute to a high proportion of landings values within ICES rectangles 46E5 and 46E6, albeit to a lesser extent than the ICES rectangles further offshore, described above. However, landings values for pots and traps and scallop dredges are proportionally lower in ICES rectangles 47E6 and 47E5 than in ICES rectangles 46E5 and 46E6. Landings by scallop dredges and pots and traps are recorded with the highest values recorded in ICES rectangle 46E5 and 46E6.

Other fishing methods recorded with comparably lower landings values, include 'other' passive and mobile gears. It should be noted that the variation in seabed features and water depths across the OAA including the presence of two shallower banks (Whiten Head Bank and Stormy Bank) may influence the type of fisheries operating across the

[5] https://www.gov.uk/government/statistics/uk-sea-fisheries-annual-statistics-report-2021.

OAA. Depths across the OAA are relatively uniform, but with some steeper slopes to the south of the OAA. Sand wave and sediment wave fields are present to the east of the OAA.

The species associated with the highest landings values in the commercial fisheries offshore study area include brown crab (*Cancer pagurus*), haddock (*Melanogrammus aeglefinus*), mackerel (*Scomber scombrus*) and cod (*Gadus morhua*) and to a lesser extent, herring (*Clupea harengus*), lobster, squid, saithe (*Pollachius virens*) and scallops. Brown crab make up a higher proportion of the landings values in the nearshore ICES rectangles 46E5, 46E6 and 47E6. Demersal whitefish, mainly haddock and cod, also contribute to a high proportion of landings values in the commercial fisheries offshore study area, especially in ICES rectangles 46E6 and 47E6, and other notable demersal species recorded in the landings data include squid and monkfish (*Lophius* spp.). Pelagic fish, including herring and mackerel are also recorded with proportionally high landings values in the commercial fisheries offshore study area. The 2021 mackerel landings were especially high, accounting for 65% of the landings value for this ICES rectangle in that year, with comparably lower average landings between 2016 to 2020 (described further in section 6.5). Overall, these species generally reflect the pattern of landings values by fishing methods described above. Table 6-2 summaries the key species caught within the commercial fisheries study area and the relevant gear type used.

Table 6-2 Summary of species caught in the commercial fisheries offshore study area, and the gear used

SPECIES CAUGHT	GEAR USED
Brown crab, velvet crab, lobster	Pots, creels, traps
Mackerel, pollack, bass	Hand lines
Flatfish	Beam trawls
Demersal whitefish species (incl. haddock, cod and monkfish), squid	Demersal otter trawls
Mackerel, herring	Pelagic trawlers
King scallops	Dredges

Within ICES rectangles 46E6 and 47E6, pots and traps mainly target crab and lobster in the commercial fisheries study area. Crab accounts for the highest proportion of landings values in ICES rectangles 46E5 and 46E6, consistent with the high landings values for pots and traps in these ICES rectangles, and lobster targeted by pots and traps contribute to a lower proportion of landings values in these ICES rectangles. In ICES rectangle 46E6, haddock and cod, targeted by demersal otter trawls and to a lesser extent demersal seines, and scallops targeted by scallop dredges, also contribute to a high proportion of landings values. Cod landings values in ICES rectangle 46E5 are comparably lower, with herring, haddock, scallops, and squid contributing to the majority of landings values. The pelagic species, such as herring and mackerel, are mainly landed by demersal otter trawls or pelagic trawls. However, landings values for these species are generally lower in ICES rectangles 46E6 and 46E5 when compared with 47E5 and 47E6. Notably, squid contributes to a greater proportion of landings in ICES rectangle 46E5 when compared to the other ICES rectangles in the commercial fisheries offshore study area, forming 64% of the average landings values for this species

across the commercial fisheries offshore study area. It is also understood through consultation that a squid fishery is present approximately 25 km to the west of the offshore ECC.

Consistent with the lower contribution of pots and traps to the landings values in ICES rectangles 47E5 and 47E6, crab contribute to a lower proportion of landings values in these ICES rectangles. Mackerel contributes a high proportion of landings values in ICES rectangle 47E5, along with haddock, crab and herring. In ICES rectangle 47E6 (that lies outwith the OAA and offshore ECC), mackerel landings values are lower, and the majority of landings values are attributed to monk/ anglerfish, cod, haddock and crabs.

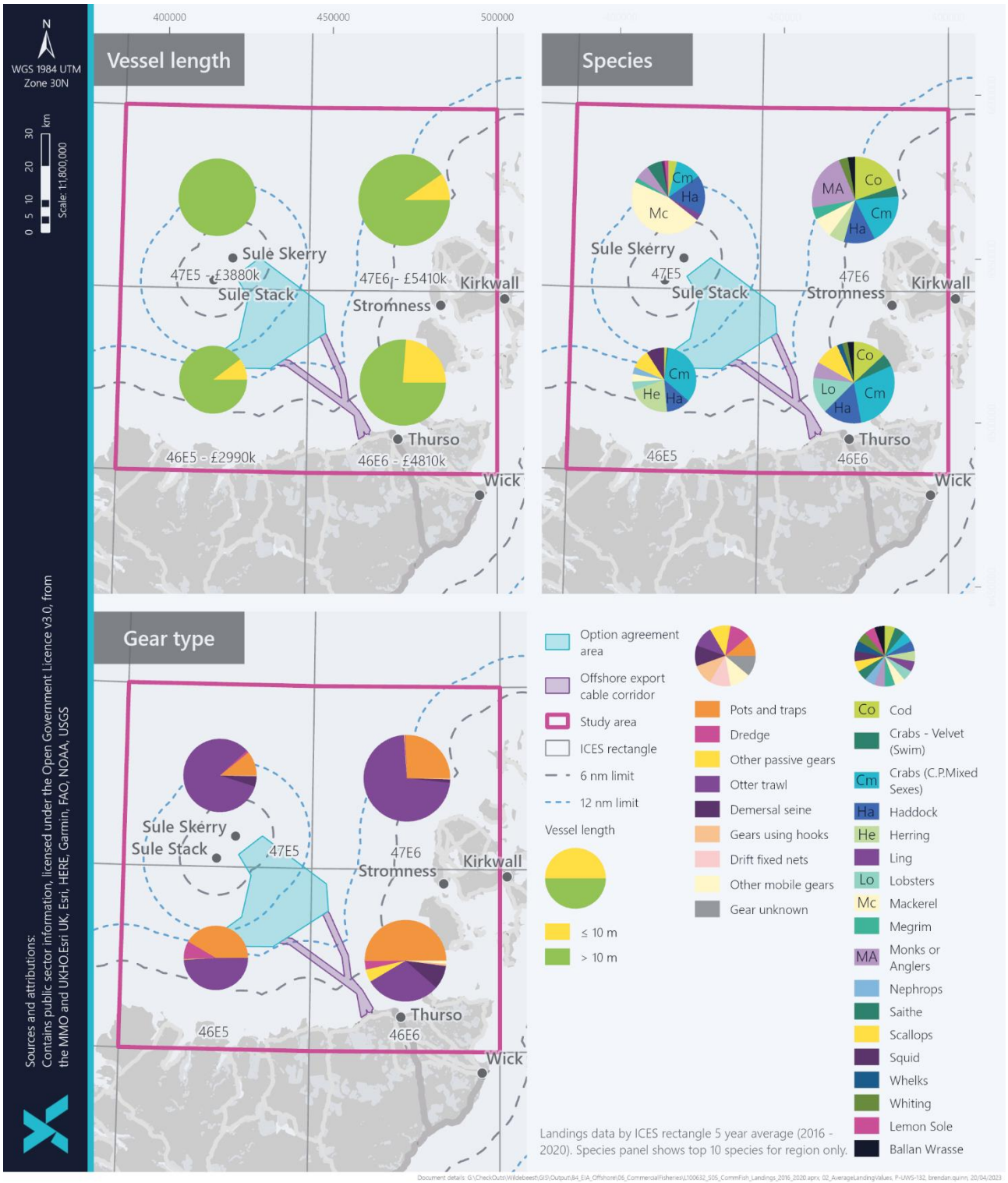


Figure 6-5 Average annual landings value (£) (2016 – 2020) per ICES rectangle within the commercial fisheries offshore study area, by vessel length, species and gear type (MMO, 2021)

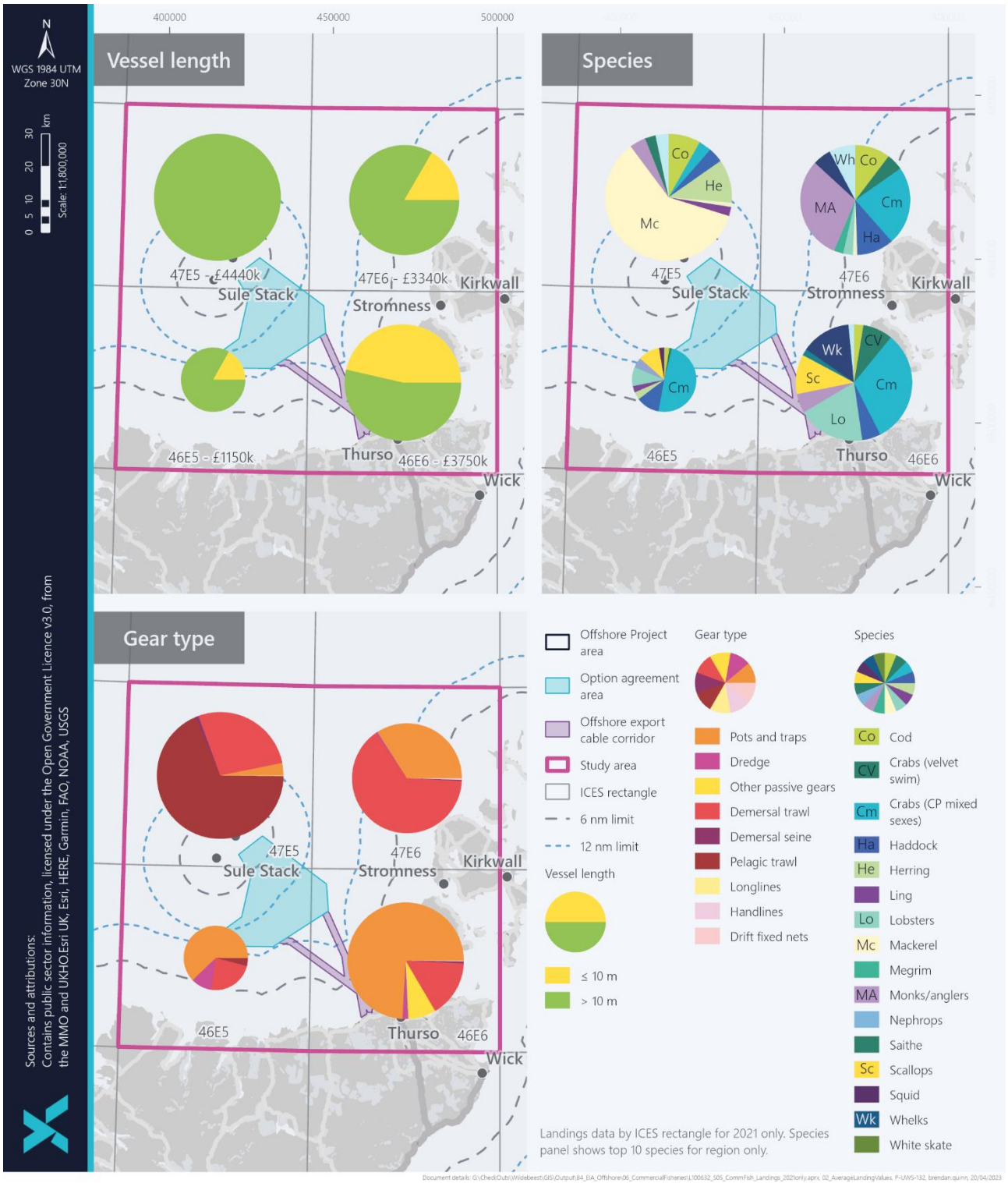


Figure 6-6 Annual landings values for 2021 per ICES rectangle within the commercial fisheries offshore study area, by vessel length, species and gear type (MMO, 2022a)

The average annual fishing effort (days fished) per ICES rectangle between 2017 and 2021 is presented in Table 6-3. This is consistent with the landings values, indicating that pots account for the majority of fishing effort across the commercial fisheries offshore study area, mainly in ICES rectangle 46E6, whereas demersal otter trawling effort is mainly focussed in ICES rectangle 47E6. The effort data also shows that pelagic (i.e. midwater) trawling effort is relatively low, suggesting that the high landings values in ICES rectangle 47E5 may be associated with high valued species and/or high Catch per Unit Effort (CPUE).

Table 6-3 Average annual fishing effort (days fished) (2017 – 2021) per ICES rectangle (MMO, 2022b)

FISHING METHOD	AVERAGE ANNUAL DAYS FISHED (2017 – 2021)				
	46E5	46E6	47E5	47E6	Grand Total
Pots	679	2,855	104	773	4,410
Otter trawls - bottom	61	99	146	370	676
Traps (not specified)	0	154	0	131	285
Hand fishing	11	236	0	3	250
Dredges	78	85	7	5	175
Set longlines	3	119	5	7	133
Otter twin trawls	7	20	16	46	90
Scottish seines	1	31	21	6	60
Miscellaneous gear	0	50	0	0	50
Nephrops trawls	0	26	2	5	33
Longlines (not specified)	1	27	1	2	31
Hooks and lines (not specified)	1	14	0	15	30
Pair trawls - bottom	1	12	6	8	27
Handlines and pole-lines (hand-operated)	0	12	0	12	24
Otter trawls - midwater	7	6	4	2	18
Bottom trawls (not specified)	0	2	3	7	11
Set gillnets (anchored)	1	3	1	2	7
Pair trawls - midwater	3	1	1	2	7
Handlines and pole-lines (mechanized)	6	0	0	0	6
Gillnets (not specified)	0	1	0	0	1
Trammel nets	0	1	0	0	1
Mechanized dredges	0	0	0	0	1

MMO landings and effort by port

Data provided by the MMO (2017 to 2021) for landings by port have been recorded from the ICES rectangles located within the commercial fisheries offshore study area (Table 6-4). Landings from the commercial fisheries offshore study area were recorded at 72 different ports. Scrabster is associated with the highest average landings values in the commercial fisheries offshore study area.

Two of the ten ports associated with the highest average landings value from the ICES rectangles in the commercial fisheries offshore study area are non-UK ports (Table 6-4). It is anticipated that the high landings values for non-UK ports are due to large pelagic trawler vessels (see section 6.6). Although high value pelagic fishing activity occurs within the commercial fisheries offshore study area, the majority of pelagic fishing activity occurs outwith the OAA and offshore ECC (see section 6.2). It should be noted that the high landing values for Maloy, Norway (£276,254) were landed in 2017 only and Hirtshals, Denmark (£365,073) are associated with landings in 2018 only. No landings values were recorded into these ports in any other years.

Table 6-4 Average landings values (£) by port (2017 to 2021) for the ICES rectangles in the commercial fisheries offshore study area (MMO, 2022b)

LANDING PORT	AVERAGE LANDINGS VALUE (£) BY PORT (2017– 2021)				
	46E5	46E6	47E5	47E6	TOTAL
Scrabster	2,464,284	1,071,305	1,185,030	1,823,466	6,544,086
Peterhead	623,856	201,214	834,307	229,056	1,888,432
Stromness	490,966	381,932	170,612	676,228	1,719,739
Burray	1,528	0	279	571,597	573,404
Tingwall	477,415	0	0	1,074	478,490
Fraserburgh	144,668	46,640	193,782	16,634	401,724
Kinlochbervie	125,249	78,536	117,153	69,683	390,621
Hirtshals	0	0	365,073	0	365,073
John O'Groats	39	0	0	342,888	342,927
Maloy	0	0	276,254	0	276,254
Other	407,245	503,139	805,214	850,541	2,566,139

The average number of unique vessels counted at ports associated with landings from the ICES rectangles in the commercial fisheries offshore study area is provided in Table 6-5. According to active vessel numbers, most vessels in the commercial fisheries offshore study area are landing into Scrabster, Peterhead and Stromness.

Table 6-5 Number of active vessels by port (2017 – 2021) (MMO, 2022b)

LANDING PORT	AVERAGE NUMBER OF ACTIVE VESSELS BY PORT (2017– 2021)				
	46E5	46E6	47E5	47E6	TOTAL
Scrabster	24	42	31	57	154
Peterhead	5	19	16	12	53
Stromness	3	6	3	16	27
Kinlochbervie	6	4	7	5	22
Fraserburgh	3	9	3	3	18
Kirkwall	0	5	0	9	14
Tingwall	0	9	0	1	10
Wick	2	1	0	5	8
Buckie	3	2	1	1	7
Macduff	1	3	1	1	7
Other	13	15	5	38	71

6.2 VMS Data

Average VMS value from 2017 to 2020 for demersal trawls and seines (e.g. demersal otter trawls and demersal seines), dredge, passive gear (e.g. pots and traps), and pelagic fishing methods (e.g. midwater trawls) are presented in Figure 6-7 to Figure 6-11. Although fishing vessels over 12 m must be fitted with VMS units, the MMO VMS dataset only shows effort and value for vessels over 15 m in length. Therefore, reference to the Marine Scotland VMS intensity layers, covering vessels over 12 m in length using bottom trawls and dredges, has also been included.

VMS data indicate that demersal trawling for species such as haddock, cod and squid is highest in the east of the commercial fisheries offshore study area in ICES rectangles 46E6 and 47E6, overlapping with the offshore ECC. Comparably lower average VMS values are present in the OAA in ICES rectangle 46E5 (Figure 6-7). The offshore ECC in the south of ICES rectangle 46E6 experiences lower demersal trawling value and effort, and this is expected to be partly due to the Dounreay (FEPA Order Zone) closed area. Within the wider commercial fisheries offshore study area, VMS values and effort from ICES rectangle 47E6 to the north of ICES rectangle 46E6 are higher, and the area of demersal trawling in ICES rectangles 47E5 and 47E6 is larger than that of 46E6. VMS data presented within a North Atlantic Fisheries College (NAFC) Marine Centre report which maps fisheries and habitats within the NECRIFG area indicate that both otter trawling and seine netting activity occurs along the west of ICES rectangle 46E6 (Shelmerdine and Mouat, 2021). During consultation, it was also identified that Scottish seine netting vessels and trawlers are operational in the vicinity of the offshore ECC, predominantly to the west. This is also consistent with the Marine Scotland VMS data for 2010 to 2020, which shows the highest fishing effort within the northeast of the commercial fisheries offshore study area, with relatively low effort levels within the OAA.

VMS data shown in Figure 6-8 indicates that moderate to high levels of scallop dredging occur in the west of the commercial fisheries offshore study area, concentrated in ICES rectangle 46E5 and overlapping with the western

extent of the OAA and in the offshore ECC. ICES rectangle 46E6 supports relatively low levels of dredging activity for scallops, with low to moderate levels of scallop dredging activity taking place to the east and west of the commercial fisheries offshore study area nearshore and in the vicinity of the export cable landfall. The surrounding ICES rectangles to the north of ICES rectangle 46E6, ICES rectangles 47E6 and 47E5, support patchy small areas of low dredging activity. Dredging activity is higher and more widespread in the west in ICES rectangle 46E5 and higher still in the Moray Firth to the southeast of the offshore study area. VMS datasets for scallop dredging available through Marine Scotland, which cover 2010 to 2020 are shown in Figure 6-9, and this data is generally consistent with Figure 6-8.

As shown in Figure 6-10, passive fishing activity (such as pots and traps), is moderate to high across the commercial fisheries offshore study area, concentrated in ICES rectangle 46E5 and 46E6. This is consistent with the high landing values recorded for pots and traps recorded in the commercial fisheries offshore study area. Effort and value in the remainder of the commercial fisheries offshore study area are concentrated in the south of ICES rectangle 46E5, with comparably lower value and effort in ICES rectangles 47E5 and 47E6. Notably, the majority (89%) of 10 m and under vessels represented in the landings values between 2016 and 2020, are attributed to pots and traps and will not be represented by the MMO VMS data, which only covers vessels over 15 m in length. During consultation, local fishers were requested to provide details on their fishing grounds, and it was identified that creeling vessels are operational across the commercial fisheries offshore study area, targeting mainly crab and lobster to a lower extent (see section 6.4). Passive fishing income is higher within the OAA compared to the offshore ECC, particularly in the centre of the OAA and to the southwest of the OAA. As the offshore ECC approaches the shore, passive fishing income is very low (Figure 6-7). Again, fishing activity by vessels under 15 m length may be underrepresented due to the absence of these vessels in the MMO data.

Low levels of relatively patchy pelagic trawling activity are recorded in waters relevant to the OAA and offshore ECC, and surrounding ICES rectangles in the commercial fisheries offshore study area. Average VMS values of pelagic trawling increase to the north and west of ICES rectangle 46E6 and 47E5 and in the west of ICES rectangle 46E5 (Figure 6-11).

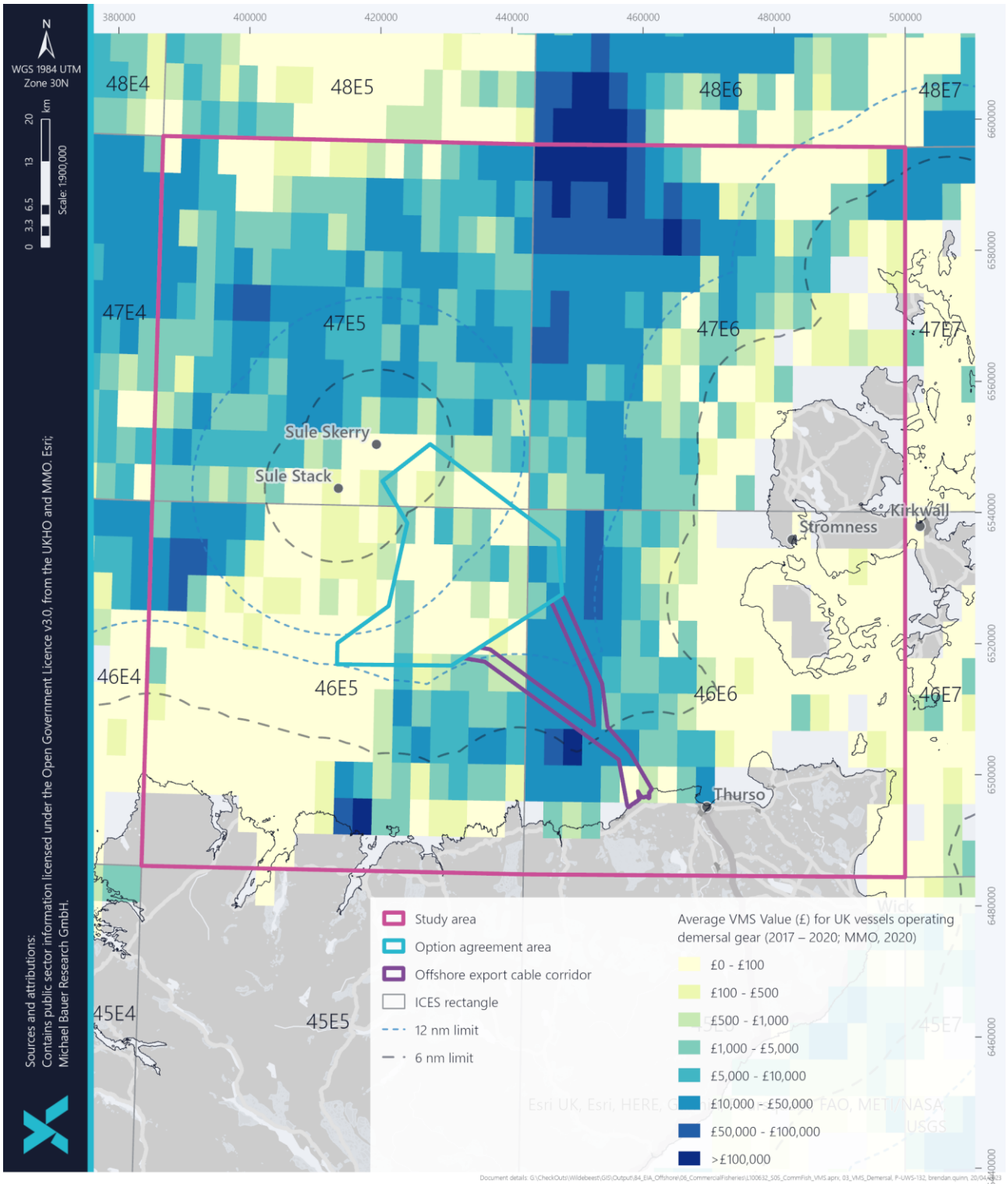


Figure 6-7 Average VMS value for demersal trawling (2017 – 2020) (MMO, 2020b)

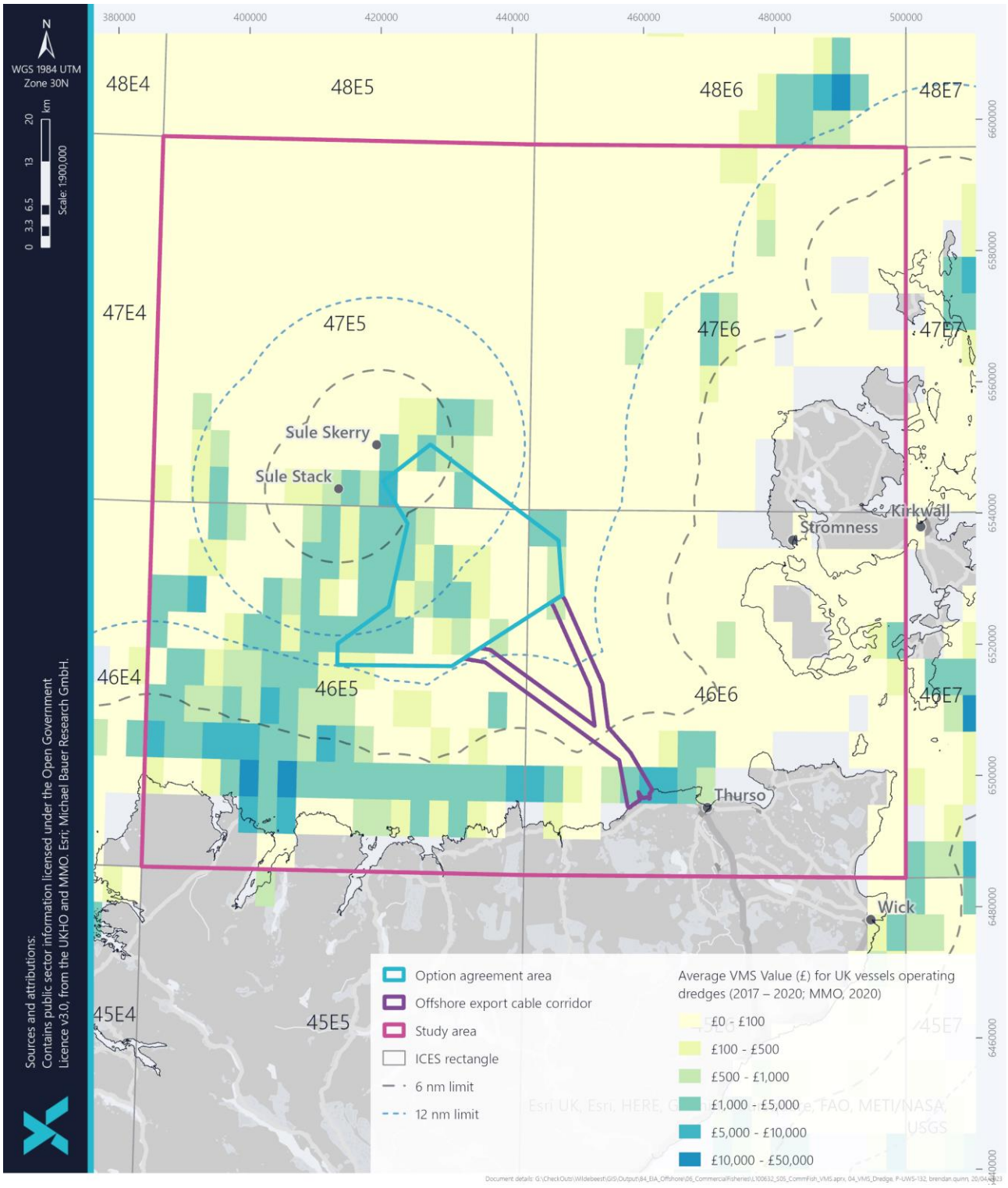


Figure 6-8 Average VMS value for dredges (2017 – 2020) (MMO, 2020b)

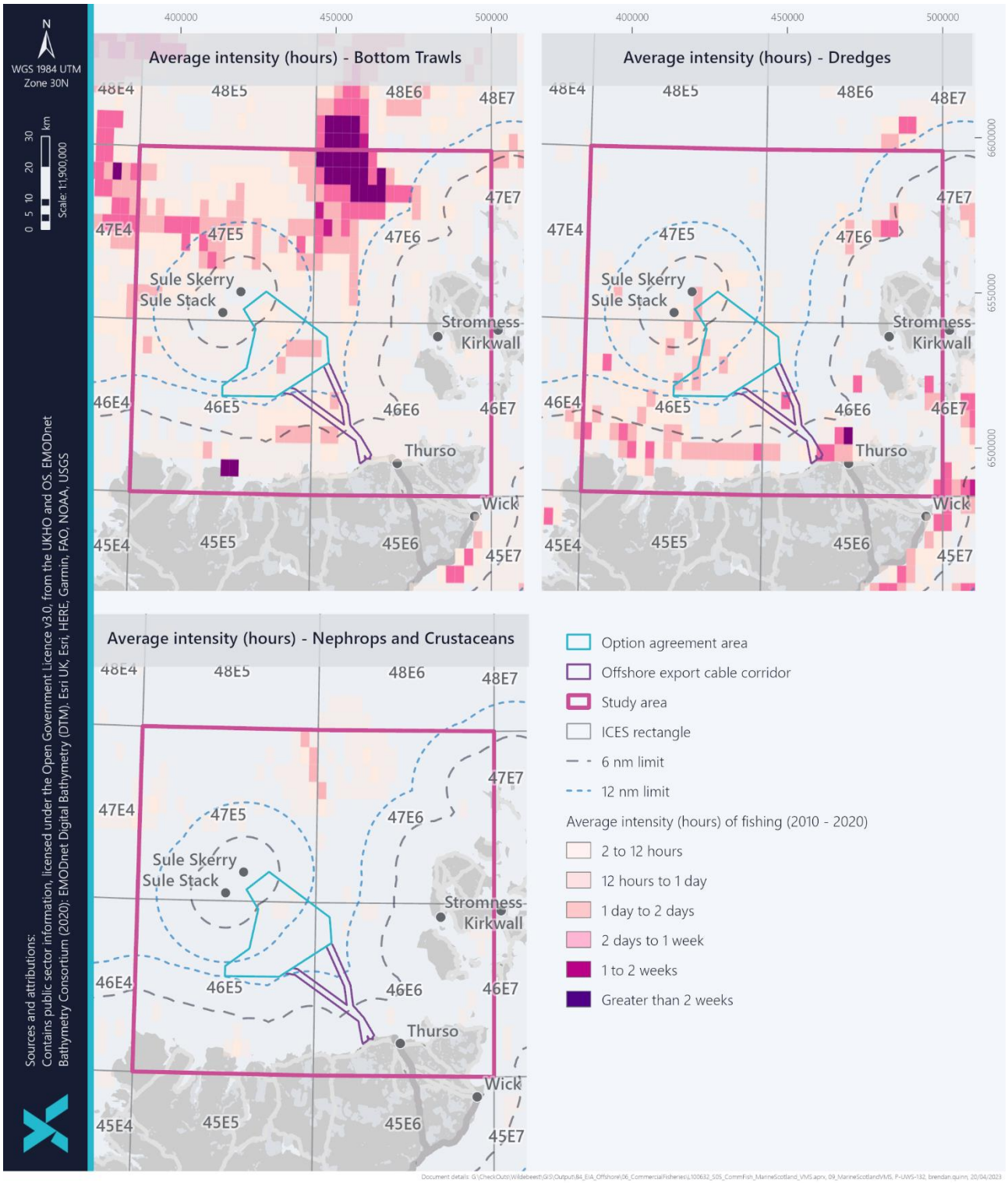


Figure 6-9 Average intensity (hours) for bottom trawls, dredges and bottom trawling for Nephrops and crustaceans (2010 – 2020) (Marine Scotland, 2022b)

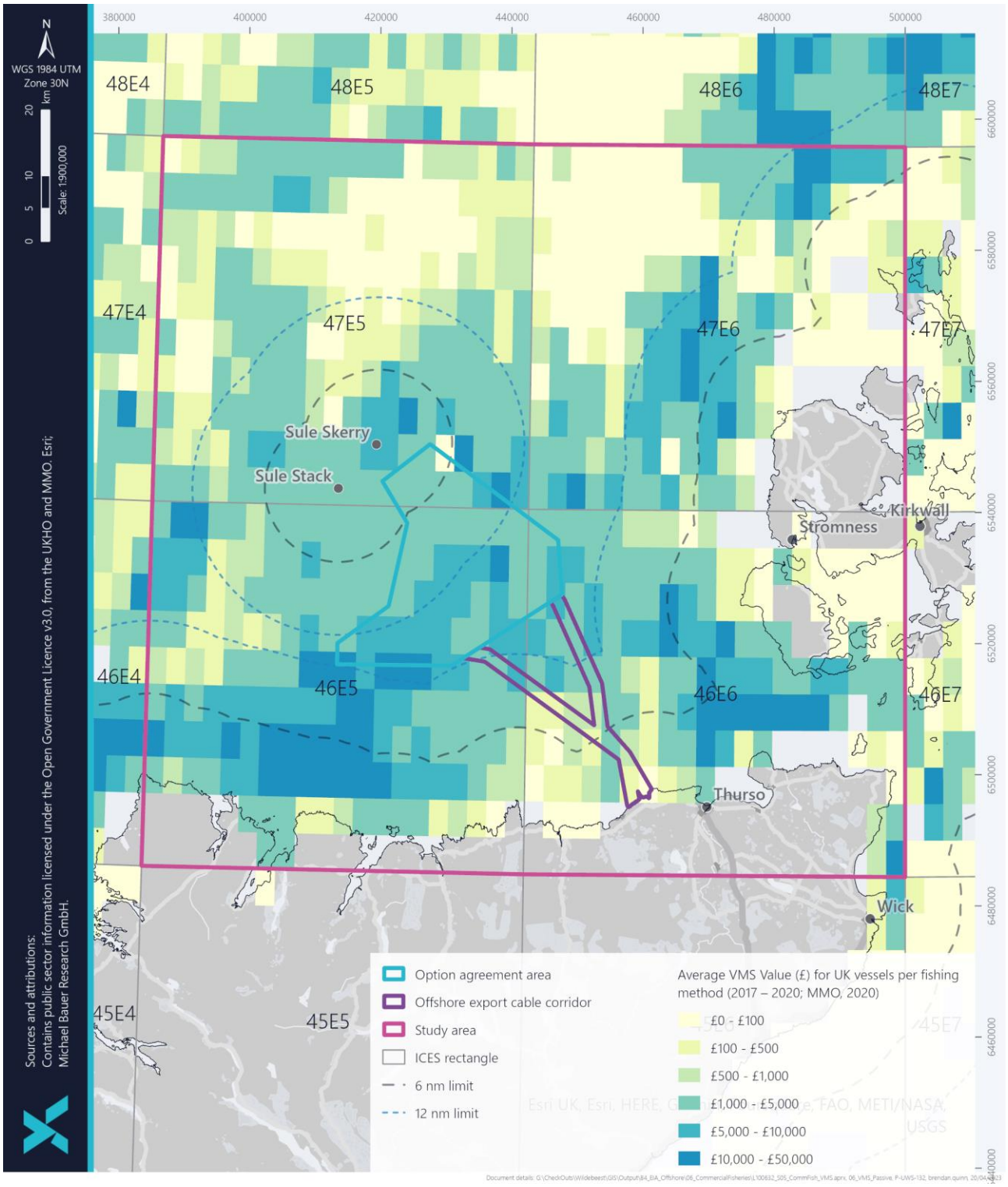


Figure 6-10 Average VMS value for passive fishing methods (2017 – 2020) (MMO, 2020b)

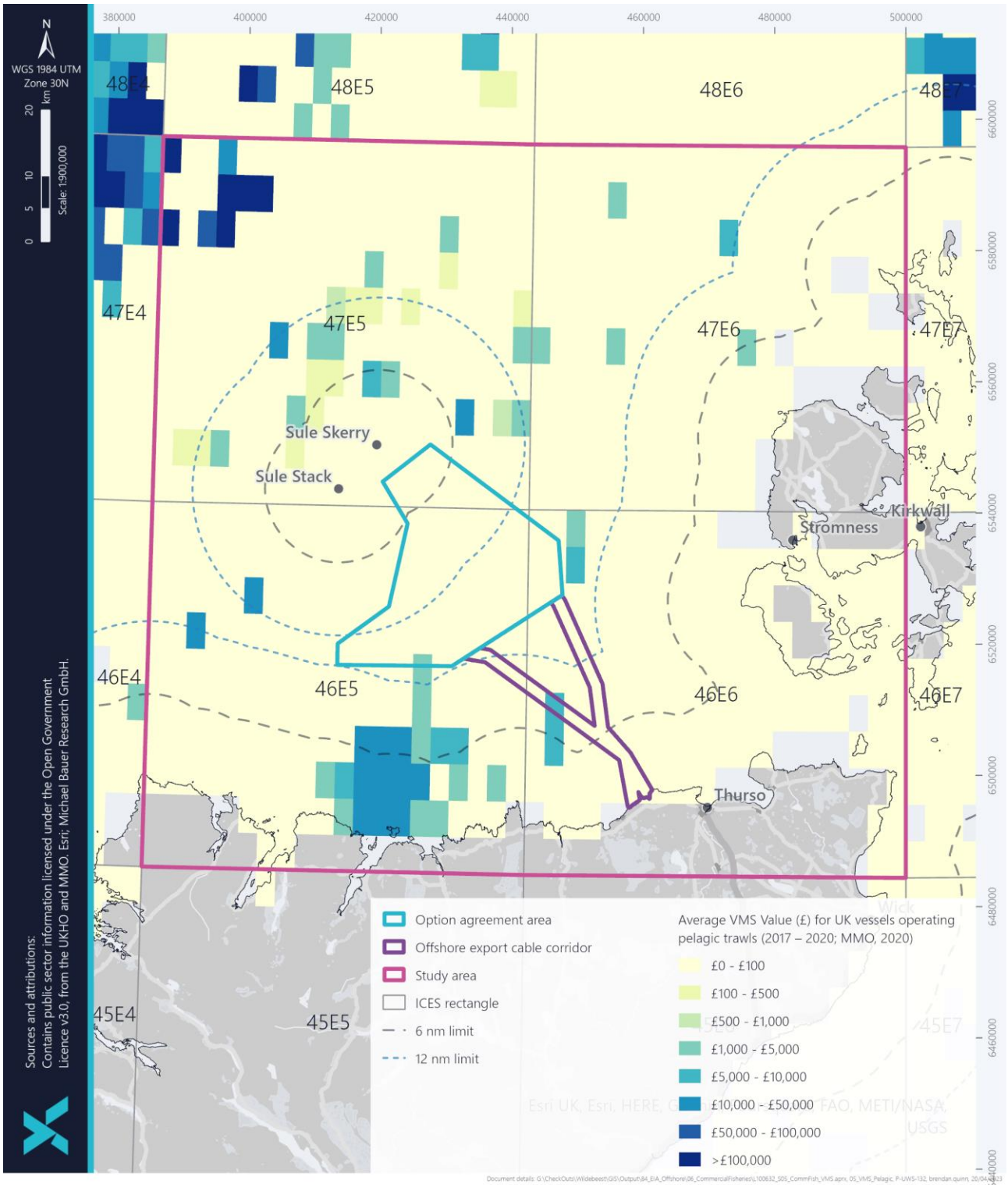


Figure 6-11 Average VMS value for pelagic fishing methods (2017 – 2020) (MMO, 2020b)

6.3 AIS Data

AIS-derived fishing vessel tracks (2015-2019) for vessels over 15 m in length are displayed in Figure 6-12. The figure shows many vessel tracks starting in Thurso, coming from the east and to a lesser extent, tracks starting from Stromness. Many tracks cross the OAA and the offshore ECC as steaming grounds. There are clear fishing vessel routes to the south of the OAA and through the offshore ECC across the Pentland Firth and across the west of the Orkney Islands. Additionally, some tracks show characteristics of active fishing, going back and forth over a small area. These occur in the south of ICES rectangles 45E5 and 46E6 as well as in waters further offshore to the north. Potting activity is evident as straight lines in a north / south orientation along the north coast of Caithness, and consultation confirmed the vivier crabbers also use a north-south orientation in the OAA. Vessel tracks characteristic of seine netting are also present in the northwest of ICES rectangle 47E6 (which lies outwith the OAA and offshore ECC).

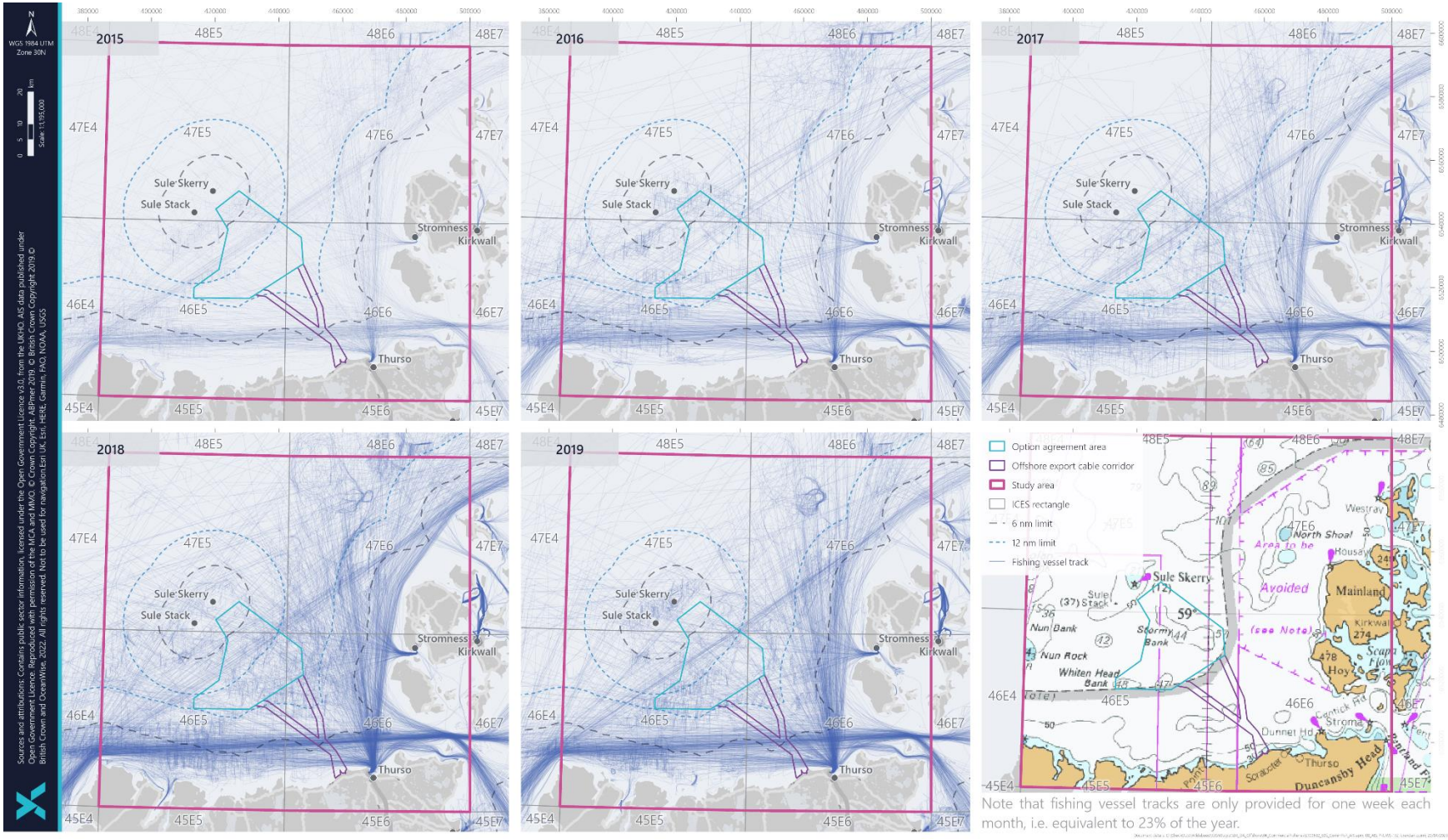


Figure 6-12 AIS fishing tracks in the commercial fisheries offshore study area (MMO, 2019)

6.4 Information gained through consultation

6.4.1 Fishing plotter data

Most larger fishing vessels collect their own tracks on their onboard computer (plotter). The data is confidential and owned by the fishermen themselves, there is no (national) database where this information is collected. The Scottish Fishermen's Federation (SFF) and Scottish White Fish Producers Association (SWFPA) collected and shared some plotter data from their members. The data were based on the draft N1 PO area, as published by the Scottish Government in February 2019.

The data, whilst very limited, confirms some of the fishing activity as described in the sections above. There is no knowledge on the metadata of the fishing tracks; it is unknown how many vessels are represented, nor when the fishing tracks were recorded.

6.4.2 Inshore data (ScotMap)

As described in Section 4.3, a discussion around the ScotMap inshore fisheries data took place between OWPL, OFA and NECRIFG. It was agreed in the meeting that ScotMap is the most comprehensive and detailed data presently available, and some members confirmed ScotMap accurately represented their current fishing practices.

The ScotMap data shows the number of vessels that the OAA and offshore ECC are generally used by a small number of vessels (<10) and that the main fishing grounds for all vessels, mainly creelers, are in the northeast of the OAA and nearshore area of the offshore ECC. The main scallop grounds are located around the offshore ECC (Figure 6-13), and there are no ScotMap demersal trawling grounds near the offshore Project area (Figure 6-14) (Kafas *et al.*, 2014).

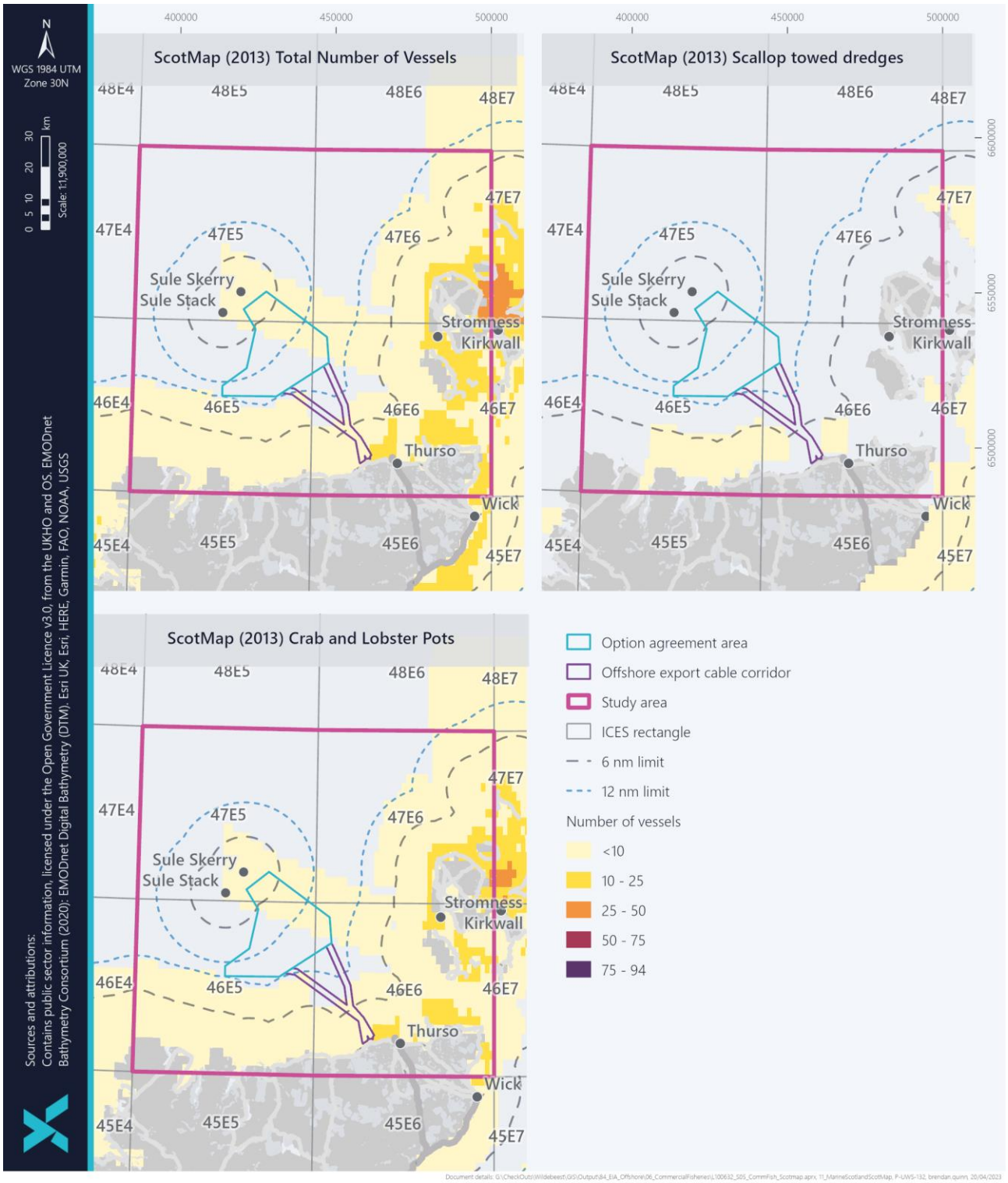


Figure 6-13 ScotMap total number of vessels, total number of scallop dredgers and number of vessels with crab and lobster pots (Kafas et al., 2014)

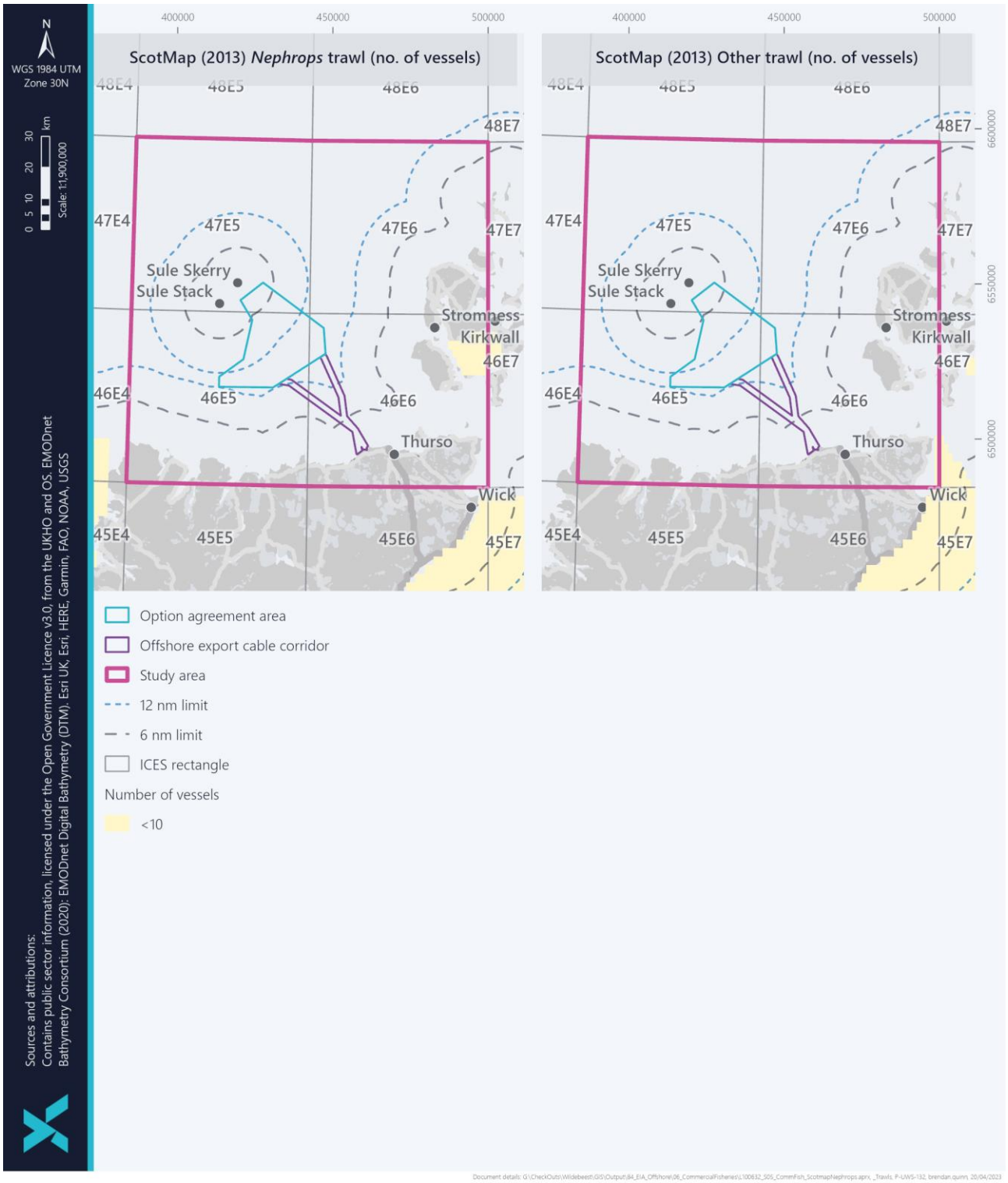
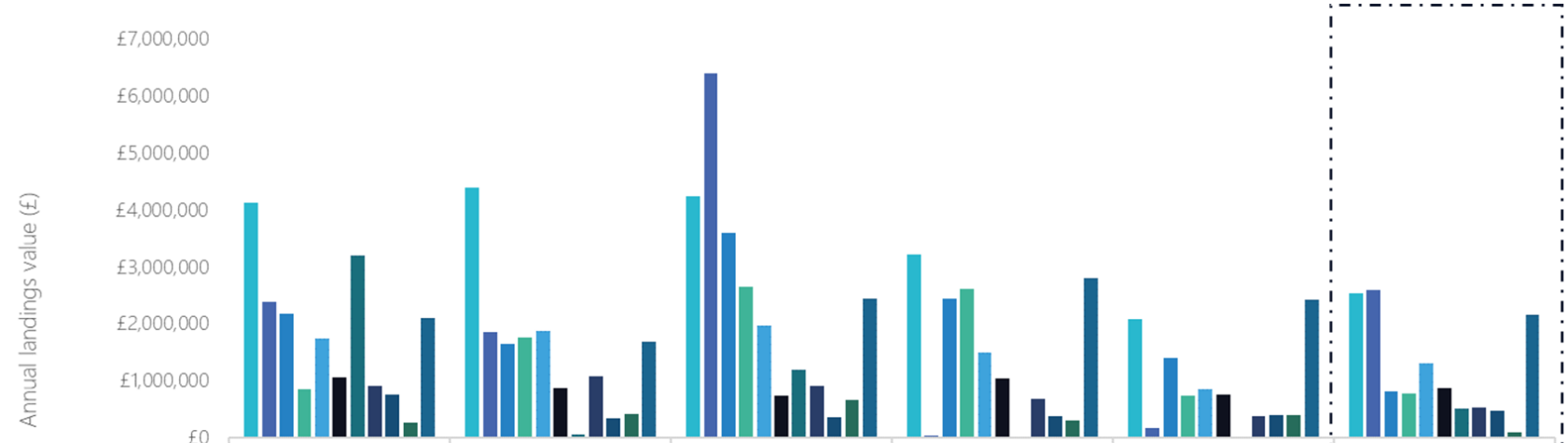


Figure 6-14 ScotMap total number of vessels, total number of Nephrops trawlers and other trawlers (Kafas et al., 2014)

6.5 Annual and seasonal variation

Figure 6-15 displays the combined annual landings values for the ICES rectangles within the study area between 2016 and 2021. Landings values in 2020 and 2021 are the lowest in this time period, which may be partly due to the COVID-19 pandemic, although it is notable that landings values in 2019 were also relatively low compared with previous years. The data also indicate that the annual landings values for mackerel and herring varied by year. Landings values for mackerel were particularly high in 2018 (89% of which was associated with ICES rectangle 47E5), with lower landings values in 2019 and 2020, whereas landings values for herring show a general decline from 2016 to 2020, ranging from £3,197,774 in 2016 to £112 in 2020, before increasing again in 2021. Landings values for haddock and cod also show a peak in 2018 and 2019, followed by a gradual decline in 2020 and 2021 and brown crab landings suggest a general decline between 2018 and 2021. Other species' landings values were relatively consistent between 2016 and 2020, although a gradual decline in brown crab landings can be observed.

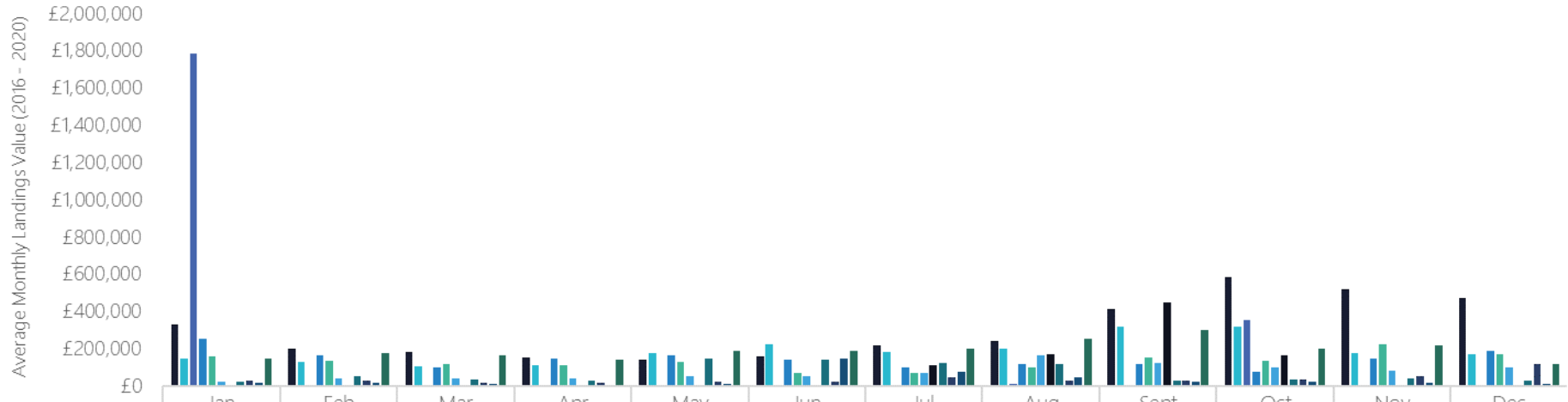
Figure 6-16 displays the seasonal variation in the landings values in the commercial fisheries offshore study area between 2016 and 2020 and the seasonal variation in 2021 is shown in Figure 6-17. The seasonal patterns for 2016 to 2021 indicates that mackerel landings show a pattern of higher value in January, and further analysis of the data indicates that this is attributed to higher landings in January 2016, 2017, and 2018, predominantly in ICES rectangle 47E5. This pattern was also observed in 2021 with especially high landings values for mackerel in January. The data also indicate that landings values for crabs and lobster peak in the winter months between September and January and landings values for herring are highest between July and November. On the contrary, scallop landings values are highest in the summer between May and September (although this pattern is less obvious in the 2021 dataset) and squid landings values exhibit a pattern of higher landings values between June and September. Within 2021, there was a peak in ballan wrasse (*Labrus bergylta*) landings values between June and October.



	2016	2017	2018	2019	2020	2021
Crabs (C.P.Mixed Sexes)	£4,138,958	£4,404,264	£4,240,359	£3,223,046	£2,093,738	£2,535,323
Mackerel	£2,395,728	£1,861,760	£6,399,398	£31,418	£177,618	£2,590,815
Haddock	£2,183,979	£1,650,781	£3,602,445	£2,441,363	£1,411,951	£814,616
Cod	£857,281	£1,762,561	£2,646,603	£2,609,710	£745,851	£786,993
Monks or Anglers	£1,747,525	£1,868,494	£1,975,261	£1,505,464	£845,093	£1,311,951
Lobsters	£1,062,131	£871,318	£746,712	£1,049,691	£758,202	£874,765
Herring	£3,197,774	£51,669	£1,196,673	£4,611	£112	£516,812
Scallops	£914,482	£1,085,123	£909,311	£678,637	£376,146	£535,327
Crabs - Velvet (Swim)	£754,576	£345,225	£356,638	£384,138	£393,547	£466,467
Squid	£260,061	£413,831	£657,446	£304,718	£399,345	£101,106
Other	£2,097,396	£1,692,868	£2,448,596	£2,801,849	£2,434,652	£2,152,027

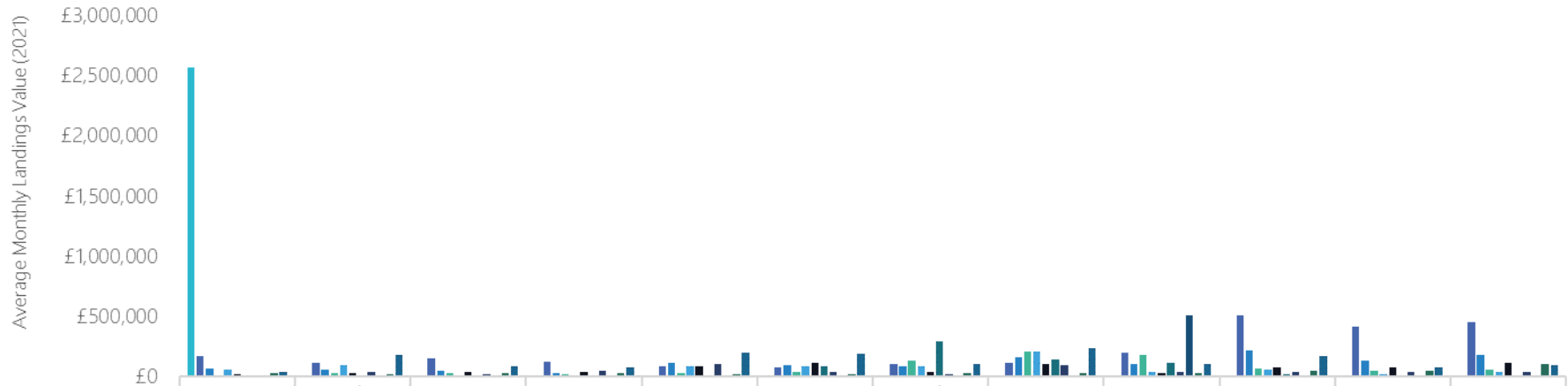
Figure 6-15 Annual landings values (2016 to 2021) for ICES rectangles 46E5, 46E6, 47E5, and 47E6 (MMO, 2021, MMO, 2022a)[6]

[6] *Please note that the 2021 data has been highlighted due to the fact that this data was derived from a different dataset to 2016 – 2020.*



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Crabs (C.P.Mixed Sexes)	£328,978	£201,581	£184,407	£154,901	£140,816	£159,159	£218,546	£243,829	£411,708	£586,421	£518,952	£470,775
Haddock	£144,909	£129,776	£105,619	£111,182	£179,432	£223,481	£181,451	£199,656	£320,183	£316,661	£177,587	£168,166
Mackerel	£1,786,649	£0	£9	£51	£1,239	£5,096	£7,419	£9,130	£6,155	£356,294	£836	£305
Cod	£252,956	£165,077	£98,809	£149,535	£166,238	£139,610	£102,298	£119,028	£119,608	£76,218	£147,999	£187,026
Monks or Anglers	£158,442	£137,565	£118,506	£112,920	£132,065	£71,344	£67,348	£101,905	£155,779	£135,132	£224,137	£173,223
Lobsters	£21,928	£40,597	£43,461	£43,536	£51,796	£49,550	£72,679	£162,883	£124,952	£100,437	£84,820	£100,970
Herring	£0	£0	£0	£0	£0	£0	£110,332	£170,098	£446,128	£163,592	£18	£0
Scallops	£21,310	£50,590	£34,624	£30,710	£145,212	£138,800	£126,064	£116,367	£26,284	£36,591	£38,451	£27,739
Crabs - Velvet (Swim)	£29,950	£26,075	£17,600	£18,333	£23,641	£20,611	£49,016	£28,883	£29,974	£33,354	£51,845	£117,541
Squid	£18,955	£18,126	£9,182	£5,575	£12,591	£144,488	£74,477	£48,015	£22,480	£21,980	£18,269	£12,942
Other	£146,814	£178,046	£162,629	£139,669	£188,115	£187,680	£199,853	£253,582	£303,580	£197,693	£220,503	£116,908

Figure 6-16 Average monthly landings values (2016 to 2020) for ICES rectangles 46E5, 46E6, 47E5, and 47E6 (MMO, 2021)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Mackerel	£2,570,313	£0	£0	£0	£0	£2,154	£6,831	£4,958	£4,554	£1,938	£67	£0
Crabs (C.P.Mixed Sexes)	£168,033	£118,366	£156,441	£122,017	£84,424	£79,681	£107,859	£115,739	£200,356	£511,776	£415,324	£455,309
Monks or Anglers	£67,965	£61,964	£50,327	£31,050	£112,690	£99,913	£86,218	£160,946	£106,972	£218,182	£135,660	£180,064
Lobsters	£15,865	£29,982	£29,632	£22,496	£33,919	£44,325	£129,978	£209,278	£182,035	£68,356	£52,975	£55,924
Haddock	£55,802	£100,183	£14,289	£12,406	£83,160	£85,525	£88,738	£209,705	£42,320	£58,449	£24,524	£39,514
Cod	£22,143	£28,140	£36,381	£36,643	£90,842	£116,705	£43,525	£108,179	£33,242	£74,818	£76,299	£120,076
Ballan Wrasse	£0	£0	£0	£0	£0	£89,135	£293,420	£145,628	£117,796	£22,483	£0	£0
Scallops	£5,937	£36,199	£17,497	£46,951	£103,382	£44,489	£19,251	£93,026	£42,743	£39,170	£42,843	£43,839
Herring	£2,260	£0	£0	£0	£0	£224	£30	£0	£514,297	£0	£0	£0
Crabs - Velvet (Swim)	£28,487	£21,814	£32,548	£31,258	£23,967	£21,439	£34,601	£32,789	£34,020	£48,827	£52,386	£104,330
Other	£43,011	£178,996	£88,396	£75,575	£201,965	£195,075	£101,729	£239,558	£109,207	£171,888	£79,951	£99,320

Figure 6-17 Average monthly landings values (2021) for ICES rectangles 46E5, 46E6, 47E5, and 47E6 (MMO, 2022a)

6.5.1 King scallops annual variation

Scallop landings generally follow a trend of peaks and troughs over seven to ten years. Figure 6-18 displays the annual scallop live weights for the ICES rectangles within the commercial fisheries offshore study area between 2014 and 2021. Overall, live weights in 2020 are the lowest in this time period when the combined live weights across the commercial fisheries offshore study area are considered, which may be partly due to the COVID-19 pandemic. It is notable that the live weights in 2019 were also relatively low compared with previous years. However, in ICES rectangles 46E5, 46E6 and 47E6 experienced an increase in annual live weights in 2021.

The data indicate that the annual live weights for scallops varied by year. Within ICES rectangles 46E5, live weights peaked in 2016 and in ICES rectangle 46E6 live weights peaked in 2018. Across both of these ICES rectangles, there was a gradual decrease in live weights in 2019 and 2020, before increasing again in 2021. Live weights in ICES rectangles 47E5 and 47E6 are generally lower than in ICES rectangles 46E6 and 45E6 and both have experienced a general decline in live weights between 2016 and 2021.

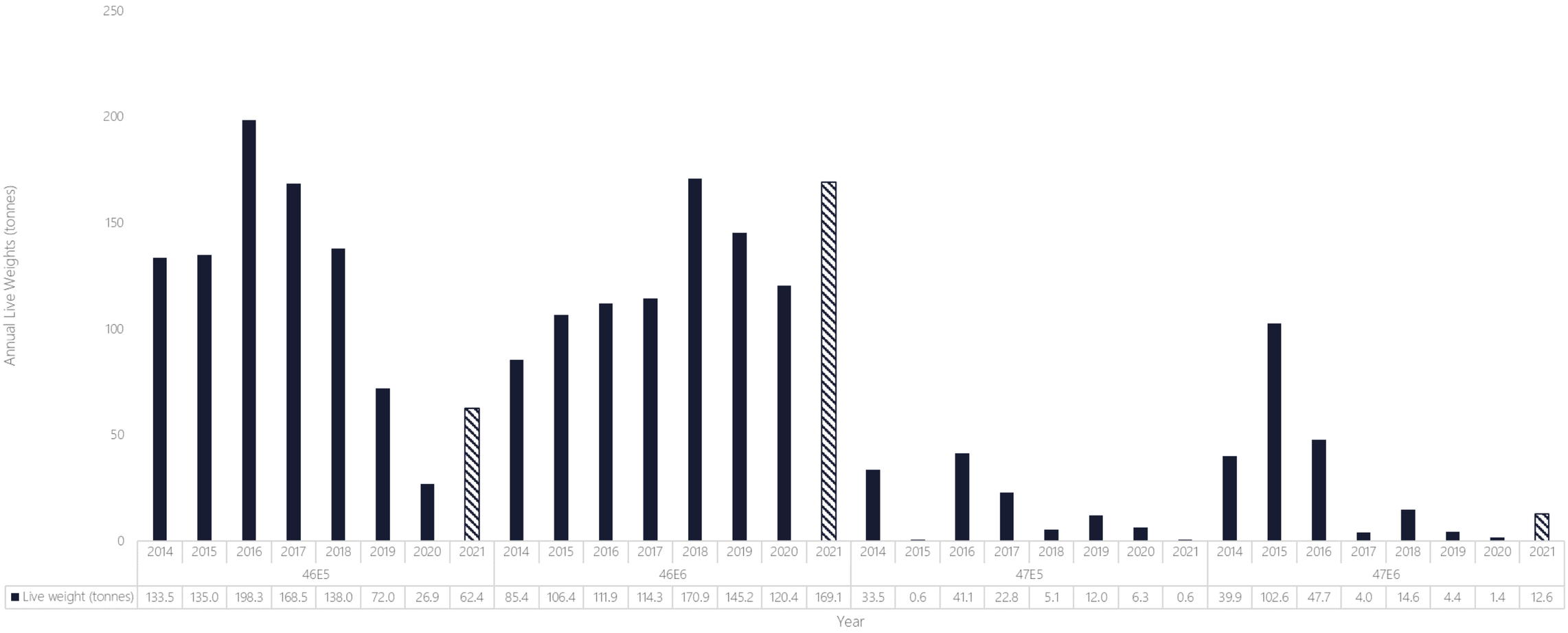


Figure 6-18 Annual landed weights for king scallops (2014 to 2021) for ICES rectangles 46E5, 46E6, 47E5, and 47E6 (MMO, 2021, MMO, 2022a)[7]

[7] *Please note that the 2021 data has been highlighted due to the fact that this data was derived from a different dataset to 2016 – 2020.*

6.6 Non-UK fishing activity

The MMO surveillance sightings data indicate that there are low levels of fishing activity by non-UK vessels in the commercial fisheries study area.

Data on non-UK fishing effort by EU Member States are available through the EU Data Collection Framework database via the STECF. The most recent dataset includes effort data by non-UK vessels from 2014 to 2020. This dataset amalgamates fishing effort by EU vessels and can be queried by gear type and ICES rectangle, but not by country. The most recent dataset with fishing effort by EU vessels, which can be queried by country only, contains data up to 2016.

The annual average fishing effort (days fished) by EU vessels between 2014 and 2020 for the ICES rectangles within the commercial fisheries offshore study area is presented in Figure 6-19. EU vessels primarily utilise pelagic trawls within the commercial fisheries offshore study area, predominantly in the offshore ICES rectangles 47E5 and 47E6. Within ICES rectangle 46E6, the average annual fishing effort by EU vessels is very low, at less than one day of effort per year.

It is important to note that the majority of the offshore Project area is located within the 12 nm limit where there are stricter restrictions on non-UK fishing.

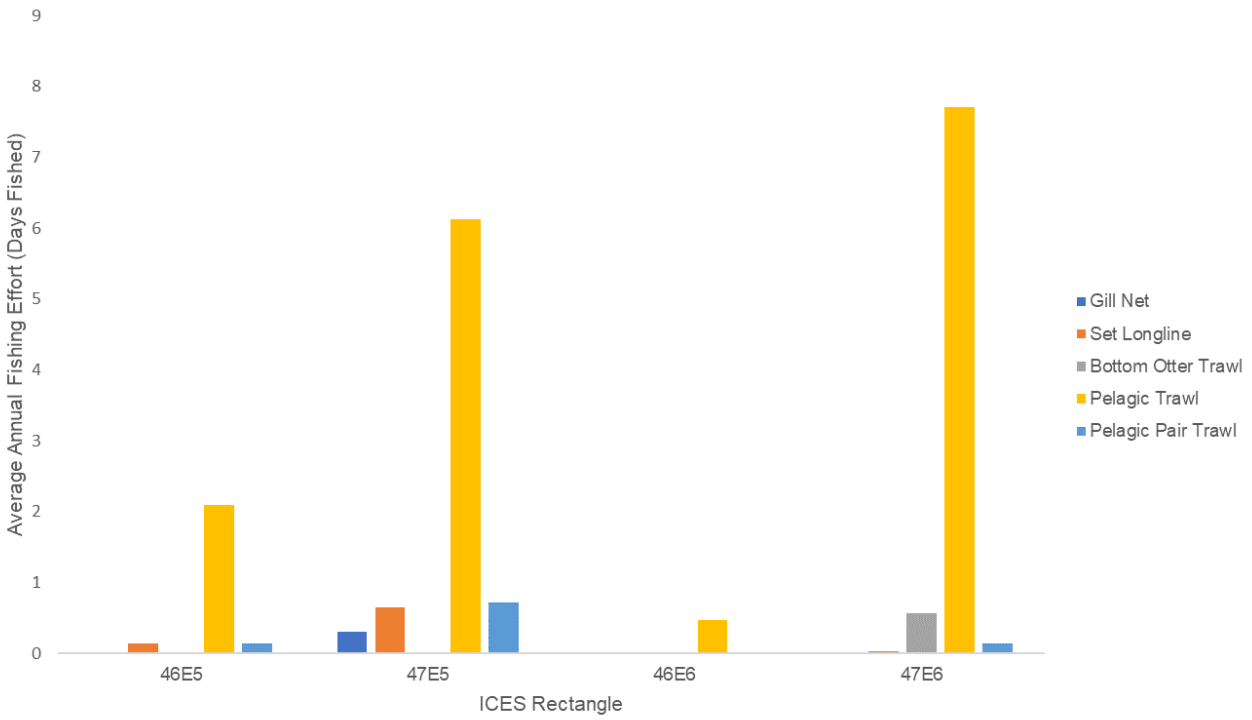


Figure 6-19 EU Annual fishing effort (days fished) (2014 to 2020) (Gibin et al., 2021)

6.7 Summary of fishing activity within the offshore Project area

6.7.1 Key ports

The top 5 ports for highest average landings value include:

- Scrabster;
- Peterhead;
- Stromness;
- Burray; and
- Tingwall.

The top 5 ports for highest average vessel number include:

- Scrabster;
- Peterhead;
- Stromness;
- Kinlochbervie; and
- Fraserburgh.

6.7.2 Key species

The key species caught include:

Table 6-6 Key species caught, gear used for their capture, general area where caught and occurrence of capturing these species in the OAA and offshore ECC

SPECIES CAUGHT	GEAR USED	WHERE CAUGHT	OCCURRENCE
Brown crab and lobster	Pots, creels, traps	OAA, cable route	Frequent
Demersal whitefish (e.g. haddock, cod, monkfish), flatfish, squid	Demersal otter trawls	OAA, cable route (mainly cable route, not as much in OAA)	Occasional
King scallops	Dredges	OAA, cable route	Occasional, more so over cable route
Mackerel, herring	Pelagic trawlers	OAA, cable route	Very rare

6.7.3 Key fleets

The key fleets operational in the commercial fisheries offshore study area include:

- Creels (pots and traps) operating across the commercial fisheries offshore study area, but mainly in ICES rectangles 46E6 and 46E5, targeting brown crab and to a lesser extent, lobster and velvet crab;
- Demersal trawls targeting haddock and cod, and to a lesser extent monkfish / anglerfish and squid, mainly concentrated in the east of the commercial fisheries offshore study area, relevant to the offshore ECC;
- Scallop dredges operating mainly in ICES rectangles 46E5 and 46E6, relevant to the OAA (specifically at Whitten Head Bank) and the offshore ECC; and
- Non-UK fishing activity is expected to occur in the area, mostly Dutch and Norwegian pelagic vessels.

7 FUTURE FISHING ACTIVITY

It is anticipated that as a result of the UK's withdrawal from the EU, gradual changes to quota shares and TACs are expected to result in a decrease in the EU quota share in UK waters.

The future baseline may also gradually change due to changes in:

- Stock abundance (e.g. resulting from range shifts of commercial species driven by climate change (Barange *et al.*, 2018; SFF, 2020);
- Fisheries management measures and licencing;
- Gear technology / efficiency;
- Increasing maintenance costs and/or fuel costs; and
- Market prices (which could drive changes in target species).

Overall, the current baseline described in section 6, which spans five years in most cases, is considered to be generally consistent with the future baseline, whilst recognising the multitude of factors that can alter commercial fishing activity.

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9 ABBREVIATIONS

ACRONYM	DESCRIPTION
AIS	Automatic Identification System
CBRA	Cable Burial Risk Assessment
CES	Crown Estate Scotland
cm	centimetre
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EU	European Union
FEPA	Food and Environment Protection Area
FIR	Fisheries Industry Representative
FLO	Fisheries Liaison Officer
FLOWW	Fishing Liaison with Offshore Wind and Wet Renewables Group
FOIA	Freedom of Information Act
ICES	International Council of the Exploration of the Sea
ICPC	International Cable Protection Committee
kg	Kilogramme
km	kilometre
kW	Kilowatt
m	metres
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
NAFC	North Atlantic Fisheries College
NECRIFG	North East Coast Regional Inshore Fisheries Group
nm	nautical mile
NMPi	National Marine Plan Interactive
OAA	Option Agreement Area
OFA	Orkney Fisheries Association
OWF	Offshore Wind Farm
OWPL	Offshore Wind Power Limited
PO	Plan Option
RBS	Registered Buyers and Sellers

ACRONYM	DESCRIPTION
REM	Remote Electronic Monitoring
SFF	Scottish Fishermen's Federation
STECF	Scientific, Technical and Economic Committee for Fisheries
SWFPA	Scottish White Fish Producers Association
TAC	Total Allowable Catch
UK	United Kingdom
VMS	Vessel Monitoring System

APPENDIX A FISHING GEAR DESCRIPTION, VESSELS AND OPERATING PRACTICES

A.1 Introduction

This section provides an overview of the types of fishing gear that may be used in the commercial fisheries offshore study area.

A.2 Pots/traps/creels

Pots, traps or creels (Figure A-1) are static traps commonly baited with low value fish and are the principal method used to target brown crab, velvet crab and lobster. A number of pots are set on a main line anchored to the seabed and marked at either end with a buoy (fleets). The amount of creels in a fleet can vary from five in some inshore fisheries to over 100 in offshore fisheries. Small, inshore vessels often operate a few fleets whilst larger vessels (like the viviers in the OAA) operate several thousand pots in fleets of around a hundred (Seafish, 2022). These long fleets can be around 2.4 km (1.5 mi) in length. The fleets can be hauled and re-baited daily, though some vessels let the gear 'soak' up to several days.

As static gear, creels have a relatively low potential to interact with subsea infrastructure. Fastening may occur when the gear is being hauled, although under normal circumstances, the mainline or anchors would part before the vessel was destabilised or any significant damage was sustained to the infrastructure to which the gear was attached.

There is potential for the gear to move during bad weather, however, this is a minimal risk (Seafish, 2022).

Figure A-1 Pots and traps (creels). Source: (SWFPA, 2022; British Sea Fishing, 2022)

A.3 Hand lines

Hand line fishing is the use of a rod or handheld line in a similar manner to recreation angling. There are several different methods, including jigging (Figure A-2), bait fishing and trolling, which are usually used by smaller, inshore vessels, either single handed or with very few people on board. The landings are usually on a daily basis in small quantities, in a pristine condition. Species caught with different types of handlines are bass, pollack, mackerel and squid.

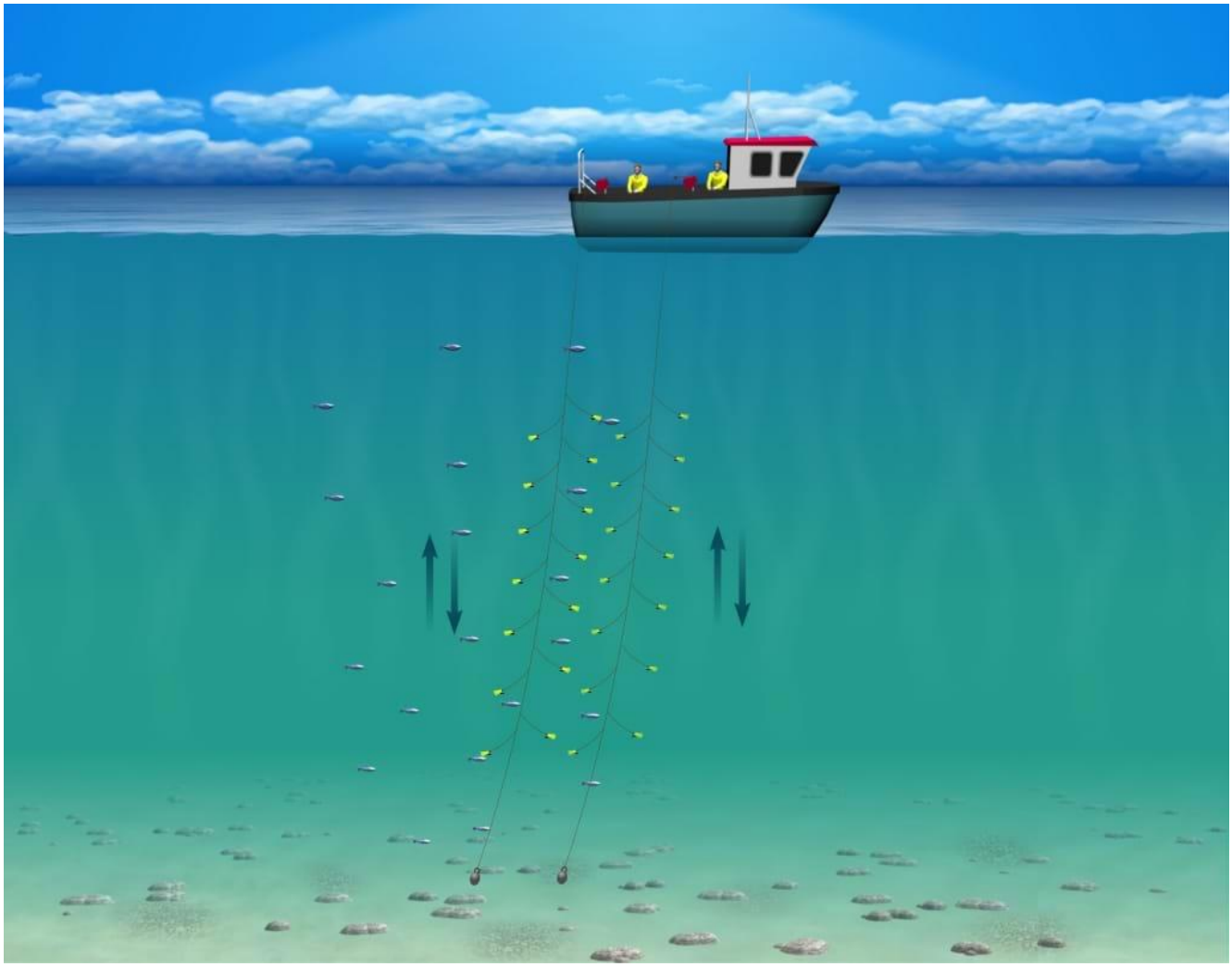

Figure A-2 Mackerel jigging (Seafish, 2022)

A.4 Beam trawling

Most vessels tow two beam trawls, where the beam is supported above the seabed by steel trawl heads (''shoes'') which penetrate the seabed substrate to a maximum of 20 centimetre (cm), depending on seabed type (Figure A-3). The method is used to target flatfish species such as sole and plaice. Beam trawl gear can weigh up to 8 tonnes and are towed at relatively high speeds of up to 7 knots. Rises in fuel costs have led to the development of new beam trawl technologies which are essentially hydrofoils stabilised by a single central shoe.

The combined weight, speed, and increased ground contact of beam trawls during towing means they have a high potential for interaction/fastening with subsea infrastructure. Whether a vessel can pull over the infrastructure and the potential damage inflicted will depend on the engine power and height of the infrastructure and the gear above the seabed. Certain circumstances, such as a single beam fastening in heavy seas, present a considerable risk of the vessel becoming destabilised and capsizing.

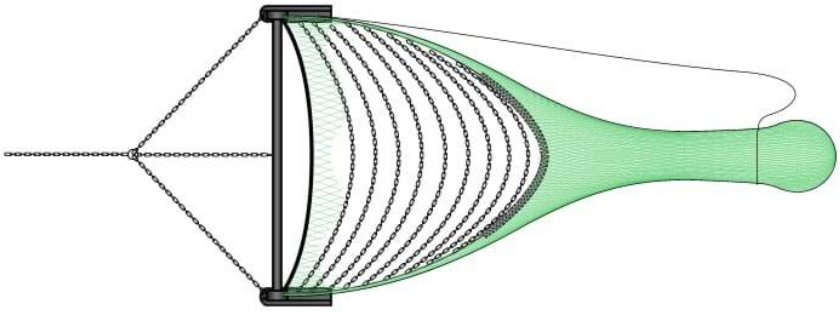

Figure A-3 A beam trawl net (Seafish, 2023a)

A.5 Demersal otter trawling

The spread of a single demersal trawl net is maintained by trawl doors ('otter boards'), which penetrate the substrate to a maximum of 20 cm (Figure A-4). Vee type otter boards are the most common door type, typically weighing between 500 – 1,000 kilograms (kg).

Twin rig trawls operate on the same principles as a single rig demersal otter trawl with the addition of an extra net. The spread of the outer wings of the nets are maintained by the otter boards, with the inner wings attached to a heavy central weight known as a 'clump' weight towed on a third central warp. Both single and twin rig trawls are used to target demersal fish species and *Nephrops*.

Pair trawlers are two vessels towing one trawl net, where the trawl nets are kept open through the vessels maintaining a distance between each other.

Trawl doors are the component most likely to fasten under subsea infrastructure, particularly when destabilised. Clump weights present a lower fastening risk but are capable of displacing protection or damaging exposed infrastructure.

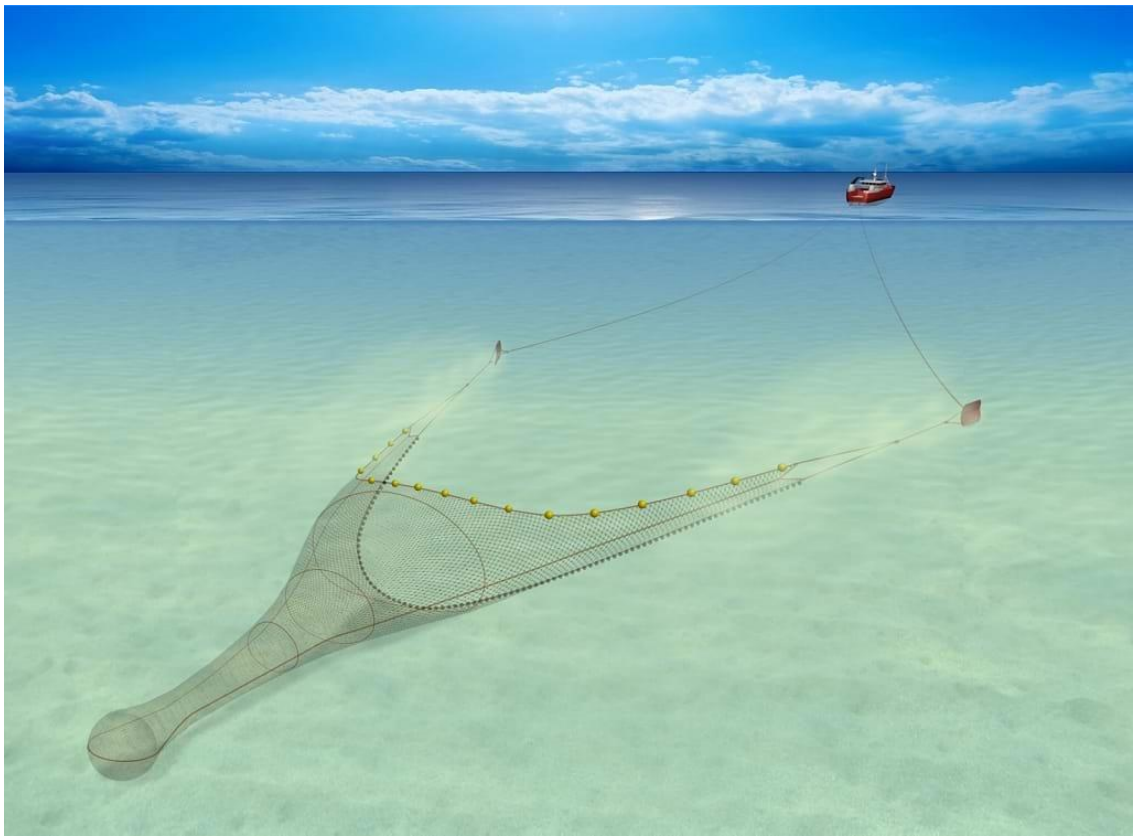

Figure A-4 A demersal otter trawl net (Seafish, 2023b)

A.6 Pelagic trawling

The spread of a pelagic trawl net (Figure A-5) is maintained through trawl doors, and the horizonal opening through a clump weight. The net is positioned within the water column and is therefore not touching the seabed. The nets can be very large, up to 200 m wide and 150 m deep. Pelagic trawls are used to catch pelagic fish like herring and mackerel.

Pelagic trawling either happens single, with one vessel towing one net, or in a pair, with two vessels towing one net.

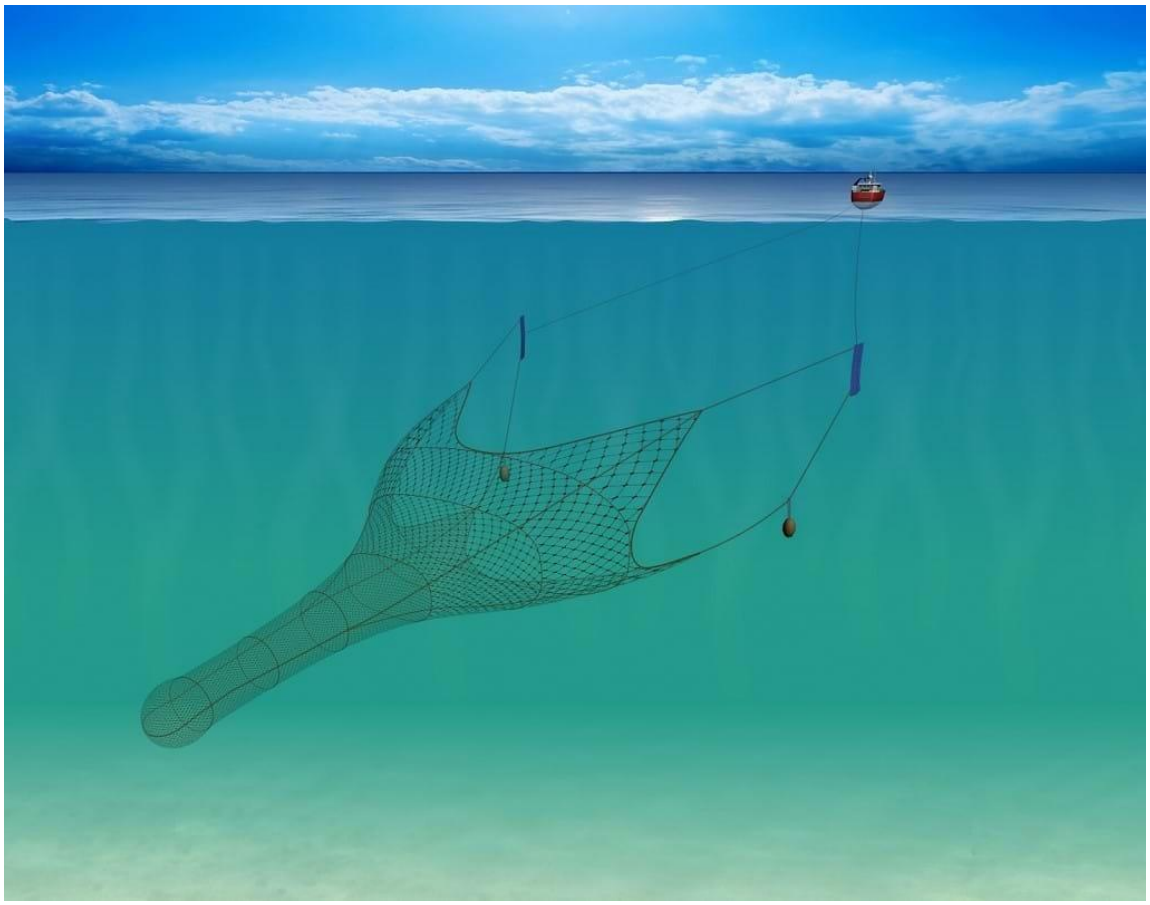

Figure A-5 Pelagic trawl net (Seafish, 2023c)

A.7 Scallop dredging

Newhaven scallop dredges (Figure A-6) consist of a toothed bar with a grid or chain belly to the gear and a nylon mesh bag. The gear is deployed in groups (typically 3-12 dredges on one or two bars, maximum of 22 dredges per side on larger vessels) from a towing beam which is towed along the seabed. A 'French dredge' consists of a 2 m wide dredge with fixed teeth (spaced approximately 9 cm apart). Both gears operate in a similar fashion by raking the seabed, disturbing the shellfish which in-turn are collected in the trailing bag. The teeth penetrate to a depth of between 5 and 10 cm depending on the sediment type. These gear types are highly susceptible to snagging on shallow buried or exposed subsea infrastructure but can also cause significant damage to subsea cables as the gear is heavy and robust.

The number of dredges that can be deployed is dictated by the Regulation of Scallop Fishing (Scotland) Order 2017 with different requirements for within and outwith the 12 nm limit. Under these regulations, in order to operate a scallop dredge within 12 nm of the Scottish coast, the vessel must either:

- Ensure that any tow bar deployed is no longer than 7.5 metres in length; no more than 2 two bars are deployed at any time; and no more than 8 dredges are towed per side at any time; or

- A fully functioning Remote Electronic Monitoring (REM) system (GPS, winch sensors & cameras) is installed on-board that allows analysts in Marine Scotland Compliance to verify the number of dredges being deployed at sea. Vessels with an appropriate REM system can fish with up to 8 dredges per side in the 0-6 nm zone, and with up to 10 dredges per side in the 6-12 nm zone.

These dredge restrictions are currently in force to help control and monitor dredge effort in the 0-12 nm zone (Marine Scotland, 2022).

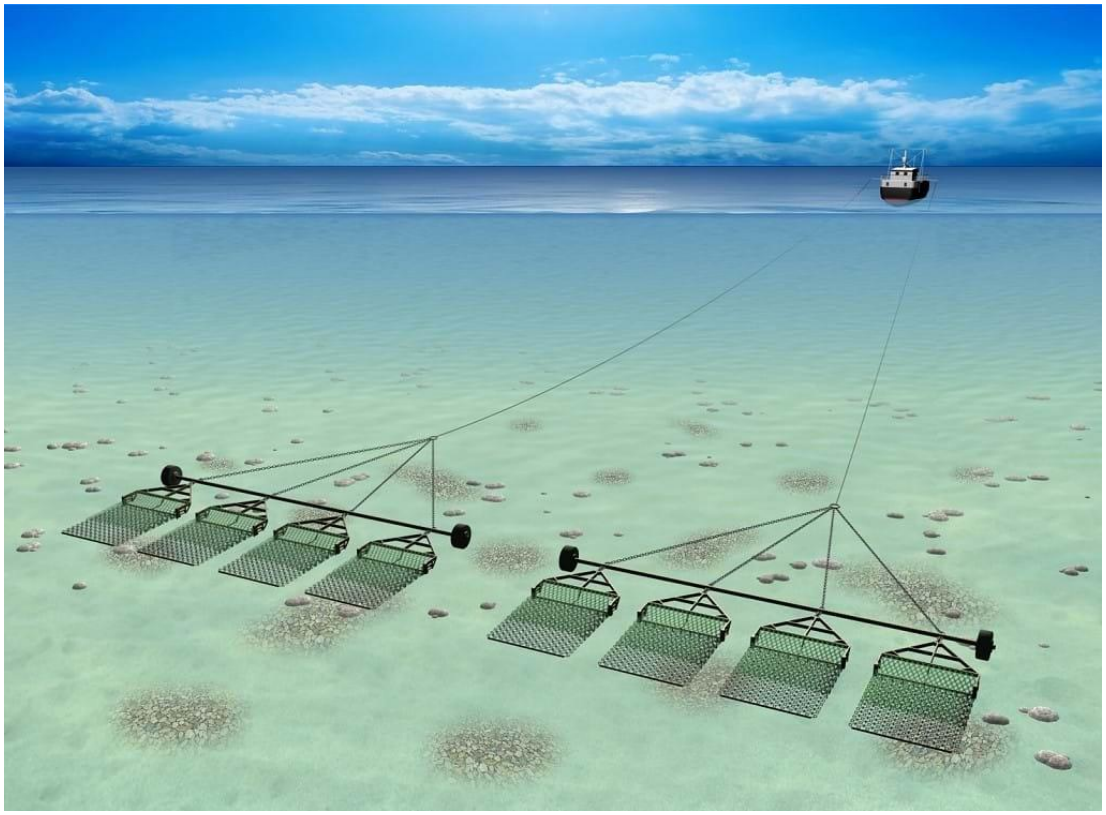

Figure A-6 A scallop dredge net (Seafish, 2023d)

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