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Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

Annex 9-1: Commercial Fisheries Technical Report

June, 2018, Revision A

Document Reference: 6.4.9.1

Pursuant to: APFP Reg. 5(2)(a)

Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

Annex 9-1: Commercial Fisheries Technical Baseline

June 2018

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Date of Approval	June 2018
Revision	A

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Volume 4: Offshore Annexes

Annex 9-1: Commercial Fisheries Technical Report

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Ref	Issue	Author	Checked	Approved	Issue Date
TECommFishTR 6.4.9.1	**1**	JM	JK		25/04/2018

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Abbreviations

Abbreviation	Definition
BMM	Brown & May Marine Limited
CCTV	Closed Circuit Television
CFP	Common Fisheries Policy
CNPMEM	Comité National des Pêches Maritimes et des Élevages Marins
CRPMEM	Comité National des Pêches Maritimes et des Élevages Marins
EC	European Council
FDF	Fully Documented Fisheries
ICES	International Council for the Exploration of the Sea
IFCA	Inshore Fisheries and Conservation Authority
IFREMER	Institut Français de Recherche pour L'exploitation de la Mer
KEIFCA	Kent and Essex Inshore Fisheries and Conservation Authority
MLS	Minimum Landing Size
MMO	Marine Management Organisation
PEI	Preliminary Environmental Impact
PO	Producers' Organisation
RTC	Real Time Closures
SMP	Square Mesh Panels
TAC	Total Allowable Catch
TFA	Thanet Fishermen's Association
TOWF	Thanet Offshore Wind Farm
UK	United Kingdom
VMS	Vessel Monitoring System

1.0 Introduction

This document forms the technical report for commercial fisheries for Vattenfall Wind Power Limited's Thanet Extension Offshore Wind Farm ("the proposed development") off the coast of Kent. It provides a baseline of commercial fishing activities on a national, regional and local basis. For the purposes of this report, commercial fishing is defined as the legitimate capture of finfish and shellfish to be sold for profit by a licensed fishing vessel.

The approach for evaluating the existing baseline has been to provide an overview which identifies the fishing grounds within the vicinity of the project that will potentially be impacted by the installation and operation of the proposed development. International Council of the Exploration of the Sea (ICES) rectangles have been used to provide a general overview of fishing activity in the area of the proposed development. ICES rectangles are the smallest spatial unit used for the collection and analysis of fisheries statistics by the European Commission (EC) and Member States. ICES rectangles cover approximately 900nm^2 and align to 30' latitude by 1° longitude. The area of an ICES rectangle is considerably greater than that of the proposed development. Furthermore, it is presumed that activity within a rectangle is not evenly distributed. Specific fishing grounds in the immediate vicinity of the proposed development have therefore been identified where possible.

Commercial fishing in the southern North Sea is a diverse and constantly changing industry, subject to a wide variety of fishing legislation and regulations which can be altered and implemented at relatively short notice. Other factors, such as variations in target species, weather, fluctuations in market prices and operating costs, can influence the commercial fisheries baseline both spatially and temporally. Predicting future changes to the commercial fisheries baseline identified in this report is therefore difficult and as such potential sources of variation should be accounted for.

There is currently no single data set, source or model which can determine patterns of commercial fishing activity within relatively small sea areas. As a consequence, the baseline has been compiled using data and information obtained and derived from a number of

sources. Due to the varying formats the data has been provided in however, these cannot be assessed simultaneously and each data set has therefore been analysed separately.

The proposed development will be, up to 340 MW, project with up to 34 wind turbines a minimum of 8 km from the closet land point, the Isle of Thanet. The foundation type is yet to be confirmed with monopoles, tripods, quadropods (piled or suction caisson), gravity base and floating options being assessed.

1.1 Identification of Study Area

The regional study area for the assessment of commercial fishery activities in the vicinity of the proposed development is shown in Figure 1.1. The regional study area covers rectangles 31F1, 31F2, 32F1 and 32F2, whilst the proposed development is located within ICES rectangle 31F1 (the local study area).

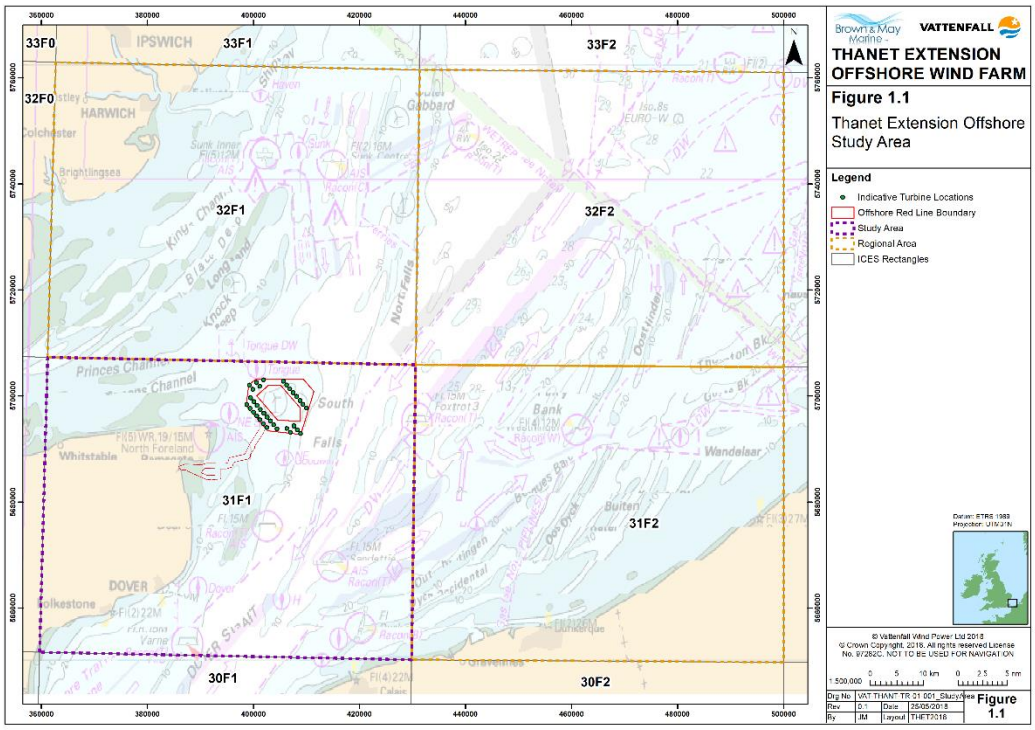


Figure 1.1 Regional and local study area in relation to the proposed development (indicative layout)

The proposed development, is located in ICES Division IVc (Southern North Sea). Fisheries data are recorded, collated and analysed by ICES rectangle within each division. As mentioned

previously ICES rectangles are the smallest available units for collation of fisheries data and are therefore used to define the analysis areas for the proposed project.

There is currently one landfall locations being considered for the Offshore Export Cable Corridor (OECC): Pegwell Bay or Sandwich Bay. The proposed development is located within the 12nm limit along the Kent coast, near Ramsgate.

2.0 SOURCES OF DATA AND INFORMATION AND THEIR LIMITATIONS

There is no single data source or model for establishing a commercial fisheries baseline within small, discrete sea areas such as offshore wind farms. Therefore, accurate characterisation of a commercial fisheries baseline requires an approach whereby data and information should be derived from a number of sources, including:

- Marine Management Organisation (MMO), UK ;
    - Surveillance sightings data (averaged over the period 2012 to 2016);
    - Fisheries landings values and effort data (2007 to 2016);
- Belgian Institute for Agricultural and Fisheries Research (ILVO) (2010-2014);
- French Institute of Research for the Exploration of the Sea (IFREMER) (where available) (2008-2009, 2014);
- Netherlands, Institute for Marine Resources and Ecosystems Sturdies (IMARES) (2007-2016);
- UK fishermen and fishermen's representatives;
- Belgium fishermen and fishermen's representatives;
- French fishermen and fishermen's representatives;
- The Netherlands fishermen and fishermen's representatives;
- Kent & Essex Inshore Fisheries and Conservation Authority (KEIFCA); and
- Local MMO officers – Hastings office.

The data and information used are subject to varying degrees of sensitivities, coverage and limitations and therefore, separate analysis is required in each instance.

In order to ensure that all fishing activities over a sufficient period were identified, ten years of data (where available) were initially analysed to give an annual overview between 2007 and 2016. Subsequent to this yearly summary, in order to more accurately reflect recent activity when averaging years, a subset of data from a five-year period (2012-2016) have been used to illustrate current methods and levels of activity.

Full details of the data sources used in this report, how they are gathered and compiled can be found in Appendix 1.

2.1 Consultation

Data and relevant information has been gathered from a range of sources including via consultation. Information collected from fishermen and their representatives has contributed to the establishment of this commercial fisheries baseline. The information provided assists in the identification of specific fishing activity in the vicinity of the proposed development.

The Thanet Fishermen's Association (TFA) was tasked by Vattenfall Wind Power Ltd to undertake the local consultation with fisheries stakeholders as the majority of fishermen who operate in this area are members of this association. However, to ensure accurate coverage, TFA were requested to contact other fishermen from the Greater Thames and Kent fleet, who are unaffiliated to TFA but that may work these grounds. This consultation was primarily undertaken by Merlin Jackson of the TFA (and also the Fisheries Liaison Officer) and focused on collation of local information on fishing grounds, species targeted and methods used.

Table 2.1 provides a summary of the consultation undertaken by TFA and BMM with UK commercial fishing stakeholders.

Table 2.1 Summary of UK stakeholder consultation

Consultees	Role / Organisation	Consultation date
Fisherman 1	Ramsgate Fisherman TFA	2016
Fisherman 2	Ramsgate Fisherman TFA	2016
Fisherman 3	Ramsgate Fisherman TFA	2016
Fisherman 4	Ramsgate Fisherman TFA	2016
Fisherman 5	Ramsgate Fisherman TFA	2016
Fisherman 6	Ramsgate Fisherman TFA	2016
Fisherman 7	Ramsgate Fisherman TFA	2016
Fisherman 8	Ramsgate Fisherman TFA	2016
Fisherman 9	Ramsgate Fisherman TFA	2016
Fisherman 10	Ramsgate Fisherman TFA	2016
Fisherman 11	Ramsgate Fisherman TFA	2016
Fisherman 12	Ramsgate Fisherman TFA	2016
Fisherman 13	Ramsgate Fisherman TFA	2016
Fisherman 14	Ramsgate Fisherman TFA	2016
Fisherman 15	Broadstairs Fisherman TFA	2016
Fisherman 16	Margate Fisherman TFA	2016
Fisherman 17	Whitstable Fisherman TFA	2016
Fisherman 18	Whitstable Fisherman TFA	2016
Fisherman 19	Ramsgate , non TFA	2016
Tom Clegg	Kent and Essex IFCA	28th April 2017
Merlin Jackson	TFA and FLO	April & November 2017

In addition, non-UK stakeholder consultations have been carried out by Brown and May Marine (BMM). This has involved face-to-face meetings with representatives of national fishermen's associations or Producer Organisation managers to understand their levels of activity, size of fleet, gear types and seasonality of landings in relation to the proposed development.

Table 2.2 provides a summary of the consultation undertaken by BMM with non-UK commercial fishing stakeholders. The comments and responses are detailed in the Commercial Fisheries Environmental Statement (6.2.9).

Table 2.2 Summary of non –UK stakeholder consultation

Consultees	Role / Organisation	Consultation date
Pim Visser	VisNed Chief Executive	13th February 2017
Sander Meyns, Jasmine Vlietinck	Rederscentrale – Producer Organisation Manager	13th March 2017
Antony Viera, Olivier Lepretre	CRPMEM, Boulogne sur Mer	14th March 2017

Consultation with the local MMO office has not occurred. Attempts were repeatedly made to arrange a consultation but this was not possible due to logistics or minimal response.

2.2 Fisheries Controls and Legislation

The UK's commercial fishing industry is subject to a range of constraints and legislation which are set by the EC, UK government, MMO and local authorities. The majority of such measures have a direct and significant impact on fishing effort, and therefore on landings weights and values. Furthermore, many regulations are implemented at short notice with limited consultation, reducing confidence in predicting future trends.

The main bodies regulating the relevant fisheries in the proposed development are the EU through the Common Fisheries Policy (CFP), the MMO through national and regional regulations and IFCAs (whose jurisdiction is out to 6nm) through local byelaws and Regulating Orders. In the case of the proposed development, it is managed by the Kent and Essex IFCA.

It should be noted that legalisation is likely to be reviewed as part of the "Brexit" negotiations currently being undertaken. It is presently unclear what changes, if any, will be implemented. In the meantime, EU regulations, and in particular the CFP, will still be enforced.

Full details of the legislation can be found in Appendix 2.

3.0 OVERVIEW OF FISHING ACTIVITY

3.1 Gear types and operating practices

3.1.1.1 Potting

Potting and trapping for crab, lobster and whelks occurs throughout the southern North Sea although the design of pots may vary depending on region and target species. In general, all pots have one or more "funnel" shaped entrances for the shellfish to enter (Plate 3.1).

Parlour pots are generally used for the capture of crabs and lobster with pots baited, usually with fish. Pots are rigged in fleets of between 10 and 50 pots per fleet (in a string) depending upon the vessel size and the area to be fished. Ramsgate fleet deploys around 20-25 lobster pots per string due to smaller vessel size. Lengths of a fleet (or string) of pots may range from 100 to 500 metres, anchored at each end with either an anchor or chain clump weights. A variety of surface markers are used including flagged dhans (marker flags), buoys and cans. Soak times, the time between baiting and deployment to emptying and harvesting, varies from approximately 12 hours to two days, although this can be longer during periods of adverse weather.

Whelks are generally harvested using a purpose designed pot or, more often, a modified and weighted 25 litre plastic drums. The number of whelk pots in a fleet can be higher than for crab and lobster, with up to 80 pots per fleet. Fleets are generally similar lengths to those used for crab and lobster potting but can be longer.

Vessels engaging in potting are generally under-10 m in length, with crew members varying from one to three.

Plate 3.1 Whelk pots (left) and "parlour" pots (right) used to target whelks and lobsters (source: BMM 2016, 2013)

3.1.1.2 Gillnetting

Gillnets (Figure 3.1) which can be either fixed or drifting, are a series of monofilament nets joined together to form fleets which can be up to 1200 m in length. As with fleets of pots, at each end of the fleet of nets are surface marker buoys. Gillnets can either be single panels of monofilament nets, which are also called tangle nets, or trammel nets which comprise of a smaller mesh inner net with larger mesh net panels either side of it. Fixed nets are set either in line with the tidal flow or across it and are normally only deployed on neap tides. Drift nets are deployed across the tide and left for a period of normally three to six hours to drift over the seabed with the tidal current.

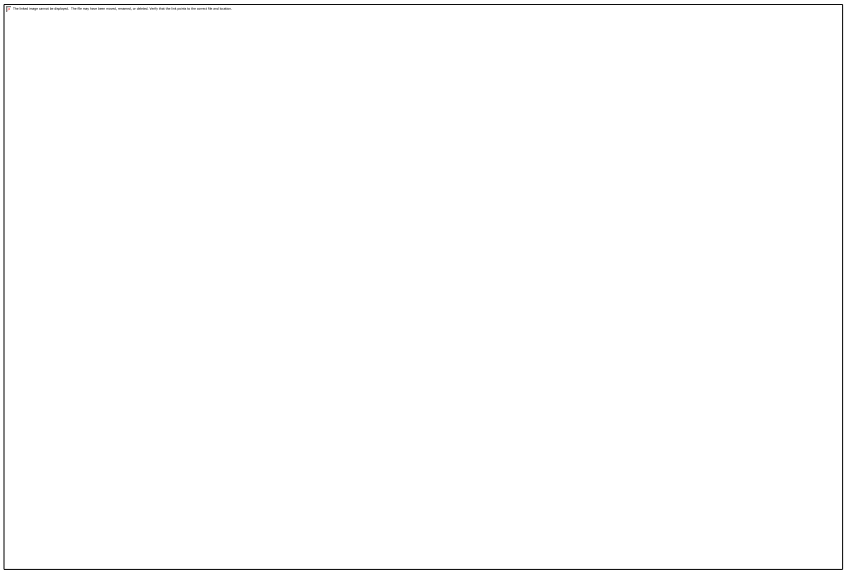


Figure 3.1 A bottom set gillnet (source: Galbraith & Rice, 2004)

3.1.1.3 Mechanised and Suction Dredging

The traditional method for harvesting bivalve shells is to beach a flat-bottomed vessel on a known cockle bed, wait for low tide and then individuals rake or dredge cockles out of the sand. The alternative, mechanised, way is the use of a hydraulic suction dredger (Plate 3.2). This consists of a cone shaped dredge connected directly to a 'solids lift' pump on the vessel. The cockles are displaced from the sediment using water jets and then lifted to the deck using the solids lift pump, where they are riddled and the small cockles returned to the sea.

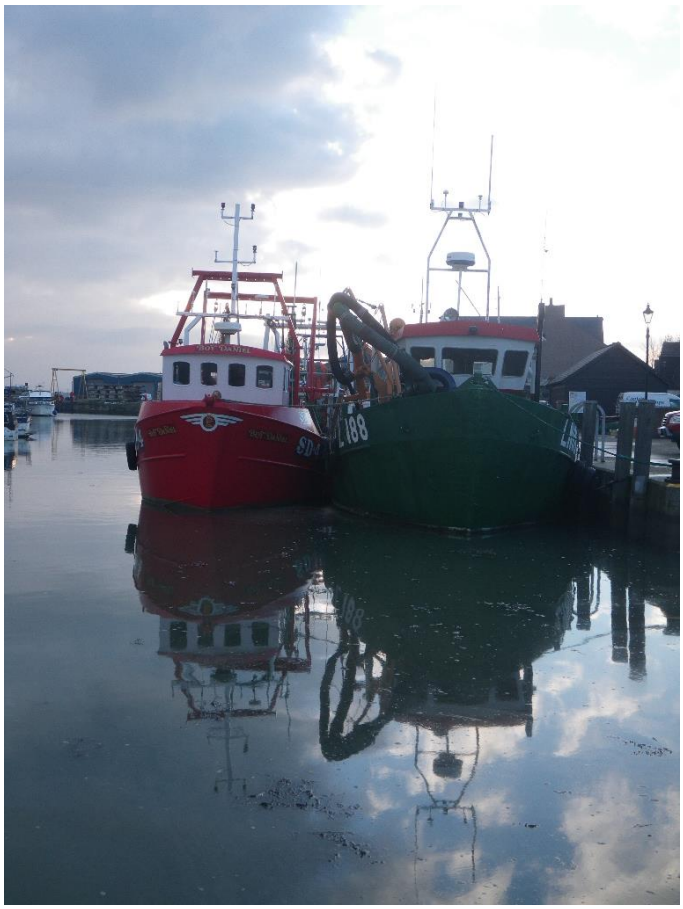


Plate 3.2 Suction Dredger in Queenborough (Source: BMM, 2013)

3.1.1.4 Beam Trawling

Beam trawling targets flatfish, predominantly sole and is undertaken primarily by Belgian vessels. Other whitefish species are also caught but to a lesser extent.

Beam trawls comprise of steel beams held off the seabed by shoes or rollers at each end, onto which a net is attached (Figure 3.2and Plate 3.3). The net is attached to the beam by the headrope and to the shoes by the footrope; this in turn keeps the trawl open. The headline height is limited by the height of the shoes/rollers. The beam is towed using three chain bridles that attach to the shoes and beam and is towed from the vessels outrigger booms either side of the boat.

Vessels operating on soft sediments often use tickler chains; these are attached in front of the mouth of the net. These chains disturb the fish so they rise off the seabed to be caught in the net. When operating in areas of hard, rocky substrate, chain mats are used and are normally operated by the larger class of vessels. A lattice work of chains is attached to the beam and footrope, guiding the net over rough ground and boulders and therefore minimising damage to the net.

Beam trawls can range in length from 4 to 12 metres. Some smaller vessels deploy one beam from the stern with larger vessels operating a beam on each side of the vessel. Due to the size and weight of beam trawl gear this method of fishing has high running costs, particularly due to fuel consumption. The fully rigged (in air) weights of beam trawls used in the area can vary from 5.2 to 8.2 tonnes, although there has been a move to reduce weights and therefore drag due to increasing fuel costs.

Towing directions are influenced by a number of factors such as seabed contours, tidal flow direction, weather and the need to avoid fasteners. In the event of gears becoming fast, a number of tactics can be deployed in attempts to recover them. These can include increasing engine revolutions, hauling on the winch and manoeuvring the vessel. In the worst case, when gear is lost due to towing warps parting, the normal practice is to deploy a grapple and tow a search pattern over the area where the gear was lost.

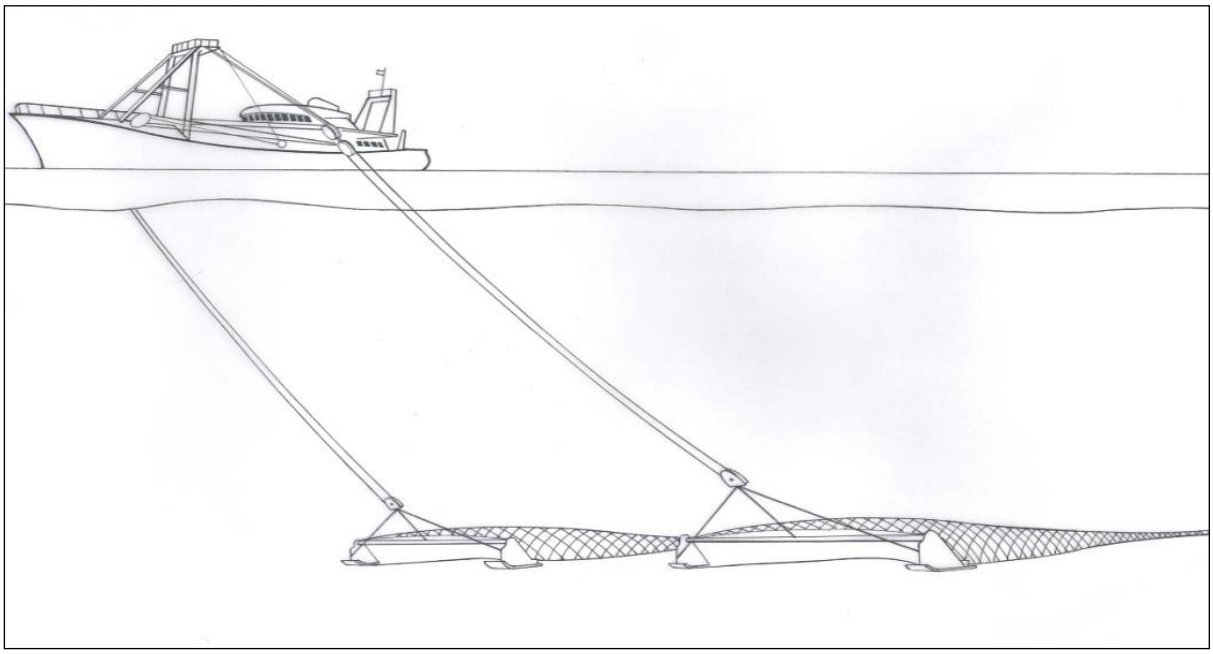


Figure 3.2 A beam trawl (source : BMM)

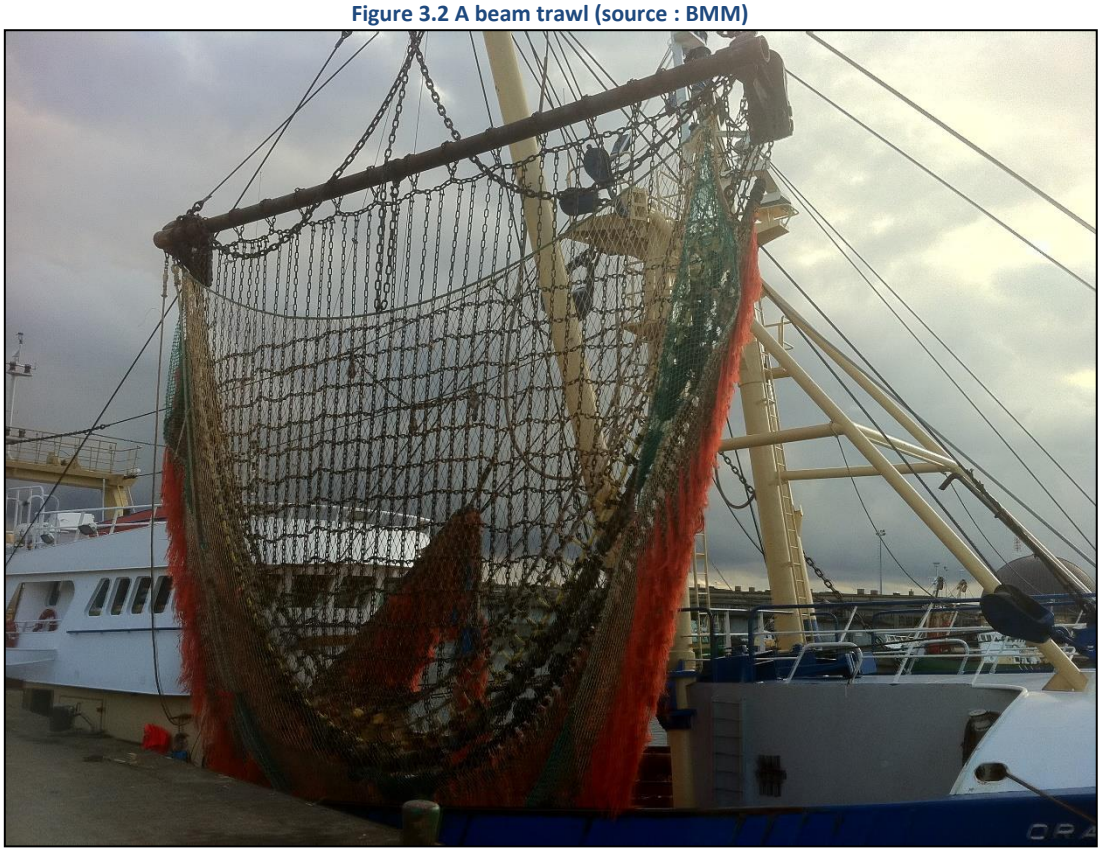


Plate 3.3 Traditional beam trawl with tickler chains and chain mat (source: BMM, 2012)

3.1.1.5 Demersal Otter Trawling

Otter trawl gear (Figure 3.3) features a basic funnel shaped net tapering towards the cod-end, with the sides of the net extended to form wings which herd the fish into the net. The net is held open by trawl doors which are designed to flow through the water at an angle causing them to spread away from each other and therefore opening the net horizontally. The net is held open vertically by the ballooning effect of the net and by a series of floats attached to the headline. The ground lines of nets are weighted to maintain contact with the seabed and can vary in size and design depending on the type of ground fished.

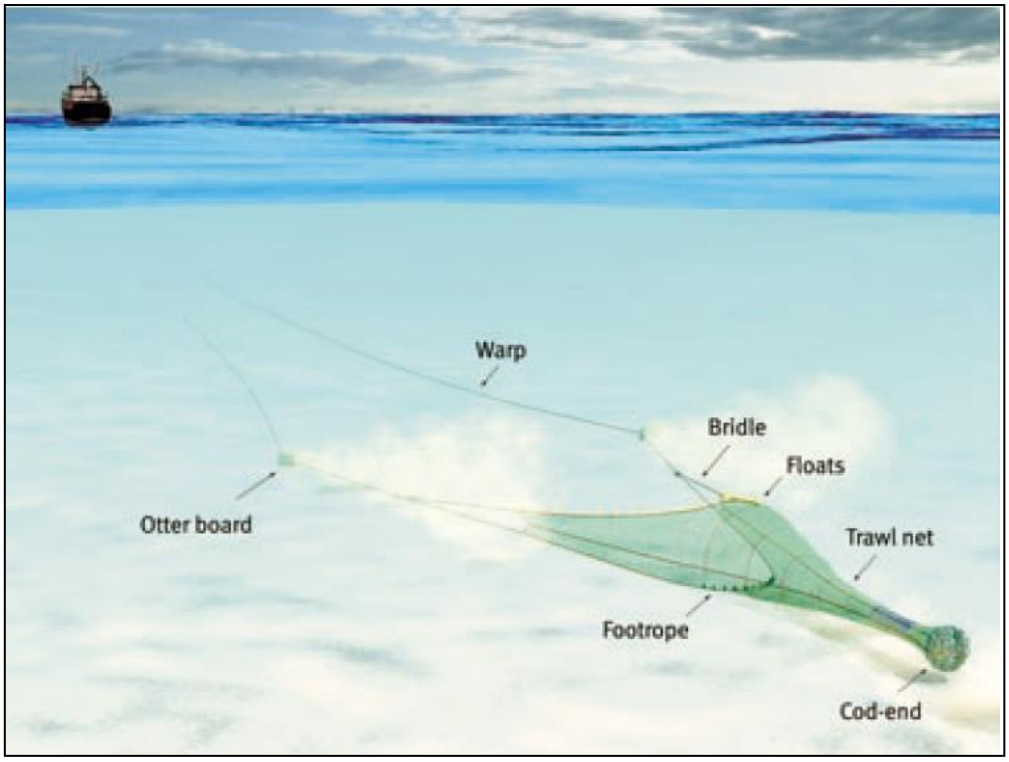


Figure 3.3 A typical otter trawl (source Galbraith & Rice, 2004)

3.1.1.6 Otter Trawling – Single Rig

Otter trawls are used to target plaice, sole and rays from spring to autumn and cod and whiting during the winter season. The activity generally involves deployment of a single net trawling with effective gear widths (i.e. the distance between the trawl doors) from between 25 m for smaller, under-10 m vessels and 65 m for the larger, over-15 m vessels. Otter trawl towing speeds over the ground are generally between 2.5 and 3.5 knots, depending on the areas of seabed, state of tide and the weather conditions (Figure 3.3).

3.1.1.7 Otter Trawling – Twin Rig

Vessels targeting demersal species generally operate a twin rig otter (Figure 3.4) with gear trawled close to the seabed on softer grounds to the otter trawls described previously. The main advantage of towing two nets is that the area swept is greater and hence the catch. The set up allows a larger area of seabed to be covered without towing an increased area of netting. As with a single trawl, the trawl doors provide the spread. A third warp runs from the boat to the clump, a weighted piece of metal designed to roll along the seabed.

With both methods of otter trawling, the mesh size of the cod-end can range between 70 – 110 mm; this is dictated by regulations regarding target species and the area fished.

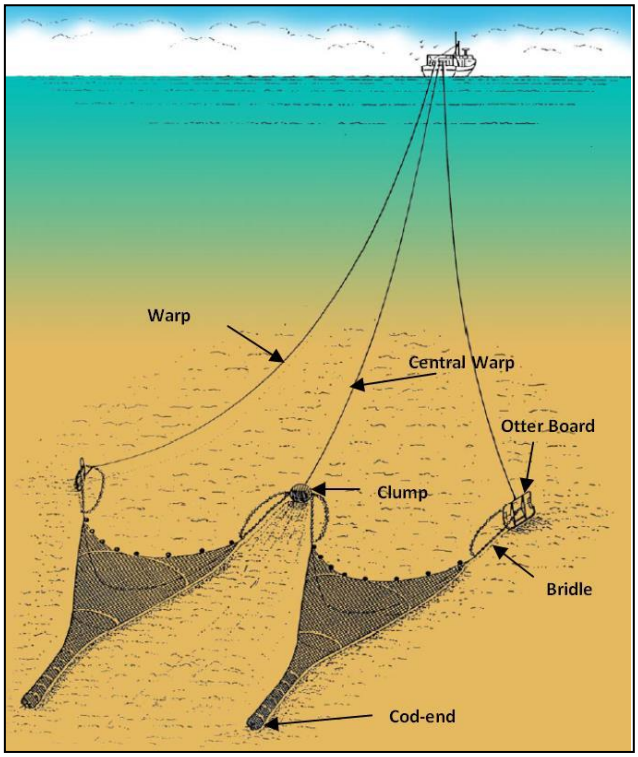


Figure 3.4 A Twin rig trawl (source: SeaFish, 2005)

3.1.1.8 Scottish Seine Netting (Single and Pair)

Scottish seines are traditionally used to target demersal species on sandy substrates. Due to the changes in the fishing industry and increasing restrictions, new seine net vessels are generally built as multi-purpose seine netter/trawlers, allowing them to alternately target species on sandy and rocky substrates, thus increasing their catch capability.

Scottish seine netting involves surrounding the fish by warps laid out on the seabed with a trawl shaped net at mid-length (Figure 3.5). As the warps are hauled in, the fish are herded into the path of the net. The warps are usually very long (up to 3 km per side) and set in the water to ensure that as many fish as possible are driven or herded towards the opening of the net. The design of seine nets consists of two wings, a body and a bag and is very similar to that of trawl nets (Figure 3.6).

Scottish seine netting can be undertaken by either one or two vessels towing one net. Historically, seine net vessels were equipped with much lower power engines than their trawler counterparts, making them quieter when fishing. Seine netting also produces a higher quality of catch and is more fuel efficient than bottom otter trawlers.

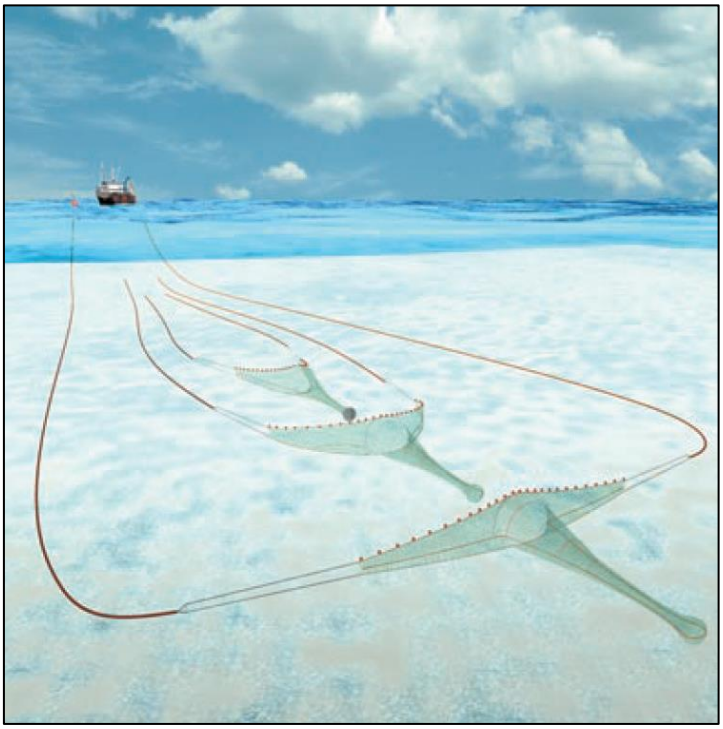


Figure 3.5 Scottish seine net (source: Galbraith & Rice, 2004)

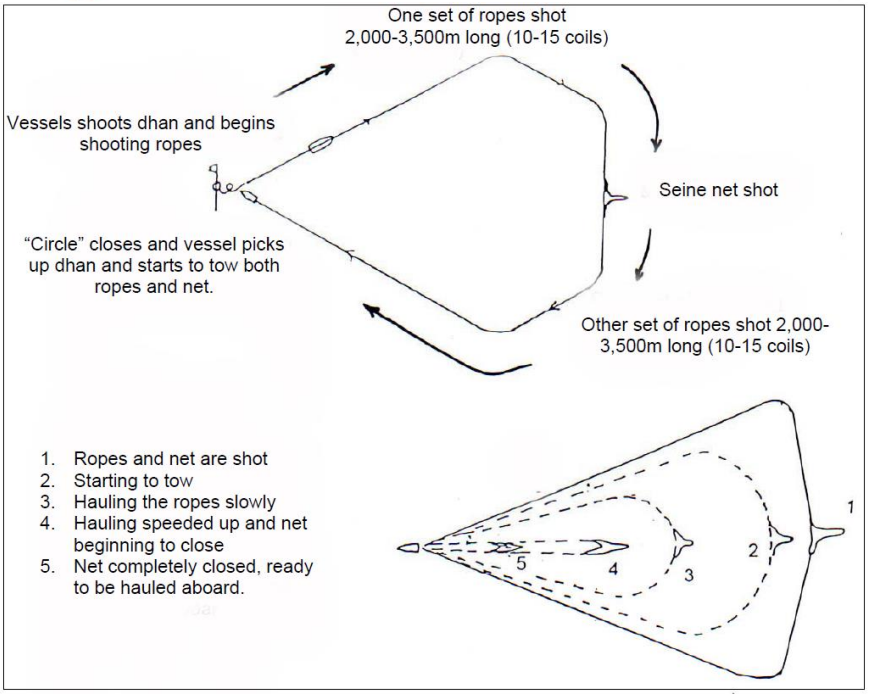


Figure 3.6 Scottish seine net operation

3.2 Surveillance Sightings

The distribution of surveillance sightings of fishing vessels recorded in the local and regional area of the proposed development is shown by nationality and method (gear type) in Figure 3.7. It should be noted that surveillance sightings do not accurately describe the levels of fishing activity, but purely give an indication of the proportions of activity by vessels of specific gear types and nationalities.

There is a range of fishing activities undertaken by UK vessels as well as those from a number of other nation states. Due to the proposed development being within 12 nm of the coast, many of the local vessels, which are under 10 m or 10-15 m in length, operate within and near to the existing Thanet Offshore Wind Farm. The Belgian and French fleets have historic fishing rights between the 6 and 12 nm limits and therefore have access to parts of the proposed

development area (see Appendix 2). The UK, Belgian, French and Dutch fleet surveillance sightings are detailed further in sections 3.3.7, 3.4.3, 3.5.2 and 3.6.3 respectively.

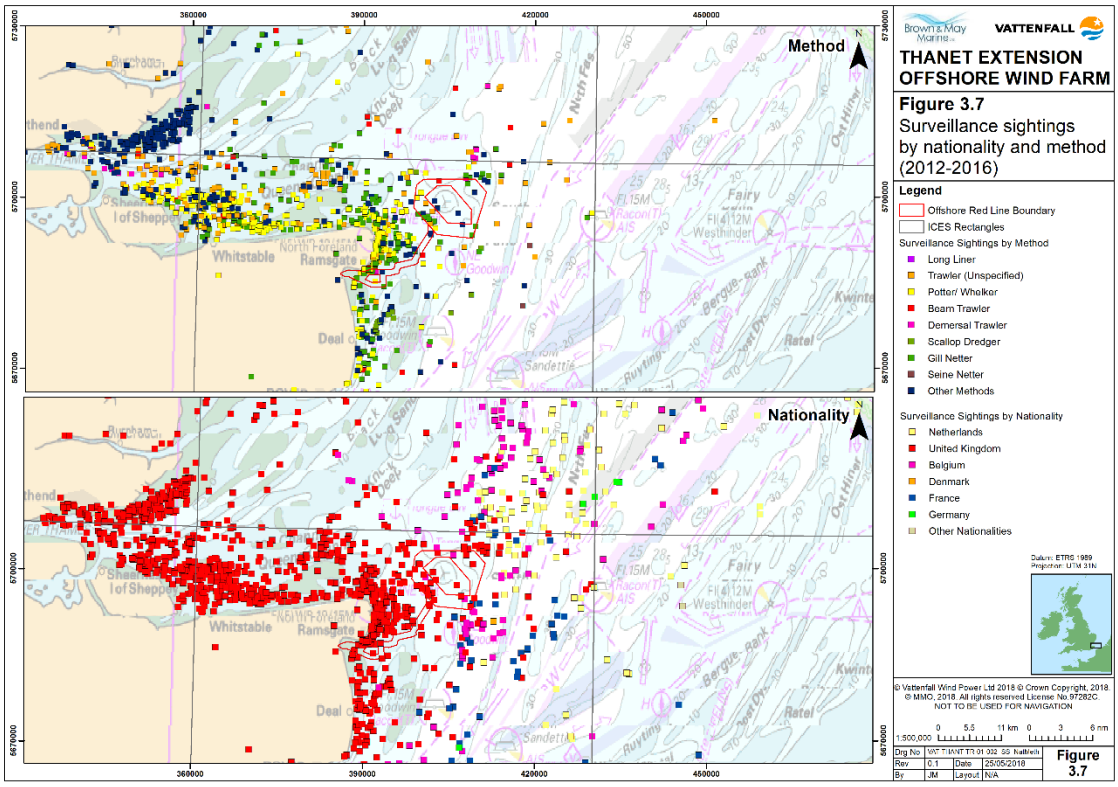


Figure 3.7 Surveillance sightings by nationality and method in the vicinity of the proposed development (indicative layout) (2012-2016; source: MMO, 2018)

As shown in Table 3.1, 84% of sightings in 31F1 are of UK registered vessels. The highest percentage is of potting/whelking vessels at 35.5%, followed by gill netters at 26.0% and general trawlers at 13.5%. A range of other vessel types have been observed at lower levels.

Of the non-UK fleet, French vessels make up 7.5% of the observations, primarily trawlers (6.7%). Sightings of the Belgian fleet comprise exclusively of beam trawlers which also account for 7.0% of vessels seen within 31F1.

Vessels from three nations predominately operate in the area: UK, Belgium and France. The Belgian and French fleets have access to the fishing grounds between the 6 and 12 nm limits due to historic rights enshrined in the London Convention.

Other nationalities such as the Dutch, Danish and German fleets account for 1.8%, 0.1% and 0.1% of vessel sightings respectively. All of these are not permitted inside the 12 nm limit and therefore should only be fishing outside of the proposed development area.

The main fishing activities undertaken in the vicinity of the proposed development identified through the initial data analysis and through consultation are:

- Dredging for cockles and Mussels;
- Potting for crab, lobster and whelk;
- Gill netting;
- Otter trawling;
- Beam trawling for Sole and other flatfish.

Table 3.1 Surveillance sightings (2012-2016) in ICES rectangle 31F1 by nationality and method

Nation	Method	% of total Sightings in 31F1
United Kingdom	Potter/Whelker	35.5
	Gill Netter	26.0
	Trawler (All)	13.5
	Other Dredges (Including Mussel)	6.8
	Scallop Dredger (French/Newhaven)	2.4
	Drift Netter	1.7
	Beam Trawler	1.5
	Stern Trawler (Pelagic/Demersal)	1.2
	Demersal Stern Trawler	1.0
	Rod and Line	0.7
	Bottom Seiner (Anchor/Danish/Fly/Scots)	0.4
	Suction Dredger	0.1
	United Kingdom % of total sightings (all gears)	**84.0**
France	Trawler (All)	6.7
	Stern Trawler (Pelagic/Demersal)	0.5
	Beam Trawler	0.1
	Demersal Stern Trawler	0.1
	Pair Trawler (All)	0.1
	Pelagic Stern Trawler	0.1
	Suction Dredger	0.1
	France % of total sightings (all gears)	**7.5**
Belgium	Beam Trawler	6.7
	Belgium % of total sightings (all gears)	**6.7**
Netherlands	Beam Trawler	1.2
	Trawler (All)	0.4
	Bottom Seiner (Anchor/Danish/Fly/Scots)	0.1
	Pelagic Stern Trawler	0.1
	Stern Trawler (Pelagic/Demersal)	0.1
	Netherlands % of total sightings (all gears)	**1.8**
Denmark	Bottom Seiner (Anchor/Danish/Fly/Scots)	0.1
	Industrial Trawler (Sandeeler)	0.1
	Denmark % of total sightings (all gears)	**0.1**
Germany	Trawler (All)	0.1
	Germany % of total sightings (all gears)	**0.1**

3.3 UK Fleet

3.3.1 Vessels, Gear and Operating practices

Due to the location and relatively small scale of the proposed development, consultation with fishermen has been primarily focused on ports within the Greater Thames Estuary. The key ports identified in the MMO scoping response are the local ports of Margate, Broadstairs, Ramsgate, Whitstable, Deal, Queenborough, Dover and Folkestone. However, consultation with the TFA indicated that the vessels fishing in and around the proposed development were predominantly from four main ports: Ramsgate, Broadstairs, Margate and Whitstable (Table 3.2) (TFA, 2017). The principle target species identified during consultation with local fisheries stakeholders include Dover sole, bass, skate, cod, plaice, mullet, herring, cuttlefish and shellfish (lobsters, edible crabs, whelks, mussel spate).

Analysis of MMO monthly vessel lists showed a total of four over 10 m vessels registered at Queenborough, three at Whitstable, and one at each of Folkestone and Dover. The majority of the vessels from Queenborough focus on shellfish (cockles / mussels) in the Thames Estuary making them unlikely to operate in the area of the proposed development. The principle port for local under 10 m UK vessels operating within and around the proposed development is Ramsgate (Table 3.2). Here the fleet is made up of 22 vessels, the majority of which are under 10 metres in length. Whitstable has 13 working under 10 m vessels, three of which are cockle dredgers working in the Greater Thames Estuary whilst Broadstairs and Margate have low numbers of under 10 m vessels, three and one respectively.

Table 3.2 <10m Vessels registered on the MMO monthly vessel lists for ports close to the proposed development (Source : MMO- 2017)

Port	Number of <10 m Vessels Registered	Methods Used
Ramsgate	23	Potting, otter trawling, bottom drift netting, mussel dredging
Whitstable	7	Otter trawling, bottom drift netting, static netting, potting, oyster dredging
Margate	3	Netting, potting
Broadstairs	1	Netting, potting

It should be noted that the port of registration and/or the defined home port of a specific vessel, as specified in the MMO vessel lists doesn't restrict which port they operate from or define where they undertake fishing activities.

In addition to those listed in table 3.2, there are a number of nomadic fishing vessels currently working around the proposed development area primarily targeting whelks. These nomadic vessels operate out of Ramsgate on a daily basis, working pots to the north of the proposed development. Their home ports are principally on the south coast at Shoreham, Eastbourne and Newhaven.

Under 10 metre vessels working from these ports principally operate on grounds within 20 nautical miles of their home port. Whilst some vessels are specifically trawlers, the majority are multi-purpose with the ability to switch gears on a seasonal basis depending on the target species. The main method pursued in this region is bottom drift netting (mostly year-round but limited to November to April for Cod). Other methods used include potting (year-round, for lobster and whelks), static netting (March to November) and dredging (primarily in the Thames estuary for cockles). It has been confirmed that mussel dredging has historically been undertaken between Sandwich Bay and Deal (K&EIFCA; 2017).

Larger trawlers operate in a much wider area throughout the Greater Thames Estuary and southern North Sea and spend some of the year nomadically moving up and down the east coast of England.

Examples of local vessels that operate a range of gear types in the area are shown in Plate 3.4 (Stella Maris) and Plate 3.5 (FV Boy Joshua). Both static and drift nets are operated in the area around the proposed development. The static gear is usually deployed between the shore and the proposed development with drift nets operated further offshore. Pots are deployed often on wrecks within the existing wind farm and at specific sites further inshore where static netting is also undertaken.

The vessel illustrated in Plate 3.6 is Provider (FE7), an example of a trawler which can undertake activity in the region of the proposed development.

Plate 3.4 FV Stella Maris (DR 167) which operates out of Ramsgate undertaking static and drift netting (Source: TFA, 2017)

Plate 3.5 FV Boy Joshua (R480) which undertakes potting for lobsters, drift netting for bass, sole and cod, and utilises static gear for skate, cod and Dover sole. (Source TFA, 2017)

Plate 3.6 FV Provider (FE7) a trawler operating from Ramsgate (Source: TFA, 2017)

3.3.2 Vessel Specifications

Table 3.3 lists questionnaire responses gathered during consultation which has been undertaken by TFA. Whilst the individual specification of each vessel varies, the data gives a good indication of target species and the types of gear used. The fishing areas identified are an indication of the grounds currently targeted in association with the existing Thanet Offshore Wind Farm (TOWF) and provide a good indication of the location in relation to the proposed development. The names of skippers and fishing vessels have been retained by BMM to preserve anonymity.

Table 3.3 General specifications and fishing activity of vessels gained from returned consultation documents.

Vessel Number	Port	Methods	Target species	Key fishing grounds
1	Ramsgate	Static nets, drift nets (surface and bottom).	Not specified	Drift nets- to north of TOWF, static nets inshore of TOWF along cable route
2	Ramsgate	Static nets, pots, bottom drifting.	Whelks, Dover sole, skate, bass,	All round the TOWF
3	Ramsgate	Pots, drift nets	Whelks, lobsters, crabs, Dover sole, cod, bass	All round the TOWF
4	Broadstairs	Pots, static gillnets	Whelk, crab, lobster, Dover sole	All round the TOWF
5	Ramsgate	Pots, bottom drift nets, static nets	Lobsters, crabs, Dover sole	Primarily to south and east of TOWF
6	Ramsgate	Static gillnets, drifting bottom trammel nets, drifting gillnets	Lobster, skate, cod, bass,	All round the TOWF
7	Ramsgate	Gillnets, trammel nets	Not specified	All round the TOWF
8	Ramsgate	Drift and static gillnets and trammel nets	Not specified	To the east (drift) and south of TOWF (static)
9	Ramsgate	Static and drift trammel and gill nets	Not specified	Bottom drifting to north of site and static netting to west of site along cable route
10	Whitstable	trawling	Not specified	Principle grounds to north of TOWF

Vessel Number	Port	Methods	Target species	Key fishing grounds
11	Ramsgate	Drift nets, static nets, pots	Not specified	Drift netting to south east of site, static nets and pots to south west of site
12	Ramsgate	Dredging	Mussels	Along export cable
13	Ramsgate	Trawling	Not specified	Throughout regional area, focussed on north of TOWF
14	Ramsgate	Trawling , potting for whelks	Dover sole, whelks	All round the TOWF
15	Whitstable	Triple rig trawls, single rig trawls	Dover sole, cod	North of TOWF
16	Ramsgate	Nets , pots	Not specified	All round the TOWF
17	Ramsgate	Static nets, drift nets	Not specified	Drift nets to north and east of site, static gear to south and along OECC
18	Whitstable	Trawl	Dover sole, cod	North of TOWF
19	Margate	Static netting, potting	Not specified	East of TOWF
20	Ramsgate	Whelk pots, drift nets, static nets	Whelks, cod, skate, Dover sole	Drift nets to east of site, whelk pots and static nets to east of site and along OECC.

3.3.3 Fishing Grounds

Following consultation with TFA and individual fishermen, a general overview of targeted fishing grounds has been identified for Greater Thames Estuary vessels. Fishing grounds for potting, drift nets and static nets are shown in Figure 3.8, Figure 3.9 and Figure 3.10 respectively.

The grounds encompassed by the proposed development are extensively worked by the local fishing fleet with methods overlapping due to the specific seasonality of each fishery.

Drift nets are focused on grounds to the north and east of the existing Thanet offshore windfarm (TOWF). The drift nets will be deployed over “clean ground” which is limited in the area. Potting for lobsters and crabs can occur throughout the year in the area for the proposed development and the offshore export cable corridor (OECC) but is concentrated to the north of the TOWF. Whelk pots can be found throughout the area to the west and south of the site but are used most intensively along the OECC.

Static nets are found throughout the proposed developed area, being focussed to the east and south of the site and along the OECC.

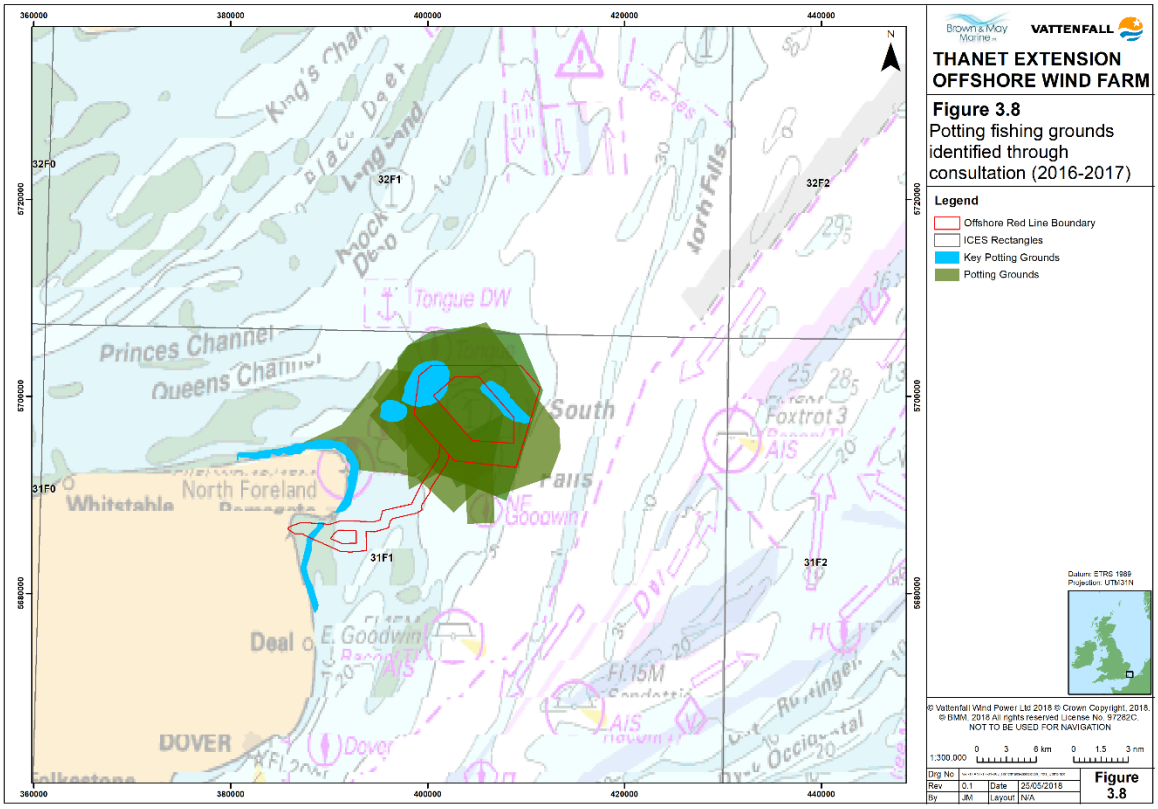


Figure 3.8 Potting fishing grounds identified during TFA consultation (indicative layout) (Source TFA: 2016, 2017)

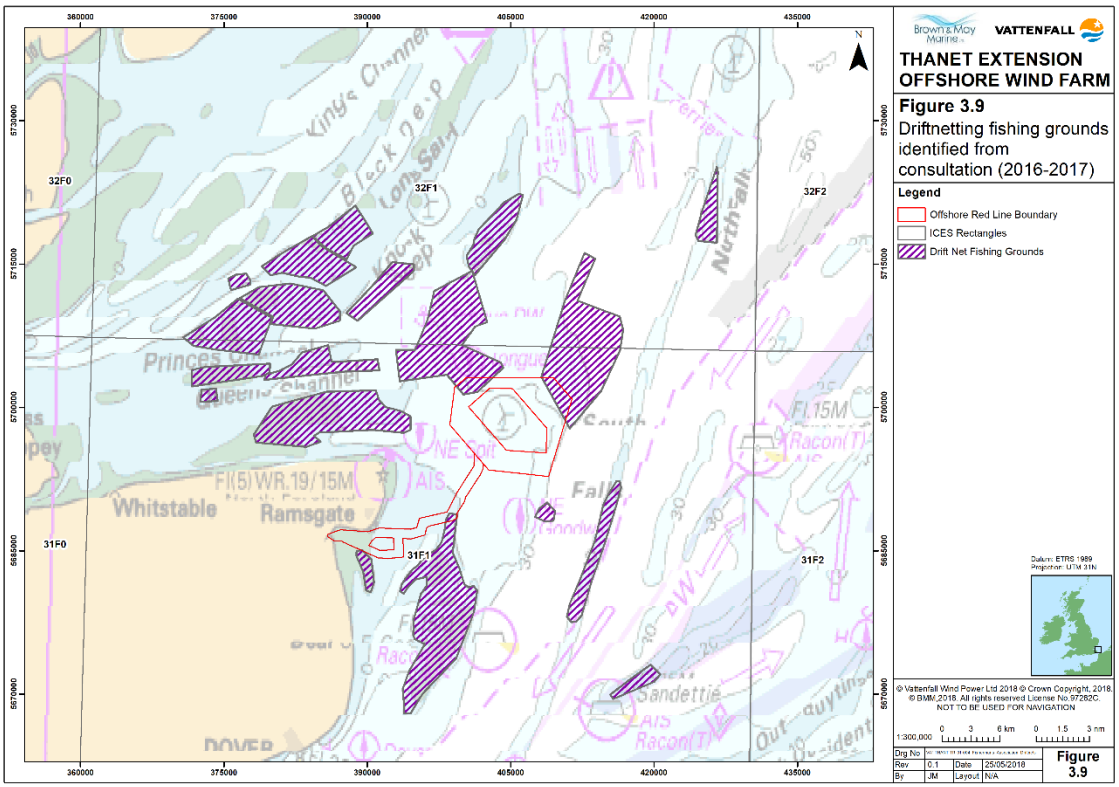


Figure 3.9 Driftnetting fishing grounds identified during TFA consultation (indicative layout) (Source TFA: 2016)

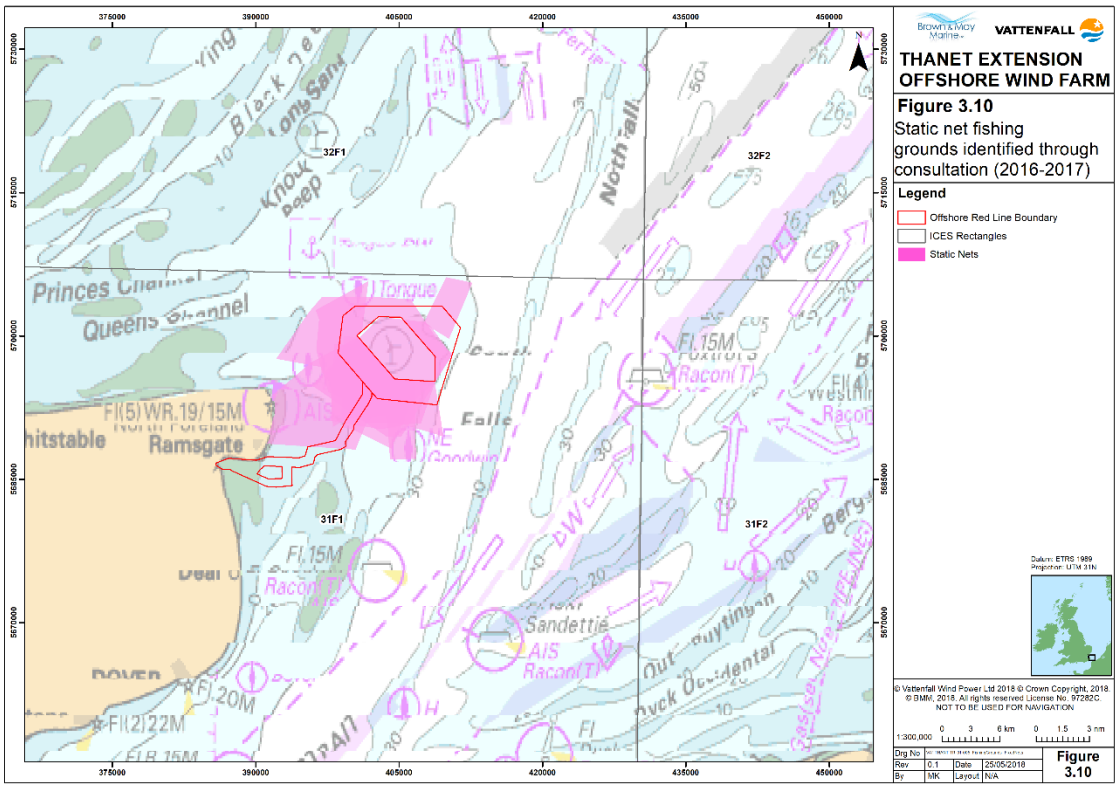


Figure 3.10 Static netting fishing grounds identified during TFA consultation (indicative layout) (Source TFA: 2016)

3.3.4 UK Landings Data

Data provided by the MMO have been analysed using ICES rectangles to provide an overview of fishing activity in the regional area of the proposed development.

Figure 3.11 shows landings values (sales price at auction) by species for the regional study area. Within each of the four ICES rectangles of the regional study area, whelks and cockles, obtained by dredging and whelk specific pots, are the highest grossing species. Fishing for these species is focussed within the Greater Thames Estuary and therefore less likely to occur around the proposed development. Other high grossing species, specifically targeted within 31F1 are Dover sole, bass, lobster, cod and edible crab. The total average landings value in 31F1 is £3,197,996.

Figure 3.12 shows the species landed from rectangle 31F1 on average between 2012 and 2016 and the methods used to catch each species. The principle gear types employed are pots,

mechanised dredges, gillnets and otter trawls. Pots record the highest average landings predominately due to whelks. Mechanized dredges also yield high landings, due to cockles (average value is £546,997). Lobsters and edible crabs are targeted with pots while Dover sole, bass, cod and thornback rays are targeted using gillnets, otter trawls and trammel nets.

Figure 3.13 shows the size of vessels deploying specific gear types. The <10 m vessels have the highest landings and predominately utilise pots, whilst those of 10-15 m in length focus on mechanized dredges, pots and boat dredges. Landings from over 15 m vessels primarily utilise midwater trawls and Scottish seine nets and make up the lowest proportion of landings for ICES rectangle 31F1.

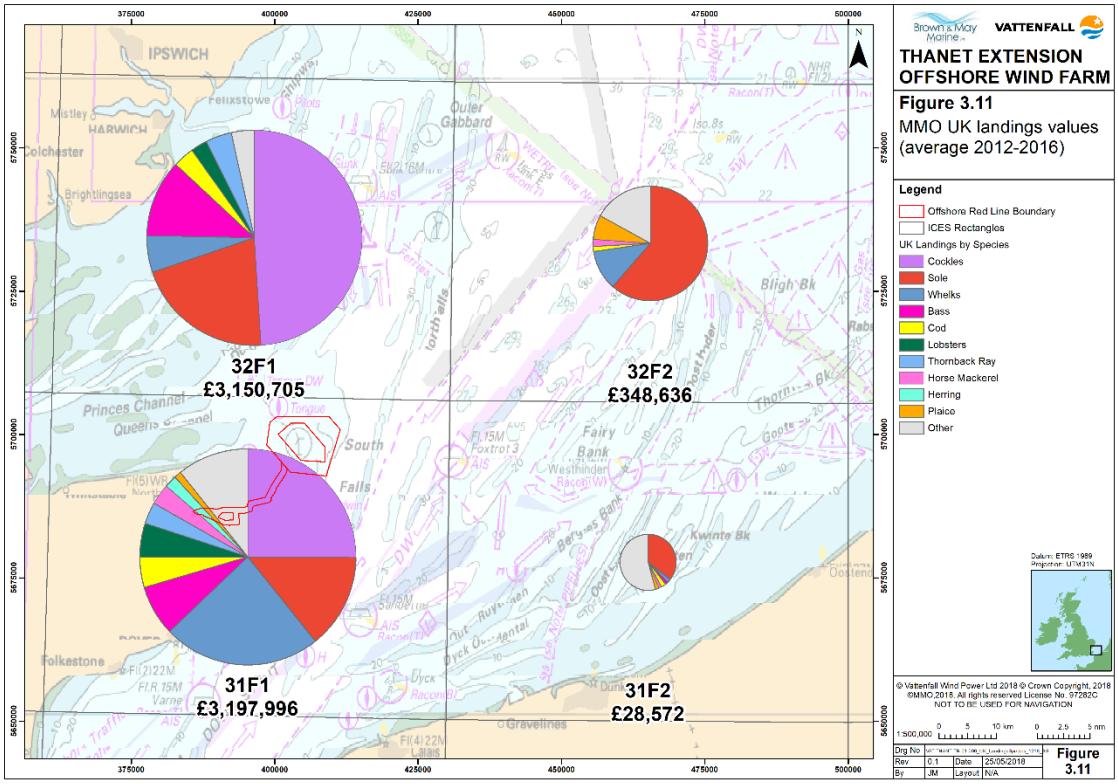
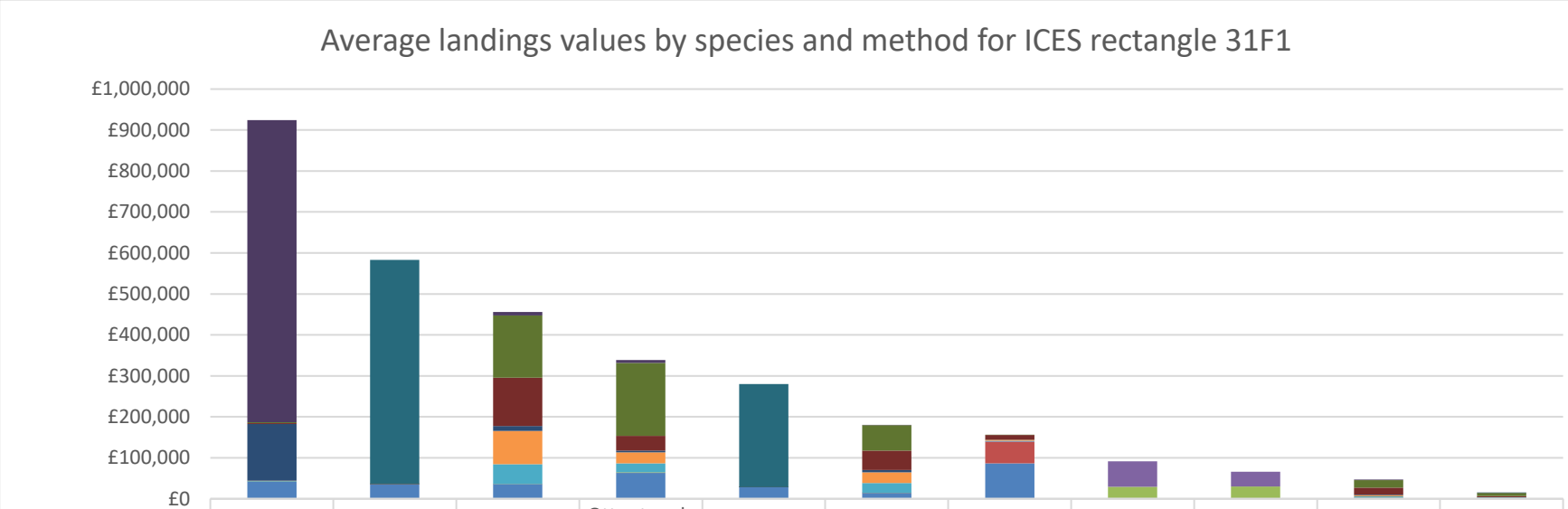
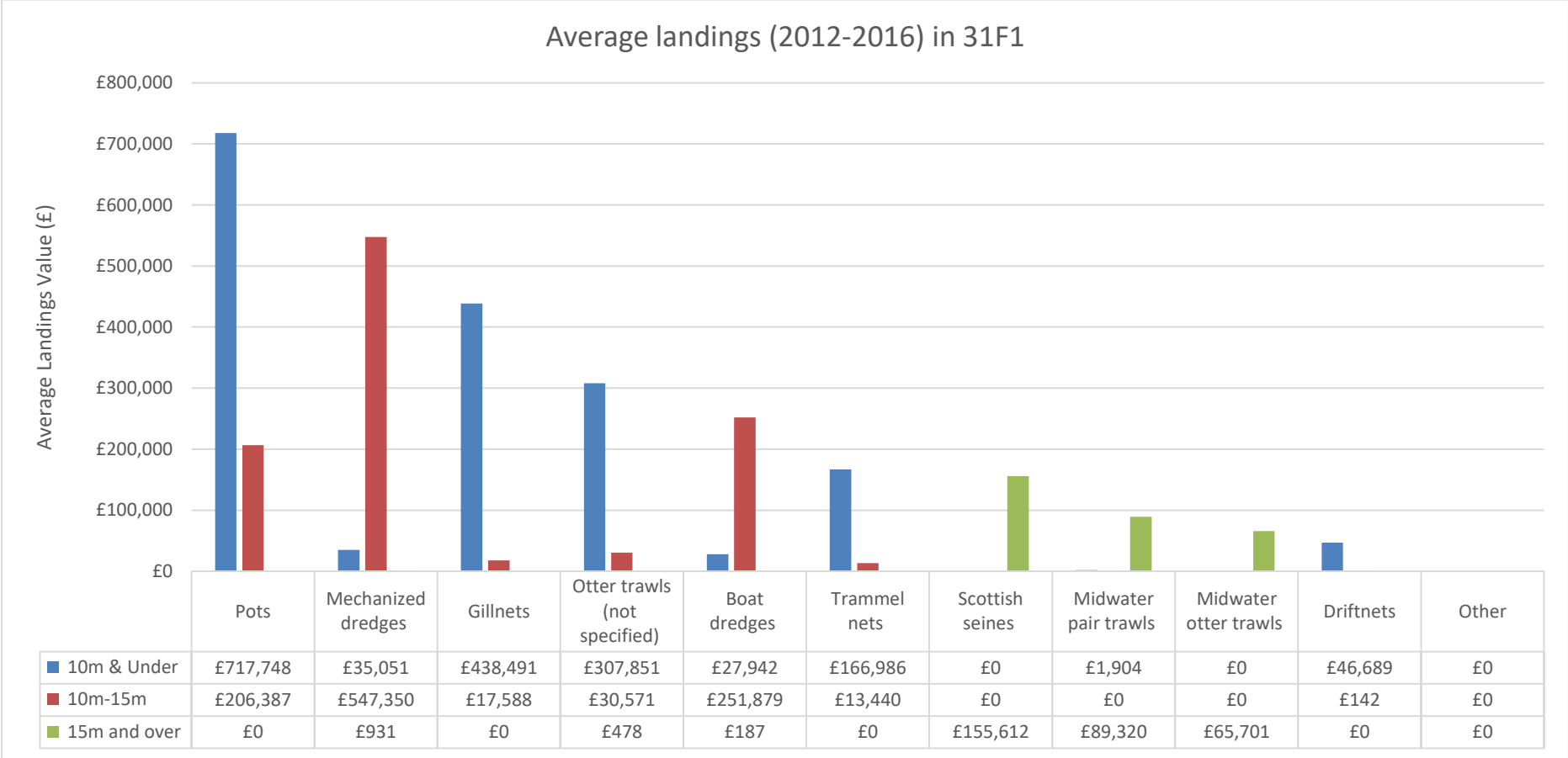


Figure 3.11 Average landings values (2012-2016) by species in regional study area (indicative layout) (source: MMO, 2018)



	Pots	Mechanized dredges	Gillnets	Otter trawls (not specified)	Boat dredges	Trammel nets	Scottish seines	Midwater pair trawls	Midwater otter trawls	Driftnets	Other methods
Cockles	£0	£546,997	£0	£0	£251,224	£0	£0	£0	£0	£0	£718
Whelks	£737,502	£36	£8,878	£7,490	£146	£515	£0	£0	£0	£924	£8
Sole	£2,204	£140	£151,630	£178,059	£50	£62,295	£1	£0	£0	£18,954	£8,015
Bass	£1,956	£8	£117,830	£35,758	£21	£47,451	£11,086	£0	£0	£16,433	£2,232
Lobsters	£138,243	£69	£11,761	£4,081	£22	£5,310	£130	£0	£0	£1,644	£125
Cod	£868	£99	£81,812	£27,001	£15	£26,307	£3,122	£0	£0	£3,029	£478
Thornback Ray	£558	£18	£48,490	£22,159	£6	£23,876	£949	£0	£0	£2,834	£793
Horse Mackerel	£0	£0	£2	£0	£0	£0	£1,635	£62,094	£36,015	£0	£0
Herring	£2	£0	£735	£849	£0	£314	£31	£27,028	£29,575	£241	£5
Red Mullet	£0	£0	£80	£102	£0	£34	£52,042	£0	£0	£1	£1
Other species	£42,802	£35,964	£34,862	£63,401	£28,525	£14,323	£86,615	£2,102	£110	£2,772	£2,776

Figure 3.12 Average landing values (2012-2016) by species and method in ICES rectangle 31F1 (source: MMO, 2018)



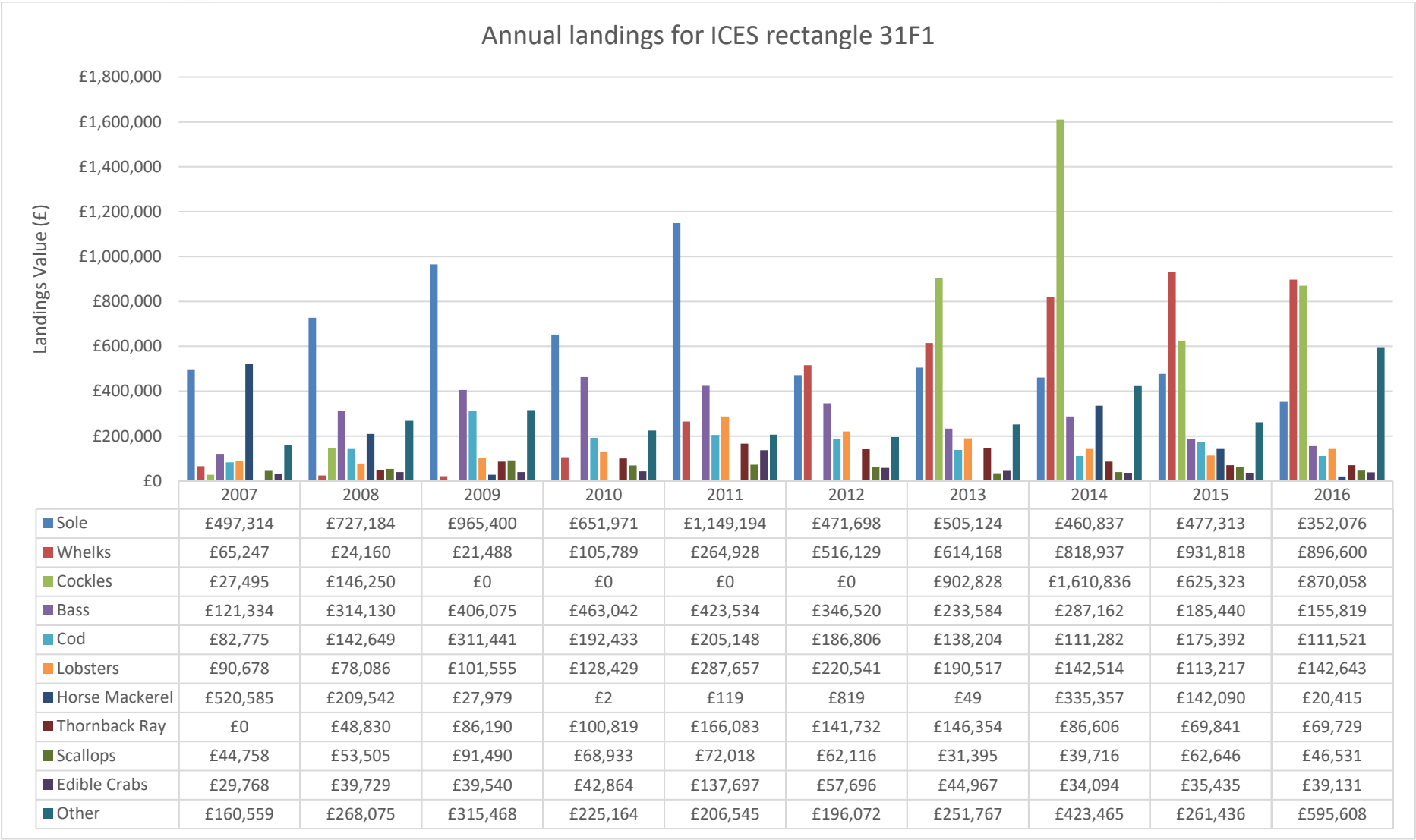
	Pots	Mechanized dredges	Gillnets	Otter trawls (not specified)	Boat dredges	Trammel nets	Scottish seines	Midwater pair trawls	Midwater otter trawls	Driftnets	Other
10m & Under	£717,748	£35,051	£438,491	£307,851	£27,942	£166,986	£0	£1,904	£0	£46,689	£0
10m-15m	£206,387	£547,350	£17,588	£30,571	£251,879	£13,440	£0	£0	£0	£142	£0
15m and over	£0	£931	£0	£478	£187	£0	£155,612	£89,320	£65,701	£0	£0

Figure 3.13 Average landings values (2012-2016) by method and vessel category in 31F1 (source: MMO, 2018)

3.3.5 Annual and Seasonal Variations

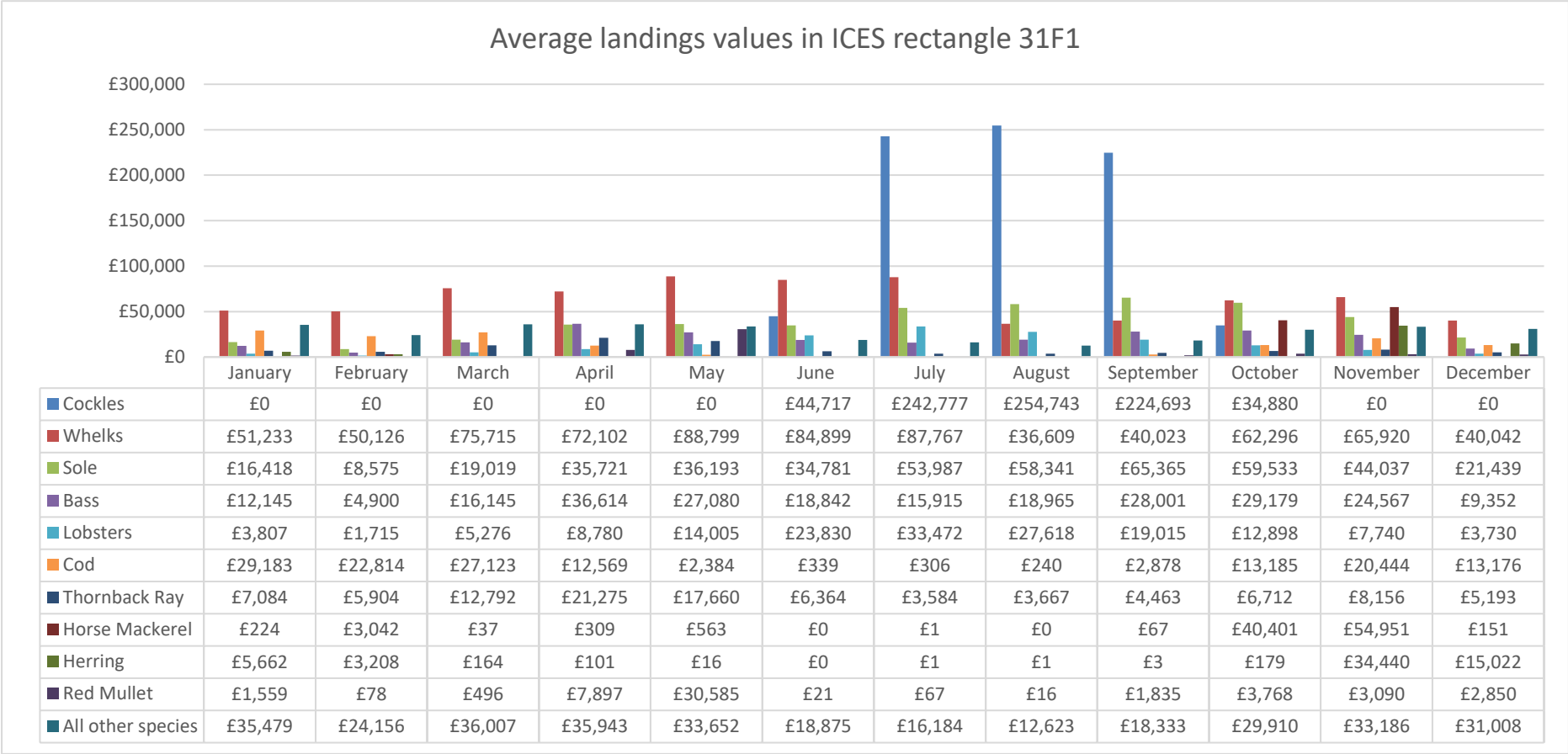
Figure 3.14 shows annual variation in total landings values by species for ICES rectangle 31F1 for the period 2006 -2015. Dover sole landings increased from 2006 to 2011 (£1,149,194) then reduced to levels around £500,000 per annum for subsequent years. Conversely whelk landings have increased from £105,789 in 2010 to £931,818 in 2015. The highest cockle landings were recorded between 2013 and 2015 with the peak being £1,610,836 in 2014. The K&E IFCA define the principle cockle grounds as Maplin and Foulness Sands along the Essex coast which is a considerable distance from the proposed development (Heywood *et al*, 2016). Sole landings peaked in 2011 at almost £1,150,000 and then halved and have remained constant since (2016 value was £352,076). Among other potential causes, Dutch pulse beam trawling intensity has been anecdotally cited as accelerating the decline in sole landings. Similarly, bass landings peaked in 2010 at £463,042 but then fell by half over the subsequent years. Bass is increasingly subject to restrictions implemented at EU, national and regional levels. Landings of cockles have increased in the last 4 years, peaking in 2014 at £1,610,836 (Figure 3.12). Landings of other species have remained relatively steady, albeit at lower levels than bass and sole, over the ten-year period analysed.

Monthly landings values by species for ICES rectangle 31F1 are given in Figure 3.15 to show the seasonal variation. Whelks are caught year-round. Cockles landings are the highest but are landed between June and October only. Dover sole and bass are targeted between April and November, peaking in September and April respectively. Lobsters are caught year-round but peak between May and October. Cod landings are highest January to March and lowest during the summer months.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sole	£497,314	£727,184	£965,400	£651,971	£1,149,194	£471,698	£505,124	£460,837	£477,313	£352,076
Whelks	£65,247	£24,160	£21,488	£105,789	£264,928	£516,129	£614,168	£818,937	£931,818	£896,600
Cockles	£27,495	£146,250	£0	£0	£0	£0	£902,828	£1,610,836	£625,323	£870,058
Bass	£121,334	£314,130	£406,075	£463,042	£423,534	£346,520	£233,584	£287,162	£185,440	£155,819
Cod	£82,775	£142,649	£311,441	£192,433	£205,148	£186,806	£138,204	£111,282	£175,392	£111,521
Lobsters	£90,678	£78,086	£101,555	£128,429	£287,657	£220,541	£190,517	£142,514	£113,217	£142,643
Horse Mackerel	£520,585	£209,542	£27,979	£2	£119	£819	£49	£335,357	£142,090	£20,415
Thornback Ray	£0	£48,830	£86,190	£100,819	£166,083	£141,732	£146,354	£86,606	£69,841	£69,729
Scallops	£44,758	£53,505	£91,490	£68,933	£72,018	£62,116	£31,395	£39,716	£62,646	£46,531
Edible Crabs	£29,768	£39,729	£39,540	£42,864	£137,697	£57,696	£44,967	£34,094	£35,435	£39,131
Other	£160,559	£268,075	£315,468	£225,164	£206,545	£196,072	£251,767	£423,465	£261,436	£595,608

Figure 3.14 Annual total landings values by species in ICES rectangle 31F1 (source: MMO, 2018)



	January	February	March	April	May	June	July	August	September	October	November	December
Cockles	£0	£0	£0	£0	£0	£44,717	£242,777	£254,743	£224,693	£34,880	£0	£0
Whelks	£51,233	£50,126	£75,715	£72,102	£88,799	£84,899	£87,767	£36,609	£40,023	£62,296	£65,920	£40,042
Sole	£16,418	£8,575	£19,019	£35,721	£36,193	£34,781	£53,987	£58,341	£65,365	£59,533	£44,037	£21,439
Bass	£12,145	£4,900	£16,145	£36,614	£27,080	£18,842	£15,915	£18,965	£28,001	£29,179	£24,567	£9,352
Lobsters	£3,807	£1,715	£5,276	£8,780	£14,005	£23,830	£33,472	£27,618	£19,015	£12,898	£7,740	£3,730
Cod	£29,183	£22,814	£27,123	£12,569	£2,384	£339	£306	£240	£2,878	£13,185	£20,444	£13,176
Thornback Ray	£7,084	£5,904	£12,792	£21,275	£17,660	£6,364	£3,584	£3,667	£4,463	£6,712	£8,156	£5,193
Horse Mackerel	£224	£3,042	£37	£309	£563	£0	£1	£0	£67	£40,401	£54,951	£151
Herring	£5,662	£3,208	£164	£101	£16	£0	£1	£1	£3	£179	£34,440	£15,022
Red Mullet	£1,559	£78	£496	£7,897	£30,585	£21	£67	£16	£1,835	£3,768	£3,090	£2,850
All other species	£35,479	£24,156	£36,007	£35,943	£33,652	£18,875	£16,184	£12,623	£18,333	£29,910	£33,186	£31,008

Figure 3.15 Average seasonal variation by species (2012-2016) in ICES rectangle 31F1 (source: MMO, 2018)

3.3.6 Landings Values by Port

The principle ports by landings values for rectangle 31F1 and the percentage of each of the ports total income that this represents are listed in Table 3.4.

The highest average value of landings recorded for 31F1 between 2012 and 2016 is £1,150,461 into Whitstable. This is followed by £751,736 into Ramsgate and £387,300 into Folkestone. The percentages of the annual landing values from 31F1 for those ports are 36.0%, 23.5% and 12.1% respectively.

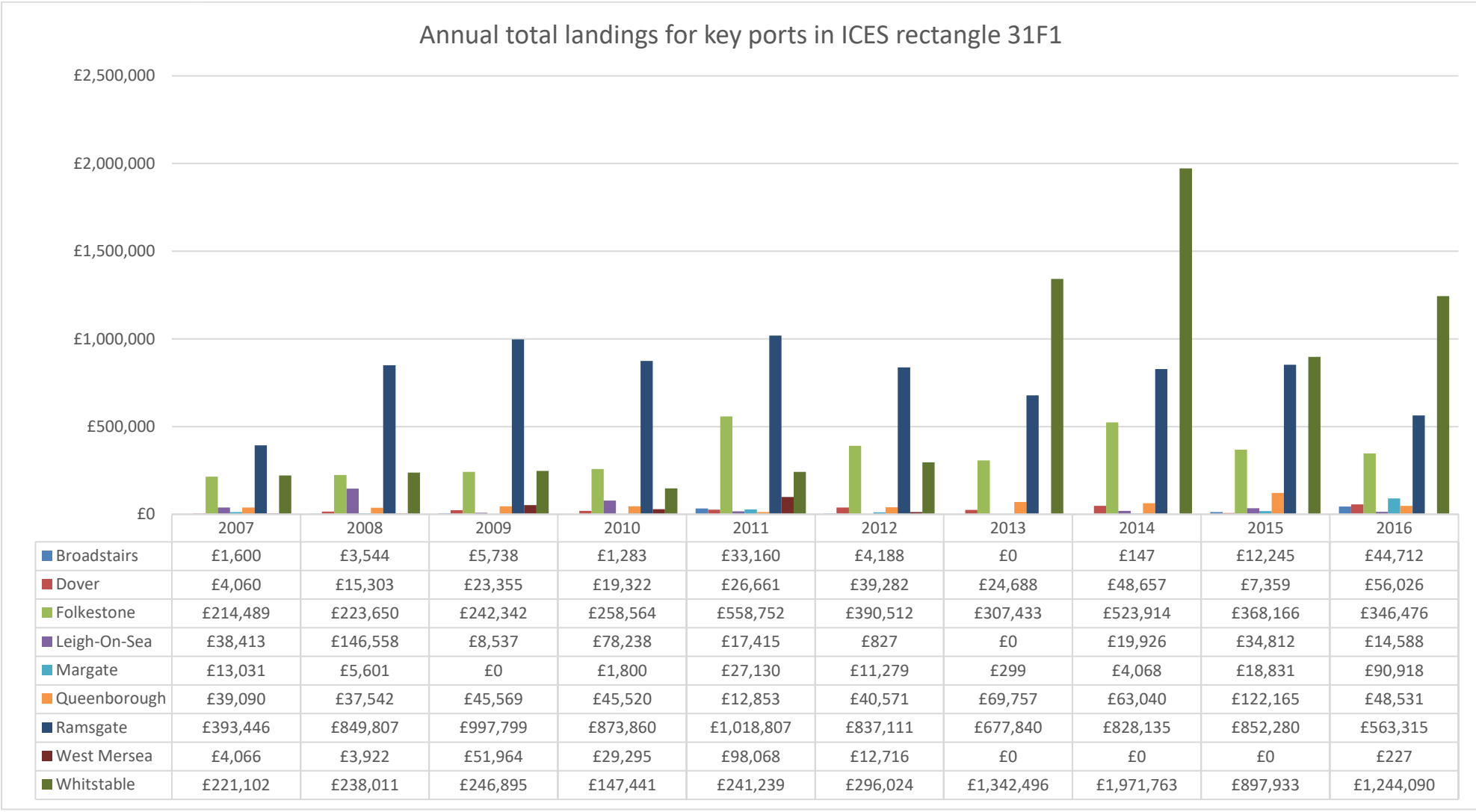
The average annual landings have been compared to the total average landings (from all studied rectangles in the regional study area) for each port, to identify the dependence of ports on 31F1. The highest values are for Whitstable (95.4%), Ramsgate (87.7%) and Folkestone (89.7%). Other ports with high percentages, albeit based on lower annual landings, include Hythe (83.2%) and Queenborough (41.3%).

Table 3.4 Top 10 ports by landings values from ICES rectangle 31F1 by UK vessels (source: MMO, 2017)

Port	Average Annual Landings (£) in 31F1	% of Annual Value in 31F1	Total Average Annual Port Landings (£)	% of Total Annual Landings Value that those from 31F1 represent
Whitstable	£1,150,461	36.0	£1,205,660	95.4
Ramsgate	£751,736	23.5	£857,013	87.7
Folkestone	£387,300	12.1	£431,840	89.7
Rye	£125,223	3.9	£1,369,117	9.1
Scheveningen	£120,310	3.8	£5,709,501	2.1
Boulogne	£118,941	3.7	£3,187,370	3.7
Ijmuiden	£70,184	2.2	£13,001,398	0.5
Queenborough	£68,813	2.2	£166,649	41.3
Hythe	£65,938	2.1	£79,234	83.2
Hornsea	£56,285	1.8	£820,162	6.9

Annual total landings data in ICES rectangle 31F1 has been collated for the local ports within the Greater Thames Estuary and along the Kent coast (Figure 3.16). The highest landings values were recorded by Whitstable in 2014 (£1,917,763) and 2013 (£1,342,496). It is likely that these are linked to the high levels of cockles and whelks landed in these years. Other

local ports have maintained relatively steady landings values with Ramsgate reaching a peak of £1,018,807 in 2011 and Folkestone registering £558,752, also in 2011.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Broadstairs	£1,600	£3,544	£5,738	£1,283	£33,160	£4,188	£0	£147	£12,245	£44,712
Dover	£4,060	£15,303	£23,355	£19,322	£26,661	£39,282	£24,688	£48,657	£7,359	£56,026
Folkestone	£214,489	£223,650	£242,342	£258,564	£558,752	£390,512	£307,433	£523,914	£368,166	£346,476
Leigh-On-Sea	£38,413	£146,558	£8,537	£78,238	£17,415	£827	£0	£19,926	£34,812	£14,588
Margate	£13,031	£5,601	£0	£1,800	£27,130	£11,279	£299	£4,068	£18,831	£90,918
Queenborough	£39,090	£37,542	£45,569	£45,520	£12,853	£40,571	£69,757	£63,040	£122,165	£48,531
Ramsgate	£393,446	£849,807	£997,799	£873,860	£1,018,807	£837,111	£677,840	£828,135	£852,280	£563,315
West Mersea	£4,066	£3,922	£51,964	£29,295	£98,068	£12,716	£0	£0	£0	£227
Whitstable	£221,102	£238,011	£246,895	£147,441	£241,239	£296,024	£1,342,496	£1,971,763	£897,933	£1,244,090

Figure 3.16 Annual total landings values for key local ports (source: MMO, 2018)

3.3.7 Surveillance Sightings

Figure 3.17 shows the distribution of surveillance sightings (averaged for 2012 to 2016) of UK fishing vessels recorded in the area of the proposed development area, by gear.

The data indicates that the majority of activity by the local UK fleet is close to the shore although some activity does occur in the proposed development area at a lower level. This is principally along the western boundary and north eastern sector. This also shows some vessel activity within the existing TOWF.

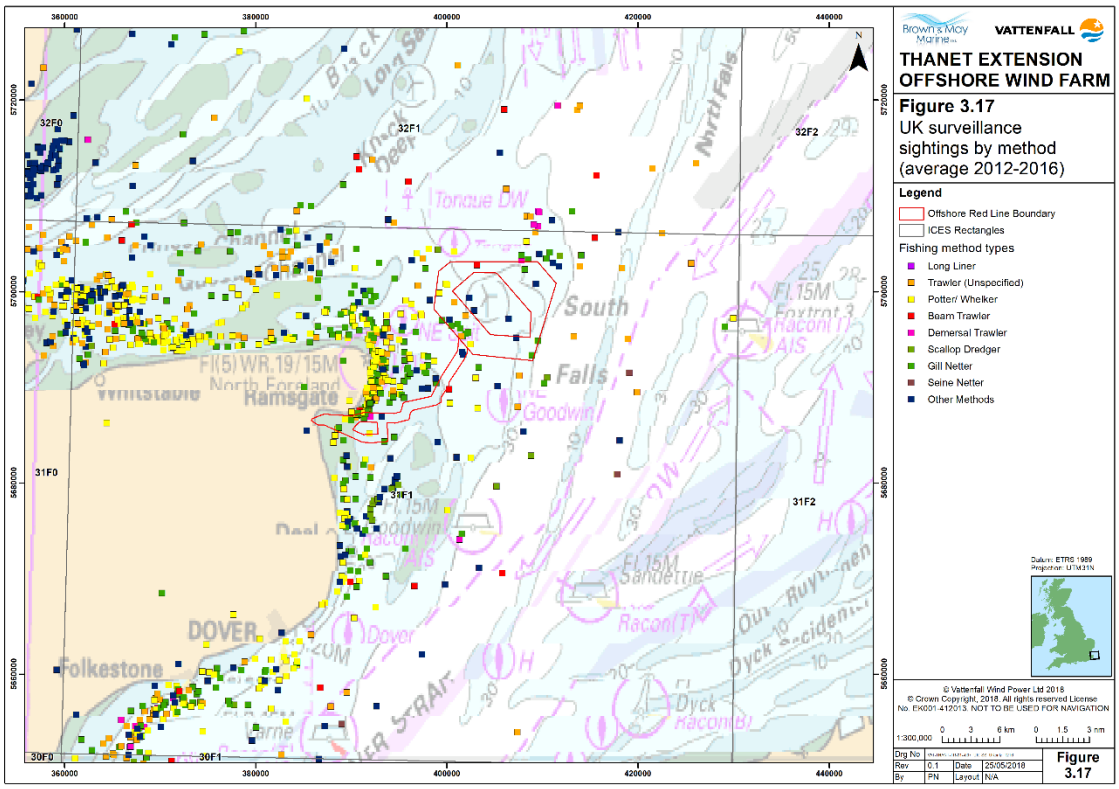


Figure 3.17 UK Surveillance sightings by method in the vicinity of the proposed development (indicative layout) (2012-2016); (Source: MMO,2018)

3.3.8 Satellite Tracking (VMS) Data

As previously mentioned, VMS density data does not take into account fishing activity undertaken by vessels under 15 m in length (although data for <12 m vessels is collected it has not been made available by the MMO), therefore fishing activity in some areas,

particularly inshore areas, is not represented by this dataset. This means that the majority of vessels operating from local UK ports are not recorded by this method.

Figure 3.18 illustrates the spread of activity recorded via VMS for the UK pelagic fleet. This activity is focused on the eastern boundary of the proposed development and grounds to the south of this area. The effort data for the UK pelagic fleet is at a low level, averaging less than 20 hours per year.

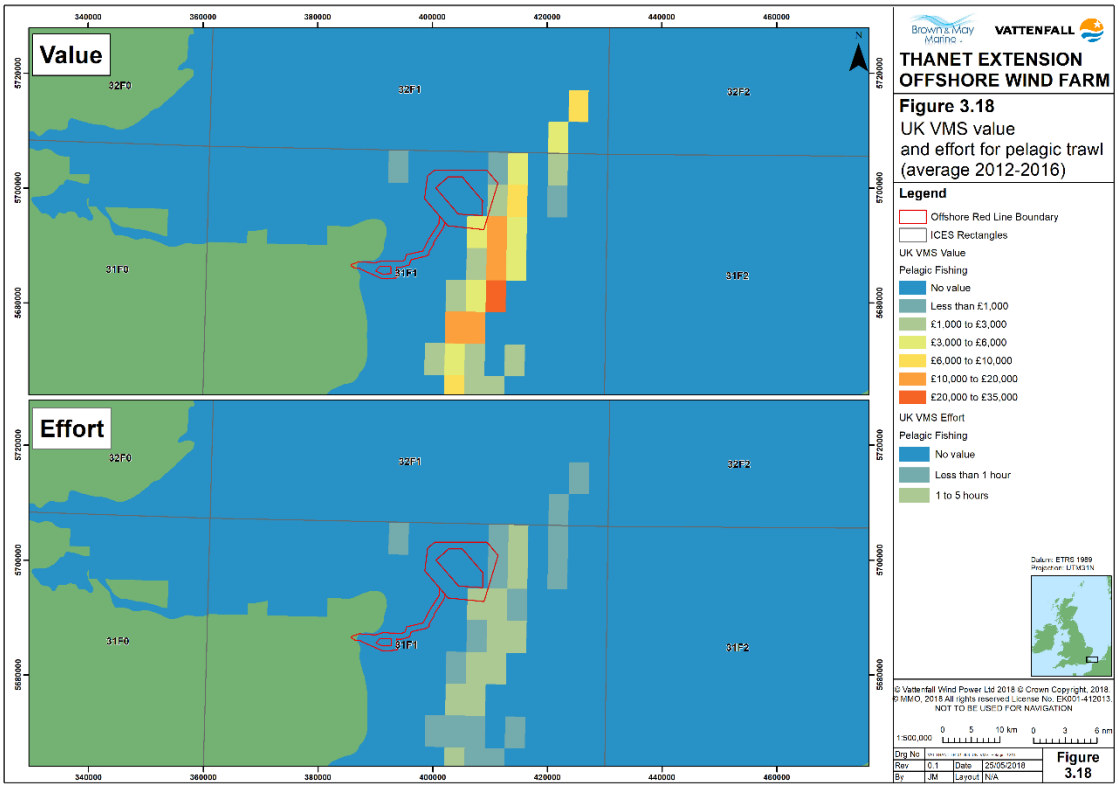


Figure 3.18 UK VMS effort and value data by pelagic trawl (average 2012-2016) (indicative layout) (Source: MMO 2018)

Demersal trawling (Figure 3.19) occurs throughout the area surrounding the proposed development. However, the highest earnings are recorded offshore beyond the proposed development area. It should also be noted that activity appears to be reduced around the proposed development area, which may be due to altered fishing patterns following the construction of the existing TOWF (TFA, 2017). The effort data illustrates that the majority of activity is to the north of the proposed development.

Figure 3.20 illustrates that shellfish dredging by over 15 m vessels occurs within the Greater Thames Estuary and is not an activity which generally occurs close to the proposed development site.

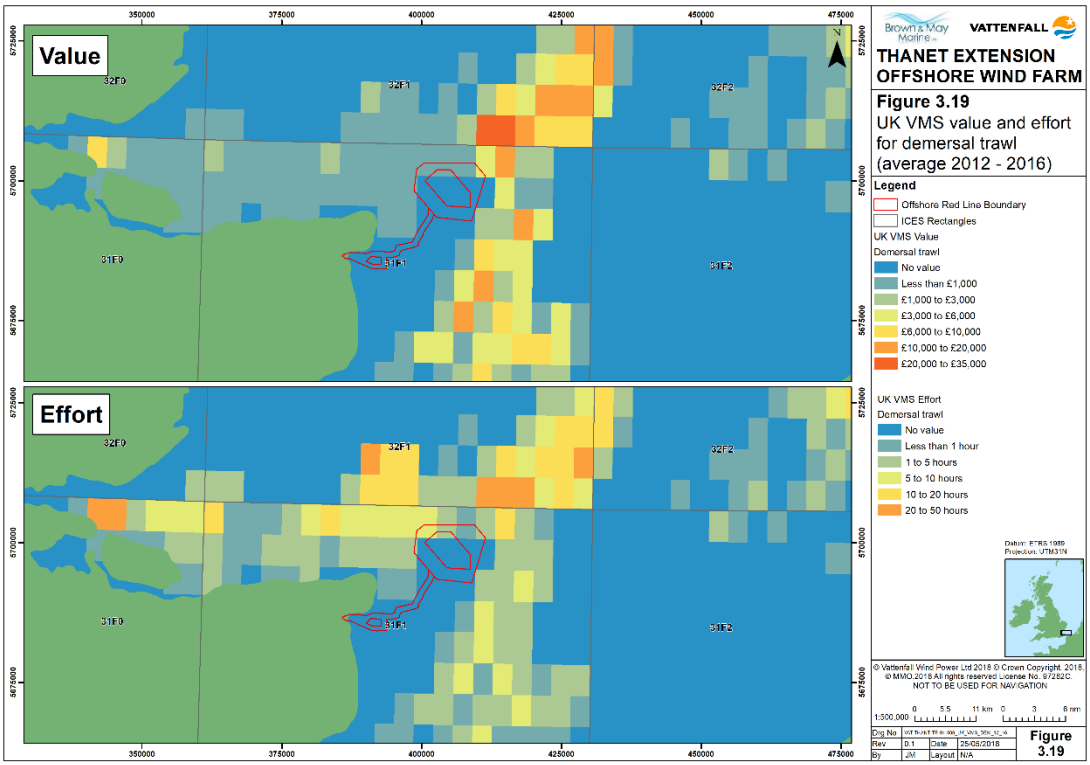


Figure 3.19 UK VMS effort and value data for demersal trawl (average 2012-2016) (indicative layout) (Source MMO, 2018)

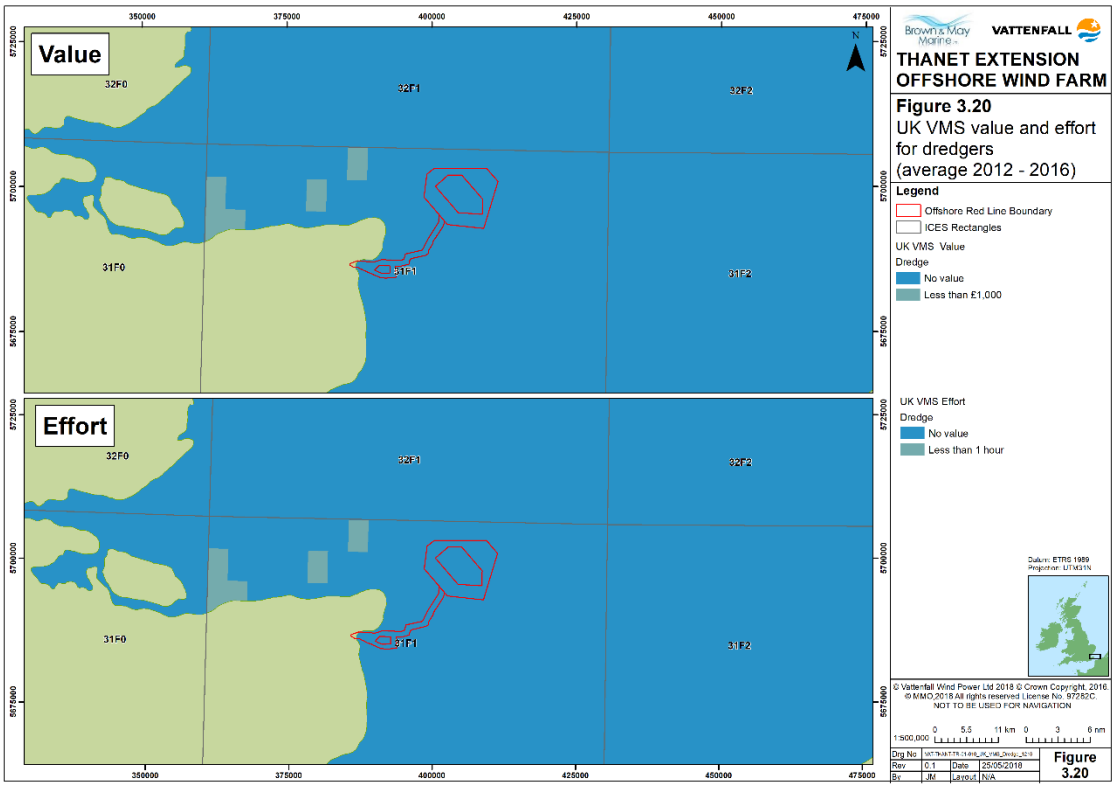


Figure 3.20 UK VMS effort and value data for dredge (average 2012-2016) (indicative layout) (Source MMO, 2018)

3.3.9 Succorfish Tracking data

As previously mentioned, MMO VMS does not cover vessels of 10 m and under. Succorfish Limited provide an attachable position tracker suitable for these smaller vessels. This technology has been recently employed by a subset of TFA vessels. GIS data supplied by Succorfish ltd. from April until December 2017 is shown in Figure 3.21 to Figure 3.29. The vessel names have been anonymised to protect the owners' identity. Only vessels that have provided data for that month are shown in each chart.

The Succorfish data shows that vessels use the proposed development area to varying degrees. This data has confirmed that vessels have alternative grounds in the vicinity of the proposed development and that it is primarily used as a transit route rather than fishing ground. The data also shows vessels are able to fish and steam through the existing TOWF. There is seasonal variation in activity levels, with the highest activity being between June and October (Figure 3.23 to Figure 3.27).

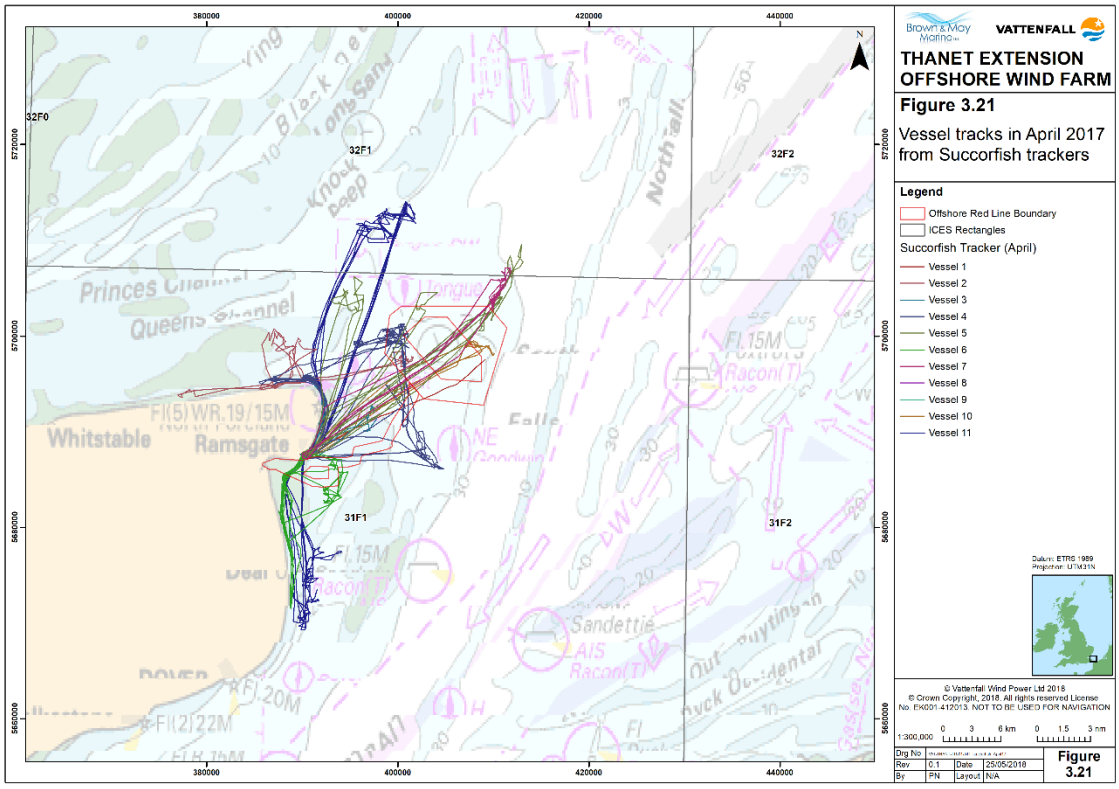


Figure 3.21 Vessel tracks for April 2017 as recorded by portable trackers (Succorfish Ltd.)

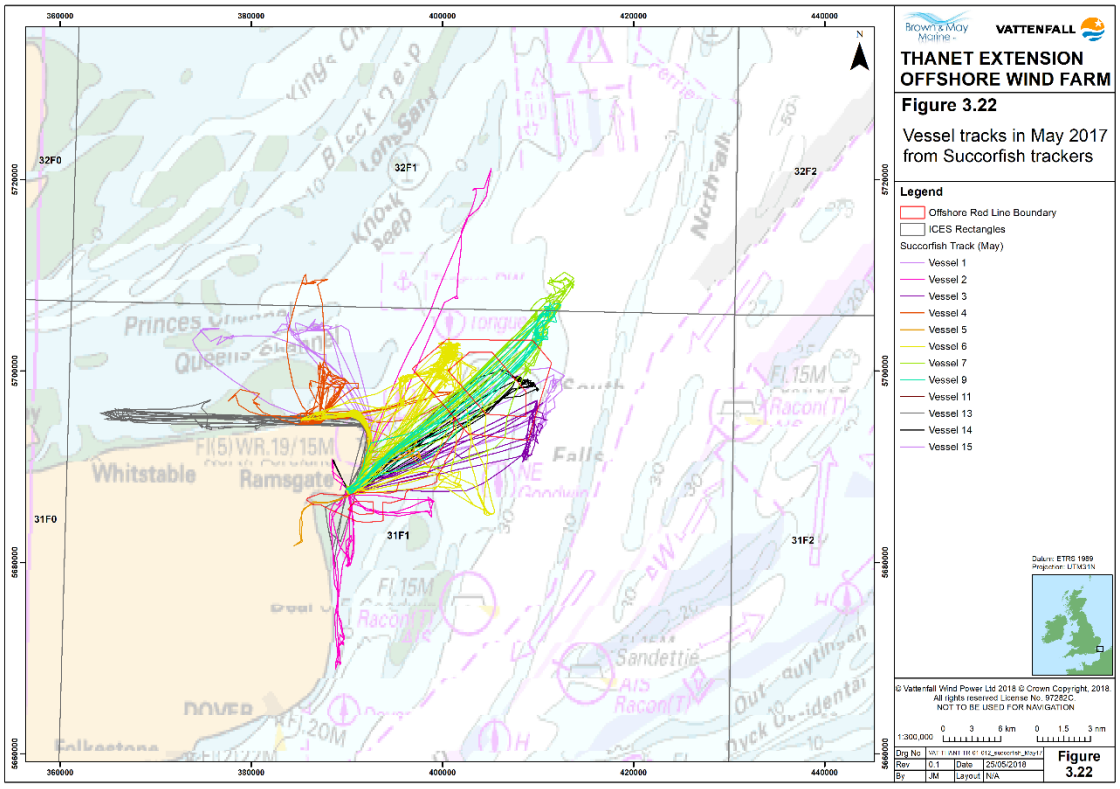


Figure 3.22 Vessel tracks for May 2017 as recorded by portable trackers (Succorfish Ltd.)

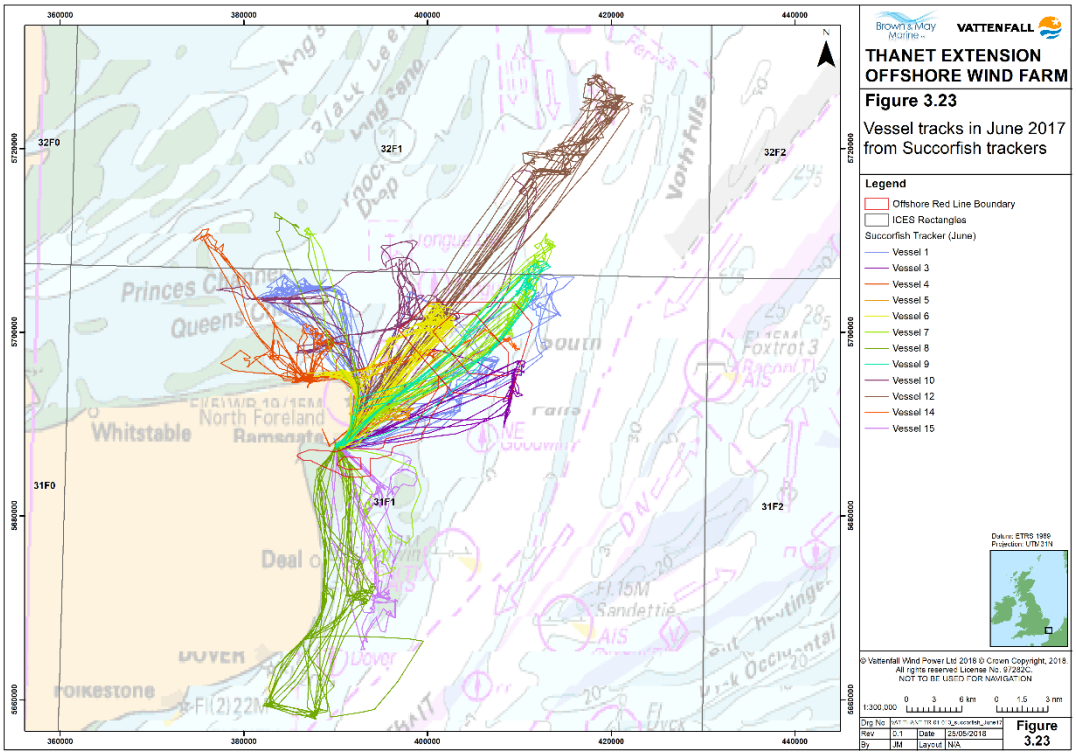


Figure 3.23 Vessel tracks for June 2017 as recorded by portable trackers (Succorfish Ltd.)

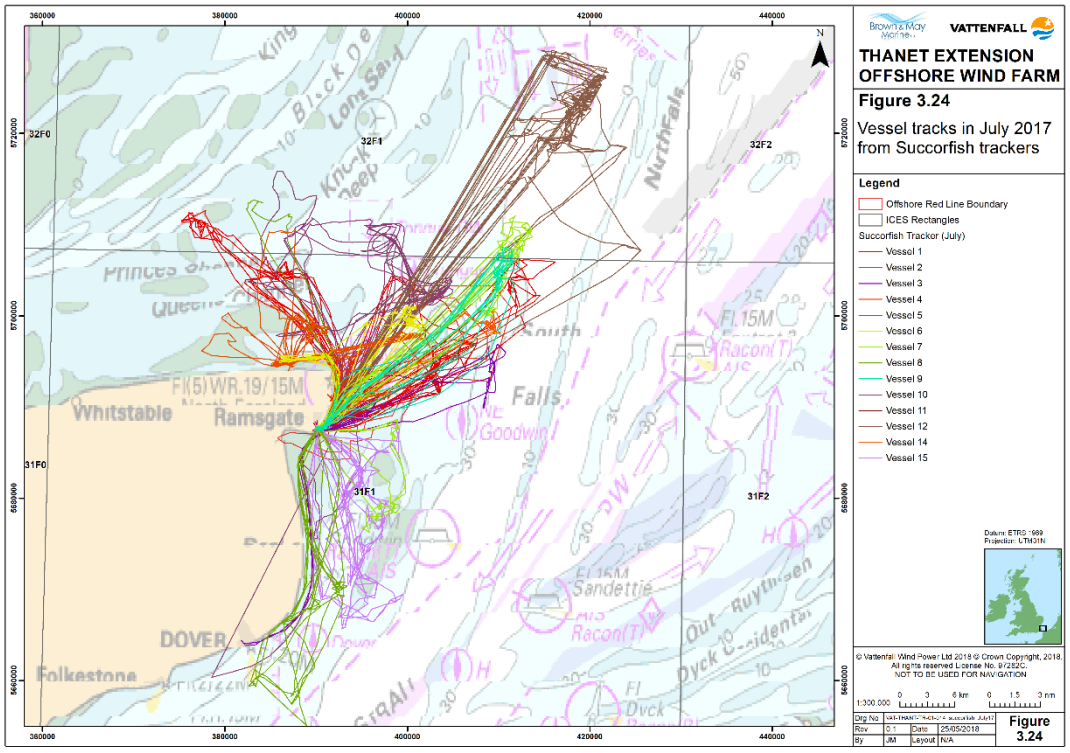


Figure 3.24 Vessel tracks for July 2017 as recorded by portable trackers (Succorfish Ltd.)

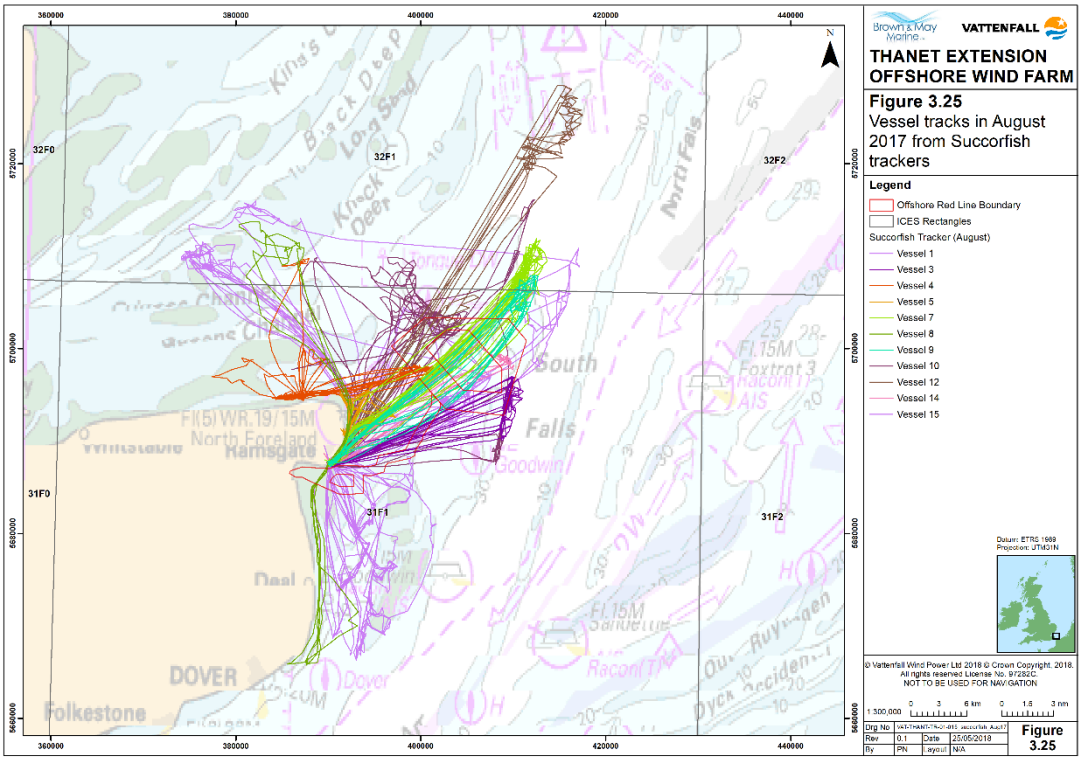


Figure 3.25 Vessel tracks for August 2017 as recorded by portable trackers (Succorfish Ltd.)

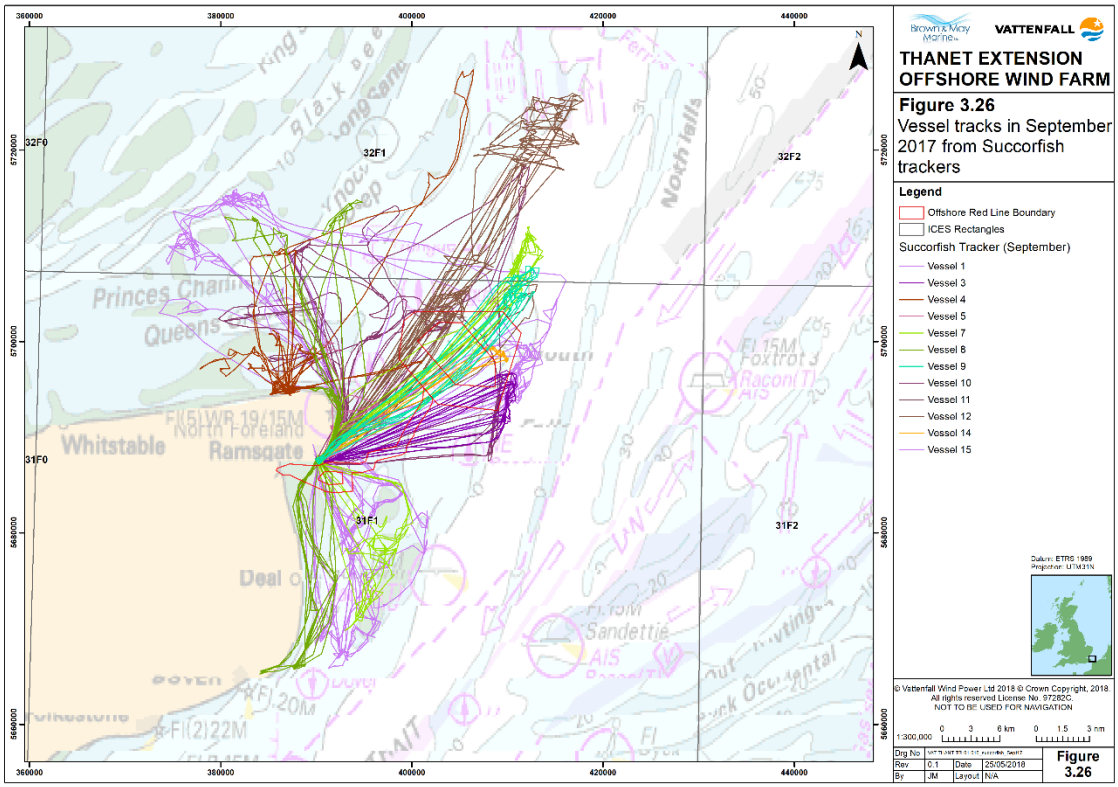


Figure 3.26 Vessel tracks for September 2017 as recorded by portable trackers (Succorfish Ltd.)

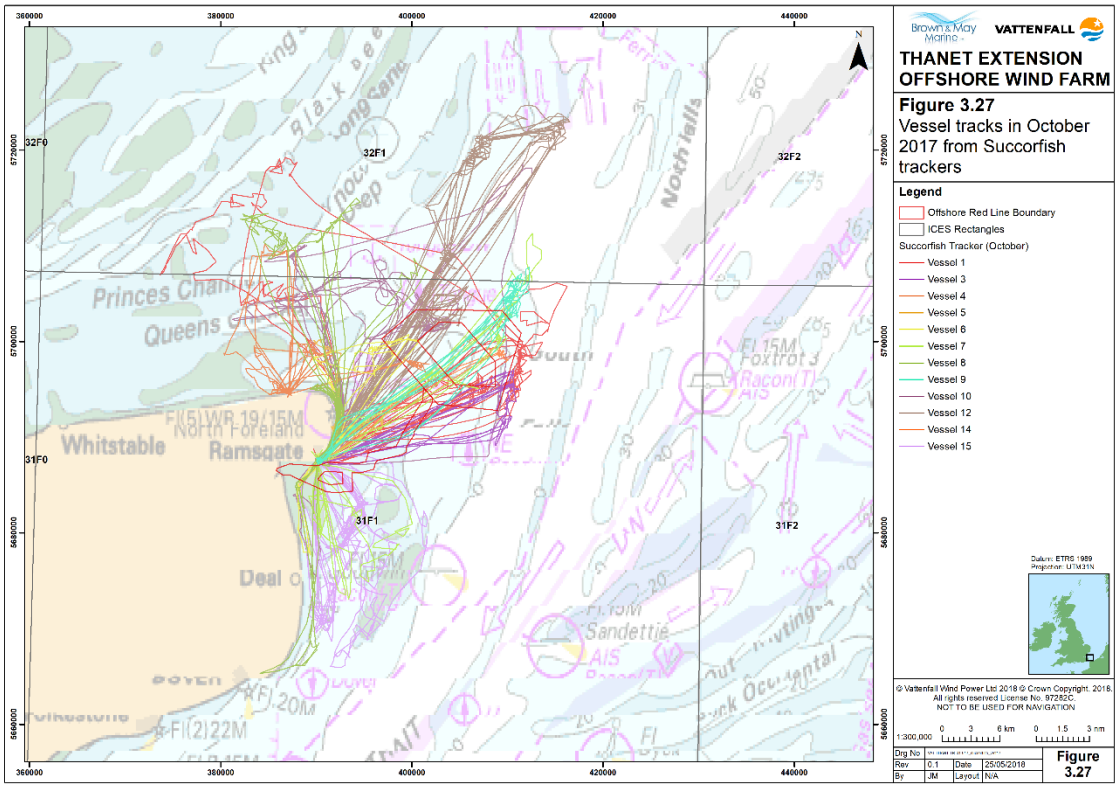


Figure 3.27 Vessel tracks for October 2017 as recorded by portable trackers (Succorfish Ltd.)

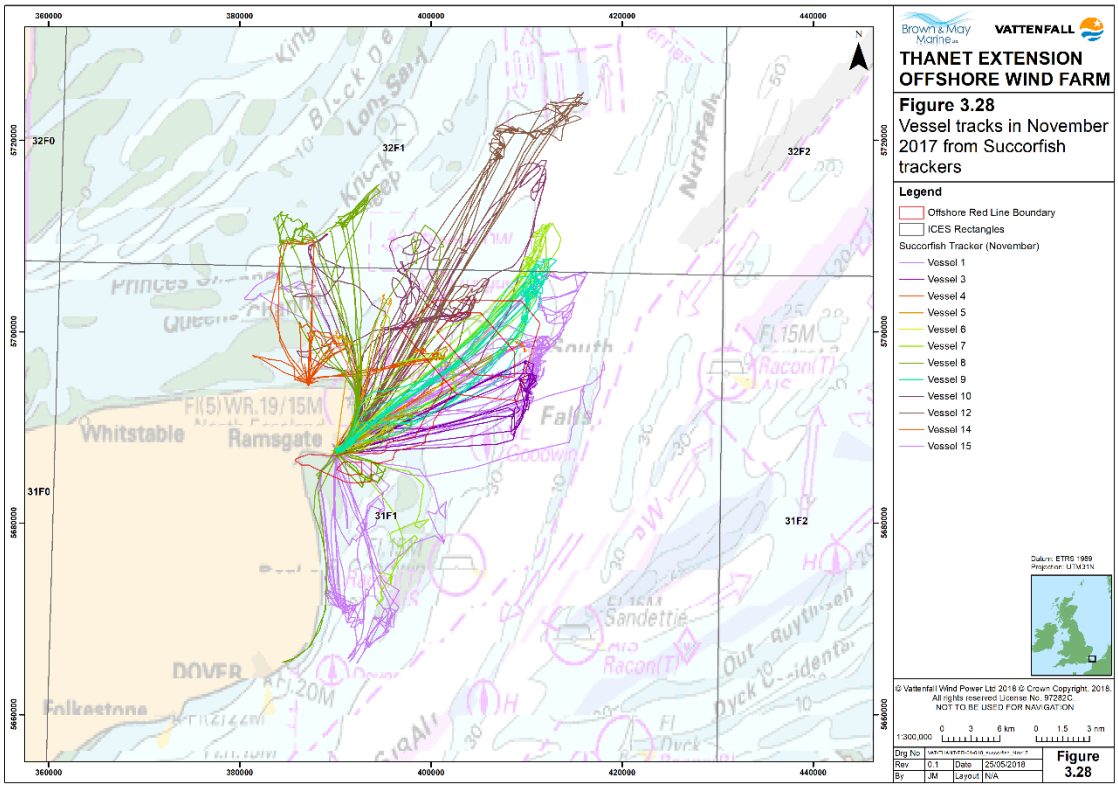


Figure 3.28 Vessel tracks for November 2017 as recorded by portable trackers (Succorfish Ltd.)

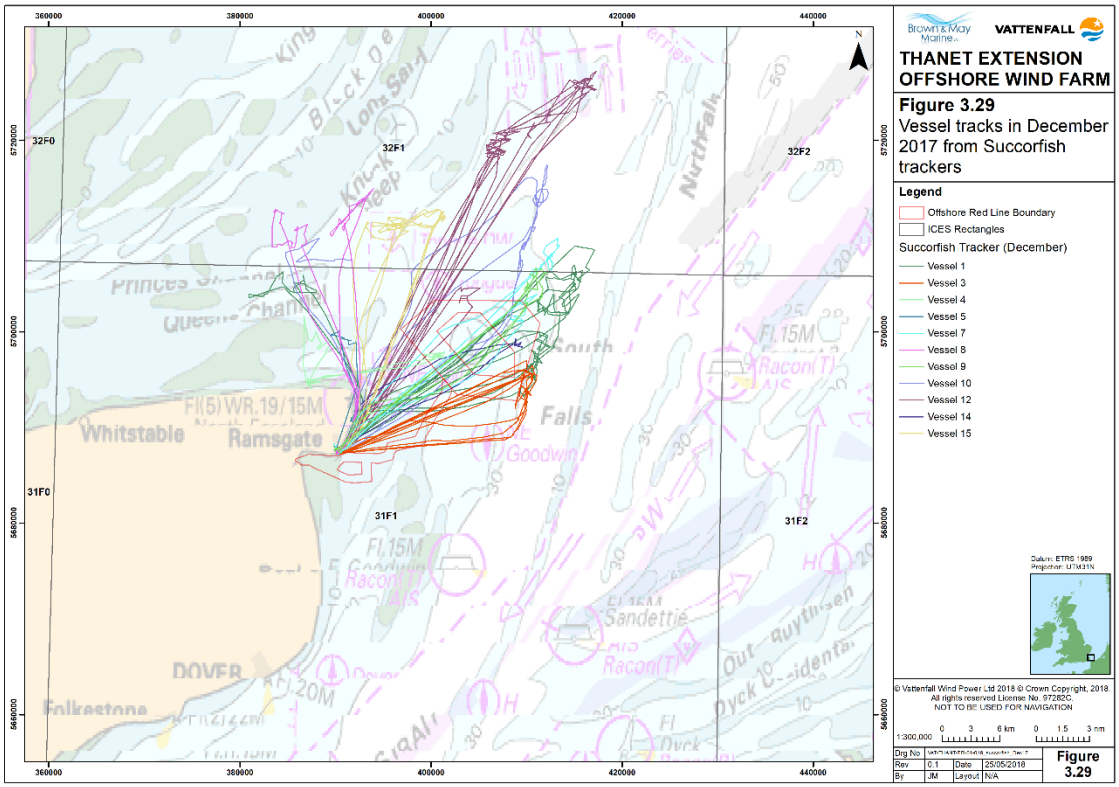


Figure 3.29 Vessel tracks for December 2017 as recorded by portable trackers (Succorfish Ltd.)

3.4 Belgian Fleet

3.4.1 Vessels, Gear and Operations

The Belgian fleet is the most active transboundary fleet in relation to the proposed development Offshore Wind Farm. The fleet focuses on the southern North Sea and English Channel, and comprises of around 65 vessels, the majority of which are beam trawlers (Table 3.5). Some vessels are also capable of operating both beam and otter trawls. The few remaining vessels are spread over static, flyshooting and seine nets.

Table 3.5 Vessel numbers in Belgian fleet by type

Vessel type	Number of vessels	Percentage of fleet (%)
Beam trawler	47	72.3
Otter trawler	4	6.1
Beam & otter trawler	8	12.3
Static gear vessel	2	3.1
Flyshooter	2	3.1
Seine netter	2	3.1

The majority of vessels which target the area around the proposed development are classed as eurocutters which work the local area for 6-12 months a year. The majority of eurocutters within the Belgian fleet operate from Oostende, examples of which are illustrated in Plate 3.7 and Plate 3.8.

Plate 3.7 A Belgian eurocutter in the boatyard at Ostende (Source: BMM, 2017)

Plate 3.8 A Belgian Eurocutter in Ostende (Source: BMM, 2017)

3.4.2 Belgian Landings Data

The effort data in Figure 3.30 and Figure 3.31 indicates that Belgian vessels in the vicinity of the proposed development are predominately 18 – 24 m in length although some larger vessels (24 – 40 m) are also present. The total average effort in 31F1 is 433 days. Within the local study area, the majority of effort is undertaken outside of ICES rectangle 31F1 using beam trawl and to a lesser extent demersal trawls and nets. Demersal trawl activity is focused on near shore areas to the north of the proposed development, and beam trawling is focused in ICES rectangle 31F2.

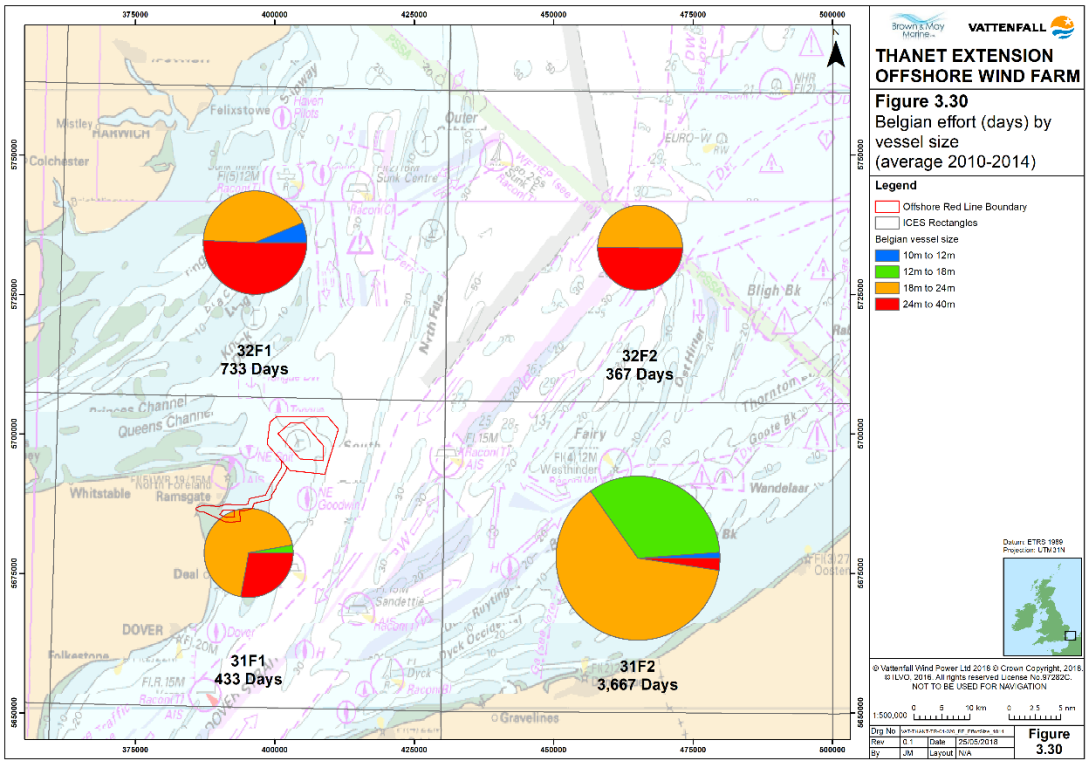


Figure 3.30 Belgian effort (days) by vessel size (average 2010-2014) (indicative layout) (Source: ILVO)

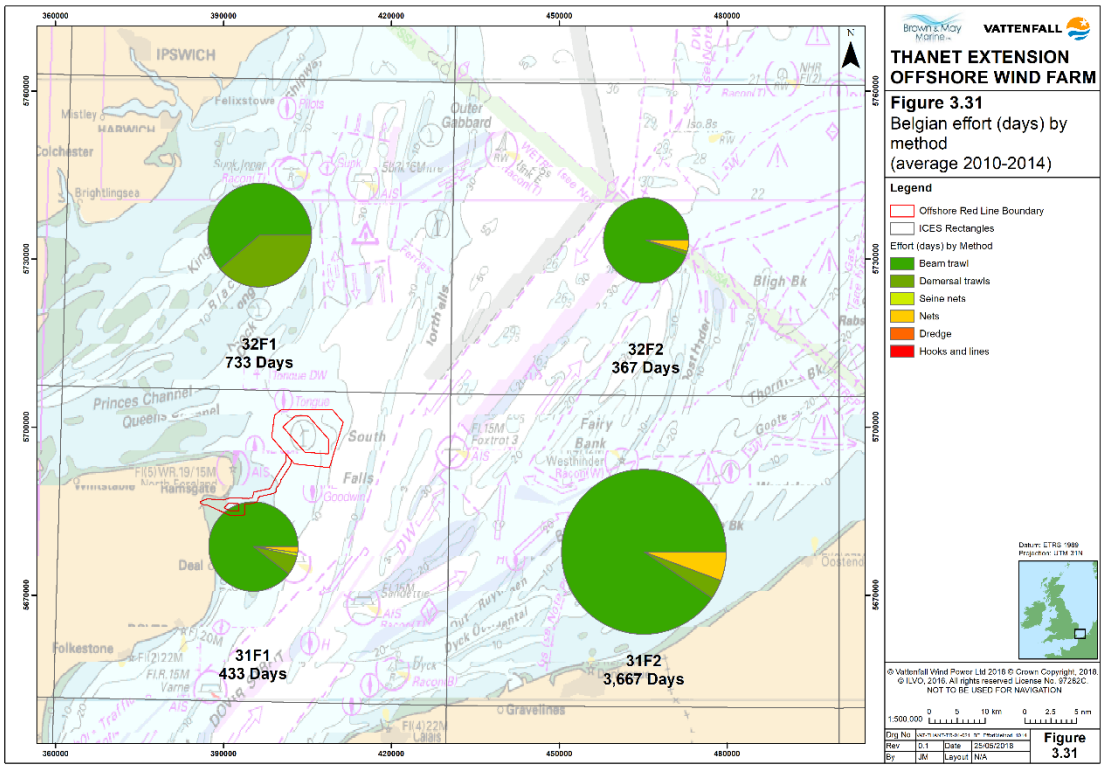


Figure 3.31 Belgian effort (days) by method (average 2010-2014) (indicative layout) (Source: ILVO)

Within the regional study area, landings values are recorded for vessels from 10 – 40 m in length (Figure 3.32) whereas in the local study area, the majority of landings values are attributed to 18 – 24 m vessels, and to a lesser extent 24 – 40 m vessels. The total average annual value of landings is €1,670,912 within 31F1, a similar value to the adjacent 32F1 rectangle. The highest landings values in the regional study area are recorded in 31F2, the ICES rectangle closest to the Belgian coast.

Figure 3.33 confirms that the majority of landings values are undertaken by beam trawlers, with a small percentage obtained by otter trawls.

Figure 3.34 illustrates the landings by species within the regional study area. The majority of the landings value within 31F1 is of Dover sole, followed by plaice and a range of other species which are landed at lower values.

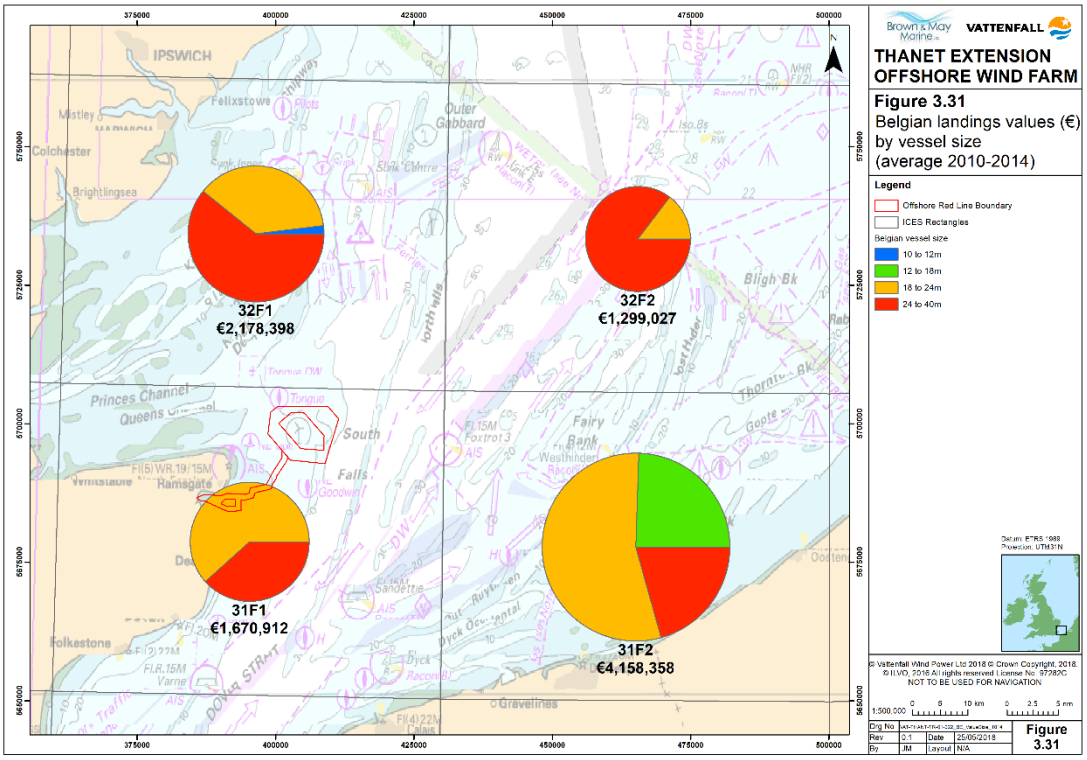


Figure 3.32 Belgian landings (€) by vessel size (Average 2010-2014) (indicative layout) (Source: ILVO, 2016)

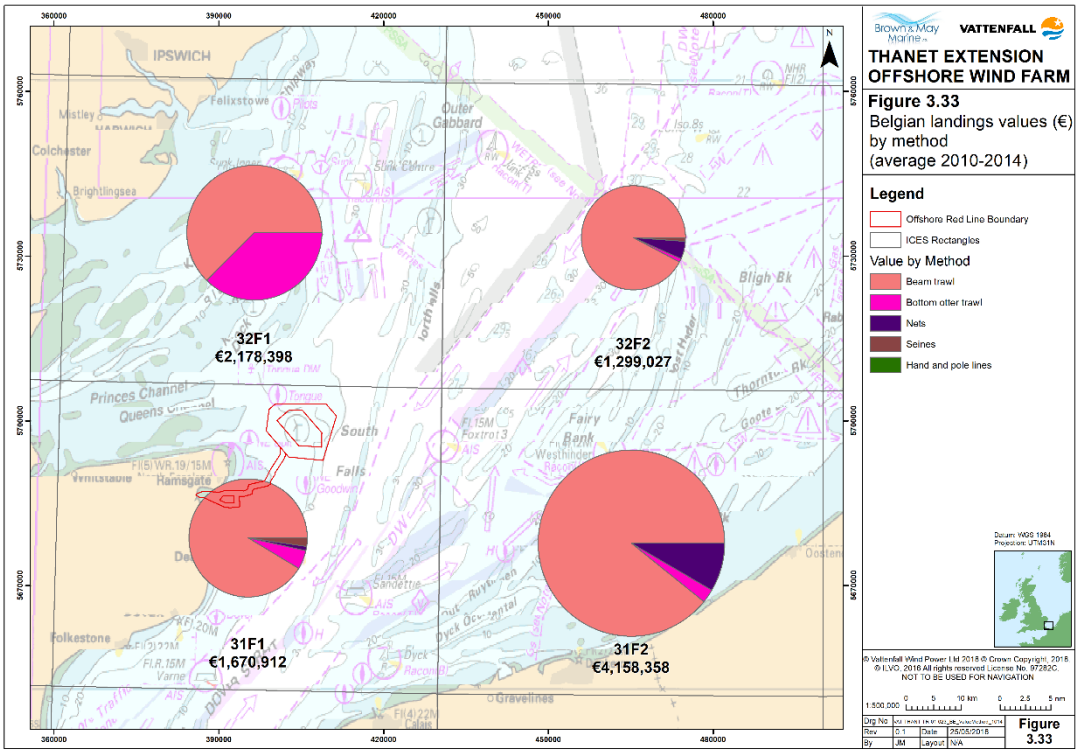


Figure 3.33 Belgian landings (€) by method (Average 2010-2014) (indicative layout) (Source: ILVO, 2016)

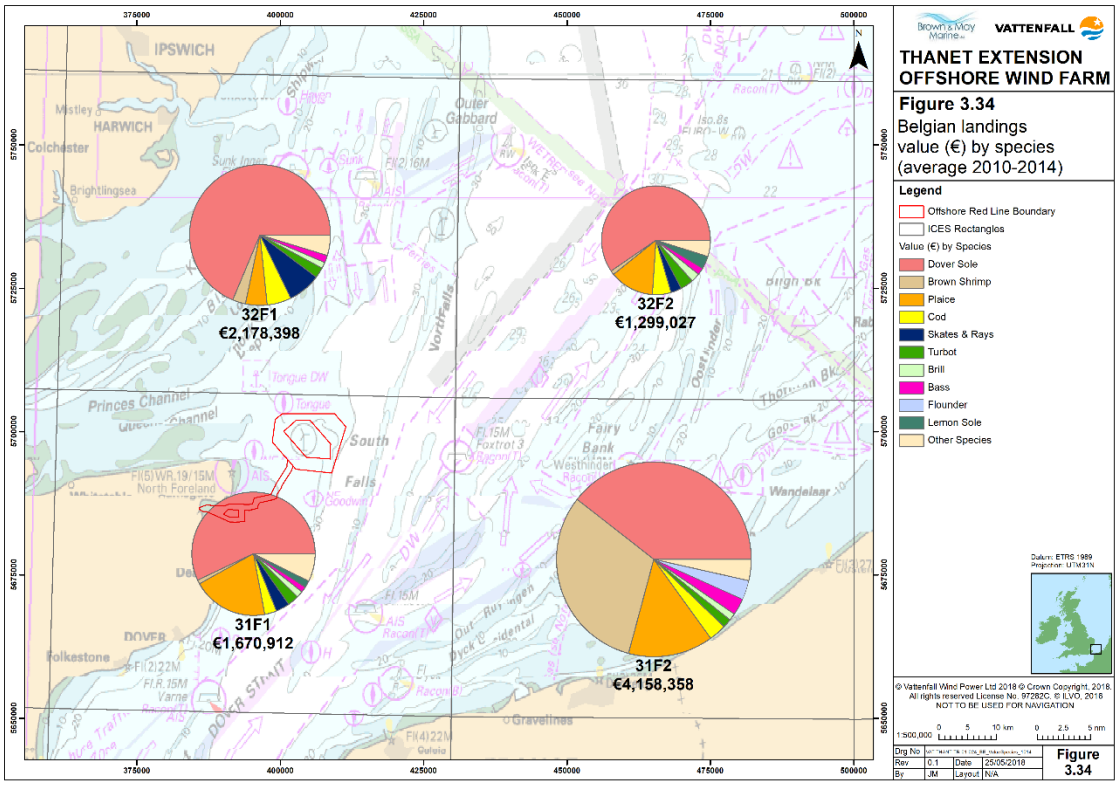


Figure 3.34 Belgian landings by species (average 2010-2014) (indicative layout) (Source: ILVO, 2016)

3.4.3 Surveillance Sightings

Surveillance sightings indicate that the Belgian fleet focus fishing effort on grounds to the north and south of the proposed development, although some vessels have been observed within the proposed development area (Figure 3.35).

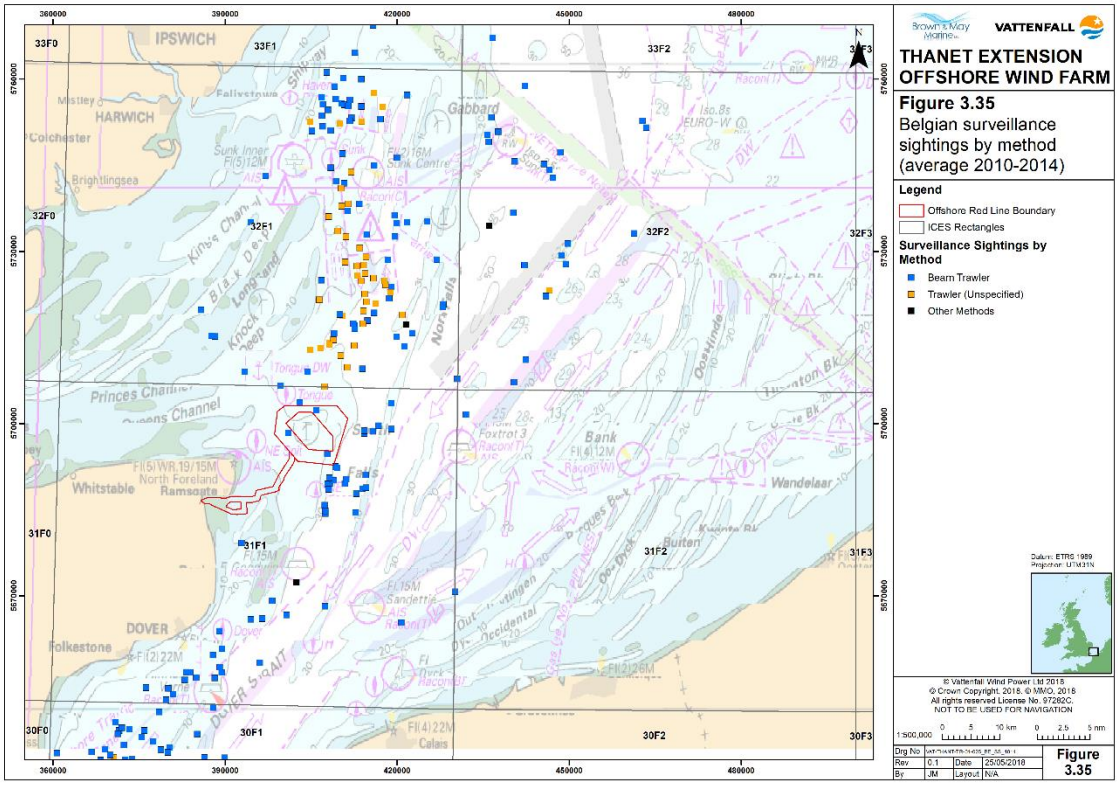


Figure 3.35 Belgian surveillance sightings by method (2012-2016) (indicative layout) (Source MMO, 2018)

3.4.4 Satellite Tracking (VMS) Data

Belgian VMS data by effort and value has been supplied by ILVO with a breakdown by gear type (Figure 3.36). Analysis of the combined Belgian VMS data illustrates that the proposed development is located within an area of relatively high fishing intensity. This fleet operates in the proposed development area for an average of up to 100 days per year with landings of €250,000 to €500,000.

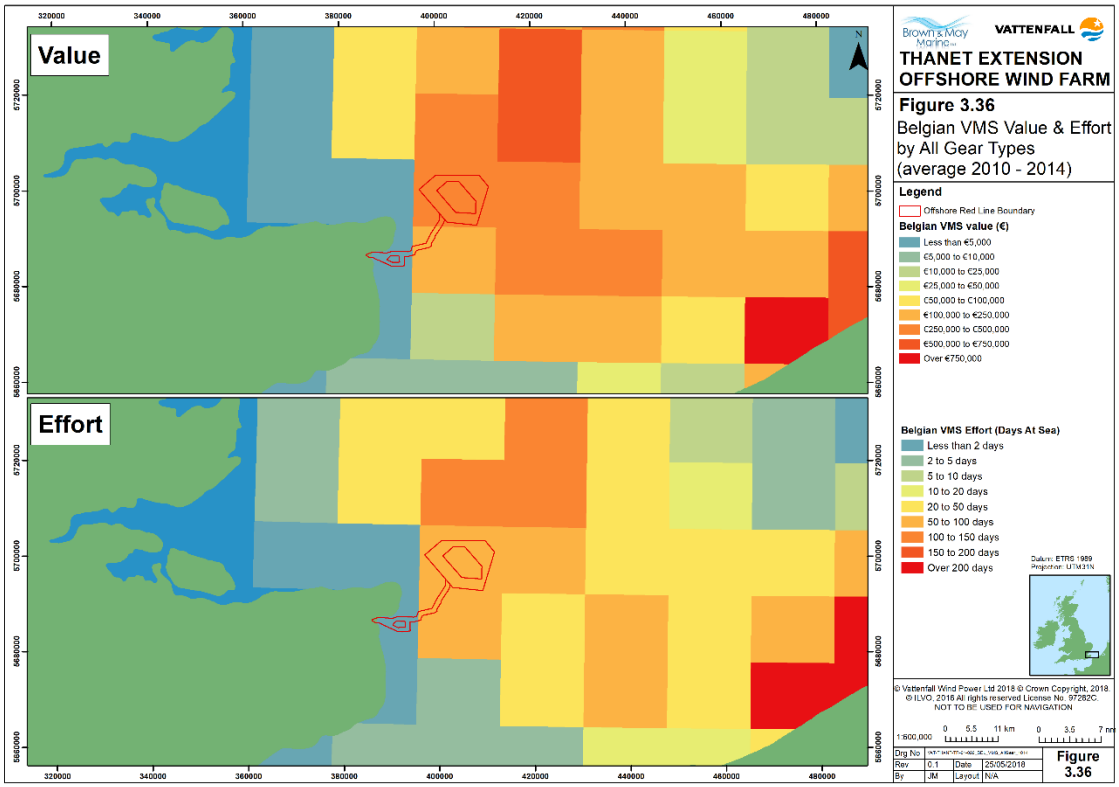


Figure 3.36 Belgian VMS value and effort data for all gear types (average 2010-2014) (indicative layout) (Source: ILVO 2016)

Figure 3.37 shows that the majority of Belgian fishing activity and effort is undertaken by beam trawlers with landings recorded as €250,000 to €500,000 with effort averaging 100 days per annum.

Demersal trawling activity by the Belgian fleet is of lower intensity than beam trawling (Figure 3.38) and focused on specific grounds principally to the north of the proposed development site although low levels of activity are recorded within it. Effort levels of up to 20 days were recorded on average per year with a peak to the north of 50 - 100 days. The highest value landings are €250,000 – €500,000, whilst the value of landings in the proposed development area are €25,000 – €50,000.

Belgian netting activity is at a low level and focused on grounds to the east of the proposed development (Figure 3.39).

Other methods such as seine netting and hooks and lines occur at negligible levels and have not been included.

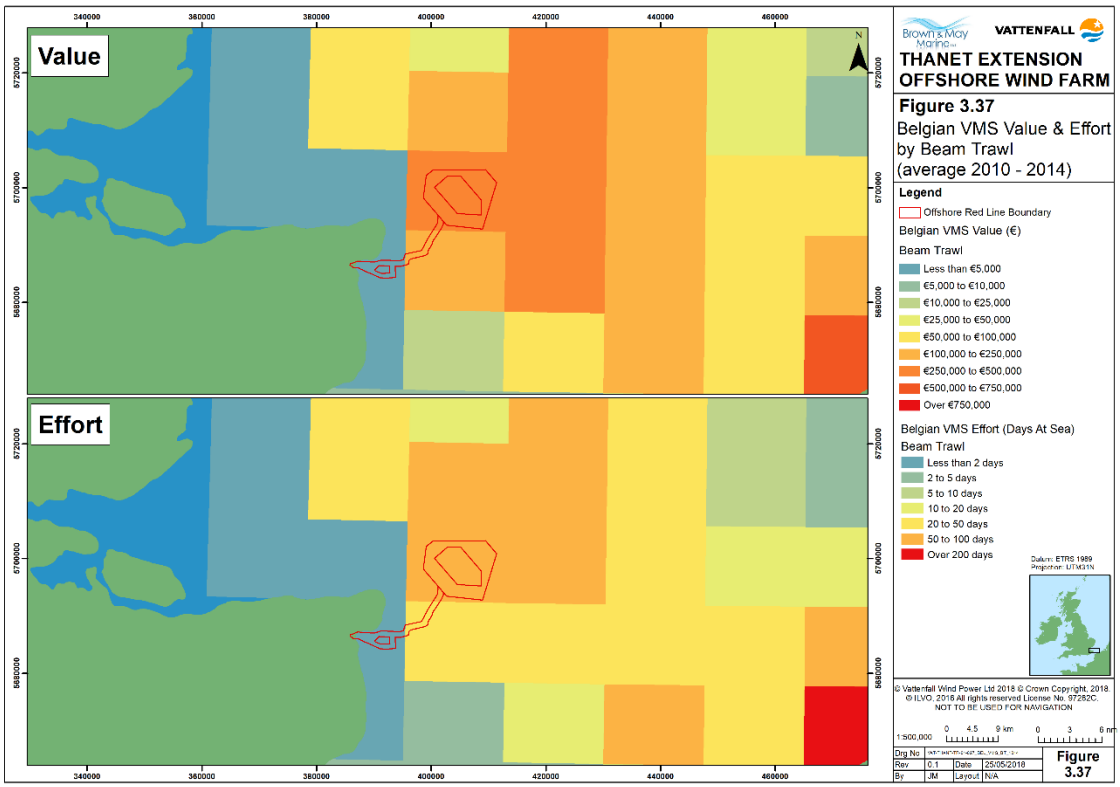


Figure 3.37 Belgian VMS value and effort data - beam trawl (average 2010-2014) (indicative layout) (Source: ILVO 2016)

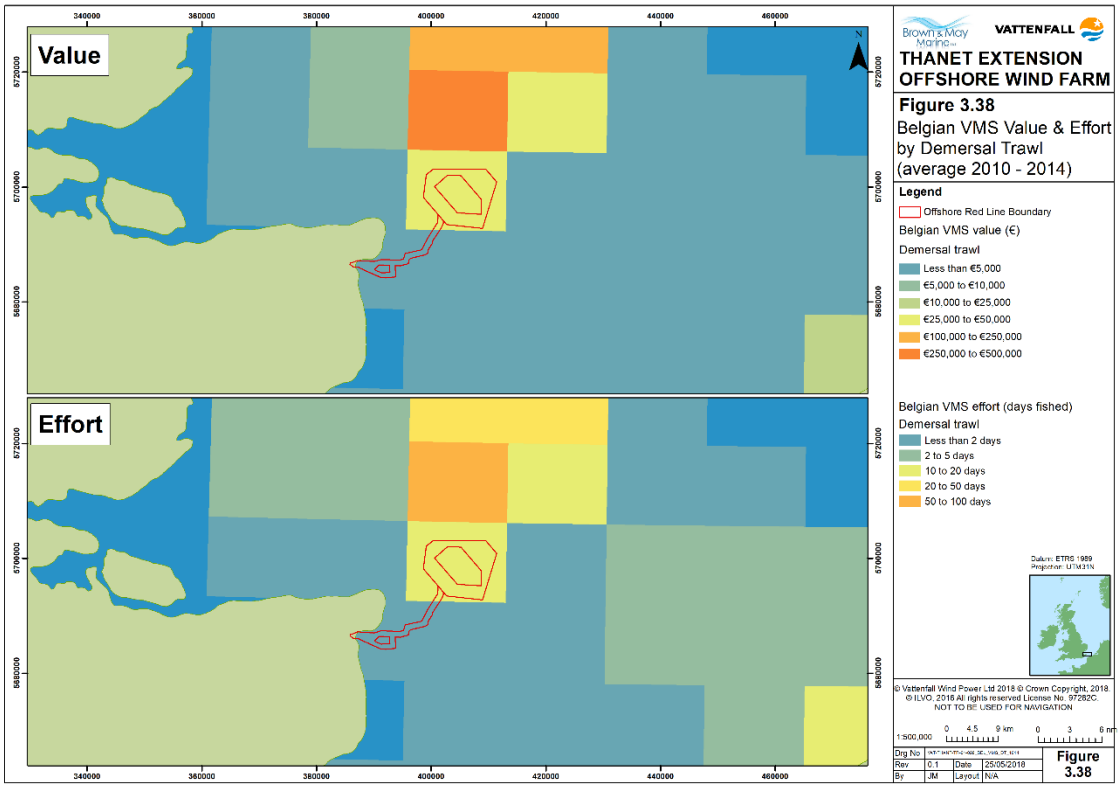


Figure 3.38 Belgian VMS effort and value data for demersal trawl (average 2010-2014) (indicative layout) (Source: ILVO 2016)

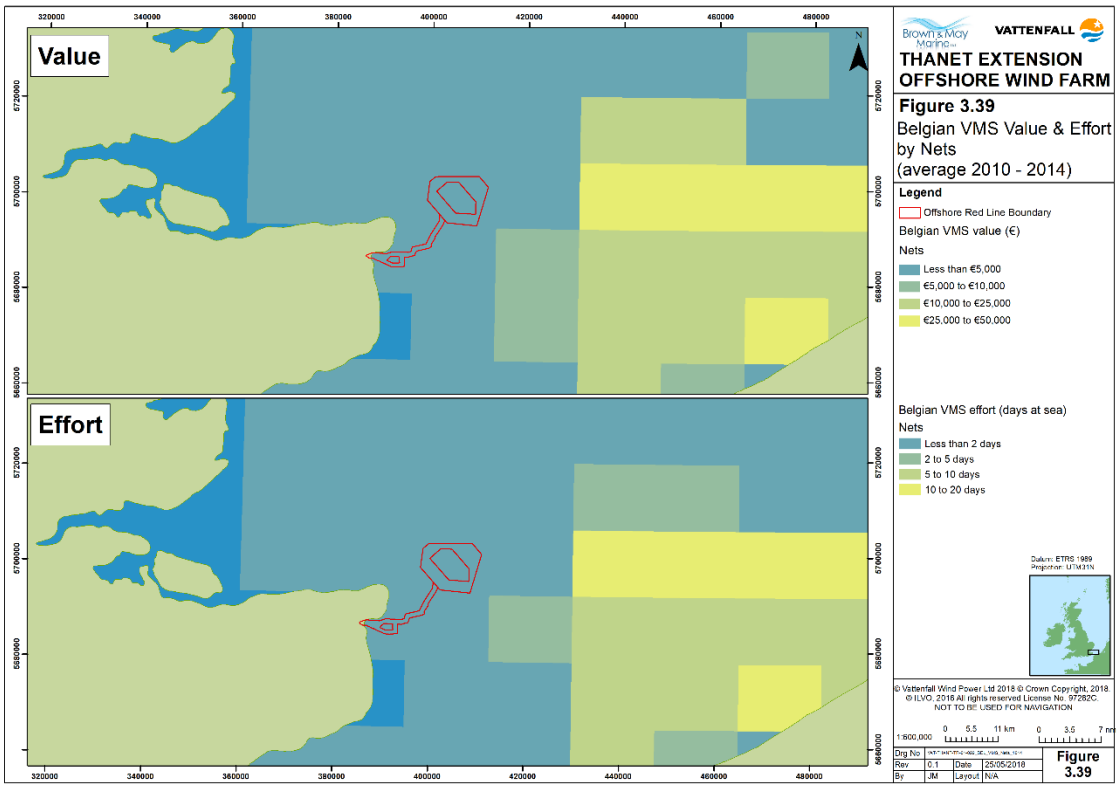


Figure 3.39 Belgian VMS value and effort by nets (average 2010-2014) (indicative layout) (Source : ILVO:2015)

3.5 French Fleet

3.5.1 Vessels, Gear and Operations

French vessels are known to operate occasionally in the area of the proposed development. French fishermen have historic rights to access grounds up to the 6 nm limit, within which the eastern section of the proposed development is located.

The French fleet use a range of methods in the southern North Sea and the English Channel. The principle methods are bottom trawls targeting demersal and cephalopods species (Dover sole, red mullet, cuttlefish, whiting and plaice) and pelagic trawls which target pelagic species such as herring, mackerel, horse mackerel and sardine.

The majority of French vessels are larger demersal otter trawlers (>18 m in length) operating from the Nord Pas de Calais region, principally from Boulogne and to a lesser extent Dieppe. Plate 3.9 shows two of these trawlers seen in Boulogne port in March 2017. During

consultation with CRPMEM, it was stated that several of these vessels are converting to seine netting in order to target red mullet. In general, however, French trawlers target sole, whiting, plaice and mackerel (IFREMER, 2015).

French vessels which operate pelagic trawls focus fishing effort on grounds to the south of the proposed development where they target herring.

Plate 3.9 French trawlers which operate out of Boulogne (Source BMM: 2017)

3.5.1.1 Satellite Tracking (VMS) Data

In response to initial consultation and the publication of the Round 3 Zone locations and boundaries, (Comite National des Peches Maritimes et des Elevages Marins) CNPMEM in association with Institut Français de Recherche pour L'exploitation de la Mer (IFREMER), produced the document “French Answer to the Consultation on Round 3 UK Windfarms Proposal 2009”. In 2012, the Comité Régional des Pêches Maritimes et des Elevages Marins (CRPMEM) produced a paper, also in association with IFREMER: “Components of Activity of French Vessels in 2008 to 2009 Near the East Anglia Offshore Windfarm Project Zone”.

The stated objective of the CNPMEM (2009) report was to assess the socio-economic impact of the Round 3 developments on French fishing activity. The results and charts produced are based on speed filtered VMS data and sales registered at French fish auctions. The data used were not presented however, nor were details given of the modelling used, although reference was made to the use of algorithms.

The premise of the CNPMEM (2009) report is that loss of fishing area equates to loss of fishing income. The final assessment is based on a single years' worth of data (2008).

Despite numerous requests (most recently in February 2018), up to date VMS data has not been forthcoming from French authorities. The CRPMEM have offered use of their Valpena system (which records VMS data from some of their members' vessels) but it is unclear if this will cover the whole French fleet.

Figure 3.40 illustrates that French fishing activity using bottom trawls and pelagic gear occurs in the eastern boundary of the proposed development and is highest on grounds to the south of the proposed development. A similar pattern is illustrated for bottom otter trawls (Figure 3.41).

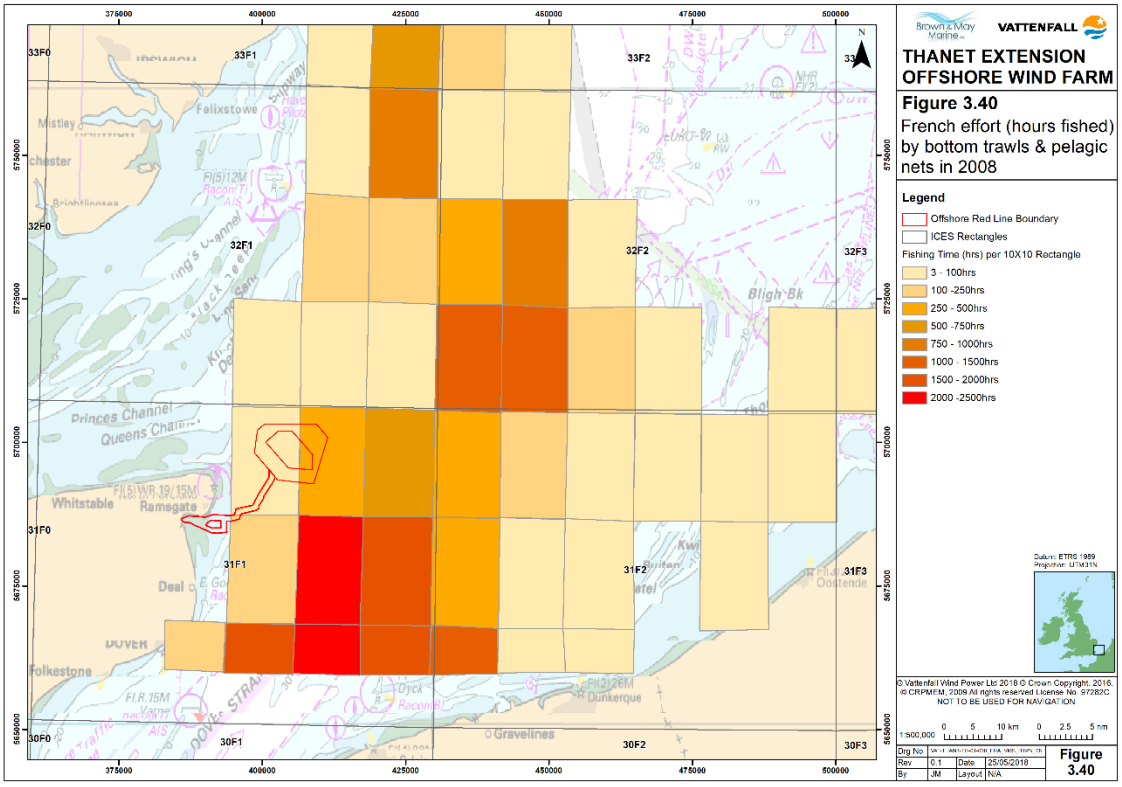


Figure 3.40 VMS effort data for bottom trawls and pelagic nets (indicative layout) (CRPMEM, 2009)

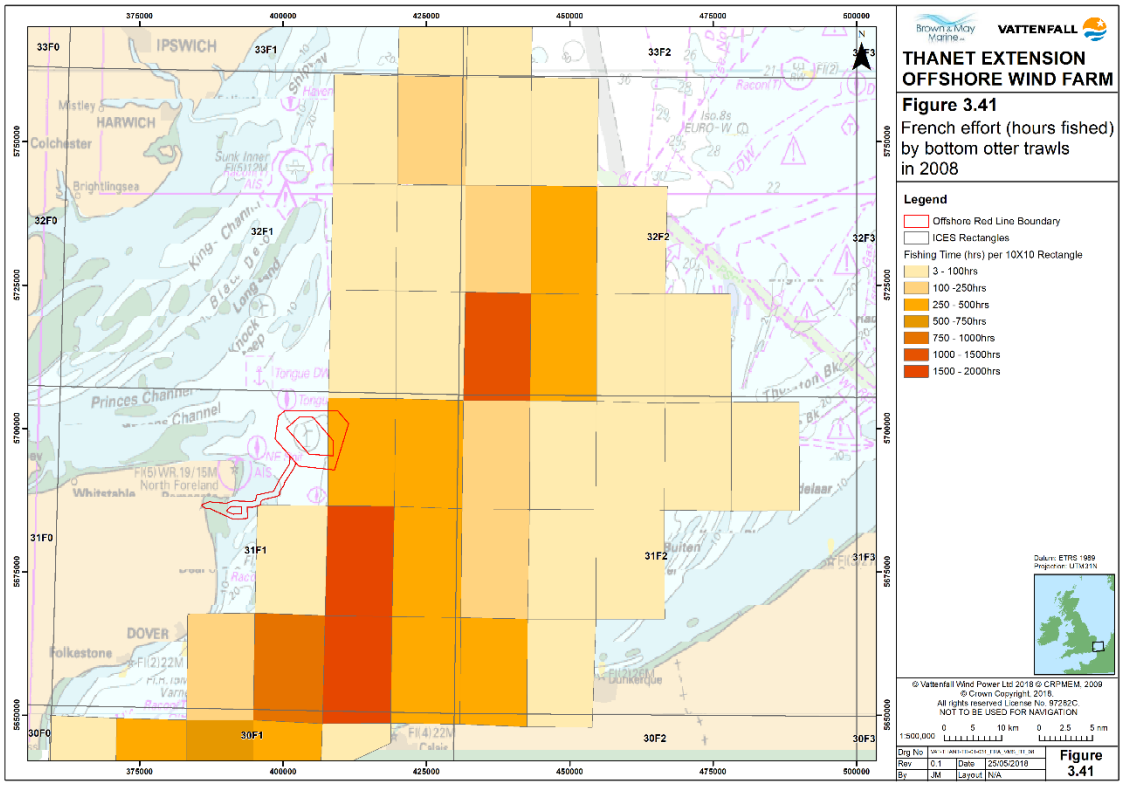


Figure 3.41 VMS effort by bottom otter trawls (indicative layout) (CRPMEM, 2009)

A more recent source of data is from IFREMER's 2014 annual report (Figure 3.42). This shows French fishing effort recorded in days for over 18 m vessels which use bottom trawls. This highlights that effort is at levels of 15010 - 2000 days within 31F1. As shown by the earlier CRPMEM data, the majority of effort is undertaken to the east and south of the proposed development.

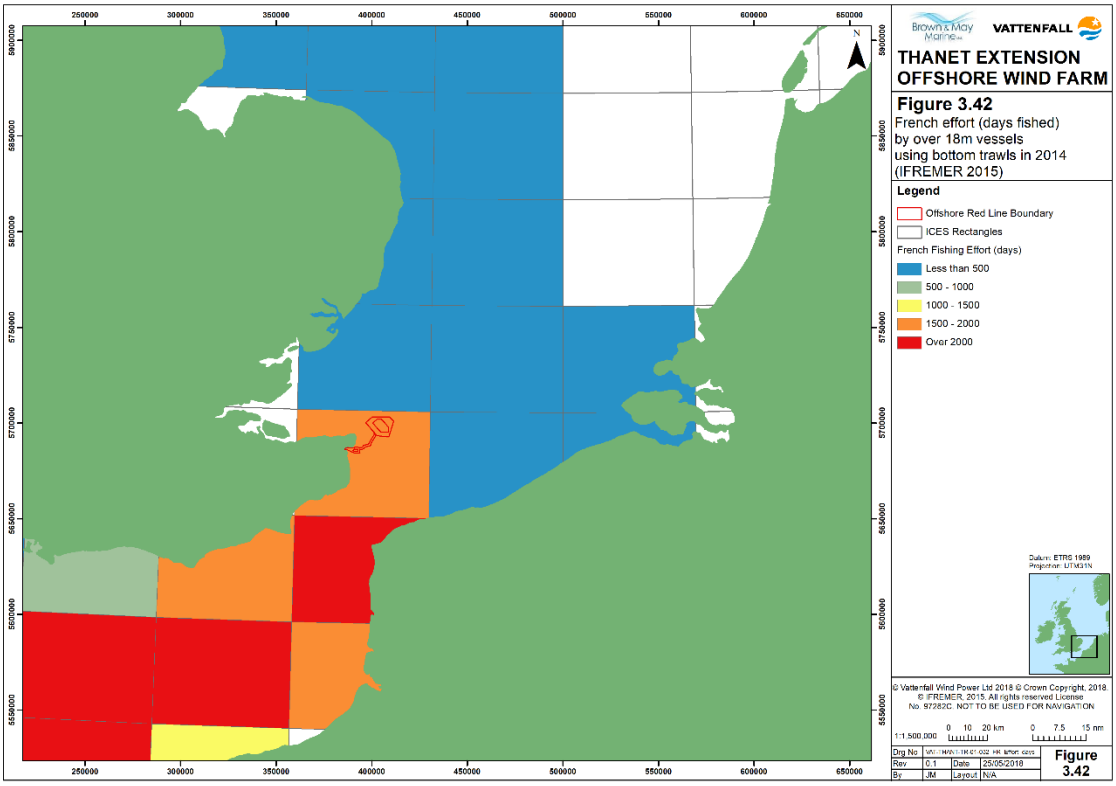


Figure 3.42 French fishing effort (days) by over 18m vessels using bottom otter trawls (2014) (indicative layout) (Source: IFREMER, 2015)

3.5.2 Surveillance Sightings

Surveillance sightings of French fishing vessels (Figure 3.43) illustrate few sighting of vessels within the proposed development and the majority of French vessels sighted to the south.

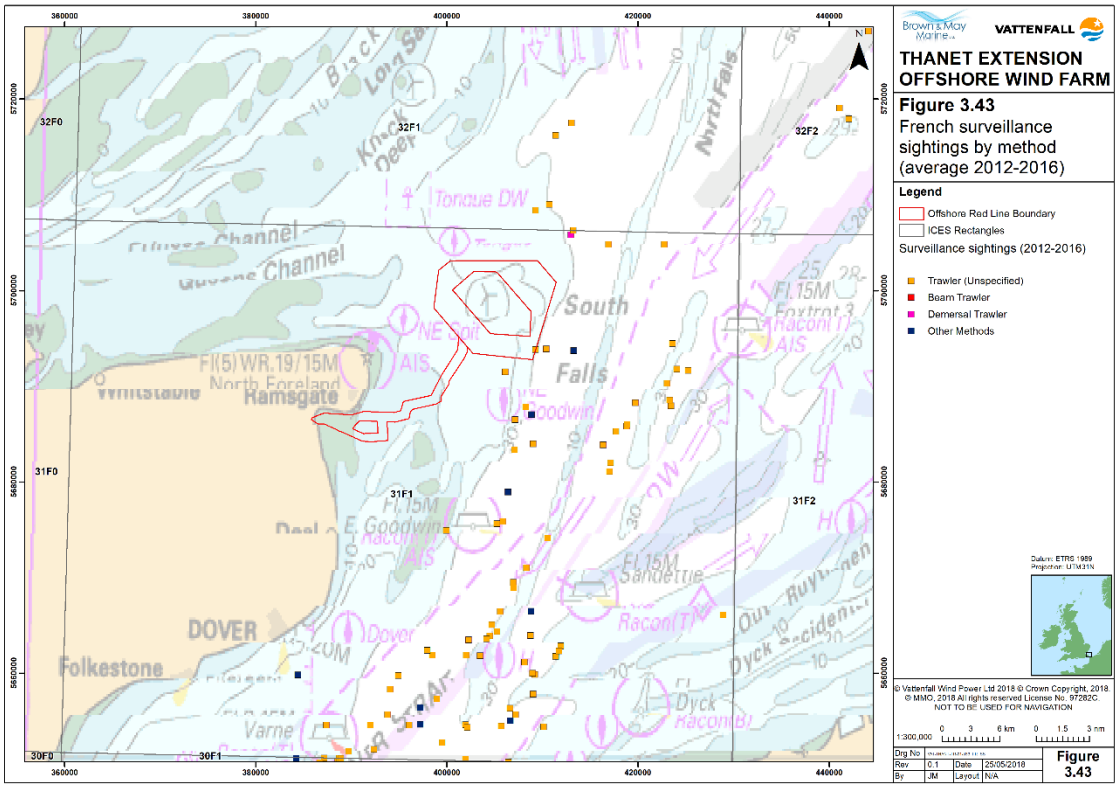


Figure 3.43 Surveillance sightings of French vessels by method (2012-2016) (indicative layout) (Source: MMO; 2018).

3.6 Dutch Fleet

3.6.1 Vessels, Gear and Operations

The Dutch operate the largest fleet in the southern North Sea. They deploy a range of gear types throughout the area, although the majority of vessels undertake beam trawling. An example of a Dutch beam trawler with Sumwing gear is shown in Plate 3.10.

Dutch vessels work within the regional and local area of the project, but due to legislative restrictions are unable to operate directly within the proposed development area. The Dutch do not have historic rights and therefore cannot fish within the UK 12 nm limit.

Plate 3.10 Dutch beam trawler known to operate in the southern North Sea with Sumwing technology (Source: BMM, 2015)

3.6.2 Dutch Satellite Tracking (VMS) Data

As demonstrated in Figure 3.44, the southern North Sea is an area of high intensity fishing for the Dutch beam trawling fleet. However, due to the 12 nm restriction, moderate activity occurs close to the proposed development (5 - 10 days), with associated landings values of between €50,000 to €100,000.

The VMS data illustrated in Figure 3.45 demonstrates that seine netting is undertaken to the east of the proposed development (€100,000 to €250,000). Activity within and landings obtained from the proposed development area are negligible.

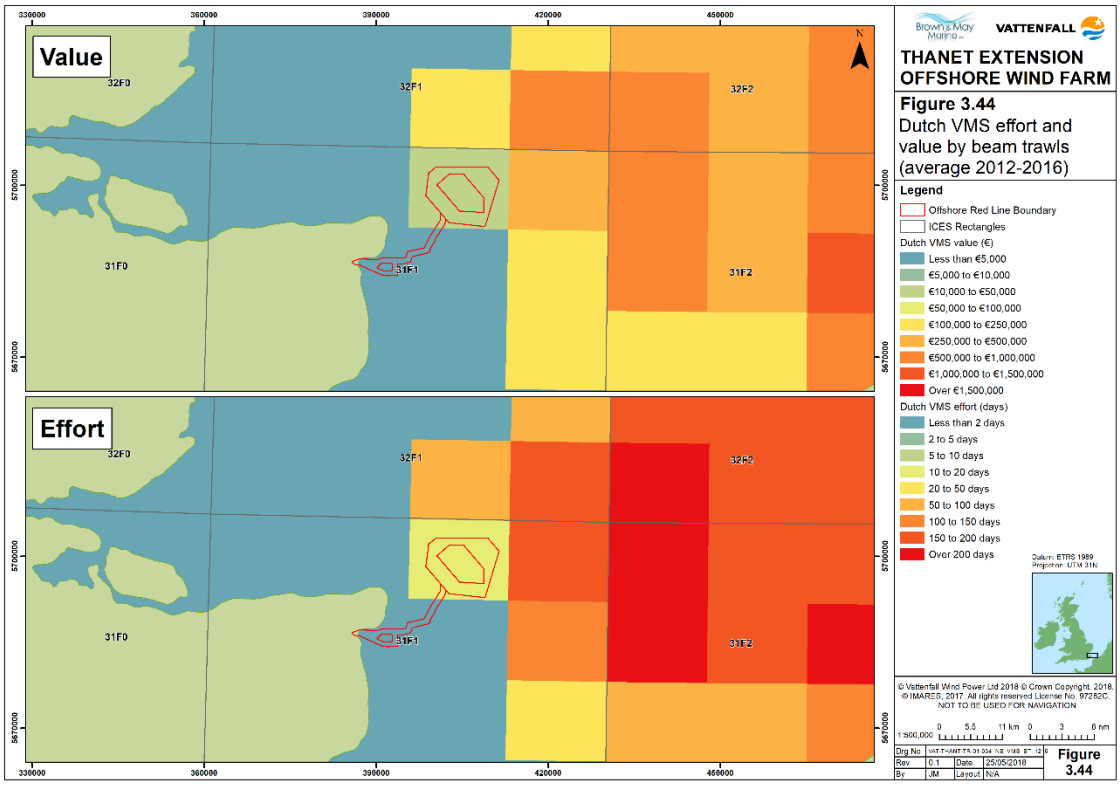


Figure 3.44 Dutch VMS effort and value by beam trawls (average 2012-2016) (indicative layout) (Source IMARES: 2018)

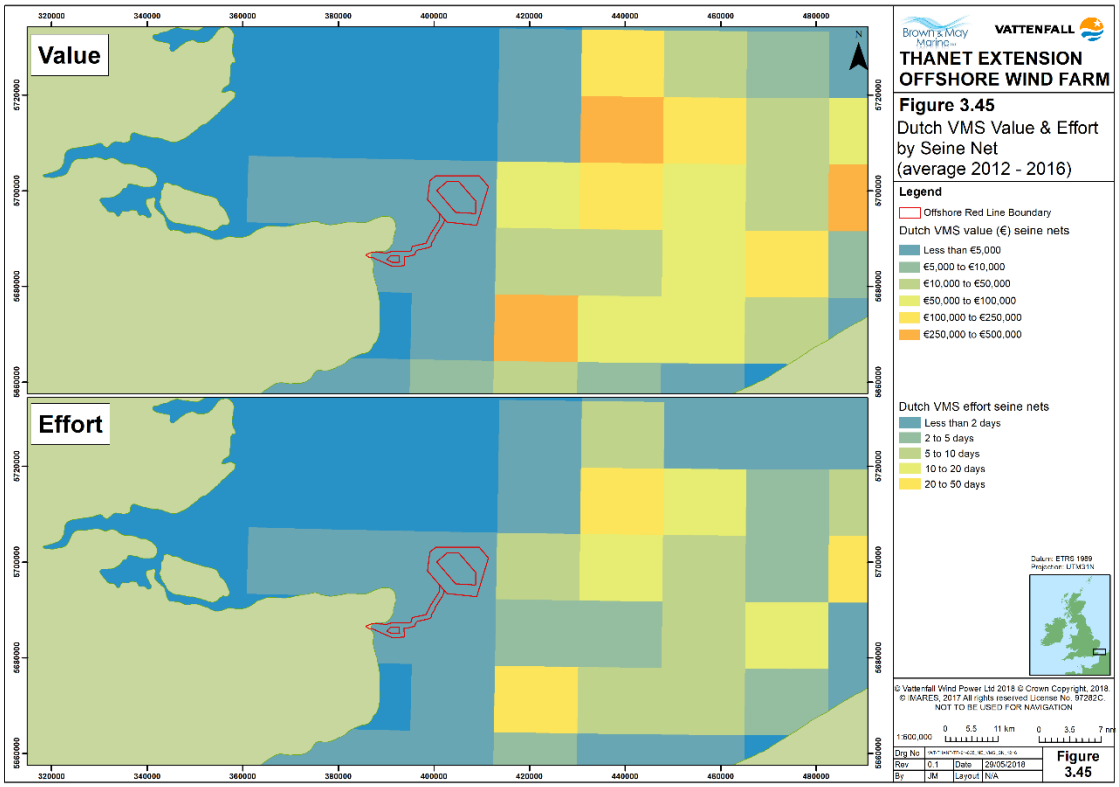


Figure 3.45 Dutch VMS effort and value by seine nets (average 2012-2016) (indicative layout) (Source IMARES: 2018)

Figure 3.46 illustrates that midwater / demersal trawling by Dutch vessels occurs sporadically throughout the regional area but is at negligible levels around the proposed development. Other methods such as Dutch seine nets and hook and lines are also negligible in the local area.

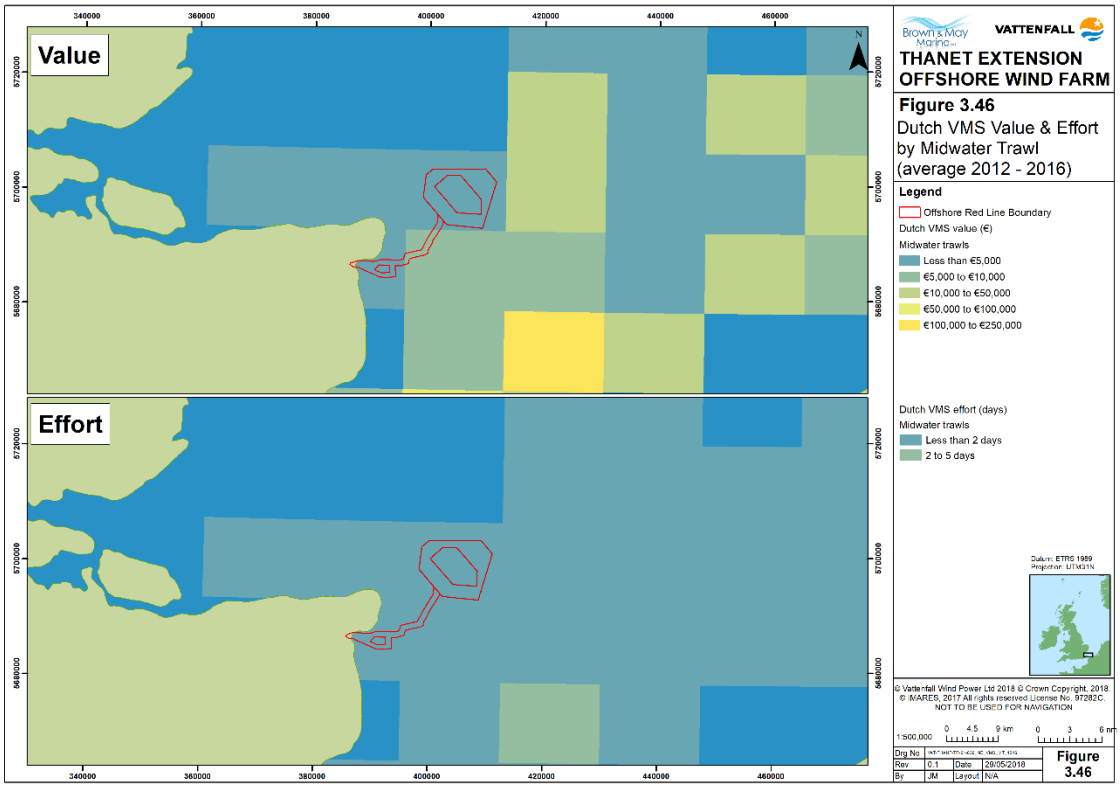


Figure 3.46 Dutch VMS effort and value by mid-water trawls (average 2012-2016) (indicative layout) (source IMARES: 2018)

3.6.3 Dutch Landings Data

Effort values by vessel type clearly demonstrate that the majority of Dutch vessels operating in the regional area are over 24 m in length (Figure 3.47). The effort levels are relatively low compared to the rest of the southern North Sea, at a total average of 127 days per annum within ICES rectangles 31F1.

Figure 3.48 identifies that most of the landings are from over 15 m vessels and Figure 4.39 shows that the majority are captured via beam trawls. The higher landing values are recorded in other rectangles within the regional study area which are closer to the Dutch coast.

Figure 3.49 indicates that the majority of Dutch vessels in the study region employ beam trawls. In ICES rectangle 31F1, there are more vessels using seine nets and midwater trawls, as well as beam trawls and other methods.

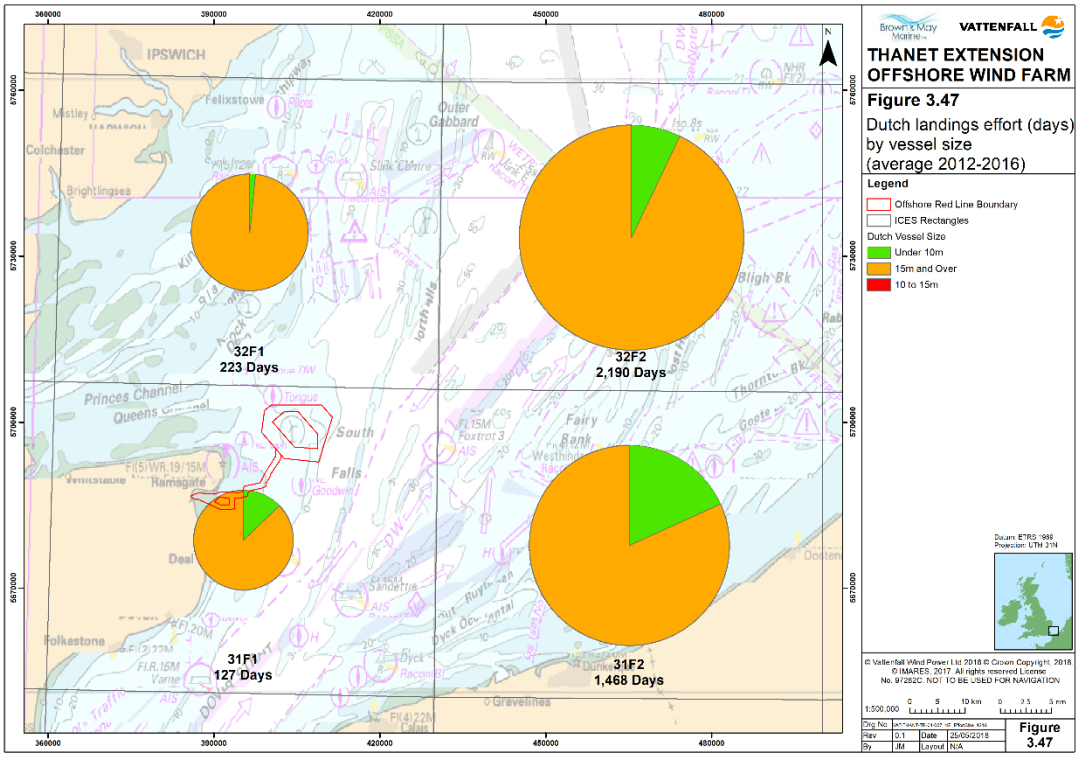


Figure 3.47 Dutch effort (days) by vessel size (average 2012-2016) (indicative layout) (Source: IMARES: 2018)

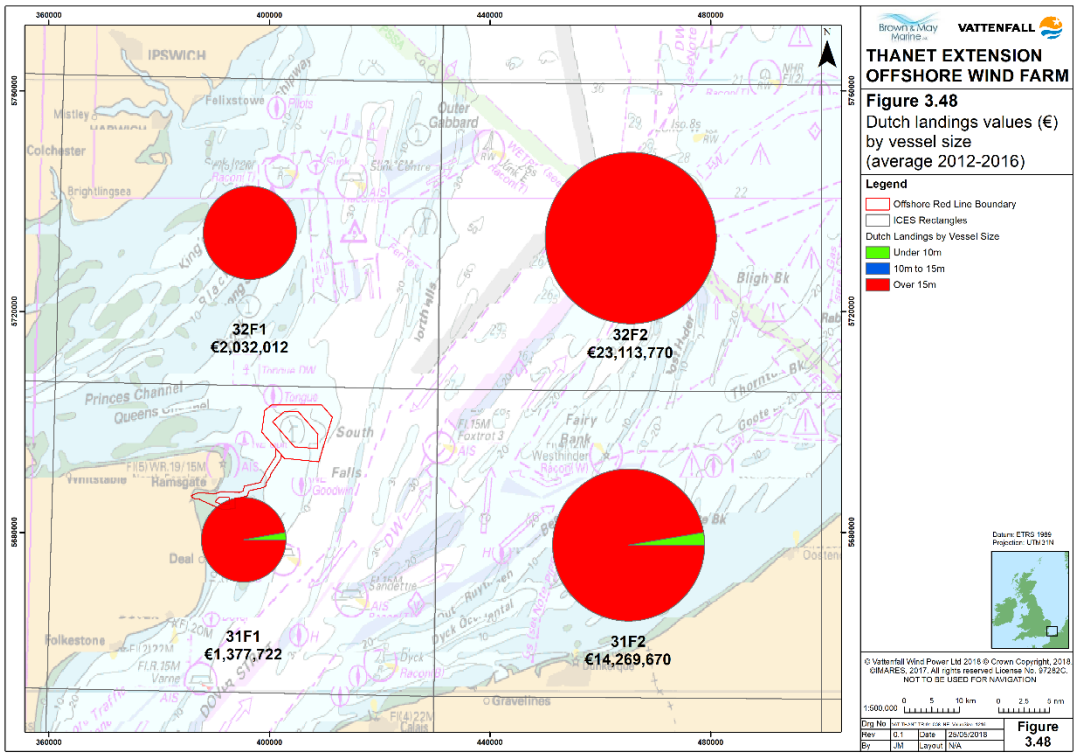


Figure 3.48 Dutch landings (€) by vessel size (Average 2012-2016) (indicative layout) (Source: IMARES: 2018)

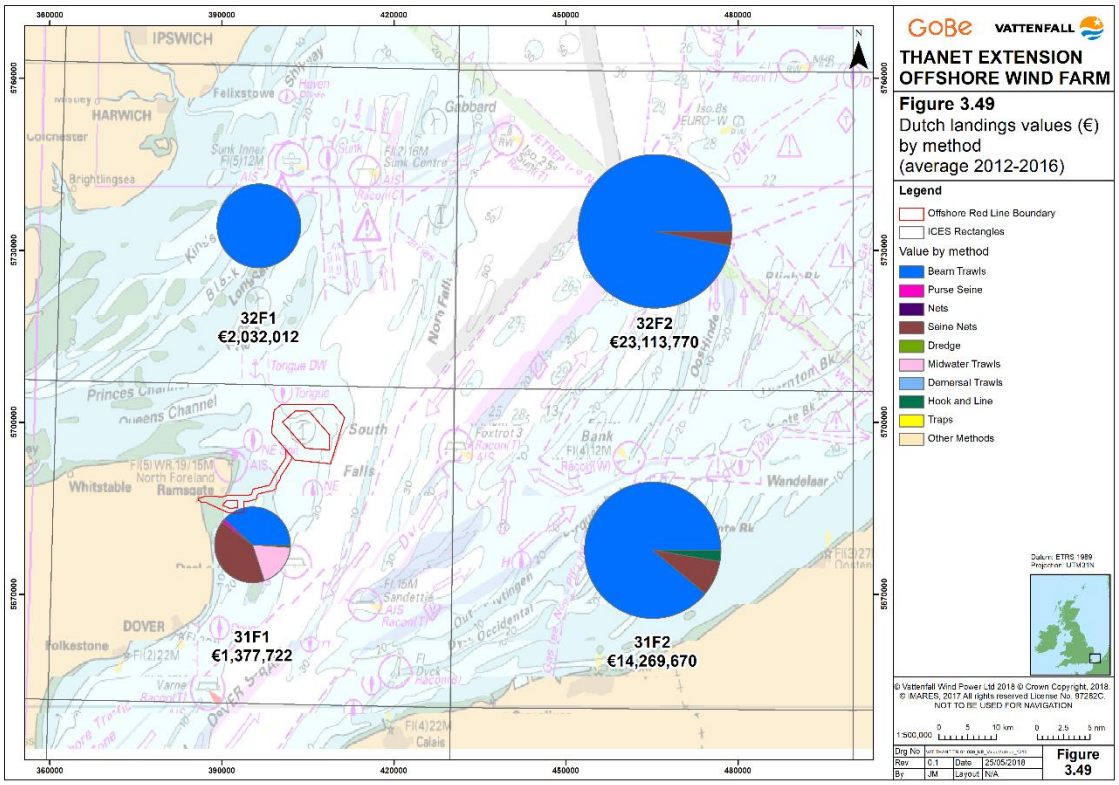


Figure 3.49 Dutch landings (€) by method (average 2012-2016) (indicative layout) (Source: IMARES: 2018)

3.6.4 Surveillance Sightings

Surveillance sightings of Dutch fishing vessels (Figure 3.50) illustrate that the vessels remain outside of the 12 nm limit, with their activity focussed on grounds to the north east of the proposed development. Occasional sightings are recorded within the 12 nm limit, but these vessels are likely to be steaming to port or alternative fishing grounds rather than undertaking fishing activities.

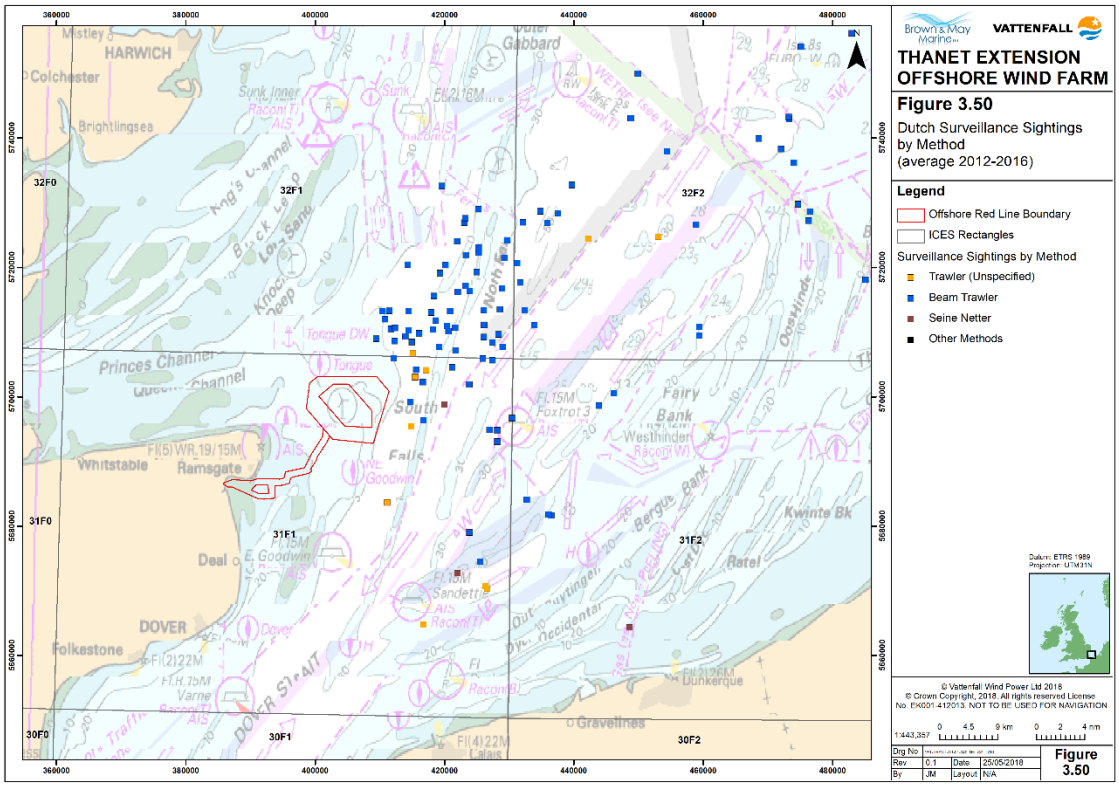


Figure 3.50 Surveillance sightings of Dutch fishing vessels by method (2012-2016) (indicative layout) (Source: MMO: 2018)

4.0 FUTURE FISHERIES

Changes to quota and effort allocation, fishing areas and gear restrictions make predicting future fishing activity difficult and subjective. Additional to the Brexit negotiations there have also been significant changes to the CFP which are being rolled out to all fleets and are likely to have a major impact on the management of commercial fishing activities.

Fishing activity does not remain constant year on year due to fluctuations in fish stocks, changes in legislation and alterations in the economy. Changes to quota and effort allocation, weather, fishing areas and gear restrictions make predicting future fishing activity difficult and subjective. The following section outlines possible changes to current fishing activity and practices.

4.1 Future Activity and Regulations

4.1.1 Reform of the Common Fisheries Policy (CFP)

Since 1983, the EU has primarily dictated the structure and capacity of the UK fishing fleet through the CFP. The CFP was reviewed both in 2002, 2008 and most recently in 2014. The reformed CFP places an emphasis on achieving long-term environmental sustainability. The main aspects were:

- Fisheries to be managed in accordance with Maximum Sustainable Yield (MSY) by 2015 where possible and 2020 by the latest;
- Increased regionalisation: Member states to be given greater freedom to develop and implement measures to meet targets defined by EU legislation;
- A ban on discarding; the discard ban is to be phased in to all EU fisheries by 2019;
- Measures to reduce overcapacity, with an obligation to report on the balance between fleet capacity and fishing opportunities and implement plans to address imbalances;
- New mandatory rules on the labelling of fisheries products on sale to consumers;
- Establishment of the European Maritime and Fisheries Fund (EMFF); and
  Fisheries management is underpinned by data on biological and socio-economic factors. Member states are to expand and coordinate data collection, with funding provided by the EMFF.

The discard ban was implemented for pelagic vessels in January 2015 and has been rolled out to cover all vessels in the coming years.

In addition, “Brexit” has added to the uncertainty in relation to future fisheries, and legislation of UK waters.

4.1.2 Quotas and Effort

4.1.2.1 Changes in Quotas

Over the past ten years, the quotas for a number of species have shown a progressive decline due to concern over the condition of a number of fish stocks within the North Sea. For example, a number of beam trawl vessels previously targeting flatfish species with quota allocations have converted to targeting non-quota species such as scallops. It is possible that more vessels will switch to alternative species as quota allocations become more restrictive.

4.1.2.2 Community Quota

A number of fishing communities around the UK have signed up to community quota schemes. The community quota scheme has been established to find a long-term solution for the under-10 m fleet. The scheme aims to enable fishermen and other local businesses and organisations to manage their quotas flexibly and allow them to swap and purchase additional quota. The scheme may also introduce a rights-based management scheme for shellfish, beginning with edible crab and lobsters (Defra, 2011).

4.1.2.3 Days at Sea

Over-10 m vessels are restricted by the number of days per month they can spend fishing depending on species targeted, gear type and mesh size. Currently, vessels targeting whitefish are restricted to 14 to 15 days per month. The present days at sea system is under review in the CFP reform which may result in changes to the current restrictions.

4.1.3 Changes in Fleet Composition, Fishing Vessels and Gear

Vessels have generally increased in size and power over the past twenty years, however this is considered to be incremental and in line with normal advancement. There are several factors which have the potential to affect the fishing method or gear a vessel employs:

4.1.3.1 Changes in Fleet Size

The current national fleet is considered to be proportionate with sustainable stock levels by those in the fishing industry and it is therefore considered that fishing practices will not alter considerably in the future. It is possible however, that reduction in quota allowance and cuts in effort could lead to a reduction in fleet size.

4.1.3.2 Increases in Fuel Costs

Increases in fuel costs have led to fishermen altering the configuration of their vessels, fishing gears and operating patterns to minimise costs. A number of fishing gear trials to assess the feasibility of modified and alternative gears are currently being undertaken.

4.1.3.3 Increased Restrictions upon certain Fishing Methods

Restrictions on specific fishing methods have led to vessels utilising different gear types or becoming multi-purpose in order to target other, less restrictive fisheries. This is most likely to be the case for demersal towed gear, which is considered to be one of the more environmentally sensitive fishing methods. Static gear methods, such as gill netting and long lining, are not considered to have such an environmental impact but can still target demersal species. It is therefore possible that use of static gear to target demersal species may increase in the future as a result of increasing restrictions on demersal towed gear.

4.1.3.4 Change in Fishing Practices

Fuel can constitute up to 60% of a fisheries cost. It is predicted that an increase in fuel costs will cause a decrease in fishing effort (Sumaila, Teh *et al*. 2008). As a result of increasing fuel costs, many fishermen have altered the configuration of their vessels, fishing gears and fishing patterns to reduce costs.

4.1.4 Sustainable Fisheries and Consumer Demand

The fishing industry is increasingly working in collaboration with fisheries scientists to adopt ecosystem-based approaches for increasing fisheries sustainability. Fishermen are increasingly aware of the requirements for environmental protection, to increase the resilience of the marine environment to increasing pressures including climate change. Increasingly the fisheries are to be managed sustainably with the industry recognising the need for maintaining a healthy marine environment for the benefit of the stocks which may generate higher return for reduced effort.

Changes in consumer demand, with increasing demand for fish and shellfish harvested in an environmentally responsible way, have resulted in changes to the fishing industry. Consumers are also more open to try different types of fish. There may be preference in the future towards more locally caught seafood with increasing benefits to coastal communities.

4.2 Potential Changes to Existing Fisheries

Commercial fishing activities are not constant and patterns of fishing activity fluctuate both annually and on a longer-term basis. As a result, predictions of future fishing activity are complicated.

A summary of the potential changes which may occur to the fisheries previously identified is provided below. This is based upon current knowledge of fishing patterns and practices in the study area.

4.2.1 Demersal Whitefish Fisheries

During the 1960s and 1970s, abundances of whitefish species such as cod, haddock, whiting and saithe were particularly high. The demersal fleet also expanded rapidly throughout this period and fishing activity shifted towards towed demersal otter trawls as a result (Hislop, 1996).

The conservation credits scheme and Real Time Closures (RTCs) were introduced in 2007 and 2008 in order to protect spawning aggregations of cod. Additional measures are in place under the EU long term cod management and these include a minimum mesh size for vessels targeting cod (and haddock) of 120 mm, and gear must be equipped with square mesh panels (SMPs) to facilitate the escape of small, undersized fish. Days at sea are also limited by vessel engine size and TACs are agreed at levels which are likely to increase the size of the spawning stock.

There is evidence that since the initiation of the conservation credits scheme, cod discarding rates have decreased from 62% in 2008 to 24% in 2011. In 2017, EU cod stocks were certified as sustainable.

In 2009, 2010 and 2011, Danish, English and Scottish vessels took part in the closed-circuit TV (CCTV) and Fully Documented Fisheries (FDF) trial schemes. In these programmes, UK vessels were not permitted to discard any cod at sea, while Danish vessels were permitted to discard cod which were less than the minimum landing size (MLS). In all cases cod caught were

counted against allocated quota and fishing was monitored by CCTV. Participating vessels were either allocated or granted access to additional quota. These trials were designed to encourage gear selectivity in order to reduce discards and maximise profit. The trials were largely successful, with rates of discards reduced and net revenue increased in some cases. Following this pilot study, an EU discard programme has been implemented.

4.2.2 Potting Fishery

Unregulated creel fishing can potentially lead to some crab and lobster stocks being fished close to, or above sustainable levels, and that a 'race to fish' can occur where the numbers of pots deployed increase in response to competition and to secure and protect grounds.

Measures such as a blanket limit on the number of pots a single vessel can operate (independent of size), or limits based on vessel size have both been proposed. The former measure is currently operational in the Northumberland IFCA and Isle of Man potting fisheries. In addition, the introduction of crab and lobster quotas managed independently of the EU TAC system has also been suggested. It is believed that such regulations could have a number of benefits such as reducing conflict both within and between (e.g. trawl and pot) fisheries and improve market conditions by limiting the numbers of crustaceans for sale.

With respect to gear restrictions in the crab and lobster fisheries, measures are under consideration to introduce limits on the numbers of parlour pots operated by a single vessel. Parlour pots are double chambered and capable of retaining more catch than traditional pots, with less frequent lifting of fleets required. The use of this pot type has increased in recent years, and it is believed that this may be resulting in reduced catch rates in some areas.

In the event that the proposed regulations are implemented, significant changes could be expected in the crab and lobster fisheries, particularly within the inshore fleet operating within the 12 nm limit.

5.0 REFERENCES

CRPMEM (2009) French Answer to the Consultation on Round 3 UK Wind Farms Proposal – 2009- Comite National Des Peches CNPMEM.

Defra (2011). New plan to secure future of fishing communities and fleets, available online: http://www.defra.gov.uk/news/2011/04/05/fisheries-future/ (Accessed 18/02/15)

Galbraith & Rice (2004) An Introduction To Commercial Fishing. Gear And Methods Used In Scotland. FRS marine laboratory, Aberdeen

IFREMER(2015) Obsmer report - French fishing activity - Observations a bord des navires de peche professionnelle Bilan de l'' echantillonnage 2014

Heywood, J.L., Senechal, A. and Bailey, D. (2016). Thames Estuary Cockle Survey Report 2015. Kent and Essex Inshore Fisheries and Conservation Authority.

K&EIFCA (2017) Personal communication: 28/04/2017

Lee, J., South, A.B., Jennings, S. (2010). Developing reliable, repeatable, and accessible methods to provide high-resolution estimates of fishing-effort distributions from vessel monitoring system (VMS) data. 2010 *International Council for the Exploration of the Sea*.

NUFTA (2012). The fishing industry, available online: http://www.nutfa.org/#/the-fishing-industry/4543398810 (Accessed 27/03/2018)

Seafish (2005) Basic Fishing Methods

Sumaila, Teh et al (2008) Fuel price increase, subsidies, overcapacity, and resource sustainability. ICES J. Mar. Sci. 65, 832–840.

TFA (2017) Personal communication: 28/04/2017

UNCLOS (1982) United Nations Convention on the Law of the Sea

6.0 APPENDIX 1 – DATA SOURCES

6.1 Surveillance Sightings Data

As a means of fisheries protection and to ensure the fishing industry complies with UK and EU law, aircraft and surface vessels are used to compile surveillance sightings of fishing vessels in UK waters. The data has been used to give a relative spatial distribution of fishing activity by method and nationality within a given area. It should be noted that, due to the low frequency of flights in an area, which are generally weekly and only occur during daylight hours, the sightings data should not be used to give a quantitative assessment of fishing activity. The MMO has provided sightings of all fishing vessels in UK waters by nationality and method between 2012 and 2016. It is known that this data includes sightings from KEIFCA patrol vessels.

6.2 Fisheries Statistics

UK fisheries statistical data for the ten year period between 2007 and 2016 has been collected by the MMO by ICES rectangles for all UK and non-UK vessels landing into UK ports. The data includes landings by value and effort (days fished). This data set has been analysed to identify:

- Species targeted;
- Fishing methods used;
- Vessel categories (under-10 m, 10 – 15 m, over-15 m);
- Annual variations;
- Seasonal variations; and
- Landings values and effort by port.

The main source of fisheries landing data is the EC daily log sheets that all vessels over-10 m must complete and submit. Fishing vessels under-10 m in length are not required to submit daily log sheets, although skippers can choose to do so. Dockside inspections are made on the under-10m fleet by local fisheries officers. The Shellfish Entitlement Scheme (2004) and the 'Registration of Buyers and Sellers of First Sale Fish and Designation Auction Site Scheme' (2005) further facilitate collection of fisheries data from the under-10m fleet. It should be noted that data collected prior to the introduction of these schemes may underestimate the

true levels of activity from the under-10m fleet. It should also be recognised that under these schemes, fishermen are required only to identify the ICES sub-area within which catch was taken and not the specific ICES rectangle. Local MMO officers, however, allocated catches, effort and values by the under-10 m fleet into ICES rectangles on the basis of best estimate.

6.3 Satellite Tracking (VMS) Data

6.3.1 MMO Data

VMS data is the most comprehensive fisheries data set currently available which shows the intensity of over-15 m fishing vessel activity in the vicinity of the proposed development. Since January 2005, all EC vessels over-15 m in length have been fitted with satellite tracking equipment which transmits the vessels' position at a minimum of every two hours to the relevant Member States' fisheries authority. The MMO monitors all UK vessels irrespective of location, and all foreign vessels within the UK Exclusive Economic Zone (EEZ). Information regarding non-UK vessels cannot be disclosed by the MMO without prior permission from the vessels national regulating body.

The satellite data has been cross-referenced with landings and effort data to give values in a 0.05° by 0.05° grid for the years 2008 to 2012. The disclosure of independent UK vessels' identities is restricted under the Data Protection Act (1998) and the coordinates of individual vessels are only available at the request of the vessels skipper/owner. Any rectangles that record less than five transmissions are not included in the data set and specific fishing methods have not been identified; instead the type of method (mobile or static) has been defined. All vessels that are stationary in port have not been included in the data set and the VMS data does not differentiate between vessels fishing and steaming. As a result the data has been filtered by speed, with vessels travelling at speeds of between 1 and 6 knots included (Lee *et al.*, 2010).

Due to VMS only applying to vessels over-15m in length, activity by vessels under-15m will not be represented in the analysis. As of 2012, EU legislation required all Member State vessels over-12m in length to have VMS installed. Due to delays in the release of this data by MMO, however, this will not be included in this assessment.

7.0 APPENDIX 2 – FISHERIES LEGISLATION

7.1 Fishing Vessel Licences

For a vessel to commercially fish (i.e. to catch and sell fish for profit) it must hold a valid licence. The current vessel licensing scheme was introduced to stabilise fleet numbers and reduce catching capacity through the use of vessel capacity units (VCUs). Successive decommissioning schemes have also reduced the size of UK and several other Member States' fleets over the past 20 years.

7.2 Territorial Limits and Fishing Rights

Under the United Nations (UN) Convention on the Law of the Sea (UNCLOS, 1982), the UK's territorial sea extends out to 12 nm from the mean low water mark. With few exceptions, access within 6 nm of the coast is restricted to the vessels of that country. Access to fishing grounds between the 6 – 12 nm limit is only granted to vessels from non-UK countries if they have historic fishing rights (Figure 7.1).

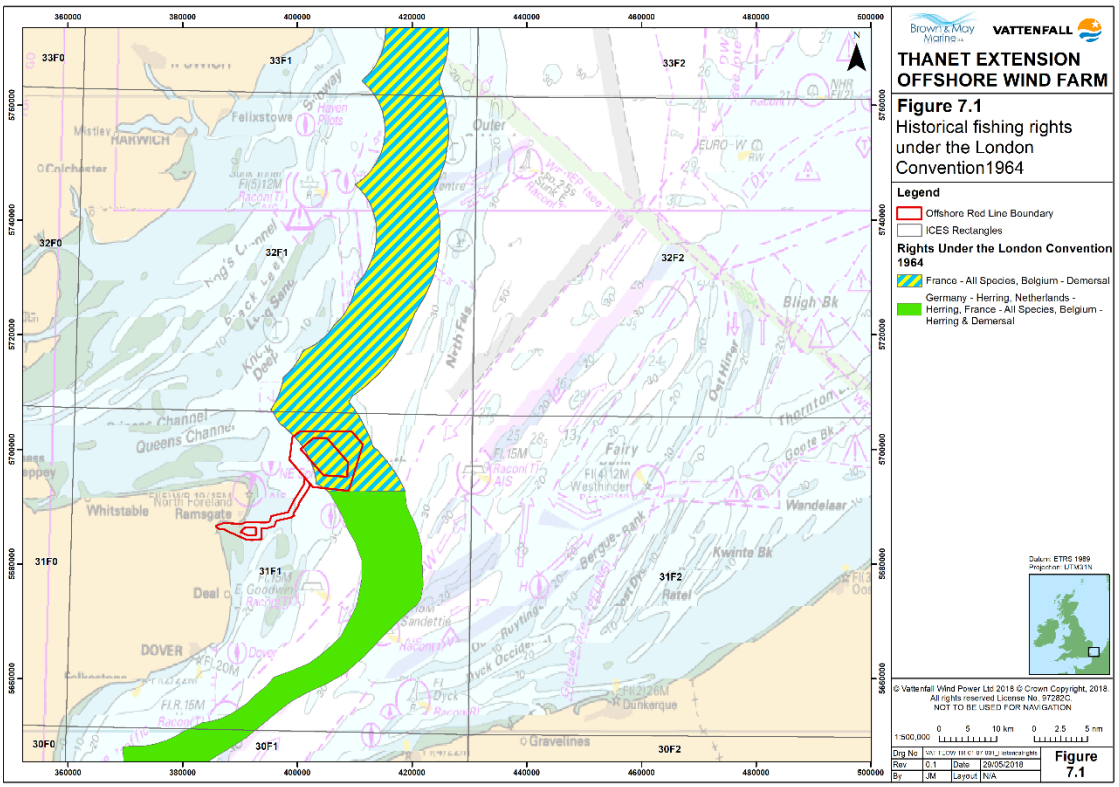


Figure 7.1 Historic Fishing Rights in relation to the proposed development (indicative layout)

7.3 Regional and Local Fishing Restrictions

The proposed development falls within the jurisdiction of the KEIFCA, which enforces the local byelaws within 6nm of the coast. Byelaws include:

- Minimum Landing Sizes (MLS) for fish and shellfish species;
- Maximum vessel sizes (not greater than 17 m in length);
- Maximum dredge sizes – for mussel not to exceed 2 m in width of opening;
- Seasonal closures (e.g. catch of Bass not permitted January – March); and
- Fishing permits for shellfish species.

7.4 Quota Restrictions

In European waters, quota in the form of Total Allowable Catches (TACs) is allocated to EU Member States by ICES sub-area based on historic fishing rights. A quota is a permission to catch quota stocks that are allocated between non-sector vessels (those who own quota), Producer Organisations (who manage quota for their members) and the inshore fleet. The UK

quota management system aims to ensure that the quota is shared fairly amongst the UK fishing industry and that fishing activity is managed to ensure that these quotas are not exceeded.

In recent years the quota system has been heavily criticised due to the volume of fish that are discarded at sea either because they are undersized or over-quota. The problems associated with quota allocation are planned to be addressed in the reform of the Common Fisheries Policy (CFP) has led to the introduction of discard ban regulation for pelagic fleet from 2015 and demersal ones from 2016.

7.4.1 Over-10 Metre Fleet

National, regional and individual quotas for the over-10 m fleet are assigned on the basis of historic rights. Vessel quotas are tangible assets which are eligible to be sold or leased, and national quotas may be exchanged between Member States.

7.4.2 Under-10 Metre Fleet

Vessels under-10m in length represent 65% of the UK's fishing fleet but are allocated 4% of the UK's fishing quota. Half of the under-10m fleet have uncapped licences allowing them to catch more than 300 kg of quota species per year (NUFTA, 2018).

7.5 Effort (Days at Sea) Restrictions

In addition to quota restrictions, the over-10 m fleet is subject to days at sea restrictions. This is part of the EC policy of reducing fishing effort in EU waters. The regulation controlling days at sea (Annex V, EU Regulation 2287/2003) is somewhat complex, relating to species targeted, gear type, mesh size and elected management periods. In essence, vessels using demersal whitefish gears are restricted to the equivalent of 13 to 14 days a month (vessels catching less than 5% cod by-catch gain an extra 2 to 3 days). Pelagic vessels are not effort restricted, being subject only to quota limits. As with the system of quotas, the review of the CFP following Brexit negotiations is likely to alter the current effort restrictions.

7.6 The Common Fisheries Policy (CFP)

The main method the European Union (EU) uses to manage fishing activity in European waters is the CFP. The CFP provides a management strategy for fishing activities in order to prevent overfishing and provide economic and social stability to fishing communities.

The UK government remains a reserved power with regard to European fisheries negotiations, such as the setting of quotas. The implementation of fisheries regulations is undertaken by the Scottish Government in Scottish waters, the MMO in English waters and the Welsh Assembly Government in Welsh Waters.

As of 2009 the CFP has been under review and changes to the Policy came into legislation in 2014. The proposals are wide-ranging and cover all aspects of fisheries management and objectives. The key priorities of this reform are to ban discards, fish at sustainable levels and decentralise decision making, allowing Member States to agree the measures appropriate to their fisheries. A ban on discarding pelagic fisheries (such as mackerel and herring) started on 1st January 2015, with a ban on discards in all other fisheries to be phased in between January 2016 and 2019.

7.7 Shellfish Entitlements

National shellfish entitlement licences were introduced in 2004 for vessels targeting crabs and lobsters. The licence allows an unrestricted quantity of crab and lobster to be caught by vessels which have a historic record in the fishery. Vessels that are under-10 m and have a valid shellfish licence must submit weekly log sheets for crab and lobster to the local Fishery Officer.

7.8 Marine Protected Areas

The aims of Marine Protected Areas (MPAs) are to protect species and habitats of EU and national importance through the management of sea areas. In the UK, there are various types of MPAs, which include in the area of the proposed development:

- Special Areas of Conservation (SACs) - designated to protect species and habitats under the EC Habitats Directive both inshore and offshore;

- Special Protection Areas (SPAs) - areas where birds and their habitats are given protection under the EC Wild Bird and Habitat Directive. SPAs have little or no impacts on the commercial fisheries sector; and
- Marine Conservation Zones (MCZs) – designed to protect species and habitats of national importance under the Marine and Coastal Access Act (2009).