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Norfolk Boreas Offshore Wind Farm

Appendix 14.1

Commercial Fisheries Technical Report

Environmental Statement

Volume 3

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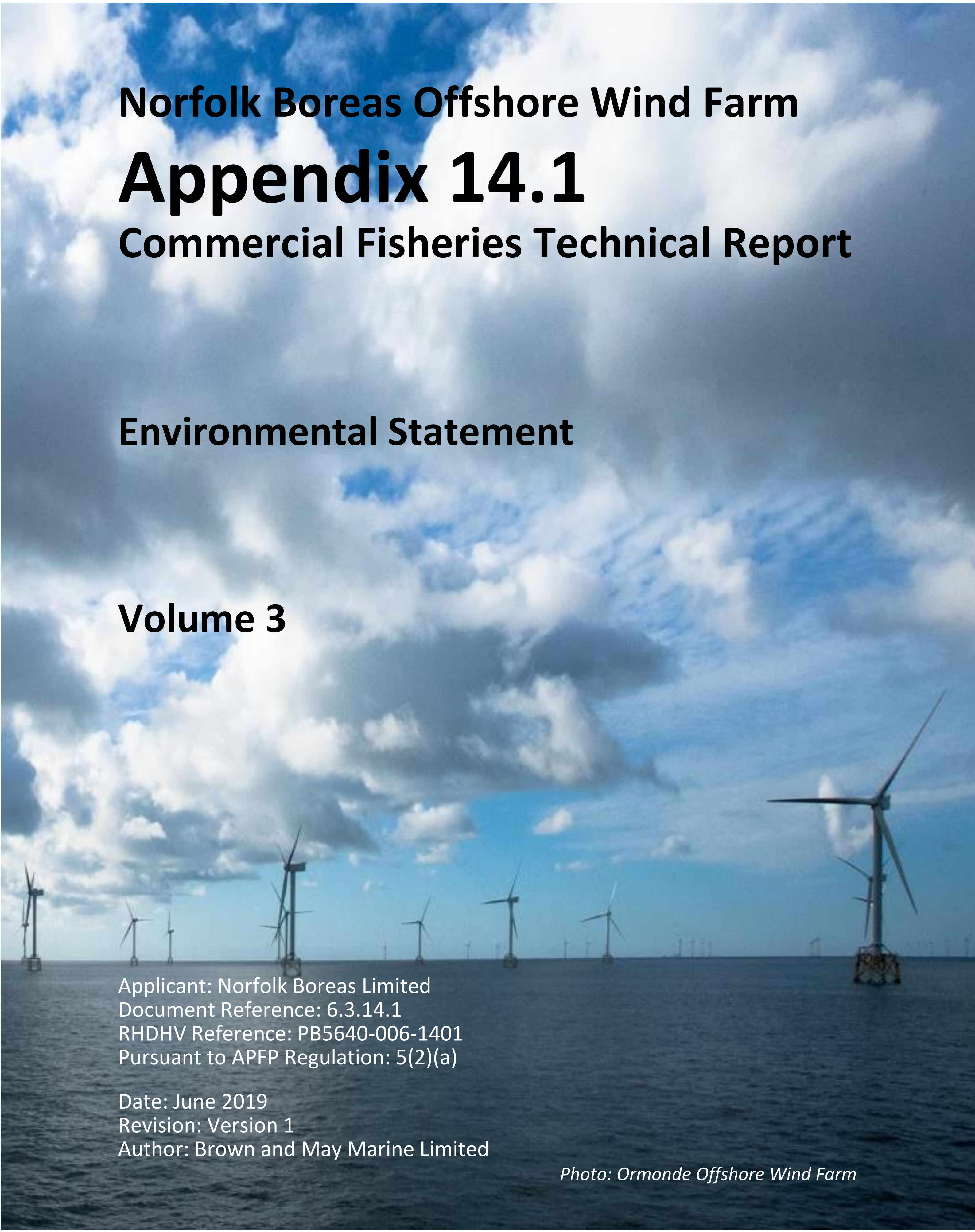

Photo: Ormonde Offshore Wind Farm

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Table of Contents

Figures

Tables

Plates

Glossary of Acronyms

BMM	Brown and May Marine
CFP	Common Fisheries Policy
CNPMEM	Comité National des Pêches et des Elevages Marins
CRPMEM	Comité Regional des Pêches et des Elevages Marins
EC	European Commission
EIFCA	Eastern Inshore Fisheries Conservation Authority
ESFJC	Eastern Sea Fisheries Joint Committee
EU	European Union
EZZ	Exclusive Economic Zone
HP	Horsepower
ICES	International Council for the Exploration of the Sea
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer
ILVO	Instituut voor Landbouw-, Visserij- en Voedingsonderzoek (Belgian Institute for Agriculture, Fisheries and Nutrition Research).
IMARES	Institute for Marine Resources and Ecosystem Studies
MMO	Marine Management Organisation.
NFFO	National Federation of Fishermen's Organisations
NNFS	North Norfolk Fishermen's Society
TAC	Total Allowable Catch. A catch limit set for a particular fishery, generally for a year or a fishing season.
VCU	Vessel Capacity Unit
VisNED	Organisation representing the Dutch beam trawler ('kotter') fleet and fishermen in the southwest region of the Netherlands.
VMS	Vessel Monitoring System

Glossary of Terminology

Beam trawling	Type of bottom trawling in which the towing net is attached to a metal beam
Bottom (demersal) otter trawling	Fishing whereby a single net is towed behind the vessel on the seabed.
Demersal	Refers to either fishing gears fished on the seabed or fish species associated with the seabed.
ICES Statistical Rectangles	The spatial units by which fisheries data are recorded, collated and analysed.
Norfolk Boreas site	The Norfolk Boreas wind farm boundary. Located offshore, this will contain all the wind farm array.
Offshore cable corridor	The corridor of seabed from the Norfolk Boreas or Norfolk Vanguard to the landfall site within which the offshore export cables will be located.
Offshore project area	The area including the Norfolk Boreas site, project interconnector cable area and offshore cable corridor.
Project interconnector cable	Buried offshore cables which would link an offshore electrical platform in the Norfolk Boreas site with an offshore electrical platform in the Norfolk Vanguard site.
The project	Norfolk Boreas Wind Farm including the onshore and offshore infrastructure.
Pair trawling	Fishing method where two vessels tow one large net along the seabed between them.
Pelagic	Refers to fishing gear fished in the water column as opposed to seabed or fish present mid-water (e.g. herring, mackerel).
Potting	Fishing method whereby the fish are caught in portable traps laid onto the sea bed.
Pulse wing trawling	Method of beam trawling which uses electrical impulses to disturb the fish.
Scallop dredging	Fishing method used to catch scallops. Heavy dredges are towed along the seabed with teeth which rake scallops from the seabed.
Seine netting	Fishing method which works by encircling a shoal of fish with ropes laid on the seabed.
Twin Rig Otter Trawling	Fishing method which effectively uses two nets which are towed behind the vessel. The use of two nets increases the area of seabed covered.
VMS	Satellite tracking system used to track positions of EU vessels.
Whitefish	Refers to species such as cod, haddock and whiting

1 Introduction

1. The following technical report describes the commercial fisheries existing baseline for Norfolk Boreas ('the project'). The areas of the project relevant to this report are the Norfolk Boreas site, the offshore cable corridor and the project interconnector search area. Collectively, these areas are referred to as 'the offshore project area'.

2. For the purposes of this baseline characterisation, commercial fishing is defined as the legitimate capture of finfish and shellfish for sale by licensed fishing vessels.

3. The Norfolk Boreas site, the far shore section of the offshore cable corridor and the project interconnector search area are located beyond the UK’s 12nm limit and therefore other EU nationalities have rights to fish these areas. As a result, in order to inform the fisheries baseline data and information has been obtained from a number of EU fisheries data centres and stakeholders. It should however be noted that the availability and methods of data collation varies between the various national data centres.

4. Commercial fishing is subject to a variety of policies, regulations and controls at EU, national and regional levels, many of which are revised and implemented at relatively short notice. A case in point is the annual EU national quota allocations which are only agreed each December less than a month prior to their implementation for the following year. Other factors, such as variations in target species stock abundances, fluctuations in market prices and operating costs can influence the nature and levels of commercial fishing both spatially and temporally. Predicting future commercial fisheries baselines is therefore subject to a range of unpredictable variables. In the UK this is further exacerbated by the uncertainty currently surrounding Brexit negotiations.

2 Consultation

5. In order to inform this report, consultation has been carried out with relevant UK and non-UK commercial fisheries stakeholders in respect of Norfolk Boreas. Table 2.1 lists the consultation that has been undertaken for Norfolk Boreas. Consultation is on-going and will continue after submission of the Environmental Statement (ES).

6. In addition, given the proximity between the Norfolk Boreas site and Norfolk Vanguard East (NV East) and Norfolk Vanguard West (NV West) and the fact that both projects share the same offshore cable corridor, where relevant, information gathered during consultation undertaken for Norfolk Vanguard has also been used to inform this report as Norfolk Boreas was also mentioned during these consultations. The consultation carried out for Norfolk Vanguard and Norfolk Boreas is outlined in Table 2.2.

Table 2.1 Summary of fisheries stakeholder consultation undertaken for Norfolk Boreas

Consultees	Role / Organisation	Consultation date
Representative 1	VisNED	20/06/2018
Representative 2	Comité Régional des Pêches Maritimes et des Elevages Marins (CRPMEM), Hauts de France	03/07/2018
Representative 3	Danmarks Fiskeriforening Producent Organisation	03/07/2018
Representative 4	Rederscentrale	03/07/2018
Fisherman 1	Caister fishermen	10/08/2018
Fisherman 2		
Fisherman 3		
Fisherman 4		
Fisherman 5		
Fisherman 6		
Fisherman 7		
Fisherman 8		
Fisherman 9		
Fisherman 10	Sea Palling fisherman	10/08/2017
Representative 5	National Federation of Fishermen's Organisations	14/08/2018
Fisherman 11	Sea Palling fishermen	22/08/2018
Fisherman 12		
Fisherman 13	Great Yarmouth fisherman	10/09/2018
Fisherman 14	Sea Palling fisherman	
Fisherman 15	Caister fisherman	
Representative 6	North Norfolk Fishermen Society (NNFS)	12/09/2018
Fisherman 16	Lowestoft fishermen	11/11/2018
Fisherman 17		
Fisherman 18		
Representative 7	Chair of Eastern regional NFFO committee	

Table 2.2 Summary of fisheries stakeholder consultation undertaken for Norfolk Vanguard (where Norfolk Boreas was also discussed

Consultees	Role / Organisation	Consultation date
Representative 6	Area Officer - Eastern IFCA	31/05/2016
Sea Palling Fishermen's Association		31/05/2016
Fisherman 1	Sea Palling fisherman	06/06/2016 18/07/2016
Fisherman 2	Great Yarmouth fisherman	06/06/2016 12/07/2016
Fishermen 3	Sea Palling fisherman	06/06/2016
Fishermen 4	Sea Palling Fisherman	08/06/2016
NFFS		10/06/2016 13/06/2016 12/07/2016 11/08/2016 05/07/2016
Fishermen 5	Caister fisherman	15/06/2016 12/07/2016
Fishermen 6	Sea Palling fisherman	17/06/2016
Representative 7	MMO – Lowestoft	19/10/2016
Representative 8, Representative 9	Eastern IFCA	21/10/2016
Representative 10, Representative 4, Representative 11, Representative 12	Rederscentrale, Vlaanderen	29/11/2016
Representative 3	Danmarks Fisheriforening PO	30/11/2016
Representative 13	Fiskbat	30/11/2016
Representative 1	VisNED	14/02/2017 11/04/2018 26/04/2018 29/05/2018
Representative 14	Fiskbat	07/03/2017
Representative 2, Representative 15	CRPMEM- Pas de Calais	14/03/2017
Fisherman 7	Lowestoft fisherman	31/03/2017 16/05/2017
Representative 5, Representative 16	NFFO	05/04/2017
Representative 17	VisNED	19/04/2017
Fisherman 8	Lowestoft fishermen	16/05/2017
Fisherman 9	Lowestoft fishermen	16/05/2017
Fisherman 10	Lowestoft fishermen	16/05/2017
Fisherman 11	Lowestoft fishermen	16/05/2017
Fisherman 12	Lowestoft fishermen	16/05/2017
Fisherman 13	Lowestoft fishermen	16/05/2017
Representative 18	Deutchser Fisherei Vernband	23/05/2017
Fisherman 14	Caister fisherman	06/06/2017
Fisherman 15	Lowestoft fisherman	15/06/2017
Fisherman 16	Happisburgh fisherman	09/08/2017

3 Study Area

7. The study area used to characterise the commercial fisheries baseline for the project is shown in Figure 3.1. The offshore project area is located in International Council for the Exploration of the Sea (ICES) Division IVc (Southern North Sea). As shown, the Norfolk Boreas site overlaps with relatively small areas of four adjoining ICES rectangles (34F2, 34F3, 35F2 and 35F3). The far shore section of the offshore cable corridor and the project interconnector search area fall within rectangle 34F2 with the nearshore cable corridor being located in rectangle 34F1.

8. The study area defined above has been used to identify fisheries active in areas relevant to the project and the levels of fishing that that the offshore project area sustains.

9. Where relevant, however, data and information have been analysed for wider areas to describe the full extent of the fishing activity of the fleets identified.

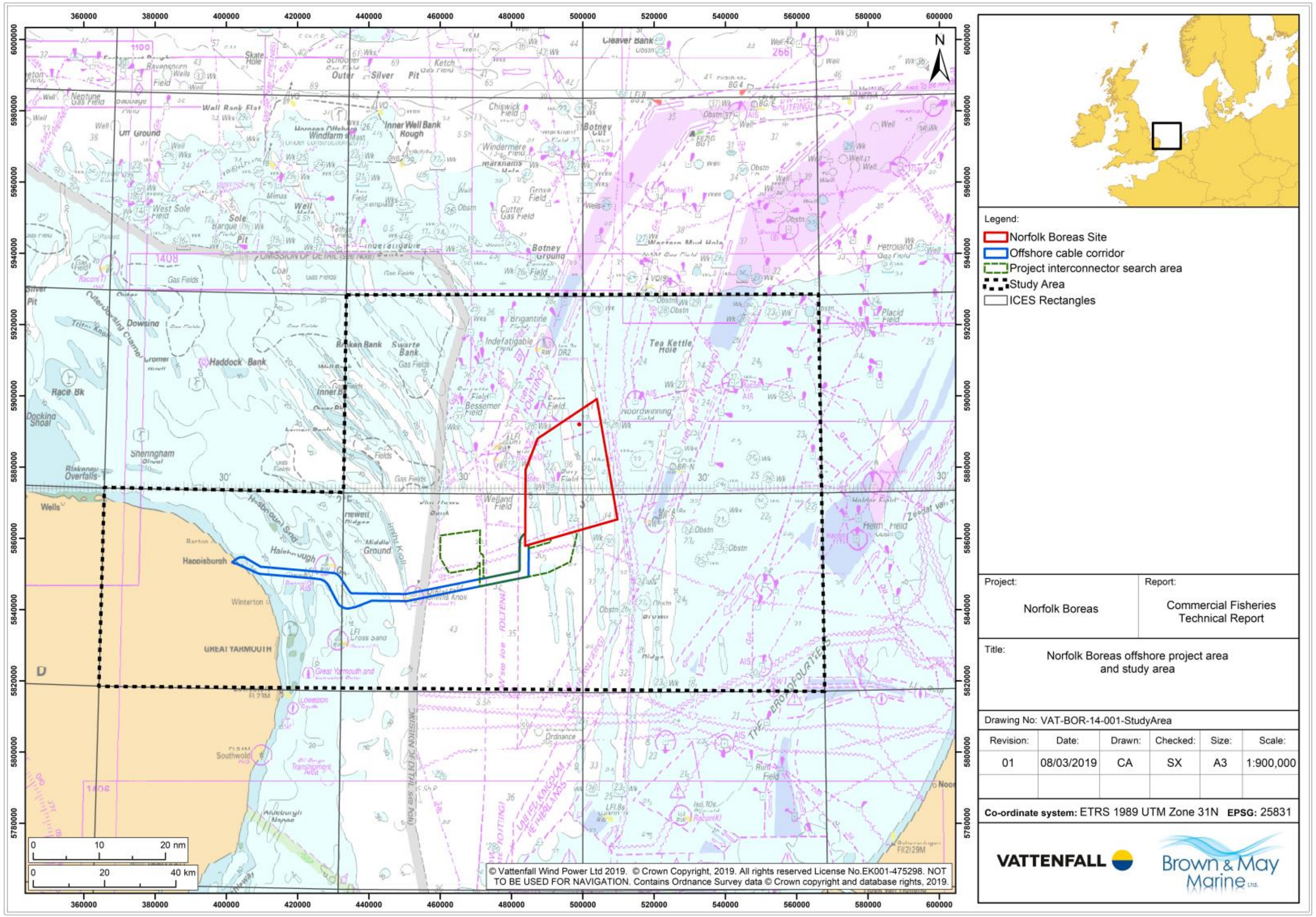


Figure 3.1 Study area

4 Data and Information Sources

10. The principal sources of data used to inform this report are outlined in Table 4.1. Full details of the data sources used, methods of data collection and data analysis can be found in Annex 2 – Data Sources.

11. In addition to the datasets listed in Table 4.1, information gathered during consultation with fisheries stakeholders has also been used to inform this report. Details of the consultation undertaken are presented in Annex 2 – Data Sources.

Table 4.1 Key datasets used to inform the baseline report

Data	Year	Coverage	Confidence	Notes
UK Marine Management Organisation (MMO) fisheries statistics	2007 to 2016	UK vessels landing into UK and European ports. Non-UK vessels landing into UK ports.	High	Landings data provided by value (£).
UK MMO Surveillance Sightings	2011 to 2015	Sightings of vessels by gear type (all nationalities) recorded in UK waters on weekly surveillance fly overs during daylight hours.	Medium to High	May underestimate total extent of fishing activity due to flyover frequency and timing.
UK MMO Satellite Tracking (VMS) data	2012 to 2016	Aggregated VMS pings recorded in 0.05° by 0.05° grids from UK vessels only in European waters.	High	VMS - effort (days) and value (£), by gear type
Belgian Institute for Agriculture, Fisheries and Food (ILVO) fisheries statistics (landings values data)	2010 to 2014	Landings of Belgian vessels over 10m	High	Landings values (€),provided by method and species
Belgian ILVO VMS data	2010 to 2014	VMS data combined with logbook data by Belgian vessels. The data has been filtered by speed.	High	VMS -effort (days) and value (€), by gear type.
Netherlands Institute of Marine Research (IMARES), Landbouw Economisch Instituut (LEI) VMS and integrated landings data	2013 to 2017	VMS data combined with logbook data by Dutch vessels in the North Sea. A grid is defined based on 1/16th of an ICES rectangle. The data is filtered by speed.	High	VMS -effort (days) and value (€) provided by gear type.
Netherlands IMARES fisheries statistics (landings values data)	2013 to 2017	Landings of Dutch vessels (all vessel size categories)	High	Fisheries statistics (landings values) available from 2013 to 2017 by method and species.

Data	Year	Coverage	Confidence	Notes
Danish Ministeriet for Fødevarer, Landbrug og Fiskeri VMS data	2011 to 2015	VMS data for all UK waters by Danish vessels that can be split into gear categories. The data is filtered by speed.	High	VMS is provided by effort (days) and by gear type.
French L'Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER) VMS data	2014	VMS charts provided for the Central (IVb) and Southern North Sea (IVc).	High	VMS provided by effort (days).
French Comité National des Pêches Maritimes et des Elevages Marins (CNPMEM) VMS data	2008	VMS charts provided in CNPMEM report "French Answer to the Consultation on Round 3 UK Windfarms Proposal 2009"	Medium	VMS provided by effort (days)
German Federal Office for Agriculture and Food VMS data	2011 to 2015	VMS provided by vessel density in the North Sea.	Medium	VMS provided by density.

4.1 Fisheries Controls and Legislation

12. Commercial fishing in UK waters is currently subject to a range of policies, controls and legislation set by the European Commission (EC), the UK Government, the MMO and Inshore Fisheries and Conservation Authorities (IFCAs). Many of such measures have a direct effect on the nature and levels of fishing effort and therefore on landings compositions, weights and values. Of these, the two measures with the greatest impact on limiting fishing effort and catches are currently the control of catching capacity as a consequence of fishing vessel licences Vessel Capacity Units (VCUs) and pressure stock quotas, both of which are central to the EU Common Fisheries Policy (CFP).

13. It is possible that current legislation is likely to be reviewed as part of Brexit negotiations, although at present it is unclear what commercial fisheries policies and regulations will be in place following the end of the Brexit transition phase. In the meantime, it is understood that EU regulations, in particular the CFP, will be enforced up to the end of the transition period (31st December 2020).

14. A detailed description of the controls and legislation to which commercial fisheries is subject, is given in Annex 3 – Fisheries Legislation.

5 Overview of Fishing Activity

5.1 Background

15. The current commercial fisheries baseline within the general area of the Southern North Sea is largely the consequence of the following factors:

- The decline of the East Anglian herring fishery;
- The development of the North Sea oil and Gas industry;
- The implementation of the EU Common Fisheries Policy (CFP); and
- The sale of vessel licences and quotas.

16. The East Anglian herring fishery reached its peak immediately prior to the First World War when in 1913 a total of 1776 English and Scottish steam drifters operated from Great Yarmouth and Lowestoft during the fishing season. During the following 50 years however the fishery progressively declined, until 1996 when the last of the companies with herring fishing vessels (Small & Co), ceased its herring fishing operations.

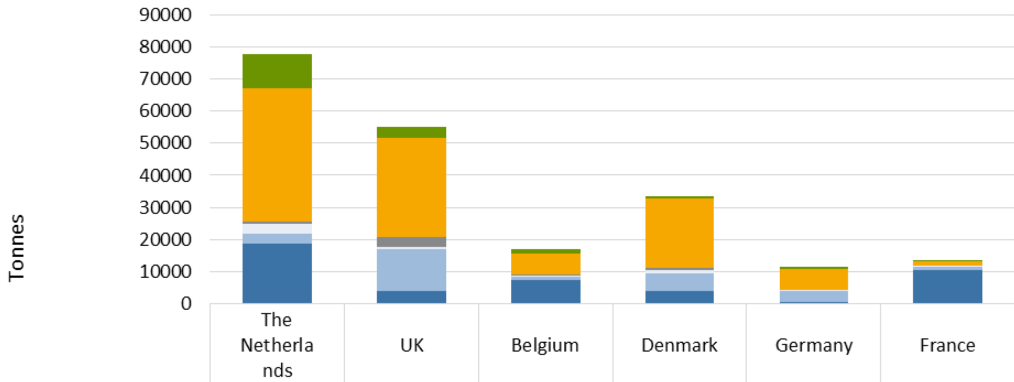
17. Following the decline of the herring fishery, attention switched to demersal otter trawling, with the vessels being based at Lowestoft rather than Great Yarmouth, largely as a consequence of the presence of market and processing infrastructure in Lowestoft. With the growth of the North Sea oil and gas industries in the 1970s and 1980s, a number of the locally based trawlers were however converted to oil and gas rig standby duties, which along with declining landings into Lowestoft led to the closure of a number of the ports' buyers and processors.

18. A central feature of the EU's CFP is the system of annual national quotas based on agreed Total allowable Catches (TACs) for pressure stock species, which in turn leads to vessel quotas. The allocation of national quotas is based upon historic track records during the reference period prior to the enactment of the CFP in 1983. During this reference period a number of the trawlers in the East Anglian trawler fleet were engaged in oil and gas standby work or fishing grounds north of the Southern North Sea, concentrating on round fish species such as cod and haddock. As a consequence, the East Anglian trawler fleet was allocated insufficient quotas to maintain its existing size, reaching a head in 1995 when 14 trawlers were decommissioned as a consequence of quota earmarked for East Anglian sector being awarded to Dutch vessels.

19. In comparison to the East Anglian trawler fleet, the Dutch beam trawler fleet was able to produce records of significantly higher catches of plaice and Dover sole in the North Sea during the reference period thus acquiring substantially larger quotas.

20. This is reflected in the current allocation of quotas for plaice and Dover sole, which as shown in Figure 5.1 is considerably higher for the Netherlands than for the UK and other EU countries.

21. In addition to the decline of the otter trawler fleet, the Lowestoft based beam trawler fleet built up in the 1980s began to decline from 1992 with insolvencies and the progressive scrappages or sales to Dutch interests of vessels and quotas, the last being in 2002. A number of the beam trawlers sold to Dutch interests retained their UK fishing licences and quotas and whilst being on the UK register are in reality Dutch owned and crewed. Whilst the effort and landings of such vessels are recorded within the MMO's statistics for UK vessels they should be considered part of Dutch fleet.



	The Netherlands	UK	Belgium	Denmark	Germany	France
Common Sole	10351.2	3592.2	1146.4	524	917.2	229.4
Plaice	41571.6	30763.4	6651.4	21637.4	6235.8	1247.4
Lemon sole & witch flounder	794	3125.4	346	953	122	261
Turbot & brill	2868.2	797.2	378.4	808.6	206.6	97.6
Cod	3141.6	12755.4	967.6	5560.2	3525.2	1135.2
Herring	18811.4	4149.4	7450	3994	615.6	10553.8

Figure 5.1 Average quotas (tonnes) by nation and species (2014 to 2018)

5.2 Principal Fleets in the Study Area

22. This section outlines the principal nationalities active in the study area and fishing methods deployed based on MMO surveillance sightings data (Figure 5.2 and Figure 5.3).

23. Due to the frequency of the flights of surveillance aircraft and passages of fishery protection vessels, surveillance sightings do not accurately reflect the actual levels of fishing activity within a given area. The data does, however, give a general indication of the relative levels and distribution of activity by nationality and method.

24. The majority of sightings in inshore rectangle 34F1 (where the inshore section of the offshore cable corridor is located) are of UK vessels, primarily potters / whelkers (Figure 5.2 and Table 5.1). French, Belgian and Dutch vessels have also been

recorded in this rectangle, however in very low numbers. It should be noted that with the exception of Belgian vessels (which have historic fishing rights to fish between the UK's 6 and 12nm limit in this area), non-UK vessels do not have rights to fish within the 12nm limit in rectangle 34F1. It is therefore understood that the sightings of French and Dutch vessels recorded in this rectangle correspond with vessels steaming to fishing grounds or ports rather than actively fishing.

25. Further offshore, in rectangle 34F2 (where the southwest section of the Norfolk Boreas site, the offshore section of the offshore cable corridor and the project interconnector search area are located), the majority of sightings are of Dutch vessels (beam trawlers). Sightings of other nationalities in this rectangle are comparatively low and primarily include UK long liners, gill netters and beam trawlers and Belgian beam trawlers. Vessels from other nationalities such as German beam trawlers and French and Danish trawlers have also been recorded in this rectangle however to a much lesser extent.

26. In the remaining offshore ICES rectangles that comprise the study area (rectangles 34F3, 35F2 and 35F3) the number of observations recorded are comparatively low and are, for the most part, of Dutch beam trawlers (Figure 5.2 and Table 5.2 to Table 5.5).

27. A detailed breakdown of surveillance sightings by nationality and method is given in Table 5.1 to Table 5.5 for each of the ICES rectangles within the study area.

28. A further detailed description of fishing activity by nationality is given in the following sections, including analysis of sightings, landings and VMS data and information gathered during consultation with fisheries stakeholders on fishing grounds, vessels and operating practices. Detailed descriptions of the main fishing methods used in the offshore project area are provided in Annex 1- Fishing Methods.

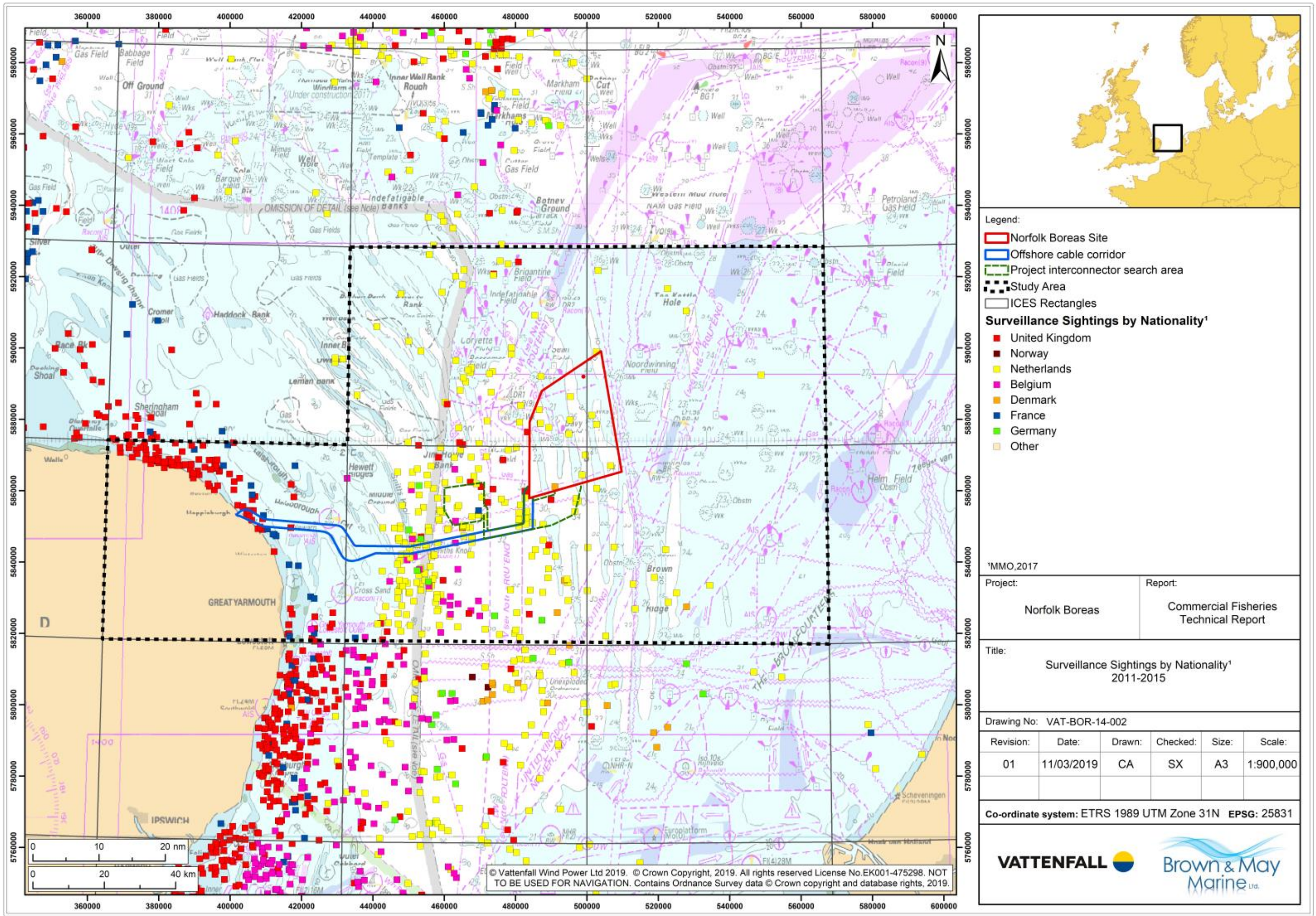


Figure 5.2 Surveillance sightings by nationality (2011 to 2015) (Source: MMO, 2017)

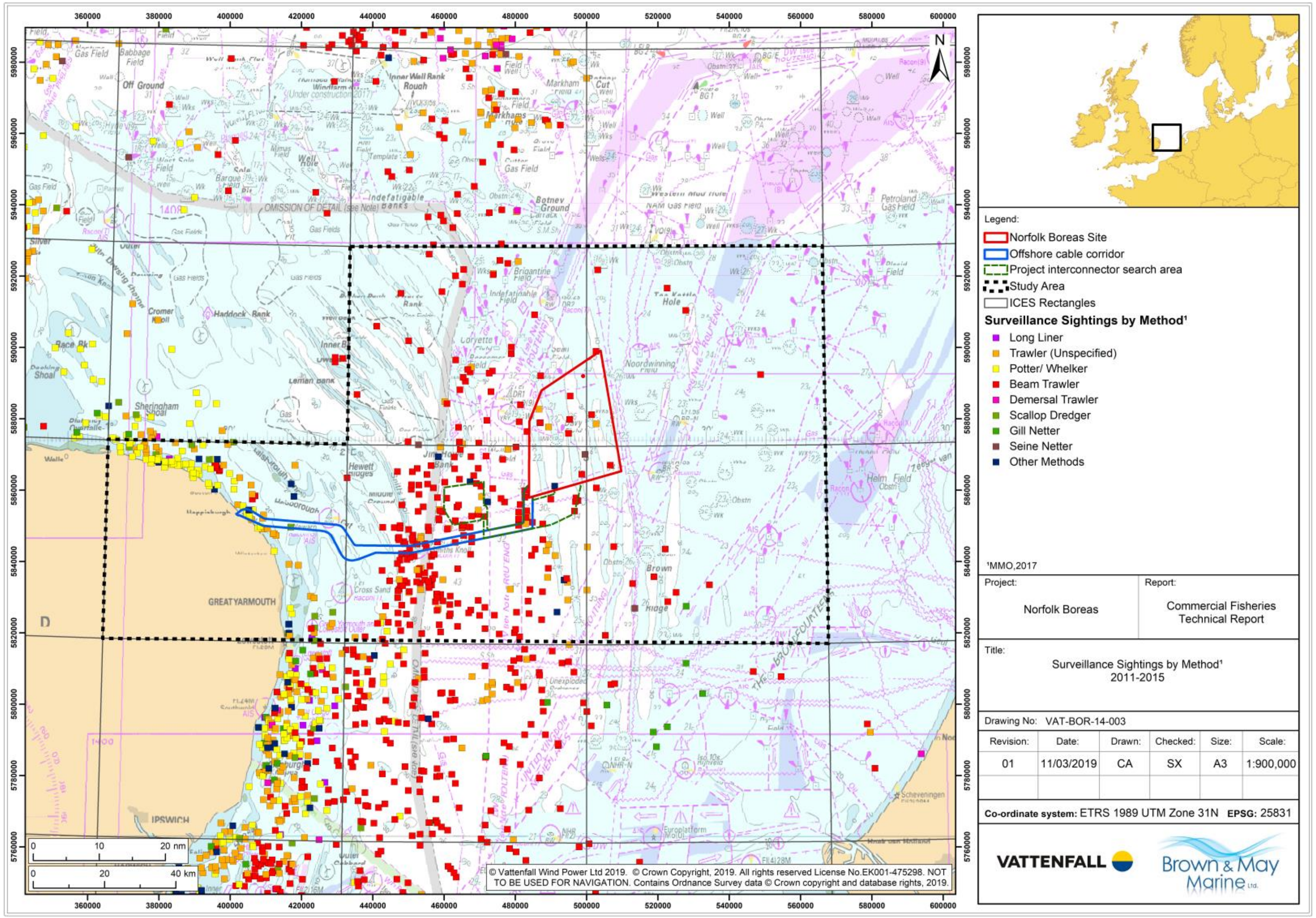


Figure 5.3 Surveillance sightings by method (2011 to 2015) (Source: MMO, 2017)

Table 5.1 Surveillance sightings (2011 to 2015) in ICES rectangle 34F1 by nationality and method

Nationality	Method	% of total Sightings in 34F1
United Kingdom	Beam Trawler	6.8
	Demersal Side Trawler	0.9
	Demersal Stern Trawler	0.2
	Gill Netter	2.9
	Long Liner	1.4
	Null	1.1
	Other Dredges (Including Mussel)	0.9
	Pair Trawler (All)	0.5
	Potter / Whelker	62.4
	Rod and Line	0.5
	Scallop Dredger (French / Newhaven)	2.5
	Shrimper	0.9
	Stern Trawler (Pelagic / Demersal)	0.5
	Trawler (All)	5.6
	Unknown	0.9
	United Kingdom % Of Total Sightings (All Gears)	87.8
France	Pelagic Stern Trawler	0.2
	Stern Trawler (Pelagic / Demersal)	0.9
	Trawler (All)	7.9
	France % Of Total Sightings (All Gears)	9.0
Belgium	Beam Trawler	2.9
	Belgium % Of Total Sightings (All Gears)	2.9
Denmark	None	0.0
	Denmark % Of Total Sightings (All Gears)	0.0
Germany	None	0.0
	Germany % Of Total Sightings (All Gears)	0.0
Netherlands	Beam Trawler	0.2
	Netherlands % Of Total Sightings (All Gears)	0.2

Table 5.2 Surveillance sightings (2011 to 2015) in ICES rectangle 34F2 by nationality and method

Nationality	Method	% of total Sightings in 34F1
United Kingdom	Long Liner	1.6
	Potter / Whelker	1.6
	Beam Trawler	1.5
	Gill Netter	1.4
	Trawler (All)	1.3
	Bottom Seiner (Anchor / Danish / Fly / Scots)	0.1
	Demersal Stern Trawler	0.1
	Unknown	0.1
	Drift Netter	0.0
	Purse Seiner	0.0
	Stern Trawler (Pelagic / Demersal)	0.0
	UK % Of Total Sightings (All Gears)	7.9
France	Trawler (All)	1.8
	Stern Trawler (Pelagic / Demersal)	0.6
	Demersal Stern Trawler	0.2
	Beam Trawler	0.1
	Freezer Trawler (Pelagic / Demersal)	0.0
	Scallop Dredger (French / Newhaven)	0.0
	France % Of Total Sightings (All Gears)	2.7
Belgium	Beam Trawler	13.6
	Trawler (All)	0.2
	Stern Trawler (Pelagic / Demersal)	0.1
	Belgium % Of Total Sightings (All Gears)	13.8
Denmark	Trawler (All)	0.8
	Beam Trawler	0.2
	Pair Trawler (All)	0.2
	Gill Netter	0.1
	Null	0.1
	Pelagic Stern Trawler	0.0
	Stern Trawler (Pelagic / Demersal)	0.0
	Suction Dredger	0.0
	Denmark % Of Total Sightings (All Gears)	1.5

Nationality	Method	% of total Sightings in 34F1
Germany	Beam Trawler	0.6
	Trawler (All)	0.2
	Pair Trawler (All)	0.1
	Demersal Stern Trawler	0.0
	Germany % Of Total Sightings (All Gears)	1.0
Netherlands	Beam Trawler	70.0
	Trawler (All)	2.1
	Pair Trawler (All)	0.5
	Bottom Seiner (Anchor / Danish / Fly / Scots)	0.1
	Unknown	0.1
	Null	0.1
	Demersal Stern Trawler	0.0
	Gill Netter	0.0
	Scallop Dredger (French / Newhaven)	0.0
	Netherlands % Of Total Sightings (All Gears)	73.0

Table 5.3 Surveillance sightings (2011 to 2015) in ICES rectangle 34F3 by nationality and method

Nationality	Method	% of total Sightings in 34F3
United Kingdom	Beam Trawler	1.7
	Gill Netter	1.7
	United Kingdom % Of Total Sightings (All Gears)	3.3
France	Gill Netter	0.4
	Pelagic Stern Trawler	0.4
	Stern Trawler (Pelagic / Demersal)	0.4
	Trawler (All)	0.8
	France % Of Total Sightings (All Gears)	2.1
Belgium	Beam Trawler	0.4
	Side Trawler (Pelagic / Demersal)	0.4
	Stern Trawler (Pelagic / Demersal)	0.4
	Trawler (All)	0.8
	Belgium % Of Total Sightings (All Gears)	2.1
Denmark	Beam Trawler	0.4

Nationality	Method	% of total Sightings in 34F3
	Gill Netter	1.2
	Stern Trawler (Pelagic / Demersal)	0.4
	Denmark % Of Total Sightings (All Gears)	2.1
Germany	Beam Trawler	1.2
	Gill Netter	0.4
	Germany % Of Total Sightings (All Gears)	1.7
Netherlands	Beam Trawler	74.8
	Bottom Seiner (Anchor / Danish / Fly / Scots)	1.2
	Demersal Stern Trawler	0.4
	Gill Netter	0.4
	Pair Trawler (All)	0.4
	Potter / Whelker	0.4
	Purse Seiner	0.4
	Stern Trawler (Pelagic / Demersal)	0.8
	Trawler (All)	9.5
	Unknown	0.4
	Netherlands % Of Total Sightings (All Gears)	88.8

Table 5.4 Surveillance sightings (2011 to 2015) in ICES rectangle 35F2 by nationality and method

Nationality	Method	% of total Sightings in 35F2
United Kingdom	Beam Trawler	1.96%
	Bottom Seiner (Anchor / Danish / Fly / Scots)	0.23%
	Demersal Stern Trawler	0.15%
	Gill Netter	1.58%
	Long Liner	0.38%
	Pelagic Stern Trawler	0.08%
	Potter / Whelker	0.08%
	Stern Trawler (Pelagic / Demersal)	0.23%
	Trawler (All)	1.43%
	Unknown	0.30%
	UK % Of Total Sightings (All Gears)	6.41%

Nationality	Method	% of total Sightings in 35F2
France	Demersal Stern Trawler	0.08%
	Trawler (All)	1.21%
	France % Of Total Sightings (All Gears)	1.28%
Belgium	Beam Trawler	2.04%
	Belgium % Of Total Sightings (All Gears)	2.04%
Denmark	Beam Trawler	0.23%
	Demersal Stern Trawler	0.23%
	Industrial Trawler (Sandeeler)	0.68%
	Pelagic Side Trawler	0.30%
	Pelagic Stern Trawler	0.30%
	Stern Trawler (Pelagic / Demersal)	0.08%
	Trawler (All)	2.71%
	Denmark % Of Total Sightings (All Gears)	4.52%
Germany	Beam Trawler	0.15%
	Germany % Of Total Sightings (All Gears)	0.15%
Netherlands	Beam Trawler	83.94%
	Demersal Stern Trawler	0.23%
	Gill Netter	0.08%
	Null	0.08%
	Pair Trawler (All)	0.15%
	Stern Trawler (Pelagic / Demersal)	0.15%
	Trawler (All)	0.45%
	Netherlands % Of Total Sightings (All Gears)	85.07%
Norway	Beam Trawler	0.15%
	Industrial Trawler (Sandeeler)	0.08%
	Purse Seiner	0.08%
	Trawler (All)	0.15%
	Norway % Of Total Sightings (All Gears)	0.45%
Unknown	Beam Trawler	0.08%
	Unknown % Of Total Sightings (All Gears)	0.08%

Table 5.5 Surveillance sightings (2011 to 2015) in ICES rectangle 35F3 by nationality and method

Nationality	Method	% of total Sightings in 35F3
United Kingdom	Beam Trawler	5.10%
	Gill Netter	1.02%
	UK % Of Total Sightings (All Gears)	6.12%
Belgium	Beam Trawler	1.02%
	Belgium % Of Total Sightings (All Gears)	1.02%
Denmark	Trawler (All)	8.16%
	Denmark % Of Total Sightings (All Gears)	8.16%
Germany	Beam Trawler	2.04%
	Germany % Of Total Sightings (All Gears)	2.04%
Netherlands	Beam Trawler	77.55%
	Bottom Seiner (Anchor / Danish / Fly / Scots)	1.02%
	Null	1.02%
	Trawler (All)	1.02%
	Unknown	1.02%
	Netherlands % Of Total Sightings (All Gears)	81.63%
Norway	Trawler (All)	1.02%
	Norway % Of Total Sightings (All Gears)	1.02%

6 Dutch Fleet

6.1 Surveillance Sightings of Dutch Vessels

29. Sightings of Dutch vessels recorded by MMO surveillance in the study area are illustrated in Figure 6.1. As shown, the majority of surveillance sightings in the offshore project area are of beam trawlers (beam trawlers or “trawlers all” in Figure 6.1) with a limited number of sightings of seine netters also recorded. Dutch vessels have been recorded within the Norfolk Boreas site, the project interconnector search area and the offshore cable corridor, with the area around the central part of the offshore cable corridor showing the highest concentration of surveillance sightings within the offshore project area (Figure 6.1).

30. In respect of the sightings of Dutch vessels recorded within the 12nm limit, as previously mentioned, given that Dutch vessels do not have rights to fish in this area, it is likely that these vessels are steaming to port or alternative fishing grounds, rather than undertaking fishing activities.

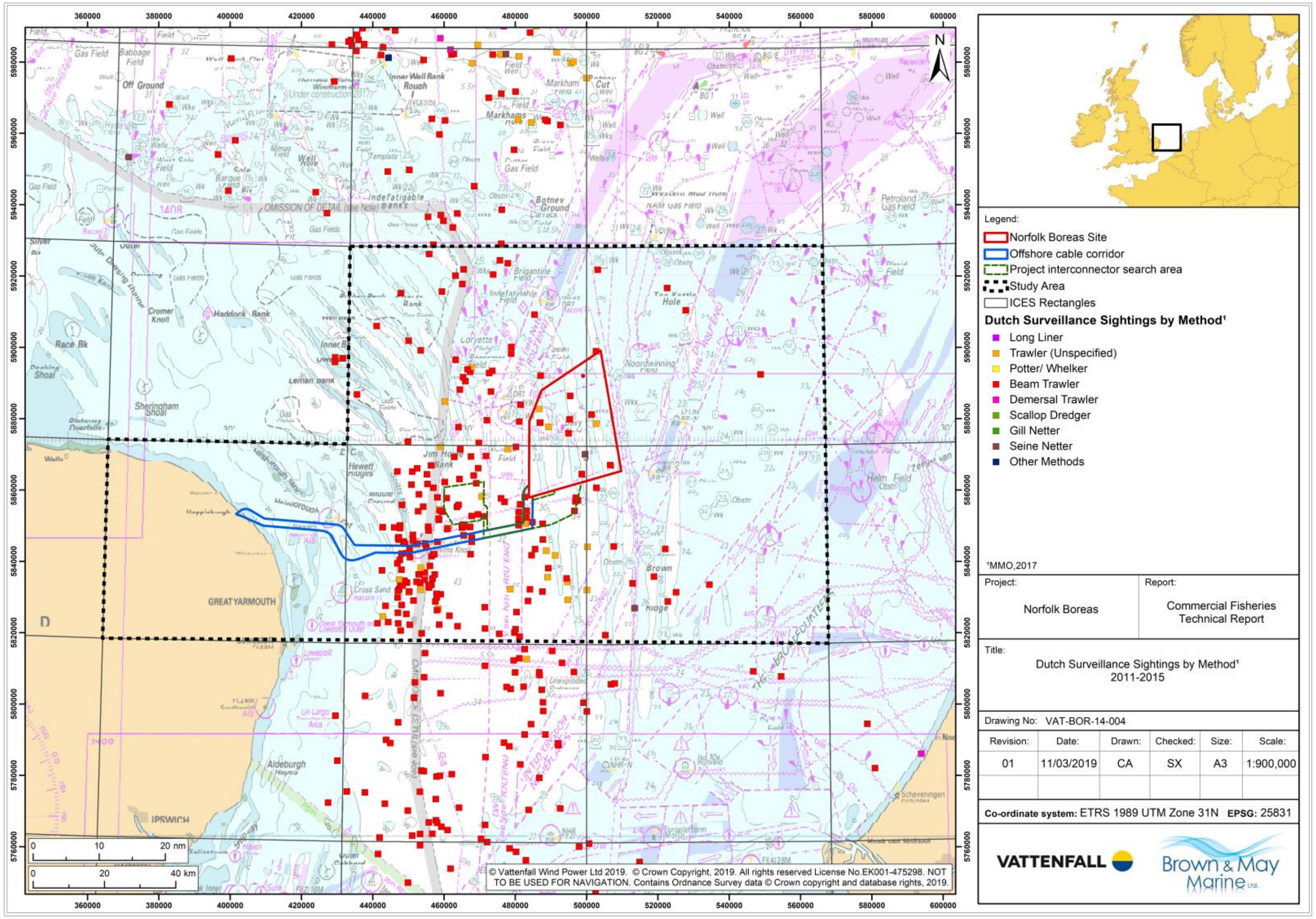


Figure 6.1 Dutch Surveillance sightings by method (2011 to 2015) (Source: MMO, 2017)

6.2 Dutch Landings Data

31. Landings values of Dutch vessels from the ICES rectangles in the study area are almost entirely from beam trawling, with significantly smaller values for seine netting and negligible values for other methods (Figure 6.2). The principal species landed are Dover sole, plaice and turbot. The latter, however, to a much lesser extent (Figure 6.3).

32. The higher landings values recorded for Dover sole in comparison to plaice can be explained in part by the fact that Dover sole is between four to seven times more valuable and the fact that pulse beam trawlers (the type of beam trawl currently used by the majority of Dutch vessels) have increased efficiency targeting sole compared to traditional beam trawlers.

33. It should be noted that as the Dutch beam trawlers cannot fish within the 12nm limit, the values given for rectangle 34F1 in Figure 6.2 would likely relate to the eastern sector of the rectangle.

34. A further detailed analysis of landings values by species and method for each ICES rectangle within the offshore project area is given in Figure 6.4, Figure 6.5, Figure 6.6, Figure 6.7 and Figure 6.8.

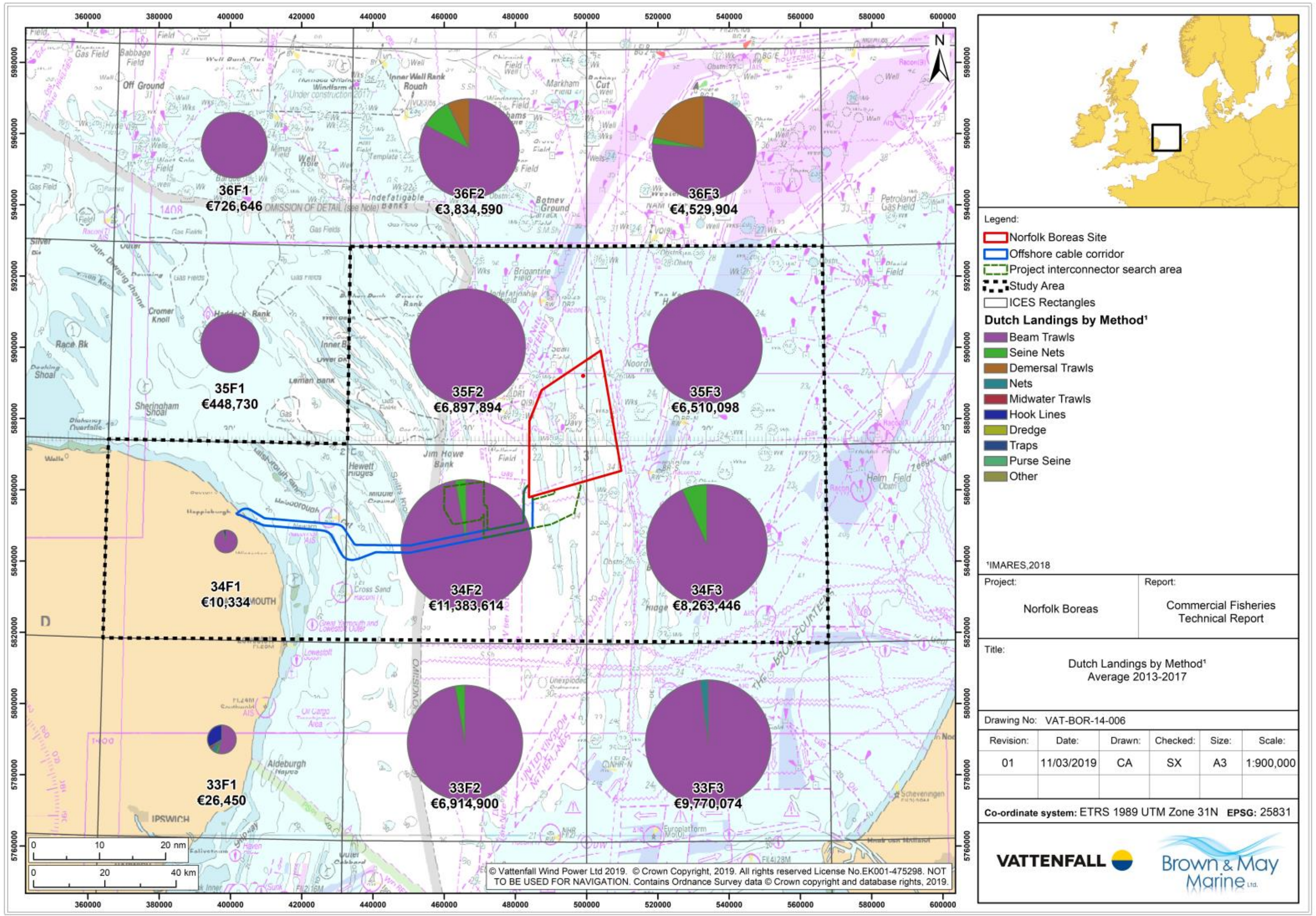


Figure 6.2 Dutch landings (€) by method (average 2013 to 2017) (Source: IMARES, 2018)

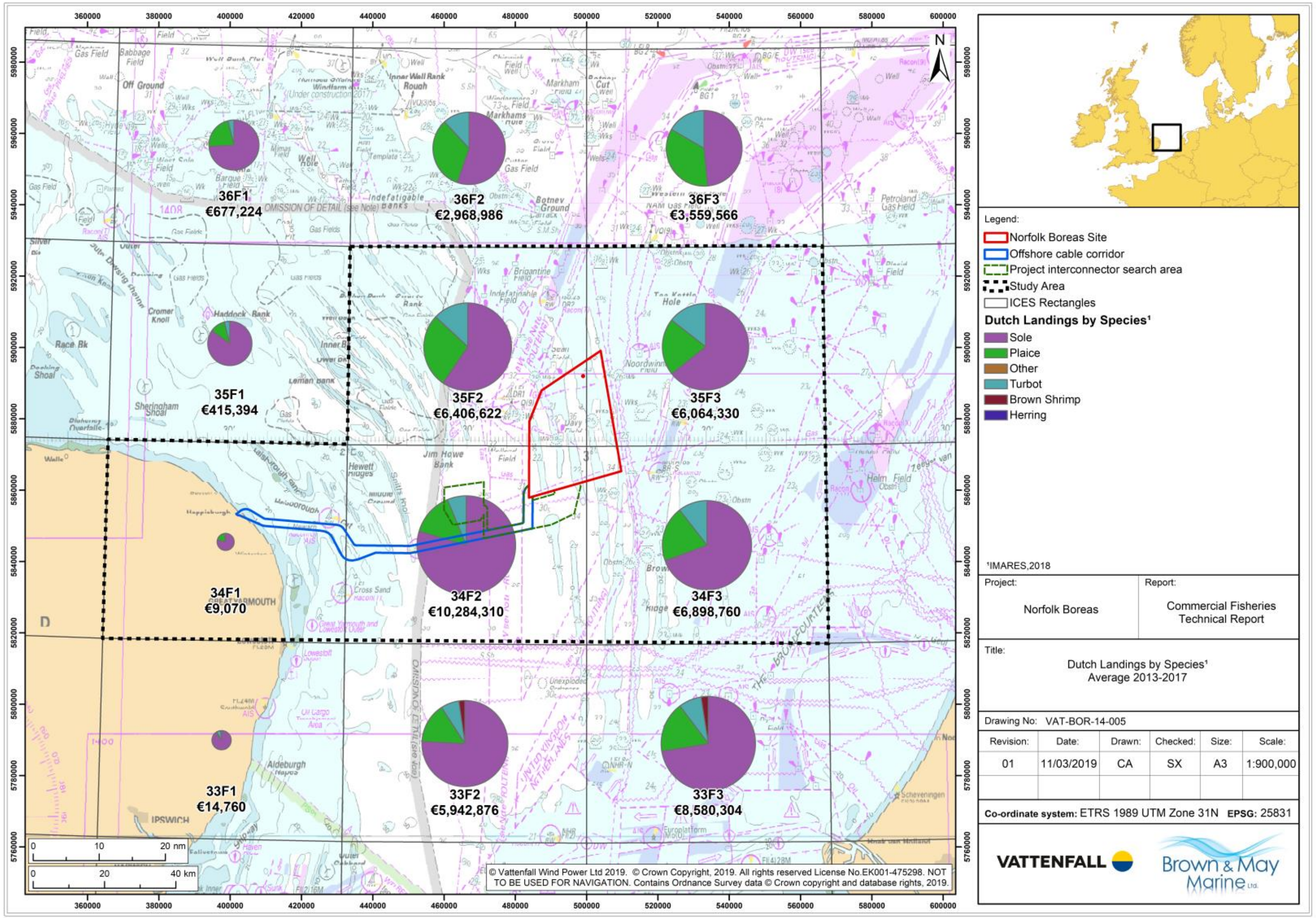
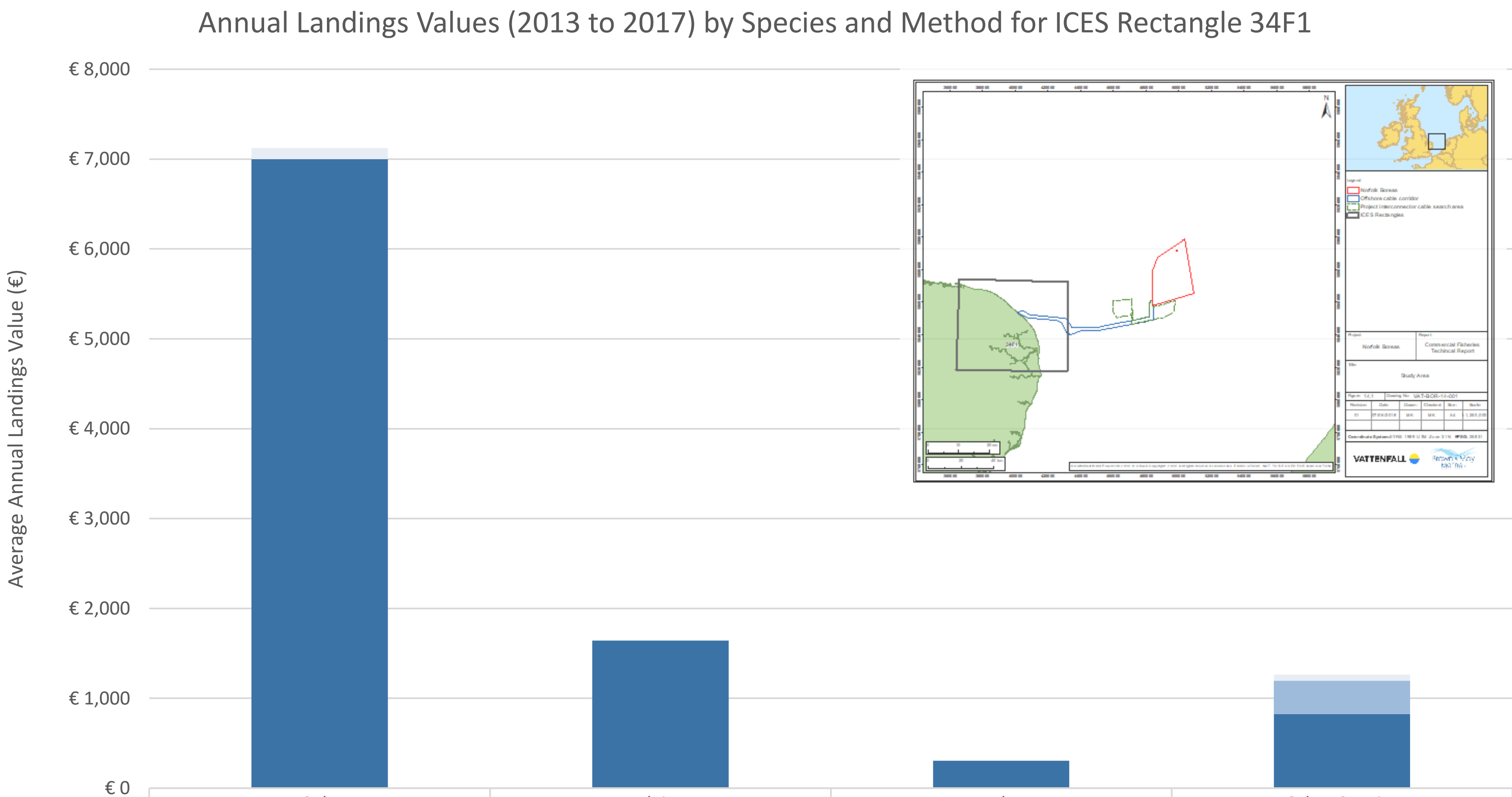
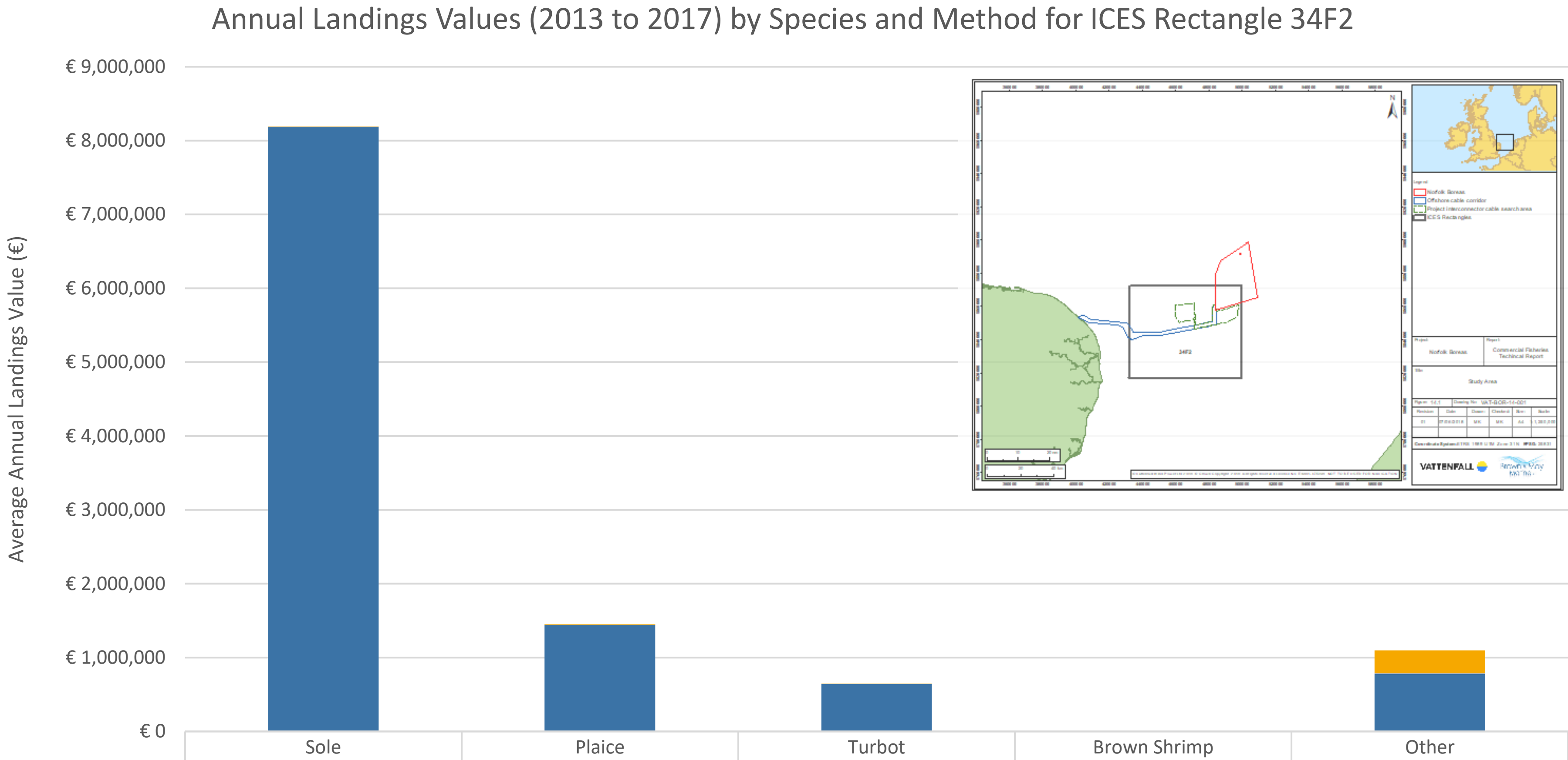


Figure 6.3 Dutch landings (€) by species (average 2013 to 2017) (Source: IMARES, 2018)



	Sole	Plaice	Turbot	Other Species
Nets	€ 124	€ 0	€ 0	€ 68
Hook & Lines	€ 0	€ 0	€ 0	€ 370
Beam Trawls	€ 6,998	€ 1,642	€ 306	€ 826

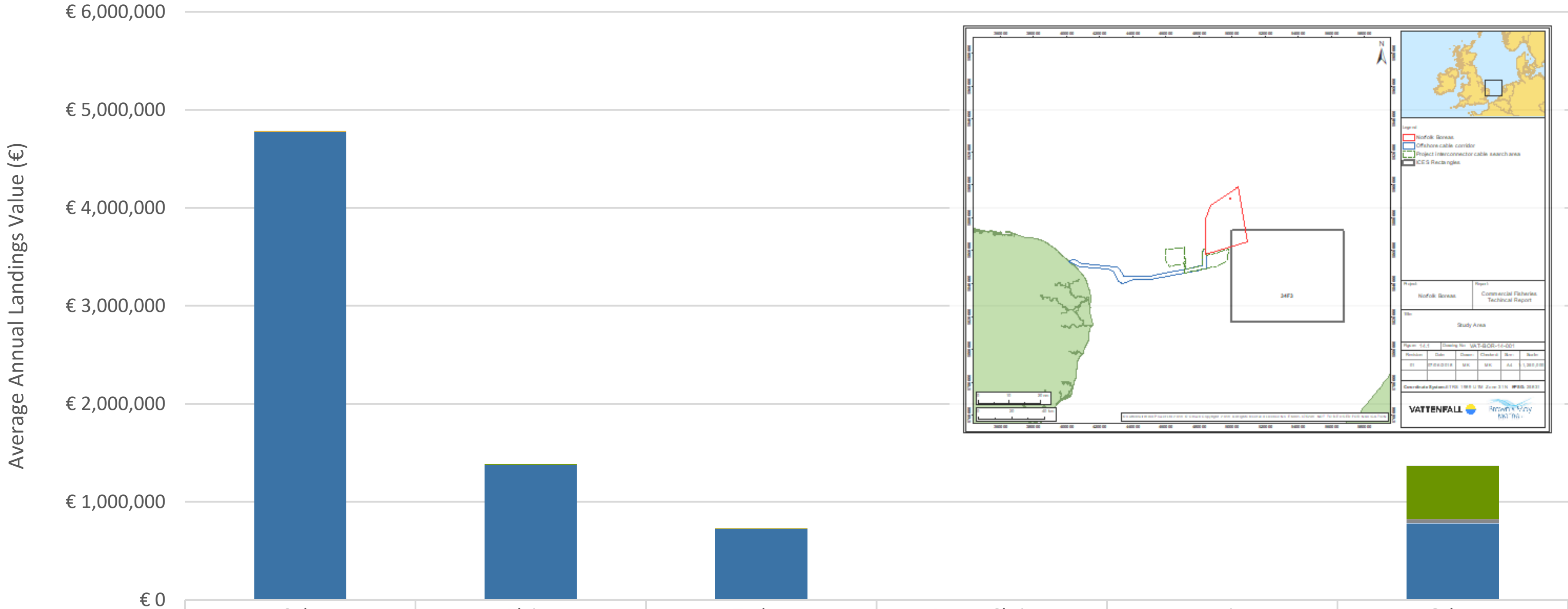
Figure 6.4 Average landing values (2013 to 2017) by species and method in ICES rectangle 34F1 (Source: IMARES, 2018)



	Sole	Plaice	Turbot	Brown Shrimp	Other
Seine Nets	€ 4	€ 6,078	€ 136	€ 0	€ 310,742
Nets	€ 228	€ 0	€ 0	€ 0	€ 5,184
Midwater Trawls	€ 0	€ 0	€ 0	€ 0	€ 4,484
Hook & Lines	€ 0	€ 0	€ 0	€ 0	€ 902
Beam Trawls	€ 8,184,822	€ 1,447,096	€ 644,880	€ 1,066	€ 777,982

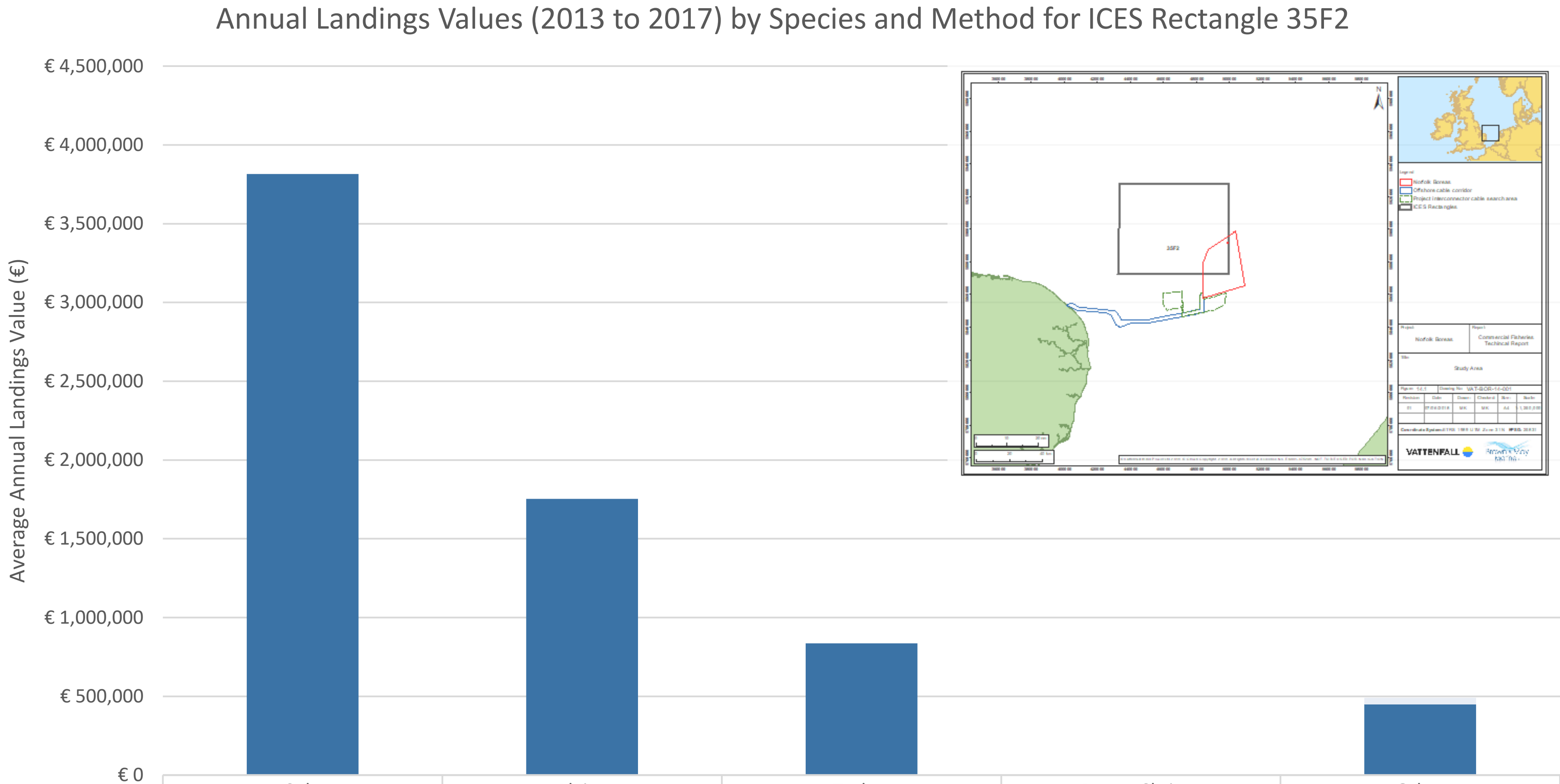
Figure 6.5 Average landing values (2013 to 2017) by species and method in ICES rectangle 34F2 (Source: IMARES, 2018)

Annual Landings Value (2013 to 2017) by Species and Method for ICES Rectangle 34F3



	Sole	Plaice	Turbot	Brown Shrimp	Herring	Other
Traps	€ 0	€ 0	€ 0	€ 0	€ 0	€ 132
Seine Nets	€ 6	€ 10,254	€ 570	€ 0	€ 0	€ 540,384
Nets	€ 6,334	€ 0	€ 192	€ 0	€ 0	€ 3,050
Midwater Trawls	€ 0	€ 0	€ 0	€ 0	€ 384	€ 37,300
Hook & Lines	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1,598
Demersal Trawls	€ 1,088	€ 294	€ 198	€ 0	€ 0	€ 8,468
Beam Trawls	€ 4,775,196	€ 1,374,940	€ 726,224	€ 3,080	€ 0	€ 773,754

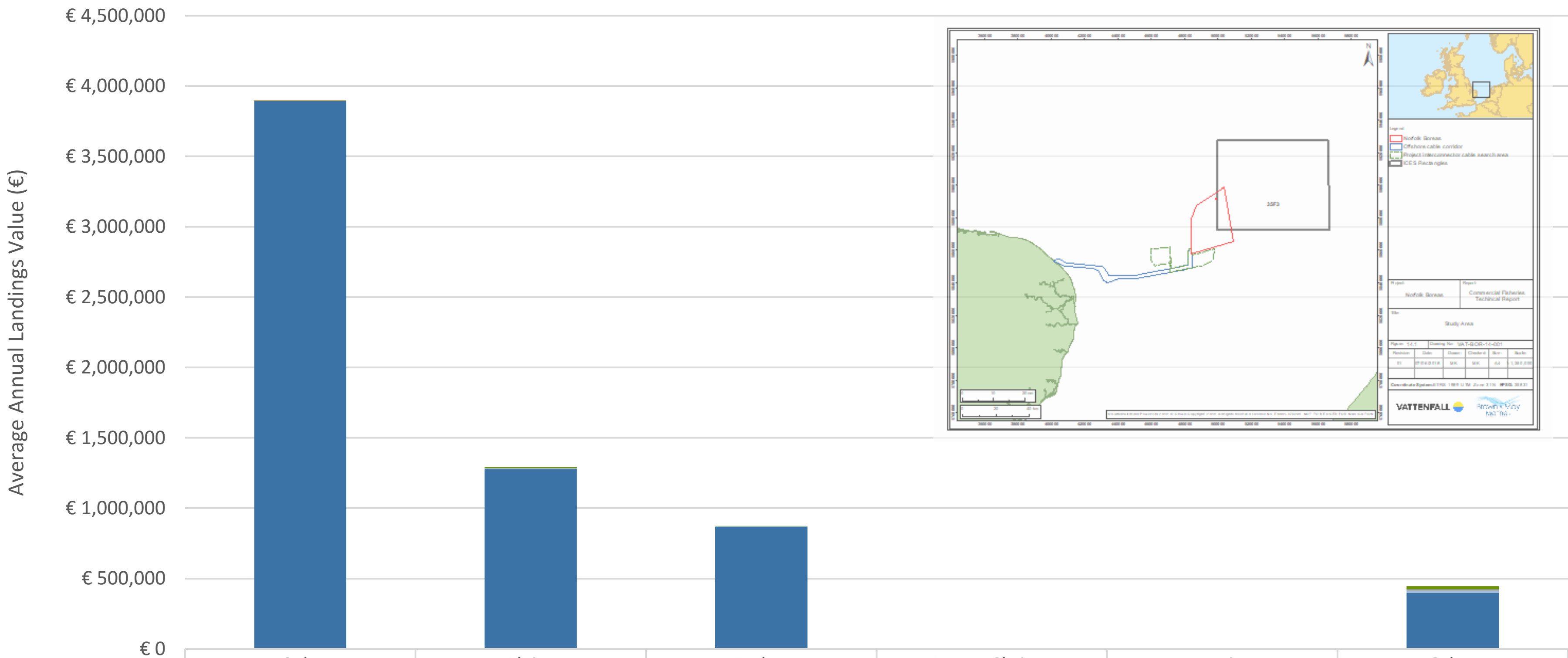
Figure 6.6 Average landing values (2013 to 2017) by species and method in ICES rectangle 34F3 (Source: IMARES, 2018)



	Sole	Plaice	Turbot	Brown Shrimp	Other
Seine Nets	€ 0	€ 646	€ 22	€ 0	€ 43,358
Nets	€ 0	€ 0	€ 0	€ 0	€ 56
Beam Trawls	€ 3,816,112	€ 1,753,418	€ 836,314	€ 110	€ 447,858

Figure 6.7 Average landing values (2013 to 2017) by species and method in ICES rectangle 35F2 (Source: IMARES, 2018)

Annual Landings Values (2013 to 2017) by Species and Method for ICES Rectangle 35F3



	Sole	Plaice	Turbot	Brown Shrimp	Herring	Other
Seine Nets	€ 0	€ 7,952	€ 136	€ 0	€ 0	€ 21,578
Nets	€ 80	€ 0	€ 0	€ 0	€ 0	€ 0
Midwater Trawls	€ 0	€ 0	€ 0	€ 0	€ 344	€ 10,540
Hook & Lines	€ 0	€ 0	€ 0	€ 0	€ 0	€ 106
Demersal Trawls	€ 732	€ 6,684	€ 4,390	€ 0	€ 0	€ 15,526
Beam Trawls	€ 3,896,086	€ 1,276,816	€ 867,252	€ 3,858	€ 0	€ 398,018

Figure 6.8 Average landing values (2013 to 2017) by species and method in ICES rectangle 35F3 (Source: IMARES, 2018)

6.3 Satellite Tracking (VMS) Data

36. A description of the level and distribution of fishing activity by the Dutch fleet in areas relevant to the project, based on VMS data (effort and value) is given in the following sections by fishing method.

6.4 Beam trawling

37. Analysis of VMS data for Dutch beam trawlers indicates that fishing activity by this method occurs at relatively high intensity over the majority of the Southern North Sea (ICES Division IVc) and less intensively over the Central North Sea (Division IVb). Within this broad area, the highest levels of fishing occur close to the Dutch and Belgian coasts (Figure 6.9 and Figure 6.10). Within the offshore project area (in areas beyond the 12nm limit), fishing activity occurs at moderate levels with the highest activity levels concentrating in a discrete section of the central part of the offshore cable corridor (Figure 6.11).

6.5 Seine netting

38. Dutch seine netting occurs at significantly lower levels than beam trawling. The highest levels of activity by this method occur in the English Channel with the offshore project area sustaining relatively low levels of seine netting activity (Figure 6.12, Figure 6.13 and Figure 6.14).

6.6 Other Dutch fishing methods

39. Analysis of VMS data indicates that pelagic, or midwater trawling by Dutch vessels occurs at low levels in the offshore project area and its vicinity (Figure 6.15, Figure 6.16 and Figure 6.17). However, from consultation with VisNed (Pers. Comms: P. Visser, 11/04/2018), it is understood that Dutch pelagic vessels are not active in the offshore project area. In this context it is important to note that the majority of the full time Dutch pelagic vessels are of a size typically 90 to 142m in length and operate gears of dimensions which would make it unviable to operate within the offshore project area.

40. Analysis of VMS data for other categories of Dutch fishing vessels, including demersal trawls, purse seines, nets, traps and dredges suggests that the offshore project area sustains negligible levels of activity by these methods (Figure 6.18, Figure 6.19, Figure 6.20, Figure 6.21, Figure 6.22, Figure 6.23, Figure 6.24, Figure 6.25, Figure 6.26 and Figure 6.27).

41. The above is consistent with the results of the analysis of surveillance and landings data for the Dutch fleet which indicates that the only Dutch fishing methods of relevance in the offshore project area are beam trawling and to a much lesser extent seine netting.

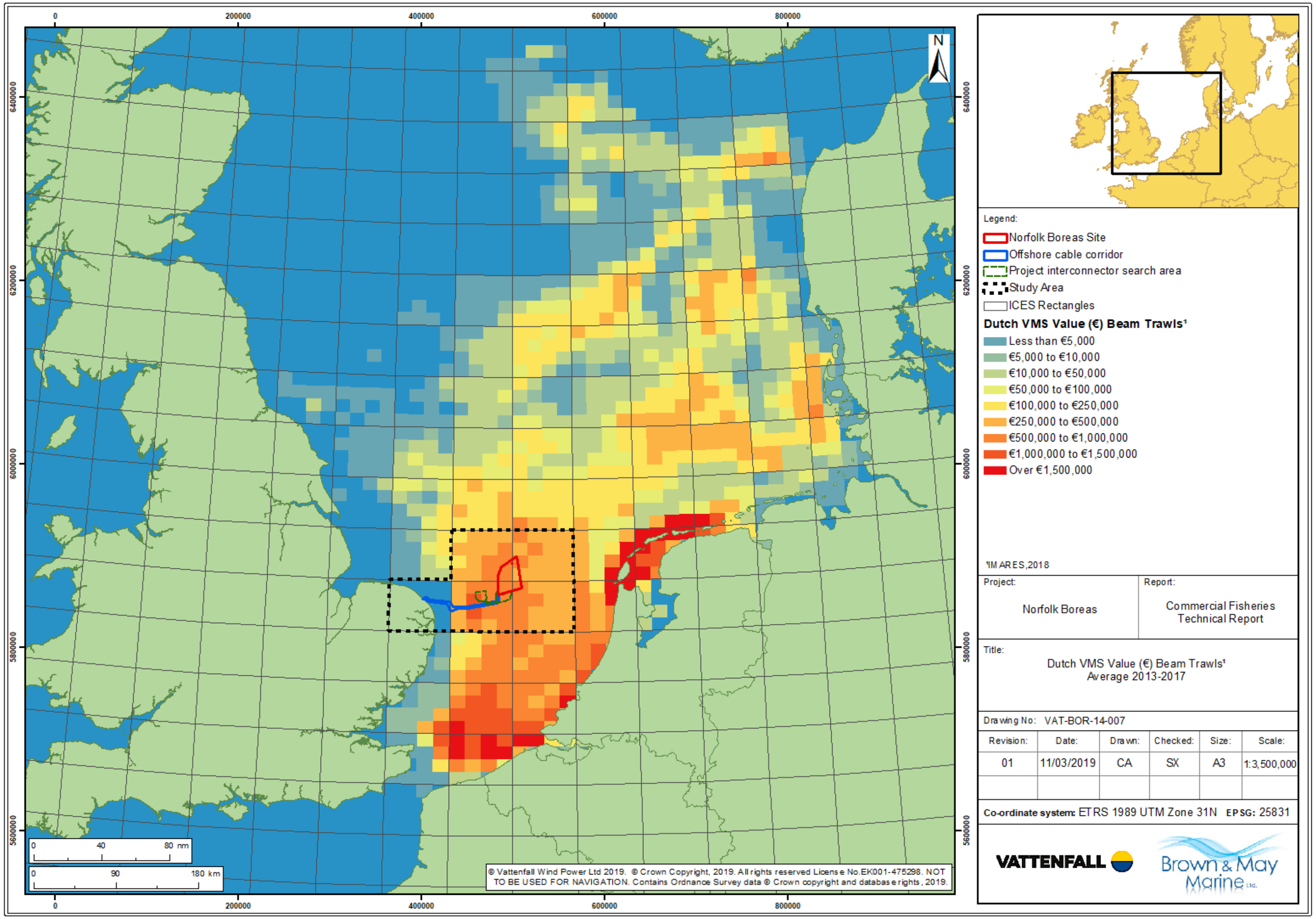


Figure 6.9 Dutch VMS value by beam trawl – wider region (average 2013 to 2017) (Source: IMARES, 2018)

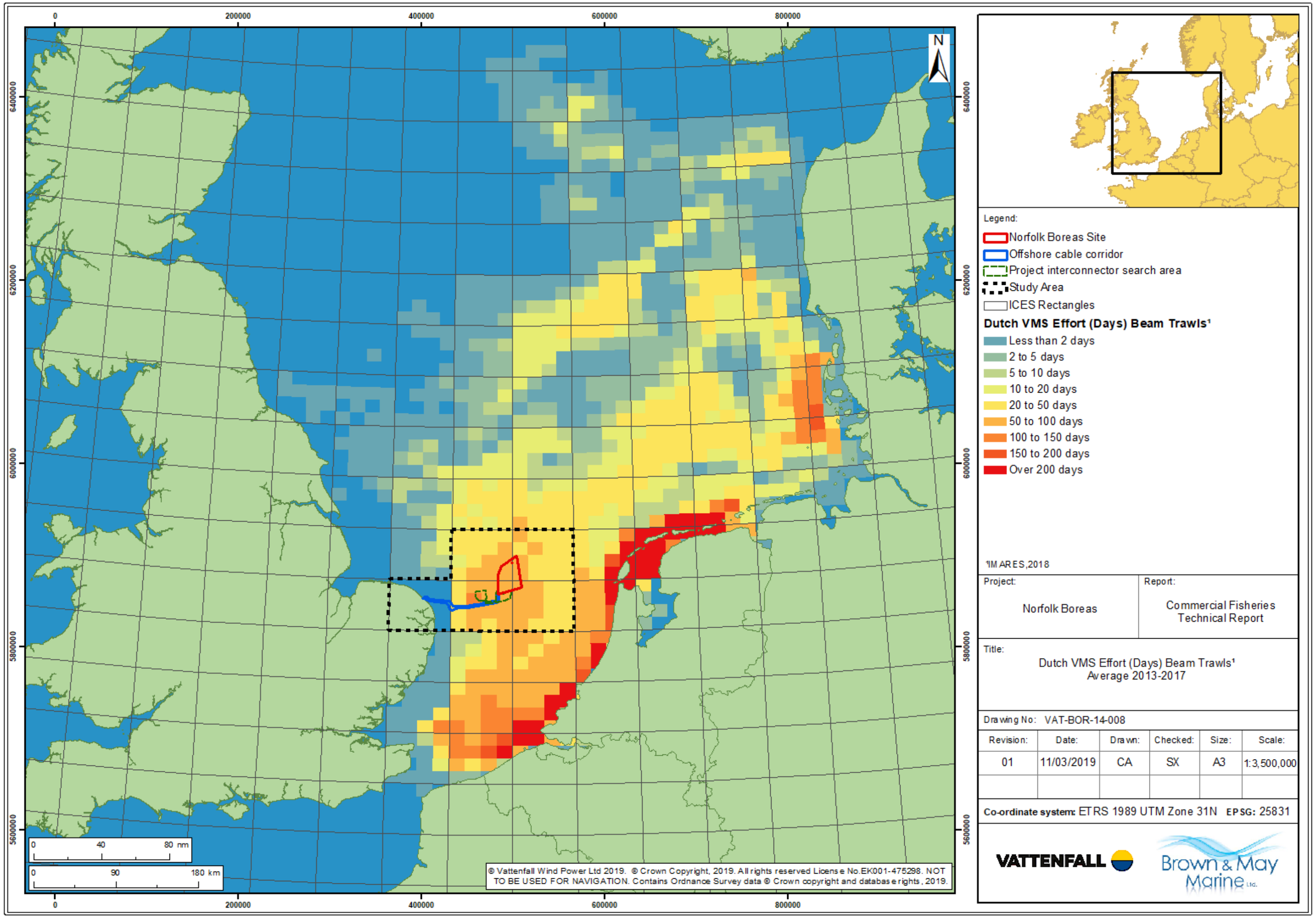


Figure 6.10 Dutch VMS effort by beam trawl – wider region (average 2013 to 2017) (Source: IMARES, 2018)

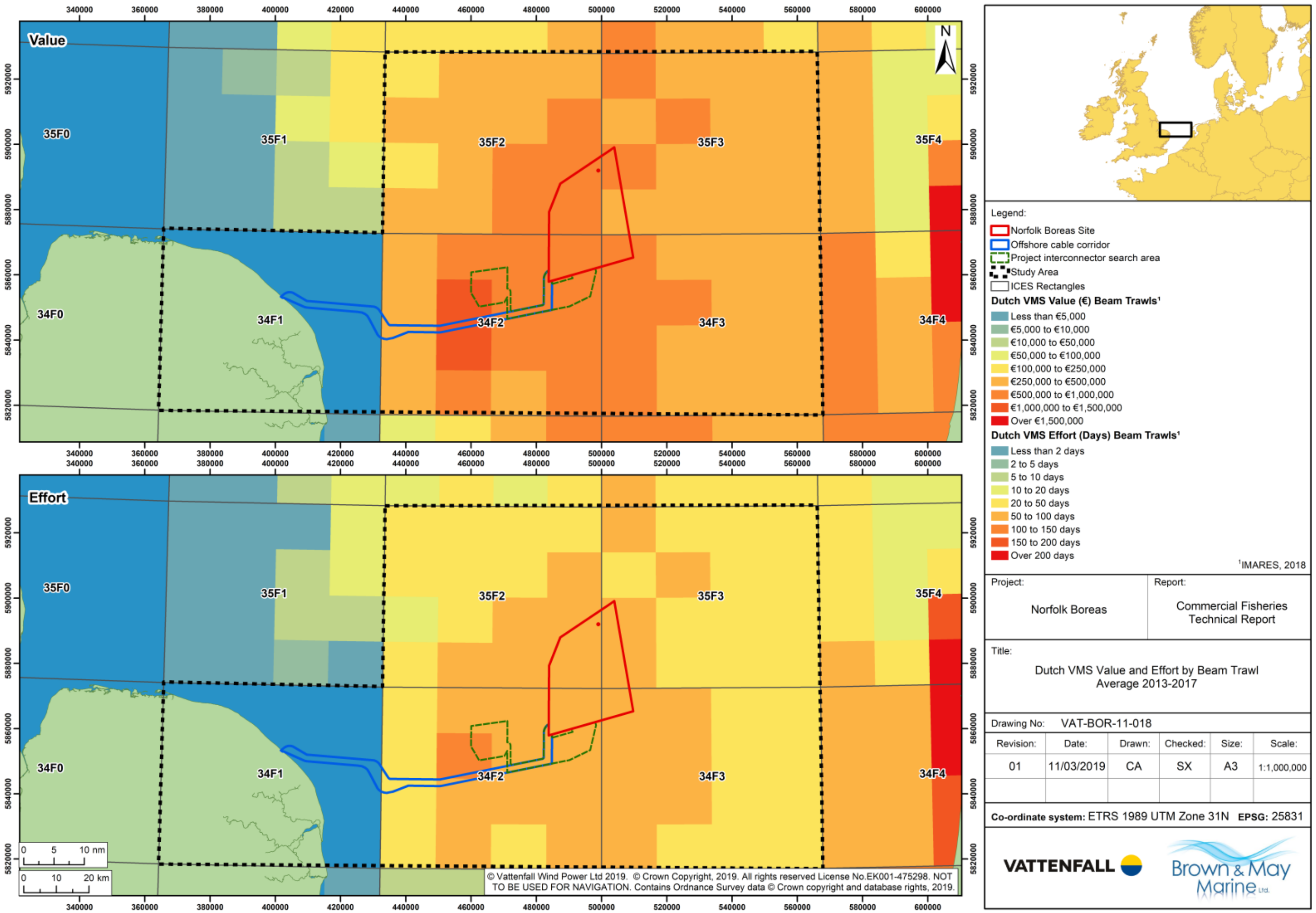


Figure 6.11 Dutch VMS value and effort by beam trawl (average 2013 to 2017) (Source: IMARES, 2018)

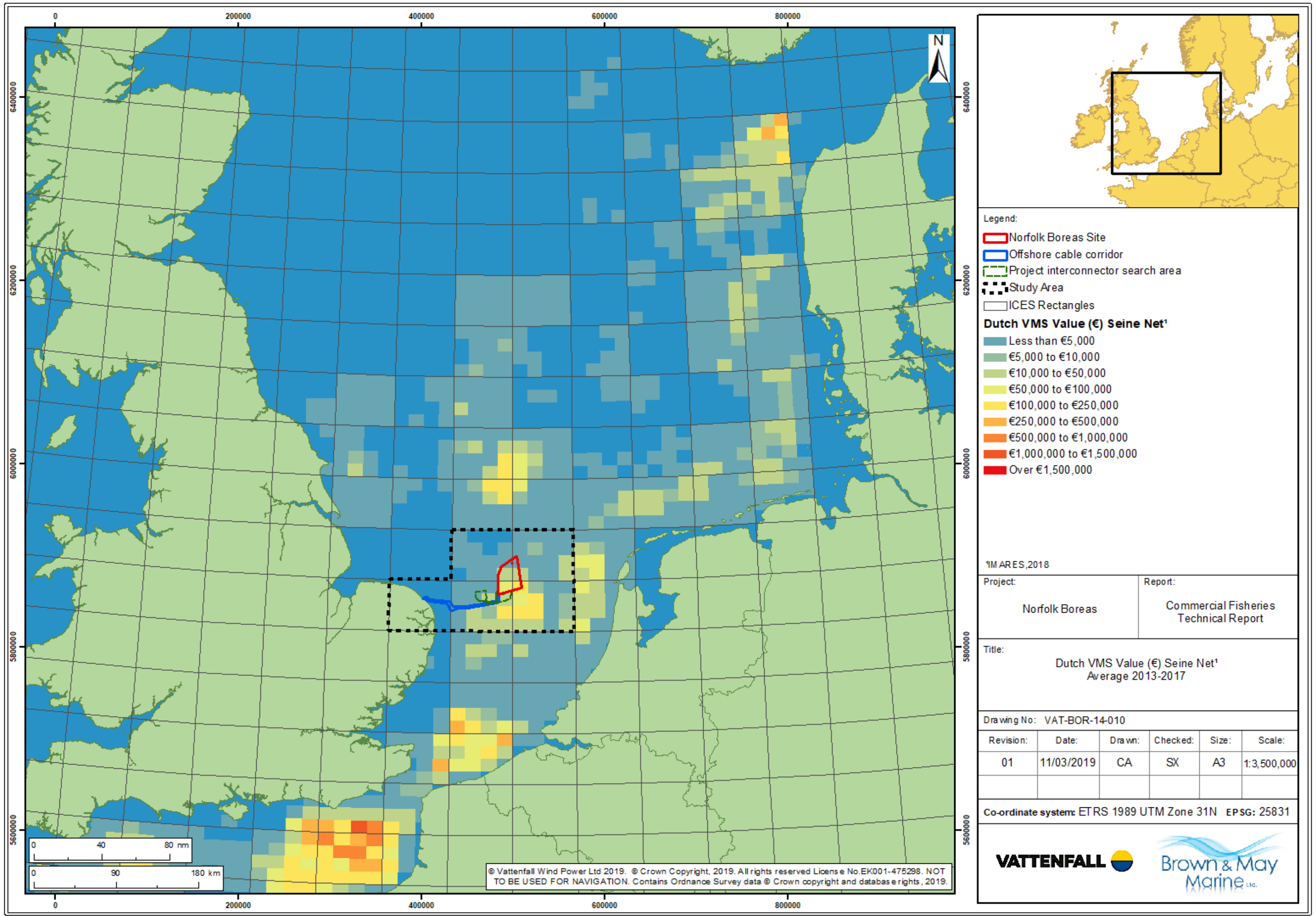


Figure 6.12 Dutch VMS value by seine net – wider region (average 2013 to 2017) (Source: IMARES, 2018)

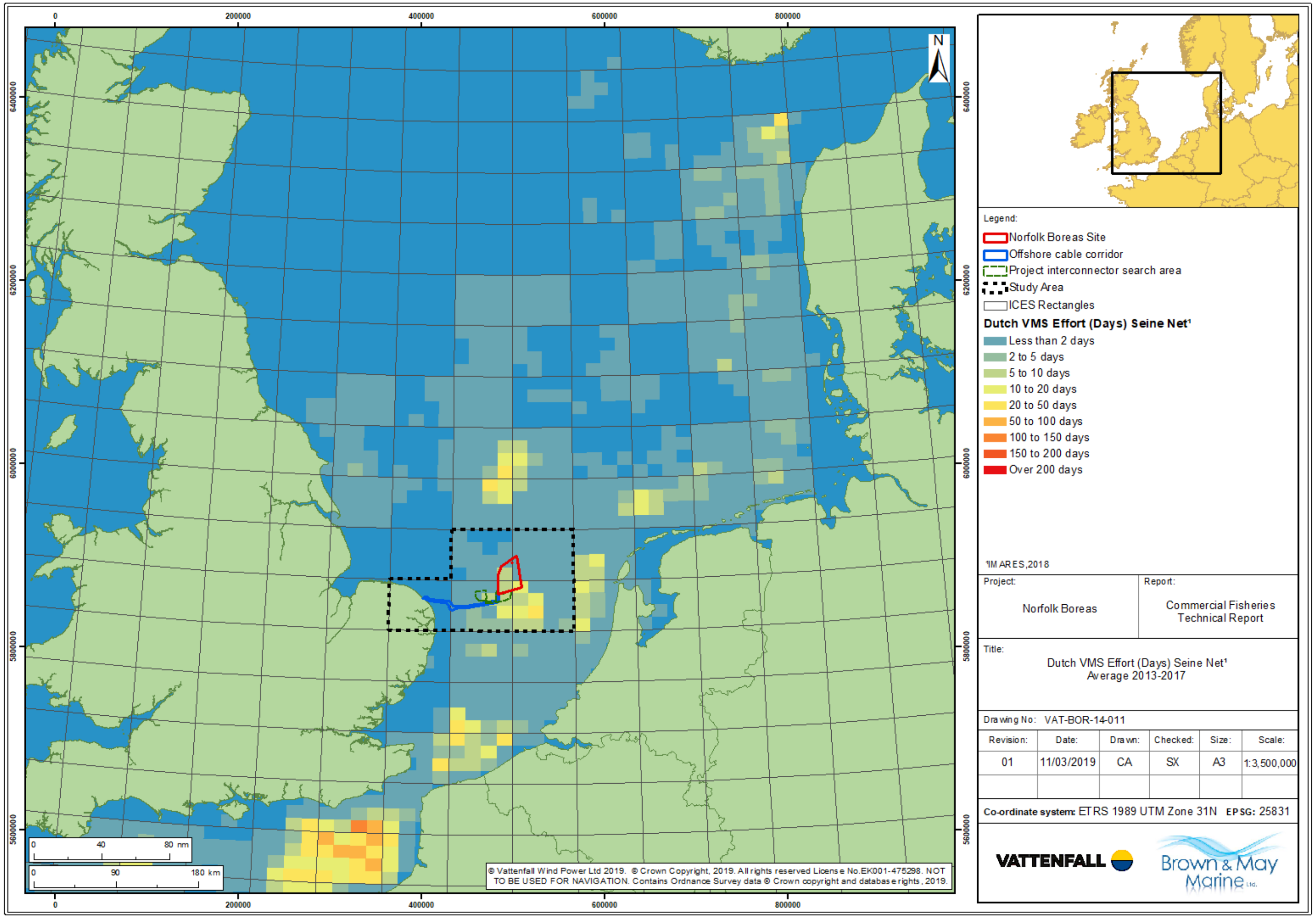


Figure 6.13 Dutch VMS effort by seine net – wider region (average 2013 to 2017) (Source: IMARES, 2018)

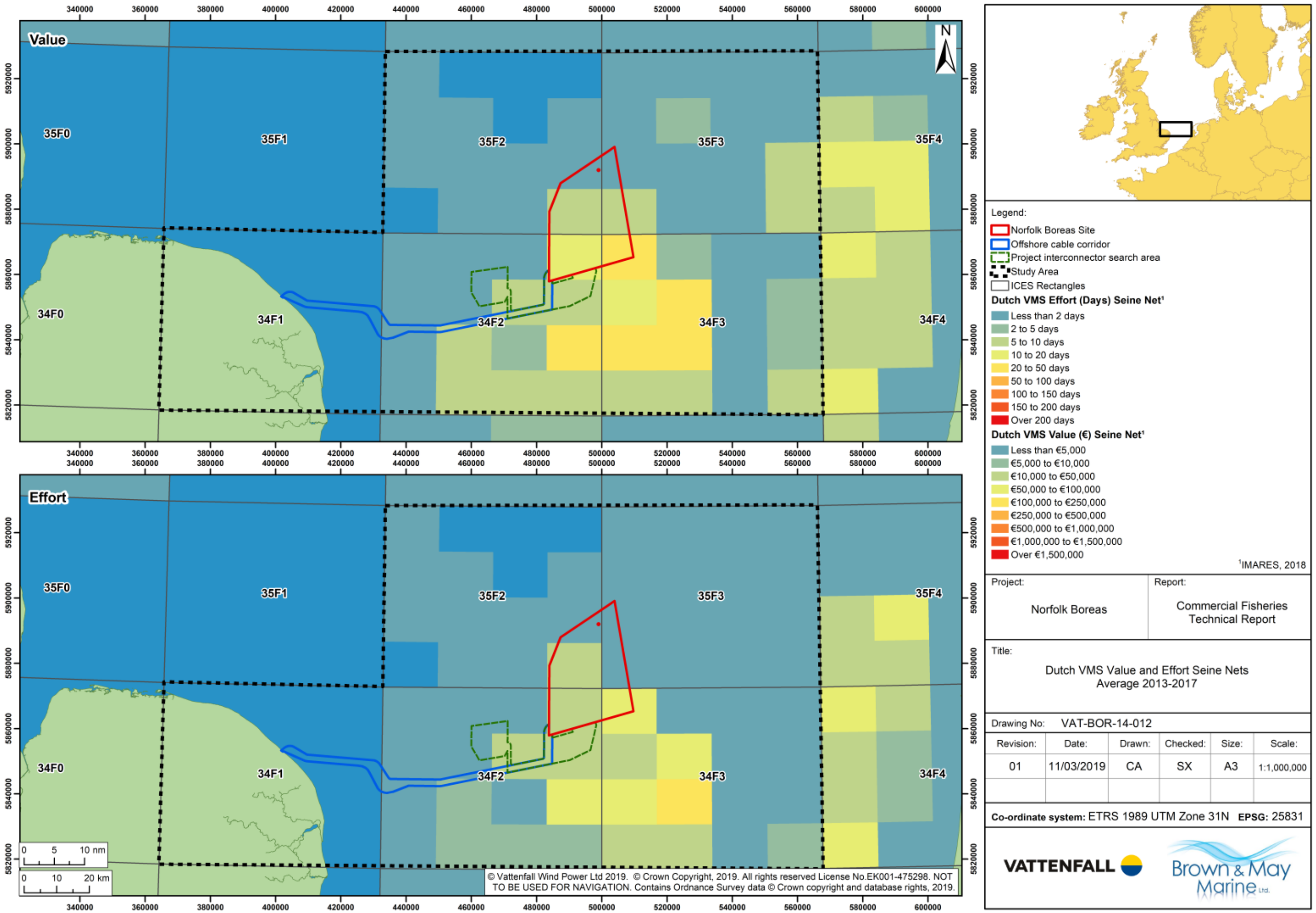


Figure 6.14 Dutch VMS value and effort by seine net (average 2013 to 2017) (Source: IMARES, 2018)

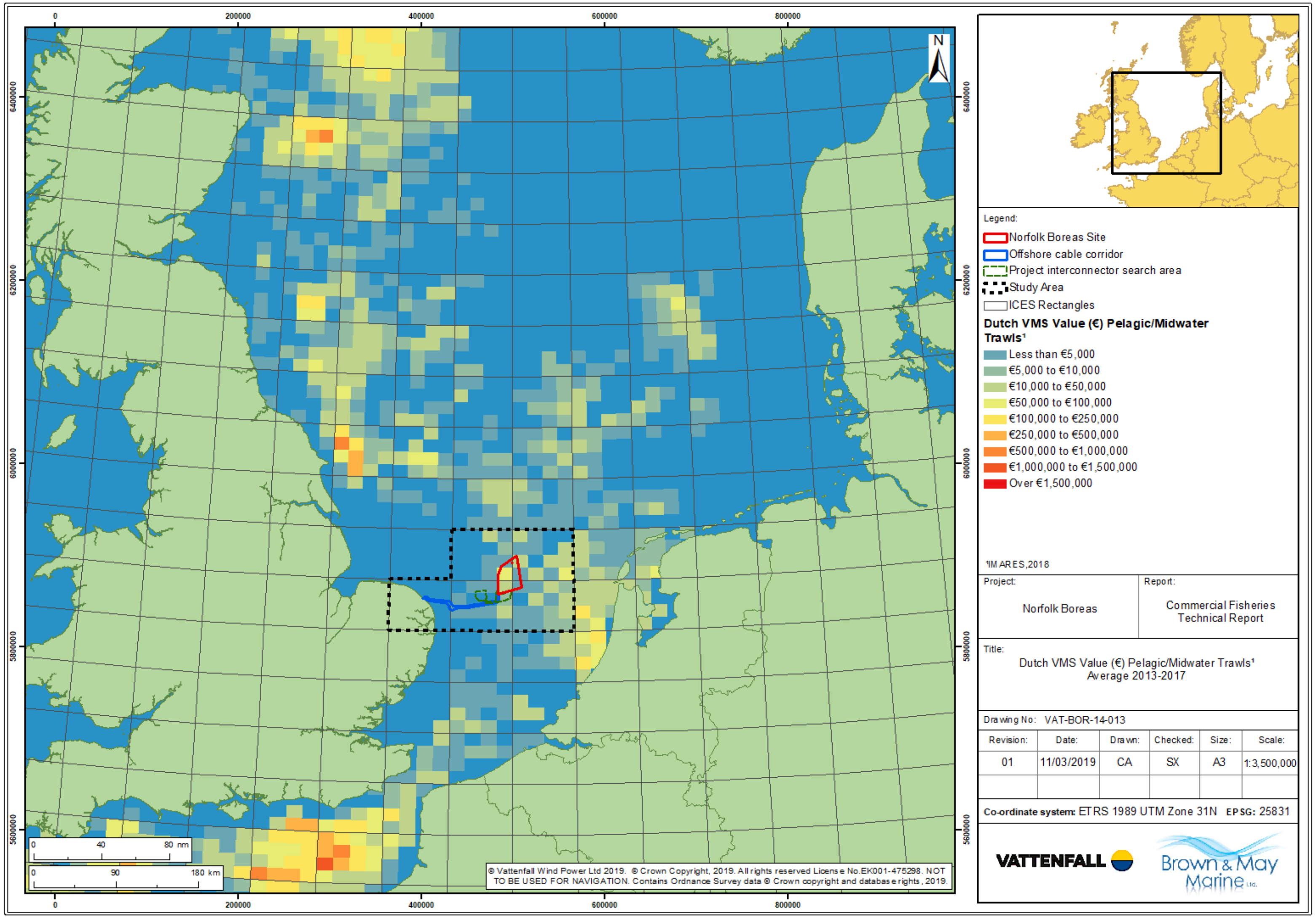


Figure 6.15 Dutch VMS value by pelagic / midwater trawl – wider region (average 2013 to 2017) (Source: IMARES, 2018)

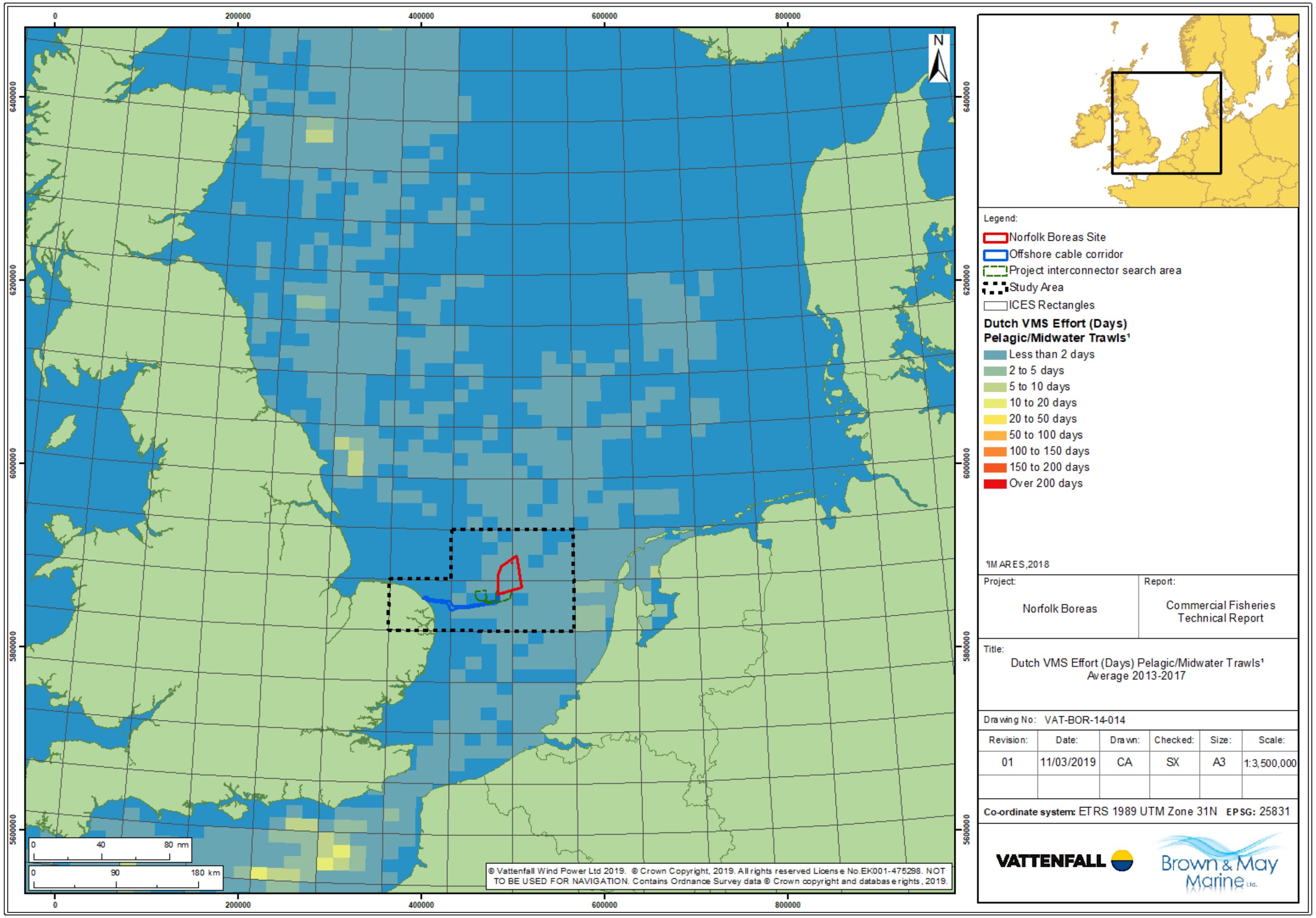


Figure 6.16 Dutch VMS effort by pelagic / midwater trawl – wider region (average 2013 to 2017) (Source: IMARES, 2018)

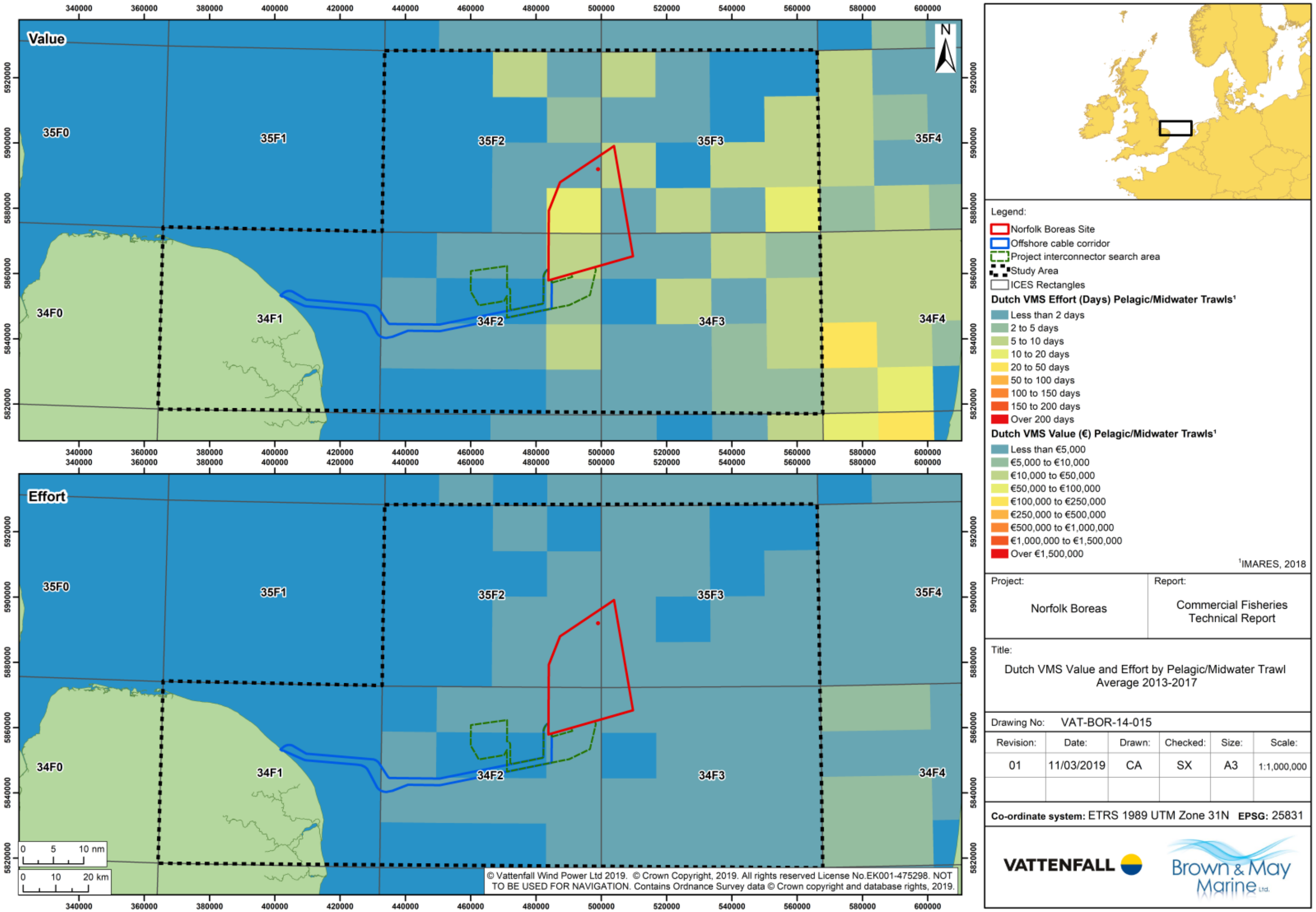


Figure 6.17 Dutch VMS value and effort by pelagic / midwater trawl – wider region (average 2013 to 2017) (Source: IMARES, 2018)

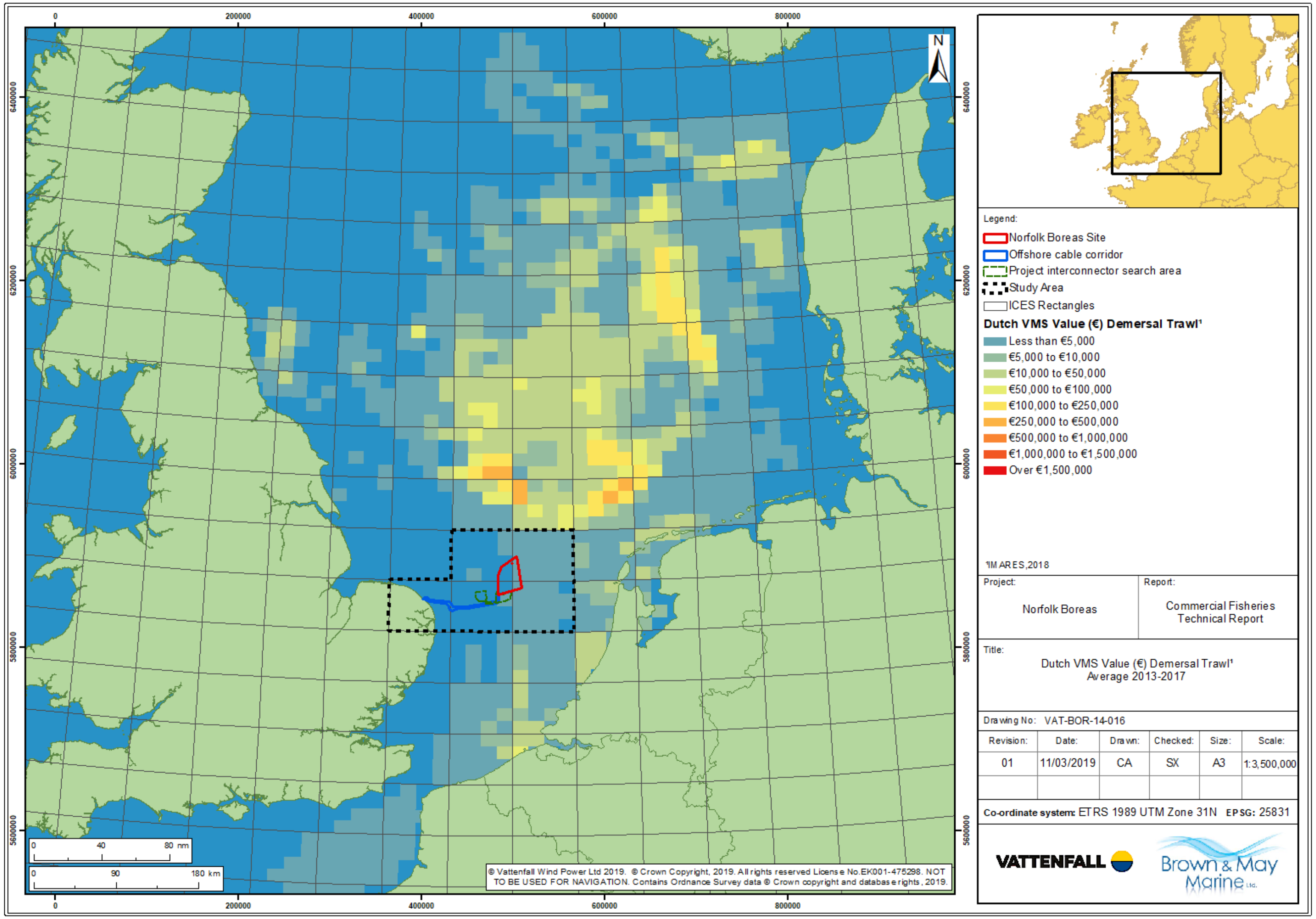


Figure 6.18 Dutch VMS value by demersal trawl – wider region (average 2013 to 2017) (Source: IMARES, 2018)

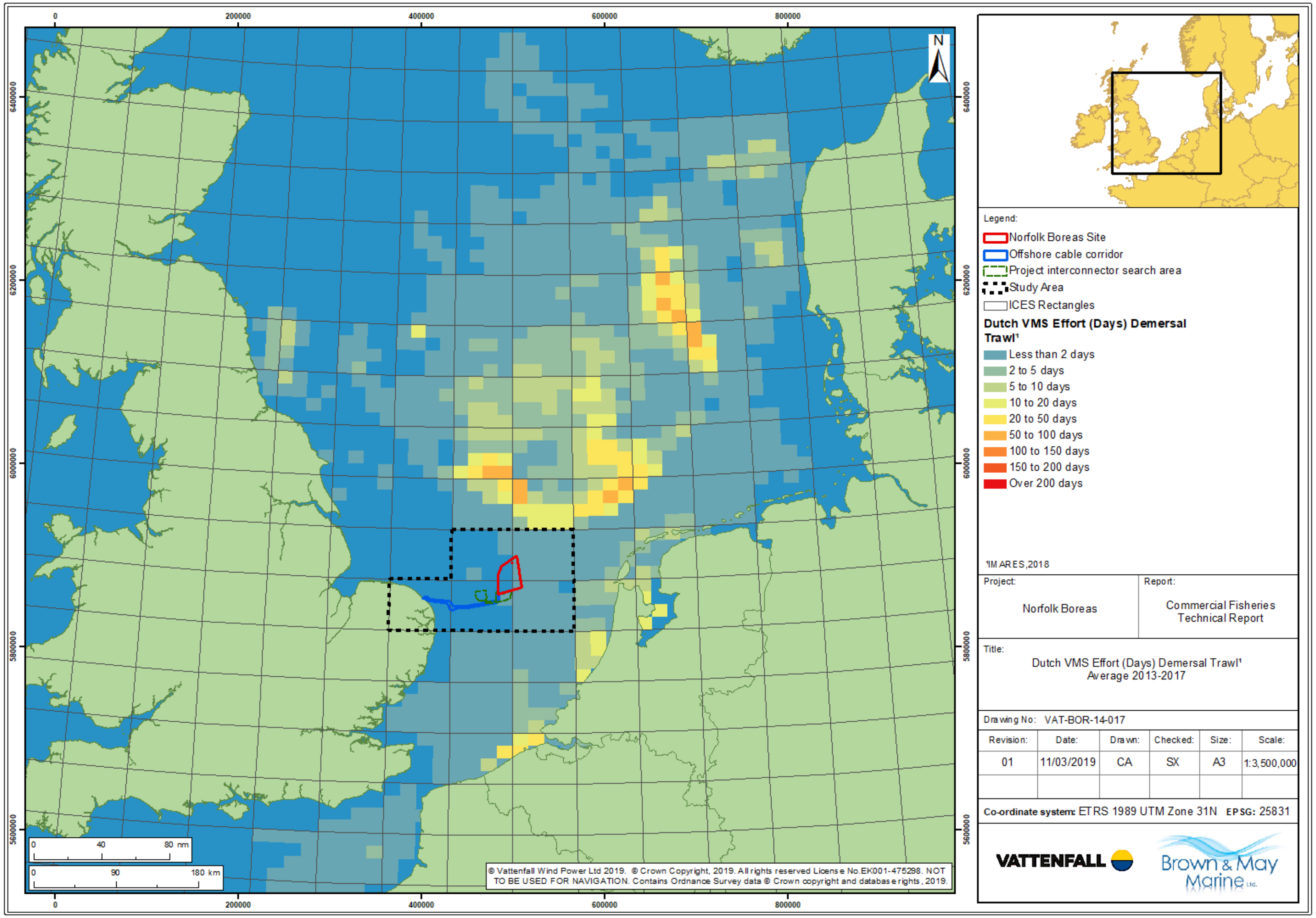


Figure 6.19 Dutch VMS effort by demersal trawl – wider region (average 2013 to 2017) (Source: IMARES, 2018)

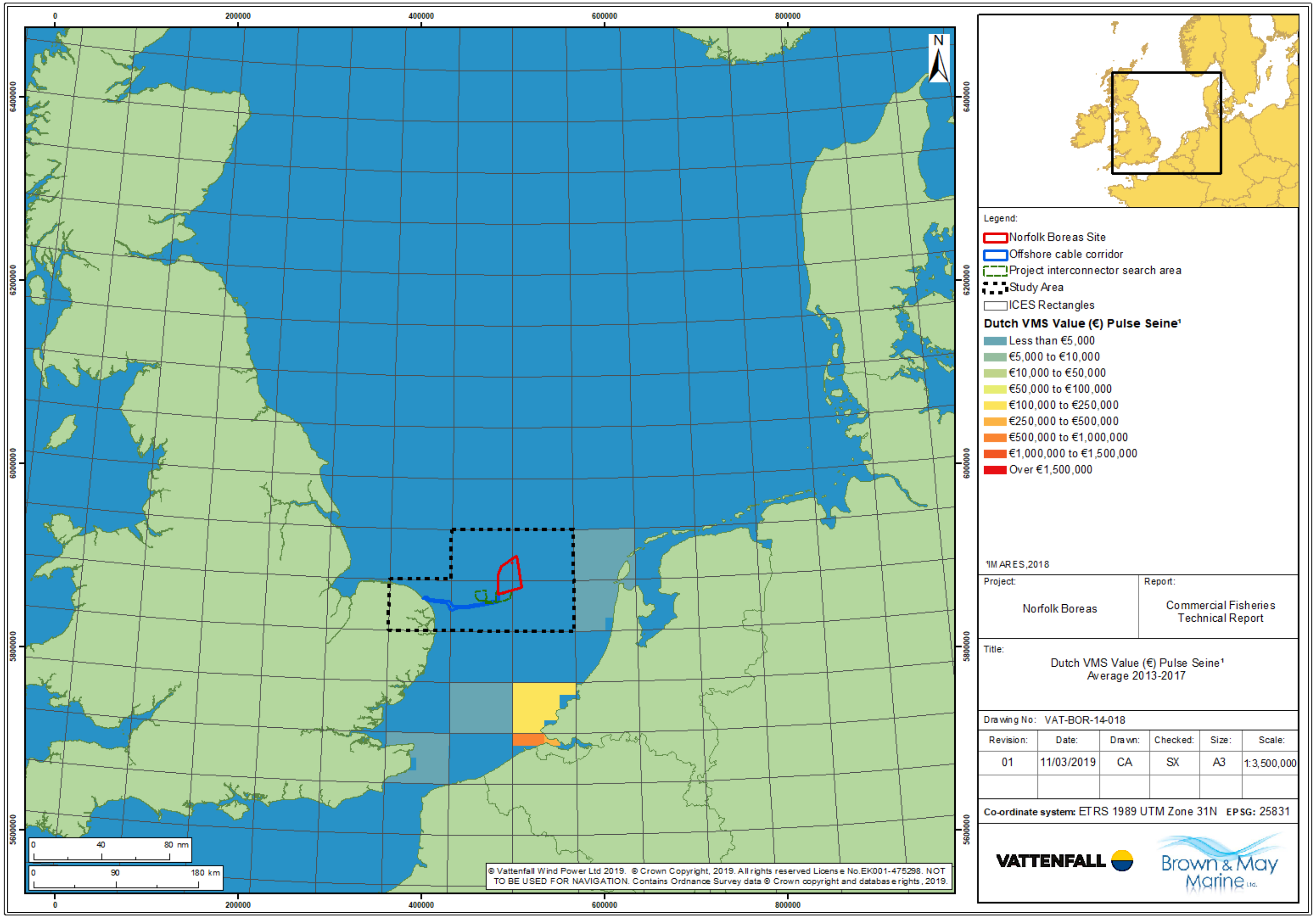


Figure 6.20 Dutch VMS value by purse seine – wider region (average 2013 to 2017) (Source: IMARES, 2018)

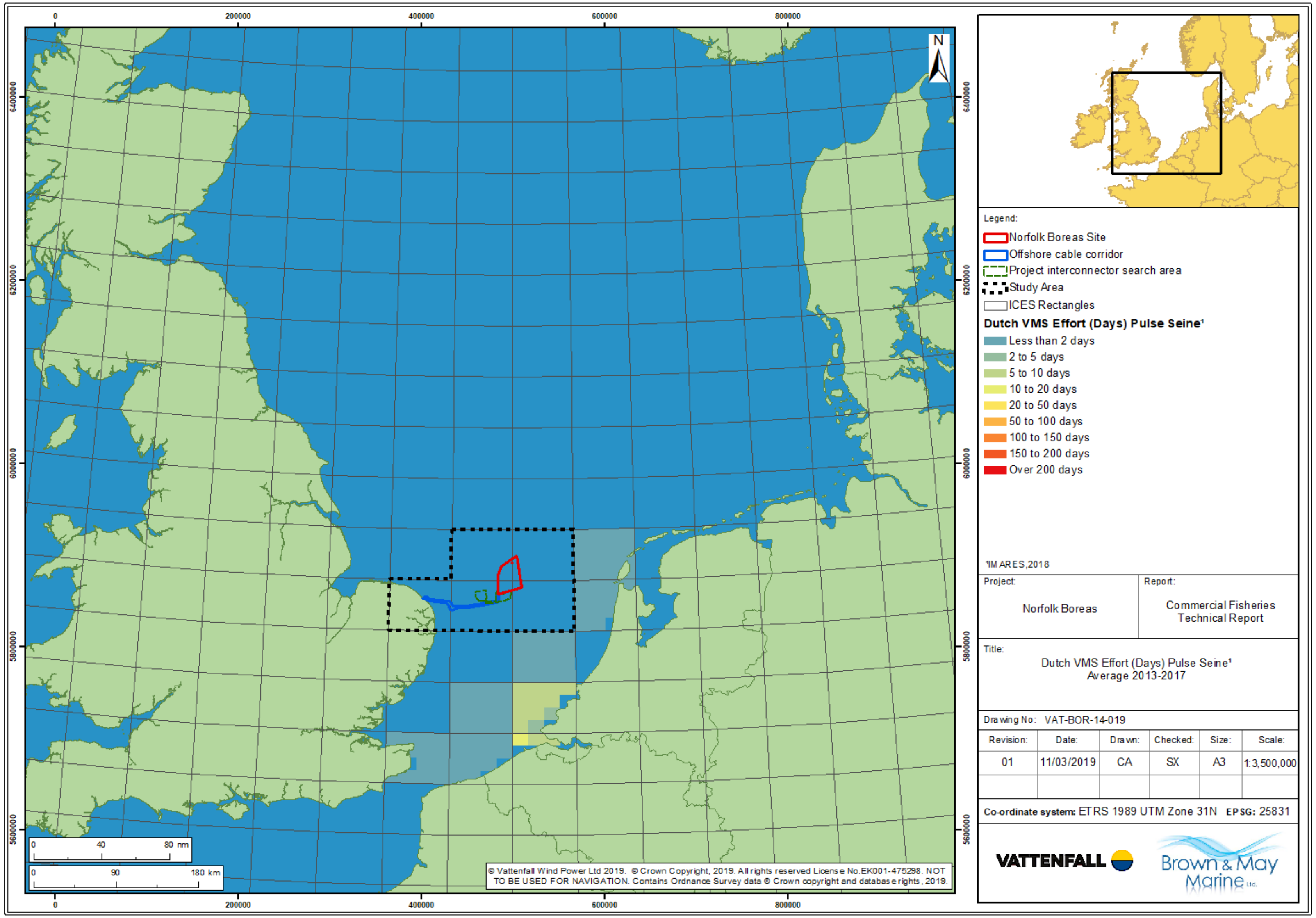


Figure 6.21 Dutch VMS effort by purse seine – wider region (average 2013 to 2017) (Source: IMARES, 2018)

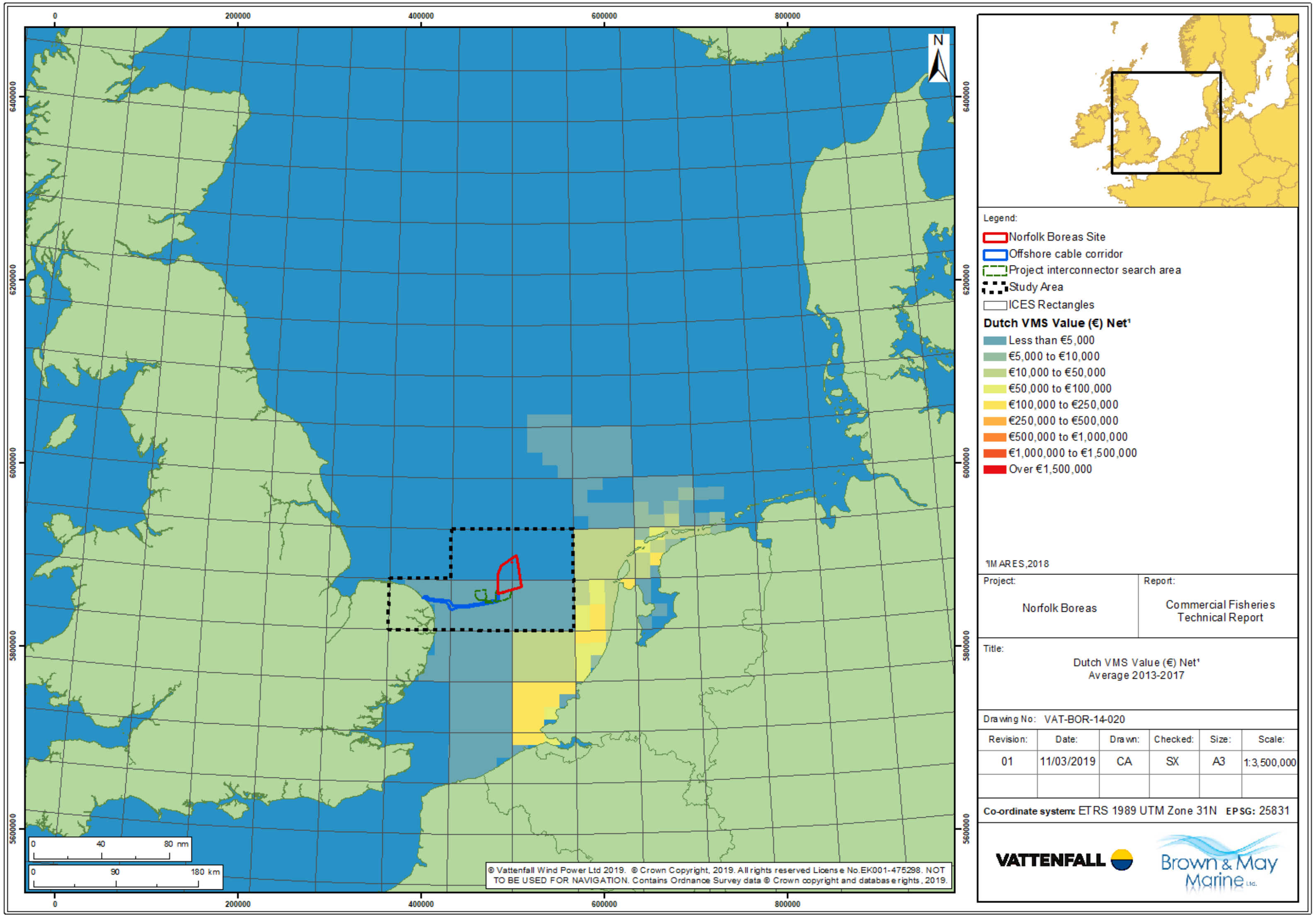


Figure 6.22 Dutch VMS value by net – wider region (average 2013 to 2017) (Source: IMARES, 2018)

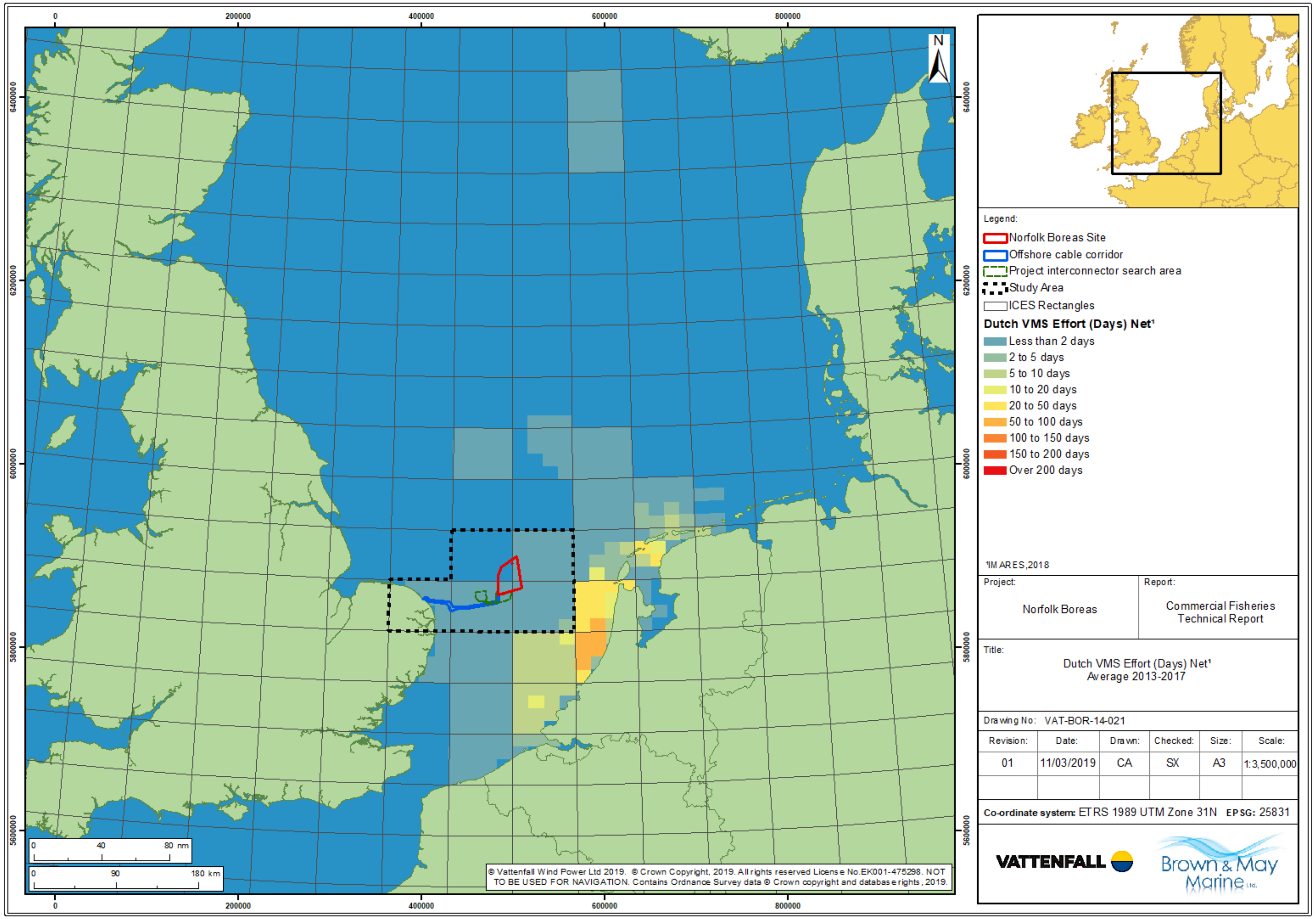


Figure 6.23 Dutch VMS effort by net – wider region (average 2013 to 2017) (Source: IMARES, 2018)

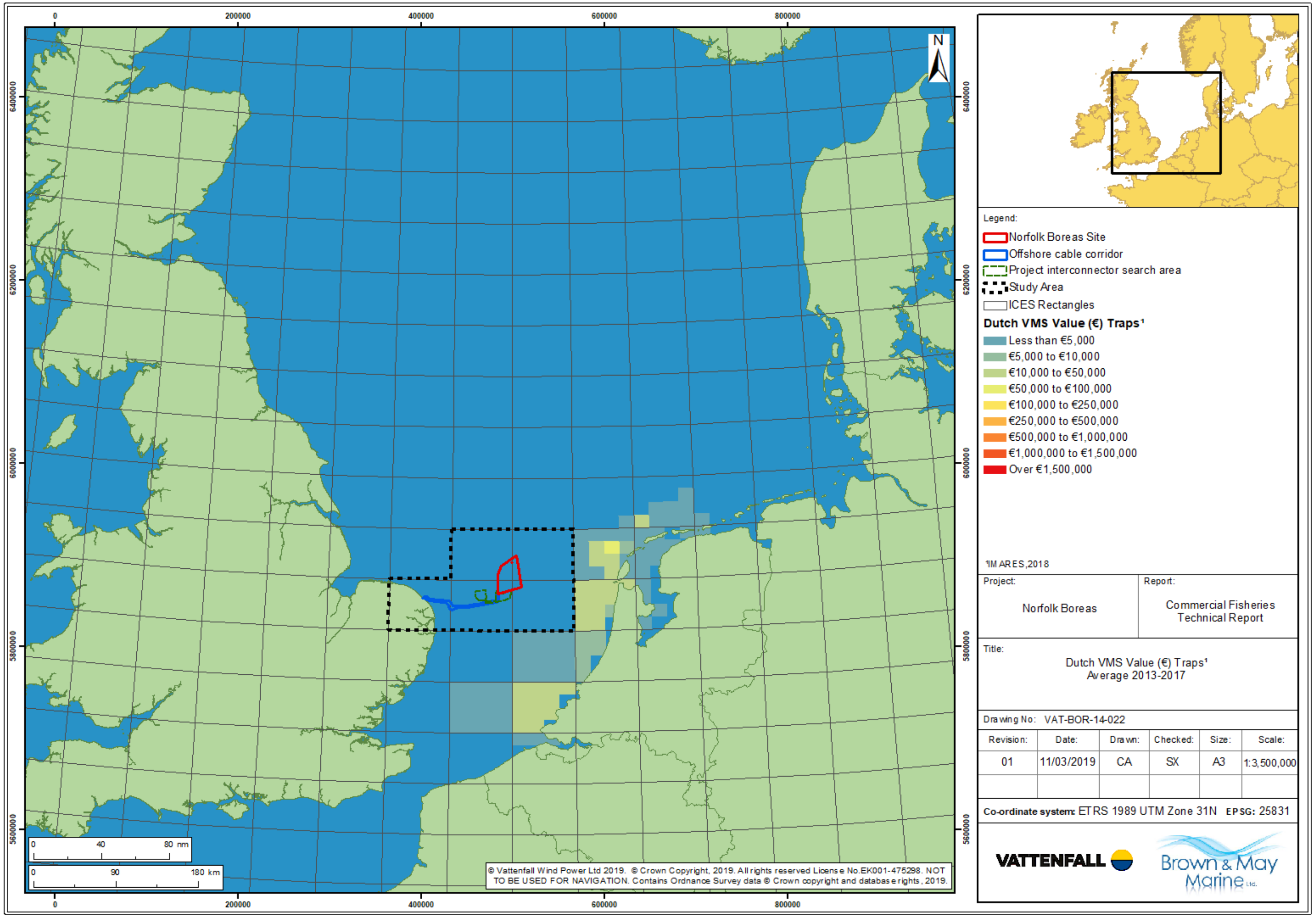


Figure 6.24 Dutch VMS value by trap – wider region (average 2013 to 2017) (Source: IMARES, 2018)

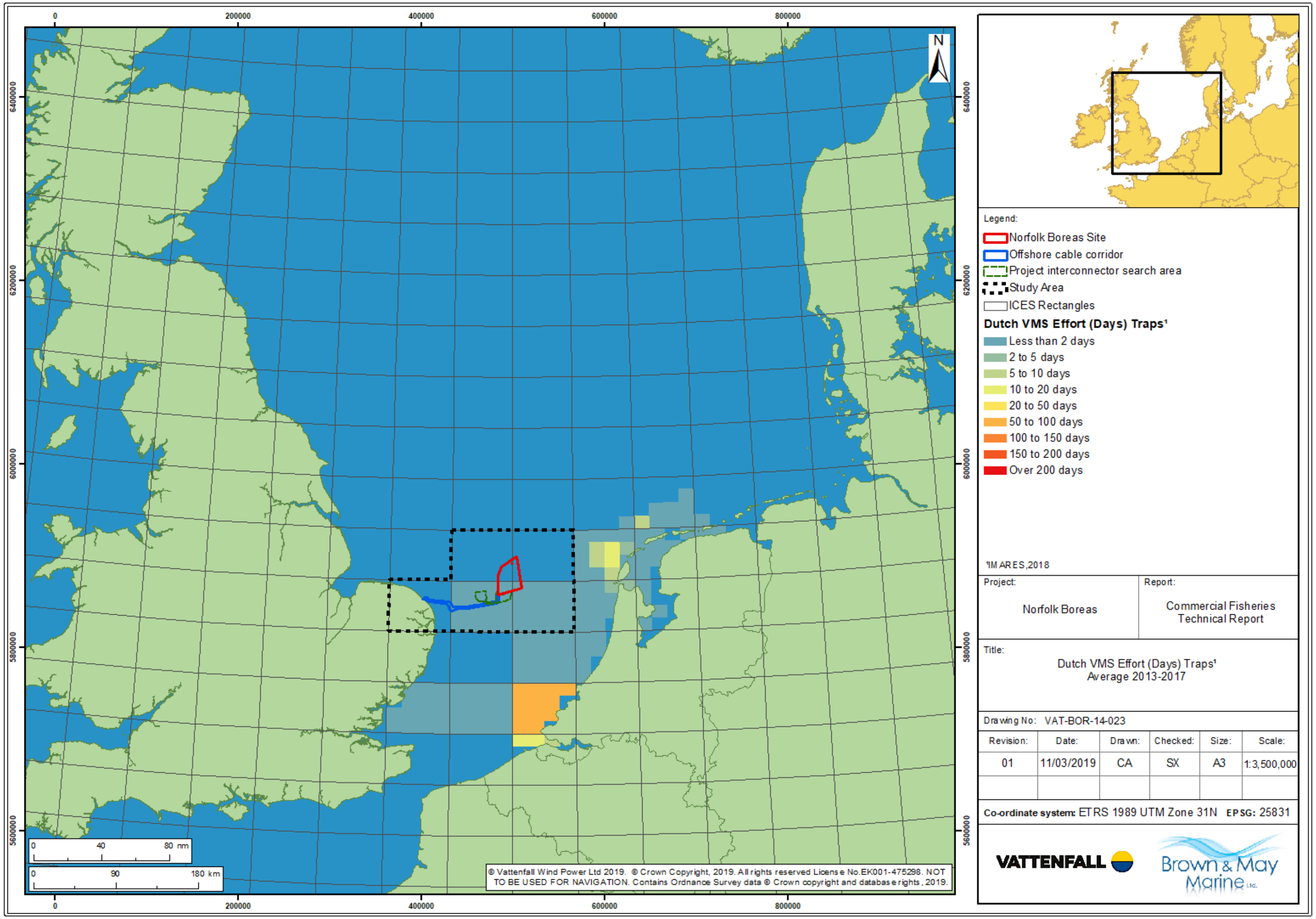


Figure 6.25 Dutch VMS effort by trap – wider region (average 2013 to 2017) (source: IMARES, 2018)

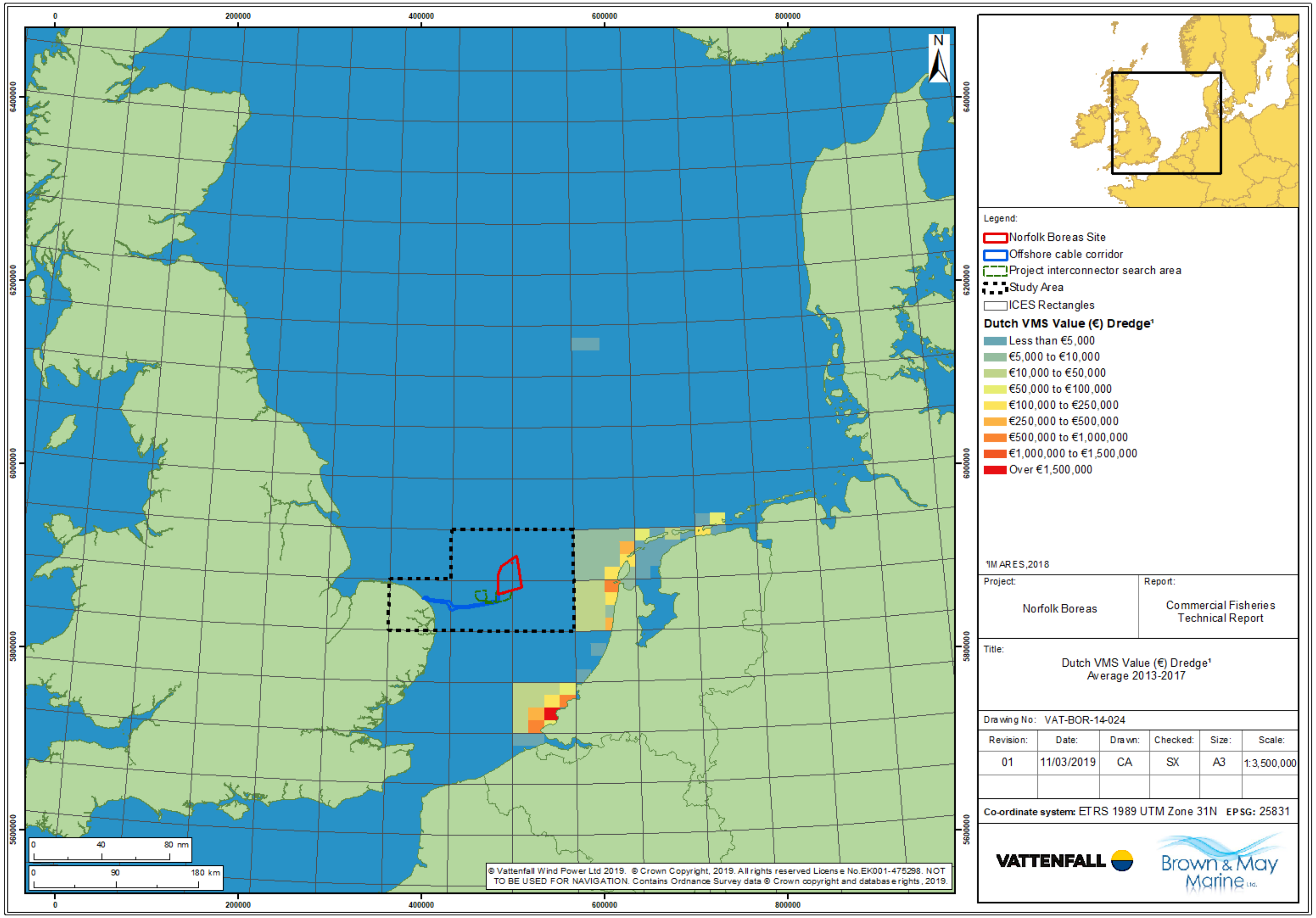


Figure 6.26 Dutch VMS value by dredge – wider region (average 2013 to 2017) (source: IMARES, 2018)

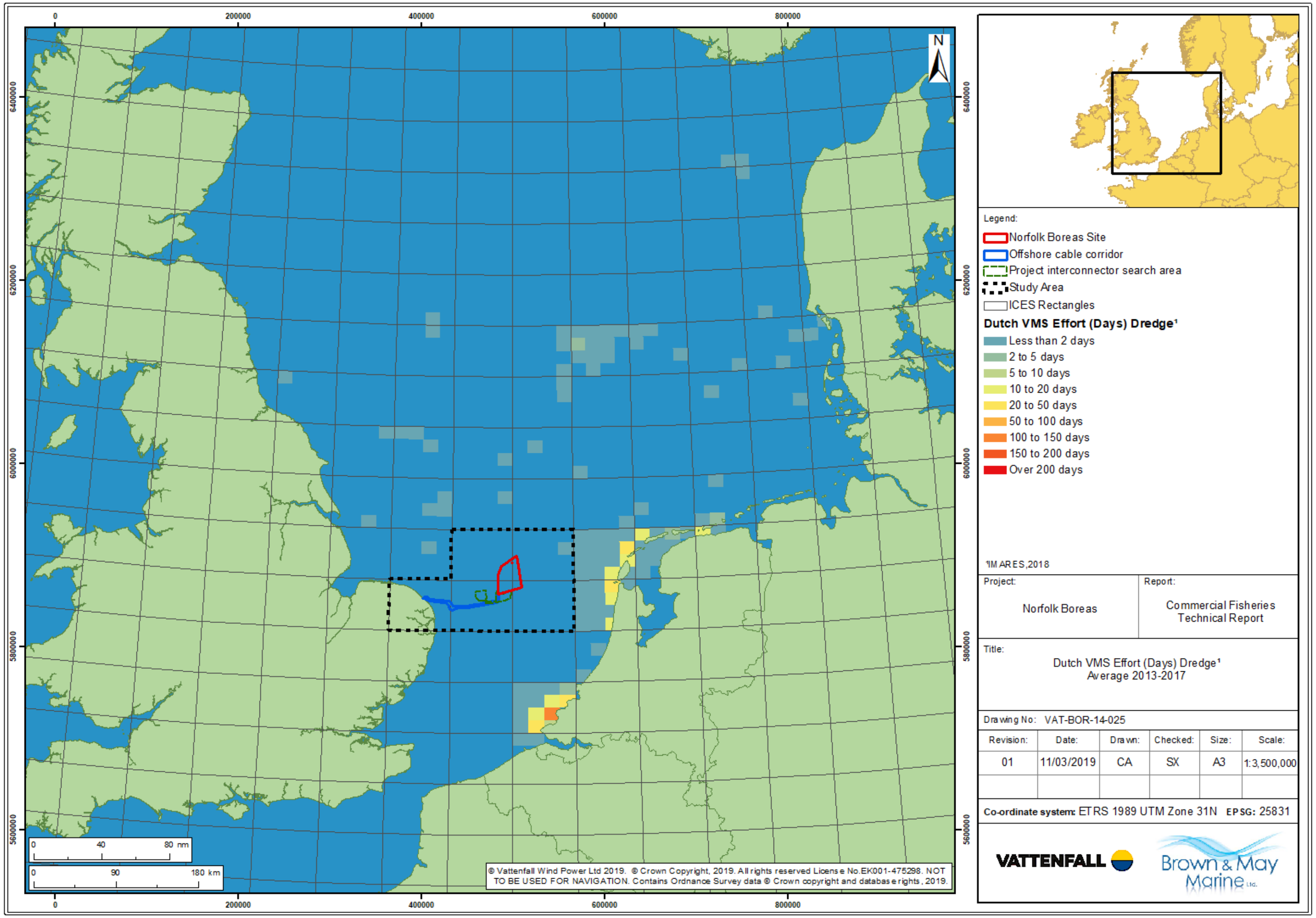


Figure 6.27 Dutch VMS effort by dredge – wider region (average 2013 to 2017) (Source: IMARES, 2018)

6.7 Vessels, Gear and Operating Patterns

42. The Dutch fishing fleet is one of the largest in Europe. The majority of the Dutch vessels operating in the Southern North Sea are beam trawlers (known in the Netherlands as 'kotters') with lower numbers of seine netters and otter trawlers (Table 6.1).

Table 6.1 Vessels by gear type in the Dutch fleet in 2015 (Source; Turenhout *et al.*, 2016)

Type of Gear	<300HP	>300HP
Beam / Sumwing / Pulse Trawls	16	67
Seine net / Fly shooting	1	12
Otter Trawl / Multi Rig	17	6
Total	34	85

43. As identified through analysis of fisheries data and from information gathered through consultation, beam trawling is the principal fishing method used by Dutch vessels in areas relevant to the offshore project area, with seine netting also taking place, however, to a much lesser extent.

44. Examples of the specifications of typical Dutch beam trawlers are detailed in Table 6.2. In the interests of confidentiality, the names and registration numbers of the vessels have been removed.

Table 6.2 Specifications of Dutch vessels which operate in the offshore project area (Source: VisNed, 2017)

Vessel Number	1	2	3	4
Home Port	Oudeschildt	Oudeschildt	Stellendam	Stellendam
PO	Texel	Texel	Delta Zuid	Delta Zuid
Length	42.35	42.21	41.05	42.37
Beam	8.5	8.5	9	8.5
Draft	5.16	5.15	5.1	5.15
Engine HP	1529	1999	1999	1999
Fishing method	Pulse wing	Pulse wing	Pulse wing	Pulse wing
Typical fishing trip	4 to 5 days	4 to 5 days	4 to 5 days	4 to 5 days
Target species	Sole	Sole	Sole	Sole

45. Whilst the majority of the Dutch beam trawler fleet operating in the Southern North Sea deploy pulse wings, some vessels continue to use traditional beam trawls. As shown in Figure 6.28, since 2009, there has been a progressive conversion from traditional beam trawls (Plate 6.1) to the use of pulse wing trawls amongst the Dutch beam trawler fleet (Plate 6.2).

46. During consultation with VisNED (Consultation meeting, 20th June 2018) it was noted that six Dutch vessels use traditional beam trawls all year round with eight using them seasonally to access grounds where pulse wings are prohibited. In addition, it is understood from the chief executive of VisNed that between five and ten Dutch beam trawlers use Sumwing trawls (Plate 6.3), which as with traditional beam trawls involve the use of tickler chains (Pers comm: Representative 1, 29/05/2018).

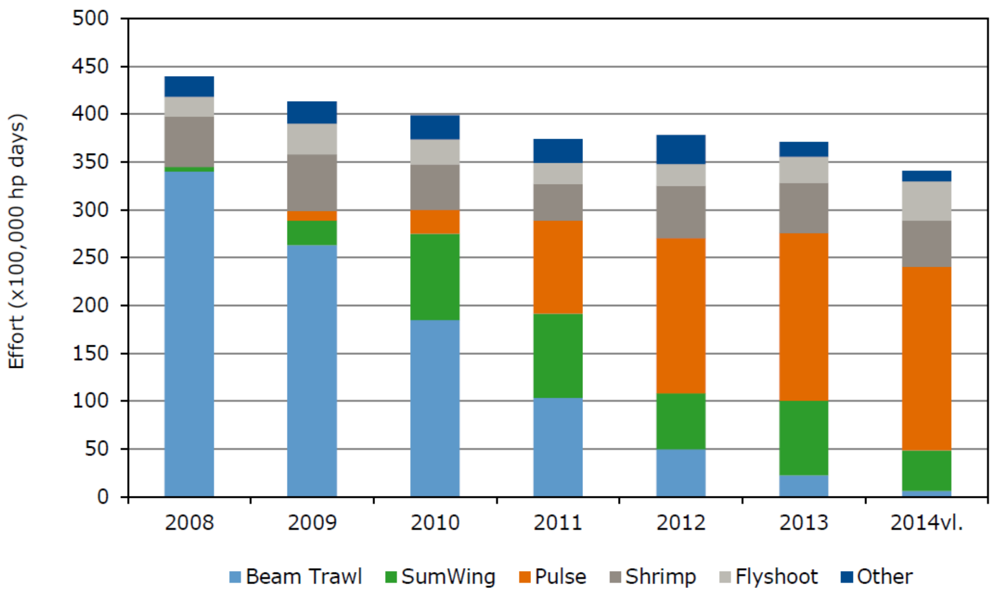


Figure 6.28 Dutch beam trawler effort by type, 2008 to 2014. (Source: Agrimatie.nl, 2015)

47. Pulse wing trawling is not without controversy. Whilst by 2015 the EU had granted 84 exemptions to the EU ban on electric fishing to the Netherlands, on 16th January 2018 as part of the overhaul of EU fishing regulations, and as a consequence of lobbying by French, Belgian and UK fishermen, the European Parliament voted to ban pulse fishing. Subsequently, a full EU ban to pulse fishing was approved on 8th February 2019. The ban will be phased in with 42 of the current 84 pulse fishing licences to be withdrawn in 2019 and the remaining 42 by July 2021.

48. It should be noted that in the UK context, regardless of EU regulations, it is anticipated that after Brexit, under the Common Fisheries Policy and Aquaculture (Amendment)(EU Exit) Regulations 2019, EU vessels will no longer be able to carry out electric pulse fishing in UK waters.

49. It should also be noted that in recognition of objections from UK East Coast fishermen, voluntary spatial separation agreements are already in place in discrete areas off the east coast of England. In these areas Dutch fishermen avoid using pulse gear. The areas where voluntary agreements apply in 2019 are shown in Figure 6.29.

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Plate 6.1 Traditional beam trawl with tickler chains and chain mat (Source: BMM, 2012)

Plate 6.2 Dutch pulse wing trawler at port (Source: BMM, 2017)

Plate 6.3 Sumwing trawl with attached tickler chains (Source: BMM, 2015)

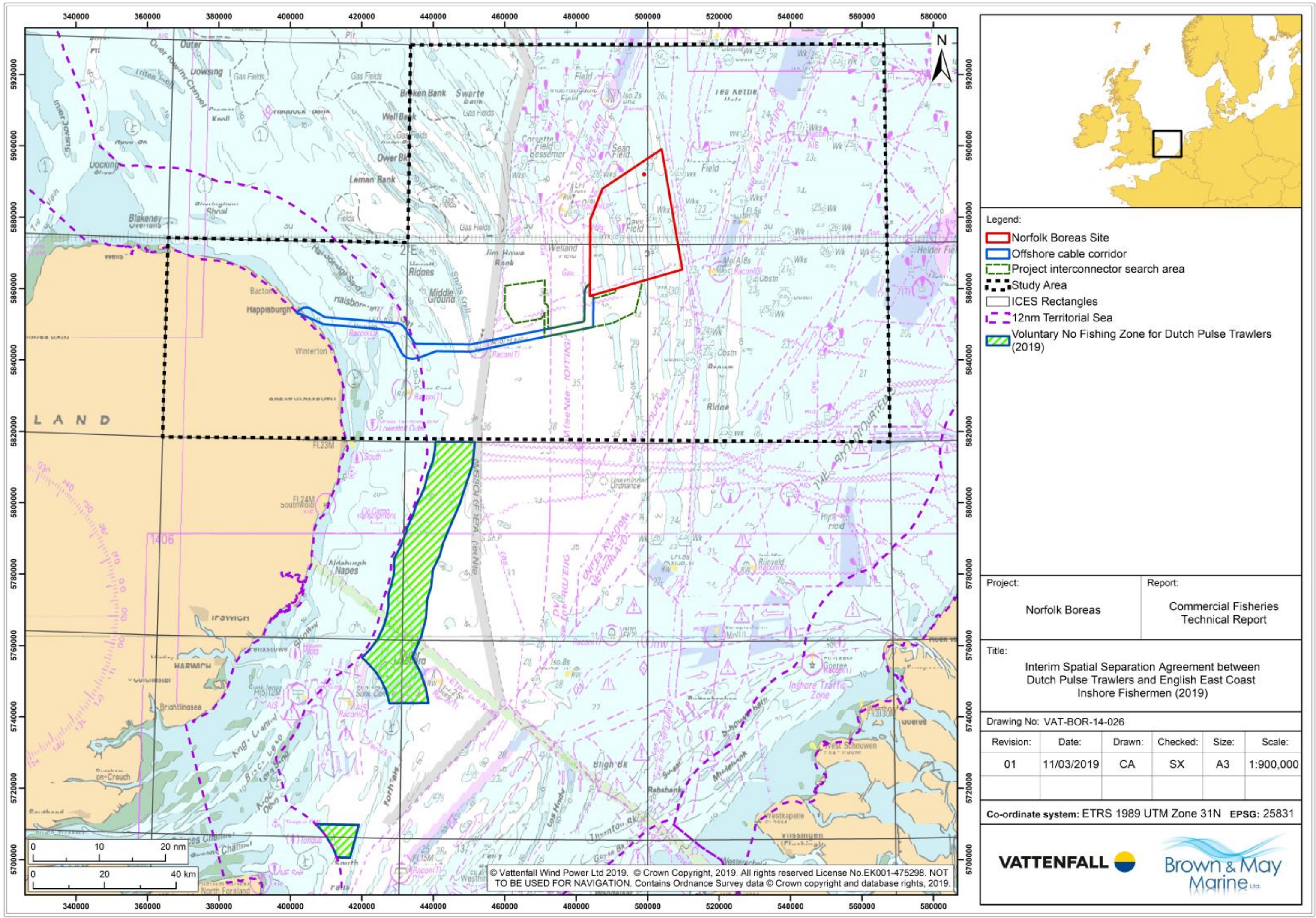


Figure 6.29 Interim Spatial Separation Agreement Areas for Pulse Fishing (NFFO, 2019)

50. The majority of seine netters within the Dutch fleet are converted beam trawlers, the rationale for the switch to seine netting being in part due to the rise in fuel prices, as seine nets per tonne of fish caught consume considerably less fuel than beam trawlers. An example of a Dutch seine netter is shown in Plate 6.4.

Plate 6.4 Dutch seine netter (Source: Trawlers Photos, 2018)

7 Belgian Fleet

7.1 Surveillance Sightings of Belgian Vessels

51. The majority of observations of Belgian vessels are in grounds to the south of the offshore project area, with no sightings recorded within the Norfolk Boreas site, and a limited number of sightings recorded in the offshore cable corridor and the project interconnector search area (Figure 7.1). The only fishing method identified in surveillance sightings within the offshore project area is beam trawling. Whilst the Belgian fleet holds historic fishing rights to operate between the UK's 6 and 12nm limits in an area between Lowestoft and Cromer (see Annex 3 – Fisheries Legislation), vessels in this area are rarely recorded in surveillance sightings.

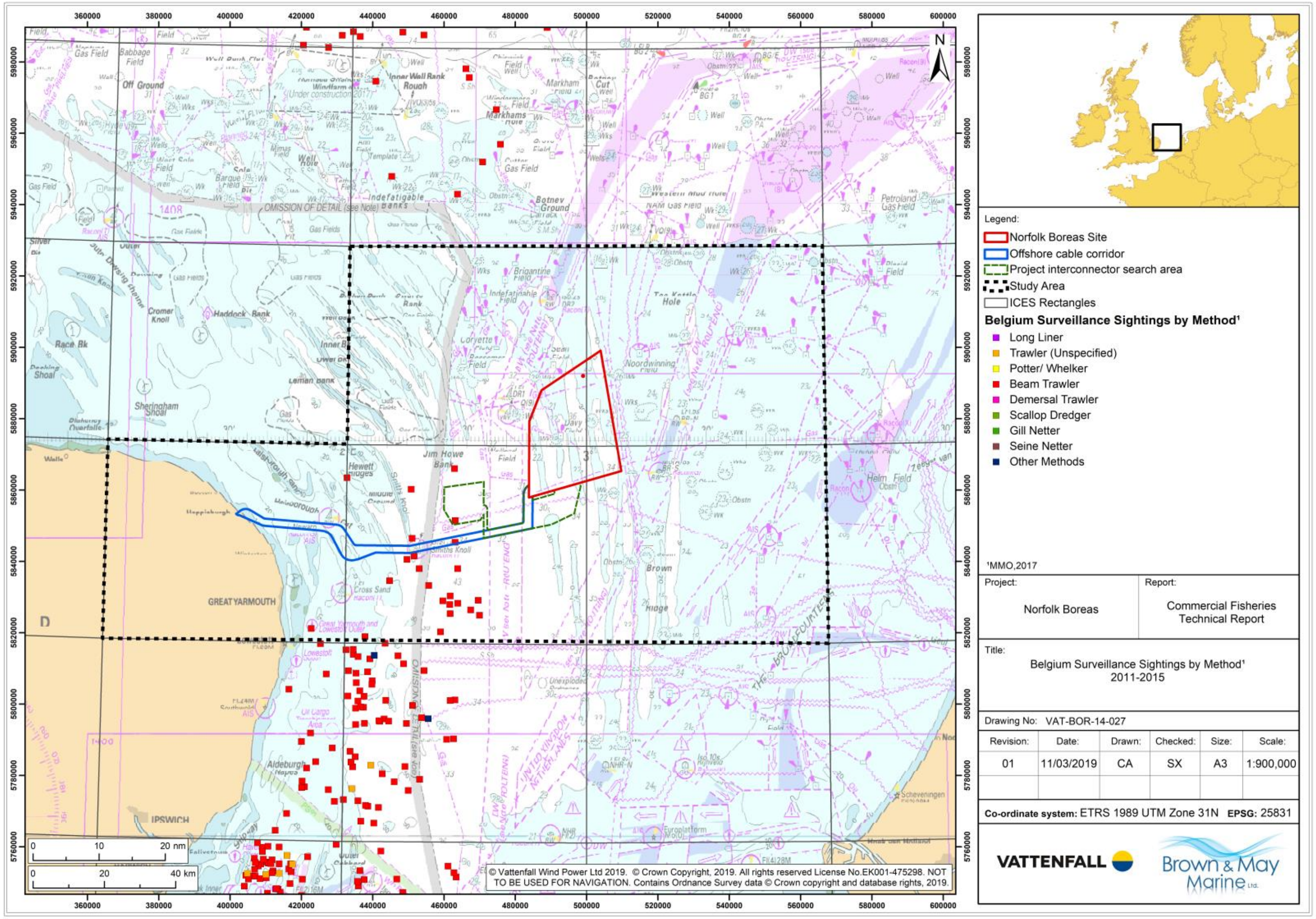


Figure 7.1 Belgian surveillance sightings by method (2011 to 2015) (source: MMO, 2017)

7.2 Belgian Landings Data

52. An overview of landings values in each of the ICES rectangles within the study area is given by method and by species in Figure 7.2 and Figure 7.3 respectively.

53. From Figure 7.2, it is apparent that beam trawling accounts for the majority of the landings values in the study area. Whilst at much lower levels, landings by seine netters are also of importance in some rectangles, particularly in rectangles 34F3 and 35F3. The only other method recorded in landings data within the study area is demersal trawling. This is however recorded at very low levels.

54. Dover sole and plaice are the principal species landed from the study area, followed to a lesser extent by turbot, skates and rays. Other species, such as brill, cod, gurnards and shrimps, are also landed, however at comparatively lower levels (Figure 7.3).

55. A more detailed breakdown of landings values by species and method is given by individual ICES rectangle in Figure 7.4 to Figure 7.8.

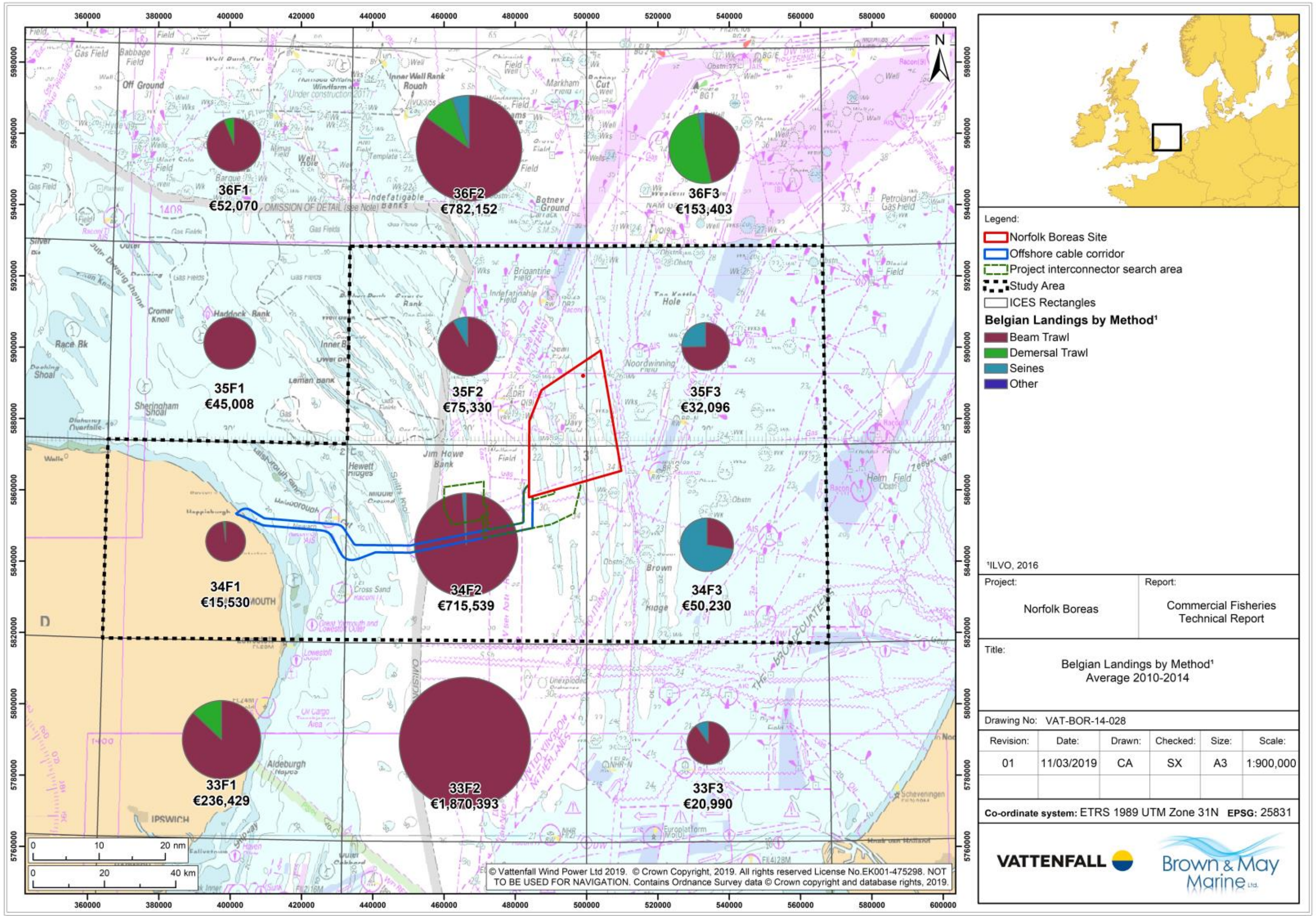


Figure 7.2 Belgian landings (€) by method (average 2010 to 2014) (Source: ILVO, 2016)

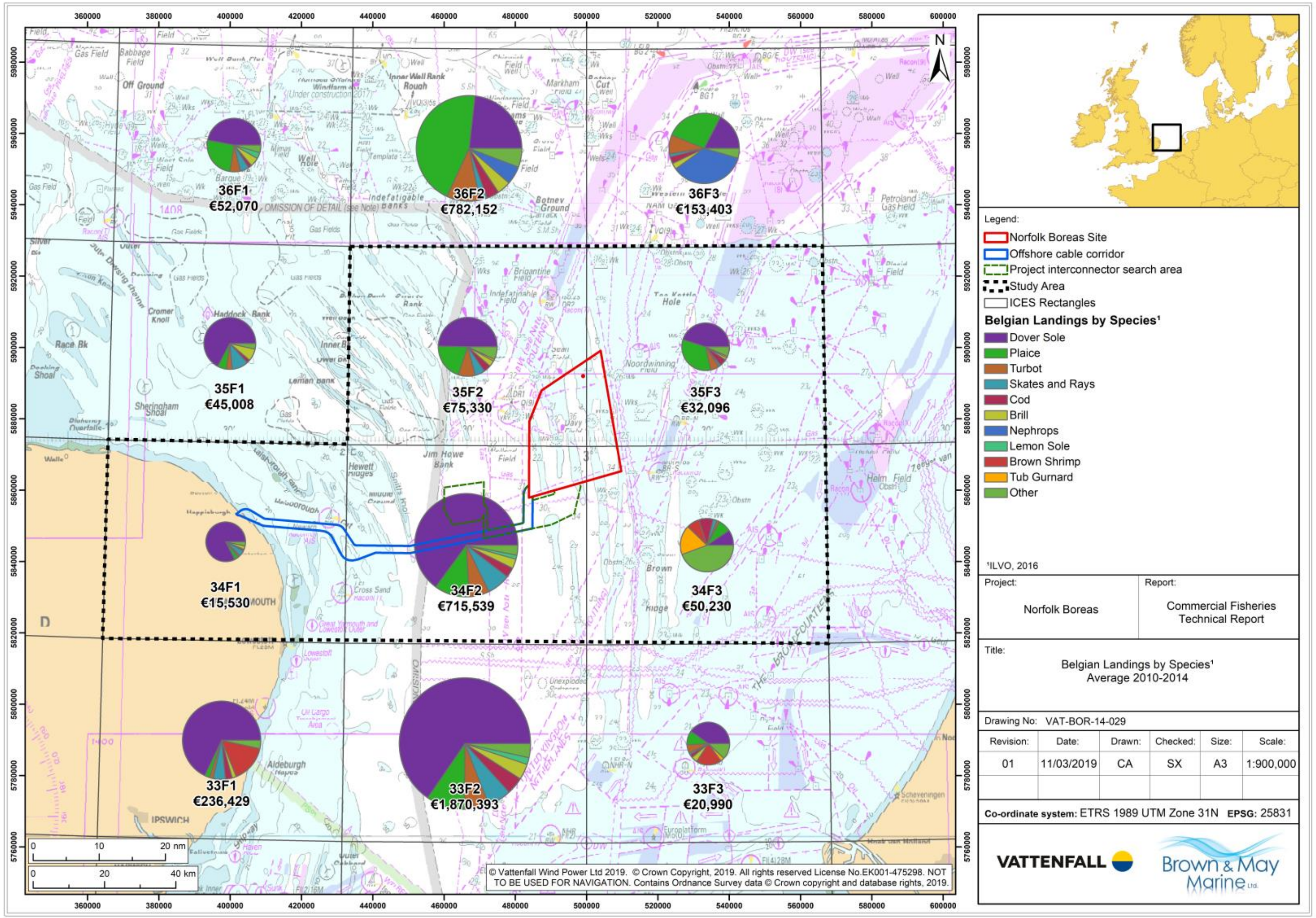
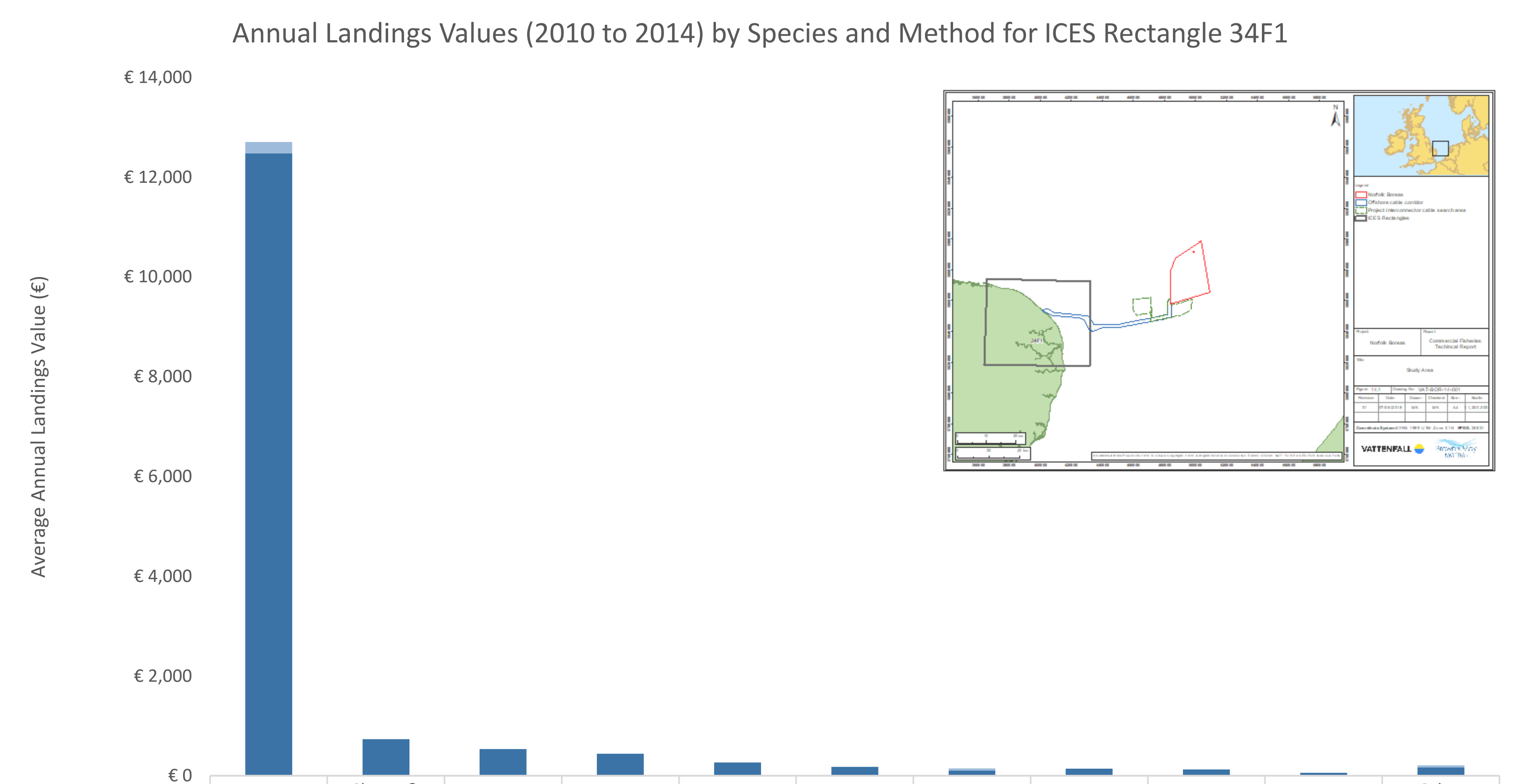
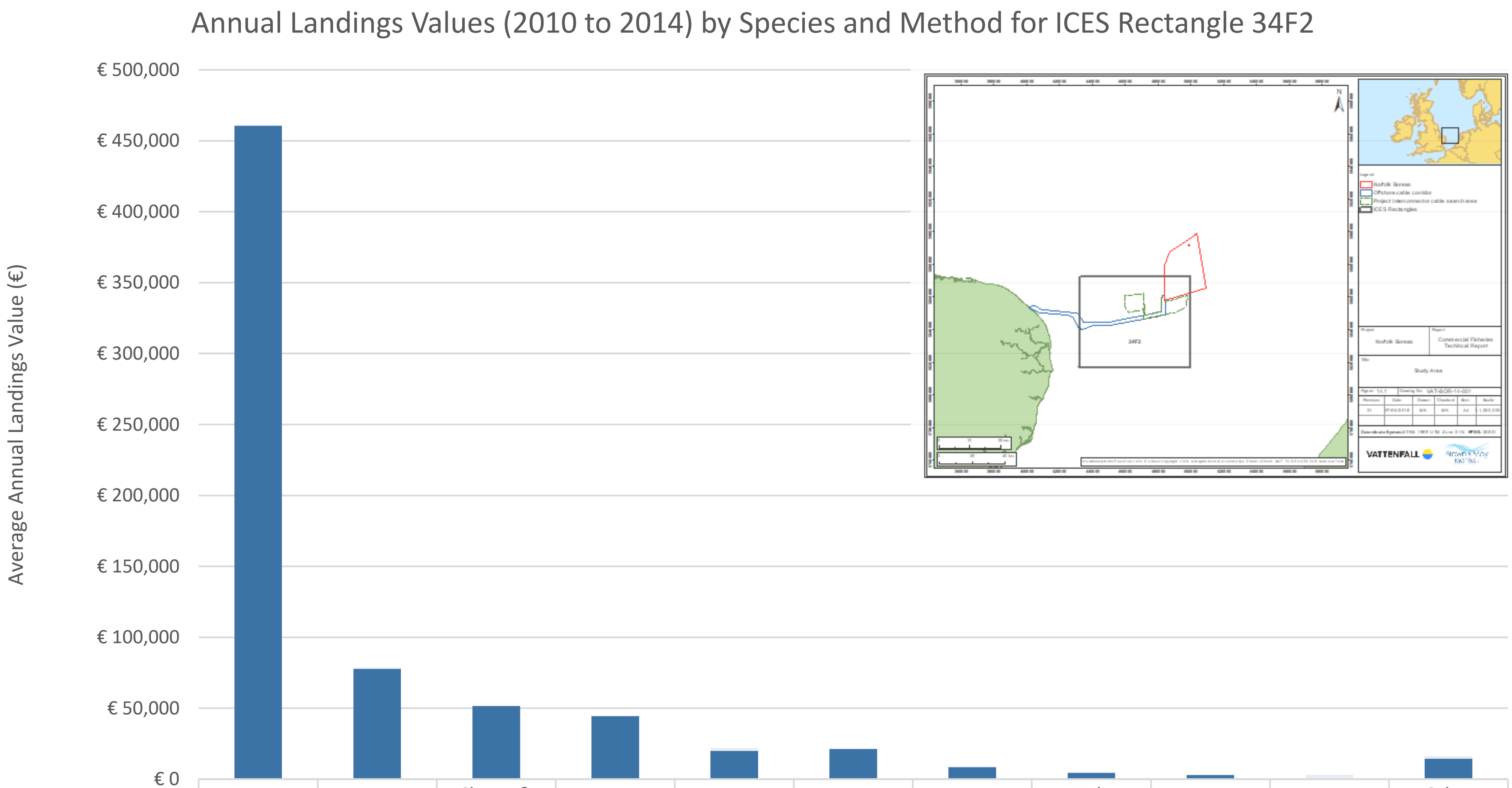


Figure 7.3 Belgian landings by species (average 2010 to 2014) (Source: ILVO, 2016)



	Dover Sole	Skates & Rays	Plaice	Brill	Turbot	Cod	Bass	Lobster	Lemon Sole	Whiting	Other Species
Bottom otter trawl	€ 228	€ 1	€ 0	€ 0	€ 0	€ 0	€ 44	€ 0	€ 0	€ 0	€ 39
Beam trawl	€ 12,477	€ 732	€ 533	€ 440	€ 264	€ 178	€ 104	€ 140	€ 125	€ 57	€ 169

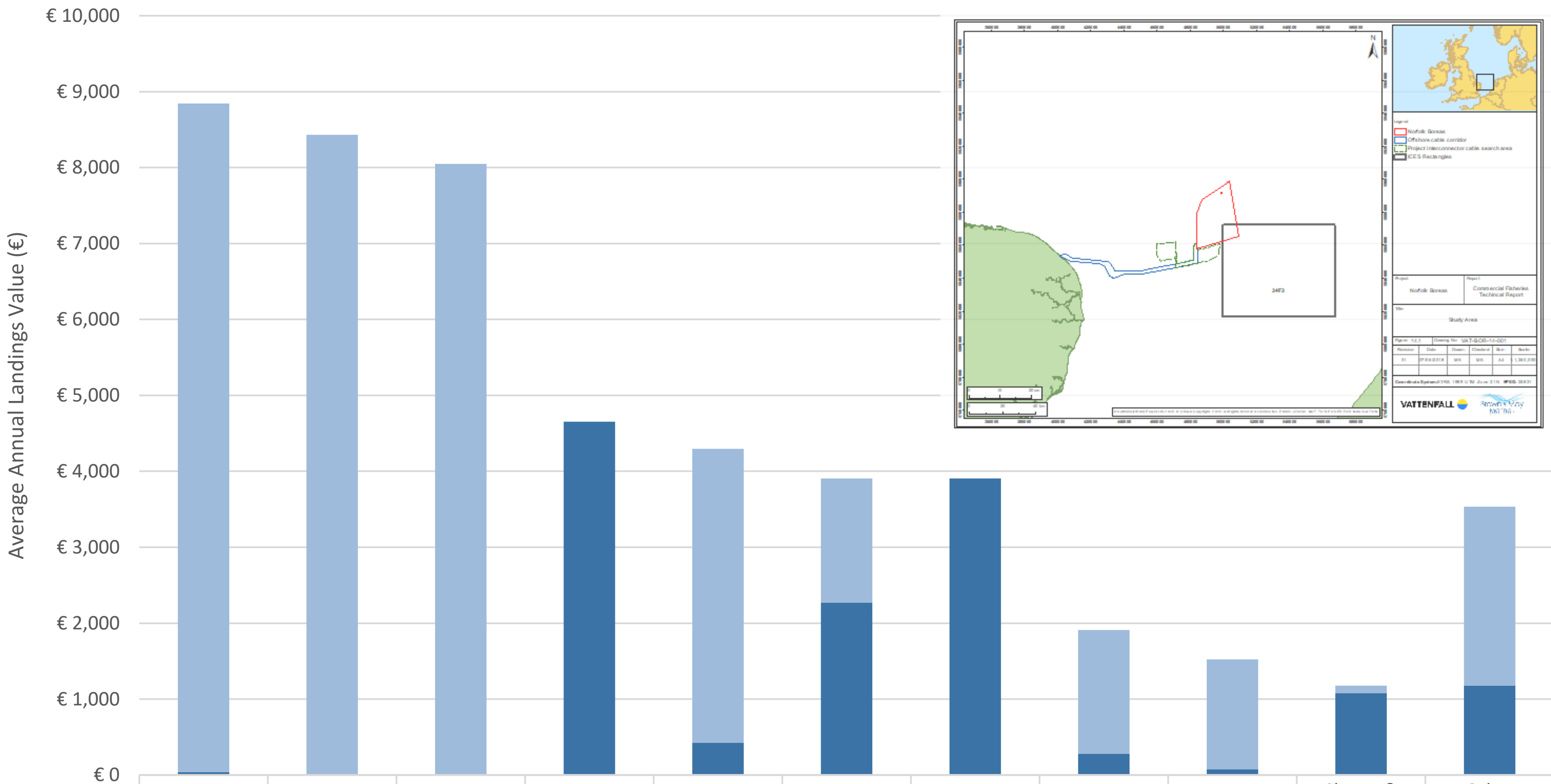
Figure 7.4 Average landing values (2010 to 2014) by species and method in ICES rectangle 34F1 (Source: IMARES, 2018)



	Dover Sole	Plaice	Skates & Rays	Turbot	Cod	Brill	Lemon Sole	Tub Gurnard	Dab	Red Mullet	Other Species
Seines	€ 1	€ 814	€ 102	€ 105	€ 2,038	€ 42	€ 222	€ 776	€ 312	€ 2,915	€ 1,708
Bottom otter trawl	€ 299	€ 91	€ 41	€ 11	€ 61	€ 8	€ 2	€ 4	€ 45	€ 0	€ 21
Beam trawl	€ 460,540	€ 77,741	€ 51,665	€ 44,463	€ 19,958	€ 21,198	€ 8,488	€ 4,357	€ 2,924	€ 134	€ 14,455

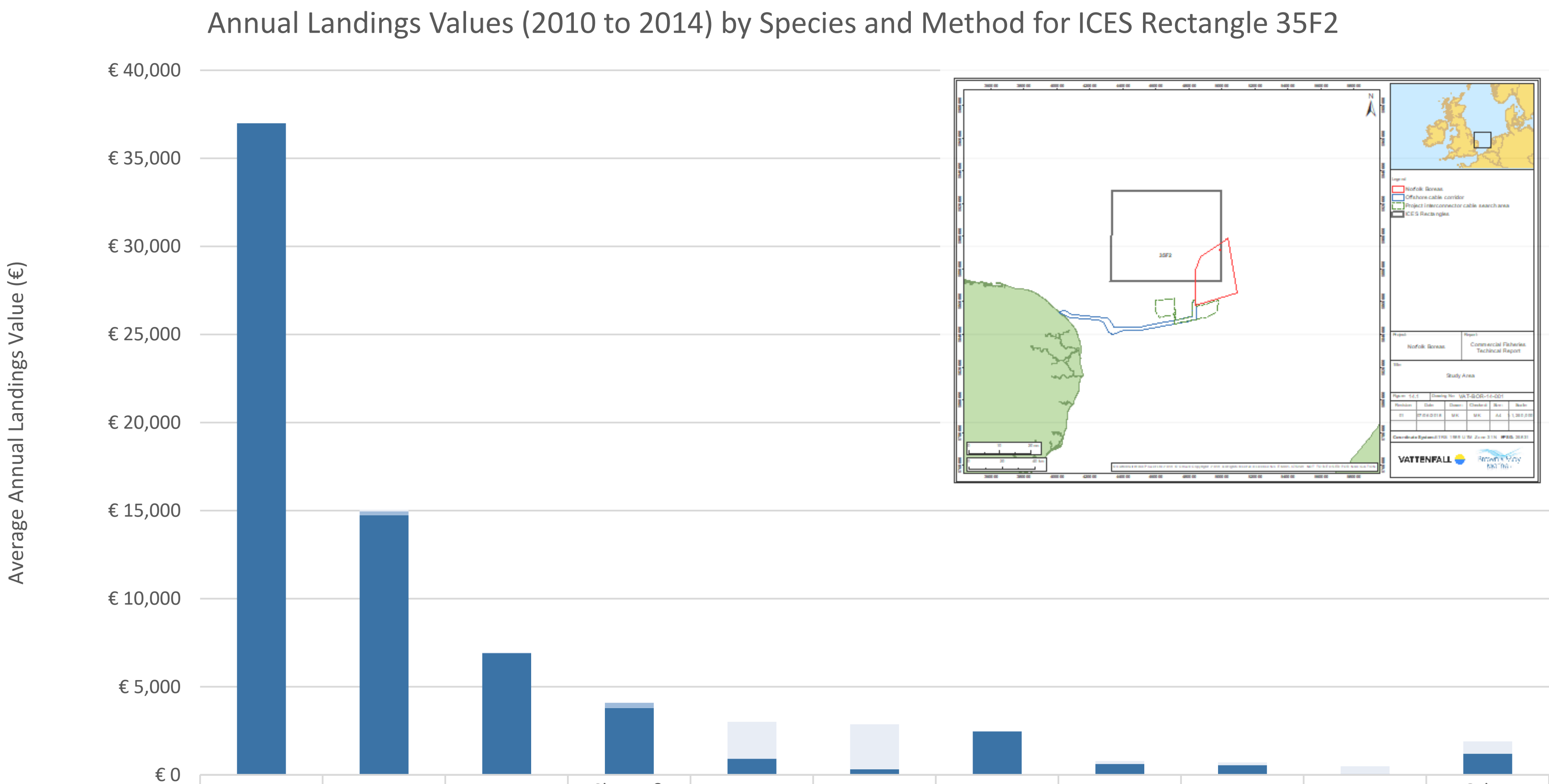
Figure 7.5 Average landing values (2010 to 2014) by species and method in ICES rectangle 34F2 (Source: IMARES, 2018)

Annual Landings Values (2010 to 2014) by Species and Method for ICES Rectangle 34F3



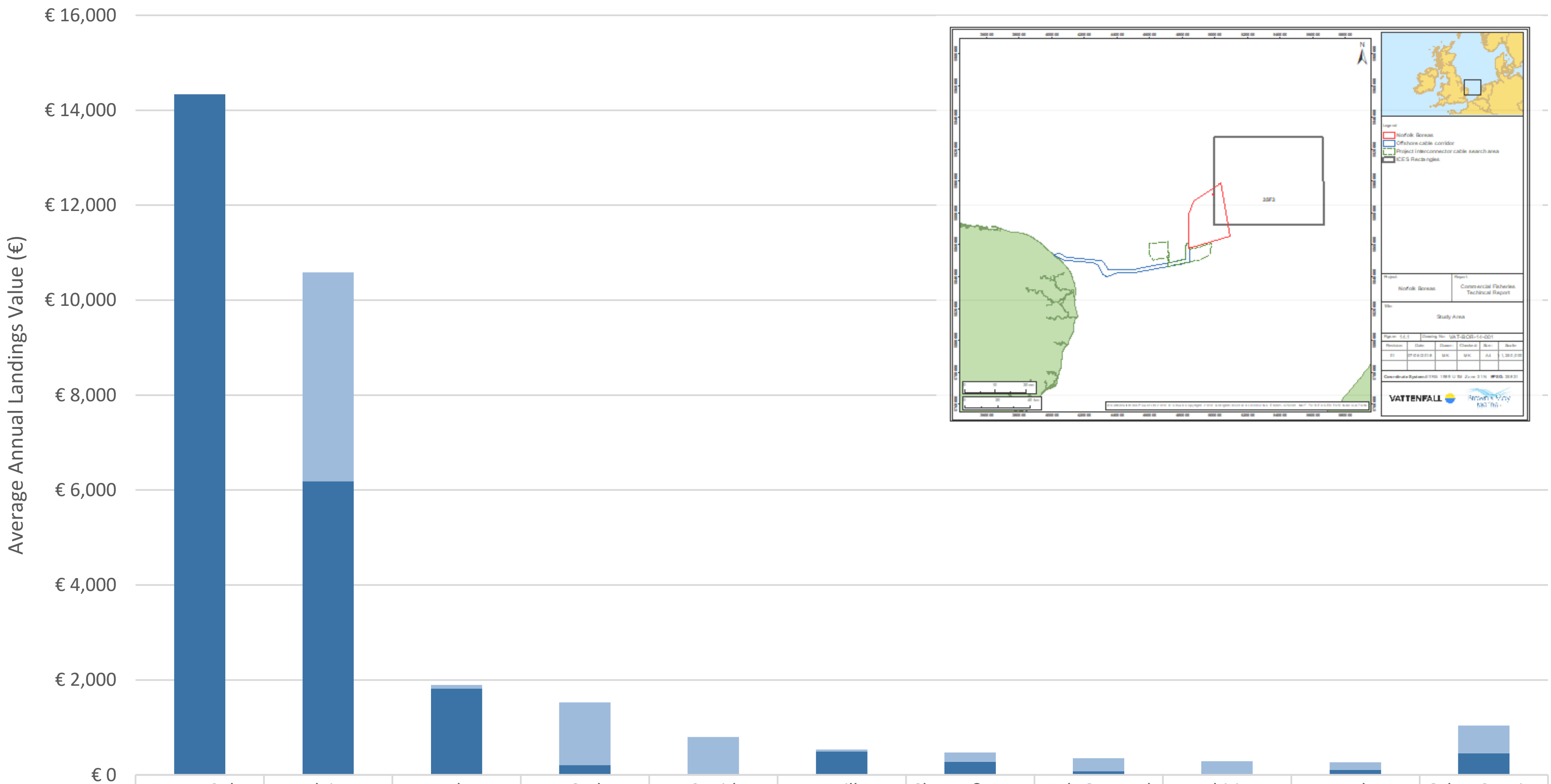
	Tub Gurnard	Mackerel	Red Mullet	Dover Sole	Cod	Plaice	Brown Shrimp	Dab	Whiting	Skates & Rays	Other Species
Seines	€ 8,806	€ 8,430	€ 8,050	€ 0	€ 3,869	€ 1,635	€ 0	€ 1,632	€ 1,448	€ 99	€ 2,356
Beam trawl	€ 39	€ 0	€ 0	€ 4,655	€ 425	€ 2,270	€ 3,905	€ 280	€ 76	€ 1,076	€ 1,178

Figure 7.6 Average landing values (2010 to 2014) by species and method in ICES rectangle 34F3 (Source: IMARES, 2018)



	Dover Sole	Plaice	Turbot	Skates & Rays	Cod	Squid	Brill	Tub Gurnard	Lemon Sole	Whiting	Other Species
Seines	€ 0	€ 84	€ 4	€ 3	€ 2,096	€ 2,556	€ 8	€ 165	€ 158	€ 432	€ 693
Bottom otter trawl	€ 0	€ 225	€ 30	€ 296	€ 18	€ 0	€ 15	€ 7	€ 0	€ 1	€ 9
Beam trawl	€ 36,990	€ 14,737	€ 6,904	€ 3,799	€ 905	€ 314	€ 2,463	€ 617	€ 553	€ 52	€ 1,196

Figure 7.7 Average landing values (2010 to 2014) by species and method in ICES rectangle 35F2 (Source: IMARES, 2018)



	Dover Sole	Plaice	Turbot	Cod	Squid	Brill	Skates & Rays	Tub Gurnard	Whiting	Dab	Other Species
Seines	€ 0	€ 4,403	€ 72	€ 1,324	€ 796	€ 41	€ 193	€ 275	€ 271	€ 162	€ 582
Beam trawl	€ 14,338	€ 6,184	€ 1,822	€ 206	€ 6	€ 494	€ 277	€ 75	€ 15	€ 104	€ 456

Figure 7.8 Average landing values (2010 to 2014) by species and method in ICES rectangle 35F2 (Source: IMARES, 2018)

7.3 Satellite Tracking (VMS) Data

56. Analysis of VMS data for Belgian beam trawlers indicates that the majority of fishing activity by these vessels occurs to the south of the offshore cable corridor, with only low levels of activity recorded across the offshore project area (Figure 7.9, Figure 7.10 and Figure 7.11).

57. Demersal trawling by Belgian vessels occurs at substantially lower levels than beam trawling and is focused on specific grounds in the Central North Sea and further south off the Essex coast (Figure 7.12 and Figure 7.13). Within the offshore project area, activity occurs at very low levels and only in areas relevant to the offshore cable corridor and project interconnector search area (Figure 7.14).

58. Similarly, Belgian seine netting also occurs at very low levels in the offshore project area (Figure 7.15, Figure 7.16 and Figure 7.17).

59. In line with the above, the relatively low levels of fishing activity by the Belgian fleet in areas relevant to the offshore project area were noted during consultation with Rederscentrale in respect of Norfolk Boreas (Table 2.1).

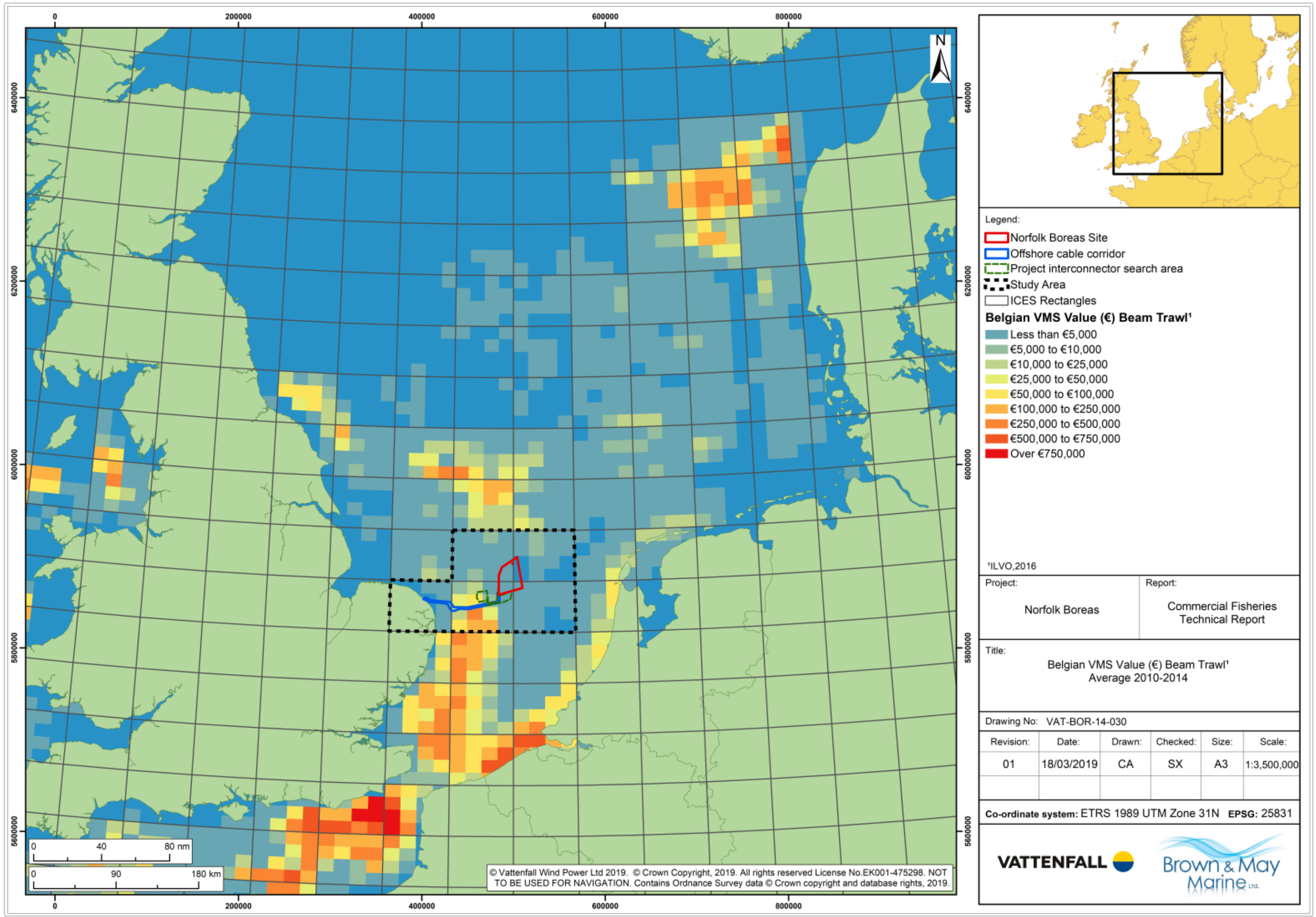


Figure 7.9 Belgian VMS value by beam trawl – wider region (average 2010 to 2014) (Source: ILVO, 2016)

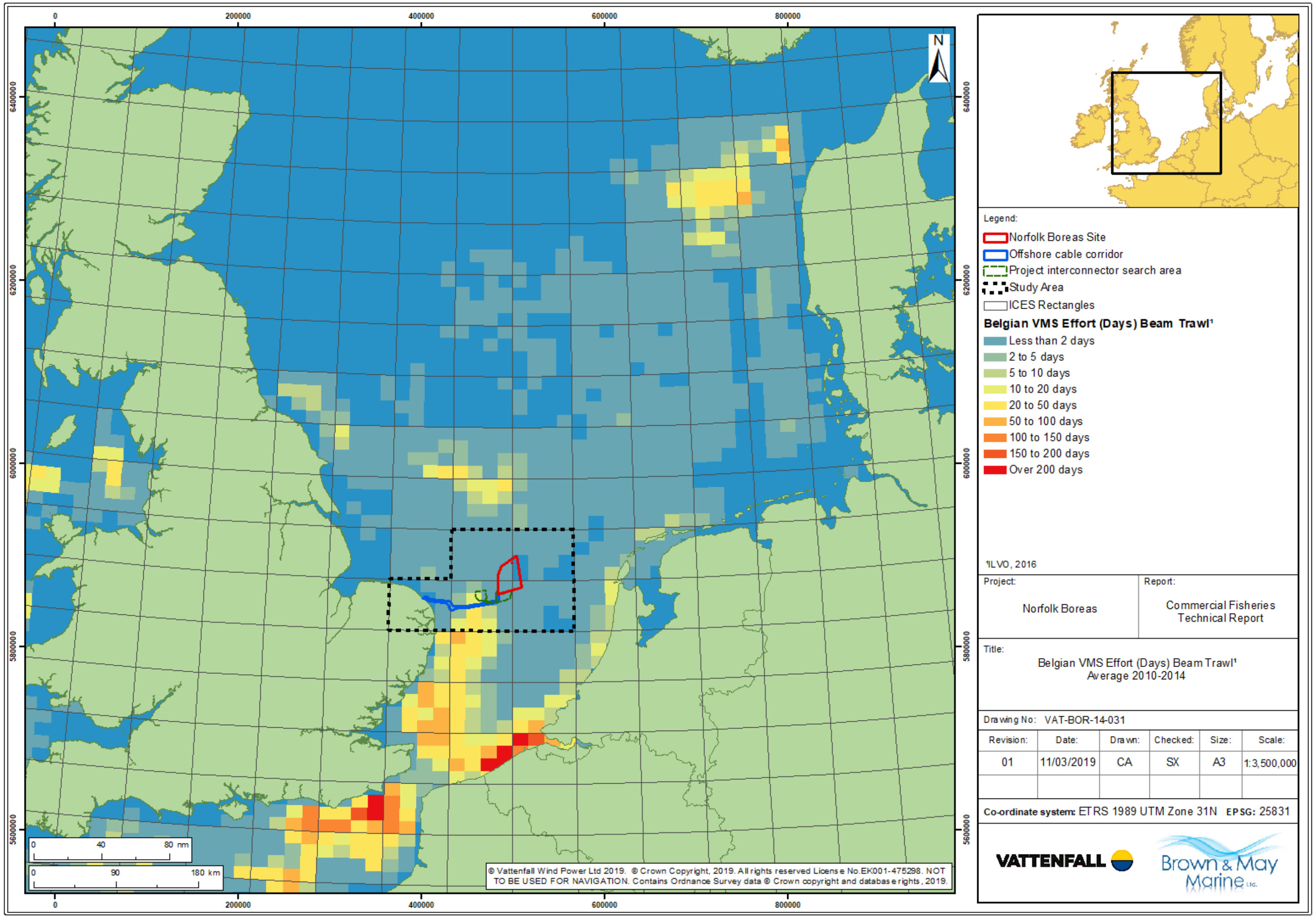


Figure 7.10 Belgian VMS effort by beam trawl – wider region (average 2010 to 2014) (Source: ILVO, 2016)

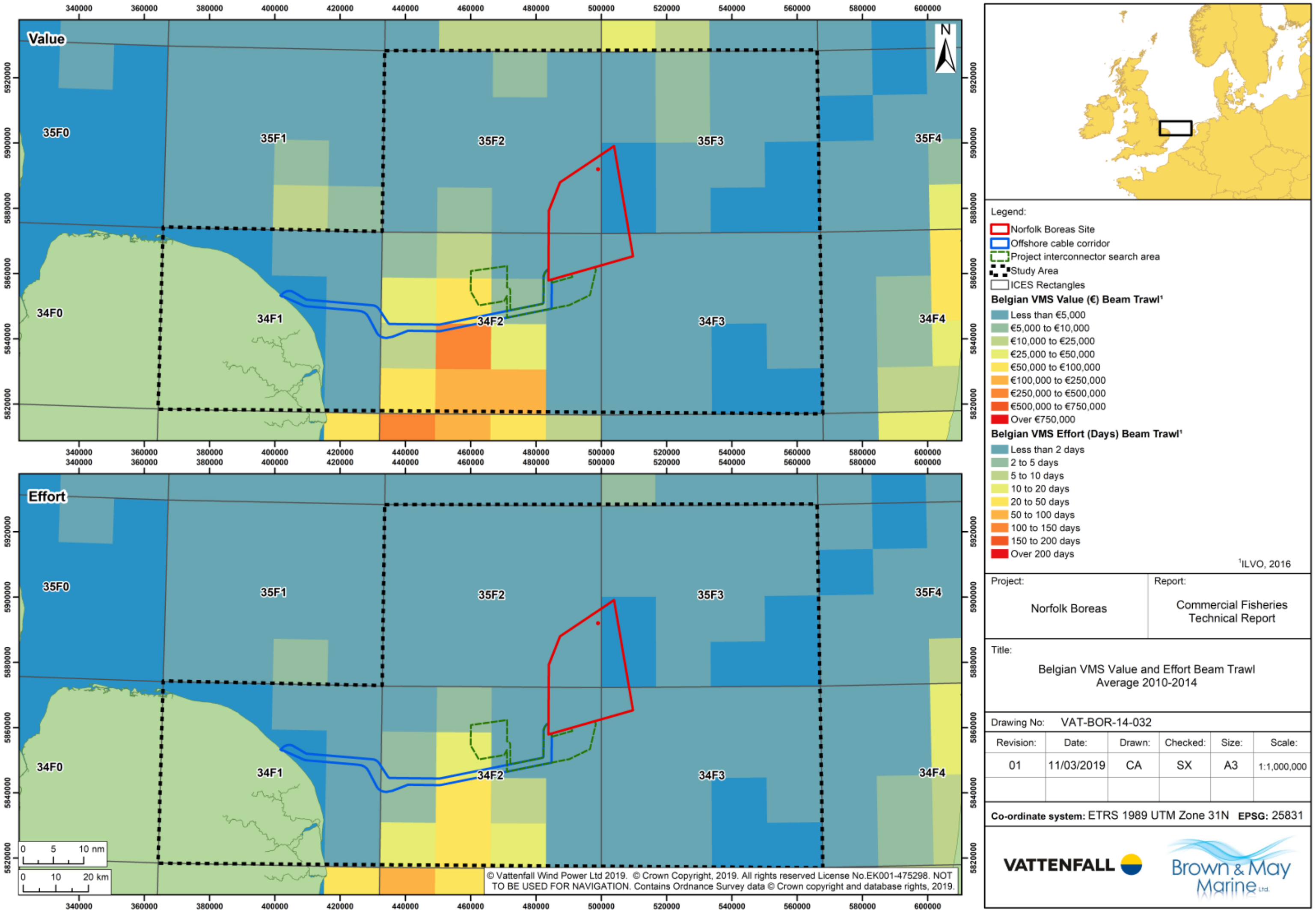


Figure 7.11 Belgian VMS value and effort by beam trawl (average 2010 to 2014) (Source: ILVO, 2016)

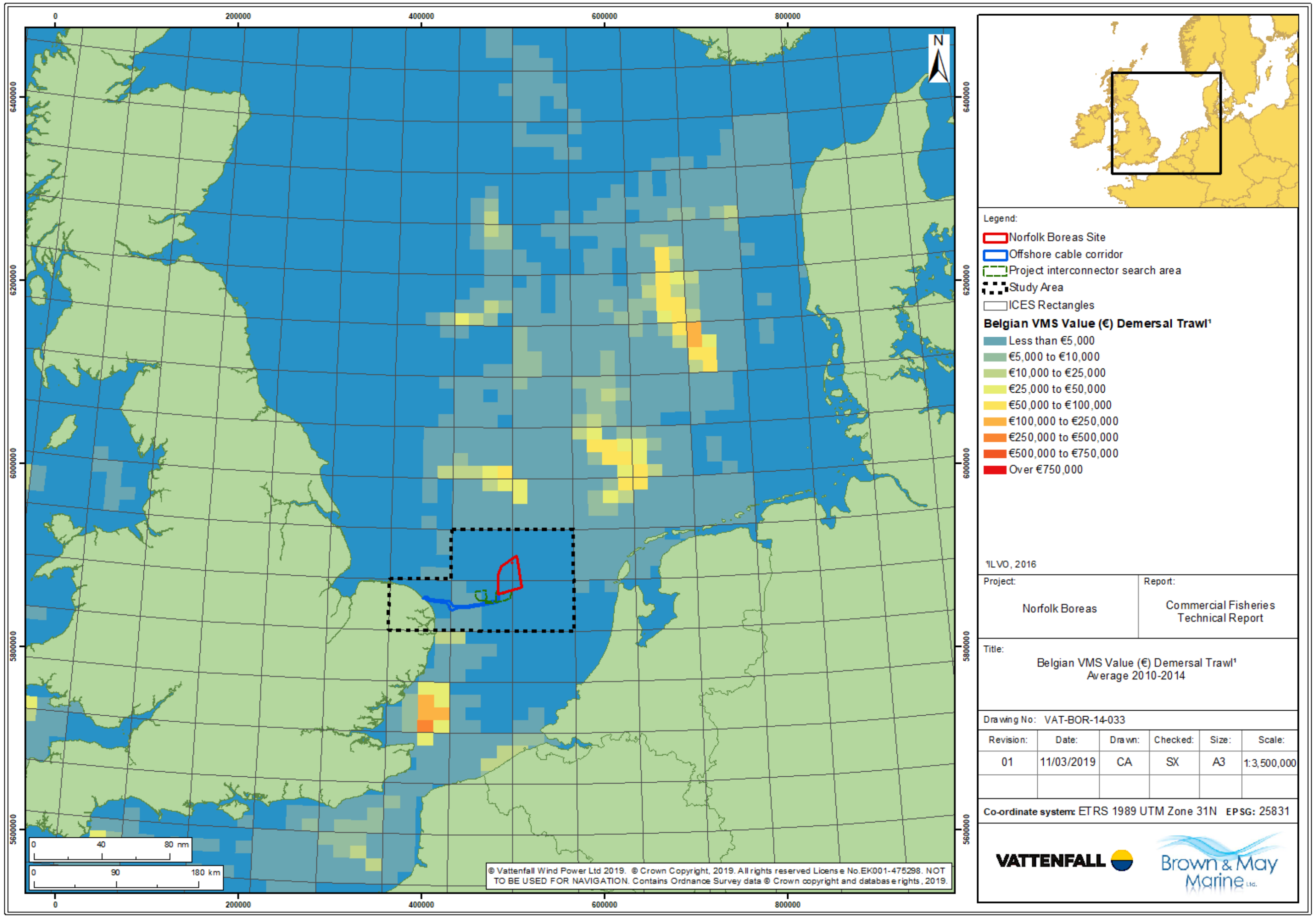


Figure 7.12 Belgian VMS value by demersal trawl – wider region (average 2010 to 2014) (Source: ILVO, 2016)

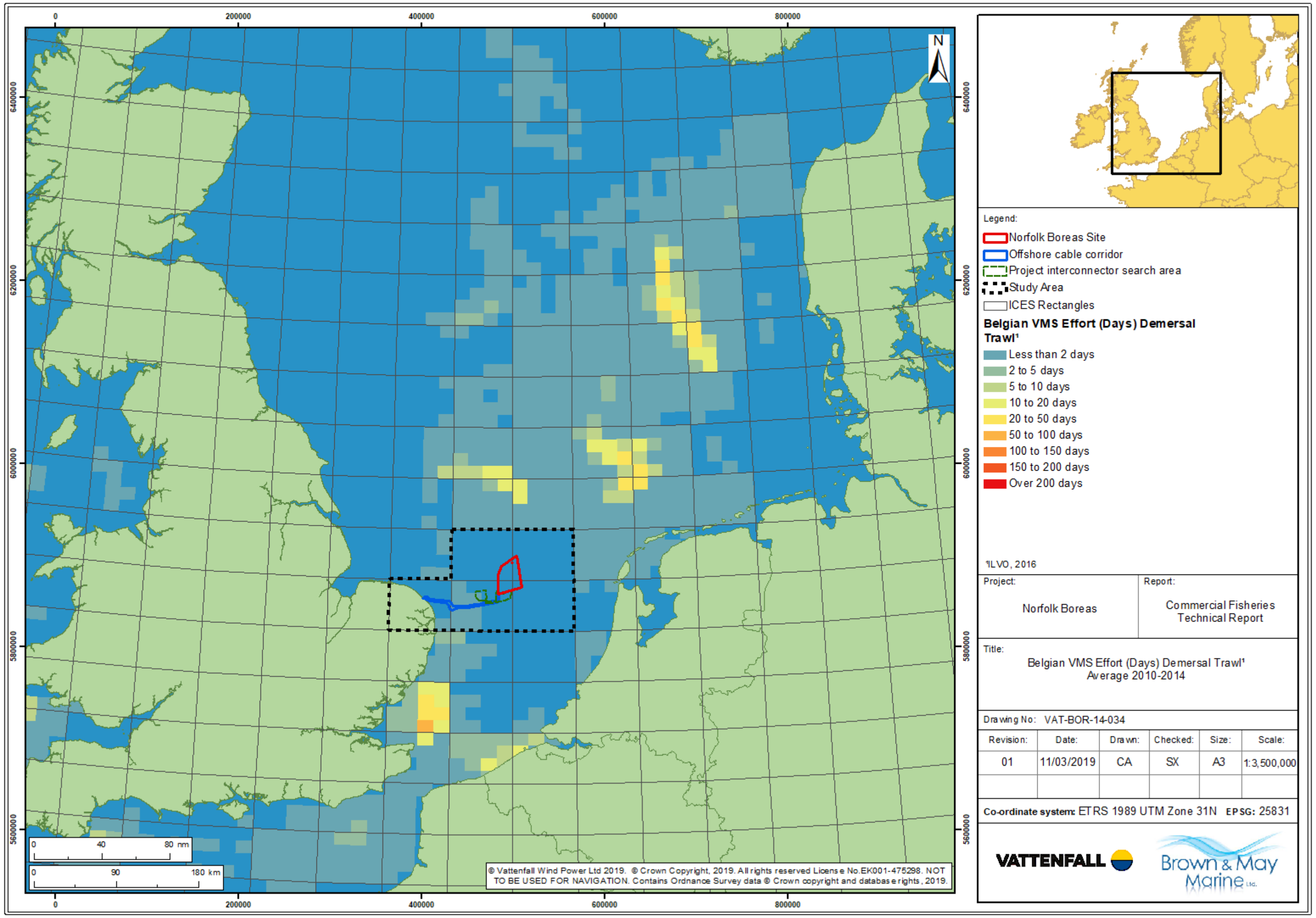


Figure 7.13 Belgian VMS effort by demersal trawl – wider region (average 2010 to 2014) (Source: ILVO, 2016)

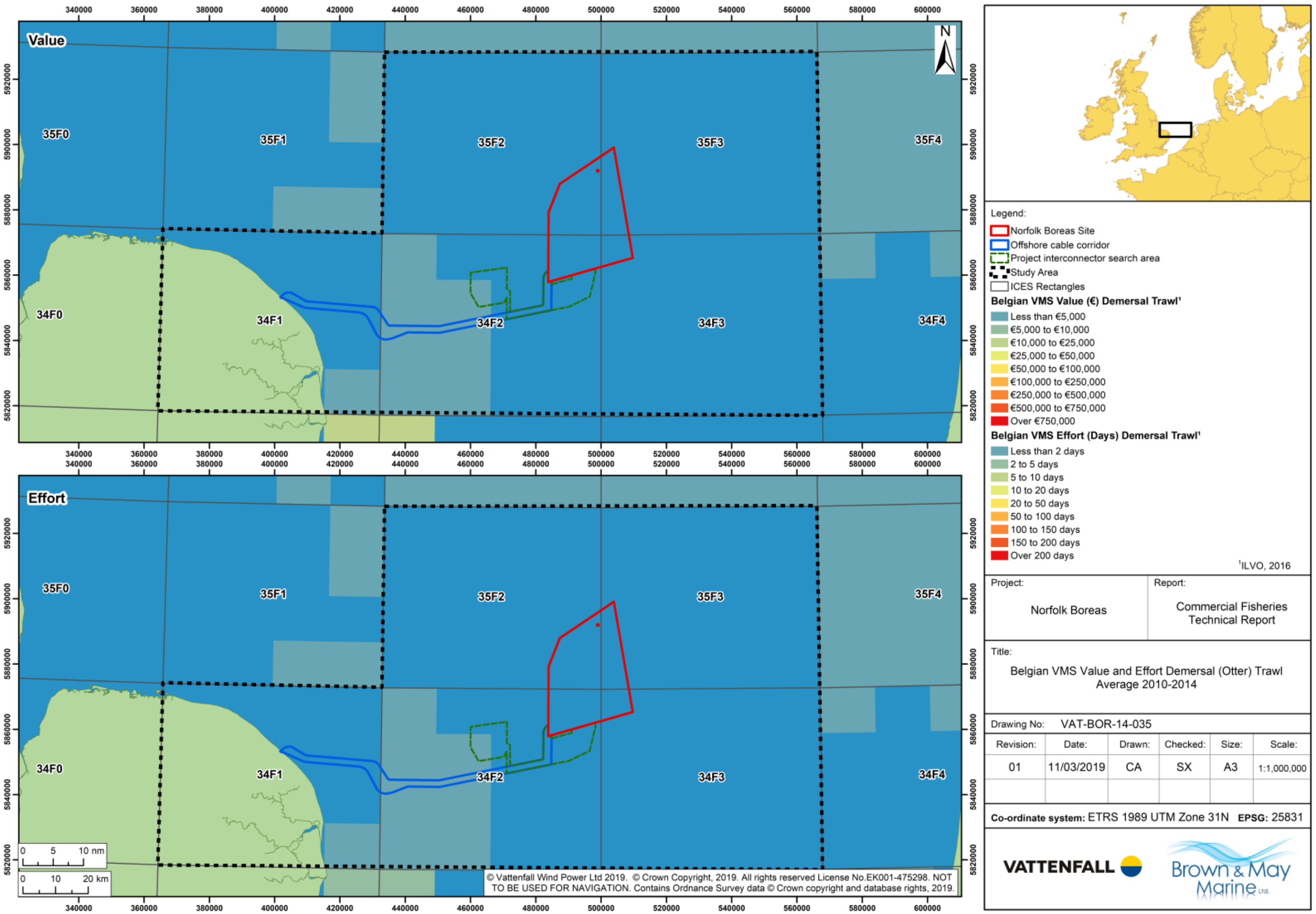


Figure 7.14 Belgian VMS value and effort by demersal trawl (average 2010 to 2014) (Source: ILVO, 2016)

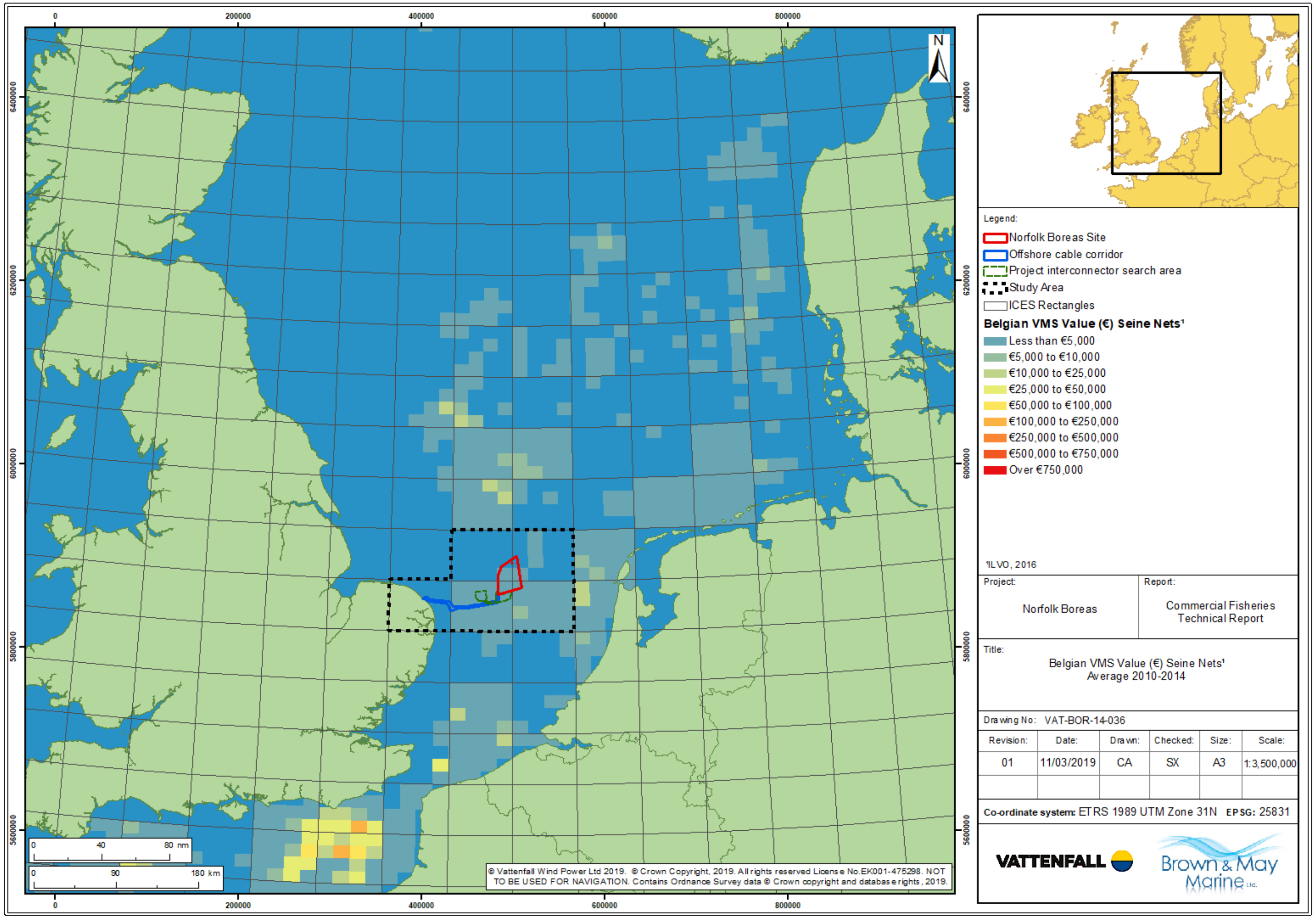


Figure 7.15 Belgian VMS value by seine net – wider region (average 2010 to 2014) (Source: ILVO, 2016)

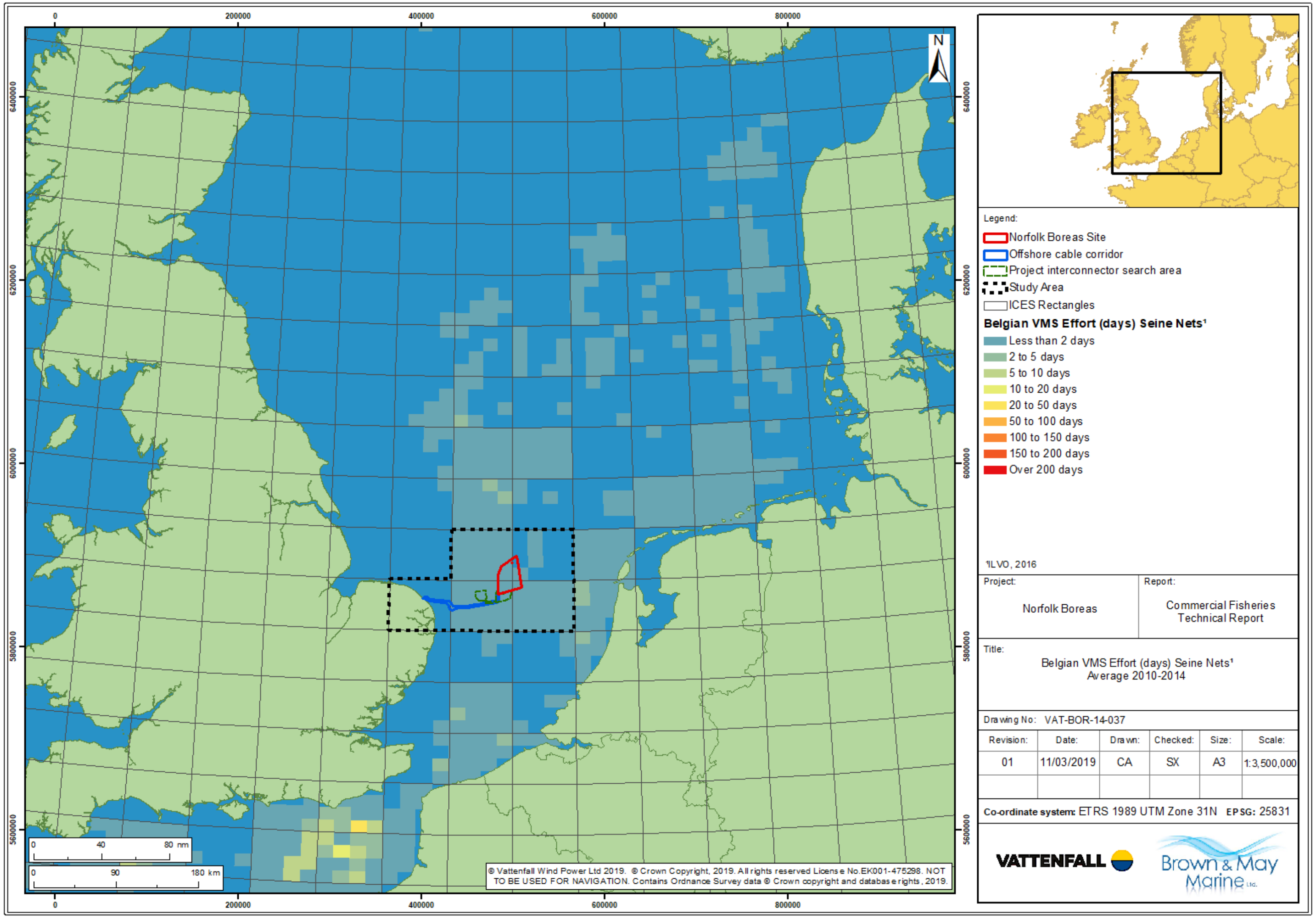


Figure 7.16 Belgian VMS effort by seine net – wider region (average 2010 to 2014) (Source: ILVO, 2016)

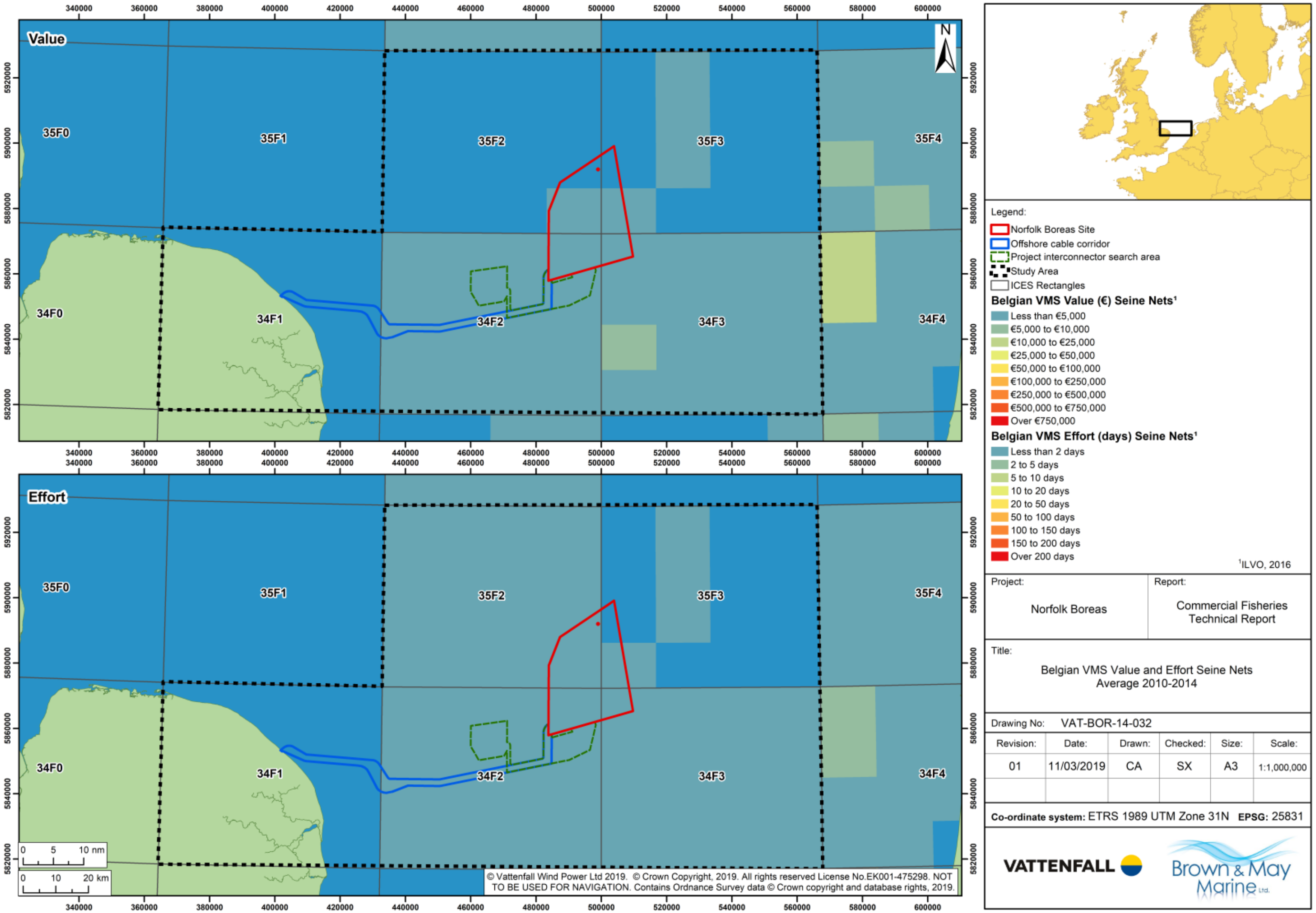


Figure 7.17 Belgian VMS value and effort by seine net (average 2010 to 2014) (Source: ILVO, 2016)

7.4 Vessels, Gear and Operating Patterns

60. As discussed in the sections above, in areas relevant to the project, fishing activity by Belgian vessels is predominantly by beam trawlers, with other methods such as seine netting and otter trawling also active in the area, however to a much lesser extent.

61. The majority of the activity of the Belgian fishing fleet is focussed in the Southern North Sea and English Channel and to a lesser extent in the Irish Sea. The fleet comprises approximately 70 vessels, the majority of which are beam trawlers (Table 7.1). Some vessels are also capable of operating both beam and otter trawls. From consultation with VisNED it is understood that 20 of these vessels are Belgian-registered, but Dutch-owned. These all deploy traditional beam trawls (Consultation meeting, 20th June 2018).

Table 7.1 Vessel numbers in Belgian fleet by type (Rederscentrale / ILVO)

Vessel Type	Number of Vessels	Percentage of fleet (%)
Beam trawler	47	72.30
Otter trawler	4	6.15
Static gear vessel	2	3.08
Seine netter / Fly shooter	4	6.16
Beam & otter trawler	8	12.31

62. The majority of beam trawlers active in the area around Norfolk Boreas are classed as ‘Eurokotters’. These vessels have main engines of just under 300HP. Most of this class of vessel operate from Ostende. An example of a Belgian Eurokotter is shown in Plate 7.1.

Plate 7.1 A Belgian Eurokotter (Source: BMM, 2017)

8 UK Fleet

8.1 Surveillance Sightings of UK Vessels

63. The distribution of surveillance sightings of UK vessels by fishing method is given in Figure 8.1.

64. As shown, within the offshore project area, the majority of sightings concentrate close to shore in inshore rectangle 34F1. In this area, sightings of UK vessels are predominantly of potters / whelkers.

65. The number of sightings is considerably lower in rectangles located further offshore (rectangles 35F2, 35F3, 34F2 and 345F3). The majority of vessels observed in these rectangles are beam trawlers and trawlers (unspecified).

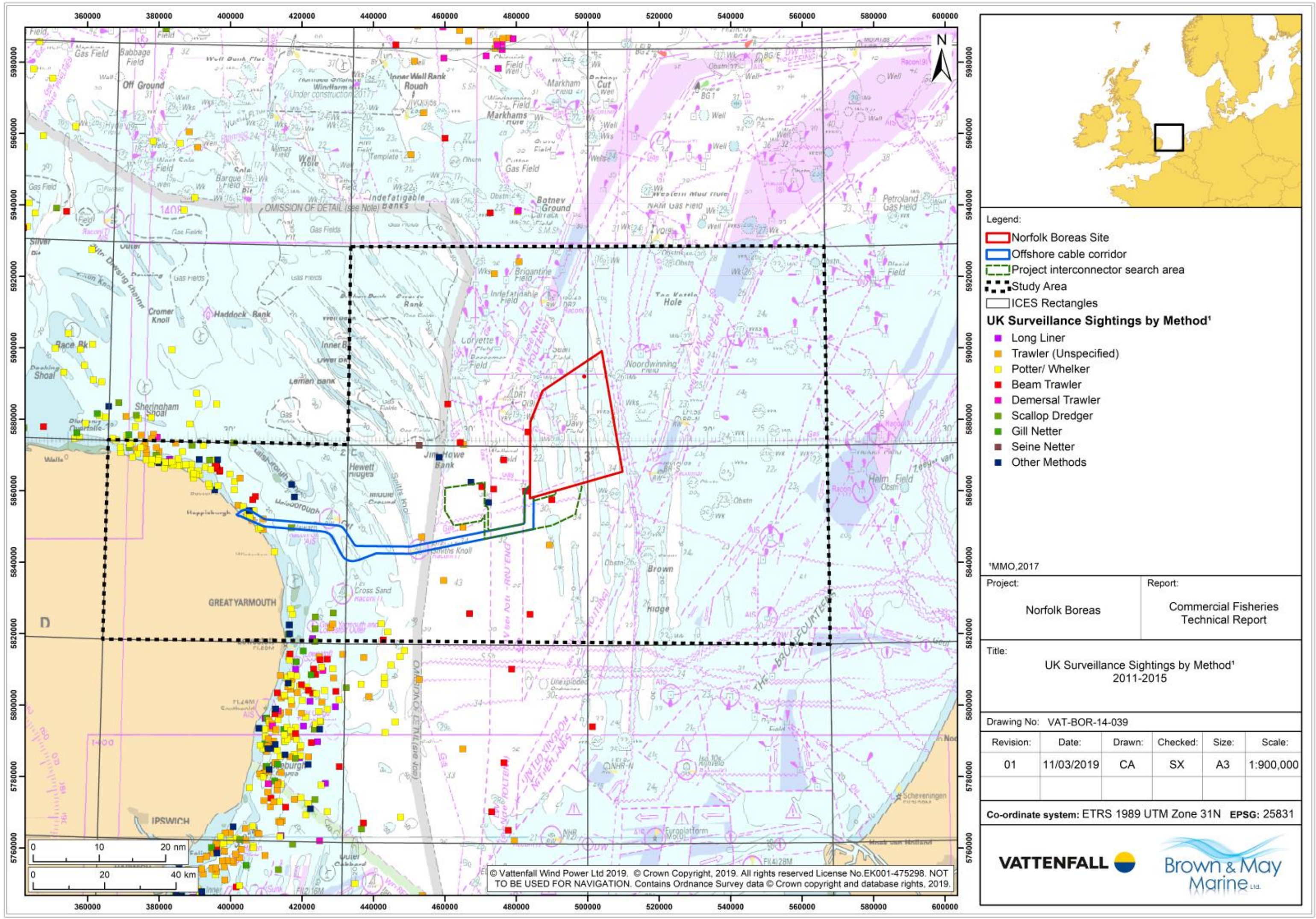


Figure 8.1 UK surveillance sightings by method (2011 to 2015) (Source: MMO, 2017)

8.2 UK Landings Data

8.2.1 Landings Values

66. UK landings values in the offshore project area are shown by method and species in Figure 8.2 and Figure 8.3, respectively.

67. In inshore rectangle 34F1 the majority of landings are from potters and to a much lesser extent netters (gillnets and driftnets), long liners, beam trawlers and trawlers (Figure 8.2). For the most part, vessels deploying these methods are small in size (<10m length) and are based in local ports. In terms of target species, lobster, crabs and whelks account for the majority of landings values (Figure 8.3).

68. In areas further offshore (rectangles 34F2, 34F3, 35F2 and 35F3), beam trawling accounts for the majority of landings values, with sole, plaice and to a lesser extent turbot, being the principal species landed from the area. Whilst at considerably lower levels, landings by other methods, particularly long lining and bottom otter trawling, are also recorded in some of the offshore rectangles.

69. A detailed analysis of landings values by species and method for each of the ICES rectangles in the offshore project area is given in Figure 8.4 to Figure 8.8.

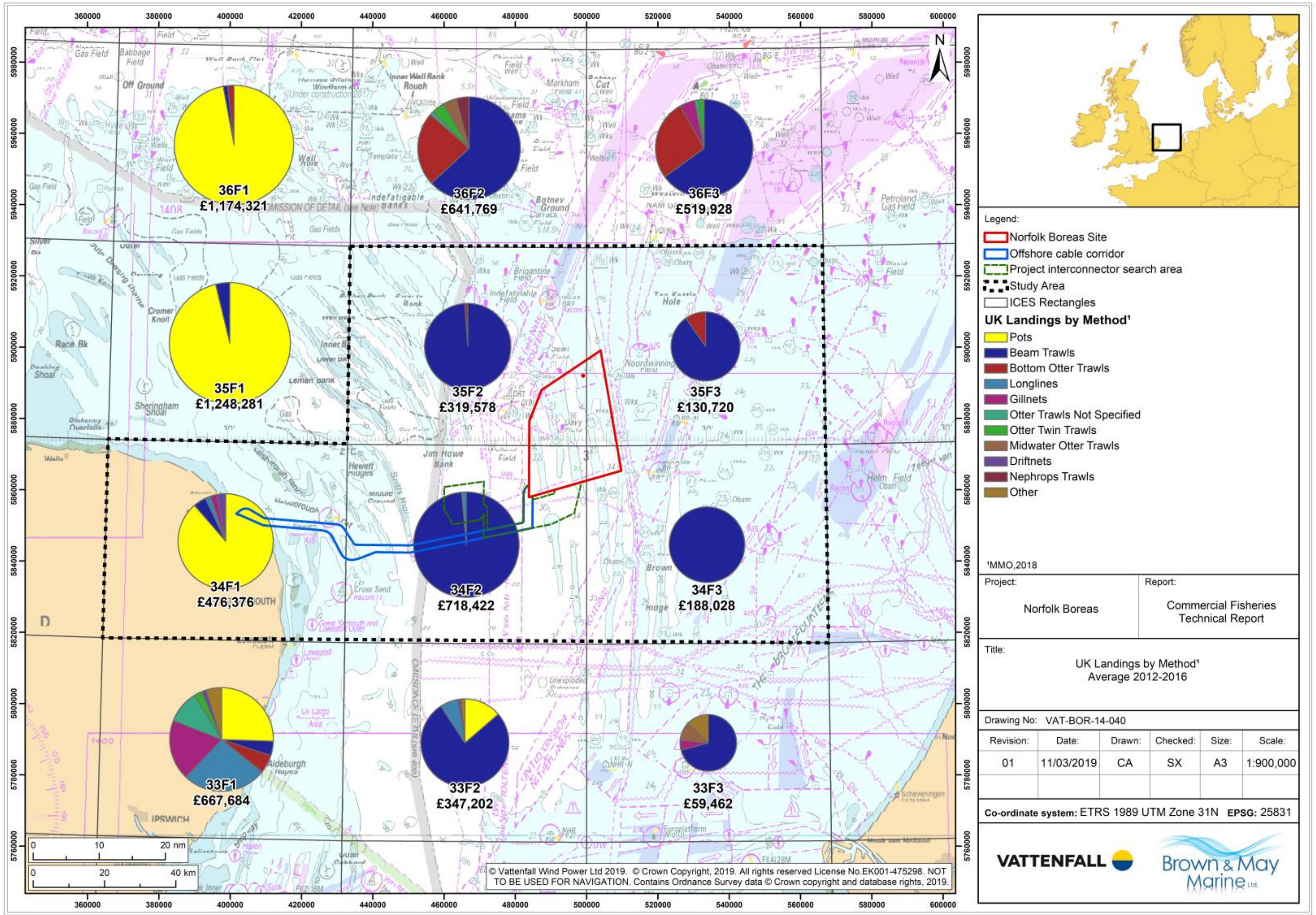


Figure 8.2 Average UK landings values by method (2012 to 2016) (Source: MMO, 2018)

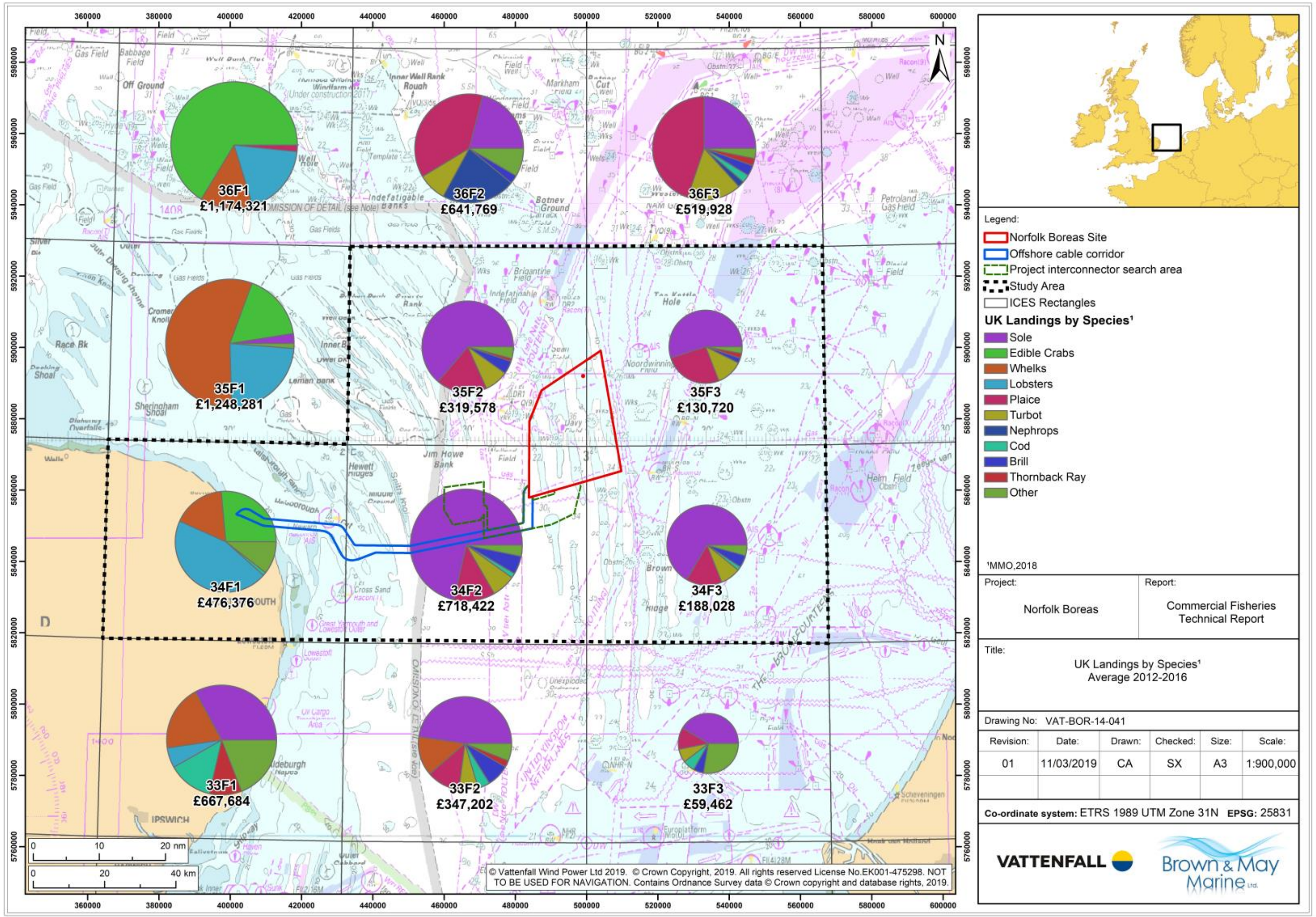
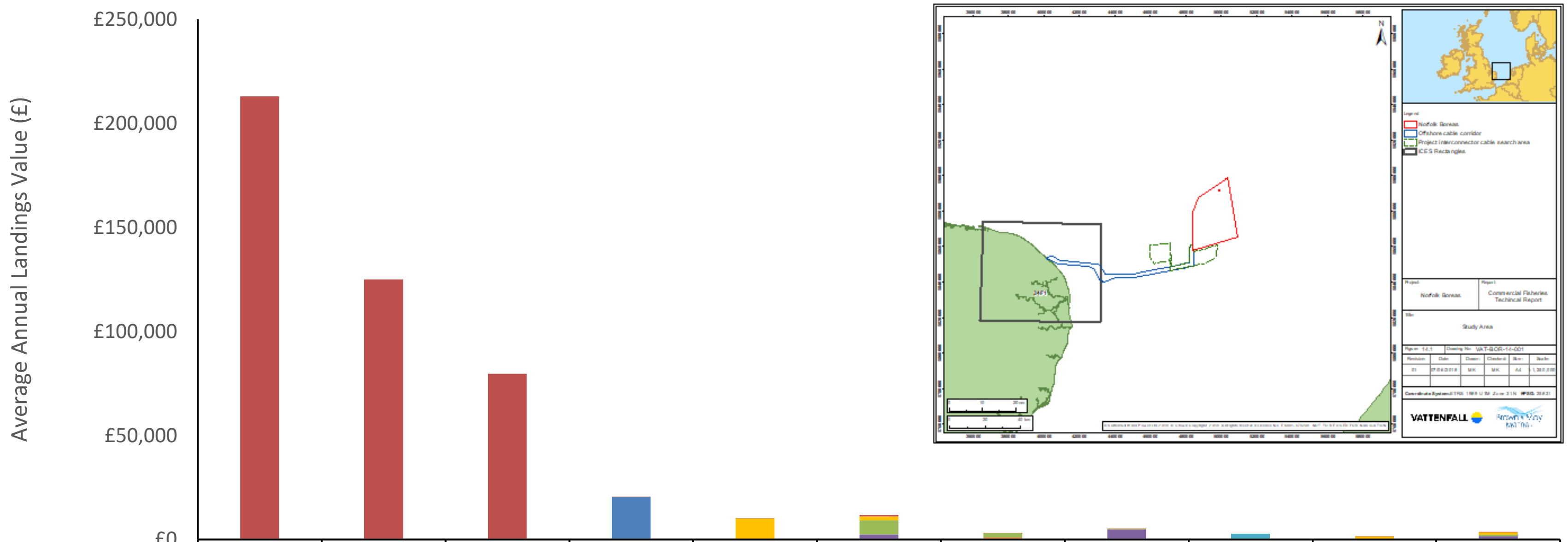


Figure 8.3 Average UK landings values by species (2012 to 2016) (Source: MMO, 2018)

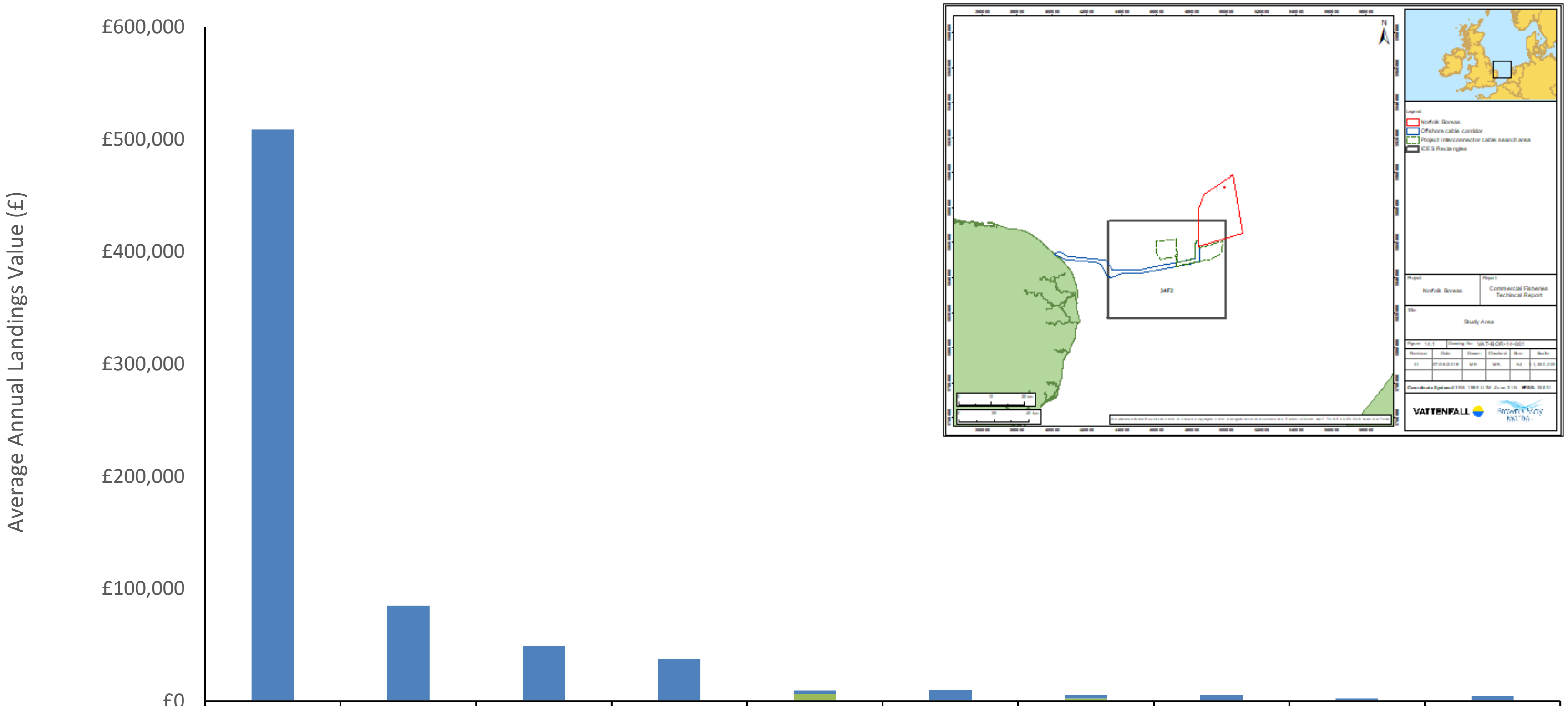
Annual Landings Values (2012 to 2016) by Species and Method for ICES Rectangle 34F1



	Lobsters	Edible Crabs	Whelks	Brown Shrimps	Herring	Bass	Sole	Cod	Cockles	Mackerel	Other Species
Pots	£212,761	£124,983	£79,588	£25	£94	£710	£5	£24	£0	£5	£251
Beam trawls	£0	£0	£0	£20,469	£0	£0	£0	£0	£0	£0	£1
Driftnets	£0	£0	£0	£0	£9,764	£1,874	£78	£4	£0	£1,422	£1,124
Gillnets	£143	£45	£3	£0	£366	£6,820	£1,938	£243	£0	£75	£679
Longlines	£50	£0	£0	£0	£1	£2,364	£32	£4,815	£0	£0	£1,500
Miscellaneous gear	£0	£0	£0	£0	£0	£0	£0	£0	£2,901	£0	£0
Otter trawls (not specified)	£0	£0	£0	£0	£0	£28	£508	£3	£0	£0	£43
Otter twin trawls	£0	£0	£0	£0	£0	£28	£508	£3	£0	£0	£43

Figure 8.4 Average landing values (2012 to 2016) by species and method in ICES rectangle 34F1 (Source: MMO, 2018)

Annual Landings Values (2012 to 2016) by Species and Method for ICES Rectangle 34F2



	Sole	Plaice	Turbot	Brill	Cod	Blonde Ray	Thornback Ray	Tub Gurnard	Dabs	Other Species
Beam trawls	£508,715	£84,835	£48,767	£37,594	£3,123	£8,494	£3,321	£5,479	£2,255	£4,220
Longlines	£0	£0	£0	£0	£6,412	£1,344	£1,995	£0	£0	£766
Bottom otter trawls	£3	£0	£0	£5	£0	£0	£238	£0	£0	£1
Otter trawls (not specified)	£0	£3	£0	£2	£10	£10	£5	£0	£0	£1

Figure 8.5 Average landing values (2012 to 2016) by species and method in ICES rectangle 34F2 (Source: MMO, 2018)

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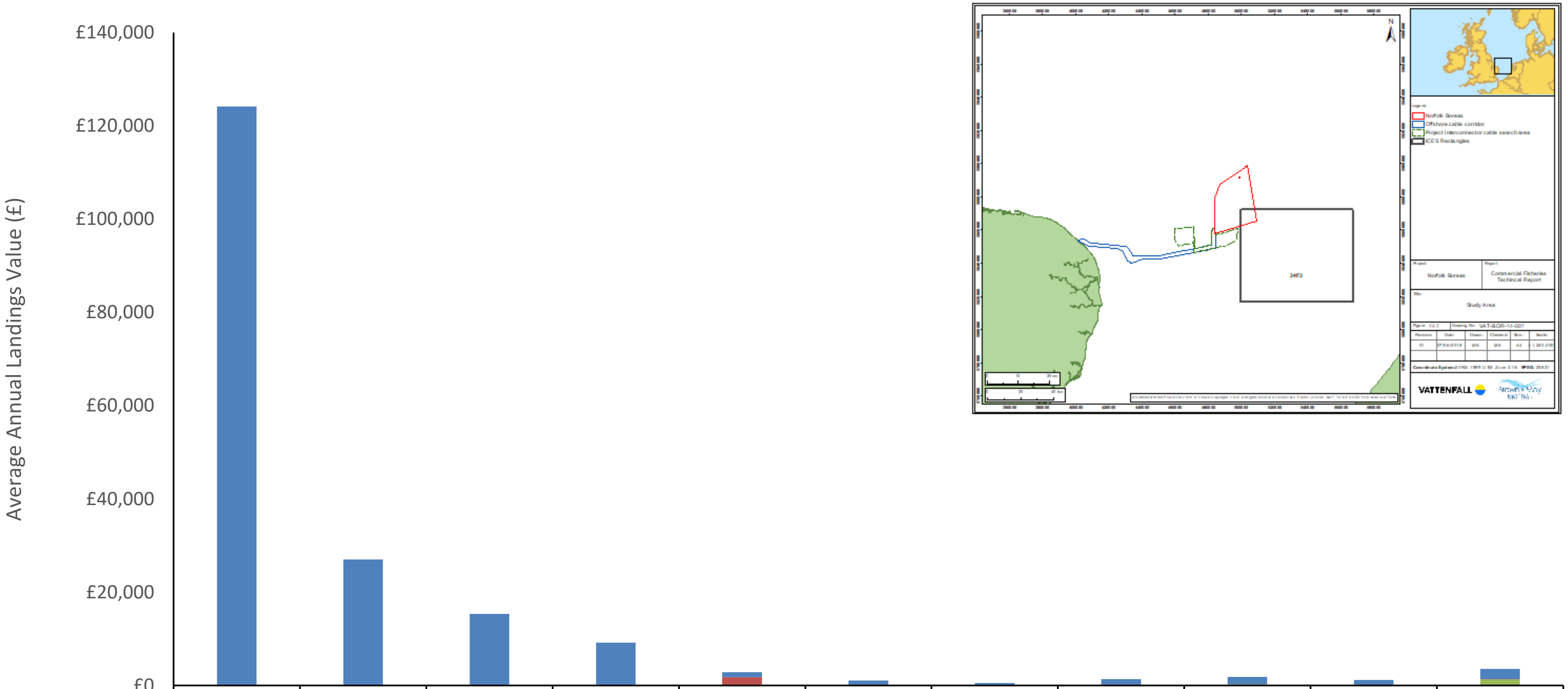
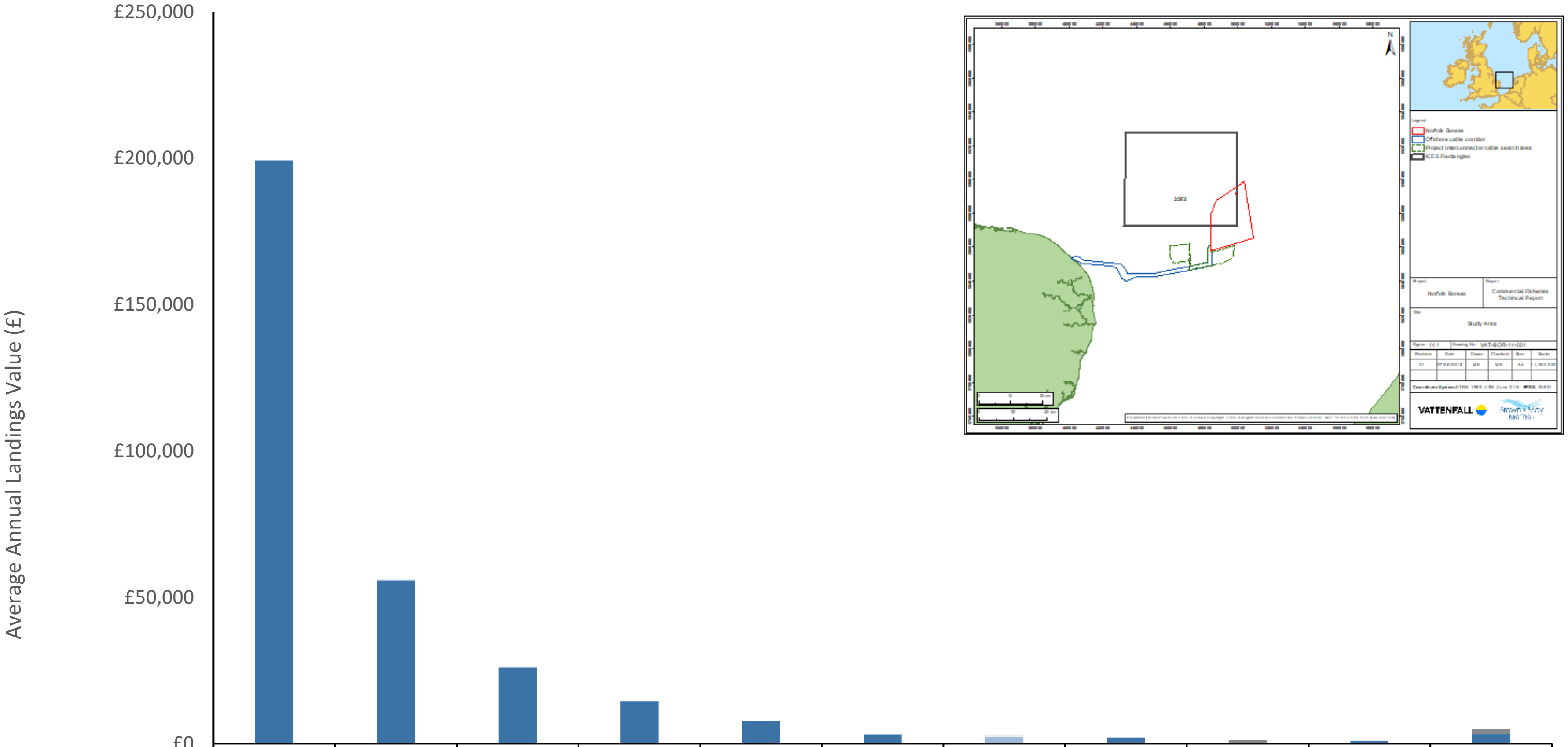
Annual Landings Values (2012 to 2016) by Species and Method for ICES Rectangle 34F3



	Sole	Plaice	Turbot	Brill	Cod	Dabs	Flounder or Flukes	Thornback Ray	Tub Gurnard	Blonde Ray	Other Species
Beam trawls	£124,157	£27,004	£15,323	£9,166	£1,067	£1,042	£529	£1,359	£1,626	£1,199	£2,167
Gillnets	£0	£3	£3	£0	£1,783	£0	£0	£0	£0	£0	£88
Scottish seines	£0	£0	£3	£0	£0	£0	£0	£0	£227	£0	£1,283

Figure 8.6 Average landing values (2012 to 2016) by species and method in ICES rectangle 34F3 (Source: MMO, 2018)

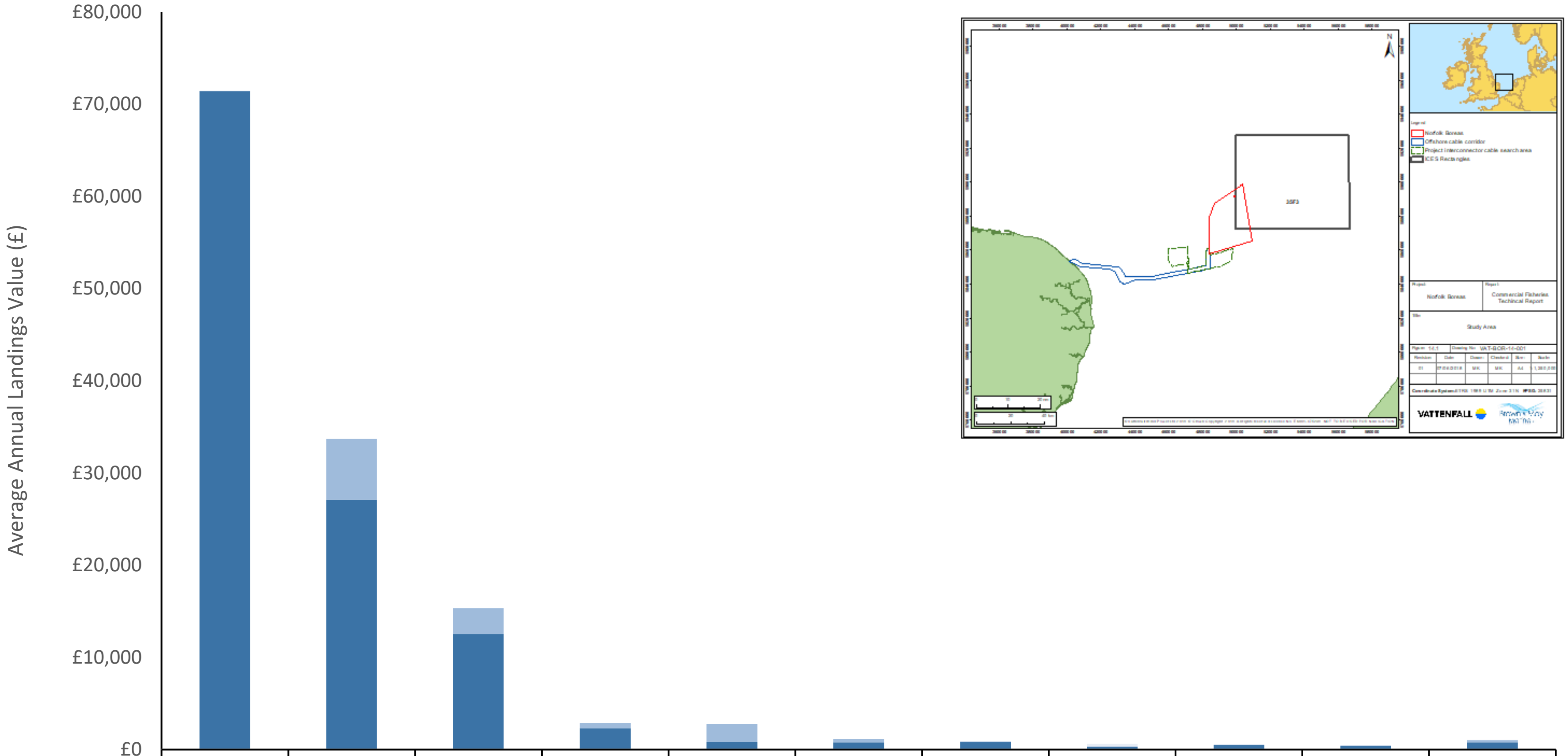
Annual Landings Values (2012 to 2016) by Species and Method for ICES Rectangle 35F2



	Sole	Plaice	Turbot	Brill	Blonde Ray	Thornback Ray	Nephrops	Tub Gurnard	Lobsters	Cod	Other Species
Pots	£0	£0	£0	£0	£0	£0	£0	£0	£995	£0	£1,622
Otter trawls (not specified)	£3	£173	£124	£22	£0	£0	£971	£0	£0	£77	£39
Bottom otter trawls	£60	£371	£322	£30	£0	£341	£2,117	£0	£0	£150	£51
Beam trawls	£199,278	£55,587	£25,846	£14,431	£7,611	£2,995	£7	£2,060	£208	£838	£3,250

Figure 8.7 Average landing values (2012 to 2016) by species and method in ICES rectangle 35F2 (Source: MMO, 2018)

Annual Landings Values (2012 to 2016) by Species and Method for ICES Rectangle 35F3



	Sole	Plaice	Turbot	Brill	Thornback Ray	Tub Gurnard	Dabs	Cod	Spotted Ray	Flounder or Flukes	Other Species
Gillnets	£0	£0	£1	£0	£0	£0	£0	£262	£0	£0	£2
Bottom otter trawls	£24	£6,600	£2,790	£568	£1,919	£384	£43	£86	£30	£15	£252
Beam trawls	£71,414	£27,084	£12,545	£2,301	£839	£774	£816	£276	£504	£411	£779

Figure 8.8 Average landing values (2012 to 2016) by species and method in ICES rectangle 35F3 (Source: MMO, 2018)

8.2.2 Landings Values by Port

70. The principal ports recording landings from rectangles in the study area (rectangles 34F1, 34F2, 34F3, 35F2 and 35F3) and the proportion of each port's total income that each rectangle represents, are presented in Table 8.1 to Table 8.5. These show five-year averages from 2012 to 2016.

71. The highest landings value recorded for rectangle 34F1 is into Cromer at £321,827, followed by Great Yarmouth at £55,427 (Table 8.1). These values represent 67.7% and 11.6% of annual landings from 34F1 respectively. The average annual landings have been compared to the total average annual landings for each port, to identify their dependence on 34F1. The ports with the highest levels of dependence are Winterton (87.1%), Cromer (84.4%), Great Yarmouth (67.2%) and Sheringham (58.1%).

72. In offshore rectangles 34F2, 34F3, 35F2 and 35F3, the principal landings ports are in the Netherlands (Table 8.2, Table 8.3, Table 8.4 and Table 8.5). This is understood to be a result of UK beam trawlers being for the most part UK flagged but Dutch owned and operated vessels. The total average annual port values for the Netherlands ports are shown to be high and therefore, landings from rectangles 34F2, 34F3, 35F2 and 35F3 represent only a small proportion of the ports' total landing values.

Table 8.1 Top 14 ports by average annual landings (2012 to 2016) from ICES rectangle 34F1 by UK vessels (source: MMO, 2018)

Port	Average Annual Landings in 34F1	% of Annual Value in 34F1	Total Average Annual Port Value	% Total Annual Port Value that 34F1 Represents
Cromer	£321,827	67.56%	£381,441	84.37%
Great Yarmouth	£55,427	11.64%	£82,516	67.17%
Lowestoft	£30,521	6.41%	£785,805	3.88%
Winterton	£23,150	4.86%	£26,586	87.08%
Sheringham	£19,415	4.08%	£33,413	58.11%
Wells	£12,106	2.54%	£1,107,403	1.09%
Kings Lynn	£7,489	1.57%	£2,338,284	0.32%
Southwold	£5,062	1.06%	£182,246	2.78%
Blakeney	£593	0.12%	£21,365	2.78%
Boston	£329	0.07%	£699,638	0.05%
West Mersea	£292	0.06%	£488,162	0.06%
Brancaster Staithe	£84	0.02%	£55,938	0.15%
Hastings	£72	0.02%	£843,568	0.01%

Port	Average Annual Landings in 34F1	% of Annual Value in 34F1	Total Average Annual Port Value	% Total Annual Port Value that 34F1 Represents
Great Wakering	£8	0.00%	£4,507	0.18%

Table 8.2 All ports by average annual landings (2012 to 2016) from ICES rectangle 34F2 by UK vessels (source: MMO, 2018)

Port	Average Annual Landings in 34F2	% of Annual Value in 34F2	Total Average Annual Port Value	% Total Annual Port Value that 34F2 Represents
Ijmuiden	£414,269	57.66%	£13,465,259	3.08%
Scheveningen	£274,942	38.27%	£5,934,373	4.63%
Lowestoft	£10,546	1.47%	£785,805	1.34%
Stellendam	£9,541	1.33%	£91,639	10.41%
Harlingen	£8,138	1.13%	£21,567,706	0.04%
Great Yarmouth	£683	0.10%	£82,516	0.83%
Vlissengen	£301	0.04%	£320,588	0.09%
Milford Haven	£438	0.10%	£13,572,239	0.00%

Table 8.3 All ports by average annual landings (2012 to 2016) from ICES rectangle 34F3 by UK vessels (source: MMO, 2018)

Port	Average Annual Landings in 34F3	% of Annual Value in 34F3	Total Average Annual Port Value	% Total Annual Port Value that 34F3 Represents
Ijmuiden	£120,122	63.88%	£13,465,259	0.89%
Scheveningen	£62,996	33.50%	£5,934,373	1.06%
Harlingen	£2,635	1.40%	£21,567,706	0.01%
Boulogne	£1,513	0.80%	£3,272,590	0.05%
Stellendam	£762	0.41%	£91,639	0.83%

Table 8.4 All ports by average annual landings (2012 to 2016) from ICES rectangle 35F2 by UK vessels (source: MMO, 2018)

Port	Average Annual Landings in 35F2	% of Annual Value in 35F2	Total Average Annual Port Value	% Total Annual Port Value that 35F2 Represents
Ijmuiden	£257,738	80.65%	£1,153,717	22.34%
Scheveningen	£45,458	14.22%	£669,361	6.79%
Harlingen	£9,558	2.99%	£818,464	1.17%

Port	Average Annual Landings in 35F2	% of Annual Value in 35F2	Total Average Annual Port Value	% Total Annual Port Value that 35F2 Represents
Scarborough	£4,098	1.28%	£131,169	3.12%
Grimsby	£2,152	0.67%	£963,082	0.22%
Wells	£465	0.15%	£672,288	0.07%
North Shields	£108	0.03%	£38,214	0.28%

Table 8.5 All ports by average annual landings (2012 to 2016) from ICES rectangle 35F3 by UK vessels (source: MMO, 2018)

Port	Average Annual Landings in 35F3	% of Annual Value in 35F3	Total Average Annual Port Value	% Total Annual Port Value that 35F3 Represents
Harlingen	£55,865	42.74%	£818,464	6.83%
Scheveningen	£47,999	36.72%	£669,361	7.17%
Ijmuiden	£26,529	20.29%	£1,153,717	2.30%
Stellendam	£327	0.25%	£28,481	1.15%

8.3 Local Fishing Grounds

73. In order to identify the extent of fishing area used by local UK vessels, information on fishing grounds was collected as part of the consultation process for Norfolk Boreas and Norfolk Vanguard (Table 2.1 and Table 2.2). As previously mentioned, both projects are located in close proximity and share the same offshore cable corridor. Therefore, the information gathered during consultation for Norfolk Vanguard is also of relevance to Norfolk Boreas.

74. From the consultation undertaken it is understood that the nearshore section of the offshore cable corridor is mainly fished by local under 10m vessels based at Sea Palling and Caister (approximately 12 vessels). These primarily operate pots and nets within the 6nm limit (Figure 8.9).

75. The majority of the Caister vessels are part-time and undertake potting and netting within nearshore waters throughout the year for a range of fish and shellfish species. Two of the larger full time vessels from Caister are understood to undertake potting for crab, lobsters and whelks, nearshore netting for herring as well as targeting cod beyond the 15m contour on a seasonal basis.

76. Whilst smaller in number, the fleet at Sea Palling is understood to be full time utilising pots and to a lesser extent nets.

77. Information collected through a collaborative project undertaken by the EIFCA predecessor (Eastern Sea Fisheries Joint Committee (ESFJC)) in 2008 working with local fishermen to create indicative charts of fishing grounds, suggests potting activity (for crustaceans) extends over a wide area to the north and south of the offshore cable corridor (Figure 8.10). It should be noted, however, that given the small number of fishermen that participated in the project and the date of the project, the grounds depicted may not necessarily represent the current or complete distribution of fishing in the area.

78. Whilst the area of the export cable is not the main fishing area for Cromer based vessels, it is understood that some larger vessels from Cromer have the capability to occasionally fish as far south as the cable corridor (Pers Comm: NNFS, 2016; ESFJC, 2010). In addition, whelking is known to be undertaken in areas within and to the south of the offshore cable corridor, including off Winterton.

79. Further offshore, longlining and to a lesser extent netting, are undertaken on a seasonal basis and when weather conditions allow (Figure 8.11). The vessels that longline out of Lowestoft are known to fish large areas off the Norfolk and Suffolk coasts and are therefore less dependent on the area of the offshore cable corridor, than for example the local potters.

80. One vessel from Lowestoft currently undertakes beam trawling for shrimp. The principal regional shrimp beaming fleet works out of King's Lynn and Boston, with the fishery centred in grounds in the Wash and along North Norfolk Coast (north of Cromer). It is understood that on occasions some activity by this vessel from Lowestoft might take place close to the offshore cable corridor.

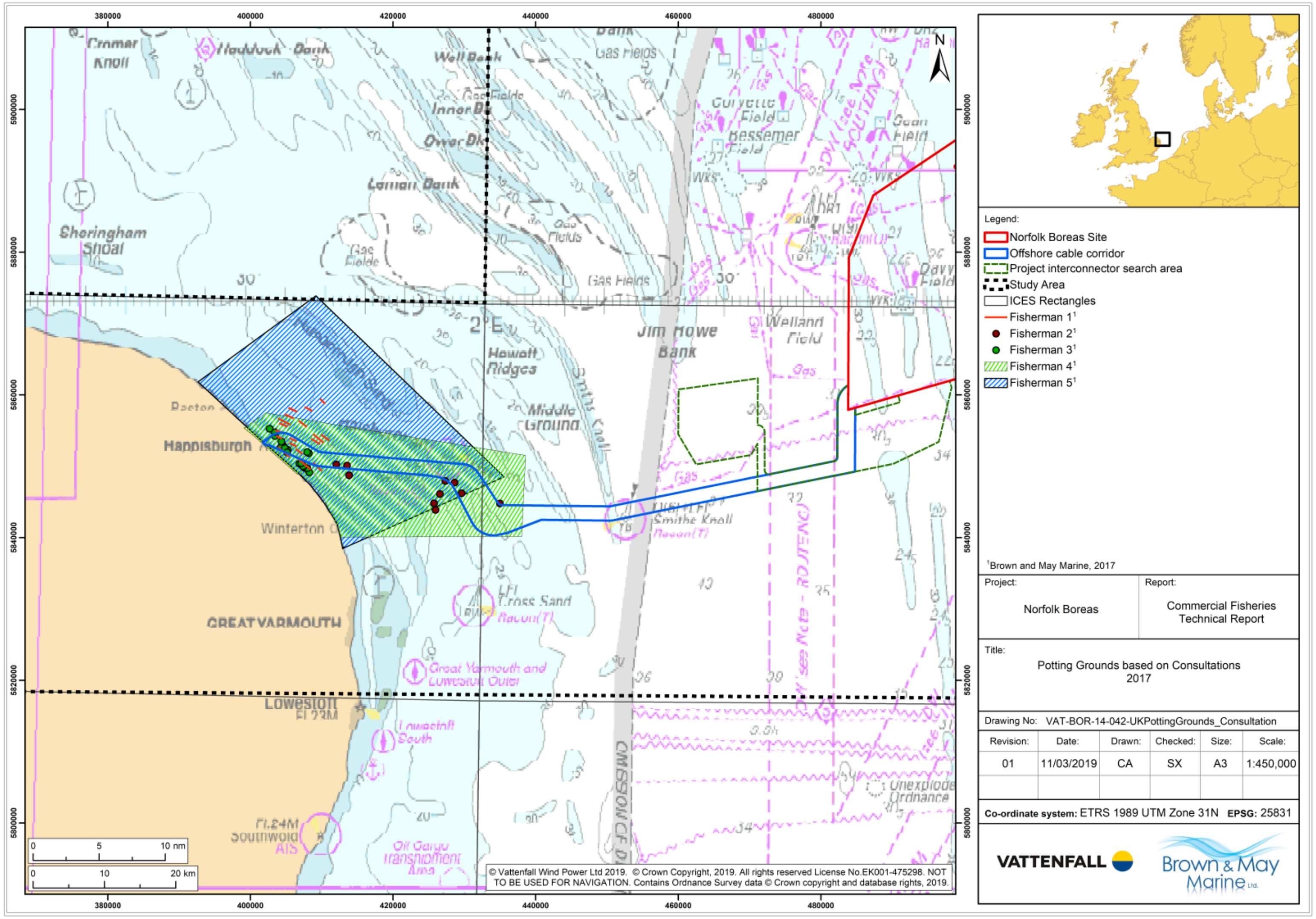


Figure 8.9 Potting fishing grounds based on UK consultation for Norfolk Vanguard (Source: BMM, 2017)

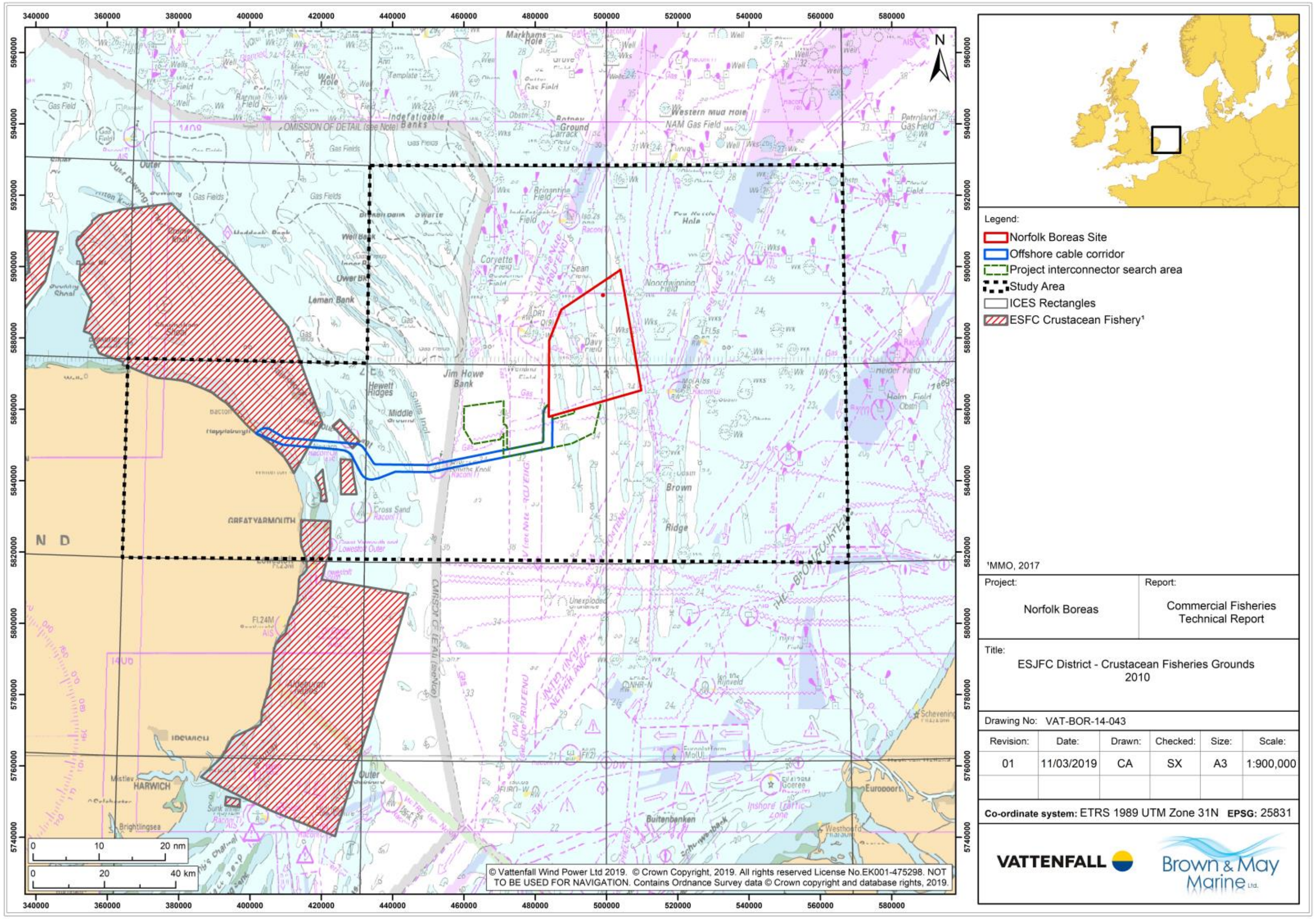


Figure 8.10 Extent of crustacean fisheries (UK) as described in ESFJC data and fisheries mapping project interviews (Source: ESFJC, 2010)

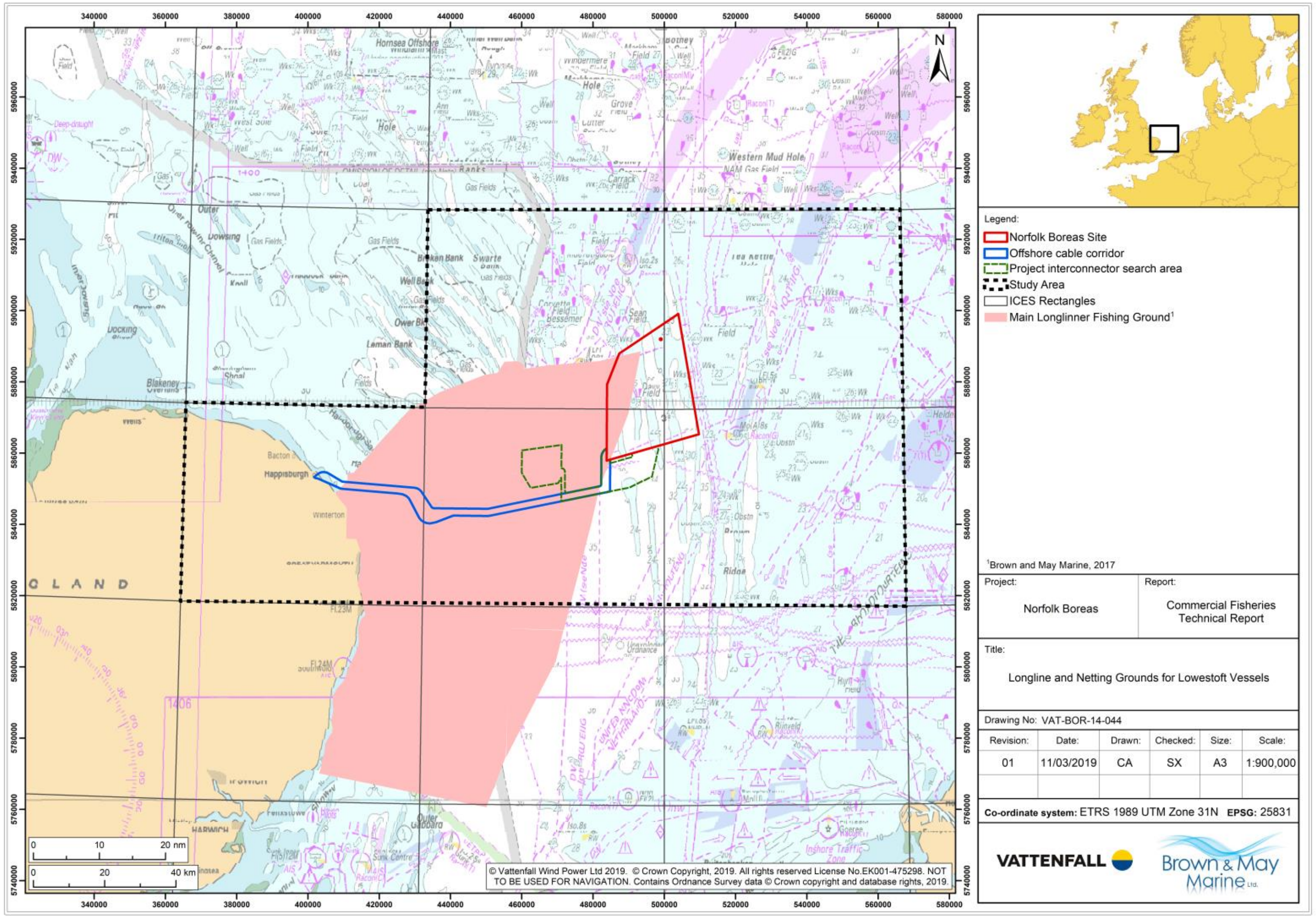


Figure 8.11 Longline and netting fishing grounds for Lowestoft (UK) vessels identified during consultation for Norfolk Vanguard (Source: BMM, 2017)

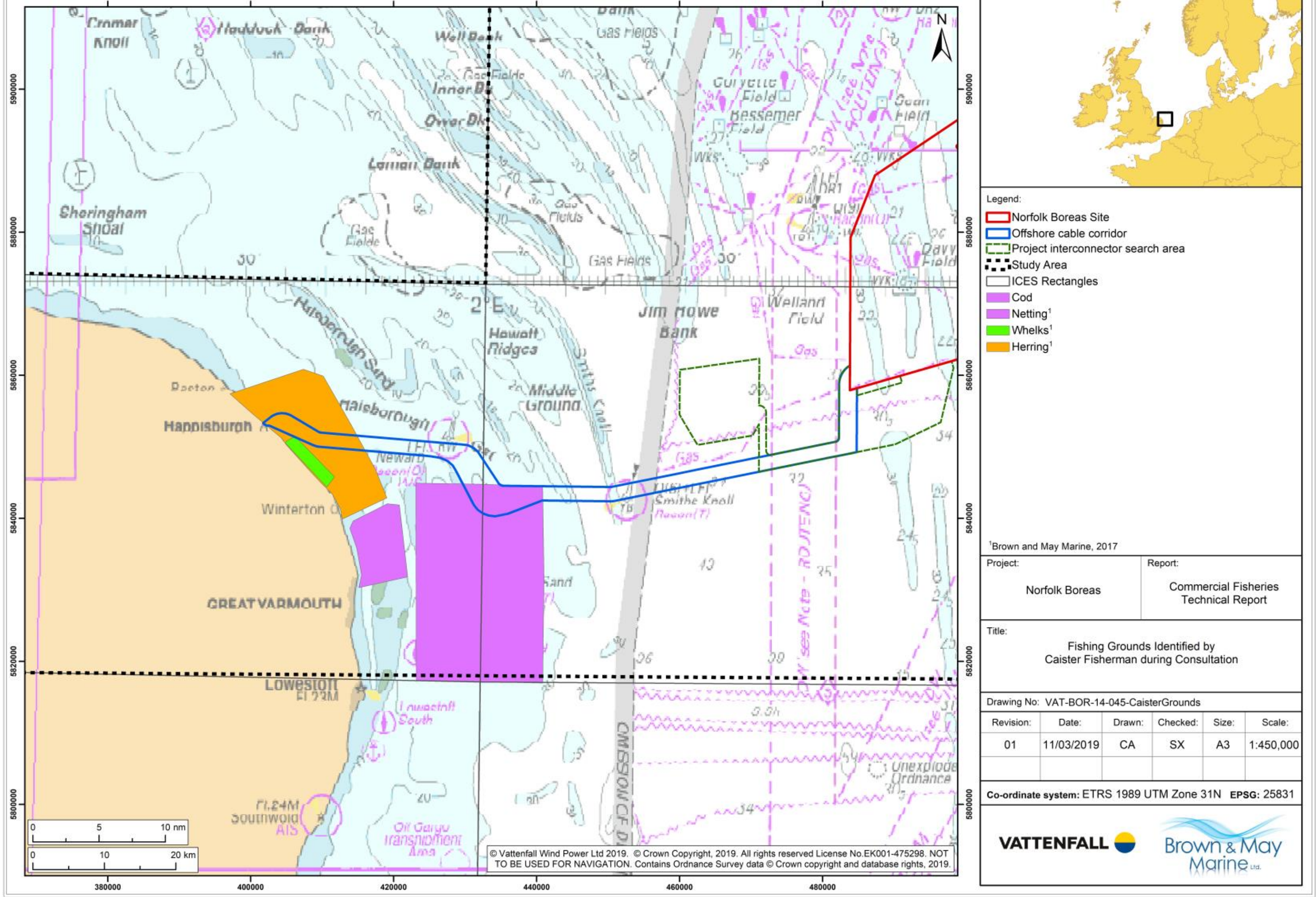


Figure 8.12 General fishing grounds as identified by Caister (UK) fisherman during consultation for Norfolk Vanguard (Source: BMM, 2017)

8.4 Satellite Tracking (VMS) Data

81. An analysis of UK VMS data is given below for relevant UK fleets. It should be noted that currently available VMS data does not take into account fishing activity by under 15m vessels. The majority of local UK vessels operating in the offshore project area (potters, netters and long liners) are less than 10m in length and therefore their activity is not recorded by VMS.

82. VMS data are therefore only provided for beam trawling and bottom otter trawling (Figure 8.13 to Figure 8.18). As outlined in Figure 8.1 and Figure 8.2, these are the two other main methods, in addition to those deployed by local under 10m vessels, recorded from surveillance sightings and landings data in the study area.

83. As shown in Figure 8.13 and Figure 8.14, in the offshore project area activity by beam trawlers mainly occurs in areas relevant to the offshore cable corridor (beyond the 12nm limit) and in the project interconnector search area, with limited activity recorded within the Norfolk Boreas site (Figure 8.13, Figure 8.14 and Figure 8.15).

84. With regards to demersal otter trawling, as shown in Figure 8.16 to Figure 8.19, VMS data indicates negligible levels of fishing activity within the offshore project area with the majority of activity concentrating to the north of the Norfolk Boreas site.

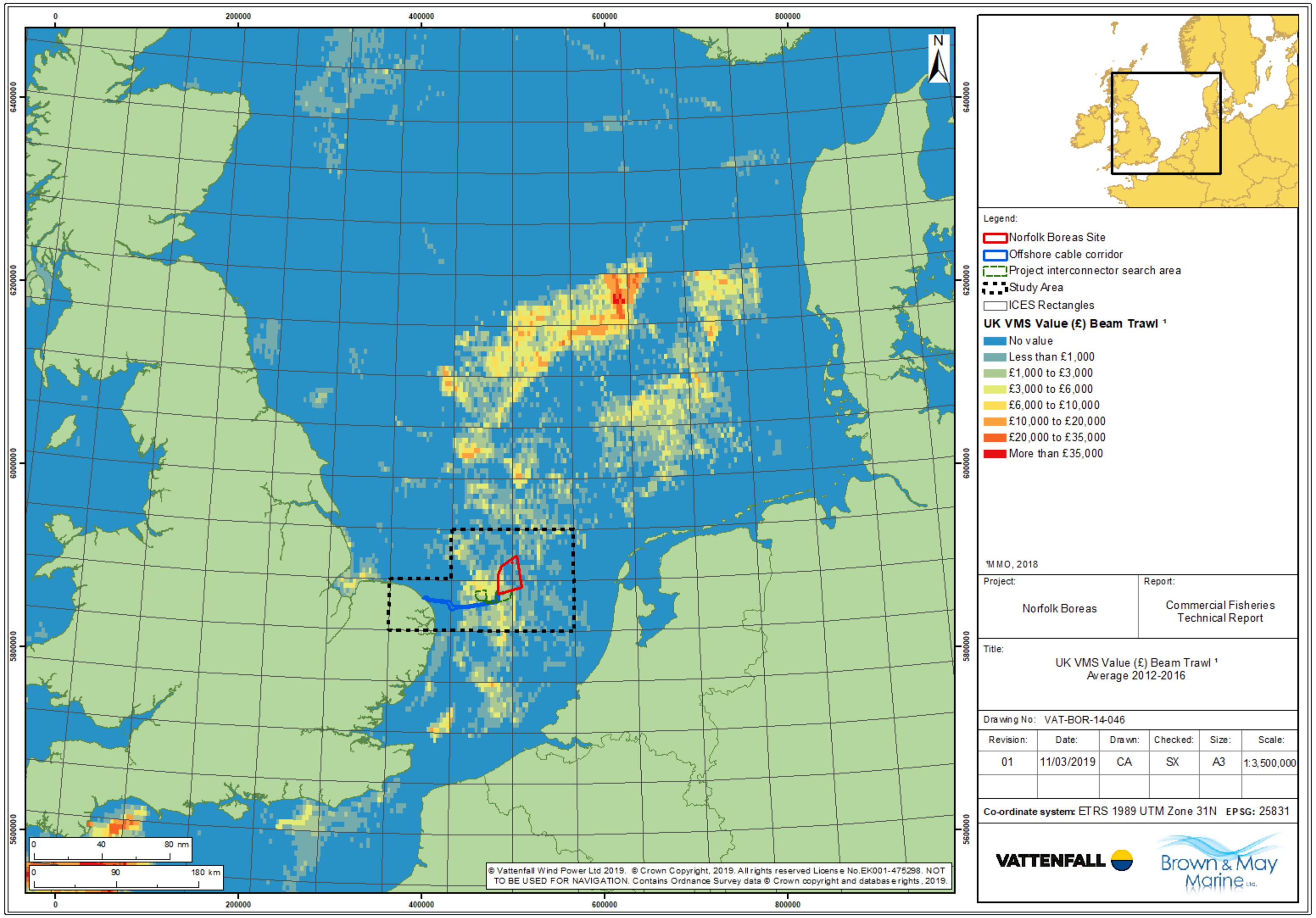


Figure 8.13 UK VMS value by beam trawl – wider region (average 2012 to 2016) (Source: MMO, 2018)

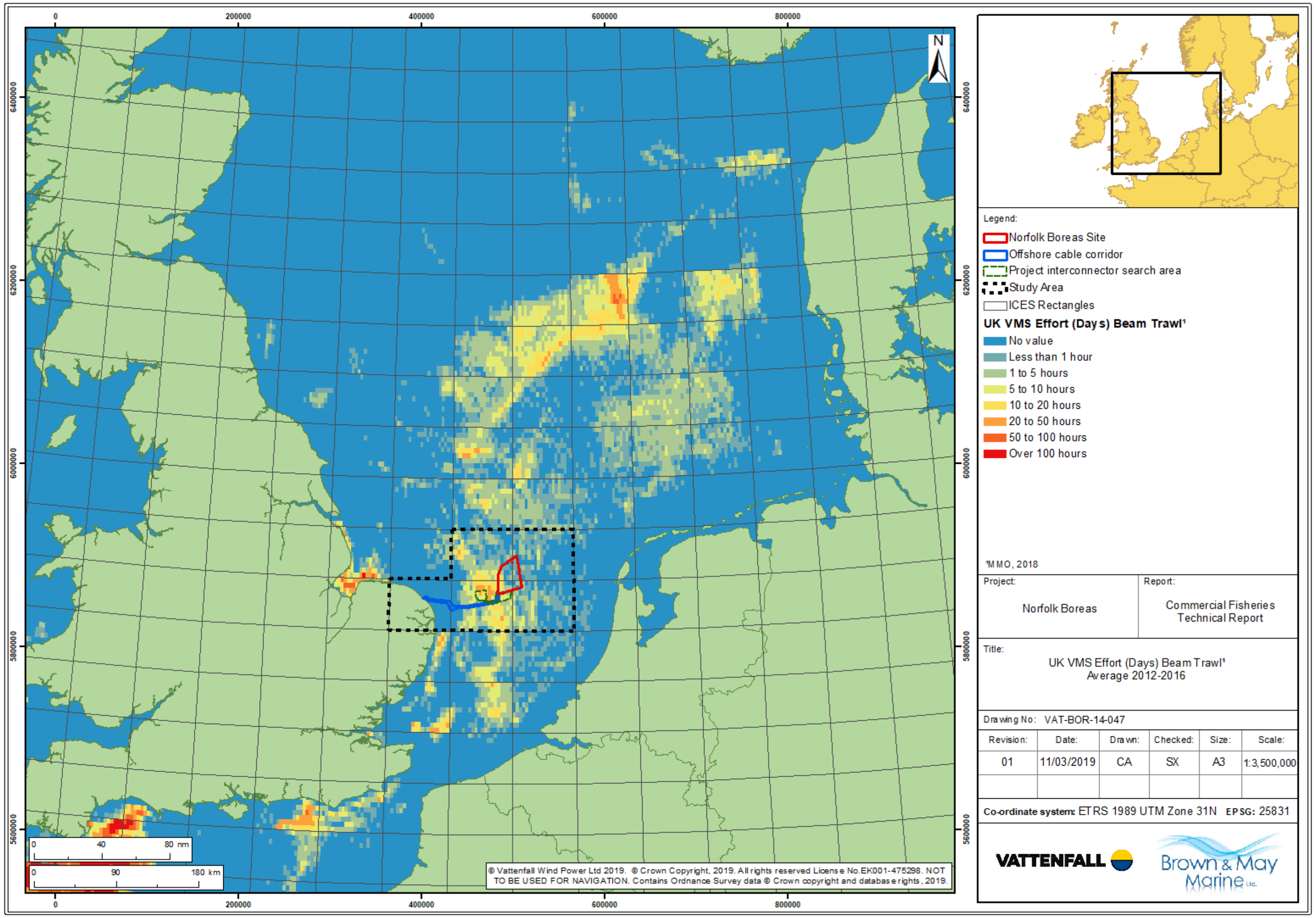


Figure 8.14 UK VMS effort by beam trawl – wider region (average 2012 to 2016) (Source: MMO, 2018)

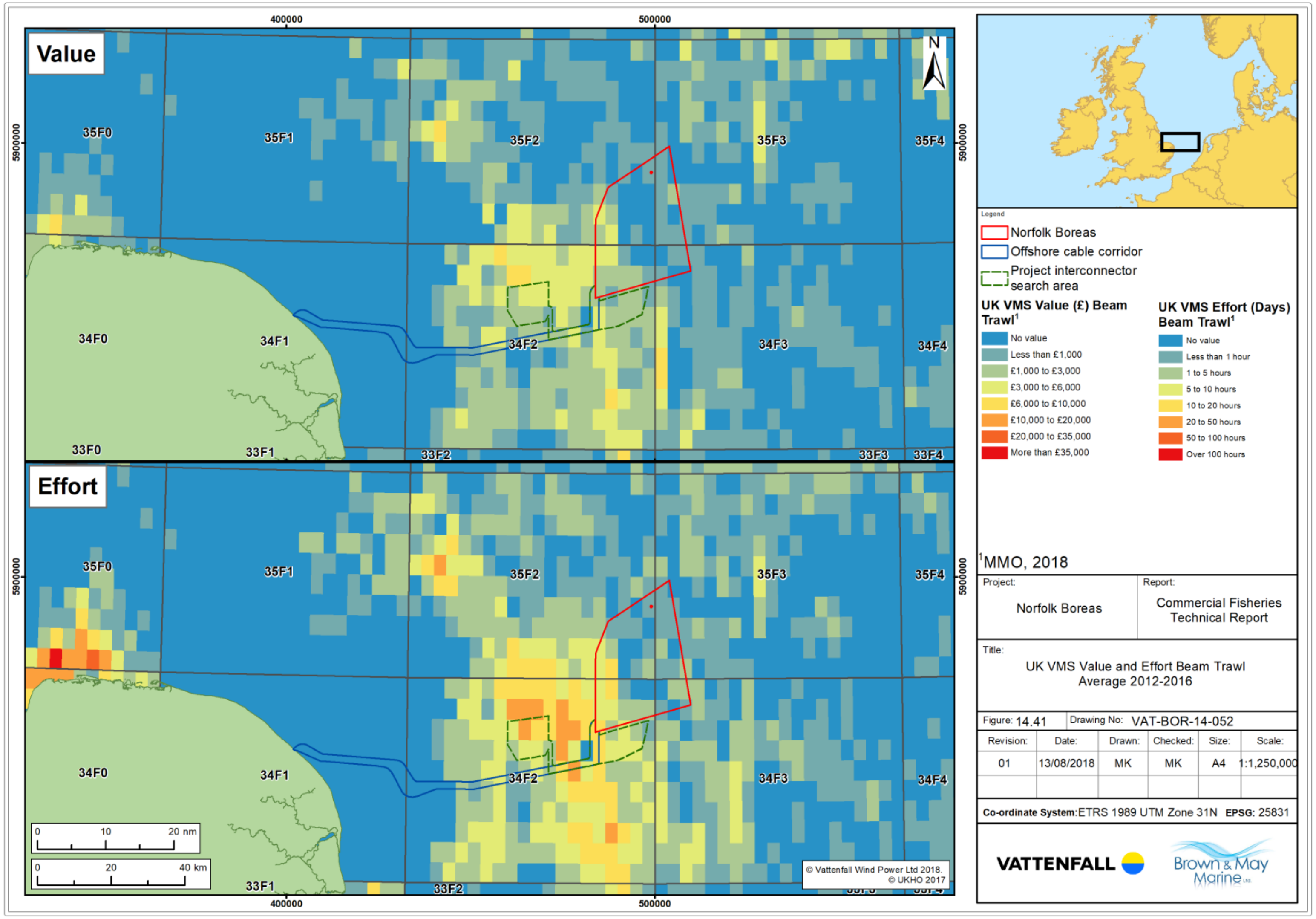


Figure 8.15 UK VMS value and effort by beam trawl – wider region (average 2012 to 2016) (Source: MMO, 2018)

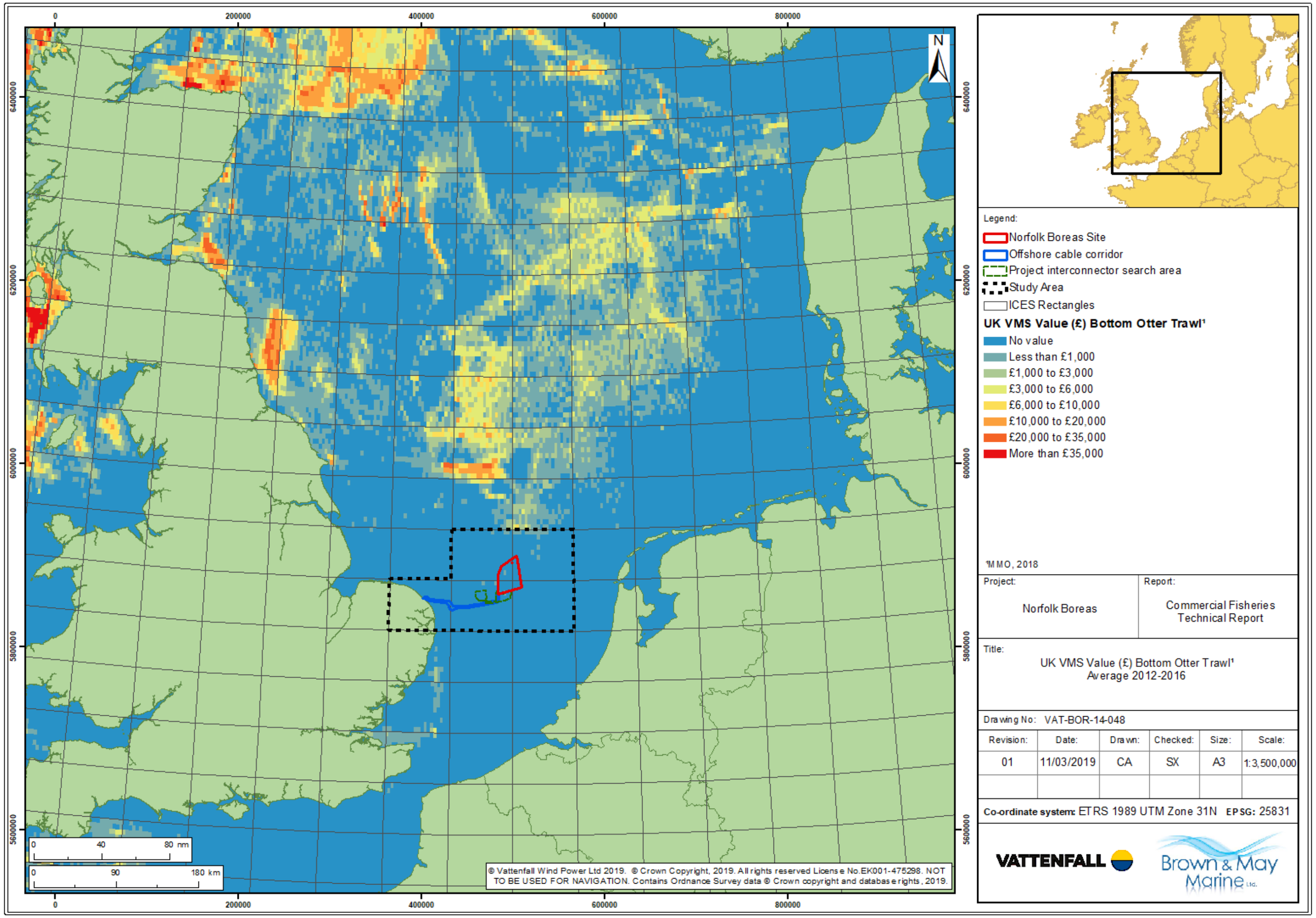


Figure 8.16 UK VMS value by bottom otter trawl – wider region (average 2012 to 2016) (Source: MMO, 2018)

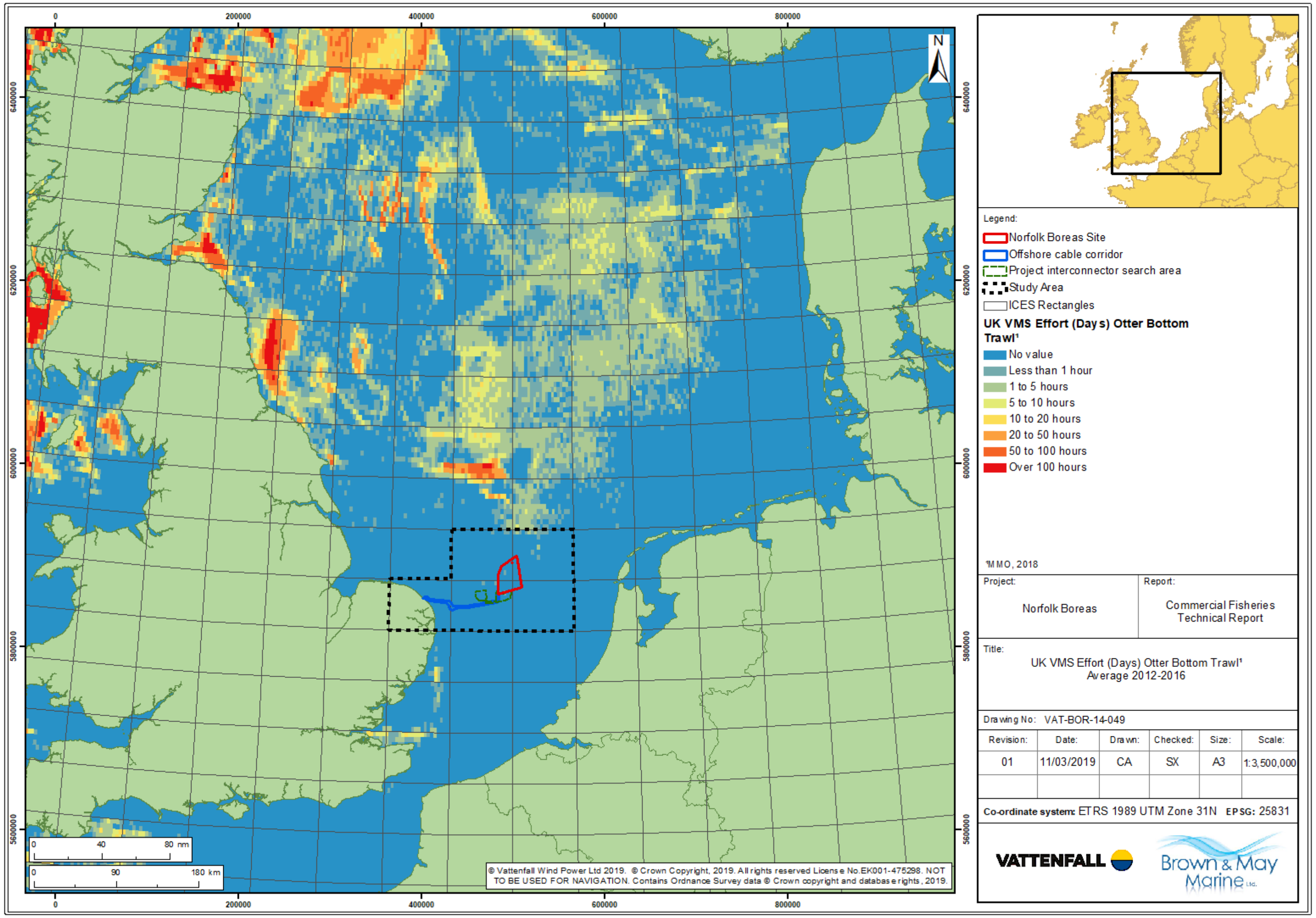


Figure 8.17 UK VMS effort by bottom otter trawl – wider region (average 2012 to 2016) (Source: MMO, 2018)

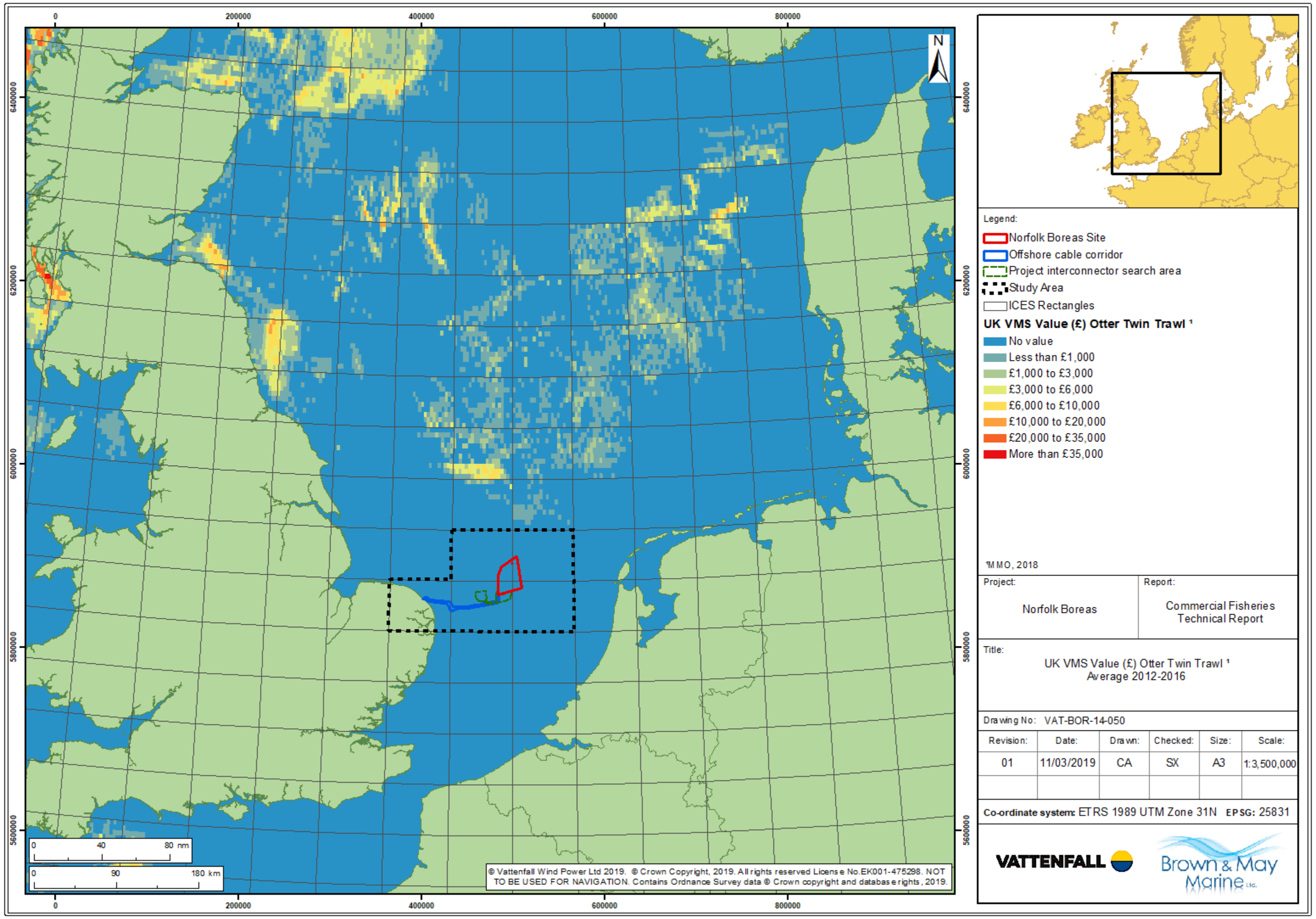


Figure 8.18 UK VMS value by bottom otter twin trawl – wider region (average 2012 to 2016) (Source: MMO, 2018)

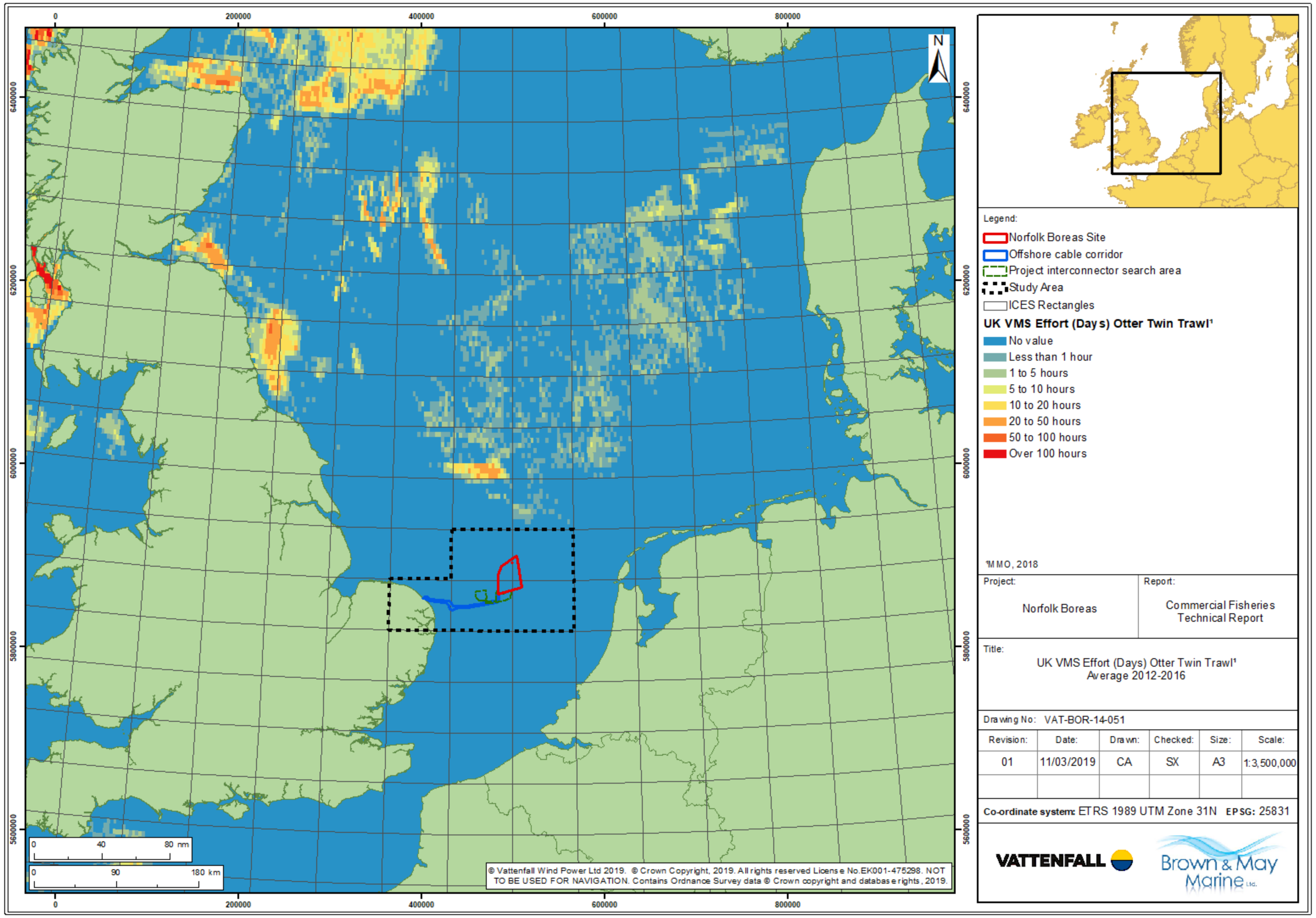


Figure 8.19 UK VMS effort by bottom otter twin trawl – wider region (average 2012 to 2016) (Source: MMO, 2018)

8.5 Vessels, Gear and Operating Patterns

85. The majority of UK vessels fishing in the offshore project area, particularly in the inshore section of the export cable corridor, are under 10m vessels beach launching from Sea Palling, Caister and Cromer and vessels operating from the ports of Lowestoft and Great Yarmouth.

86. The numbers of under 10m vessels registered on the MMO monthly vessel lists for ports relevant to Norfolk Boreas are outlined in Table 8.6. It should be noted that a vessel's port of registration and / or defined home port as specified in MMO vessel lists, does not always reflect the port from which a vessel operates.

Table 8.6 <10m Vessels registered on the MMO monthly vessel lists for ports close to Norfolk Boreas (source: MMO, 2018)

Port of Registry	Number of <10m Vessels Registered
Lowestoft	26
Cromer	25
Great Yarmouth	20

87. A total of six over 10m vessels are also registered at Lowestoft and one registered at Great Yarmouth. Two of the Lowestoft vessels are beam trawlers. Whilst these are on the UK register they are Dutch owned and operated but with UK fishing licences and under UK quotas. The effort and landings of these vessels are therefore incorporated into UK fisheries statistics even though the vessels rarely land their catches into UK ports.

88. Local vessels working from the key areas mentioned above (Sea Palling, Caister, Cromer, Lowestoft and Great Yarmouth) principally fish grounds within the UK's 12nm limit and mostly within the 6nm limit both in light of their limited operational range and to reduce the risk of potential conflicts with trawl gears. A number of the vessels are multi-purpose with the ability to switch between gears on a seasonal basis. The main method employed along this part of the East Anglian coastline is potting for lobster, edible crabs and whelks.

89. Fish species are targeted less frequently, mostly with the use of drifting and static nets and longlines. Target species are Dover sole, bass, skate, mackerel, cod, plaice and herring.

90. Typical examples of the local inshore vessels relevant to the project are shown in Plate 8.1, Plate 8.2, Plate 8.3 and Plate 8.4.

Plate 8.1 Vessel that operates longlines and nets from Lowestoft (source: BMM, 2015)

Plate 8.2 Potter from Sea Palling (source: BMM, 2016)

Plate 8.3 Multipurpose vessel (potting and netting) based from Caister (source: BMM, 2017)

Plate 8.4 Potter based in Cromer (source: BMM, 2016)

9 French Fleet

9.1 Surveillance Sightings of French Vessels

91. Surveillance sightings for French fishing vessels are illustrated in Figure 9.1. As shown, very few sightings have been recorded within the offshore project area. The majority of French vessels have been recorded close to the coast where they are understood to be transiting to fishing grounds or to port.

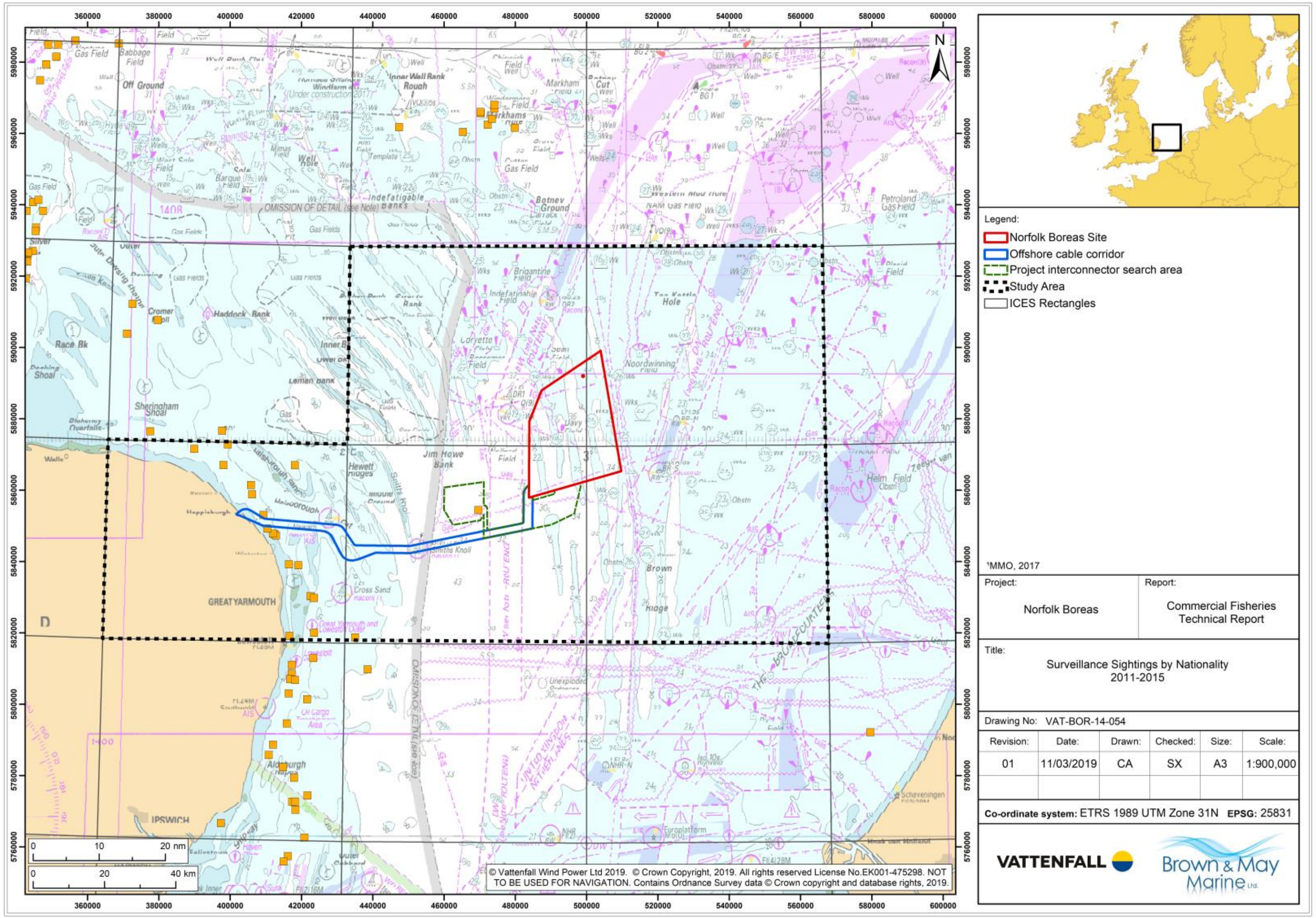


Figure 9.1 Surveillance sightings of French vessels by method (2011 to 2015) (Source: MMO, 2017)

9.2 Satellite Tracking (VMS) Data

92. In response to initial consultation and the publication of the UK offshore wind farms Round 3 Zone locations and boundaries Le Comité National des Pêches 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 Wind Farms Proposal 2009".

93. Despite numerous requests, up to date VMS data has not been forthcoming from French authorities. VMS charts included in the CNPMEM (2009) report have therefore been used to provide an indication of the distribution of French fishing activity in areas relevant to the offshore project area. These are given in Figure 9.2 and Figure 9.3.

94. Figure 9.2 illustrates that French fishing activity by demersal and pelagic trawls occurs at relatively low levels in the Norfolk Boreas site and the central section of the export cable corridor. These fleets primarily focus on grounds to the south of Norfolk Boreas. A similar pattern is illustrated for bottom otter trawls (Figure 9.3).

95. A more recent source of data is from IFREMER's 2014 annual report (Figure 9.4 to Figure 9.6). This shows French fishing effort (days) for over 18m vessels deploying bottom otter trawls, pelagic trawls and nets using large spatial units for analysis. As shown by the earlier CNPMEM data, low levels of activity are recorded in the offshore project area, with the highest activity levels concentrating to the south of Norfolk Boreas.

96. In line with the above, during consultation with the Comité Régional des Pêches Maritimes et des Elevages Marins (CRPMEM), Hauts de France (Table 2.1) it was noted that there is limited activity by the French fleet in the offshore project area, with French fishing vessels generally operating to the south of the project, at considerable distance. CRPMEM also noted that up to 10 demersal trawlers of over 20m in length target North Sea grounds, traditionally off Grimsby, and that these may occasionally fish in the proximity of the Norfolk Boreas site on their way back to port.

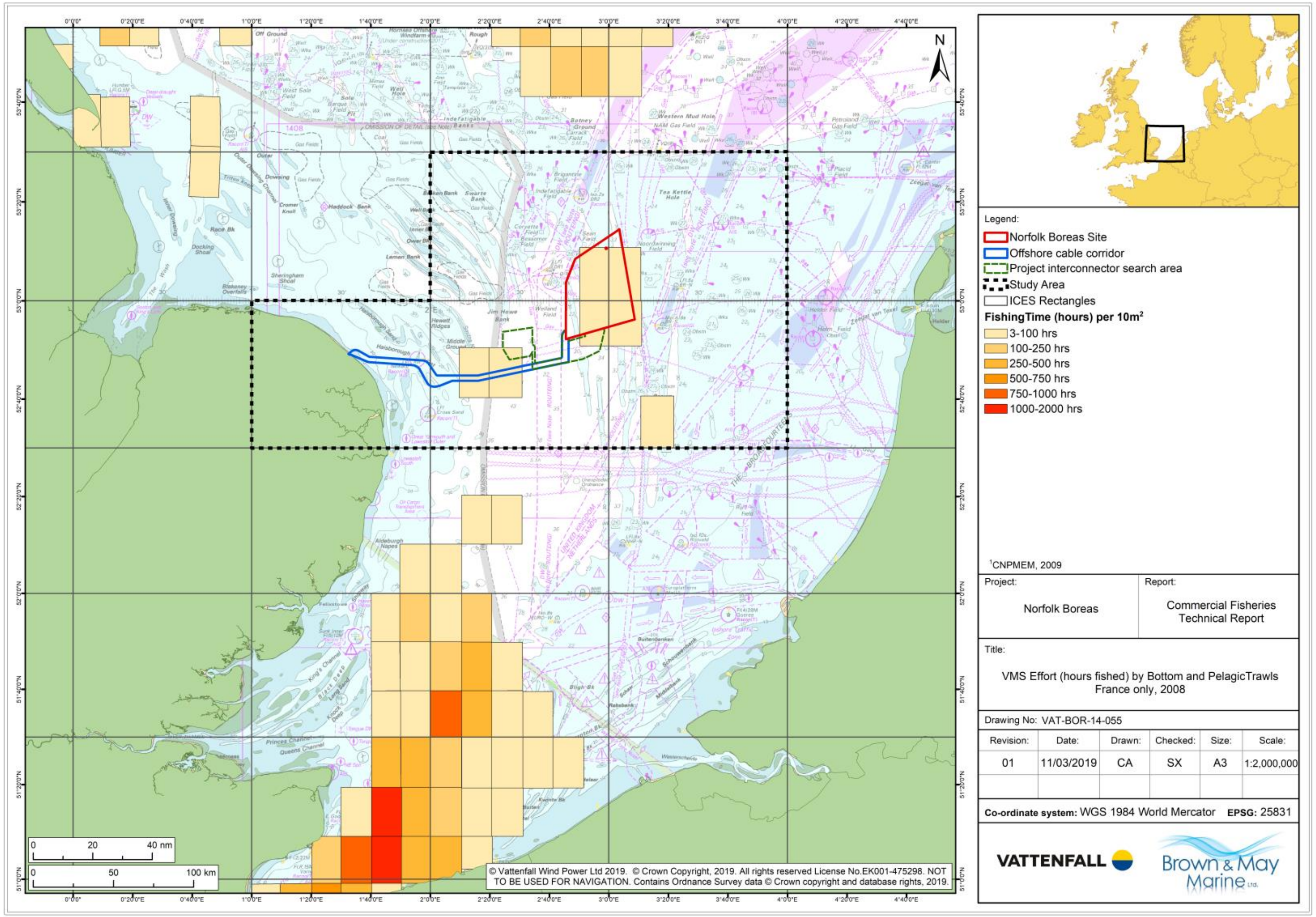


Figure 9.2 VMS effort data for bottom trawls and pelagic trawls (Source: CRPMEM, 2009)

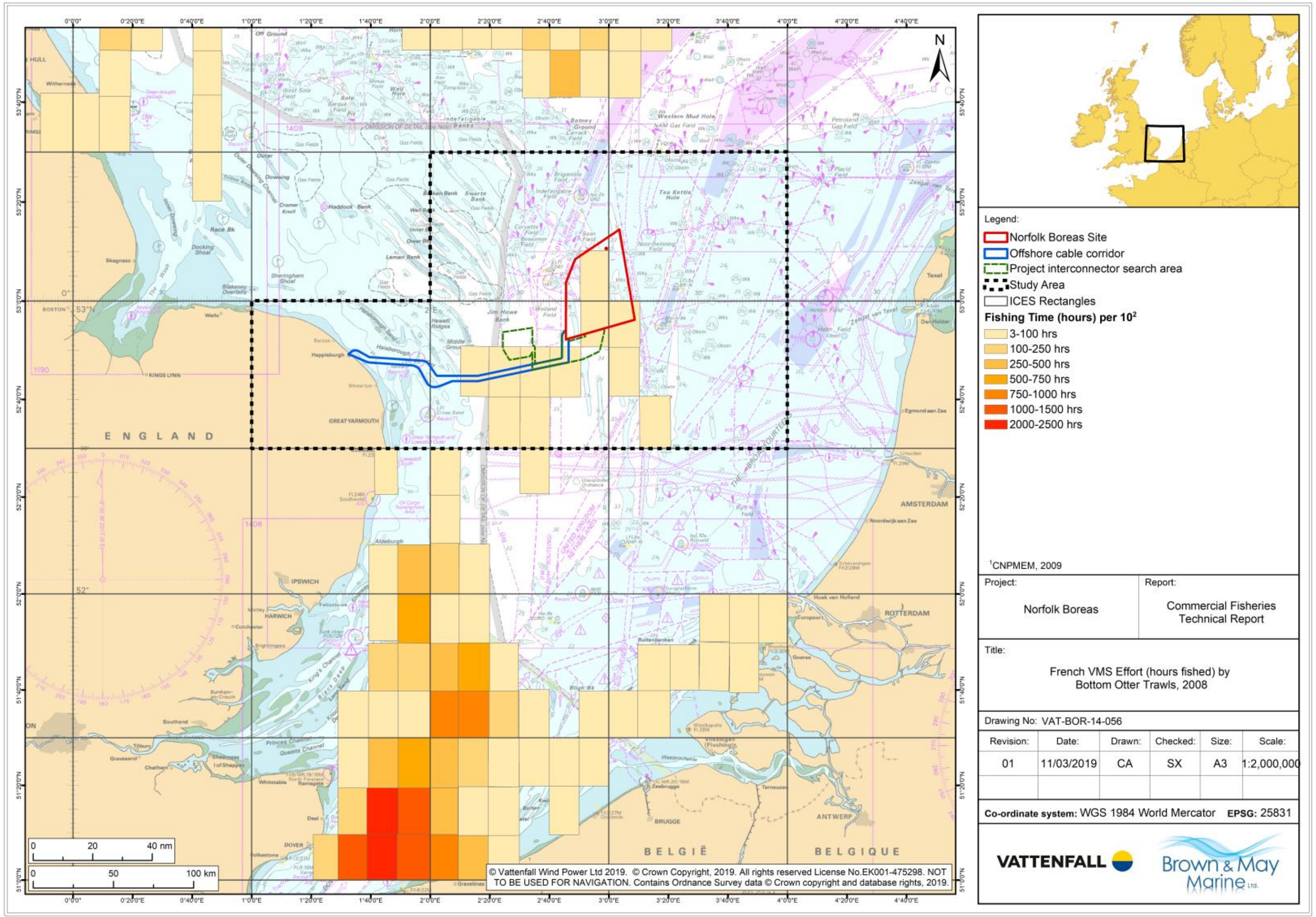


Figure 9.3 VMS effort by bottom otter trawls (Source: CRPMEM, 2009)

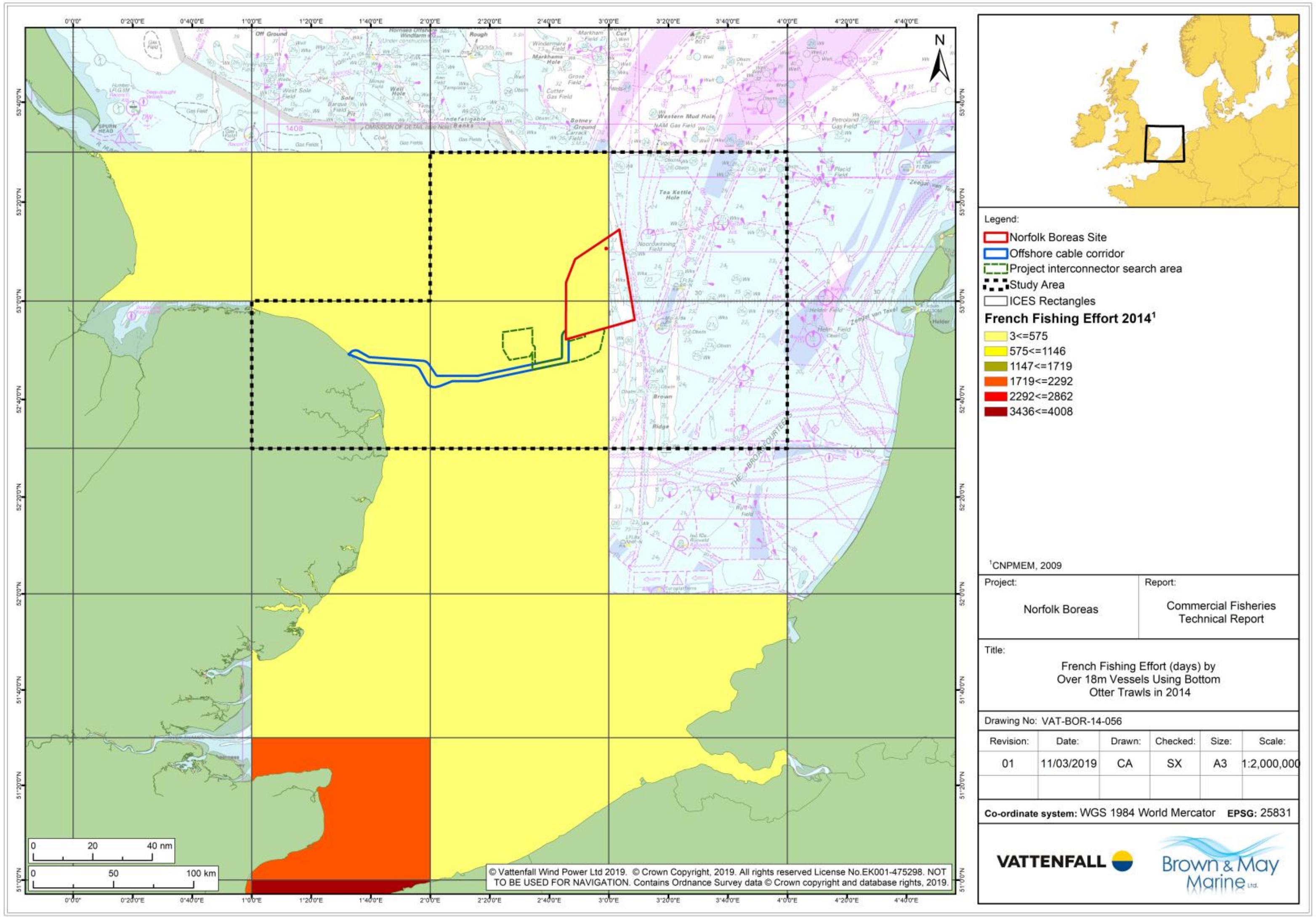


Figure 9.4 French fishing effort (days) by over 18m vessels using bottom otter trawls (2014) (Source: IFREMER, 2015)

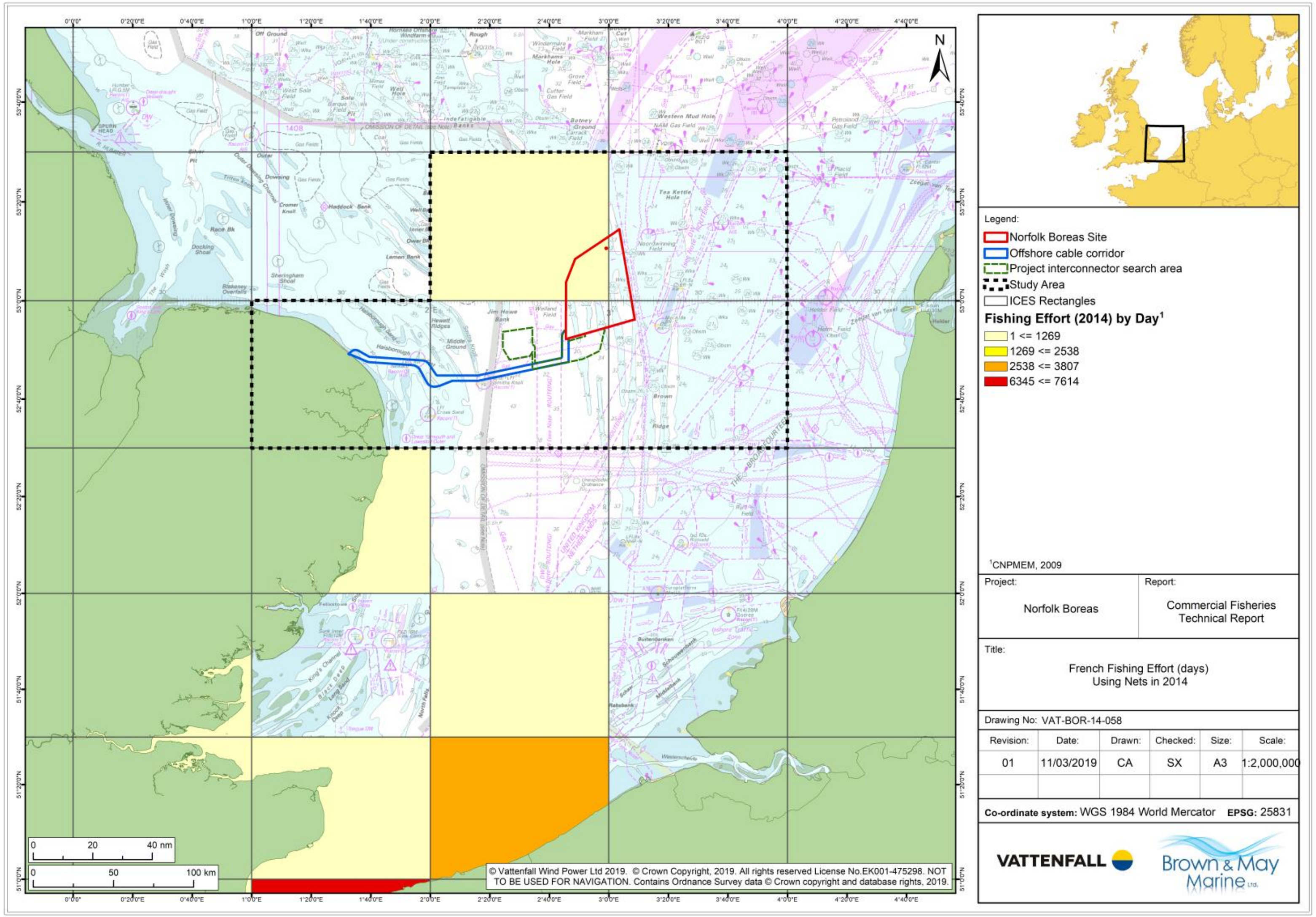


Figure 9.5 French fishing effort (days) by over 18m vessels using nets (2014) (Source: IFREMER, 2015)

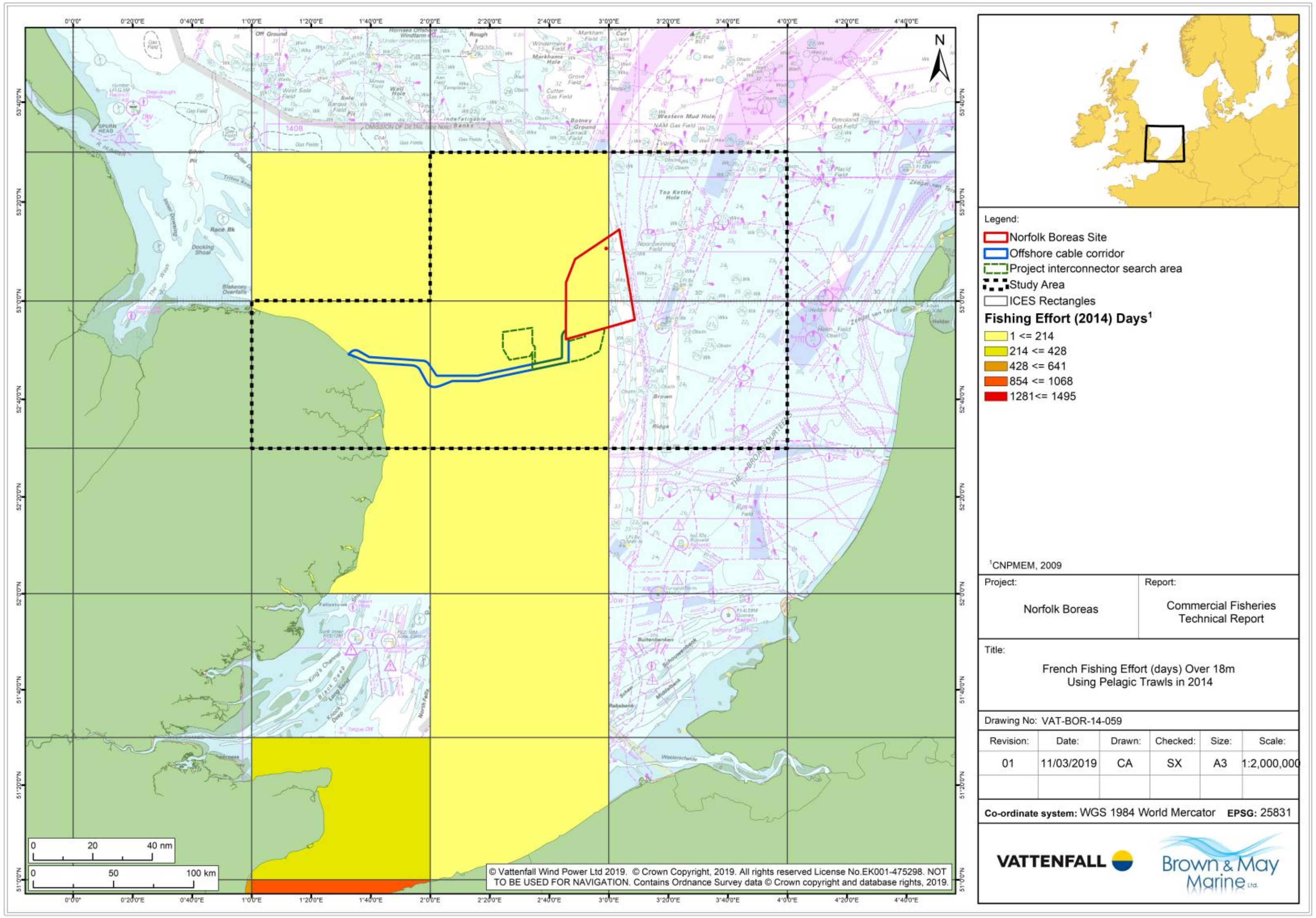


Figure 9.6 French fishing effort (days) by over 18m vessels using pelagic trawls (2014) (Source: IFREMER, 2015)

9.3 Vessels, Gear and Operating Patterns

97. As shown in the sections above, the principal methods deployed by French vessels in the offshore project area are bottom trawls and pelagic trawl. Bottom trawls primarily target demersal fish species and cephalopods (Dover sole, red mullet, cuttlefish, whiting and plaice). Pelagic trawls target a range of pelagic species such as herring, mackerel, horse mackerel and sardine.

The majority of French vessels are of the larger class of demersal otter trawlers (>18m in length) and operate predominantly from the port of Boulogne and to a lesser extent Dieppe. Examples of these vessels are shown in Plate 9.1.

Plate 9.1 French trawlers in Boulogne port (Source: BMM, 2017)

10 Danish Fleet

10.1 Surveillance Sightings of Danish Vessels

98. As shown in Figure 5.2 only a limited number of sightings of Danish vessels have been recorded in the offshore project area. These are predominantly of trawlers (Table 5.1 to Table 5.5).

10.2 Satellite Tracking (VMS) Data

99. An indication of the distribution of fishing activity of Danish trawlers (industrial sandeel fleet, pelagic / midwater trawlers and demersal trawlers) and Danish seine netters is given below based on available VMS data.

100. As shown in Figure 10.1, activity by the industrial sandeel fleet is mainly concentrated in areas such as the Dogger Bank (Central North Sea) and the Norwegian coast (Northern North Sea). Although not restricted to these areas, activity is considerably lower in the Southern North Sea, including in the offshore project area (Figure 10.1).

101. Whilst there are known sandeel grounds in areas relevant to the project (Jensen *et al.* 2011), the Danmarks Fiskeriforening Producent Organisation confirmed during consultation carried out for the neighbouring Norfolk Vanguard project (Pers. Comm: H. Lund, 22/12/2016) that activity in these areas has been at very low levels in recent years.

102. Similarly, activity by pelagic / midwater trawlers in areas relevant to Norfolk Boreas is also limited, with the highest levels of activity recorded to the west of the Danish coast (Figure 10.2). From consultation carried out for Norfolk Boreas (Per.Comm: H.Lund 03/07/2018) it is understood that some of the largest pelagic Danish vessels (45 to 90m) occasionally target a small fishery for sprat in some years in the vicinity of the Norfolk Boreas site.

103. In the case of Danish demersal trawling and seine netting as shown in Figure 10.3 and Figure 10.4, fishing is focused on grounds north of the offshore project area with no activity recorded in areas relevant to the project.

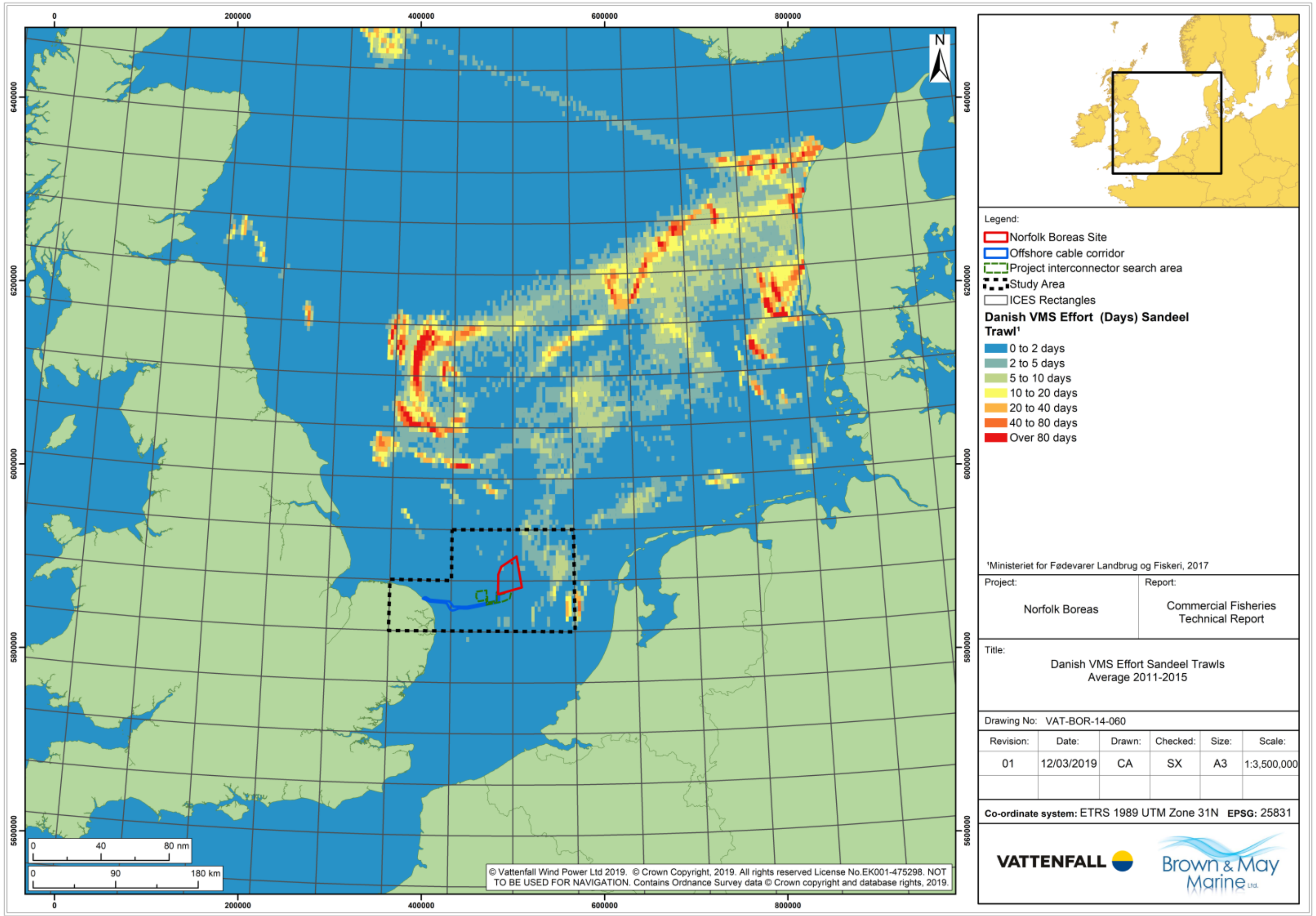


Figure 10.1 Danish VMS effort by sandeel trawl – wider region (average 2011 to 2015) (Source: Ministeriet for Fødevarer, Landbrug og Fiskeri, 2017)

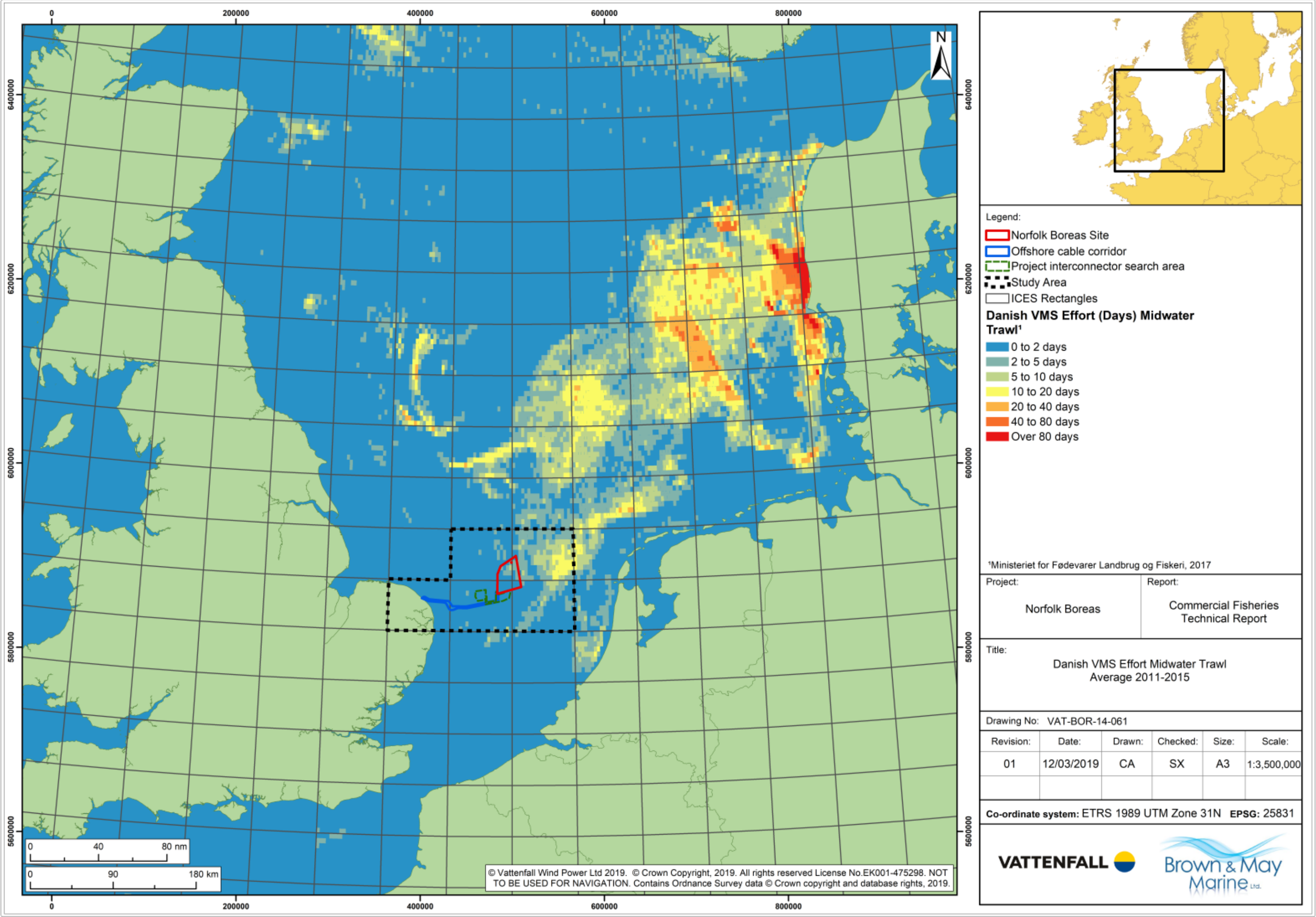


Figure 10.2 Danish VMS effort by pelagic– wider region (average 2011 to 2015) (Source: Ministeriet for Fødevarer, Landbrug og Fiskeri, 2017)

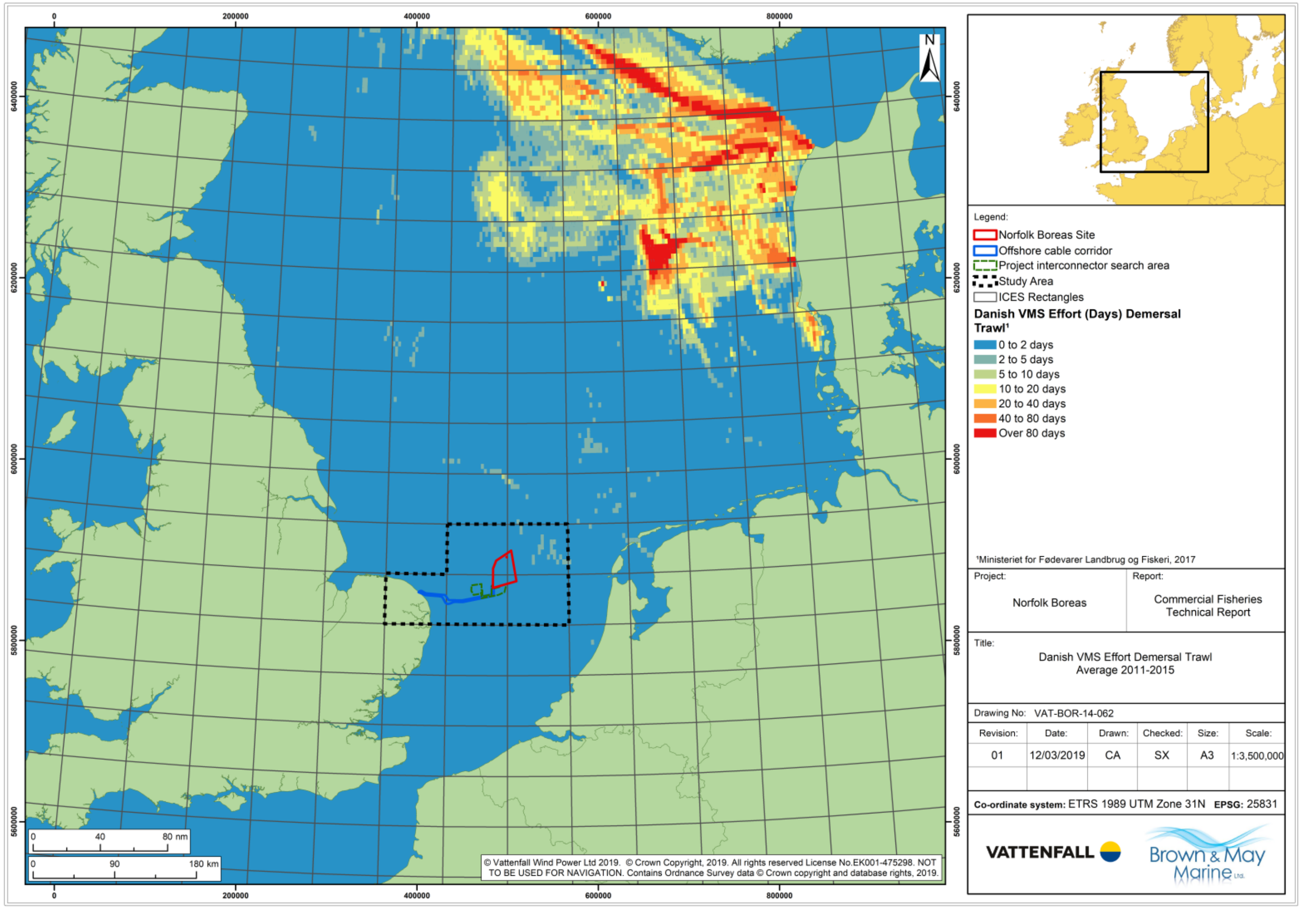


Figure 10.3 Danish VMS effort by demersal trawl – wider region (average 2011 to 2015) (Source: Ministeriet for Fødevarer, Landbrug og Fiskeri, 2017)

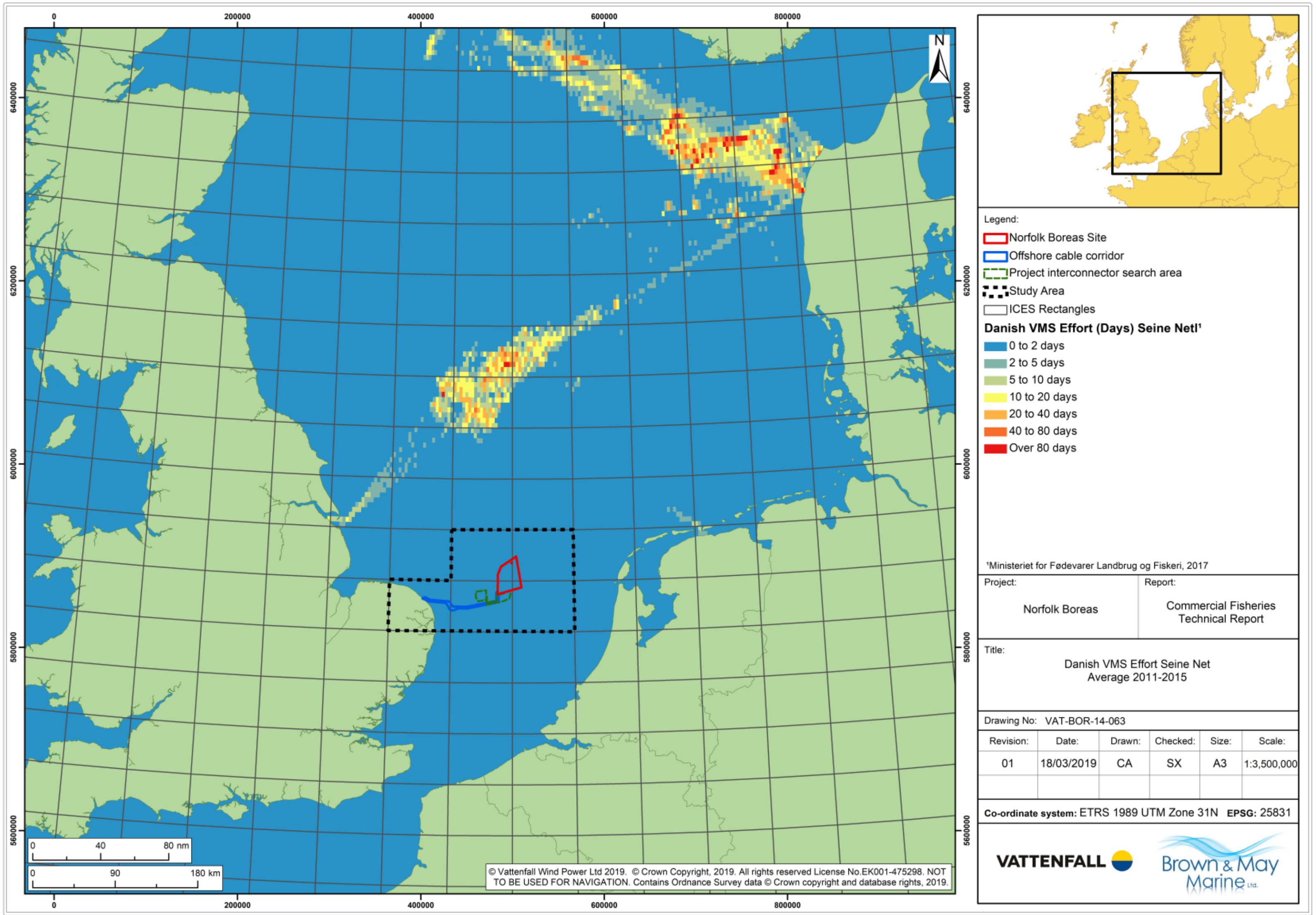


Figure 10.4 Danish VMS effort by seine net – wider region (average 2011 to 2015) (Source: Ministeriet for Fødevarer, Landbrug og Fiskeri, 2017)

10.3 Vessels, Gear and Operating Patterns

104. As indicated above through analysis of VMS data the methods of relevance in the offshore project area in respect of the Danish fleet are industrial sandeel trawling and pelagic / midwater trawling.

105. Danish sandeel trawling is undertaken by specifically designed industrial trawlers of up to 40m in length as well as occasionally by 65-80m pelagic trawlers whose principal fishing activity is the capture of higher value pelagic species, namely mackerel, herring and horse mackerel.

11 German Fleet

11.1 Surveillance Sightings of German Vessels

106. German fishing vessels have been recorded on very few occasions in surveillance sightings within the offshore project area (Figure 5.2). The majority of these are of beam trawlers (Table 5.1 to Table 5.5).

11.2 VMS Data

107. Analysis of the currently available VMS data (2011 to 2015) (Figure 11.1) indicates that negligible activity by German-registered vessels occurs in the offshore project area. Fishing activity by these vessels appears to mainly concentrate in the Dutch and Danish sectors of the Central North Sea.

108. Requests have been made to the German authorities for more recent VMS data. These have however not been made available at the time of writing this report.

11.3 Vessels, Gears and Operating Patterns

109. From consultation with VisNed it is understood that a significant proportion of the German fishing fleet whilst being on the German register of fishing vessels, fishing German licences and quotas, is actually Dutch owned and operated. Eight of the German-registered pulse beam trawlers are owned and operated by the Dutch. (Consultation meeting, 20th June 2018).

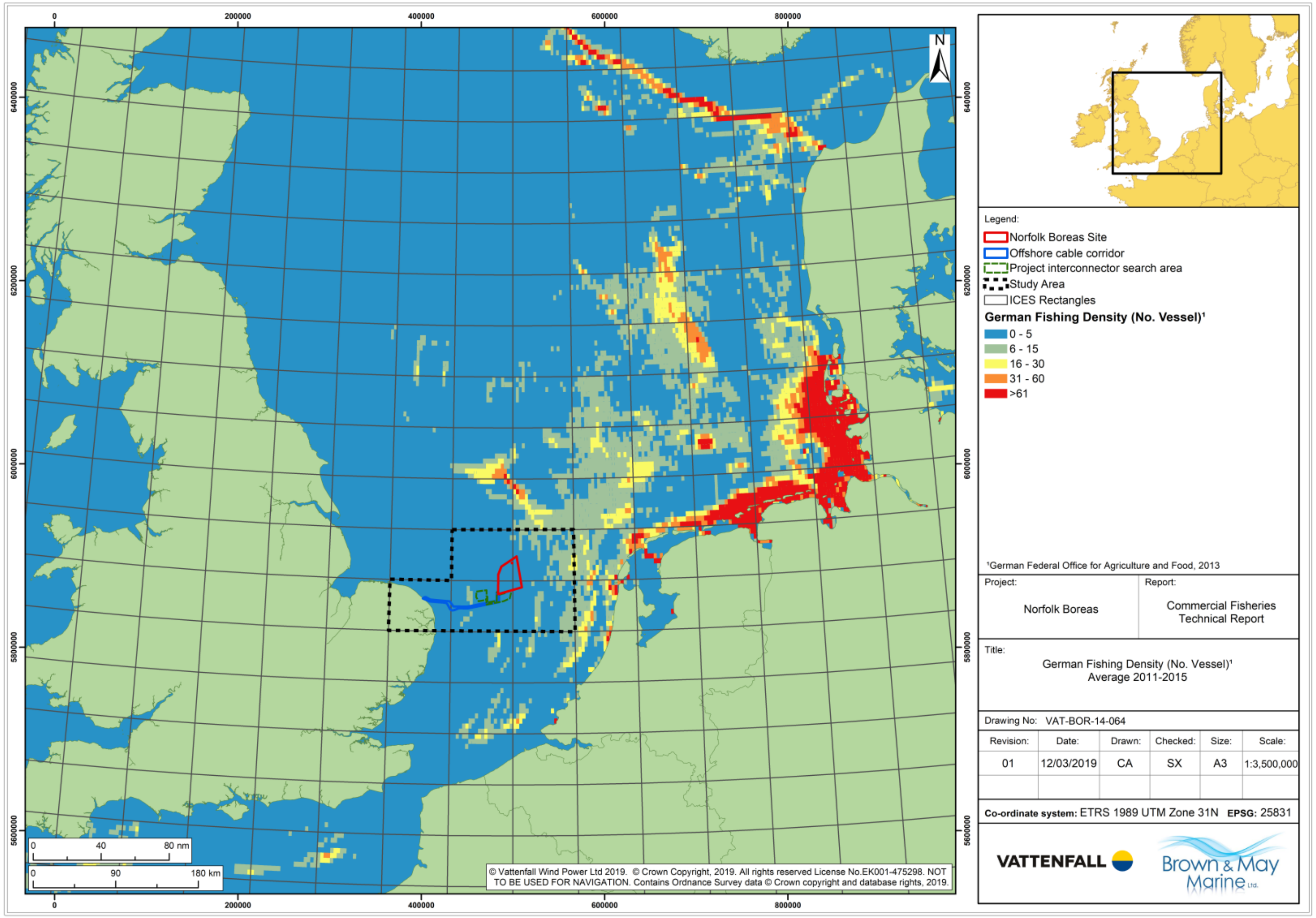


Figure 11.1 German VMS vessel density – wider region (average 2011 to 2015) (Source: German Federal Office for Agriculture and Food)

12 Future Patterns

110. Changes to quota and effort allocation, fishing areas and gear restrictions make predicting future patterns fishing activity difficult and to an extent subjective. Furthermore, significant changes to the CFP which are applied to all fleets in addition to the potential effects of Brexit are likely to have significant impacts on commercial fishing within the North Sea.

111. For foreign fishing fleets, Brexit may have a significant impact on quotas and accessibility to UK waters, as full fisheries independence within the UK's Exclusive Economic Zone (EZZ) has been postulated. At present, the final outcome in terms of foreign fleet's access within UK territorial limits is therefore difficult to predict. Whilst as stated above, full independence has been suggested, it is possible that to a large extent the current patterns of access and effort and catch controls may largely remain as they are at present following the end of the Brexit transition phase (31st December 2020).

112. Furthermore, regardless of Brexit, the pattern of fishing in the last 30 years has been one of significant change in vessel and gear design, operating practices, species targeted and the levels of controls and regulations to which fishing vessels have to adhere. Details of the existing and planned main elements of the Common Fisheries Policy affecting fisheries in the North Sea are given in Annex 3.

13 Summary

113. Fishing activity in the study area (ICES rectangles 34F1, 34F2, 34F3, 35F2 and 35F3) is undertaken by vessels from a range of nationalities.

114. In offshore rectangles 34F2, 34F3, 35F2 and 35F3, where the Norfolk Boreas site, project interconnector search area and offshore section of the offshore cable corridor are located, the majority of fishing activity is by Dutch vessels, particularly Dutch beam trawlers targeting flatfish species (Dover sole, plaice, turbot). The majority of these vessels deploy pulse wings. Whilst at much lower levels than beam trawling, seine netting is also undertaken by Dutch vessels in these offshore rectangles. Activity by Dutch vessels deploying other fishing methods occurs at negligible levels within the offshore project area.

115. Other vessel categories and nationalities active in areas relevant to the Norfolk Boreas site, project interconnector search area and the offshore section of the offshore cable corridor include:

- Belgian vessels, primarily beam trawlers and to a much lesser extent demersal otter trawlers and seine netters;
- UK vessels, primarily Anglo-Dutch (UK registered but Dutch owned and operated) beam trawlers, demersal otter trawlers at very low levels and on an occasional basis, local longliners and netters;
- French vessels deploying demersal and pelagic trawls;
- Danish vessels, primarily industrial sandeel trawlers and pelagic trawlers; and
- German vessels, principally beam trawlers, some of which are Dutch owned and operated.

116. In the nearshore area (ICES Rectangle 34F1) where the inshore section of the offshore cable corridor is located, fishing activity is principally undertaken by local UK vessels deploying static gears, primarily pots, longlines and nets. Most of these vessels are under 10m length and have therefore restricted operational ranges. As noted above, however, some longliners and netters occasionally target offshore areas, as far out as the area where the Norfolk Boreas site is located.

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Annex 1 – Fishing Methods

Beam Trawling

1. Beam trawling targets flatfish species, predominantly sole and plaice. Other species are also caught but to a lesser extent.

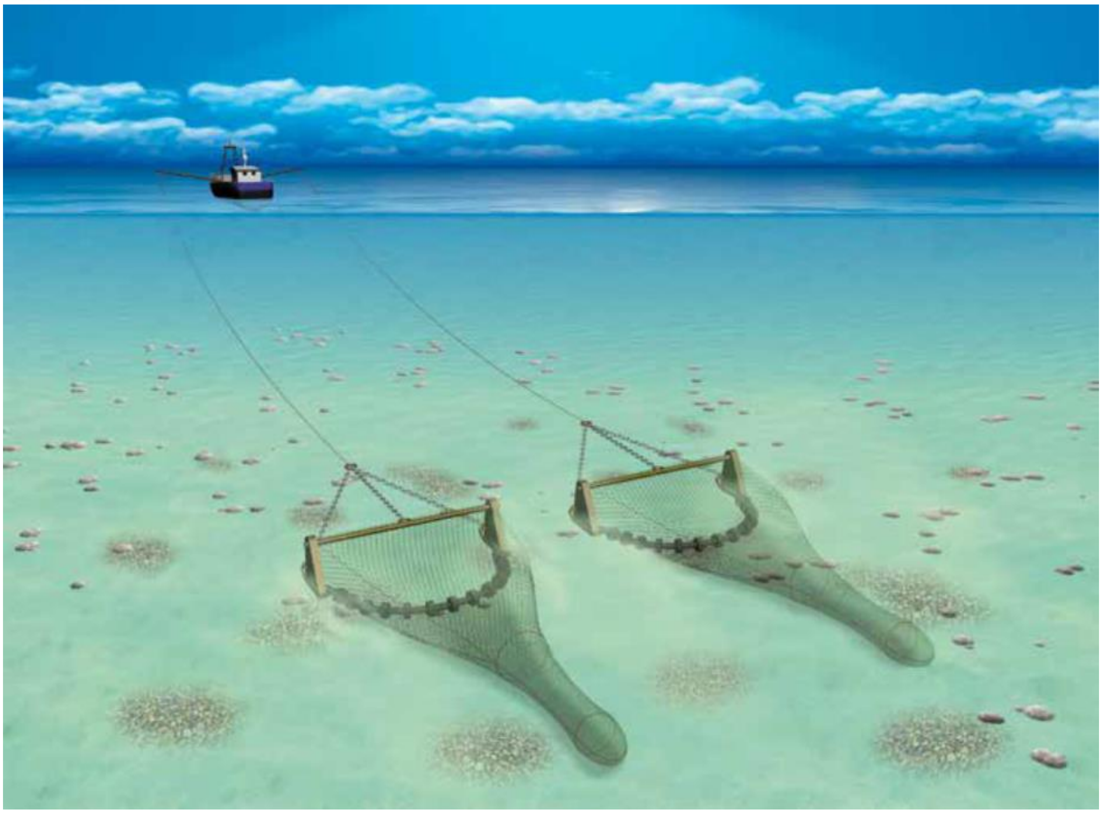
2. Traditional beam trawls comprise a steel beam held above the seabed to a height of up to approximately 50cm in by shoes at each end, onto which a net is attached. The beam is towed using chain bridles that attach to each of the shoes and gear and is towed from the vessel’s outrigger booms on either side of the vessel.

3. Tickler chains strung between the shoes ahead of the net ground line are used to disturb fish to rise from the seabed substrate into the path of the mouth of the net. When operating in areas of hard, rocky substrate, chain mats are used comprising a lattice of chains attached to the beam to hang down across the mouth of the net.

4. In the case of pulse wing trawls, the tickler chains and chain mats of conventional beam trawls are not used. This are instead replaced with trailing electrodes emitting low voltage 38-80 Hz electric pulses. The removal of the tickler chains and chain mats reduces seabed contact and therefore drag, resulting in a reduction in sea disturbance and the levels of unwanted bycatch and discarded benthos.

5. Beam trawls can range in length from four to twelve metres. Fully rigged (in air) weights of beam trawls used in the area can vary from four to six tonnes, although there has been a move to reduce weights and therefore drag in light of increasing fuel costs.

6. Towing directions are influenced by a number of factors such as seabed contours, tidal flow direction, weather and the need to avoid fasteners.

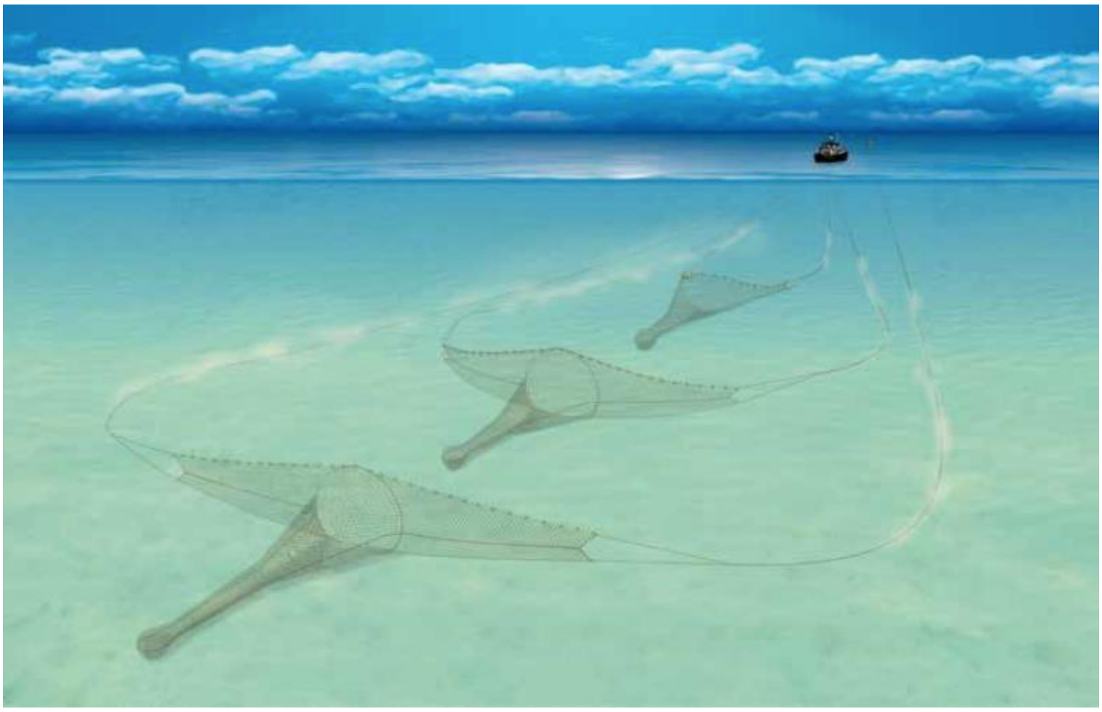


A beam trawl (Source: ©Seafish, 2015)

Seine Netting (Fly shooting)

7. Seine nets are deployed over clean seabeds free of obstructions for the capture of a range of demersal species. The seine ropes are laid on the seabed in a triangular pattern with the net located in the middle of the base of the triangle. Following deployment on the seabed, the initial phase involves the winching of the seine ropes so they move towards each other over the seabed. This exploits the reaction of the fish to swim away from the sediment cloud caused by the ropes moving over the seabed. Once the ropes are approximately parallel, the hauling speed is increased so that the net is hauled forwards capturing the fish that have been herded within its path. It is understood that the maximum lengths of ropes deployed each side of the net by the larger seine netters can be as much as 3 km (Seafish, 2015; Pers. Comms: P. Visser, 11/04/2018).

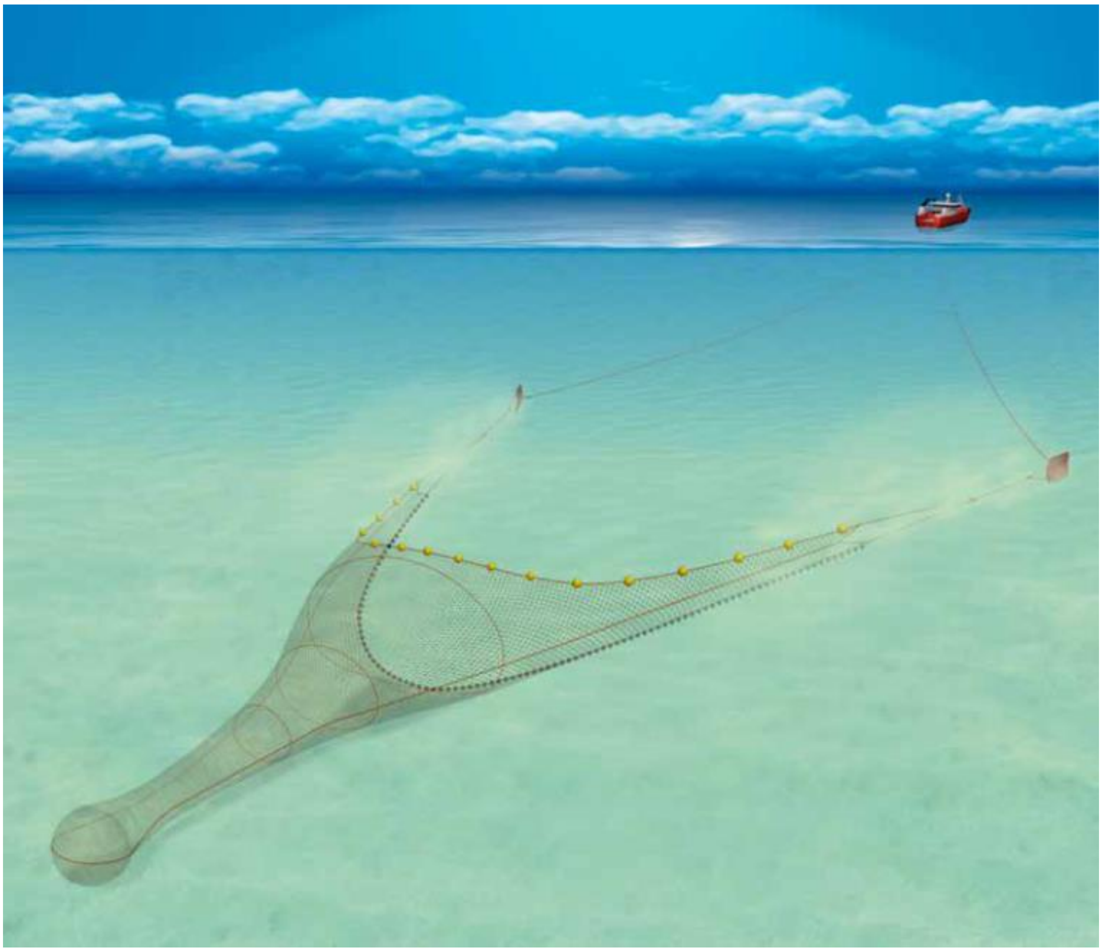
8. The majority of seine netters within the Dutch fleet are converted beam trawlers, the rationale for the switch to seine netting being in part due to the rise in fuel prices, as seine nets per tonne of fish caught consume considerably less fuel than beam trawlers.



Seine nets (Source: ©Seafish, 2015)

Demersal Otter Trawling – Single Rig

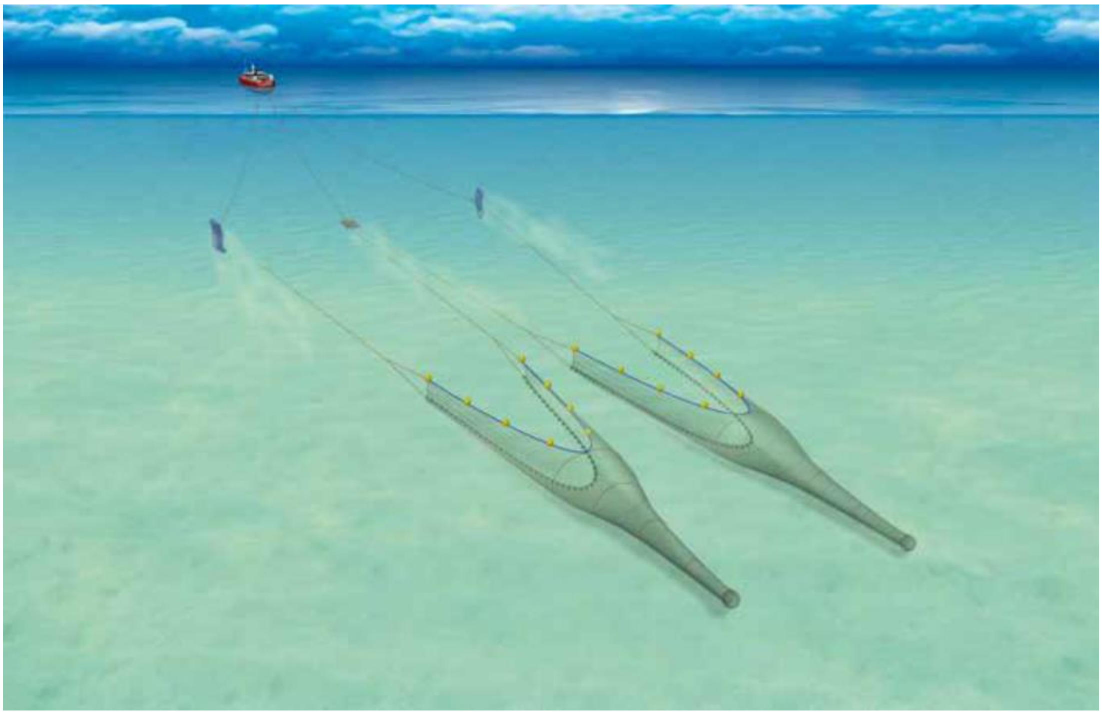
9. The otter trawls as used by French and indeed UK trawlers are essentially a funnel shaped net towed over the seabed, with the fish being retained within the cod end. The horizontal opening of the net is achieved by a combination of the hydrodynamic and ground sheer forces acting on the trawl doors. The vertical opening of the net is maintained by a series of floats along the net headline and the base of the net kept on the seabed by the weighted ground line, which for fishing over rough ground can be fitted with a series of rubber disks known as "rock hoppers". The effective gear width of demersal otter trawls is the distance between the trawl doors which can range from 25m for smaller vessels and up to 65m for larger vessels. Towing speeds are between 2.5 and 3.5 knots, depending on tidal state, seabed conditions and weather.



Single rig otter trawl (Source: ©Seafish, 2015)

Demersal Otter Trawling – Twin Rig

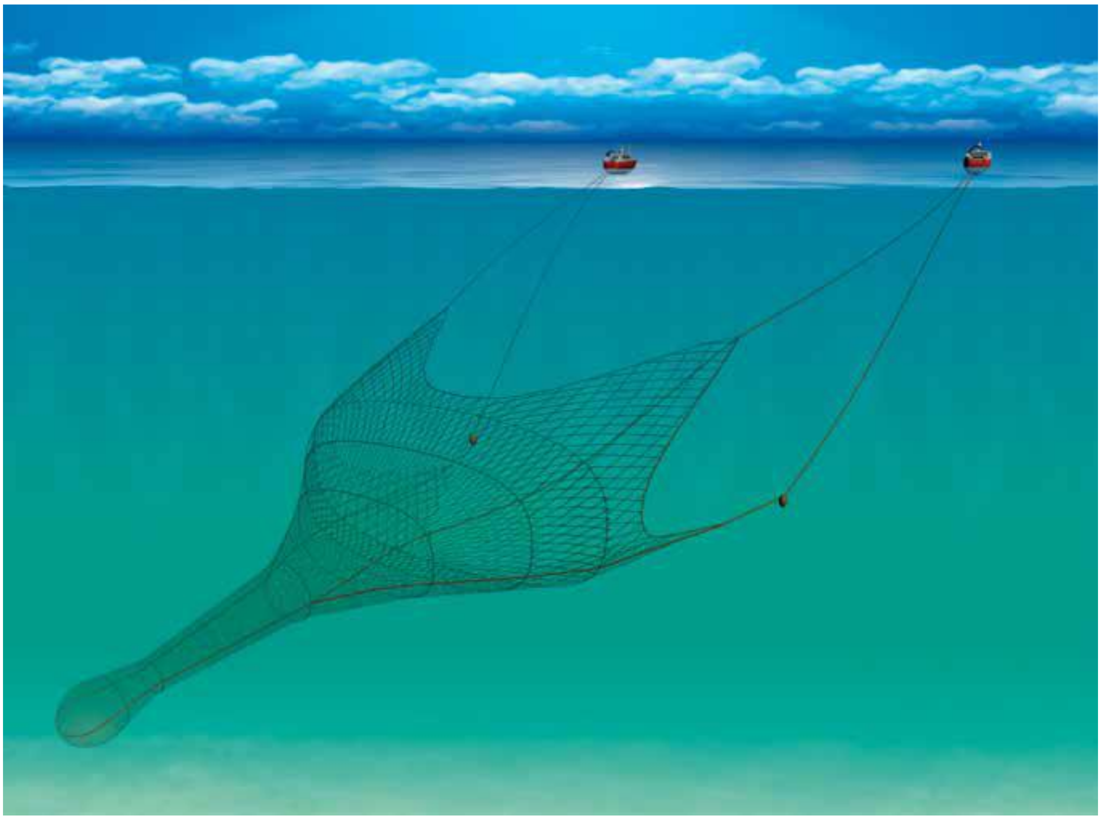
10. A more common type of demersal trawling is twin-rig trawling whereby two nets are towed side by side with trawl doors attached via sweep lines to the outer wing ends of each net. The inner wing ends of the net are attached to a central clump weight which is normally towed from a third towing warp. The advantage of twin-rig trawling is the increased area of seabed trawled. Towing speeds are generally the same as for single net trawling although the effective gear width can be as much as 110m.



Twin rig otter trawl (Source: ©Seafish, 2015)

Pelagic / Midwater Trawling

11. Pelagic trawling primarily targets shoaling species such as mackerel, sprats, and herring. Danish pelagic trawlers also occasionally catch sandeel. The location of the shoals is determined by sonar or vertical sounder echoes detected by the vessels. Pelagic trawls typically have a larger opening than demersal trawls, of up to 160m deep and 240m wide, and usually are made using four panels to help them achieve a greater height than demersal trawls.



Twin rig pelagic / midwater trawl (Source: ©Seafish, 2015)

Potting

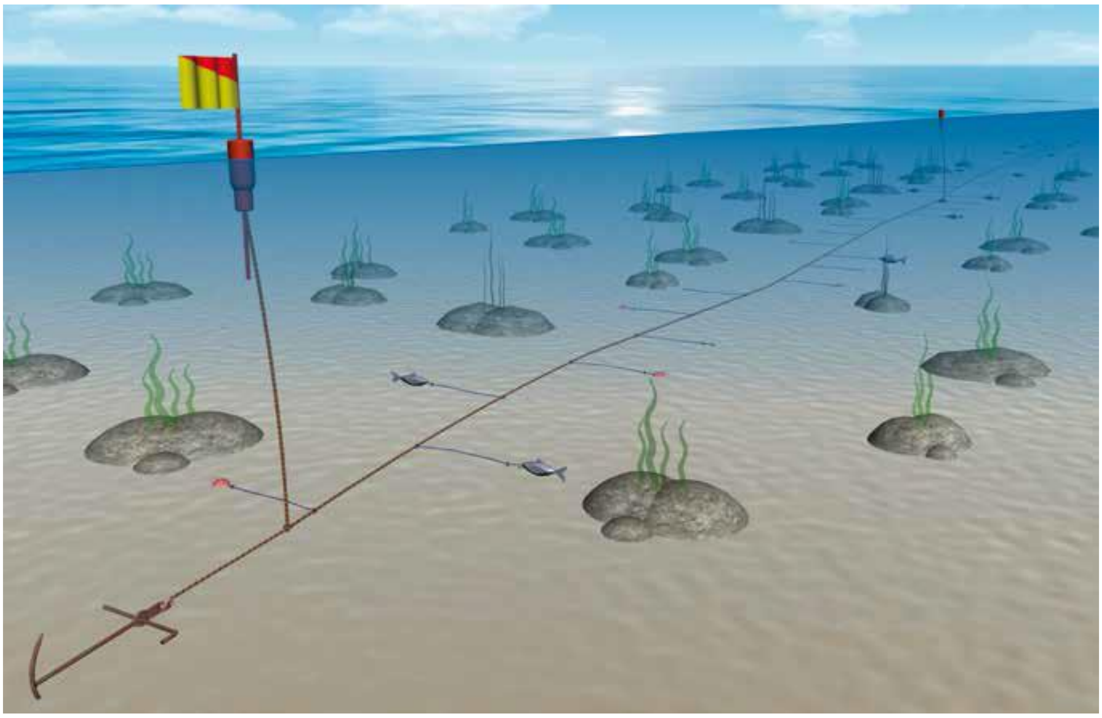
12. Potting for crab, lobsters and whelks occurs throughout the Southern North Sea. In general, crab and lobster pots have one or more "funnel" shaped entrances. Pot designs can however vary depending on region and target species. Pots can be rigged in fleets of between 10 and 50 pots per fleet, depending upon vessel size and the area to be fished. The lengths of fleets of pots may range from 100 to 500m, secured at each end with either anchors or 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) generally varies from approximately 12 hours to two days, although this can be longer during periods of adverse weather.

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

Whelk pots (left) and “parlour” pots (right) used to target whelks and lobsters (source: BMM 2016, 2013)

Longlining

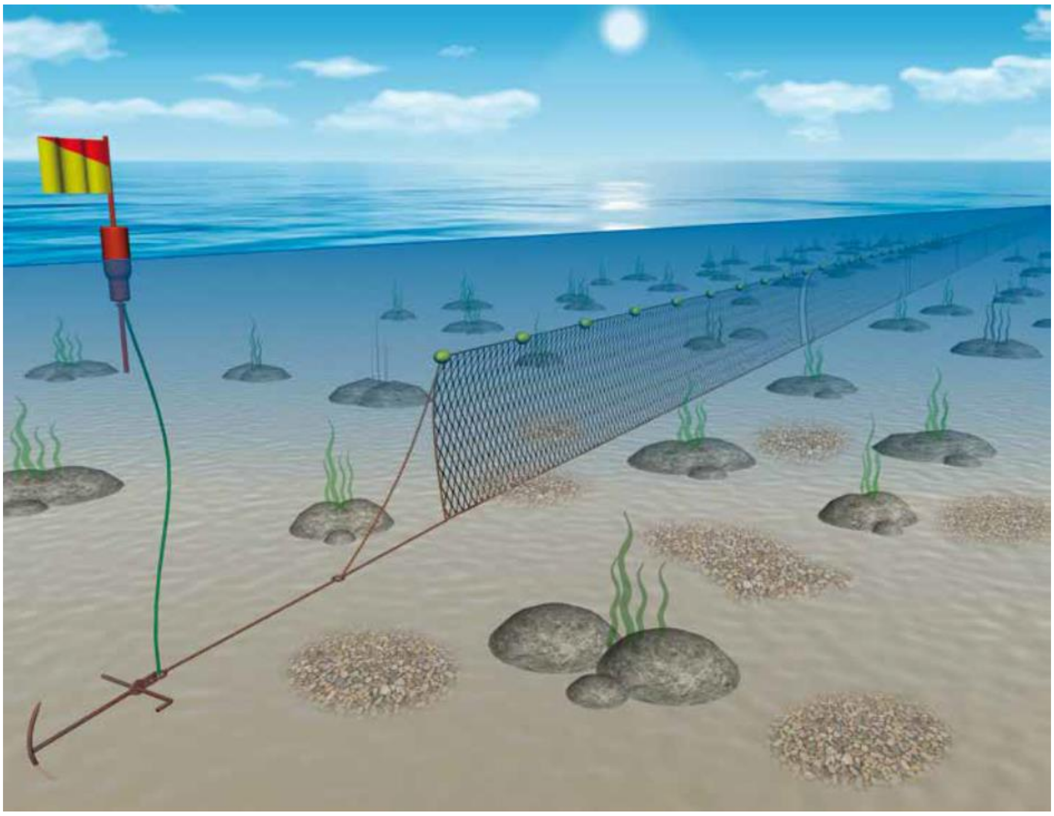
14. Longlining involves a main line on to which a series of shorter lengths of line (snoods) are attached with baited hooks. Longlines can be up to several miles in length with anchors at regular intervals and at each end. This method can be used to catch both demersal and pelagic fish species but in the area under consideration it is used primarily for the capture of demersal species, particularly cod. It is known to be fuel efficient and is recognised as a selective method with minimal bycatch.



Demersal Longlines (Source: ©Seafish, 2015)

Gillnetting

15. Fleets of gillnets usually comprise a series of four to six 500m monofilament nets joined together. Nets can be either fixed or drifting. As with fleets of pots, each end of the fleet of nets is marked by surface marker buoys. Gillnets can either be panels of monofilament nets, also called tangle nets or trammel nets, which consist of a smaller mesh inner net with larger mesh net panels on either side. Fixed nets are set normally only during neap tides. Drift nets are deployed across the tide and left for a period of three to six hours to drift with the tidal current.



Fleet of bottom set gillnets (Source: ©Seafish, 2015)

Annex 2 – Data Sources

MMO Surveillance Sightings Data

1. 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 2011 and 2015. It is known that this data includes sightings from KEIFCA patrol vessels.

2. Examination of surveillance sightings for 2016 showed no sightings recorded within the study area for that year. This was due to a modification in the MMO supplier's data collection system, which was recently changed to a call out basis (Pers. Comms: L. Conlon, 09/04/2018). As a result, 2016 sightings data have not been included for analysis.

Fisheries Statistics – Landings Data

UK

3. UK fisheries statistical data are collected by the MMO by ICES rectangles for all UK and non-UK vessels landing into UK ports. In order to inform this assessment, landings values data were provided by the MMO for the for the ten-year period between 2007 and 2016. This data set has been analysed to identify:

- Species targeted
- Fishing methods used
- Annual variations
- Seasonal variations
- Landings values by port

4. The main source of fisheries landing data is the EC daily log sheets that all vessels over 10m must complete and submit. Fishing vessels under-10m 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-10m fleet into ICES rectangles on the basis of best estimate.

The Netherlands

5. Dutch landings data for the period 2013 to 2017 has been provided by IMARES, Netherlands. Dutch landings data are given by ICES rectangle in Euros (€) by method and species

Belgium

6. Belgian landings values data have been provided by ILVO for the years 2010 to 2014. The landings values are given by ICES rectangle in Euros (€) by method and species.

Satellite Tracking (VMS) Data

UK

7. VMS data is the most comprehensive fisheries data set currently available for over-15m fishing vessels. Since January 2005, all EC vessels over 15m 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.

8. 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 2012 to 2016. 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. Specific fishing methods have been identified: pelagic trawls, demersal trawls, beam trawls, otter trawls (not specified), otter trawls (bottom), otter twin trawls. 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).

9. 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 the MMO however, data for these vessels are not included in this report.

The Netherlands

10. LEI Netherlands has provided BMM with VMS data for Dutch vessels fishing in all waters between 2013 and 2017, inclusive. This data integrates VMS with landings values for the fleet by gear type. This was made possible by the valuable assistance provided by VisNed in obtaining permission on behalf of their members for IMARES to provide the data requested. The VMS data is provided by value (€) and effort (days at sea) by method.

Belgium

11. VMS data has been provided by ILVO for the years 2010 to 2014. The data has been filtered by speed with all speeds of zero removed and the VMS data only applies to vessels over 15m in length. The VMS data is provided by value (€), and effort (days at sea). Value and effort have been provided by method.

France

12. Despite a number of requests, the French authorities have yet to provide VMS data on French registered vessels. In the absence of this data, information published in a report by IFREMER in 2015 has been included to give an indication of the relative distribution of French fishing activity. In addition to VMS data for 2008 included in the “French Answer to the Consultation on Round 3 UK Wind Farms Proposal” report (CNPMEM, 2009) has been used to inform the assessment.

Denmark

13. Ministeriet for Fødevarer, Landbrug og Fiskeri (Ministry of Food, Agriculture and Fisheries) has provided BMM with VMS by effort (days) between 2011 and 2015, inclusive, in all waters. The data has been collected as previously described and can be split into gear categories.

Germany

14. VMS dataset for German vessels were provided by the Federal Office for Agriculture and Food, Germany (Bundesanstalt für Landwirtschaft und Ernährung, BLE) for 2011 to 2015. Only density has been calculated, filtered by speed with vessels travelling at speeds of between 1 and 6 knots presumed to be fishing (Lee et al., 2010).

Annex 3 – Fisheries Legislation

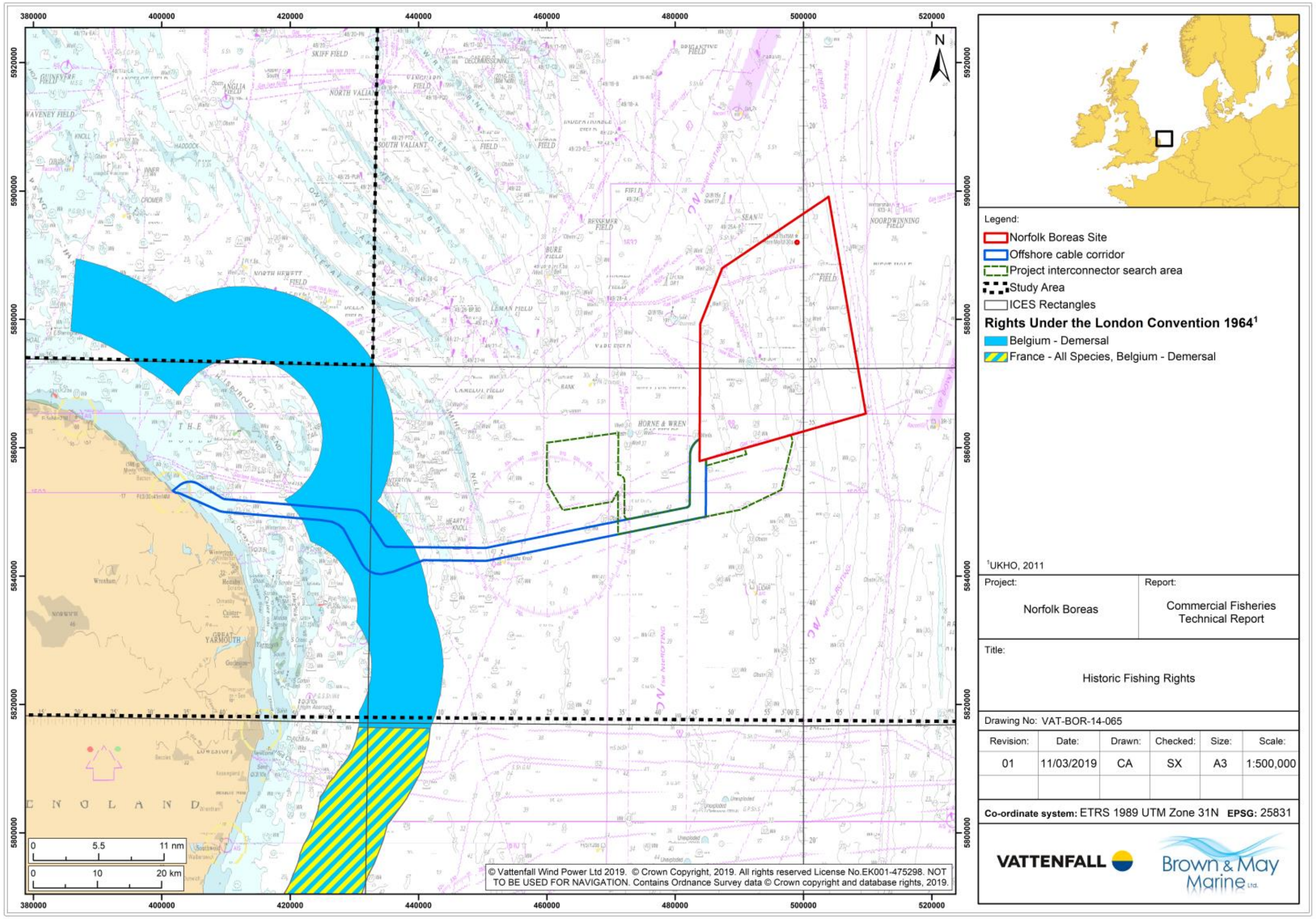
Fishing Vessel Licences

1. 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.

Territorial Limits and Fishing Rights

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

![Royal HaskoningDHV logo] ![Vattenfall logo]



Historic fishing rights in relation to the Norfolk Boreas (Source: UKHO, 2011)

Regional and Local Fishing Restrictions

3. Norfolk Boreas falls within the jurisdiction of the Eastern IFCA, which enforces the local byelaws within 6nm of the coast. Byelaws include:

- Minimum Landing Sizes (MLS) for fish and shellfish species
- Prohibition of specific gear types in SAC designated area.
- Seasonal and temporary closures as deemed necessary
- Non-removal of “white footed” crabs, known to be soft following moult between 1st November and 30th June
- Fishing permits for shellfish species such as whelks within 6nm limit.

Quota Restrictions

4. 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.

5. 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.

Over 10m Fleet

6. National, regional and individual quotas for the over-10m 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.

Under 10m Fleet

7. 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 300kg of quota species per year (NUFTA, 2012).

Effort (Days at Sea) Restrictions

8. In addition to quota restrictions, the over-10m 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 is likely to alter the current effort restrictions.

The Common Fisheries Policy (CFP)

9. 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.

10. 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.

11. 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 the 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.

Shellfish Entitlements

12. 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-10m and have a valid shellfish licence must submit weekly log sheets for crab and lobster to the local Fishery Officer.

Marine Protected Areas

13. 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 project:

- 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

- Marine Conservation Zones (MCZs) – designed to protect species and habitats of national importance under the Marine and Coastal Access Act (2009)

Future Regulations

Quotas and Effort

Changes in Quotas

14. 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.

Community Quota

15. 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-10m fleet. The scheme will 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).

Days at Sea

16. Over-10m 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.

Changes in Fleet Composition, Fishing Vessels and Gear

17. 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 could have the potential to affect the fishing method or gear a vessel employs:

Changes in Fleet Size

18. 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.

Increases in Fuel Costs

19. 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.

Increased Restrictions upon Certain Fishing Methods

20. 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.

Change in Fishing Practices

21. Fuel can constitute up to 60% of a fishery's cost. It is predicted that increasing 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.

Sustainable Fisheries and Consumer Demand

22. The fishing industry is increasingly working in collaboration with fisheries scientists to adopt ecosystem-based approaches for increasing 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.

23. 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.