

Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

Environmental Statement

Volume 2

Chapter 9: Commercial Fisheries

June 2018, Revision A

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Vattenfall Wind Power Ltd
Thanet Extension Offshore Wind Farm
Volume 2
Chapter 9: Commercial Fisheries
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9 COMMERCIAL FISHERIES

9.1 Introduction

- 9.1.1 This chapter of the Environmental Statement (ES) provides an assessment of the potential impacts on commercial fisheries of the Thanet Extension Offshore Wind Farm (referred to as Thanet Extension hereafter) proposed by Vattenfall Wind Power Ltd (VWPL).
- 9.1.2 This chapter should be read in conjunction with the Commercial Fisheries technical reports, the Fish and Shellfish, and Shipping and Navigation Chapters (Document References: 6.4.9.1, 6.2.6 and 6.2.10 respectively).
- 9.1.3 For the purpose of this report only commercial fishing activity is considered, which is defined as the activity by licensed fishing vessels undertaken for the legitimate capture and sale of finfish and shellfish. The baseline evaluation and assessment focusses specifically on those fleets which are active in the vicinity of the Thanet Extension. The assessment considers and evaluates impacts on local, national and international fishing fleets.

9.2 Statutory and policy context

- 9.2.1 The assessment process has taken account of guidance provided in the National Policy Statement (NPS) for renewable energy infrastructure (EN-3): Offshore Wind Farm Impacts – Commercial fisheries and fishing. The NPS guidance notes relevant to commercial fisheries are described in Table 9.1.

Table 9.1: Legislation and policy context

Policy / legislation	Key provisions	Section where provision addressed
NPS EN-3 Section 2.6.122	The construction and operation of offshore wind farms (OWF) can have both positive and negative effects on fish and shellfish stocks	Volume 2, Chapter 6: Fish and Shellfish Ecology
NPS EN-3 Section 2.6.123	Whilst the footprint of the OWF and any associated infrastructure may be a hindrance to certain types of commercial fishing activity such as trawling and longlining, other fishing activities may be able to take place within operational wind farms without unduly disrupting or compromising navigational safety. Consequently, the establishment of a wind farm can increase the potential for some fishing activities, such as potting, where this would not compromise any advisory safety area in place. The IPC should consider adverse or beneficial impacts on different types of commercial fishing activity.	Section 9.17
NPS EN-3 Section 2.6.124	In some circumstances, transboundary issues may be a consideration as fishermen for other countries may fish in waters within which OWFs are sited.	Section 9.23
NPS EN-3 Section 2.6.127	Early consultation should be undertaken with statutory advisors and with representatives of the fishing industry which could include discussion of impact assessment methodologies. Where any part of the proposal involves a grid connection to shore, appropriate inshore fisheries groups should also be consulted.	Section 0 Section 9.7

Policy / legislation	Key provisions	Section where provision addressed
NPS EN-3 Section 2.6.129	The assessment by the applicant should include detailed surveys of the effects on fish stocks of commercial interest and any potential reduction in such stocks, as well as likely constraints on fishing activity within the project’s boundaries. Robust baseline data should have been collected and studies conducted as part of the assessment.	Fish and Shellfish Ecology (6.2.6) and Section 9.7
NPS EN-3 Section 2.6.130	Where there is a possibility that advisory safety areas will be sought around offshore infrastructure, potential effects should be included in the assessment on commercial fishing.	Section 9.17
NPS EN-3 Section 2.6.131	Where the precise extent of potential advisory safety areas are unknown, a realistic worst-case scenario should be assessed. Applicants should consult the Maritime and Coastguard Agency (MCA). Exclusion of certain types of fishing. The assessment by the applicant should include detailed surveys of the effects on fish stocks of commercial interest and the potential reduction or increase in such stocks that will result from the presence of the wind farm development and the implementation of any advisory safety areas.	Section 9.17

9.3 Consultation and scoping

Table 9.2: Summary of scoping responses

Consultee	Scoping Opinion	Section where comment addressed
Secretary of State (SoS)	The SoS requested both commercial fisheries and fish and shellfish assessments should reflect the important inter-relationship of impacts on these two disciplines. They requested evidence that statutory consultees had been approached in relation to the proposal not to undertake further site surveys. A clear justification of the estimations of commercial fishing activity levels and relative importance to local, national and international fleets should be given. There is also a requirement to ensure a Fisheries Liaison Officer (FLO) is in place as part of the mitigation as well as clearly identifying requirements for exclusion zones and the extent and duration of these.	Section 9.7 Fisheries Liaison Co-existence Plan (Document reference: 8.8)
The Marine Management Organisation (MMO); 2/2/2017	With regard to commercial fisheries it was highlighted that the sole fishery was the most valuable to all vessels operating in the area. The MMO also requested that the possible implications of fishing displacement pressure on other areas should be scoped in. It was stated that the Kent & Essex Inshore Fisheries Conservation Authority (K&E IFCA) should be consulted in relation to confirming local fishing practices. The MMO felt that there could be a possibility that Thanet Extension could impact on pleasure craft, anglers and other users of the sea. As mentioned in paragraph 9.1.3, however, only commercial fishing has been assessed in this report.	Socio-economics, and other sea users (Document reference: 6.3.3); Shipping and Navigation (Document reference 6.2.10)

9.3.1 Brown & May Marine Limited (BMM) undertook consultation with local statutory stakeholders and also non-UK fisheries stakeholders. Local fisheries stakeholder consultation was undertaken by Merlin Jackson of the Thanet Fishermen’s Association (TFA), who is also the Fisheries Liaison Officer (FLO) for TOWF and Thanet Extension.

9.3.2 Attempts were repeatedly made to arrange consultation with the local MMO office but this was not possible due to either logistics or lack of response.

9.3.3 Please note that full details of consultation and scoping will be included in a separate consultation report, but a summary can be found in Table 9.2 and Table 9.3.

Table 9.3: Summary of consultation relating to Commercial Fisheries

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
Pim Visser – 13 December 2016	Meeting in Schiphol airport. VisNED. Whilst Dutch vessels do not have historic rights to operate inside of 12 nm limit (and therefore within Thanet Extension), PV expressed concern regarding displacement of vessels into grounds targeted by Dutch vessels.	Section 9.8.7 Section 9.12.2
Antony Viera, 14 March 2017	Meeting in Boulogne. Comite Regional des Peche Maritimes et des Elevages Marins (CRPMEM) The French fleet regularly access the 6 - 12 nm strip but cannot fish in or around the western section of Thanet Extension. This is key ground to a few vessels, primarily from Boulogne.	Section 9.11.1
Sander Meyens, Jasmine Vlietinck – 13 March 2017	Meeting in Oostende. Rederscentrale The Belgium fleet operates in the area as they have historic rights in to 6 nm limit. A concern was raised regarding turbine spacing and orientation.	Section 9.10 Section 9.16
Tom Clegg – K&E IFCA 28 April 2017	Teleconference. High density of static gear in the area. Identified as key potting ground with some trawling and static/ drift netting undertaken around site. Mussel dredging between Sandwich Bay and Deal close to cable corridor. Confirmed approval of communication with TFA.	Section 9.9.5-9.9.9 Section 9.19.5-9.19.10

Date and consultation phase / type	Consultation and key issues raised	Section where comment addressed
Merlin Jackson (TFA) and 38 vessels (30 being members of TFA) April, November 2017	Undertaken in Kent via face to face consultation. Overseen by Merlin Jackson and supplied to BMM The local UK fleet undertakes a range of methods from ports such as Ramsgate, Margate, Whitstable, Deal and Broadstairs. Generally, work within 20 nm of their port deploying multiple methods primarily netting and potting. Regularly work the area of Thanet Extension. Anecdotal evidence from the fishermen is that fishing within the Thanet Offshore Wind Farm (TOWF) is less productive than prior to construction.	Section 9.9.5-9.9.9 Section 9.19.5-9.19.10

9.3.4 The project received comments via direct meetings with the TFA along with written responses to the PEIR as part of the formal Section 42 consultation. Comments and advice have been received during the PEIR consultation period (27th November 2017 - 12th January 2018). This feedback has been considered and where appropriate addressed within this Environmental Statement (Table 9.4).

Table 9.4. Summary of comments from the PEIR in relation to Commercial Fisheries

Date and consultee	Key issues raised	Section where comment addressed
4/1/2018; Thanet Fishermen’s Association (TFA)	Concerns about alternative fishing grounds overlapping with Dutch fishing grounds	Succorfish data show alternative fishing grounds are currently used within UK waters. It is recognised that restrictions will be in place but this is minimal in relation to the overall grounds of the Dutch fleet in the North Sea. See Section 9.18

Date and consultee	Key issues raised	Section where comment addressed
4/1/2018; Thanet Fishermen’s Association	Data for the under 10-metre fishing fleet is lacking and difficult to quantify. While this report does recognise that VMS data is not directly relevant to the under 10’s, the main data sources are still based upon ICES rectangles and MMO surveillance sightings, both of which are flawed when used with any connection to the inshore vessels.	The MMO and ICES rectangles data is the best available, which is acknowledged by the TFA. Limitations have been referenced in this ES. We have supplemented this with Succorfish data. This data will only cover April-December 2017 and a select subsample of vessels, so it is only indicative of activity during 2017. Sections 9.7; 9.8, 9.8.8; Commercial Fisheries Technical Baseline (Document Reference: 6.4.9.1)
4/1/2018; Thanet Fishermen’s Association	While no additional commercial fish surveys have been required, TFA will propose that bottom drift surveys, and trawl surveys, are undertaken for all drifts and tows that cross into the proposed Thanet Extension footprint.	No additional commercial fish surveys have been required as this area has been extensively surveyed previously and sufficient data exist to robustly characterise the receiving environment (Section 3.90, Scoping Opinion, The Planning Inspectorate, February, 2017). Within the PEIR responses TFA has suggested considering further driftnet surveys, which will be considered by the project.

Date and consultee	Key issues raised	Section where comment addressed
4/1/2018; Thanet Fishermen’s Association (TFA)	The TFA considers the loss of ground to bottom drifters and trawlers to be permanent in relation to turbine construction, cable protection. The end results of low/ minor impact suggest qualitative and improved assessment is definitely needed. This can hopefully be partially achieved through the Succorfish project. TFA disagrees with decided impact level from loss of ground and method.	These impacts are not considered significant within the EIA process, which is outlined in this ES. Thanet Extension will consider if loss of ground is permanent during the operational and maintenance assessment. An operational maintenance plan will cover potential problems with the cable and make assumptions clear. The Succorfish data has been assessed and does not indicate higher level of impact as it illustrates a range of grounds used within the region. Sections 9.6, 9.9; Commercial Fisheries Technical Baseline (Document Reference: 6.4.9.1); Outline Offshore Operational Maintenance Plan (Document Reference: 8.10)
4/1/2018; Thanet Fishermen’s Association (TFA)	The TFA would like bottom drift netting and surface drift netting to be differentiated as they are operated over different grounds and bottom drift netting is the primary method for Ramsgate vessels	In order to include this Thanet Extension needs data from TFA. Anecdotal information was sent on 26/2/18 and it is understood bottom drift nets are the primary gear used, however no clear illustrative separation of the grounds for each method has been provided so this cannot be progressed.

Date and consultee	Key issues raised	Section where comment addressed
4/1/2018; Thanet Fishermen’s Association (TFA)	TFA disagrees with the decision of medium impact due to restricted operational range. It is mentioned that gear types are not always carried on board and incur time constraints.	It is appreciated that time constraints and return visits to port are sometimes necessary to switch gear although some vessels carry multiple methods. The operational range of under 10 m vessels has been noted in this ES. The EIA process has been detailed. Sections 9.6, 9.8, 9.14
4/1/2018; Thanet Fishermen’s Association (TFA)	TFA disagrees with the statement that risks only occur when vessels infringe on safety areas. During the survey, construction, O&M and repair of existing approved developments TFA are unaware of any incidents caused by a Fishing vessel breaching a safety zone yet there have been multiple safety risk incidents. These have included near misses with high speed windfarm craft, excessive wash created by high speed craft while Fishermen are hauling, unlit anchor markers, unannounced vessel operations such as PLGR, harbour collisions, speeding in fog etc	Thanet Extension will propose operational procedures for all construction vessels highlighting potential interaction possibilities with fishing vessels. There will be a Marine Construction Coordinator (MCC) in place during construction to coordinate vessel movements and be a point of contact. Shipping and Navigation Chapter (Document Reference: 6.2.10); Fisheries Liaison and Co-existence Plan (Document Reference: 8.8)

Date and consultee	Key issues raised	Section where comment addressed
4/1/2018; Thanet Fishermen’s Association (TFA)	TFA requests that vessels are allowed passage through the construction area if observing safety zones around vessels and structures. TFA notes that steaming times will be increased as TOW is a regular transit route. TFA disagrees with the conclusion that this impact will not be discernible.	Specifics of passage through Thanet Extension are detailed in the Fisheries Liaison and Co-existence Plan (Document Reference: 8.8). It is noted that an impact to steaming times may occur and that the existing Thanet Offshore Windfarm (TOWF) will be closed to passage during construction and operation of Thanet Extension). This impact is not significant in the EIA process. The Succorfish data shows vessel flexibility in transit route choices and that avoiding Thanet Extension site will not significantly add to steaming times. Section 9.6; Shipping and Navigation Chapter (Document Reference: 6.2.10); Fisheries Liaison and Co-existence Plan (Document Reference: 8.8)

Date and consultee	Key issues raised	Section where comment addressed
4/1/2018; Thanet Fishermen’s Association (TFA)	TFA states that impact is not negligible for towed gears and static fishing activity. TFA view this impact decision to not be possible without ‘very significant’ mitigation being included. TFA disagrees that longlining, drift netting and trawling will continue after construction of Thanet Extension. TFA disagrees that potters working inside operational windfarms. TFA refer to impacts to the seabed for drifting in TOWF.	Access to Thanet Extension site will be captured in the Fisheries Liaison Co-existence Plan. Impact to specific methods has been assessed following current UK legislation. Most vessels are able to use multiple gear types albeit with time constraints. No impacts have been found during TOWF monitoring. Section 9.6, 9.18; Co-existence Plan (Document Reference: 8.8)
4/1/2018; Thanet Fishermen’s Association (TFA)	TFA views the conclusions on significance considering the inshore fleet alongside the offshore fleet. The sensitivity and magnitude scales used are not considered to be representative by the TFA.	The Succorfish data shows vessels travel somewhat offshore. The Fisheries Liaison and Co-existence Plan (Document Reference: 8.8) and this chapter clarifies further queries with the EIA process. Commercial Fisheries Technical Baseline (Document Reference: 6.4.9.1); Fisheries Liaisons and Co-existence Plan (Document Reference: 8.8)
8/1/2018; Member of the public	A Whitstable fisherman notes his concerns about existing windfarms in addition to Thanet Extension impact on loss of ground, methods, navigation and safety. It also is noted that fish and shellfish are not uniformly distributed so fishing grounds are valuable.	Existing OWFs have been considered in the initial baseline assessment and the cumulative assessment, with the systems in place the impact has been assessed as minor. Section 9.6; Shipping and Navigation Chapter (Document Reference: 6.2.10)

Date and consultee	Key issues raised	Section where comment addressed
8/1/2018; Member of the public	Concerns about displacement during and after construction and logistical difficulties avoiding infrastructure	The assessment takes into account loss of ground due to access to the area during construction. Alternative fishing grounds have been identified. After construction the windfarm will be open for fishermen to access and fishing and indeed for some methods, there may be improvements in landings due to new habitats.
8/1/2018, Member of the public	Concerns about changes to fish and catch rates after new structures introduced, and Electro Magnetic Fields (EMF) affecting fish and shellfish migration.	Fish surveys have been conducted in relation to TOWF and commercially valuable species have been characterised. These did not find the impact to be major. EMF have been addressed in the Fish and Shellfish assessment. Fish and Shellfish Chapter (Document Reference: 6.2.6)
11/1/2018, The Marine Management Organisation (MMO)	The MMO suggest including 2016 data on commercial landings and vessel movements	Most recently available data from 2016 has now been included. Section 9.10
12/1/2018, The Kent Wildlife Trust (KWT)	KWT views displacement as a cumulative impact especially in relation to the sole fishery which is most valuable.	Cumulative impacts have been assessed during the EIA process and displacement has been considered. Section 9.13

Date and consultee	Key issues raised	Section where comment addressed
12/1/2018, The Kent Wildlife Trust (KWT)	KWT are concerned assessments are not based on comprehensive datasets and request that MMO data for vessels between 12 and 15 m in length and up to date VMS data on French fleet are obtained	The MMO data for vessels between 12 and 15 m long vessels is not available. A request for more data of the French fleet has also been requested (in February 2018). Section 9.5
12/1/2018, The Kent Wildlife Trust (KWT)	Seeking clarification on which groups will be responsible for creating the code of conduct and cooperation between fishing vessels and wind farm activity, and whether this will occur prior to construction of Thanet Extension	A Fisheries Liaison and Co-existence Plan (Document Reference: 8.8) has been drafted and the final version will be agreed between Vattenfall and TFA. Fisheries Liaison and Co-existence Plan (Document Reference: 8.8)
12/01/2018; French Government	A more detailed analysis of the impacts on the French fishing fleets is necessary, including cumulative impacts from Brexit, other windfarms and marine protected areas (MPAs). The IFREMER data used is not the most current. It is suggested Thanet Extension includes VALPENA data also.	Cumulative assessments have been carried out during the EIA process. Thanet Extension is following current UK legislation. Marine protected areas, other fishing activities and Brexit are not considered a project in the context of cumulative assessments. Options for obtaining VALPENA data were investigated but were cost prohibitive, and grant program schedules are not in line with Thanet Extension programme of works. A request for current data from IFREMER was sent on 22/2/2018 but has not been received to date. Section 9.5

Date and consultee	Key issues raised	Section where comment addressed
12/01/2018; French Government	French fishing activities are conducted under historic rights of the 1380/2013 regulations. The French government questions whether towed gears will be operable in the wind farm. The arrival at 'minor' impact is questioned. It is suggested a study or consultation is conducted with CRPMEM and French skippers.	Regarding the IFREMER data restrictions, these have been addressed above. (Another call will be set up with the CRPMEM to update the project with additional information on French fishing activity in the area and to discuss French skipper's views on the wind farms). It is known that UK vessels operate trawls successfully within operational windfarms.

9.4 Scope and methodology

Study area

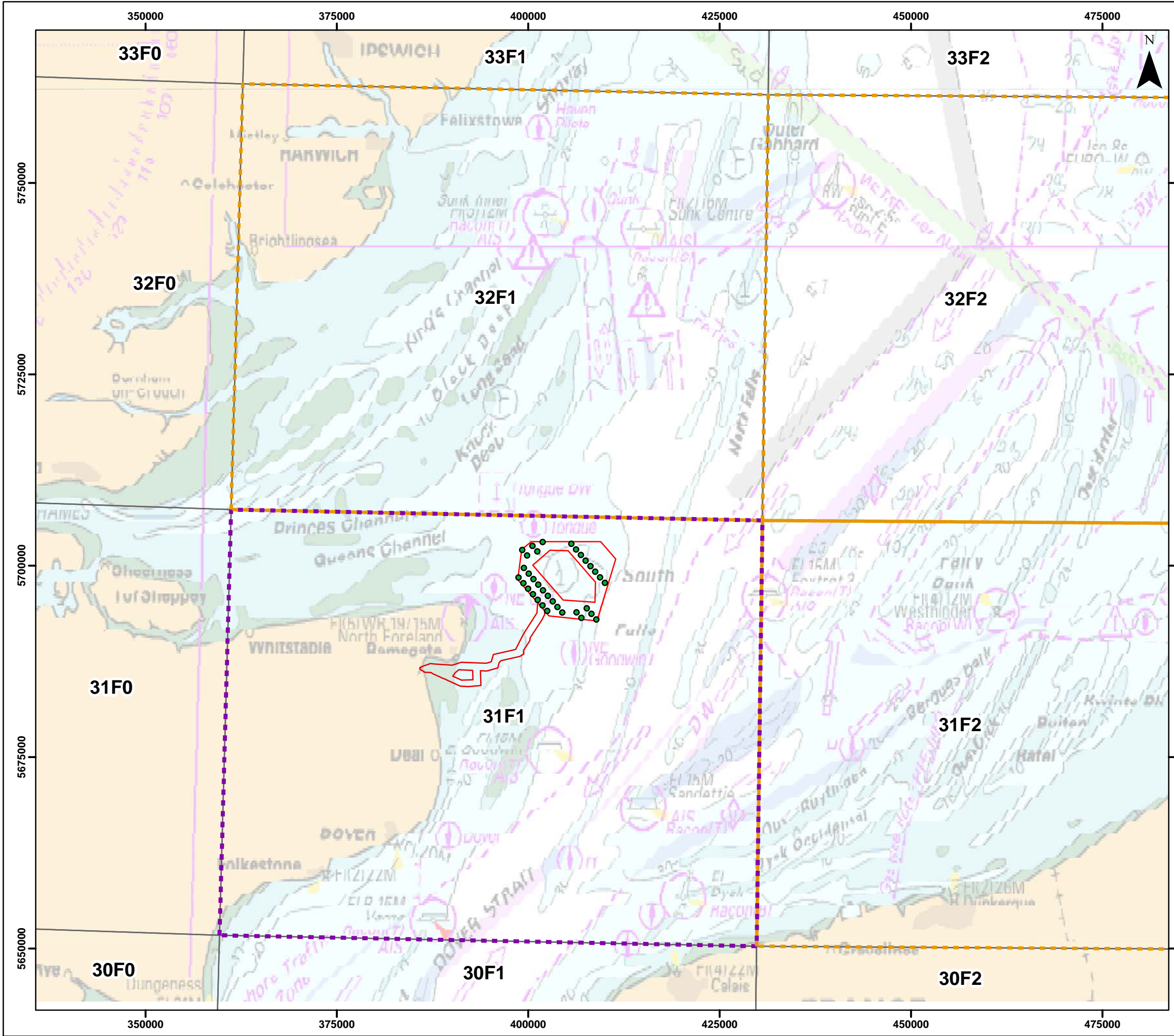
- 9.4.1 The Thanet Extension is located within International Council for the Exploration of the Seas (ICES) Division IVc (Southern North Sea). Stocks identified as under pressure from fishing mortality or overfishing are managed, and associated quotas issued, via ICES division. Fisheries data is recorded, collated and analysed by ICES rectangles within each division and these have been used to define the analysis area for the Thanet Extension.
- 9.4.2 The study area used for this assessment is focused on ICES rectangles 31F1, 31F2, 32F1 and 32F2. All offshore infrastructure for Thanet Extension (array site and export cable route) is located within rectangle 31F1 (Figure 9.1).

THANET EXTENSION OFFSHORE WIND FARM

Figure 9.1
Thanet Extension Offshore Study Area

Legend

- Indicative Turbine Locations
- Offshore Red Line Boundary
- Study Area
- Regional Area
- ICES Rectangles



Datum: ETRS 1989
Projection: UTM31N

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Drg No	VAT-THANT-01-001_StudyArea			Figure 9.1
Rev	0.1	Date	25/05/2018	
By	JM	Layout	THET2018	

Sources of data and information

9.4.3 There is currently no single data source or recognised model for establishing commercial fisheries baselines in relation to discrete offshore development. It is therefore necessary to use an approach which incorporates a number of relevant data and information sources, each subject to a range of sensitivities and limitations.

9.4.4 Data has been gathered to provide as wide a coverage as possible of fishing activities (effort) and landings values for all fleets which operate in the area, this is detailed further in 6.4.9.1: Commercial Fisheries Technical Report. The dates covered by these resources vary due to the availability of the data and if it will be released by national state organisations. For example, French data is the most historic as it has not been possible to obtain further, more recent information from the national data analysts.

9.4.5 The data sources used for this baseline and assessment are given in Table 9.5 below.

Table 9.5: Data sources used in the baseline assessment

Dataset	Year	Coverage	Confidence	Notes
UK MMO Fisheries Statistics (landings values and fishing effort data)	2007-2016	UK vessel landings into UK and European ports. Non-UK vessel landing into UK ports	High	N/A
UK MMO Surveillance Sightings	2007-2016	Sightings of vessels (all nationalities) by gear type recorded in UK waters on surveillance fly overs	Medium	Underestimate total extent of fishing activity due to flyover frequency and timing. Some spatial gaps are present from data in 2016.
UK MMO Satellite Tracking Vessel Monitoring Systems (VMS) Data	2007-2016	Aggregated VMS pings recorded in 0.05 by 0.05 degrees grid from UK vessels only in European waters	High	Only covers >15 m vessels. Have requested 12 – 15 m data from the MMO but unsuccessful to date

Dataset	Year	Coverage	Confidence	Notes
Belgian Institute for Agricultural and Fisheries Research (ILVO) fisheries statistics (landings and effort data)	2010-2014	All over 10 m Belgian vessels recorded as actively fishing irrespective of location	High	N/A
Belgian ILVO VMS data	2010-2014	VMS for > 15 m vessel (large vessel sector (> 221 kW) and Eurocutter vessels (< 221 kW))	High	N/A
Netherlands, Institute for Marine Resources and Ecosystems Studies (IMARES) and Landbouw Economisch Instituut (LEI) VMS and integrated Landings data.	2007-2016	VMS data combined with logbook data by Dutch vessels in the North Sea. Activity is defined based on 1.16th of an ICES rectangle. The data is filtered by speed.	High	N/A
French L'Institut Français de Recherche pour L'Exploitation de la mer (IFREMER) VMS	2008-2009, 2014	VMS charts provided by value and effort for Central (IVb) and Southern North Sea (IVc)	High	Further data requested

Dataset	Year	Coverage	Confidence	Notes
Succorfish GIS data	2017	Tracking data for vessels 10 m and under	Medium	Relatively new technology and there are operational challenges, along with only covering nominated vessels.

9.4.6 While it is presumed that the data sources and stakeholder consultation are comprehensive in respect to Thanet Extension, gap analysis has identified a couple of sources where further data should be requested.

9.4.7 Firstly, the currently available VMS data for the French fleet is from 2009. BMM have submitted requests to the French government data holders in August 2016 and March 2017 without success due to communication delays and charges for processing. In addition, discussion has occurred with CRPMEM, who have suggested obtaining their own Valpena data. However, this has been offered at a prohibitive cost and would only provide a selective picture as it covers an unspecified percentage of the fleet.

9.4.8 A request for more recent and detailed data was sent to IFREMER on 22/2/2018. That data was not received at time of writing.

9.4.9 Secondly, BMM was not able to arrange a meeting with the local MMO office in Hastings due to diary logistics from both parties. However, the MMO dataset is comprehensive and when considered with the results of consultations with TFA and Kent and Essex Inshore Fisheries Conservation Authority (K&E IFCA) have given a comprehensive picture of local fishing activity.

Guidance

9.4.10 A number of published standards and guidelines have been referred to in the Approach to Environmental Impact Assessment Chapter (Document Reference: 6.1.3) and have been used to identify best practice for an impact assessment.

9.5 Assessment criteria and assignment of significance

9.5.1 The assessment of potential impacts of Thanet Extension on commercial fisheries receptors follows the guidance as specified in the Cefas and MCEU (2004) guidelines for OWF developments, and as required by the SoS Scoping Opinion.

9.5.2 Based on the above the following potential impacts have been considered for assessment:

- Temporary loss of or restricted access to fishing grounds;
- Safety issues for fishing vessels;
- Increased steaming times to fishing grounds;
- Interference with fishing activities;
- Displacement of fishing activity into other areas; and
- Obstacles on the seabed.

9.5.3 All assessments are covered by a number of limitations which focus around potential changes to the existing baseline. Changes over a short timescale can occur in relation to target species, fishing grounds productivity and levels of fishing effort. These are primarily due to variation in quota allocations, legislation, preferred methods and conservation restrictions. Therefore, this assessment can only be considered in comparison to the baseline identified in the technical report.

9.5.4 Assessment is undertaken on a fleet by fleet basis, but it should be noted that some vessels are multipurpose and switch methods dependant on season and target species. Due to the data sources available it is not possible to assess impacts on a vessel by vessel basis. Fishing grounds are considered in a local and regional context. Changes in fish behaviour, abundance and distribution are assessed in the Fish and Shellfish Ecology Chapter (Document Reference: 6.2.6).

Significance criteria

9.5.5 The significance criteria for this assessment are outlined below. There is an acknowledgment that the impacts of OWF developments upon commercial fishing activity are not easily categorised due to the limitations associated with fisheries data and dynamic nature of the industry. The assigning of receptor sensitivity and impact magnitude is therefore, to some extent, qualitative and reliant on professional experience and judgement.

Sensitivity

9.5.6 The receptors have been identified by fleet and, in the case of the local UK vessels, by principle method and it is to these that sensitivity has been assigned. Sensitivity of each receptor group may change with each potential impact as well as between the three stages of Thanet Extension (construction, operations and maintenance (O&M) and decommissioning), which are described separately. Sensitivity/ importance of the environment is defined in Table 9.6.

Magnitude

9.5.7 The magnitude of an effect is considered for each predicted impact on an individual fishery basis and is defined spatially, temporally and proportionally taking account of the likelihood of occurrence. The magnitude of the potential effect on a given receptor is primarily a function of dependence on the area under consideration. The criteria used to define magnitude of a potential impact on commercial fisheries are provided in Table 9.7.

9.5.8 With respect to duration of potential impacts, those which related to construction are considered to be short to medium term, with the construction duration of Thanet Extension anticipated to be 6 years (see Table 9.10). Impacts associated with operation are longer term, throughout the anticipated design life of Thanet Extension. As there is a highly seasonal nature of certain fisheries, it is not possible to standardise the definition of duration of effects across the receptor groups as the timing of specific seasonal fisheries varies considerably.

Impact significance

9.5.9 Table 9.6 applies the significance criteria to the assessment of an effect, taking into account the magnitude of effect and sensitivity of the receptor. Considering the impacts on commercial fisheries, a low magnitude combined with a low sensitivity results in a minor significance. Those effects which are moderate or major are considered significant with respect to EIAs.

9.5.10 The impact matrix provides an outline of how the judgement has been reached from the discussion of each impact assessment and is not prescriptive.

9.5.11 Assessment of the significance of potential effects is described in Table 9.8

9.5.12 Assumptions are based on the project design as set out in the Project Description (Offshore) (6.2.2). This has been assessed to ensure the worst-case scenario has been calculated using the data provided. All fishing grounds and associated activities have been assessed via the proposed wind farm array area and Offshore Export Cable Corridor (OECC) determined by the authorised shapefiles.

Table 9.6: Sensitivity/importance of the environment

Receptor sensitivity / importance	Description/ reason
Very high	Very low spatial adaptability due to limited operational range and ability to deploy only one gear type. Very limited spatial tolerance due to dependence upon a single ground. Very low recoverability due to inability to mitigate loss of fishing area by operating in alternative areas.
High	Low spatial adaptability due to limited operational range and ability to deploy only one gear type. Limited spatial tolerance due to dependence upon a single ground. Low recoverability due to inability to mitigate loss of fishing area by operating in alternative areas.
Medium	Some spatial adaptability due to extent of operational range and/ or ability to deploy an alternative gear type. Moderate spatial tolerance due to dependence upon a limited number of fishing grounds. Limited recoverability with some ability to mitigate loss of fishing area by operating in alternative areas.
Low	High spatial adaptability due to extensive operational range and/ or ability to deploy a number of gear types. High spatial tolerance due to ability to fish numerous fishing grounds. High recoverability due to ability to mitigate loss of fishing area by operating in a range of alternative areas within the southern North Sea and English Channel.
Very low	Category of fishing receptor with an extensive operational range and very high method versatility. Vessel able to exploit a large number of fisheries.

Table 9.7: Magnitude of impact

Magnitude	Definition
Very high	A very high proportion of total annual landings weights/ values derived from fishing within Thanet Extension and/ or the change is permanent.
High	A high proportion of total annual landings weights/ values derived from fishing within Thanet Extension and/ or the change may be permanent.
Medium	A moderate proportion of total annual landings weights/ values derived from fishing within Thanet Extension and/ or the change is temporary but recovery within a reasonable timescale is not possible.
Low	A minor proportion of total annual landings weights/ values derived from fishing within Thanet Extension and/ or the change is temporary but recovery within a reasonable timescale is not possible.
Very low	The receptor has very little or no history of fishing in the area under consideration or the change is temporary and immediate.

Table 9.8: Significance of potential effects

		Sensitivity			
		High	Medium	Low	Negligible
Negative Magnitude	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Minor	Minor	Negligible	Negligible
Beneficial Magnitude	Negligible	Minor	Minor	Negligible	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Medium	Major	Moderate	Minor	Negligible
	High	Major	Major	Moderate	Minor

Note: shaded cells are defined as significant effects

9.6 Uncertainty and technical difficulties encountered

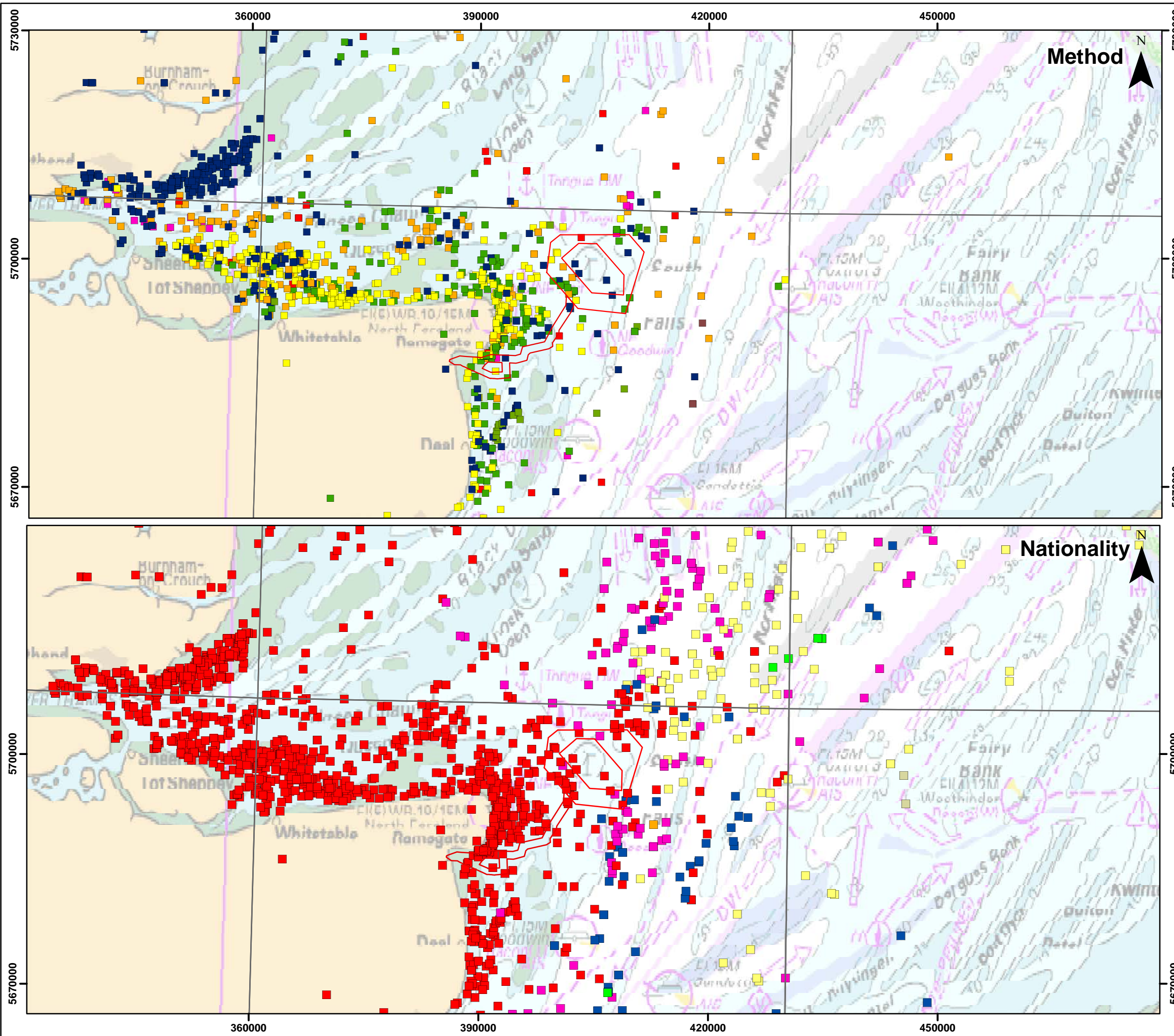
- 9.6.1 It should be noted that the MMO VMS data do not include all fishing vessels using the study area due to periods of missing data and vessels under 15 m not being satellite tracked.
- 9.6.2 In order to address this issue, the project and TFA have worked with Succorfish Limited to obtain tracking data for local UK vessels under 10 m in length. Subsequently “Succorfish” vessel tracking data for 2017 has been incorporated in this section to cover smaller vessels of 10 m or less. This data is further detailed in the Commercial Fisheries Technical Baseline (6.4.9.1).
- 9.6.3 It should also be noted that the Succorfish data collection was initiated recently (April 2017) and as it is a targeted voluntary system it is not entirely comprehensive. It does offer a snapshot positions of select vessels for this recent time period, but its use in the future will be decided by VWPL and the TFA.

9.7 Existing environment – overview of fishing activity (surveillance)

- 9.7.1 It should be noted that as per the illustrations presented within the Commercial Fisheries Technical report (Document Reference: 6.4.9.1) the Red Line Boundary (RLB) used in describing the baseline environment is greater than that brought forward in the final application. The change in RLB as illustrated in the following sections demonstrates a reduced interaction with many of the inshore fisheries and reflects areas of sensitivity raised during the formal consultation on the PEIR.
- 9.7.2 It should be highlighted that surveillance sightings do not accurately describe the levels of fishing activity but give an indication of the proportions of activity by vessels of specific gear types and nationalities. The majority of surveillance sightings of the local UK fleet are close to shore and along the OECC although some activity does occur in Thanet Extension area at a lower level (Figure 9.2). This is principally along the western boundary and north-eastern sector. Belgian and French fleets focus on grounds to the south and east of Thanet Extension. The range of methods sighted, with proportion according to nationalities and methods, are described in Table 9.9.
- 9.7.3 Due to restrictions on their activities within the 12 nm limit, Dutch vessels remain to the east of Thanet Extension.

THANET EXTENSION OFFSHORE WIND FARM

Figure 9.2
Surveillance sightings by nationality and method (2012-2016)



Legend

- Offshore Red Line Boundary
- ICES Rectangles

Surveillance Sightings by Method

- Long Liner
- Trawler (Unspecified)
- Potter/ Whelker
- Beam Trawler
- Demersal Trawler
- Scallop Dredger
- Gill Netter
- Seine Netter
- Other Methods

Surveillance Sightings by Nationality

- Netherlands
- United Kingdom
- Belgium
- Denmark
- France
- Germany
- Other Nationalities

Datum: ETRS 1989
Projection: UTM 31N

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Drg No	VAT-THANT-01-002_SS_NatMeth			Figure 9.2
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By	JM	Layout	N/A	

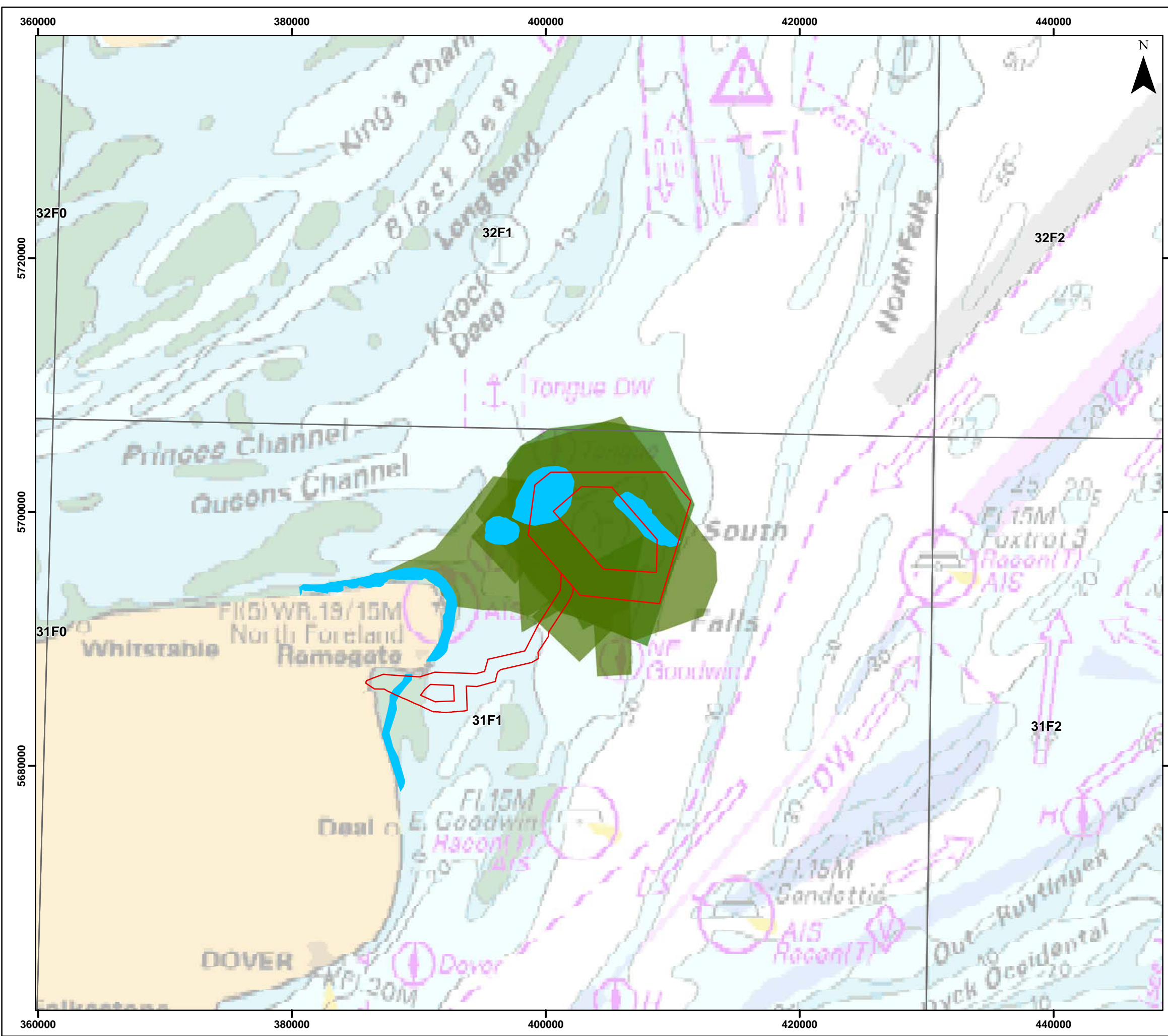
Table 9.9: Surveillance sightings (2011-2015) in ICES rectangle 31F1 by nationality and method.

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

9.8 UK fishing overview, regional and project specific

- 9.8.1 Consultation with TFA indicated that the vessels fishing in and around Thanet Extension were predominantly from four main ports: Ramsgate, Broadstairs, Margate and Whitstable. The principle port for these vessels is Ramsgate. Here the fleet is made up of 22 vessels, the majority of which are under 10 m in length. Whitstable has 13 vessels, whilst Broadstairs and Margate two and one vessels respectively. The operational range of smaller, under-10 m vessels is often limited to 20 miles offshore.
- 9.8.2 Potting, trawling and drift netting are employed year-round. Seasonal methods include static netting for sole (March to November) and drift netting for cod (November to April).
- 9.8.3 The principal target species identified during consultation with local fisheries stakeholders include Dover sole, bass, skate, cod, plaice, mullet, herring, cuttlefish and shellfish (lobsters, edible crabs, whelks, mussel spat).
- 9.8.4 The grounds encompassed by Thanet Extension are worked by the local fishing fleet with methods overlapping due to the specific seasonality of each fishery (Figure 9.3, Figure 9.4 and Figure 9.5). The drift net fishing grounds of individual vessels, illustrated within Figure 9.5, have multiple layers representing the activity level creating a darker shade.
- 9.8.5 Lobster potting grounds are shown in Figure 9.3 but please note that the chart provided should be considered as a guide only and shows the most consistent lobster potting areas. There are also small areas where pots are deployed around individual wrecks which are not possible to show on this chart.
- 9.8.6 The discrete area in Pegwell Bay is consistently potted by the smaller vessels from Ramsgate who also work along the shoreline. Lobster potting is common along the shore line. Potting for lobsters and crabs can occur throughout the year in the area of the existing TOWF array area, the development and OECC but is concentrated to the north of TOWF. Whelk pots can be found throughout the area to the west and south of the site but are most intense along the OECC.
- 9.8.7 Please note that the static fishing (Figure 9.4) chart provided should only be considered as a guide only, as there are multiple drifts shown on the chart and some of the drift nets only occupy a small part of the area shown. It is not possible to show the relative intensity of fishing in these areas nor any hierarchy of importance. Some of the areas that have been identified are not fished throughout the year and are only targeted on a seasonal basis.
- 9.8.8 Drift netting, specifically bottom drift netting, is the principal method of many of the Ramsgate and Thanet vessels but they also show gear versatility and deploy other methods at different times dependent on the targeted fishery. Changing gear types can be attributed to a number of factors including quota allocations, species availability, seasonality or tidal currents. A combination of these factors will determine how often each of the drifts are deployed. Drift netting is also consistently deployed to the north of TOWF. The drifts will be undertaken over “clean ground” which is limited in the area.

9.8.9 Static nets (Figure 9.5) are deployed throughout the proposed developed area, being focussed to the east and south of the site and along the OECC. The grounds are focused on grounds to the north and east of the existing TOWF.



THANET EXTENSION OFFSHORE WIND FARM

Figure 9.3
Potting fishing grounds identified through consultation (2016-2017)

Legend

- Offshore Red Line Boundary
- ICES Rectangles
- Key Potting Grounds
- Potting Grounds

Datum: ETRS 1989
Projection: UTM31N






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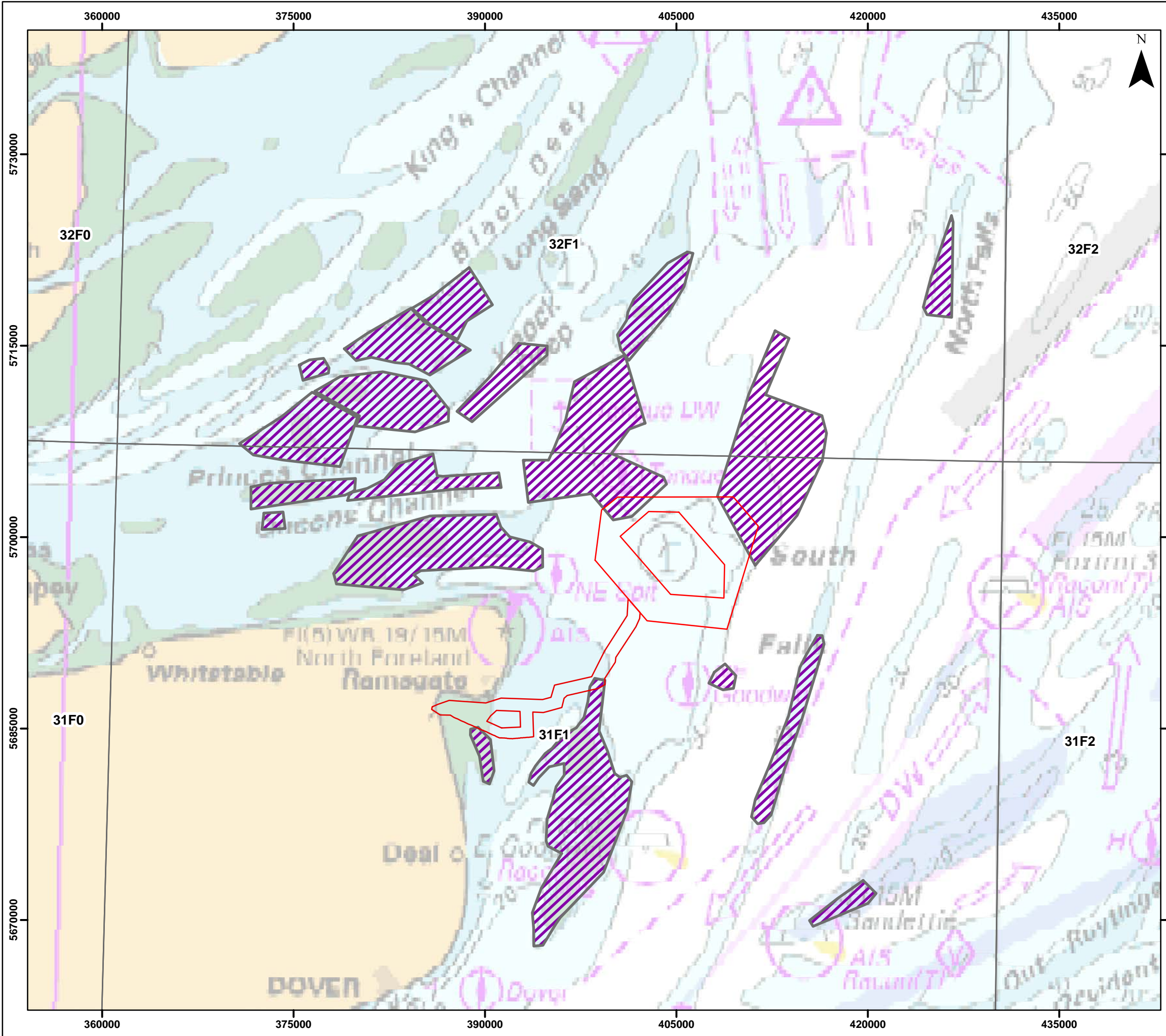


Drg No	VAT-THANT-01-003_FishermansAssociation_Pots_Combined			Figure 9.3
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	

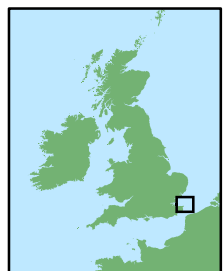
THANET EXTENSION OFFSHORE WIND FARM

Figure 9.4
Driftnetting fishing grounds identified from consultation (2016-2017)

- Legend**
-  Offshore Red Line Boundary
 -  ICES Rectangles
 -  Drift Net Fishing Grounds



Datum: ETRS 1989
Projection: UTM 31N

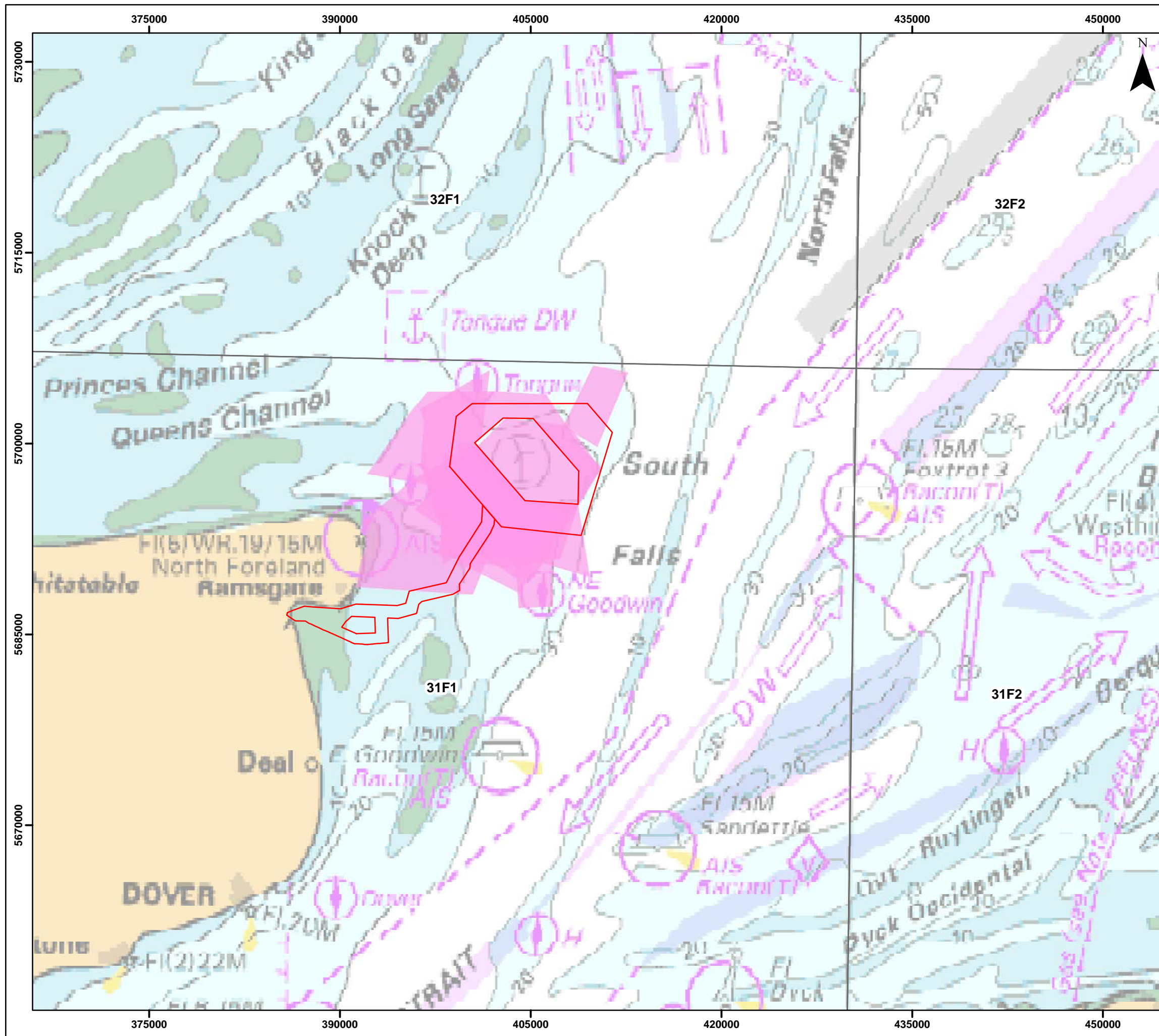




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Drg No	VAT-THANT-01-004_Fishermans_Association_Driftnets		
Rev	0.1	Date	25/05/2018
By	JM	Layout	N/A

Figure 9.4









THANET EXTENSION OFFSHORE WIND FARM

Figure 9.5

Static net fishing grounds identified through consultation (2016-2017)

Legend

-  Offshore Red Line Boundary
-  ICES Rectangles
-  Static Nets

Datum: ETRS 1989
Projection: UTM 31N

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1:300,000

0 3 6 km 0 1.5 3 nm

Drg No	VAT-THANT-01-005_FishingGrounds_FixedNets			Figure 9.5
Rev	0.1	Date	25/05/2018	
By	MK	Layout	N/A	

- 9.8.10 Within ICES rectangles 31F1 and 32F1, whelks and cockles, obtained by dredging and whelk specific pots, are the highest grossing species (Figure 9.6). Fishing for these species, however, is focused within the Greater Thames Estuary to the west of Whitstable and therefore less likely to occur around Thanet Extension. Other high grossing species, specifically targeted within 31F1 are Dover sole, bass, lobster, cod and edible crab.
- 9.8.11 The principle gear types deployed are pots, mechanised dredges, gillnets and otter trawls (Figure 9.7). Pots record the highest landings values, with the largest proportion represented by whelks, followed by lobsters and crabs. Mechanised dredges focus on cockles, whilst Dover sole, bass, cod and thornback rays are targeted using gillnets, otter trawls and trammel nets.
- 9.8.12 The < 10 m vessels utilise pots, gillnets, bottom drift nets, otter trawls and trammel nets, whilst those of 10 – 15 m in length focus on mechanized dredges, pots and boat dredges. Landings from over 15 m vessels are lowest, primarily utilising midwater trawls and Scottish seine nets. Figure 9.8 illustrates the annual variation in landings by species for 2006 - 2015 and monthly landings values averaged (2012-2016) are shown in Figure 9.9.
- 9.8.13 Figure 9.10 and Figure 9.11 illustrate via VMS that vessels over 15 m operate both demersal trawls and dredges (to a lesser extent of an average value of £1,000 to £3,000), primarily in grounds to the north and east of Thanet Extension.

THANET EXTENSION OFFSHORE WIND FARM

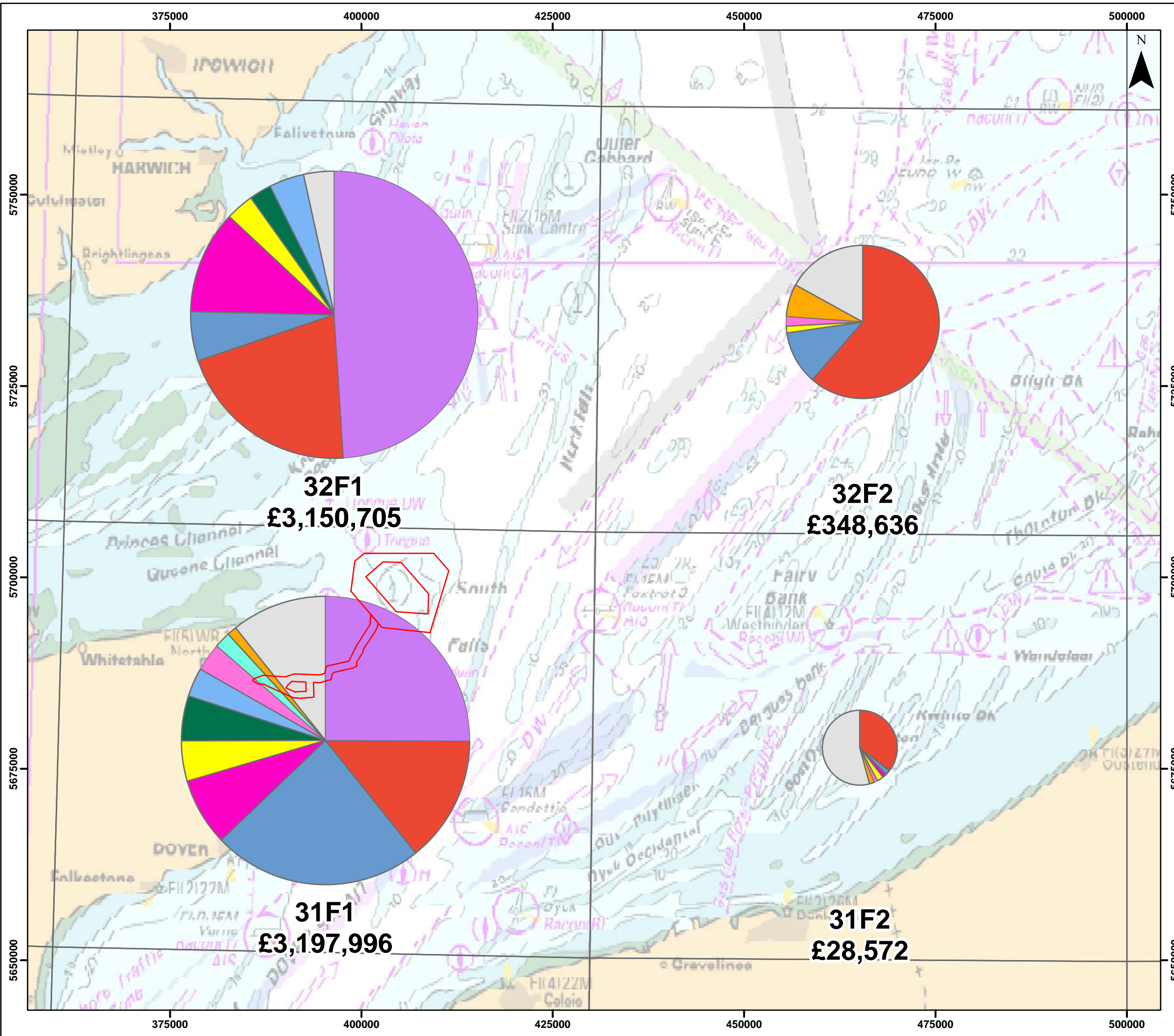
Figure 9.6
MMO UK landings values (average 2012-2016)

Legend

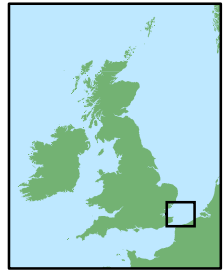
- Offshore Red Line Boundary
- ICES Rectangles

UK Landings by Species

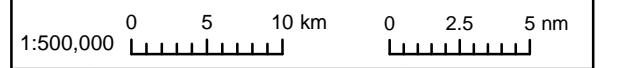
- Cockles
- Sole
- Whelks
- Bass
- Cod
- Lobsters
- Thornback Ray
- Horse Mackerel
- Herring
- Plaice
- Other



Datum: ETRS 1989
Projection: UTM31N



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Drg No	VAT-THANT-01-006_UK_LandingsSpecies_1216_9.6			Figure 9.6
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	

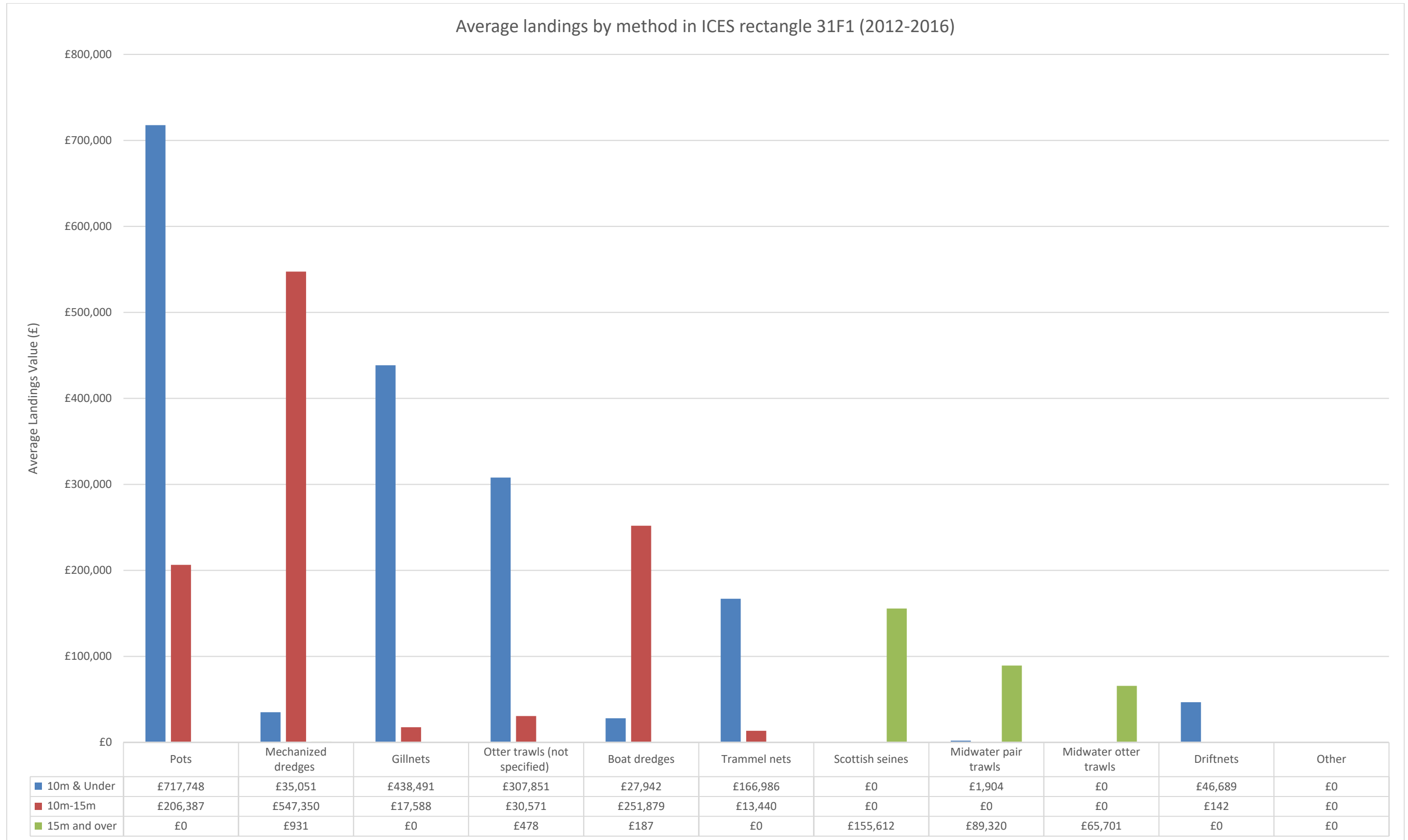


Figure 9.7: Average landings values (2012-2016) by method and vessel category in 31F1 (Source: MMO, 2018).

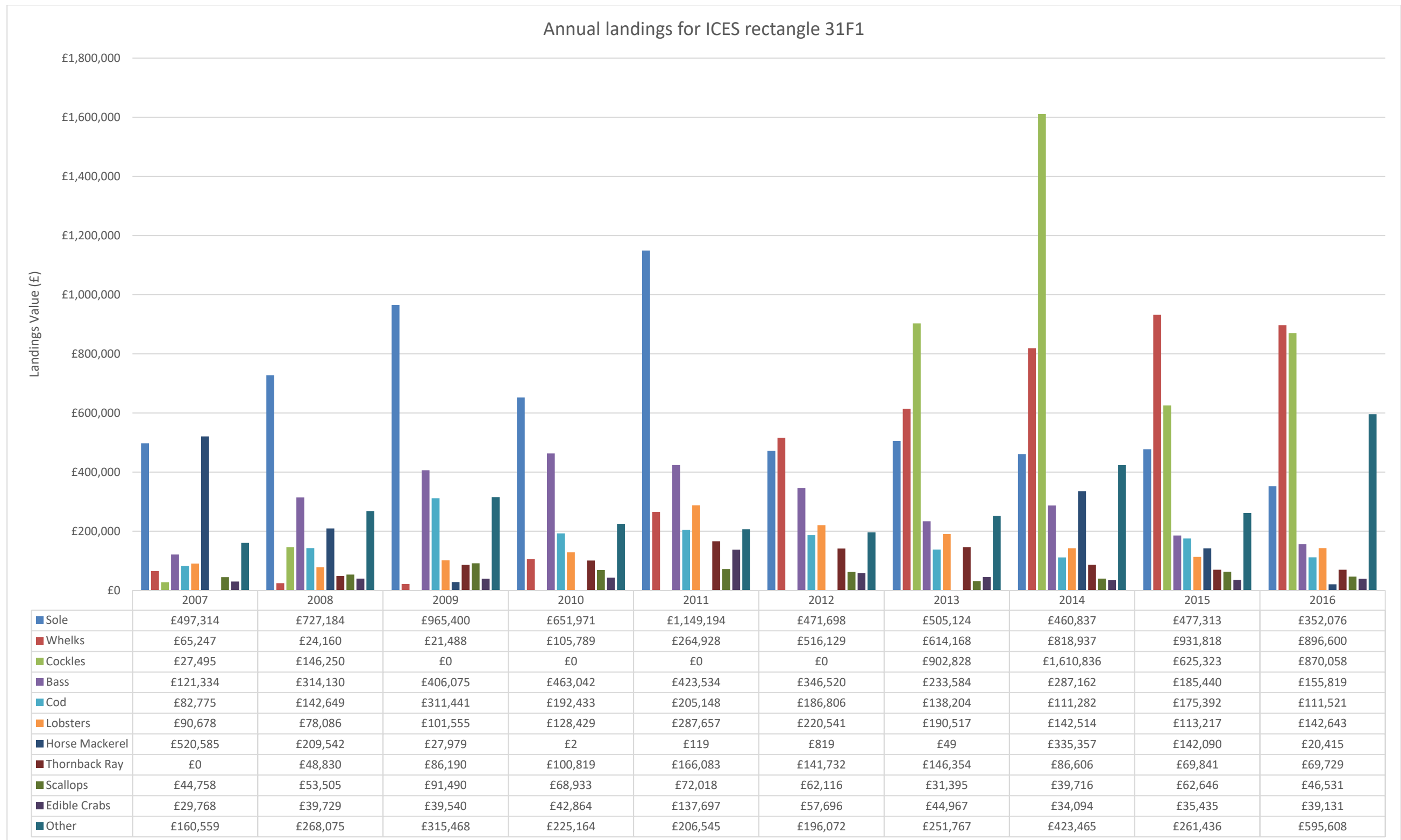


Figure 9.8: Annual landings values between 2007 and 2016 by species in ICES rectangle 31F1 (source: MMO, 2018).

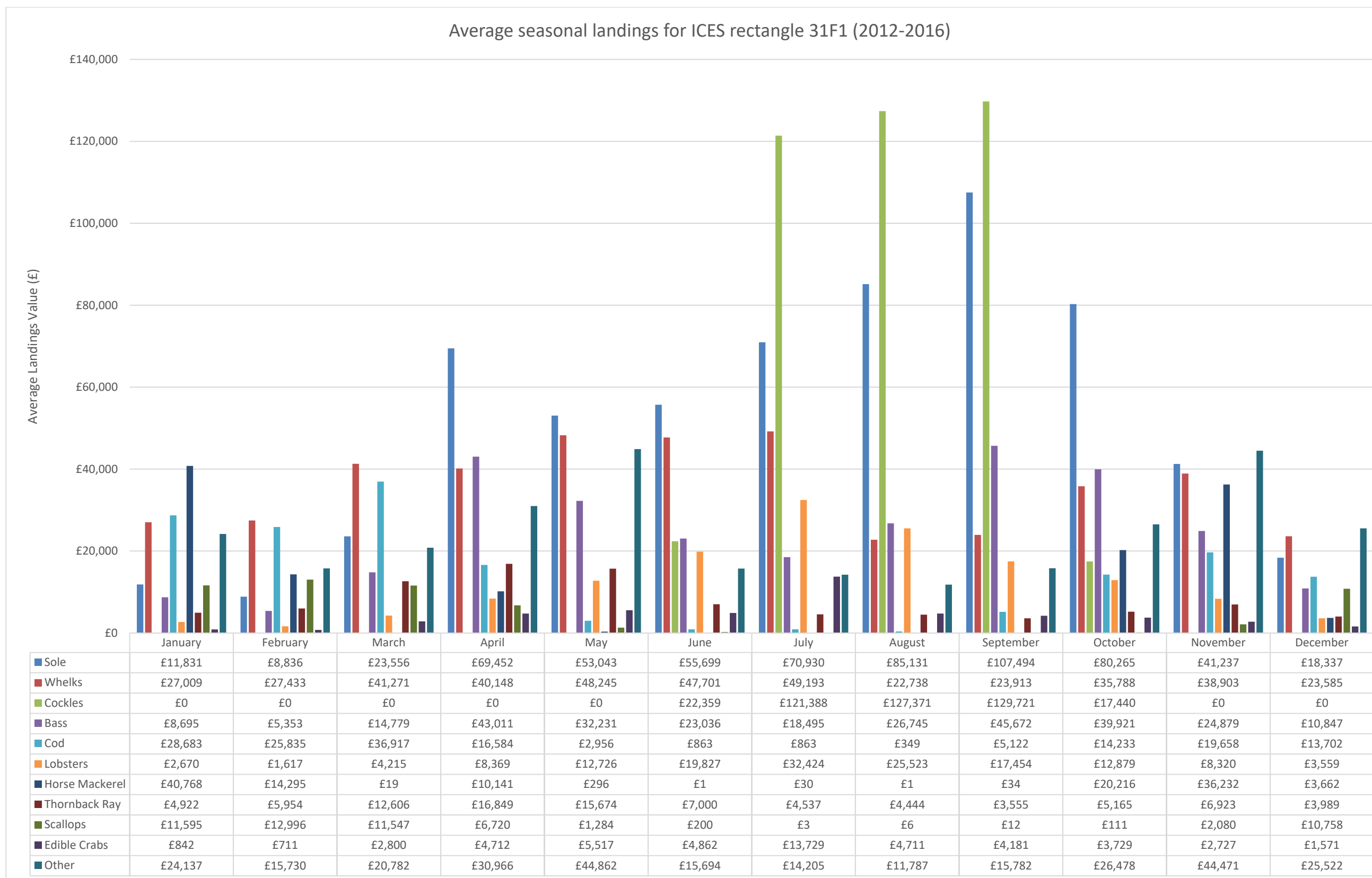
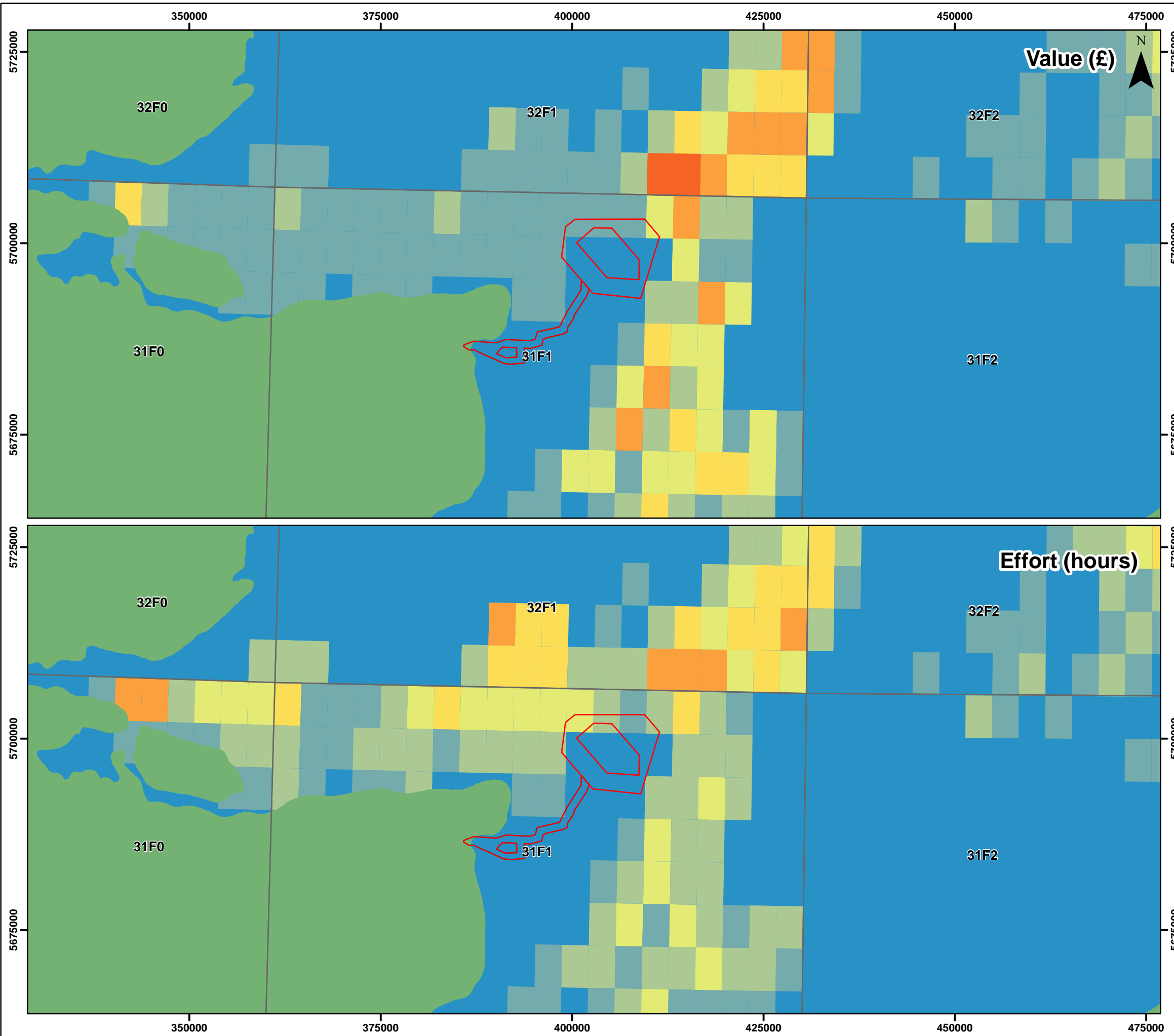


Figure 9.9. Average seasonal variation by species in ICES rectangle 31F1 between 2012 and 2016 (source: MMO, 2018).

THANET EXTENSION OFFSHORE WIND FARM

Figure 9.10
UK VMS value and effort for demersal trawl (average 2012 - 2016)



Legend

- Offshore Red Line Boundary
- ICES Rectangles

UK VMS Value
Demersal trawl

- No value
- Less than £1,000
- £1,000 to £3,000
- £3,000 to £6,000
- £6,000 to £10,000
- £10,000 to £20,000
- £20,000 to £35,000

UK VMS Effort
Demersal trawl

- No value
- Less than 1 hour
- 1 to 5 hours
- 5 to 10 hours
- 10 to 20 hours
- 20 to 50 hours

Datum: ETRS 1989
Projection: UTM31N

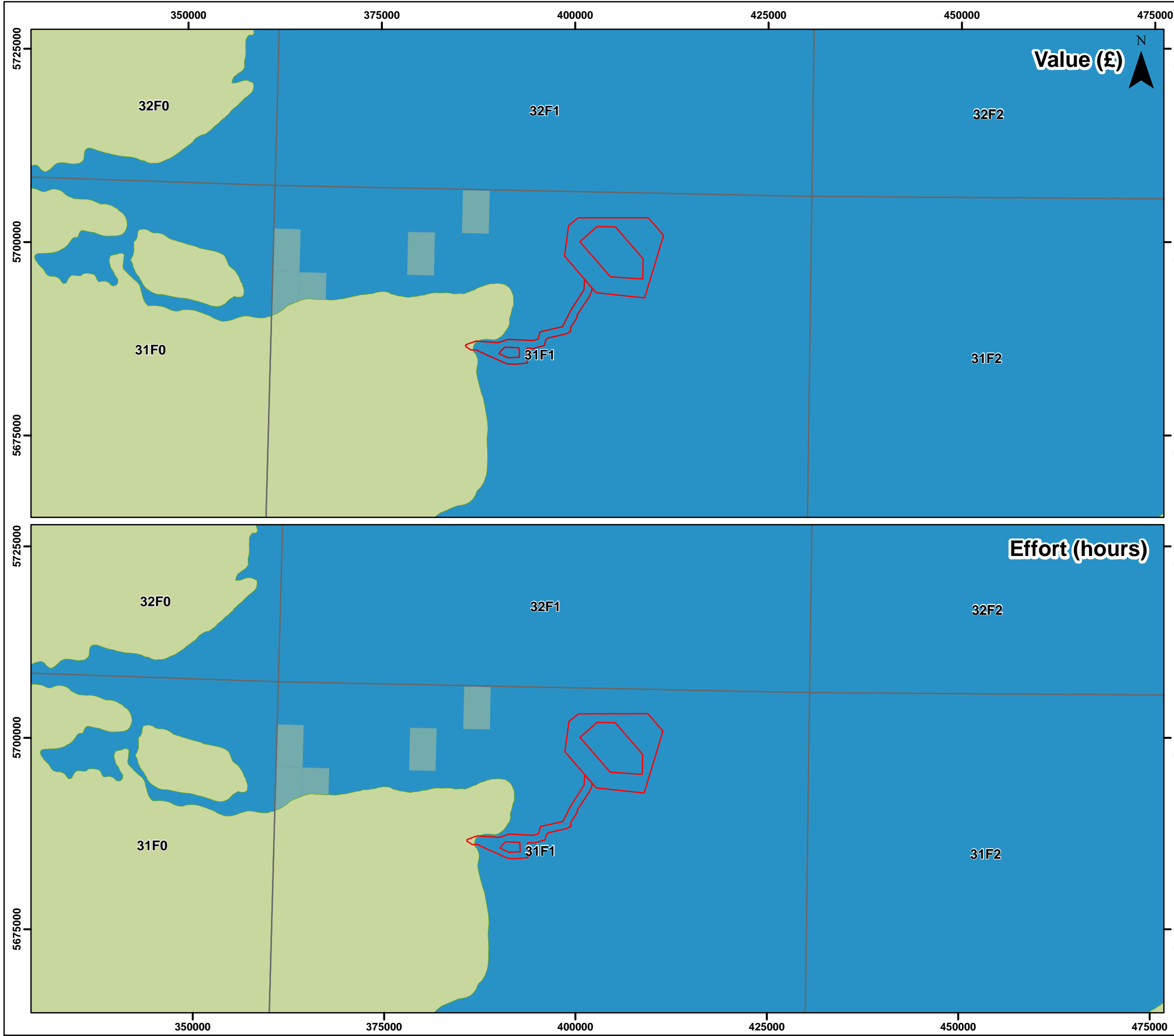
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By	JM	Layout	N/A	

THANET EXTENSION OFFSHORE WIND FARM

Figure 9.11
UK VMS value and effort for dredgers (average 2012 - 2016)



Legend
 Offshore Red Line Boundary
 ICES Rectangles

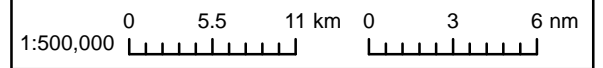
UK VMS Value
 Dredge
 No value
 Less than £1,000

UK VMS Effort
 Dredge
 No value
 Less than 1 hour

Datum: ETRS 1989
 Projection: UTM31N



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Drg No	VAT-THANT-01-008_UK_VMS_Dredge_1216			Figure 9.11
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	

Succorfish data

- 9.8.14 As previously mentioned, MMO VMS data for vessels less than 15m is not available. Succorfish Limited provide an attachable position tracker suitable for these smaller vessels. This technology has been recently employed by the majority of TFA vessels. GIS data supplied by Succorfish Ltd. from April until December 2017 is shown in the Commercial Fisheries Technical Baseline (Document Reference: 6.4.9.1).
- 9.8.15 The vessels carrying Succorfish trackers have used Thanet Extension to varying degrees, fluctuating seasonally. Some vessels transit through these areas to get to favoured fishing grounds beyond Thanet Extension.
- 9.8.16 The Succorfish data has confirmed that vessels have alternative grounds in the vicinity of Thanet Extension and that in many cases it is used as a transit route rather than a primary fishing ground.

9.9 Belgian fishing overview, regional and project specific

- 9.9.1 The Belgian fleet is the most active transboundary fleet in relation to Thanet Extension. The fleet focuses on the southern North Sea and English Channel, and comprises of around 65 vessels, the majority of which are beam trawlers.
- 9.9.2 The effort data in Figure 9.12 and Figure 9.13 indicate that Belgian vessels in the vicinity of Thanet Extension are predominately 18 – 24 m in length although some larger vessels (24 – 40 m) are also present. The average value of effort in 31F1 is 433 days. Within the local study area, the majority of effort is undertaken using beam trawl and to a lesser extent demersal trawls and nets. Demersal trawl activity is focused on near shore areas to the north of Thanet Extension. Overall netting by Belgian vessels is minimal. Within the regional study area, landings values are recorded for vessel for 10-14 m in length (Figure 9.14) whereas in the local study area, the majority of landings values are attributed to vessel between 18-24 m and to a lesser extent vessel between 24 and 40 m. The average annual value of landings is 1,670,912 within 31F1, a similar value to the adjacent 32F1 rectangle (Figure 9.15). The highest landings values in the regional study area are recorded in 31F2, the ICES rectangle closet to Belgium.
- 9.9.3 Figure 9.16 illustrates the landings by species within the regional study area. The majority of the landings value within 31F1 is of Dover sole, followed by plaice and a range of other species which are landed at lower values.

THANET EXTENSION OFFSHORE WIND FARM

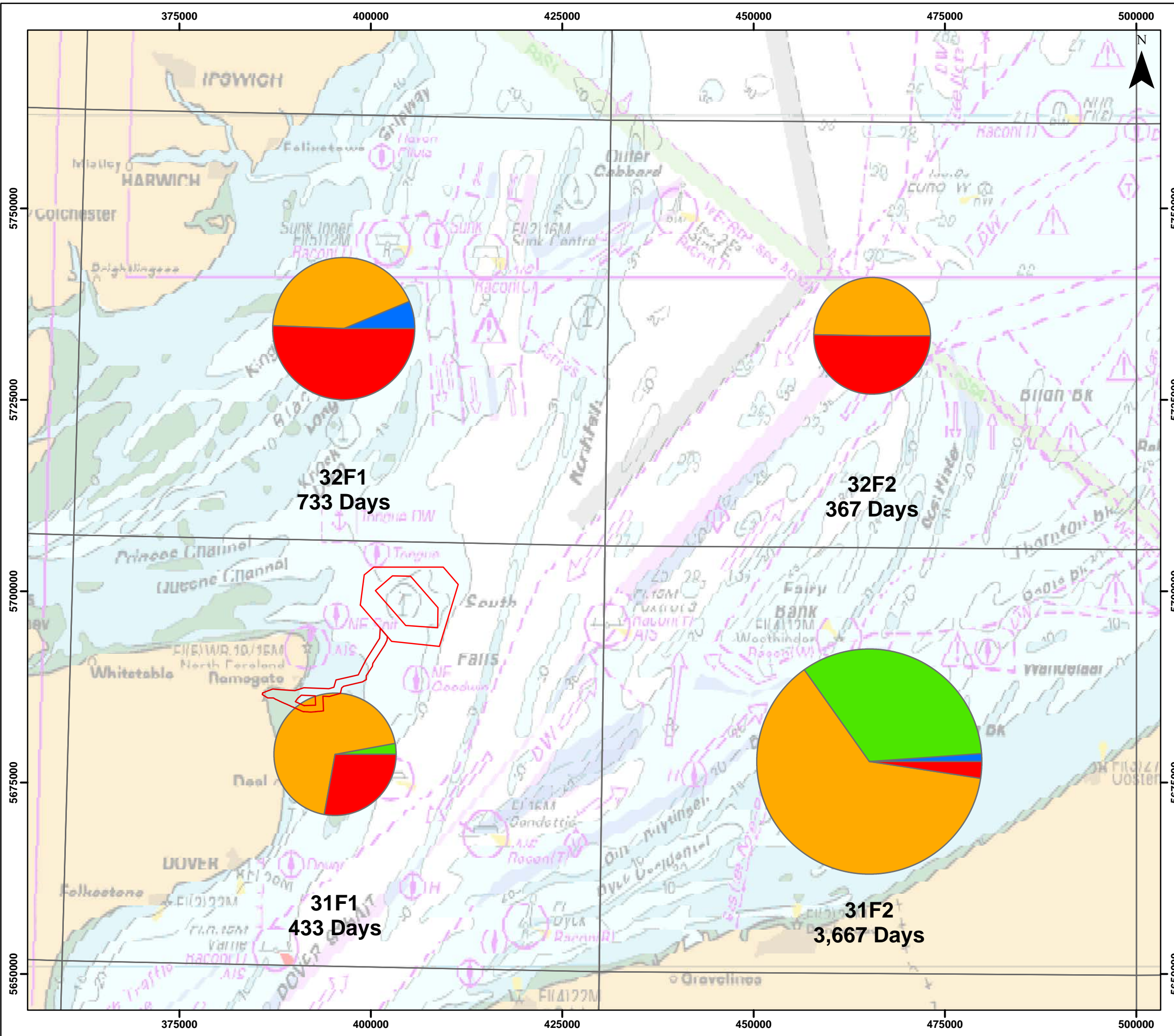
Figure 9.12
Belgian effort (days) by vessel size (average 2010-2014)

Legend

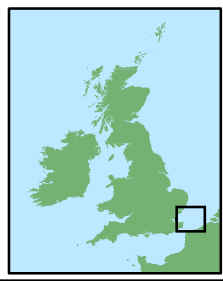
- Offshore Red Line Boundary
- ICES Rectangles

Belgian vessel size

- 10m to 12m
- 12m to 18m
- 18m to 24m
- 24m to 40m



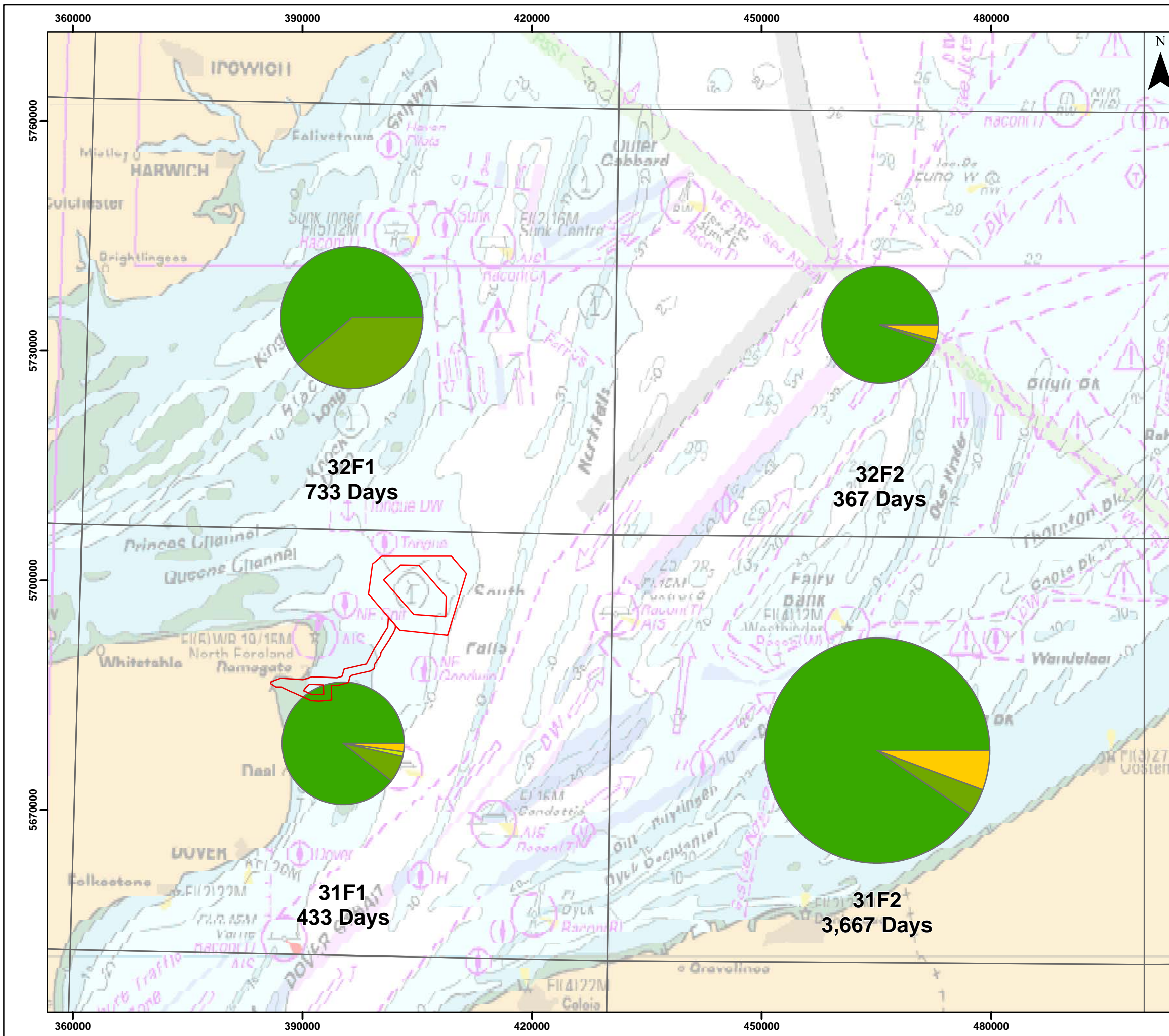
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Drg No	VAT-THANT-01-009_BE_EffortSize_1014			Figure 9.12
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	



THANET EXTENSION OFFSHORE WIND FARM

Figure 9.13
Belgian effort (days) by method
(average 2010-2014)

- Legend**
- Offshore Red Line Boundary
 - ICES Rectangles
 - Effort (days) by Method**
 - Beam trawl
 - Demersal trawls
 - Seine nets
 - Nets
 - Dredge
 - Hooks and lines

Datum: ETRS 1989
Projection: UTM 31N



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Drg No	VAT-THANT-01-010_BE_EffortMethod_1014			Figure 9.13
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	

THANET EXTENSION OFFSHORE WIND FARM

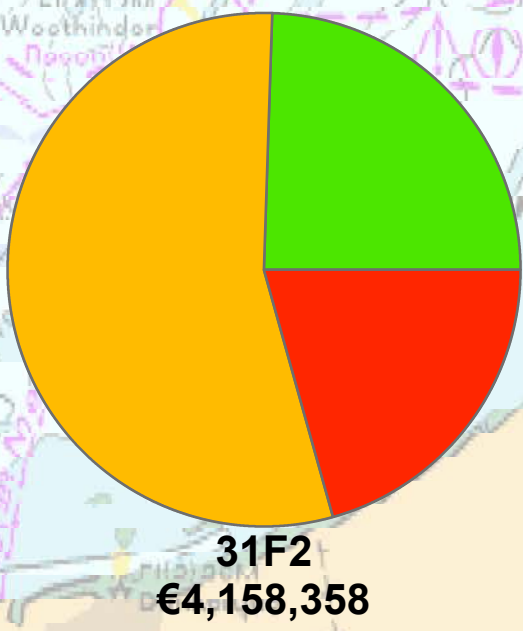
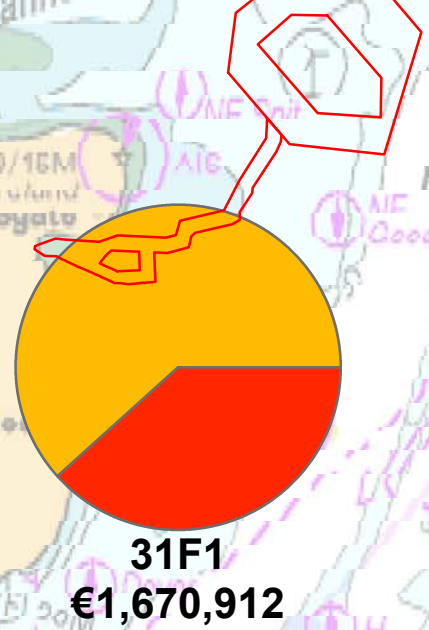
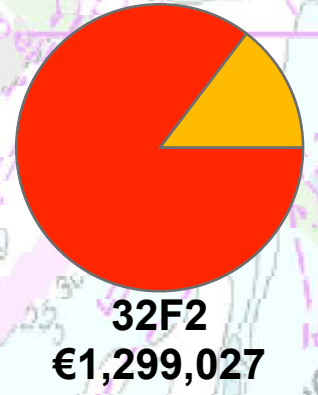
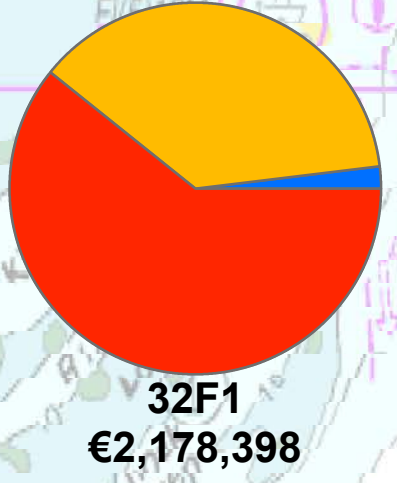
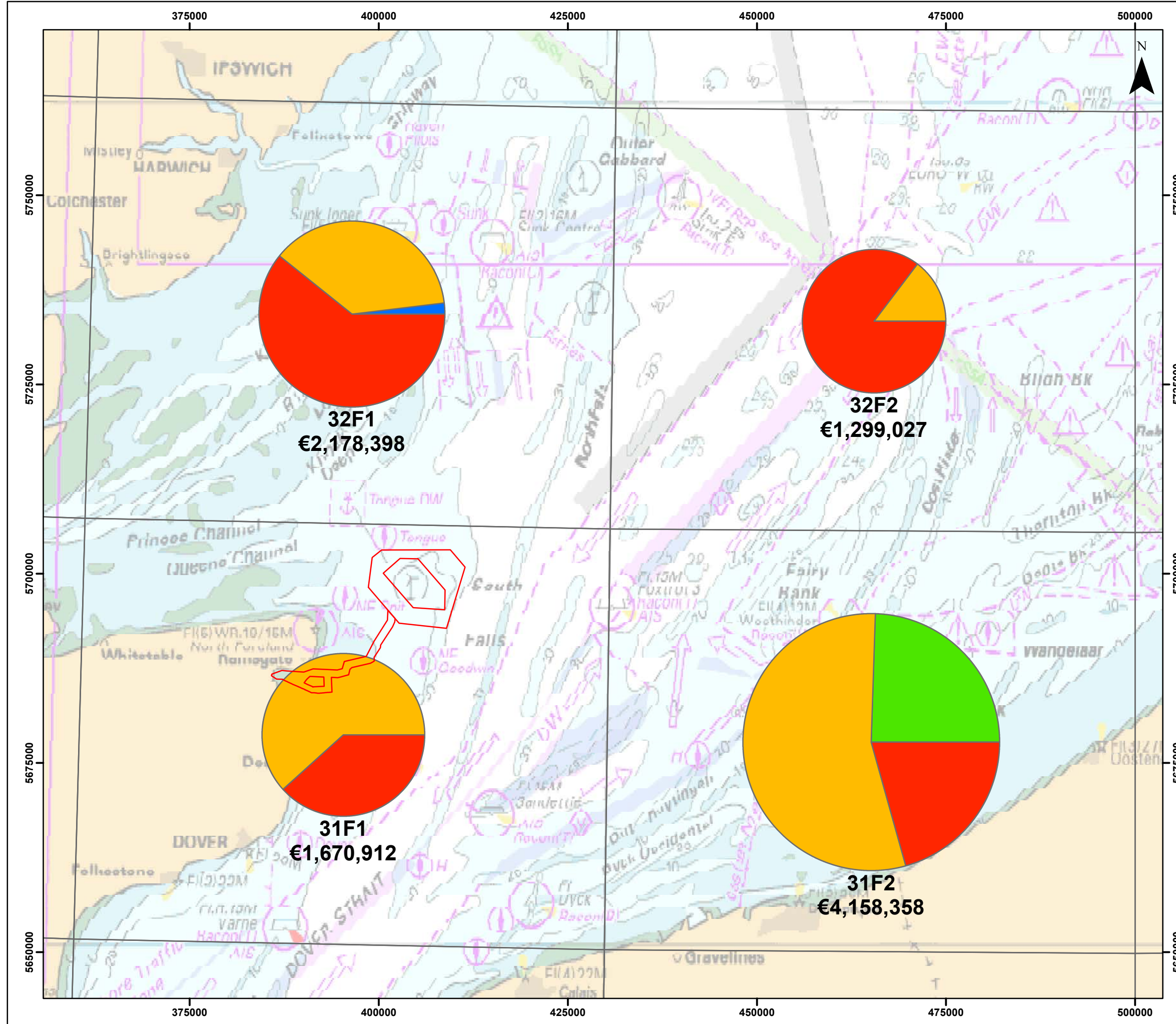
Figure 9.14
Belgian landings values (€) by vessel size (average 2010-2014)

Legend

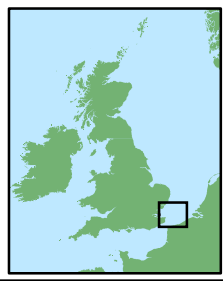
- Offshore Red Line Boundary
- ICES Rectangles

Belgian vessel size

- 10 to 12m
- 12 to 18m
- 18 to 24m
- 24 to 40m



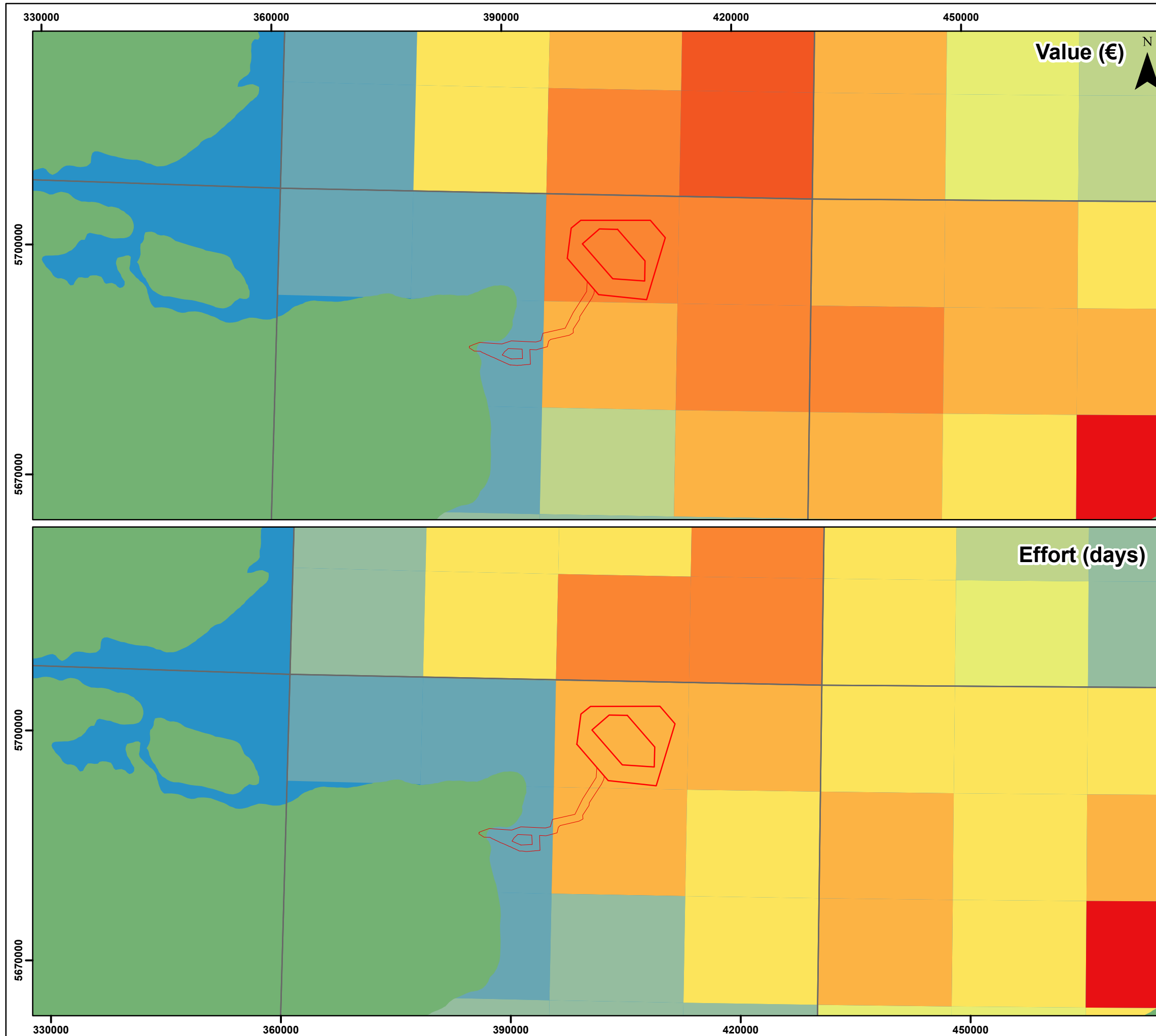
Datum: ETRS 1989
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Drg No	VAT-THANT-01-011_BE_ValueSize_1014			Figure 9.14
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	



THANET EXTENSION OFFSHORE WIND FARM

Figure 9.15
Belgian VMS value & effort all gear (fishing methods) (average 2010-2014)

Legend

- Offshore Red Line Boundary
- ICES Rectangles

Belgian VMS Value (€)

All Gear

- Less than €5,000
- €5,000 to €10,000
- €10,000 to €25,000
- €25,000 to €50,000
- €50,000 to €100,000
- €100,000 to €250,000
- €250,000 to €500,000
- €500,000 to €750,000
- Over €750,000

Belgian VMS Effort (Days At Sea)

All Gears

- Less than 2 days
- 2 to 5 days
- 5 to 10 days
- 10 to 20 days
- 20 to 50 days
- 50 to 100 days
- 100 to 150 days
- 150 to 200 days
- Over 200 days

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Drg No	VAT-THANT-01-012_BE_VMS_AllGear_1014			Figure 9.15
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By	JM	Layout	N/A	

THANET EXTENSION OFFSHORE WIND FARM

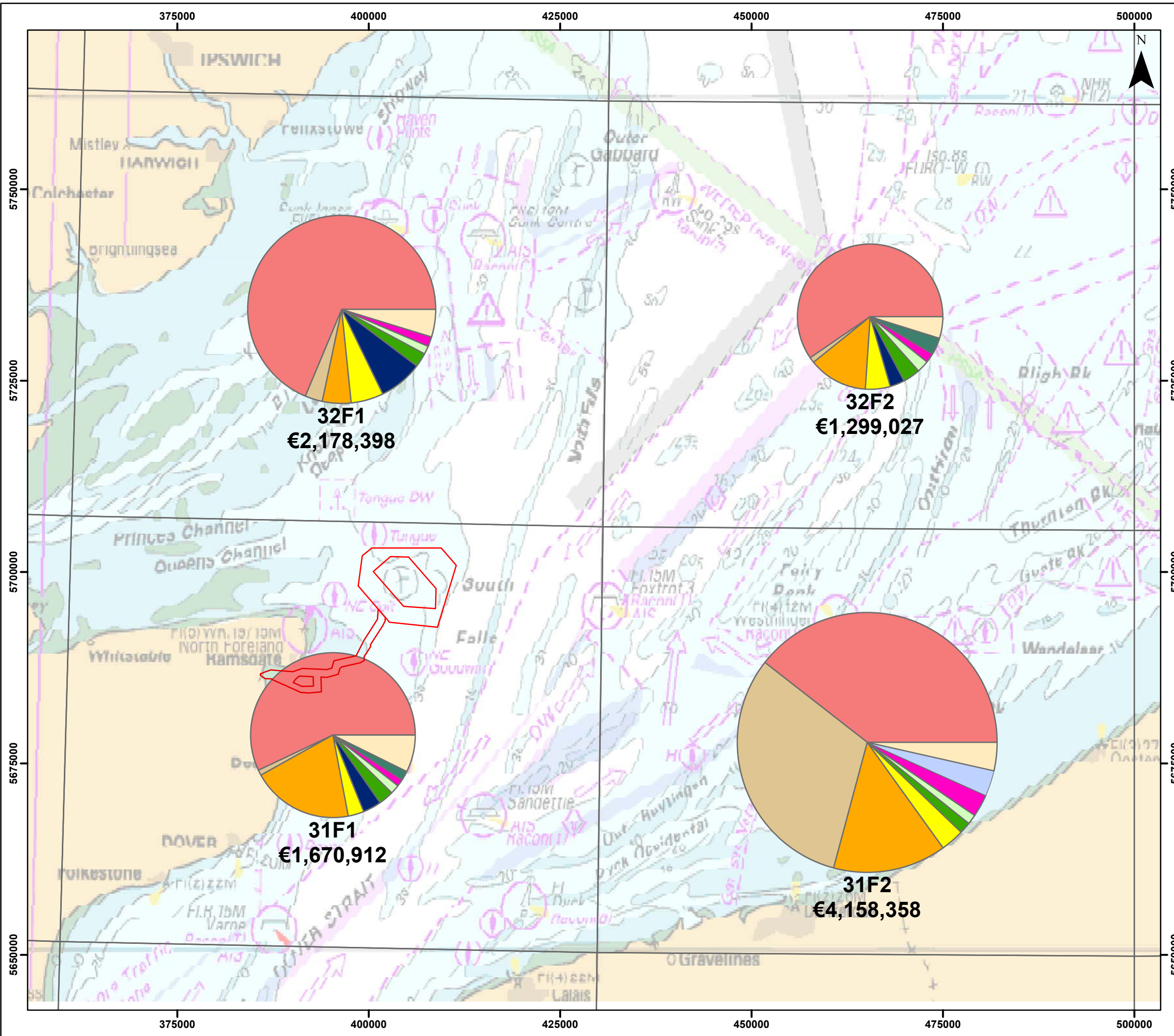
Figure 9.16
Belgian landings value (€) by species (average 2010-2014)

Legend

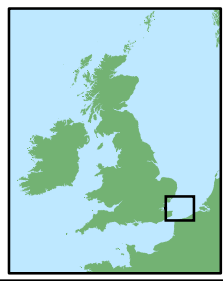
- Offshore Red Line Boundary
- ICES Rectangles

Value (€) by Species

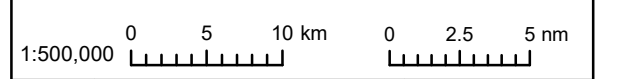
- Dover Sole
- Brown Shrimp
- Plaice
- Cod
- Skates & Rays
- Turbot
- Brill
- Bass
- Flounder
- Lemon Sole
- Other Species



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Drg No	VAT-THANT-01-013_BE_ValueSpecies_1014			Figure 9.16
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	

9.10 French overview, regional and project specific

- 9.10.1 French vessels are known to occasionally operate in the area of the proposed extension. French fishermen have historic rights to access grounds up to the 6 nm limit, within which the eastern section of Thanet Extension is located.
- 9.10.2 The principal methods used by the French fleet are bottom trawls targeting demersal and cephalopods species (Dover sole, red mullet, cuttlefish, whiting and plaice) and pelagic trawls which target pelagic species such as herring, mackerel, horse mackerel and sardine.
- 9.10.3 The majority of French vessels are larger demersal otter trawlers (more than 18 m in length) operating from the Nord Pas de Calais region, principally from Boulogne and to a lesser extent Dieppe.
- 9.10.4 Figure 9.17 illustrates that French bottom trawl, and pelagic gear activity occurs in the eastern boundary of Thanet Extension and focuses on grounds to the south of Thanet Extension. A similar pattern is illustrated for bottom otter trawls (Figure 9.18).
- 9.10.5 A more recent source of data is from IFREMER's 2014 annual report (Figure 9.19). This shows French fishing effort recorded in days for vessels over 18 m which use bottom trawls. This highlights that effort is at levels of 1719 – 2292 days per annum within 31F1. As shown by the earlier CRPMEM data, the majority of effort is undertaken to the east and south of Thanet Extension.
- 9.10.6 A data request was sent on 22/2/2018 to the IFREMER for current data following the PEIR responses but the data has not been received.

THANET EXTENSION OFFSHORE WIND FARM

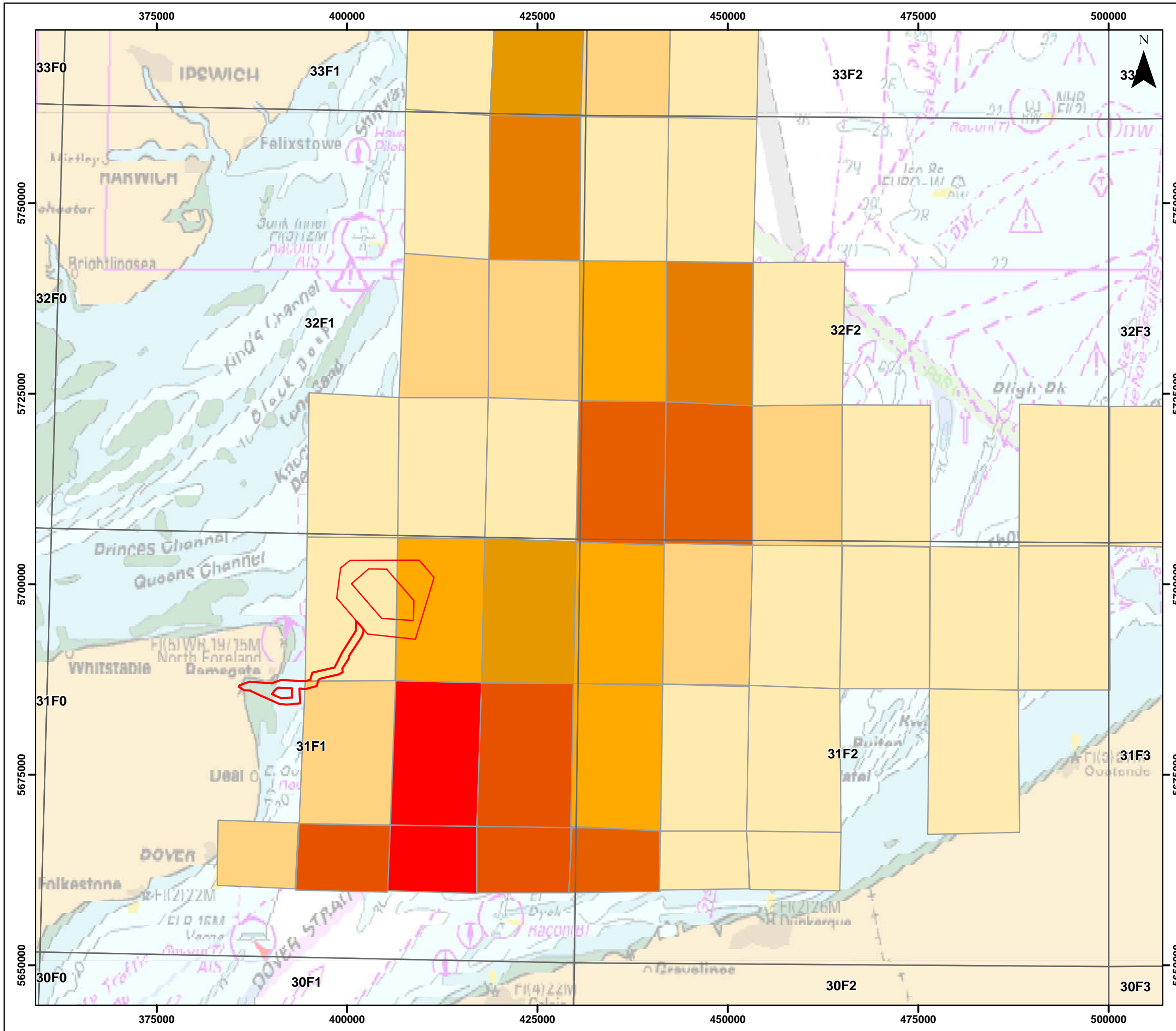
Figure 9.17
French effort (hours fished) by bottom trawls & pelagic nets in 2008

Legend

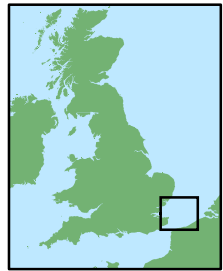
- Offshore Red Line Boundary
- ICES Rectangles

Fishing Time (hrs) per 10X10 Rectangle

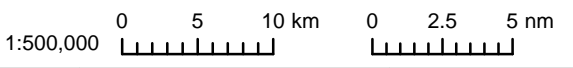
- 3 - 100hrs
- 100 - 250hrs
- 250 - 500hrs
- 500 - 750hrs
- 750 - 1000hrs
- 1000 - 1500hrs
- 1500 - 2000hrs
- 2000 - 2500hrs



Datum: ETRS 1989
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Drg No	VAT-THANT-01-014_FRA_VMS_BTPN_08			Figure 9.17
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By	JM	Layout	N/A	

THANET EXTENSION OFFSHORE WIND FARM

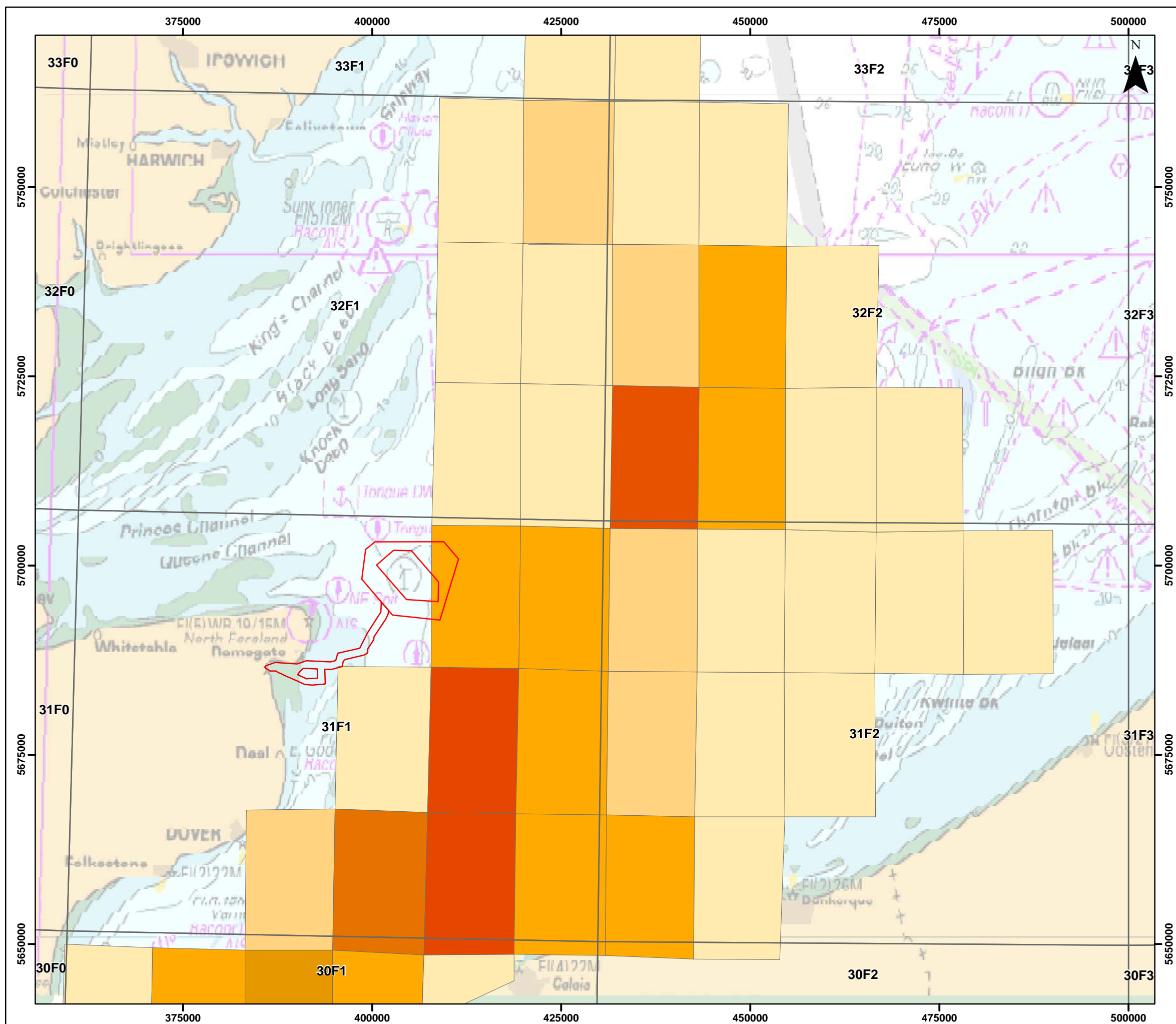
Figure 9.18
French effort (hours fished) by bottom otter trawls in 2008

Legend

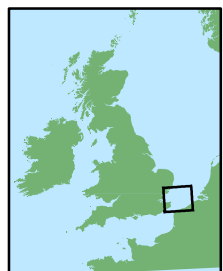
- Offshore Red Line Boundary
- ICES Rectangles

Fishing Time (hrs) per 10X10 Rectangle

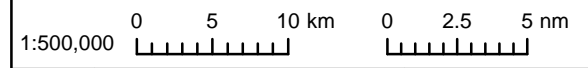
- 3 - 100hrs
- 100 - 250hrs
- 250 - 500hrs
- 500 - 750hrs
- 750 - 1000hrs
- 1000 - 1500hrs
- 1500 - 2000hrs



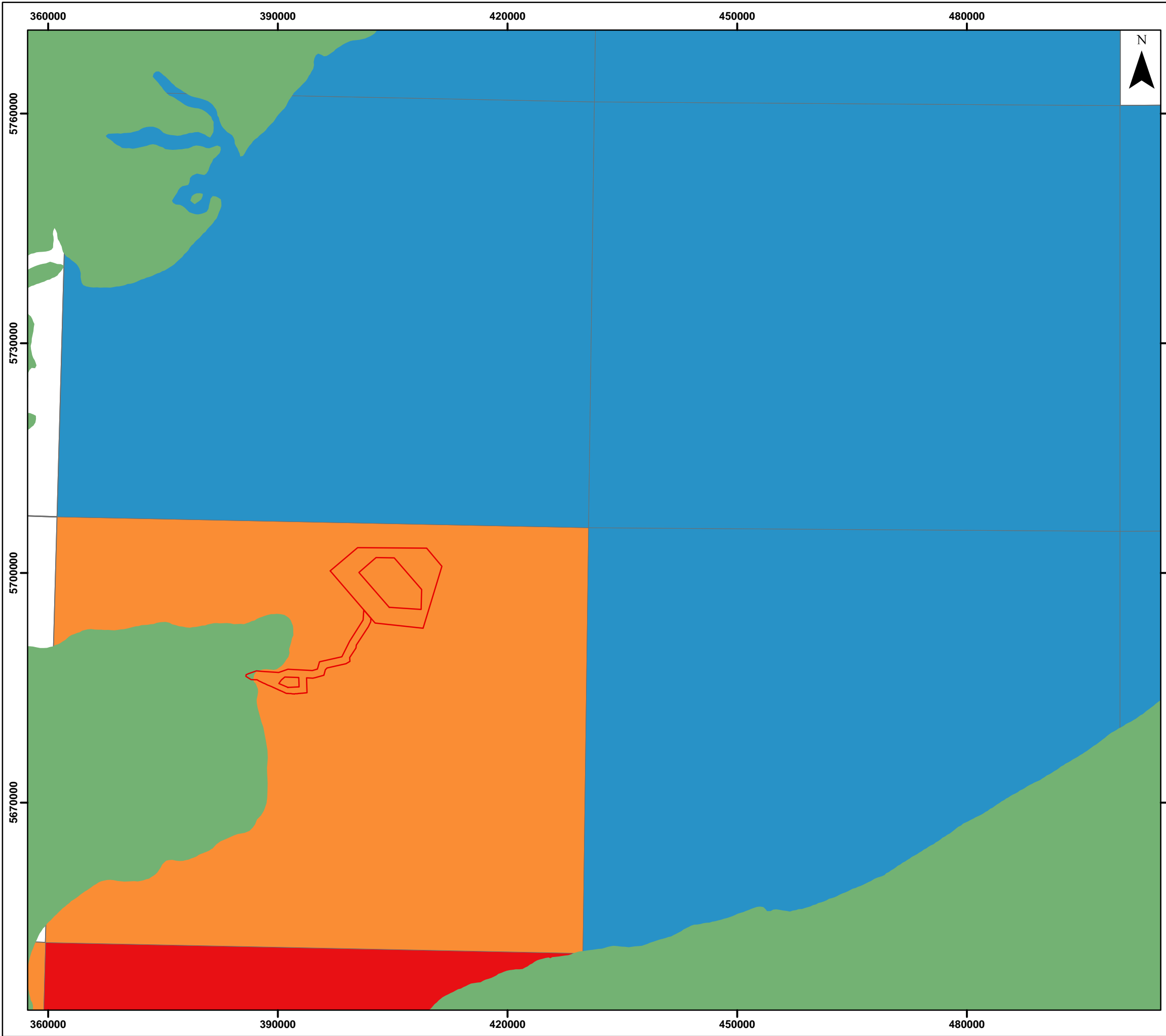
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Drg No	VAT-THANT-01-015_FRA_VMS_BT_08			Figure 9.18
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By	JM	Layout	N/A	



THANET EXTENSION OFFSHORE WIND FARM

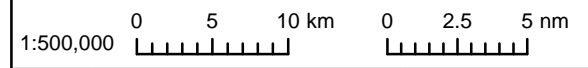
Figure 9.19
 French effort (days fished) by over 18m vessels using bottom trawls in 2014 (IFREMER 2015)

- Legend**
- Offshore Red Line Boundary
 - ICES Rectangles
 - French Fishing Effort (days)**
 - Less than 500
 - 500 - 1000
 - 1000 - 1500
 - 1500 - 2000
 - Over 2000

Datum: ETRS 1989
 Projection: UTM31N



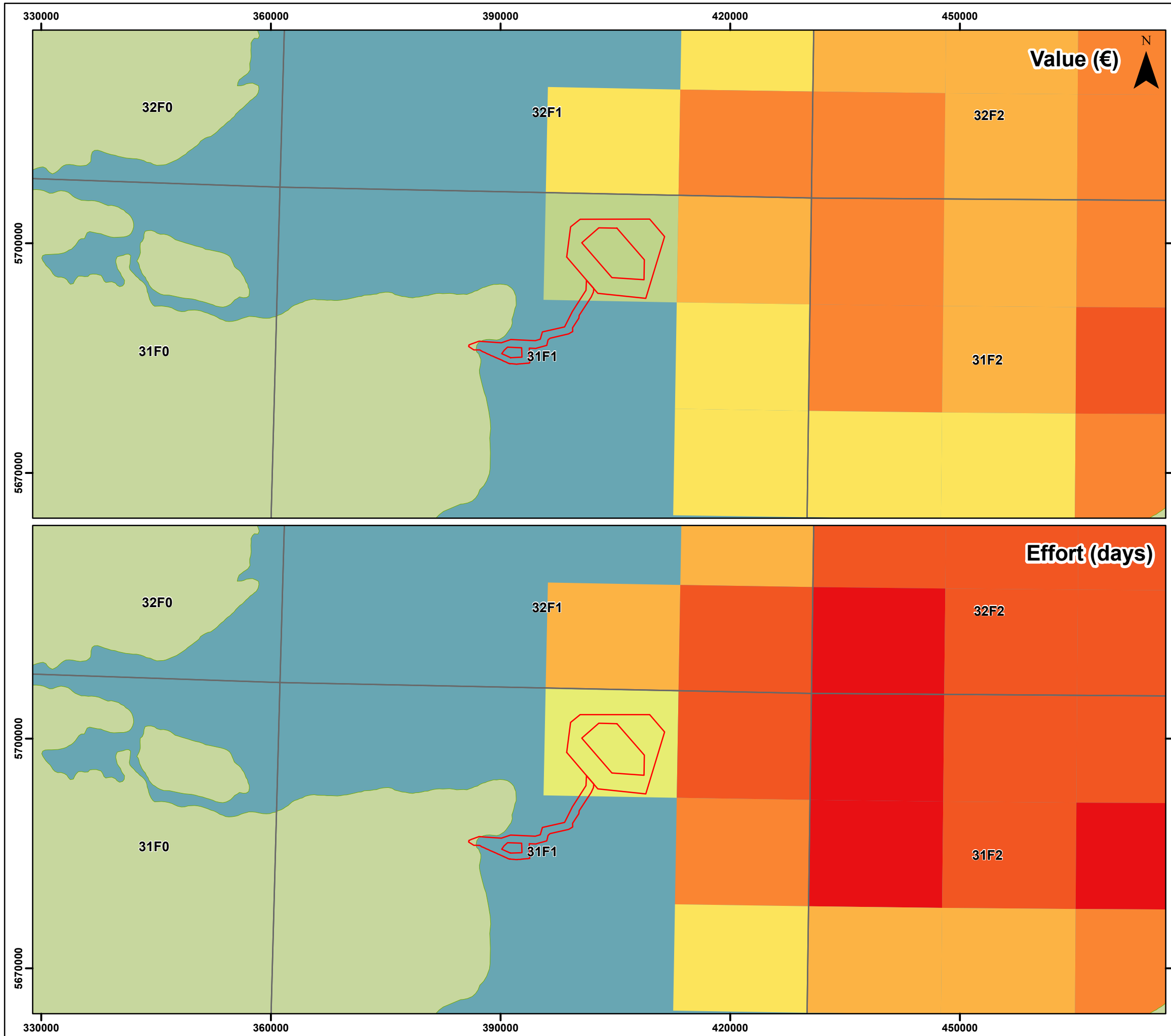
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Drg No	VAT-THANT-01-016_FR_Effort_days			Figure 9.19
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	

9.11 Dutch overview, regional and project specific

- 9.11.1 The Dutch operate the largest fleet in the southern North Sea. They deploy a range of gear types throughout the area, although the majority of vessels undertake beam trawling (pulse beaming).
- 9.11.2 Dutch vessels work within the regional and local area of the project, but due to legislative restrictions are unable to operate directly within Thanet Extension area. The Dutch do not have historic rights and therefore cannot fish within the UK 12 nm limit. It should also be noted that the NFFO and Dutch fishing interest have signed a voluntary agreement (in force from 15th February 2018) to prohibit pulse beaming from specified areas in the southern North Sea including one zone in the Greater Thames estuary to the east of the Thanet Extension.
- 9.11.3 The southern North Sea is an area of high intensity fishing for the Dutch beam trawling fleet. However, due to the 12 nm restriction, low level activity occurs close to Thanet Extension (10 - 20 days per annum), with associated landings values of between €250,000 – €500,000. It is noted that with closures to fishing grounds located within Thanet Extension some overlap may occur for local vessels between UK and Dutch alternative fishing grounds but alternative grounds for the local fleet within UK waters have been identified and shown in the Succorfish data for local UK vessels and the Dutch fleet have extensive grounds throughout the southern North Sea.
- 9.11.4 The VMS data (Figure 9.20) demonstrates that beam trawling is undertaken to the east of Thanet Extension.
- 9.11.5 Effort values by vessel type clearly demonstrate that the majority of Dutch vessels operating in the area are over 24 m in length (Figure 9.21). The effort levels are relatively low compared to the rest of the southern North Sea, at an average of 125 days per annum within ICES rectangles 31F1 (Figure 9.22).



THANET EXTENSION OFFSHORE WIND FARM

Figure 9.20
Dutch VMS effort and value by beam trawls (average 2012-2016)

Legend

- Offshore Red Line Boundary
- ICES Rectangles

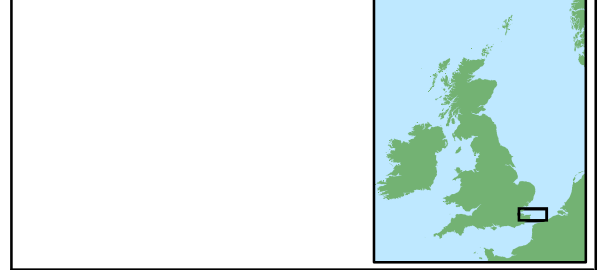
Dutch VMS value (€)

- Less than €5,000
- €5,000 to €10,000
- €10,000 to €50,000
- €50,000 to €100,000
- €100,000 to €250,000
- €250,000 to €500,000
- €500,000 to €1,000,000
- €1,000,000 to €1,500,000
- Over €1,500,000

Dutch VMS effort (days)

- Less than 2 days
- 2 to 5 days
- 5 to 10 days
- 10 to 20 days
- 20 to 50 days
- 50 to 100 days
- 100 to 150 days
- 150 to 200 days
- Over 200 days

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Drg No	VAT-THANT-01-017_NE_VMS_BT_1216			Figure 9.20
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	

THANET EXTENSION OFFSHORE WIND FARM

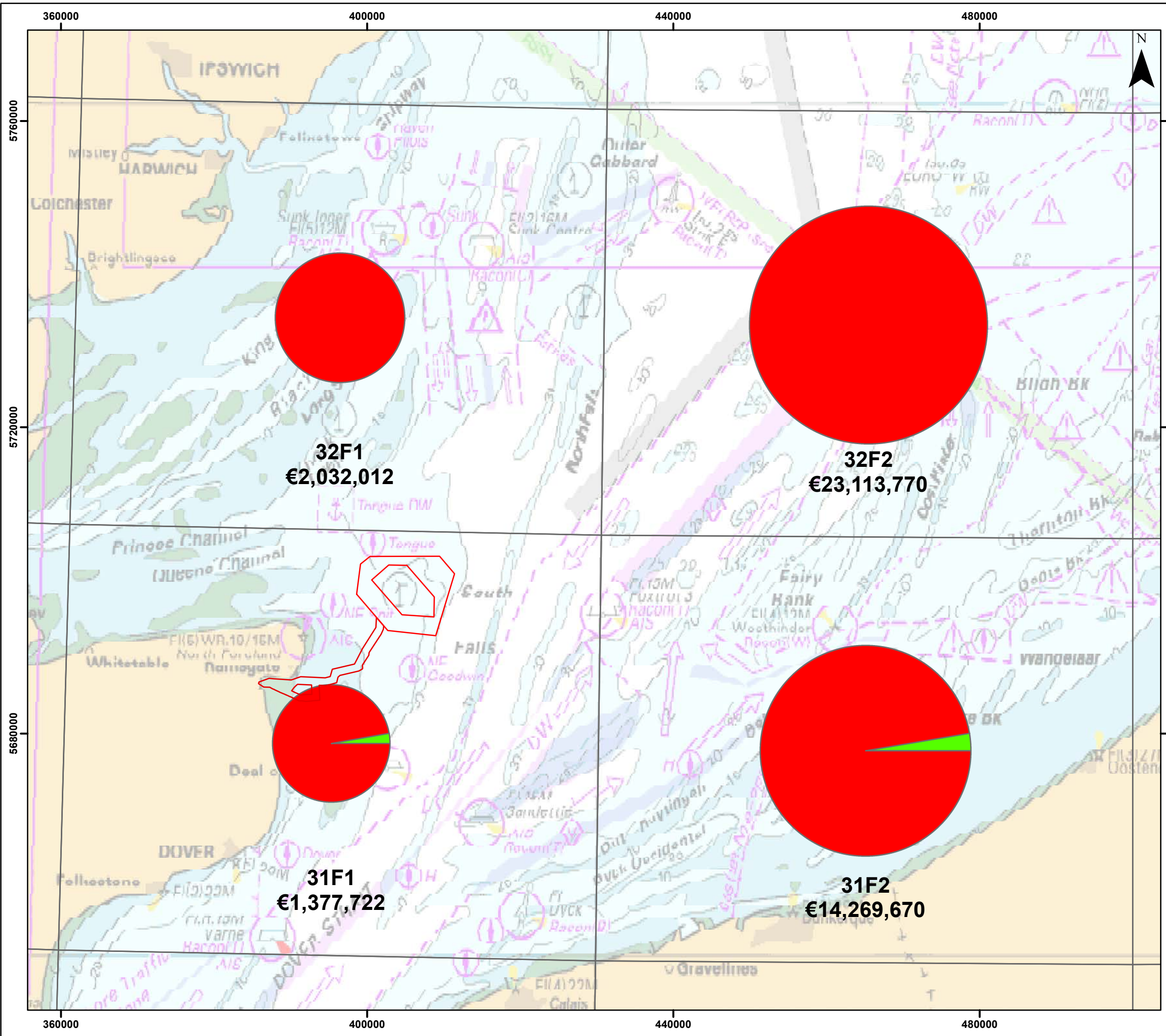
Figure 9.21
Dutch landings values (€) by vessel size (average 2012-2016)

Legend

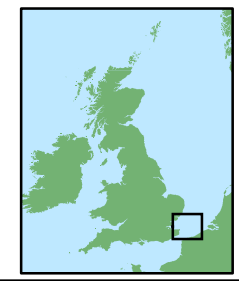
- Offshore Red Line Boundary
- ICES Rectangles

Dutch Landings by Vessel Size¹

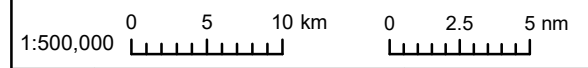
- Under 10m
- 10m to 15m
- Over 15m



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Projection: UTM31N



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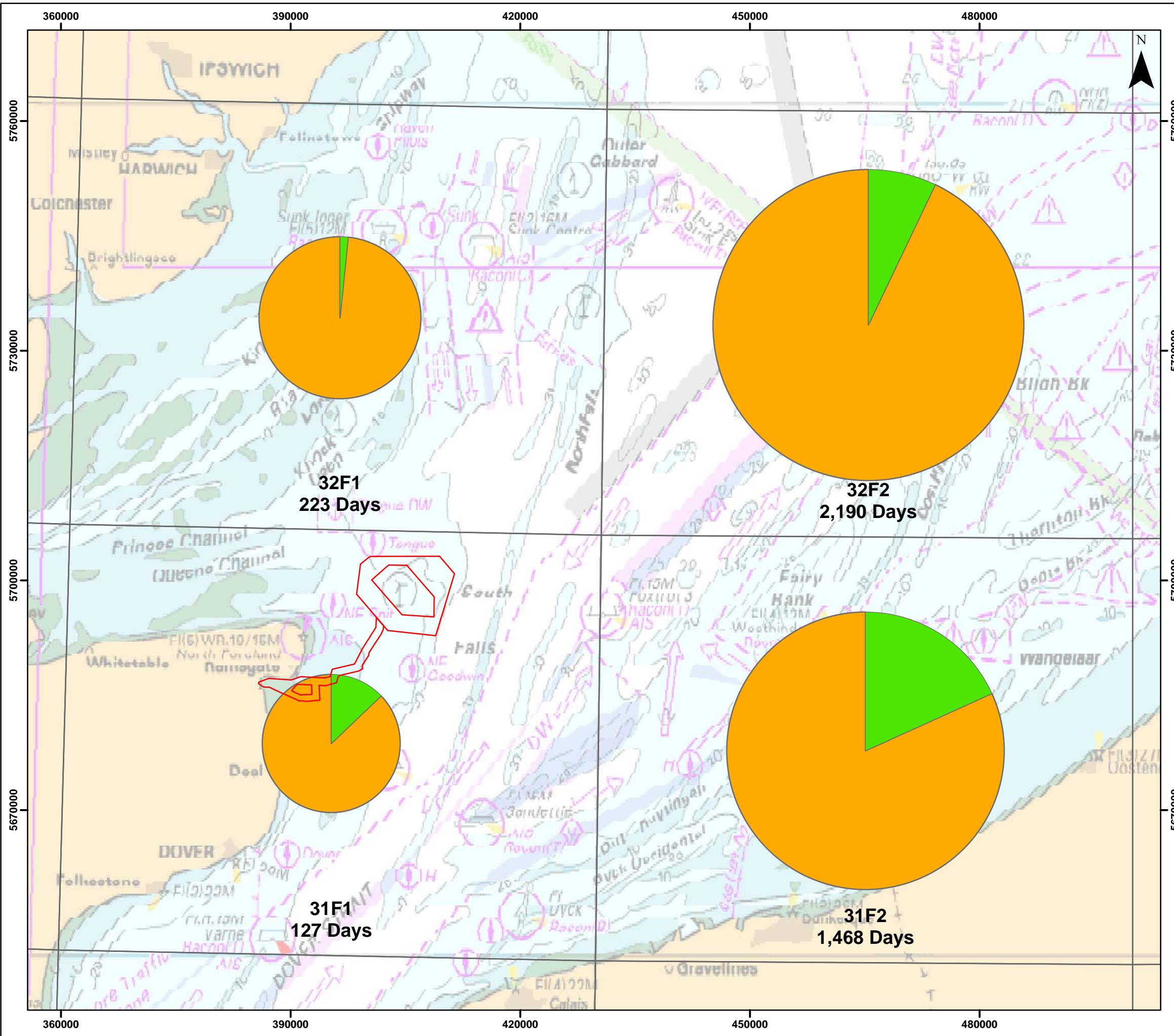
Drg No	VAT-THANT-01-018_NE_ValueSize_1216			Figure 9.21
Rev	0.1	Date	25/05/2018	
By	JM	Layout	N/A	

THANET EXTENSION OFFSHORE WIND FARM

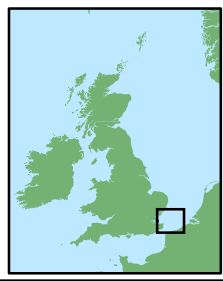
Figure 9.22
Dutch landings effort (days) by vessel size (average 2012-2016)

Legend

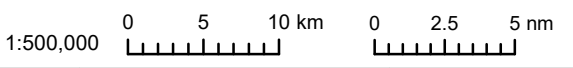
- Offshore Red Line Boundary
- ICES Rectangles
- Dutch Vessel Size**
- Under 10m
- 15m and Over
- 10 to 15m



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Drg No	VAT-THANT-01-019_NE_EffortSize_1216			Figure 9.22
Rev	0.1	Date	25/05/2018	
By	MK	Layout	N/A	

9.12 Other nationalities: Danish, German

9.12.1 Other nationalities have been recorded in the area of Thanet Extension albeit at lower levels of activity. Whilst occasional surveillance sightings of German and Danish vessels have been observed in the area, these fleets have not been discussed at length in this chapter.

9.13 Fishing methods & gear descriptions

Potting

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

9.13.2 Parlour pots are generally used for the capture of crabs and lobster with pots baited, usually with fish. Pots are rigged in fleets of 10 to 50 pots per fleet (in a string) depending upon the vessel size and the area to be fished. Ramsgate fleet deploys around 20-25 lobster pots per string due to smaller vessel size. Lengths of a fleet (or string) of pots may range from 100 to 500 m, anchored at each end with either an anchor or chain clump weights. A variety of surface markers are used including flagged dhans (marker flags), buoys and cans. Soak times, the time between baiting and deployment to emptying and harvesting, varies from approximately 12 hours to 2 days, although this can be longer during periods of adverse weather.

9.13.3 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. Fleets are generally similar lengths to those used for crab and lobster potting.

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

Gillnetting

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

Dredging

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

Beam trawls

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

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

9.13.9 Pulse beam trawls are adapted beam trawls where the nets contain a series of electrodes to emit short electric pulses that stun fish. This method primarily targets flatfish and is permitted only by exception granted by the EU (currently applied to UK and Dutch trawlers in the North Sea), but a recent vote by the EU parliament (18th Jan 2018) has proposed banning of this method. This decision is still subject to further lobbying by the Dutch fishing industry and ratification of any final law.

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

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

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

Otter trawls

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

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

9.13.15 Vessels targeting demersal species generally operate a twin rig otter with gear trawled close to the seabed on softer grounds to the otter trawls described previously. The main advantage of towing two nets is that the area swept is greater and hence the catch. As with a single trawl, the trawl doors provide the spread. A third warp runs from the boat to the clump, a weighted piece of metal designed to roll along the seabed.

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

9.14 Fisheries legislation

9.14.1 There are numerous controls on commercial fishing in UK and EU waters via legislation at local, national and European levels. Primarily this legislation has direct impacts on fishing effort, landings weights and values, thus affecting the baseline. This legislation and associated restrictions can be implemented at short notice making the assessment of future trend difficult. The principal regulatory authorities covering the area of Thanet Extension are the EU through the Common Fisheries Policy (CFP), UK's MMO through national and regional regulations and locally (out to the 6 nm limit) via Kent & Essex IFCA through their byelaws. A more detailed description of fisheries controls and legislation can be found in the technical report.

Future fisheries

9.14.2 Changes to quota and effort allocation, fishing areas and gear restrictions make predicting future fishing activity difficult and subjective. Additionally, there have been significant changes to the CFP which are being rolled out to all fleets and are likely to have a major impact on the management of commercial fishing activities in terms of discards and seasonal species restrictions.

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

9.14.4 Brexit negotiations are ongoing until March 2019 when a 2 year transition period will begin. The legislation for commercial fishing in UK waters is subject to change following these negotiations, and this may alter activity and access of both local and non-UK fleets in the future. However currently it is still under the CFP jurisdiction.

9.14.5 On analysis of the existing environment baseline, the following fleets have been identified as operating in the area of Thanet Extension:

- UK Drift and Static netters;
- UK Potters;
- UK Demersal trawlers;
- UK Dredgers;
- Belgium Fleet (principally beam trawlers);
- French Fleet (primarily Demersal and Pelagic trawlers); and
- Dutch fleet (beam trawlers).

9.15 Key parameters for assessment

9.15.1 This section identifies the maximum adverse scenario in environmental terms, defined by the project design envelope, and also lists embedded mitigation.

9.15.2 The maximum design scenario has been compiled following appraisal of the Project Description (Offshore) (6.2.2) (Table 9.10). The parameters which constitute this scenario have been selected on the premise that they could result in the greatest potential impact upon the fishing activities.

Table 9.10. Maximum design scenario assessed

Impact	Parameter	Justification
Site clearance and construction		
Adverse impacts on commercially exploited fish and shellfish populations	Impacts to commercially important fish and shellfish are assessed in Fish and Shellfish Ecology Chapter (Document Reference: 6.2.6)	
Temporary loss or restricted access to traditional fishing grounds	<p>500 m advisory safety areas around the following: construction activities and vessels; partially or fully installed infrastructure; and along exposed sections of cables.</p> <p>A maximum of 30 months construction (on- and offshore).</p> <p>A maximum of 34 WTGs and 1 Offshore Substation (OSS).</p> <p>Maximum of four HVAC cables. 5km required for pre-sweep (dredging). Total length of 30 km per cable.</p> <p>Maximum length of 64 km of inter-array cables with maximum WTG spacing.</p>	<p>Maximum duration and extent of exclusion zones during construction phase. This provides a worst-case scenario of the potential restriction of access to fishing grounds.</p>

Impact	Parameter	Justification
Safety issue for fishing vessels	<p>This considers the potential of collision between construction structures and vessels with fishing vessels within Thanet Extension site.</p> <p>Maximum of 34 WTGs with a minimum spacing of 716 m x 480 m.</p> <p>One OSS.</p> <p>One Met Mast, one wave buoy and one LiDAR.</p> <p>A maximum of 48 vessels on site at any one time.</p>	<p>Transit between locations where minimum inter WTG spacing has been applied may be difficult for fishing vessels. It is likely that this minimum spacing would be used in isolated small areas if at all. If most or all of the turbines have this minimum spacing then total area covered would be reduced therefore reducing the impact overall.</p>
Increased steaming times to fishing grounds	<p>500 m advisory safety areas around the following: construction activities and vessels; partially or fully installed infrastructure; and along exposed sections of cables.</p> <p>A maximum of 30 months construction (on- and offshore).</p> <p>Total length of 30 km per export cable from offshore substation to landfall.</p> <p>Maximum length of 64 km of inter-array cables.</p>	<p>Longest distance and duration of transit diversion during construction. The maximum number of WTGs (34) will require the highest number of construction vessels and also produce the highest number of 500 m exclusion zones within the array area which will impact on fishing vessels.</p>

Impact	Parameter	Justification
Interference with fishing activities	Vessels to be operating for a maximum of 30 months construction (on- and offshore). Base harbour will be Ramsgate.	The maximum duration of construction could result in the greatest risk of impact on fishing gear and vessels. The selected construction port will result in the transit routes being through the most intensively fished grounds.
Displacement of fishing activity into other areas	In line with impact described for “Temporary loss or restricted access to traditional fishing grounds”.	The maximum duration and extent of fishing exclusion during construction leading to the greatest potential for displacing fishing activity into other areas.
Obstacles on the seabed post construction	Offshore works will include operations such construction vessel anchoring, jack-up legs and trenching of cables which can produce obstructions due to seabed disturbance or mislaid objects. These can cause fishing net fastening and general damage to fishing gears.	Snagging hazards may result in cessation of fishing activity in the area, and unacceptable safety risks.
O&M		
Adverse impacts on commercially exploited fish and shellfish populations	Adverse impacts on commercially exploited fish and shellfish populations are addressed in Volume 2, Chapter 6: Fish and Shellfish Ecology	

Impact	Parameter	Justification
Complete loss or restricted access to traditional fishing grounds	Maximum of 34 WTGs with a minimum spacing of 716 m x 480 m. One OSS. One Met Mast, one wave buoy and on LiDAR.	In areas of the WTG array where the minimum spacing has been applied, fishing grounds will be lost throughout the O&M phase. In this scenario, a larger overall area would be left without infrastructure within the RLB which would permit full fishing activity in those sections where larger inter WTG spacing has been applied, or no WTGs exist as a result of less overall area occupied by Thanet Extension.
Safety issue for fishing vessels	Safety issues to be considered include gear interaction with exposed cables and WTGs advisory 50 m safety zone radius, risk of collision with offshore infrastructure, possible radar interference and challenges of emergency response. The safety risks proposed by the inter array and OECC have been assessed and based on: maximum inter array cable length of 64km; and maximum OECC length of 120 km (4 cables).	Maximum number of WTGs (34), with a minimum spacing of 716 m x 480m along with a single offshore substation. The worst-case scenario would include the maximum levels of inter-array and export cables exposed to possible interaction with fishing gears or anchors. These parameters have the potential to result in unacceptable safety risks to fishing vessels. This would prevent fishing from resuming in the operational site.

Impact	Parameter	Justification
Increased steaming times to fishing grounds	Maximum of 34 WTGs with a minimum spacing of 716 m x 480 m. One OSS. One Met Mast, one wave buoy and on LiDAR.	Maximum disruption to established steaming routes would be in areas where minimum spacing is applied, though this is likely to only be applied to isolated areas, and would result in a larger overall area existing without infrastructure.
Interference with fishing activities	Maximum number of O&M vessels transiting identified fishing grounds is 307 round trips per annum.	Maximum number of WTGs (34) will result in maximum number of O&M vessels.
Displacement of fishing activity into other areas	In line with impact described for “Complete loss or restricted access to traditional fishing grounds”.	Identifies the greatest potential restriction on the possibility of continuation of standard fishing activities.
Obstacles on the seabed post construction	Construction related obstacles and changes to sea bed conditions.	Obstacle could constitute a fastening risk and therefore prevent fishing from recommencing.
Decommissioning		
Decommissioning works and associated implications for commercial fisheries are considered analogous with those assessed for construction previously.		
Cumulative		
Adverse impacts on commercially exploited fish and shellfish populations	Adverse impacts on commercially exploited fish and shellfish populations are addressed in Volume 2, Chapter 6: Fish and Shellfish Ecology	

Impact	Parameter	Justification
Complete loss or restricted access to traditional fishing grounds	Full list of developments of other proposed marine development in the area included in Table 9.12.	Maximum restriction of resumption of normal fishing activities to pre-construction levels, especially for drift netters.
Safety issue for fishing vessels	See Volume 2, Chapter 10: Shipping and Navigation Chapter.	Greatest when greatest number of projects considered.
Increased steaming times to fishing grounds	Full development of other proposed marine developments.	Could result in maximum disruption to established steaming routes.
Interference with fishing activities	Full development of other proposed marine developments.	Highest potential to result in maximum disruption to regular steaming routes.
Displacement of fishing activity into other areas	Full development of other proposed marine developments.	Greatest potential to restrict return to normal fishing activities within the region.

9.16 Embedded mitigation

9.16.1 Mitigation measures that were identified and adopted as part of the evolution of the project design and that are relevant to commercial fisheries are listed in Table 9.11. Embedded mitigation relating to Commercial Fisheries. General mitigation measures, which would apply to all parts of the electrical transmission works, are set out first. Mitigation measures that would apply specifically to commercial fisheries issues associated with specific infrastructure types are described separately for each phase of Thanet Extension. The majority of embedded mitigation is linked to safe working practices and standard navigational requirements. Mitigation measures specifically related to commercial fisheries will be discussed further in the Fisheries liaison and Co-existence Plan (Document Reference: 8.8), which has been discussed with TFA.

Table 9.11. Embedded mitigation relating to Commercial Fisheries

Parameter	Mitigation measures embedded into the project design
General	
Fisheries Co-existence Plan	A document detailing commitment from Thanet Extension and the TFA for cooperation throughout all phases of the project. Document Reference: 8.8
Appropriate liaison	Regular liaison on planned activities and timescales for potential exclusion from the site.
Notice to Mariners	These will be compiled by the construction/ survey vessel owners and distributed to relevant fisheries stakeholders by the retained FLO. These will be issued in timely and efficient manner with the aim for these to be issued a fortnight prior to mobilisation of the vessel. These will provide contact details for the vessel and coordinates provided as latitude and longitude (Degree and Decimal Minutes).
Construction	
Cable burial and protection	All cables within the inter-array and OECC may be buried, where possible, to the maximum required depth (3 m) to prevent damage to and from fishing gear. Where this is not possible, cable protection measures will be deployed. Cable burial methods will be confirmed following approval by the MMO.
Construction contractors	All contractors will comply with the developer’s standard offshore policies. These prohibit discarding of objects overboard, notification to the MMO of such objects, and where practicable recovery of any accidentally dropped objects. They are also informed that their vessel should not undertake any commercial or recreational fishing activity of any sort whilst under contract to the client. All vessels contracted by the client will be required to adhere to International Regulations for Prevention of Collisions at Sea (COLREGS).
RLB change	The RLB has been amended to reduce the amount of drift net fishing grounds that it coincides with, which may reduce the impact magnitude for the local driftnetting fleet.
O&M	
Dropped Objects Procedure	Should any construction related items be dropped this will be recorded and items recovered, where practicable.

Parameter	Mitigation measures embedded into the project design
Decommissioning	
Construction contractors	All contractors will comply with the developer’s standard offshore policies. These prohibit discarding of objects overboard and where practicable recovery of any accidentally dropped objects. They are also informed that their vessel should not undertake any commercial or recreational fishing activity of any sort whilst under contract to the client. All vessels contracted by the client will be required to adhere to COLREGS.

9.17 Environmental assessment: construction phase

9.17.1 This Section addresses the site clearance and construction phase impacts, as listed in Table 9.10.

Adverse impacts on commercially exploited fish and shellfish populations.

9.17.2 There is the potential for the construction phase of Thanet Extension to have adverse impacts on commercially harvested fish and shellfish populations resulting in behavioural changes or declines in abundance, which could indirectly affect the productivity of the fishery. Adverse impacts on commercially exploited species are assessed fully within the Fish and Shellfish Ecology Chapter (Document Reference: 6.2.6) and are not expected to exceed **Minor** adverse significance.

Loss or restricted access to traditional fishing grounds

9.17.3 From consultation, in particular with local UK fisheries stakeholders, it is clear that the loss of fishing area is the principle concern with regard to this development. Whilst the RLB has been lessened, and therefore potential interaction with traditional fishing grounds reduced, as a result of the feedback received during formal consultation, during site clearance and the construction phase, temporary loss of fishing area will occur due to the following advisory safety areas being instigated as:

- Advisory safety areas around construction, decommissioning activities;
- Advisory safety areas around installed or partially installed infrastructure; and
- Advisory safety areas along vulnerable exposed sections of the OECC.

9.17.4 Installation of the export cable is likely to be via simultaneous lay and burial techniques which would require transitory advisory safety areas. Post-lay burial techniques such as jetting would however require longer term zones along the OECC.

9.17.5 The scale of any impact would be related to the intensity and value of the fishing in that area, the advisory safety area size and whether other local grounds with similar productivity could mitigate the loss.

9.17.6 Most of the local UK fleet are able to operate multiple gear types allowing flexibility in their target species and also efficiency, under monthly quota allowances. The majority of this activity is concentrated within the 12 nm limit, thus avoiding interaction with large Dutch beam trawlers.

UK drift and static netters

9.17.7 Using the information provided following consultation by the TFA, it is understood that the static gear fleet is almost entirely comprised of under 10 m vessels based at local ports along the Kent coast, which are limited both in terms of operational ranges and weather capabilities. These vessels operate a range of net types including drift (often trammel) and static gillnets. The available information indicated that netting occurs primarily inside of the 12 nm limit and in the vicinity of the existing TOWF. Drift netting is focussed on grounds to the north of Thanet Extension, whilst static netting occurs between the site and the shore in the area of RLB that has been reduced as a result of the formal consultation received.

9.17.8 Whilst these local under 10 m vessels are multi-purpose, it is noted that the use of multiple gear types is not universal among vessels and to switch between gear types requires time and possible return trips to port. However, vessels do often carry more than one type of gear and can deploy them during a single trip. Due to restrictions on operational range, seasonal target species and quota constraints, the sensitivity of these vessels is considered to be Medium.

9.17.9 The fleet work grounds directly around the existing TOWF inside of the 12 nm limit as well as grounds in the regional area such as Margate Sands, North Falls, South Falls and Godwin Sands as indicated by Succorfish data from 2017 and previous TFA consultation. Therefore, only a small proportion of identified drift net grounds are impacted by Thanet Extension. Due to the discrete nature of these grounds and the intensity of the fishing activity, the magnitude of this effect has been assessed as Low.

9.17.10 Therefore, the overall significance of the effect for UK netters, based in local ports, is considered to be **Minor** adverse.

UK potters

9.17.11 Fisheries consultation and other data have shown that potting is undertaken on similar grounds to netting (as shown in Figure 9.3). Potting for crab and lobster occurs around and, to some extent, within the existing TOWF. This is currently focused on the north-west of the area of Thanet Extension. Potting for whelks has been shown to occur to the north of Thanet Extension and is undertaken by fewer vessels, although some of them are nomadic ones for south coast ports such as Newhaven and Shoreham.

9.17.12 Whilst these local vessels can be multi-purpose, due to restrictions in operational range, available grounds and the availability of suitable seabed conditions, the sensitivity of these vessels is considered to be Medium.

9.17.13 The fleet work grounds directly around and to some extent within the existing TOWF and along the OECC inside of the 12 nm limit. Taking into account the discrete nature of these grounds and the intensity of the fishing as well as the limited and temporary nature of the duration, magnitude of this impact has been assessed as Low.

9.17.14 Therefore, the overall significance of the effect for UK potters, based in local ports, is expected to be **Minor** adverse.

UK demersal trawlers

9.17.15 Demersal otter trawling is primarily used to target Dover sole and, to a lesser extent, cod and thornback ray. Vessels that operate demersal otter trawling gear are generally over 15 m, although some local vessels are 10 – 15 m in length. Consultation has shown that the numbers of trawlers is lower than those of static gear vessels in the local area. Some of the larger trawlers consulted have extensive fishing grounds throughout the greater Thames Estuary and along the east coast of the UK depending on seasonality and their target species.

9.17.16 Therefore, the under 15 m trawlers, due to their limited operational range, dependence on limited number of fishing grounds and a reduced potential to mitigate the loss of fishing area by operating in alternative areas are considered to have Medium sensitivity.

9.17.17 Over 15 m trawlers have an extensively wider operational range, higher degrees of method and target species versatility and therefore they are assigned a Low sensitivity.

9.17.18 Over 15 m vessels have a large area of fishing grounds available to them and therefore any potential loss of a small percentage of this is assessed to have a Negligible magnitude.

9.17.19 Under 15 m vessels are more restricted in their range and available grounds closer to their home port and therefore more of their landings could come from Thanet Extension so the magnitude is considered to be Low.

9.17.20 Therefore, the significance of the effect is calculated as **Minor** adverse for the under 15 m trawlers, and **Negligible** adverse for over 15 m vessels utilising this method.

UK dredgers

- 9.17.21 Dredging occurs throughout the Greater Thames Estuary, with cockle grounds focussed on the Maplin and Foulness Sands off the Essex coast. Vessels targeting these shellfish predominantly operate from ports such as Queenborough, Leigh on Sea and Whitstable. The majority of vessels are 10 – 15 m in length and use either suction dredges or Newhaven dredges attached to a beam on each side of the vessel. Consultation has shown that a low number of dredgers operate in the area of Thanet Extension and isolated grounds have been identified along the OECC where mussels spat has been harvested.
- 9.17.22 Due to the size of their operational range, the number of fishing areas in the vicinity and therefore their ability to operate in alternative areas, these vessels have been assigned Low sensitivity.
- 9.17.23 It is understood that the majority of these vessels fish the area being considered infrequently and due to the narrow nature of the OECC, the potential effect is therefore considered to be of negligible magnitude.
- 9.17.24 The significance of the effect of loss or restricted access to fishing grounds for the dredger fleet is considered to be **Negligible** adverse.

Belgium beam trawlers

- 9.17.25 Belgium beam trawlers operate throughout the southern North Sea. A category of Belgian vessels (Eurocutter) hold historic rights in UK territorial waters for demersal species and may potentially target ground between 6nm and 12 nm limits including the OECC. The Eurocutters are 18 – 24 m in length. The Belgian fleet is able to fish a wide range of seabed types and therefore despite its inability to switch methods easily, their sensitivity has been assessed as Low.
- 9.17.26 The Belgian fleet is known to target areas throughout the English Channel, Irish Sea, Celtic Sea and the central North Sea with some vessels transferring between these grounds throughout the year.
- 9.17.27 The highest values in terms of effort are recorded closest to the Belgian coast. The landing values for ICES rectangle 31F1 are moderate compared to other rectangles in the southern North Sea. Surveillance sightings illustrate that the majority of vessels have been observed in areas to the north and south-east of Thanet Extension.
- 9.17.28 This data indicates that the area to which access could be restricted is therefore small compared to the total grounds fished and alternative grounds are of equal or higher value than those in which proposed development is located.
- 9.17.29 Therefore, in light of the above the impact magnitude is assessed as Low.

- 9.17.30 Combining the Low sensitivity of the receptor and the Low magnitude of the impact, the significance of the effect of loss or restricted access to fishing grounds for the Belgian beam trawlers is assessed as **Minor** adverse.

French demersal and pelagic trawlers

- 9.17.31 French vessels operate occasionally in the area with historic rights to grounds up to the 6 nm limit, within which the eastern section of Thanet Extension is located. In line with other fleets in the area, their principle target species is Dover sole. The French vessels are generally over 18 m in length and are known to have a range of target grounds in the southern North Sea and further north off northern England. Therefore, due to this wide spread of targeted grounds in comparison to the small nature of Thanet Extension, their sensitivity has been assigned as Low.
- 9.17.32 Fishing undertaken by the French fleet is focused on areas of the English Channel to the south of Thanet Extension and the surveillance sightings identify that these vessels are generally observed outside of the array area. Therefore, the magnitude of effect is calculated as Low.
- 9.17.33 Combining the Low sensitivity of the receptor and the Low magnitude of the impact, the significance of the effect of loss or restricted access to fishing grounds for the French trawlers is assessed as **Minor** adverse.

Dutch demersal and pelagic trawlers

- 9.17.34 The Dutch fleet is unable to legally fish within Thanet Extension area as its vessels do not have historic rights to fish between the 6 - 12 nm limits. Due to the extensive grounds fished by these vessels, the sensitivity of Thanet Extension is considered to be Low. Therefore, none of their existing grounds will be unavailable for fishing, as such the magnitude of effect is Negligible.
- 9.17.35 Based on the Negligible magnitude of effect and the Low sensitivity of this receptor, the significance of the effect is **Negligible** adverse on this fleet and is only via displacement of other vessels into their grounds.

Safety issues for fishing vessels

- 9.17.36 It is considered inappropriate to use the standard Environmental Impact Assessment (EIA) approach for fishing vessel safety. Safety risks are therefore discussed in terms of being within or outside of acceptable limits.
- 9.17.37 During site clearance and the construction phase of Thanet Extension, a standard 500 m advisory safety area would be expected around any construction vessels and activities. Fishing vessels would be expected to be excluded from this area.
- 9.17.38 To ensure accurate communication with fishermen, stakeholder liaison will continue with additional updates of the construction schedule disseminated via Notice to Mariners, Kingfisher Information Service and arranged through the local FLO –TFA.

- 9.17.39 Risks to fishing vessels would only occur if infringements of advisory safety areas occurred, but the ultimate responsibility with regard to a vessel's safety lies with the master on-board.
- 9.17.40 It is felt that compliance with the advisory safety areas during site clearance and construction would allow the safety risks to be within acceptable limits.
- 9.17.41 The Fisheries Liaison and Co-existence Plan (Document Reference: 8.8) details how Thanet Extension and TFA can cooperate to ensure safety for fishing vessels for the duration of the project. This will be discussed further by TFA and Vattenfall to create a final approved document.
- 9.17.42 This is discussed in more detail with Volume 2, Chapter 10: Shipping and Navigation as are potential collision risks between wind farm infrastructure, vessel and fishing vessels.

Increased steaming times to fishing grounds

- 9.17.43 The implementation of 500 m advisory safety areas during site clearance or construction, could, in theory, result in short-term, minor increases in steaming times and distance and therefore higher operational costs for vessels.
- 9.17.44 In the case of the majority of local vessels, there may be a small increase in steaming times as their identified grounds are located directly in the vicinity of Thanet Extension.
- 9.17.45 In relation to Belgian and French fleets there is likely to be minimal increase in their steaming times due to the distances from their home ports and the evidence that their primary fishing grounds are in the main to the south and east of Thanet Extension.
- 9.17.46 Therefore, the sensitivity is assigned as low and as there is minimal increases, the magnitude of effect is also considered to be low. Therefore, combining the Low sensitivity of the report and the Low magnitude of the impact, the significance of the effect of increased steaming times will be **Minor** adverse.
- 9.17.47 Overall, it is not expected that the construction phase of Thanet Extension will have any discernible impact on fishing vessels steaming routes.

Interference with fishing activities

- 9.17.48 All impacts discussed above could be considered to cause interference to fishing activities. In addition, interference impacts could be static or drifting nets fouling on construction or decommissioning vessel propellers, rudders or towed survey equipment.
- 9.17.49 All transiting construction vessels working on Thanet Extension will fully comply with COLREGS which should negate the requirement for vessel operating towed gears to alter course. It is also reasonable to expect that static gear will be marked as fishermen will be keen for all vessels to avoid their deployed nets and pots.

- 9.17.50 As mobile gears are temporary and have the ability to move, the sensitivity is Low, whilst static gears, which remain in situ for time periods from a few hours to several days have a considered sensitivity of Medium.
- 9.17.51 Due to the density of fishing activity in the area of Thanet Extension, it is assumed that the transit routes will be in proximity with grounds targeted by both static and towed gears.
- 9.17.52 As outlined in the Fisheries Liaison and Co-existence Plan (Document Reference: 8.8) VWPL will continue engagement with the TFA and other fisheries stakeholders throughout the construction period to address whether any specific mitigation is required for individual vessels once the construction programme has been finalised.
- 9.17.53 Therefore, as there will be policies and guidance to avoid conflicts, the magnitude of impact for towed gears is Negligible and for static gear it is assumed to be Low.
- 9.17.54 As such, the significance of the effect is considered to be **Negligible** adverse for towed gears and the significance of the impact of interference with static fishing activities during construction is therefore considered to be **Minor** adverse.

Displacement of fishing activity into other areas

- 9.17.55 It is understood that any loss of or restricted access to fishing grounds as a result of the proposed project could, temporarily, increase competition for grounds outside of Thanet Extension.
- 9.17.56 It is expected that VWPL will continue communication with local stakeholders via the TFA and this will include mitigation options should there be interruption to normal fishing practices during the construction phase of the project. It is therefore assessed that the impact of displacement will not exceed that of the temporary loss or restricted access to traditional fishing grounds, as previously described. The significance of the effect of displacement of fishing activity into other areas is therefore considered to be **Minor** adverse.

Obstacles on the seabed post construction

- 9.17.57 Any obstacles remaining on the seabed post-construction would constitute a potential risk to create damage to, or complete loss of, fishing gears.
- 9.17.58 Since 1996, IMO policy has prohibited the discarding of objects or waste at sea. In addition, the reporting and subsequent recovery, were practicable, of any accidentally dropped objects is required.
- 9.17.59 In relation to the local fleet of primarily under 10 m vessels, an additional risk could occur due to construction vessel anchoring, jack-up legs and cable trenching creating spoil or mounds upon which fishing gear could snag.

9.17.60 Where objects have been dropped they will be subject to standard reporting and recovery procedures, with surveys carried out where appropriate.

9.17.61 Therefore, following the rectification work and removal of known obstacles on the seabed, the significance of the effect on commercial fisheries activities will be **Negligible** adverse.

9.18 Environmental assessment: operational and maintenance phase

9.18.1 The impacts which will be described below account for the design life of 30 years of Thanet Extension. This is based on the current baseline which could change over the operational life of the project and will be subject to separate licences where required.

Adverse Impacts on Commercially Exploited Fish and Shellfish Populations.

9.18.2 In line with previous comments, this is assessed in the Fish and Shellfish Ecology Chapter (Document Ref: 6.2.6).

Loss or restricted access to traditional fishing grounds

9.18.3 Existing UK legislation does not prohibit fishing within operational OWFs. It is therefore assumed that there is the opportunity for fishing to resume within proposed development. This will be at the skipper's discretion and several have expressed reservations on whether this is safe or practical to do. OWFs may be a hindrance to longlining, drift netting and to a lesser extent trawling.

9.18.4 The minimum spacing proposed is in line with the existing TOWF where fishing activity occurs.

9.18.5 Restriction to traditional fishing grounds should only be impacted via O&M advisory safety areas around vessels and infrastructure as required and also the advisory safety areas around turbine foundations.

UK netters

9.18.6 The activity undertaken by this fleet is both around the array area and also along the OECC. Fishing grounds of the entire netting fleet may not overlap with those of the RLB, and this applies to a subset of individuals especially drift netters. As these are primary grounds for the local under 10 m vessels and due to quota restrictions and seasonal and operational range constraints, the sensitivity is considered to be minor for the fleet, but medium for those individuals who operate driftnetting.

9.18.7 Consultation has identified that the majority of the local fleet target these grounds at various times throughout the year and have a limited number of alternative grounds. However, the change can be described as temporary as it should be possible to recommence static netting dependant on success of inter-array cable burial and lengths of nets deployed. It should also be noted that with reduction in the footprint of the array area, there will be a similar reduction in the length of cable requiring burial and therefore the level of disturbance to the seabed. Therefore, the magnitude of the impact is considered to be Low for static nets and Medium for drift nets which will risk interaction with infrastructure and therefore are unlikely to be deployed within the array area during operation.

9.18.8 From consultation recorded, it does appear that most intense drift net fishing grounds extend to the north of the array site, although it is noted that there does appear to be fishing within the array area. Static netting appears to be undertaken closer to the shore with some occurring along the western section of the array.

9.18.9 The significance of the effect is therefore considered to be **Minor** adverse for UK static netters. The significance of the effect for UK drift netting, based on the range of grounds shown in Figure 9.4 and initial data from succorfish is in the range of moderate to minor. Individuals who have illustrated that their grounds are within the Thanet Extension as considered to be moderate whilst the fleet as a whole is considered as minor prior to mitigation. Moderate significance is considered significant in terms with this EIA. Mitigation measures may be discussed by VFPL and the TFA in relation to this activity.

UK potters

9.18.10 Potters have been identified as targeting grounds in the array area and along the OECC. As the grounds indicated are similar to those highlighted for netting, the sensitivity is considered to be Medium. Potting is known to occur within operational OWFs, and there is evidence of it occurring within TOWF with the same minimum spacing. Therefore, the magnitude of the impact is lower and is considered to be Low.

9.18.11 The significance of the effect is therefore considered to be **Minor** adverse for local potting vessels.

UK demersal trawlers

9.18.12 Local UK demersal trawlers have a track record of trawling within operational OWFs in the local and regional area. These vessels have the ability to target a range of grounds and therefore their sensitivity is assessed as Low.

9.18.13 The magnitude of the impact on their activities will be Negligible and therefore the effect is considered to be **Negligible** adverse.

UK dredgers

9.18.14 Dredgers have been identified as working in discrete areas along the OECC. The OECC is a relatively narrow section and therefore the sensitivity is considered to be Low.

9.18.15 The dredging fleet have grounds throughout the Greater Thames Estuary and therefore the grounds along the OECC covered by Thanet Extension comprises a very small area of the total available so the magnitude of the impact is considered to be Negligible.

9.18.16 In combination, the significance of effect is assessed to be **Negligible** adverse.

Belgian beam trawlers

9.18.17 The historic rights allow Belgian vessels to access the area of Thanet Extension which is between the 6 - 12 nm limits. This is the eastern section of the array area only. There is no legal barrier to Belgian vessels recommencing their trawling activity within the array area and so the sensitivity will remain low.

9.18.18 Belgian fishing grounds are extensive in the southern North Sea compared to the relatively small area which could be lost following construction and subsequent operation. Therefore, the magnitude of impact is considered to be Low.

9.18.19 The significance of the effect is therefore considered to be **Minor** adverse for Belgian beam trawlers.

French trawlers

9.18.20 The French fleet also has access to fishing grounds between 6 - 12 nm limits. This is only a small part of their total grounds in the North Sea and English Channel, so the sensitivity is Low.

9.18.21 The area utilised by WTGs and the associated advisory safety areas is a minimal percentage of the fishing grounds targeted by the French fleet. Their trawling activities would be expected to resume within the array site, subject to the individual skipper's review. Therefore, the magnitude of the effect is considered to be Low.

9.18.22 Taking into account the low sensitivity and the low magnitude assessment, the significance of the effect of complete loss or restricted access to fishing grounds for the French fleet is perceived to be **Minor** adverse.

Dutch pulse wing trawlers

9.18.23 The Dutch fleet is unable to legally fish within Thanet Extension area as its vessels do not have historic rights to fish between the 6 - 12 nm limits. Therefore, none of their existing grounds will be unavailable for fishing, as such the magnitude of effect is Negligible.

9.18.24 Based on the Negligible magnitude of effect and the Low sensitivity of this receptor, the significance of the effect is **Negligible** adverse on this fleet and is only via displacement of other vessels into their grounds.

Safety Issues for fishing vessels

9.18.25 During O&M, there will only be a requirement for 500 m advisory safety areas during the presence of maintenance vessels such as jack-up rigs, and a 50m exclusion zone around each WTG foundation. With compliance of advisory safety areas when required during the O&M phase, this should ensure safety risk is at acceptable limits.

9.18.26 As mentioned previously, sea bed rectification surveys will be undertaken post construction and if required procedures will be implemented to ensure it is returned to an acceptable standard to allow fishing to resume safely. Assuming this is successful, then the safety risks to fishing vessels from inter-array cables and OECC will be considered to be within acceptable limits.

Increased steaming times to fishing grounds

9.18.27 As vessels will be able to steam through the operational site (as shown via Succorfish data in relation to TOWF), subject to occasional O&M restrictions, the magnitude will be considered to be Negligible. This combined with the sensitivities previously described calculates the significance of the effect as **Negligible** adverse.

Interference with fishing activities

9.18.28 It is acknowledged that potential impacts previously described in this assessment could cause interference to fishing activities.

9.18.29 The activity levels of O&M vessels are programmed to be less than that estimated for the construction period. In addition, it is expected that a code of conduct and cooperation will be drawn up between fishing vessels and wind farm activity.

9.18.30 Whilst the O&M port is still to be confirmed, it is expected that, due to the relatively small nature of the fishing grounds, the transit route will be through the area of deployed static gear and other fishing activities. All works vessels will adhere to COLREGS and therefore negate any requirement for change of direction of trawling fishing vessels and avoid marked gear where practicable. It would be beneficial to all parties if fishermen who wish their gear to be avoided within the 12 nm limit used surface markers that are visible during daylight hours. It is understood the cost and added effort this entails. It is considered that, if these processes occur, interference should be minimal and therefore the magnitude for static gears is assessed as Low and towed gears as Negligible.

9.18.31 Static gear can be set in the water for periods of a few hours to several days and therefore have less adaptability than towed gears and consequently are assessed to have Medium sensitivity, whilst towed gears, considering their mobility, are considered to have a Low sensitivity.

9.18.32 The significance of the impact for mobile gears during operation is therefore considered to be **Negligible** adverse significance and **Minor** adverse significance for the static fleet.

Displacement of fishing activity into other areas

- 9.18.33 For Belgian and French vessels, there will not be any significant effects of loss of fishing areas during the O&M phase as Thanet Extension covers a very small area compared to their overall fishing ground. The minimum spacing scenario does not infer a change of fishing grounds as fishing is carried out among WTGs with the same minimum spacing in the existing TOWF. Therefore, the effect will be considered to be **Negligible** adverse.
- 9.18.34 The UK vessels which undertake trawling, dredging and potting, should not suffer a significant loss of fishing areas as these techniques can be operated in operational OWFs. Therefore, the impact on these fleets are also considered to be **Negligible** adverse.
- 9.18.35 For the local fleet of netters, there will be some displacement due to the challenges of operating drift nets with the constraints of a wind farm site and therefore the resultant displacement impact on this fleet is considered to be **Minor** adverse.

9.19 Environmental assessment: decommissioning phase

- 9.19.1 It is assumed for the purposes of assessment that, at decommissioning, all structures would be removed with decommissioning being in reverse of construction. Piled infrastructure would be cut 1 m below the seabed and scour is expected to be left in situ. The decommissioning methodology for the offshore cables is unclear as they may be left in situ or removed depending on available information at the time of decommissioning.
- 9.19.2 During the decommissioning stage, there is the potential for the range of infrastructure removal activities to disrupt normal fishing activity.
- 9.19.3 It is expected that effects would be comparable to those detailed in the construction assessment. The impacts will be identified as follows:
- Temporary loss or restricted access to traditional fishing grounds;
 - Increased steaming time to fishing grounds;
 - Interference with fishing activity;
 - Safety Issues for fishing vessels; and
 - Displacement of fishing activity into other areas.
- 9.19.4 The receptor sensitivity during decommissioning is assumed to be in line with those of the construction phase. The magnitude of effect will not be greater than for construction and in all probability, will be less and this will be similar for the overall impacts.

9.20 Environmental assessment: cumulative effects

- 9.20.1 The cumulative impact assessment takes into account, relevant planned OWF developments and other infrastructure, activities and legislation. Those constructed and in existence, form part of the existing base line to which stakeholders have already adapted. Projects considered in the cumulative assessment do not include fishing activity. In relation to this project, the extension surrounds the existing TOWF.
- 9.20.2 Cumulative effects refer to effects upon receptors arising from proposed development when considered alongside other proposed developments and activities and any other *reasonably foreseeable project(s)* proposals. In this context, the term *projects* are considered to refer to any project with comparable effects and is not limited to offshore wind projects.
- 9.20.3 The approach to cumulative assessment for proposed development takes into account the Cumulative Impact Assessment Guidelines issued by RenewableUK in June 2013, together with comments made in response to other renewable energy developments within the southern North Sea, and the Planning Inspectorate (PINS) 'Advice Note 9: Rochdale Approach'. The renewable energy developments that have informed this approach have been agreed within the Scoping Opinion as well as the suggested tiers, and the Volume 4, Annex 3-3: Cumulative Impact Assessment conducted for proposed development.
- 9.20.4 In assessing the potential cumulative impact(s) for proposed development, it is important to bear in mind that for some projects, predominantly those 'proposed' or identified in development plans etc. may or may not actually be taken forward. There is a need to build in some consideration of certainty (or uncertainty) with respect to the potential impacts which might arise from such proposals. For example, relevant projects/ plans that are already under construction are likely to contribute to cumulative impact with proposed development (providing effect or spatial pathways exist), whereas projects/ plans not yet approved or not yet submitted are less certain to contribute to such an impact, as some may not achieve approval or may not ultimately be built due to other factors.
- 9.20.5 For this reason, all relevant projects/ plans considered cumulatively alongside Thanet Extension have been allocated into 'Tiers', reflecting their current stage within the planning and development process. This allows the cumulative impact assessment to present several future development scenarios, each with a differing potential for being ultimately built out. Appropriate weight may therefore be given to each scenario (Tier) in the decision-making process when considering the potential cumulative impact associated with Thanet Extension (e.g., it may be considered that greater weight can be placed on the Tier 1 assessment relative to Tier 2).

9.20.6 The projects and plans selected as relevant to the assessment of impacts to commercial fisheries are based upon an initial screening exercise undertaken on a long list. Each project, plan or activity has been considered and scoped in or out on the basis of effect-receptor pathway, data confidence and the temporal and spatial scales involved. For the purposes of assessing the impact of Thanet Extension on commercial fisheries in the region the cumulative impact technical note submitted with the Scoping Report screens in the projects and activities identified below.

9.20.7 In addition, conservation measures such as regional Marine Conservation Zones (MCZ) and Candidate Special Area of Conservation (cSAC) locations which may have an impact have been considered. This includes MCZs of which there are several along the Kent coast.

9.20.8 All aggregate dredging areas prescribed as being within the sphere of influence of the cumulative impact assessment are described as open and therefore it is presumed that these will not have an additional cumulative impact on fishing activities of any of the fleets being assessed.

9.20.9 The proposed tier structure that is intended to ensure that there is a clear understanding of the level of confidence in the cumulative assessments provided in Thanet Extension Environmental Statement is as follows:

Tier 1

9.20.10 Proposed development is considered alongside other projects/ plans currently under construction and/ or those consented but not yet implemented, and/ or those submitted but not yet determined where data confidence for the projects falling within this category is high.

9.20.11 Built and operational projects will be included within the cumulative assessment where they have not been included within the environmental characterisation survey, i.e. they were not operational when baseline surveys were undertaken, and/ or any residual impact may not have yet fed through to and been captured in estimates of 'baseline' conditions or there is an ongoing effect.

Tier 2

9.20.12 All projects included in Tier 1 plus other projects/ plans consented but not yet implemented and/ or submitted applications not yet determined where data confidence for the projects falling into this category is medium.

Tier 3

9.20.13 The above plus projects on relevant plans and programmes (the PINS Programme of Projects and MMO 'Marine Case Management System' being the sources most relevant for this assessment). Specifically, all projects where the developer has advised PINS in writing that they intend to submit an application in the future were considered.

9.20.14 The specific projects scoped into this cumulative impact assessment, and the tiers into which they have been allocated are presented in (Table 9.12) below. The operational projects included within the table are included due to their completion/ commission subsequent to the data collection process for Thanet Extension and as such not included within the baseline characterisation. It is confirmed that Tier 3 projects have not been taken forward for assessment as there is unlikely to be any overlap between Thanet Extension and their construction period.

9.20.15 The study area assumptions for this project are linked to known fishing grounds of the local UK fleet and also the non-UK fleets known to fish with and around Thanet Extension site. The French, Belgian and Dutch vessels which operate in the area are known to fish areas throughout the southern North Sea down through to the English Channel.

Table 9.12: Projects for cumulative assessment

Development type	Project	Status	Tier
OWF	Galloper	Round 2- under construction	Tier 1
OWF	East Anglia One	Round 3 – under construction	Tier 1
OWF	East Anglia 1N	Round 3 – proposed	Tier 3
OWF	East Anglia 2	Round 3 – proposed	Tier 3
OWF	East Anglia 3	Round 3 – consented	Tier 2
OWF	Rampion	Round 3 - under construction	Tier 1
OWF	Boreas	Round 3 – pre-planning application	Tier 3
OWF	Vanguard	Round 3 – pre-planning application	Tier 3
OWF	Hornsea One	Round 3 - consented	Tier 2
OWF	Hornsea Two	Round 3 - consented	Tier 3
OWF	Hornsea Three	Round 3 - pre-planning application	Tier 3
OWF	Race Bank	Round 2 – under construction	Tier 1
OWF	Triton Knoll	Round 2 - consented	Tier 2
Interconnector	Neu Connect	Concept/ Early Planning	Tier 1

Development type	Project	Status	Tier
Interconnector	Nemo	Under Construction	Tier 1
Aggregate dredging	Inner OTE	Exploration	Tier 3
Aggregate dredging	Outer OTE	Exploration	Tier 3
Aggregate dredging	Colbart	Exploration	Tier 3
Aggregate dredging	Area 503/2	Exploration	Tier 3
Aggregate dredging	Area 470 Extension	Exploration	Tier 3
OWF	Mermaid	Belgian - approved	Tier 2
OWF	Seastar	Belgian - approved	Tier 2
OWF	Fecamp- Sieine- maritime	France – in planning	Tier 3
OWF	Parc Colien Courseulles Sur Mer	France – in planning	Tier 3
OWF	Projet colien en mer de la Baie de Saint Brieuc	France – in planning	Tier 3
OWF	Borssele 1 & 2	The Netherlands – approved	Tier 2
OWF	Borssele 3 & 4	The Netherlands – approved	Tier 2
OWF	Borssele 5	The Netherlands – approved	Tier 2
OWF	Gemini	The Netherlands – under construction	Tier 1
OWF	Holland Kust Noord 1	The Netherlands – in planning	Tier 3
OWF	Holland Kust Noord 2	The Netherlands – in planning	Tier 3
OWF	Holland Kust Zuid 1&2	The Netherlands – in planning	Tier 3
OWF	Holland Kust Zuid 3&4	The Netherlands – in planning	Tier 3
OWF	Albatros	Germany - approved	Tier 2
OWF	Borkum Riffgrund 2	Germany - consented	Tier 1
OWF	Borkum Riffgrund West	Germany - approved	Tier 2

Development type	Project	Status	Tier
OWF	Borkum West 2	Germany - in planning	Tier 3
OWF	Demonstration project Albatros 1	Germany - approved	Tier 2
OWF	Deutsche Bucht	Germany - approved	Tier 2
OWF	EnBW He dreiht	Germany - approved	Tier 2
OWF	EnBW Hohe See	Germany - approved	Tier 2
OWF	Gode Wind 3	Germany - approved	Tier 2
OWF	Gode Wind 4	Germany - approved	Tier 2
OWF	Kaikas	Germany - approved	Tier 2
OWF	Merkur	Germany- consented	Tier 1
OWF	Nordsee 2	Germany - approved	Tier 2
OWF	Nordsee 3	Germany - approved	Tier 2
OWF	OWP Delta Nordsee 1	Germany - approved	Tier 2
OWF	OWP Delta Nordsee 2	Germany - approved	Tier 2
OWF	OWP West	Germany - approved	Tier 2
OWF	Trianel Windpark Borkum Phase 2	Germany - approved	Tier 2
Oil and Gas	Leman South Gas Field	UK - Under Development	Tier 1
Oil & Gas	Aberdonia Gas Field	UK - Under Development	Tier 1
Oil & Gas	P01-FA	Germany - undeveloped	Tier 3
Oil & Gas	P01-FB	Germany - undeveloped	Tier 3
Oil & Gas	P02-E	Germany - undeveloped	Tier 3
Oil & Gas	P06-Northwest	Germany - undeveloped	Tier 3
Oil & Gas	P08-A Horizon-West	Germany - undeveloped	Tier 3

Development type	Project	Status	Tier
Oil & Gas	P10b Van Brakel	Germany - undeveloped	Tier 3
Oil & Gas	P11a-E	Germany - undeveloped	Tier 3
Oil & Gas	P11b Van Ghent East	Germany - undeveloped	Tier 3
Oil & Gas	P11b Witte de With	Germany - undeveloped	Tier 3
Oil & Gas	P12-14	Germany - undeveloped	Tier 3
Oil & Gas	P12-3	Germany - undeveloped	Tier 3
Oil & Gas	P18-7	Germany - undeveloped	Tier 3
Oil & Gas	Q13-FB	Germany - undeveloped	Tier 3
Oil & Gas	Q13-FC	Germany - undeveloped	Tier 3
MCZ	NG 16, Swallow Sand	UK - Designated MCZ	Tier1
MCZ	NG 14; North East of Farns Deep	UK - Designated MCZ	Tier1
MCZ	Blackwater, Crouch, Roach and Colne	UK - Designated MCZ	Tier1
MCZ	Medway Estuary	UK - Designated MCZ	Tier1
MCZ	Thanet coast	UK - Designated MCZ	Tier1
MCZ	Folkestone Pomerania	UK - Designated MCZ	Tier1
MCZ	Beachy Head West	UK - Designated MCZ	Tier1
MCZ	Hythe Bay	UK - Designated MCZ	Tier1
MCZ	Dover to Deal	UK - Designated MCZ	Tier 1
MCZ	The Swale Estuary	UK - Designated MCZ	Tier 1
MCZ	Dover to Folkestone	UK - Designated MCZ	Tier 1
MCZ	Offshore Foreland	UK - Designated MCZ	Tier 1
MCZ	Kingmere	UK - Designated MCZ	Tier1

Development type	Project	Status	Tier
MCZ	Goodwin Sands	UK- _proposed MCZ	Tier3
MCZ	North Norfolk Sand banks and Saturn Reef cSAC	UK - Candidate SAC/ Offshore site of community importance	Tier 2

9.20.16 The cumulative Rochdale Envelope is described in the following table with impact, scenario (e.g. aggregates sites plus OWFs) and any notes (i.e. fishing can continue in OWFs).

Table 9.13: Cumulative Rochdale envelope

Impact	Scenario	Justification
Complete loss or restricted access to traditional fishing grounds	Whilst UK OWFs do not specifically ban fishing activities from recommencing in their sites, the resumption will be at the discretion of the skipper. Methods such as drift netting could potentially be impacted to a greater extent as OWF layouts will recreate restriction of this activity within the site. In addition, dredging grounds will be lost to all fishing methods whilst aggregates are being removed.	This would be worst-case with maximum number of wind farm construction projects occurring at the same time as well as other sea user restriction such as dredging and MCZs. This has the potential to result in the maximum restriction on the resumption of normal fishing practices.
Safety issues for fishing vessels	Will be based on information from the Shipping and Navigation Chapter.	Maximum number of construction vessels deployed into regional area. Also, maximum number of WTGs and other offshore infrastructure.
Increased steaming times to fishing grounds	Maximum number of exclusion/ advisory safety areas around offshore infrastructure.	This has the potential to result in maximum disruption to established steaming routes.
Interference with fishing activities	Maximum number of construction vessels and operational vessels in areas of development.	Highest potential to result in conflict with fishing gears.














Impact	Scenario	Justification
Displacement of fishing activity into other areas	All planned wind farms are built and those that could overlap construction periods with Thanet Extension.	Greatest potential to restrict the continuation of normal fishing activities within the region.

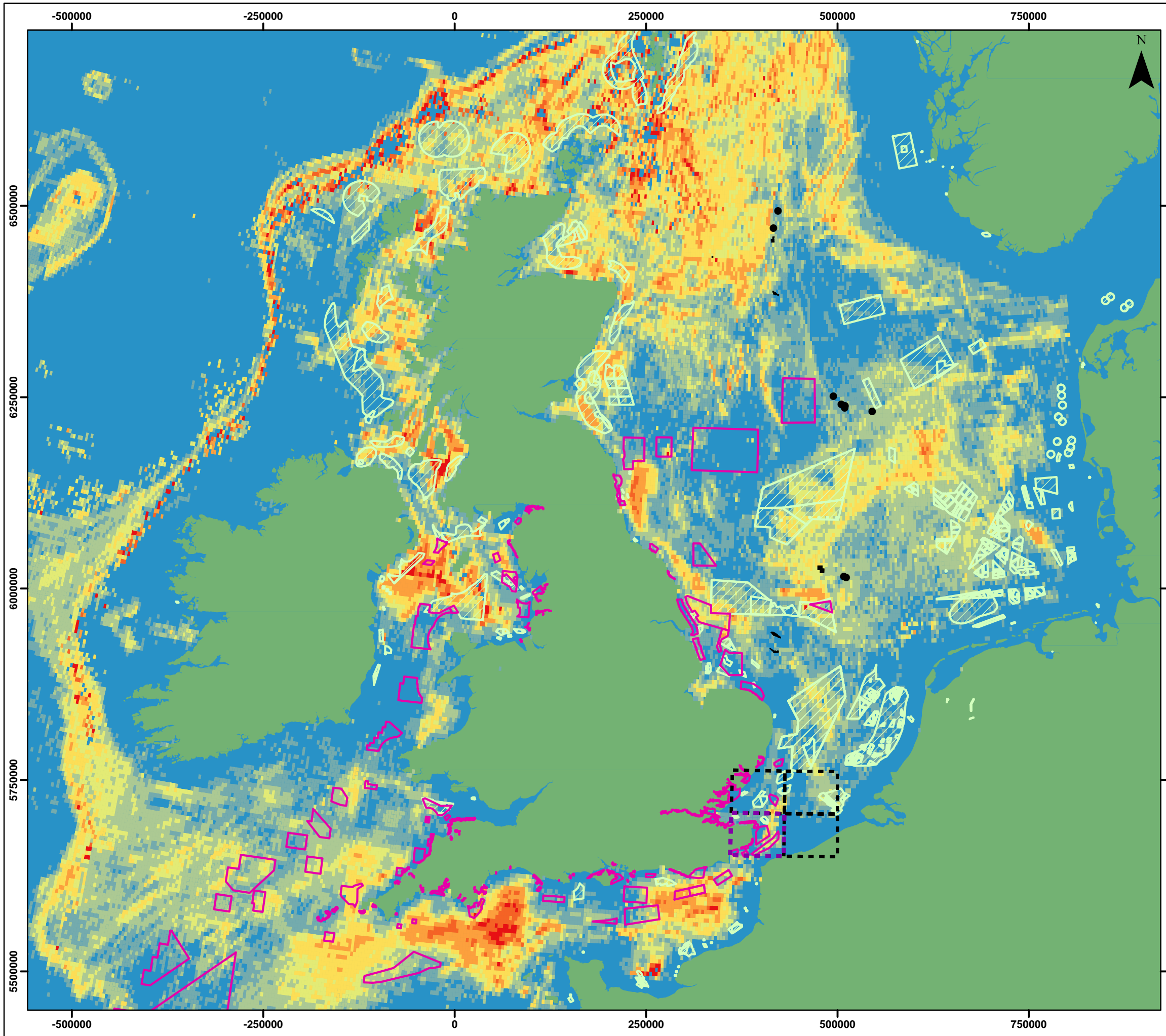
- 9.20.17 As discussed in the baseline assessment, the area of Thanet Extension is small compared to other developments in a regional, national and international context. In addition, the proposed construction period is short in comparison with other larger developments. Therefore, the contribution of Thanet Extension to the overall cumulative impact assessment is assessed as **Minor** adverse.
- 9.20.18 Cumulative impacts could occur on the commercial fisheries receptors if all the projects listed in Table 9.12 are implemented. The potential for significant impacts depends on the operating practices of individual fleets and the location of known fishing grounds in relation to other potential wind farms, oil and gas infrastructure or aggregate dredging areas and the timing of the construction, operation and decommissioning phases of each project.
- 9.20.19 As mentioned previously existing offshore infrastructure and regulated activities are considered a part of the existing environment and is therefore not part of this cumulative assessment.
- 9.20.20 OWFs are expected to cover the largest footprint of all offshore infrastructure projects, although in the majority of cases fishing can resume within the array area and along most of the cable route if successfully buried.
- 9.20.21 With regard to aggregate dredging activity, the proposed concessions, when combined, cover a substantially smaller area than that proposed for OWFs.
- 9.20.22 Many of the new oil and gas platforms and associated pipelines are at a concept stage and therefore are unlikely to have cumulative impact. In addition, they generally will also only cover discrete and small areas.
- 9.20.23 During consultation for this project, the principle concern raised was that of complete loss or restricted access to traditional fishing grounds. Therefore, this is considered for each fleet identified in the main impact assessment. The other impacts will be addressed generically for all vessels.
- 9.20.24 UK overview activity is shown in relation to offshore infrastructure in Figure 9.23.

THANET EXTENSION OFFSHORE WIND FARM

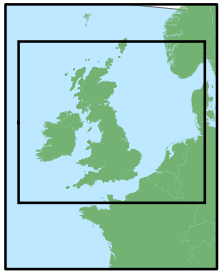
Figure 9.23
UK VMS values
(all fishing methods)
(average 2012 - 2016)

Legend

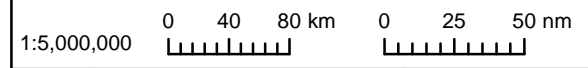
-  Study Area
 -  Regional Area
 -  Marine Conservation Zones
 -  Oil and Gas
 -  Wind Farms
- UK VMS Value (£)
-  No value
 -  Less than £1,000
 -  £1,000 to £5,000
 -  £5,000 to £10,000
 -  £10,000 to £25,000
 -  £25,000 to £50,000
 -  £50,000 to £75,000
 -  More than £75,000



Datum: ETRS 1989
Projection: UTM31N



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Figure 9.23

UK netters

9.20.25 The local netting fleet is principally under 10 m and works areas close to the shore due to operational limitations. Therefore, there is a potential for cumulative impact on this fleet due to aggregate dredging areas. The wind farm and oil and gas developments listed in Table 9.12 are a significant distance away so as to not impact on the local netting fleet. Therefore, there will not be cumulative loss of fishing grounds from this fleet due to other developments.

UK potters

9.20.26 The local potting fleet is principally under 10 m and works areas close to the shore due to operational limitations. Therefore, there is a potential for a cumulative impact on this fleet due to aggregate dredging areas and Thanet Extension during construction. However, other wind farm developments are a significant distance away so as to not impact on this type of vessel. It is likely that potting will recommence within Thanet Extension area, possibly with a restriction of fleet size (number of pots in a string) and some small areas will be unavailable due to 50 m advisory safety areas around the installed infrastructure. So, the cumulative effect will be **Negligible** adverse.

UK demersal trawlers

9.20.27 The local fleet undertake activity throughout the southern North Sea and could be impacted by a number of UK wind farm developments specifically off East Anglia and in the English Channel as well as regional aggregate dredging areas. Therefore, there may be a **Minor** adverse cumulative impact on this fleet, specifically the under 10 m vessels which have a limited range.

UK dredgers

9.20.28 Dredgers primarily work in the Greater Thames estuary and therefore are unlikely to be impacted by other wind farm developments in UK waters. There may be some **Minor** adverse cumulative impact from aggregate dredging areas.

Belgian beam trawlers

9.20.29 The Belgian fleet operates on fishing grounds through the southern North Sea, English Channel, Celtic and Irish Sea as illustrated in Figure 9.24.

9.20.30 Whilst the Belgian fleet fish grounds where several OWF and other infrastructure are proposed, the loss of grounds for Thanet Extension will be small and therefore not expected to contribute any significant cumulative loss of fishing grounds for this fleet and is identified as **Negligible** adverse.

French trawlers

9.20.31 As illustrated in Figure 9.25, the French fleet undertake activity throughout the Southern North Sea, English Channel and Celtic Sea and could be impacted by a number of UK wind farm developments specifically off East Anglia, in the English Channel and those off the French coast. It should be noted that due to difficulties in obtaining full datasets (as previously described), the French fishing activity is incomplete for the central English Channel.

9.20.32 However, the loss of a relatively small area of grounds, will not have a significant cumulative impact on this fleet and is identified as **Negligible** adverse.

Dutch beam trawlers

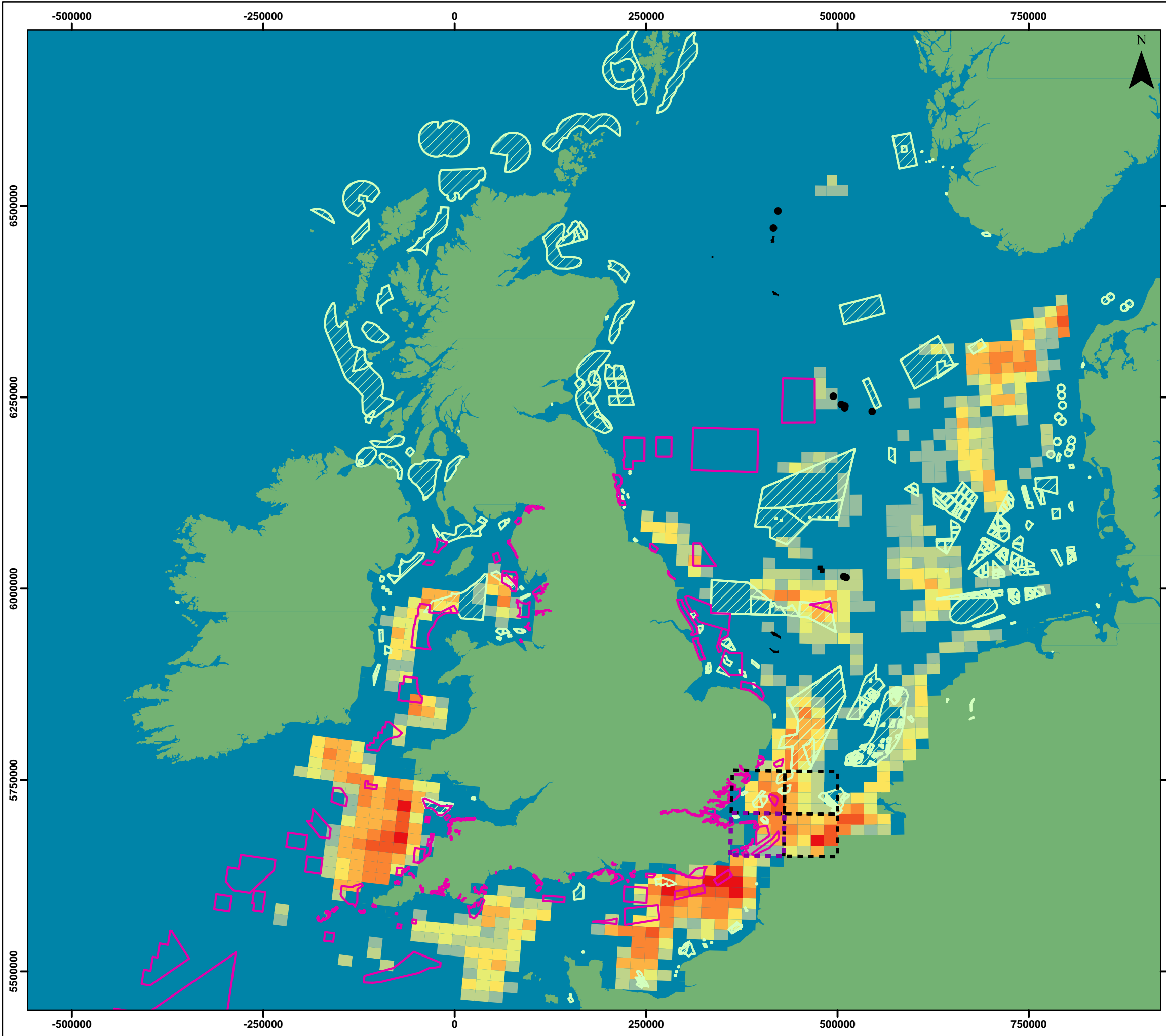
9.20.33 This Dutch fleet have extensive fishing grounds throughout the North Sea and beyond as shown in Figure 9.26. The Dutch fleet could incur a cumulative loss of fishing grounds due to construction of developments off the Dutch and Belgian coast. However, there is no specific cumulative impact from Thanet Extension as the Dutch fleet cannot legally fish within Thanet Extension area, although there may be a small amount of displacement due to movement of vessels from other nations away from Thanet Extension site. Therefore, the impact is assessed as **Negligible** adverse.

THANET EXTENSION OFFSHORE WIND FARM

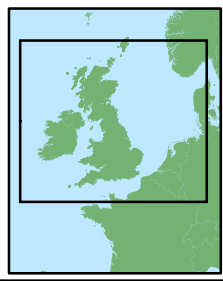
Figure 9.24
Belgian VMS values
(average 2010 - 2014)

Legend

- Study Area
 - Regional Area
 - Marine Conservation Zones
 - Wind Farms
 - Oil and Gas
- Belgian VMS value (€)
- Less than €5,000
 - €5,000 to €10,000
 - €10,000 to €25,000
 - €25,000 to €50,000
 - €50,000 to €100,000
 - €100,000 to €250,000
 - €250,000 to €500,000
 - €500,000 to €750,000
 - Over €750,000



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Projection: UTM31N



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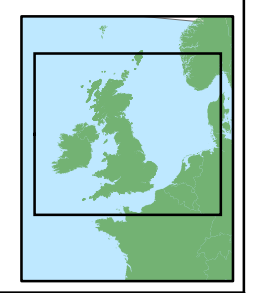
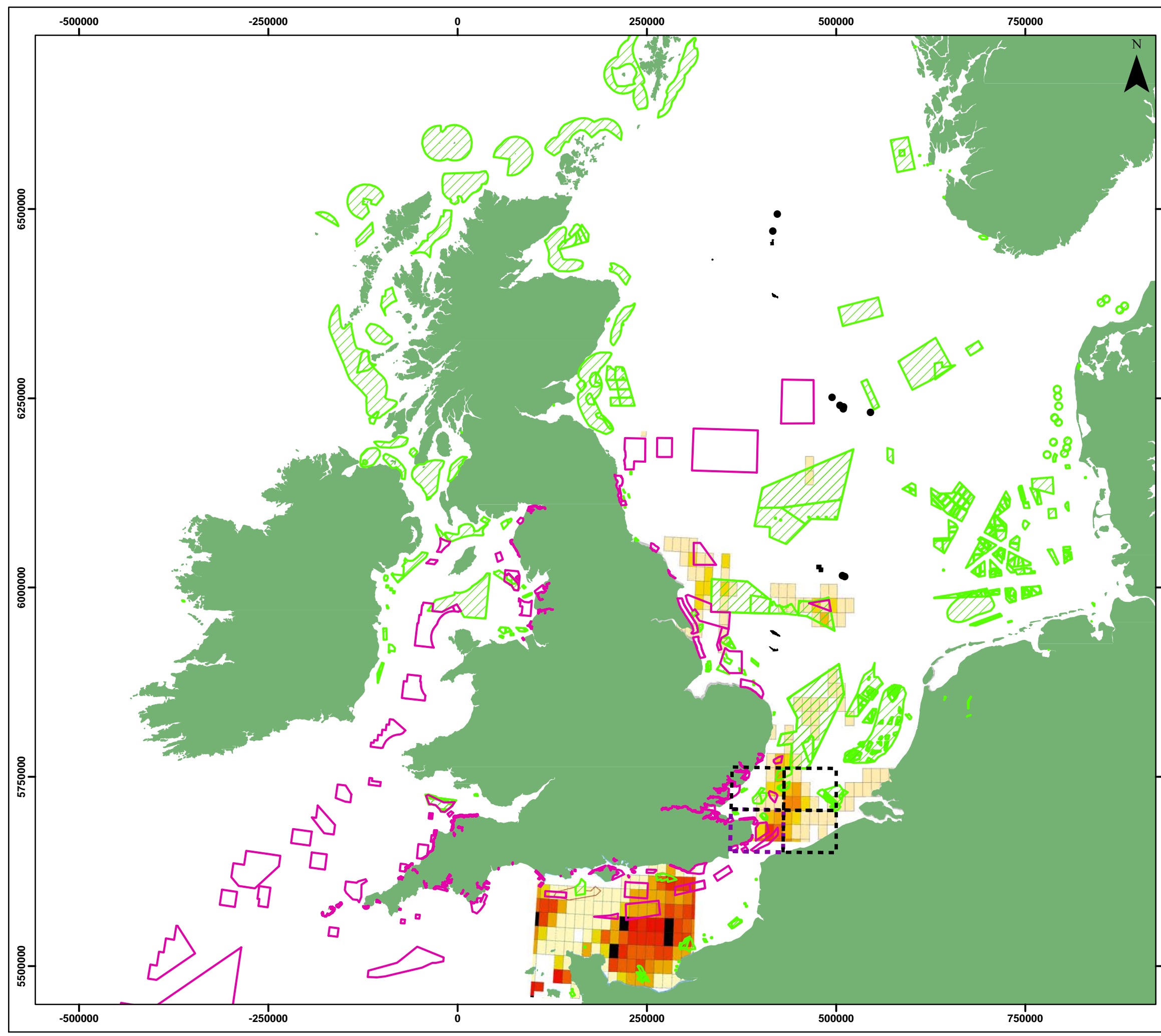
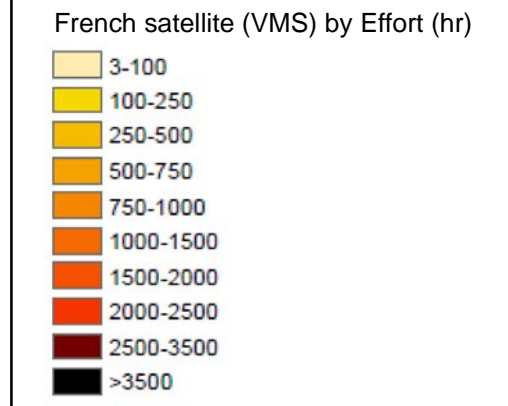
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Rev	0.1	Date	25/05/2018
By	JM	Layout	N/A

Figure 9.24

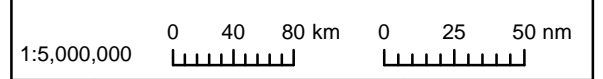
THANET EXTENSION OFFSHORE WIND FARM

Figure 9.25
French VMS Effort (hr) (2009)

- Legend**
- Study Area
 - Regional Area
 - Marine Conservation Zones
 - Wind Farms
 - Oil and Gas



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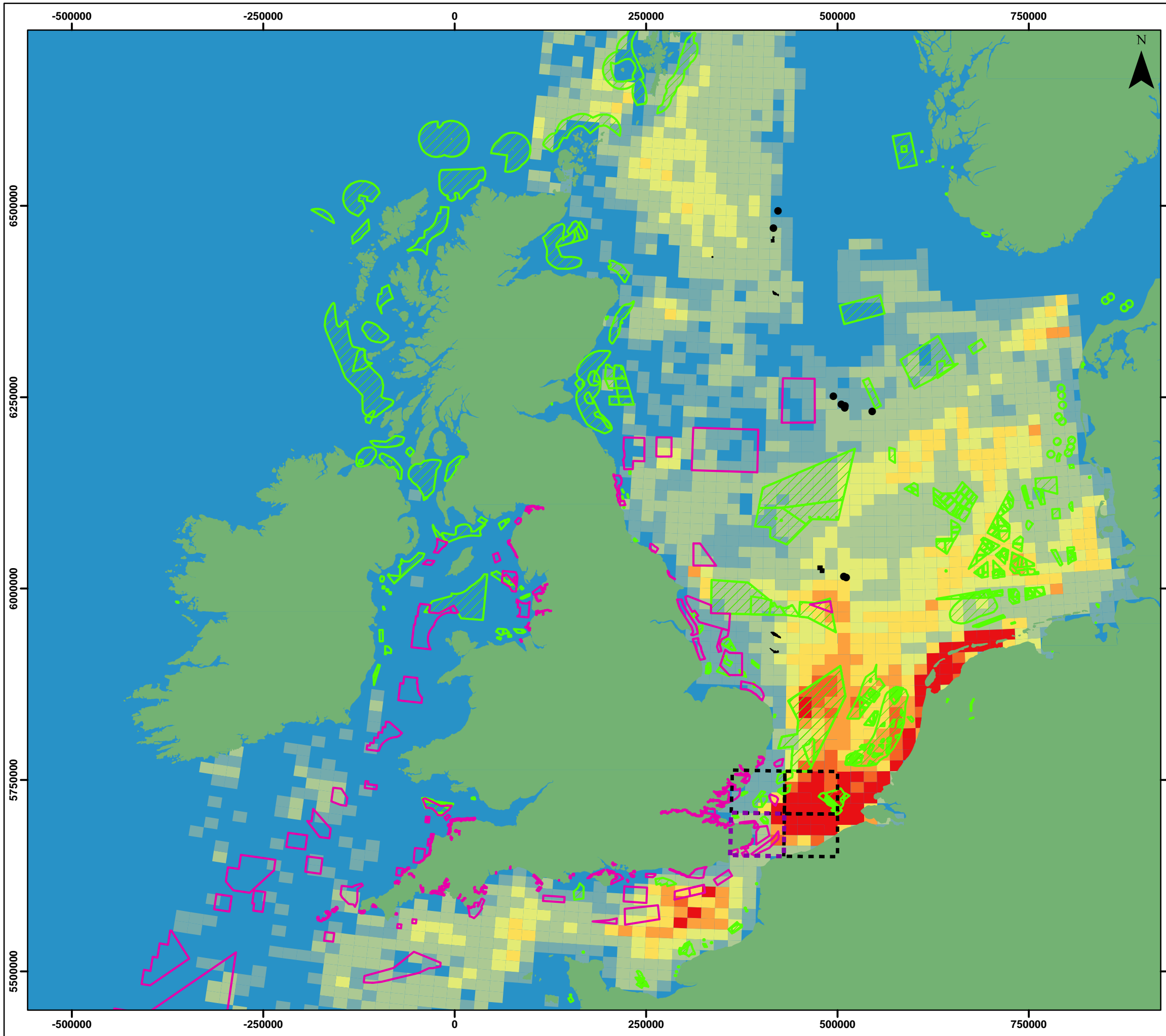
Figure 9.25

THANET EXTENSION OFFSHORE WIND FARM

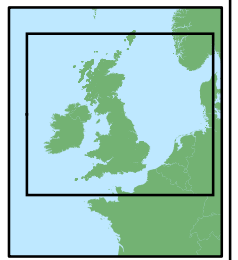
Figure 9.26
Dutch VMS values
(all fishing methods)
(average 2012 - 2016)

Legend

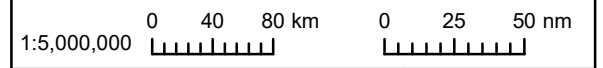
-  Study Area
 -  Regional Area
 -  OilandGas_Polygon
 -  Marine Conservation Zones
 -  Oil and Gas
 -  Wind Farms
- Dutch VMS value (€)
-  No value
 -  Less than €50,000
 -  €50,000 to €100,000
 -  €100,000 to €250,000
 -  €250,000 to €500,000
 -  €500,000 to €750,000
 -  €750,000 to €1,000,000
 -  More than €1,000,000



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Projection: UTM31N



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By	JM	Layout	N/A

Figure 9.26

Displacement of fishing activity from other areas

9.20.34 It is recognised that there may be exclusion from other wind farm areas and marine regulated activities during the period of Thanet Extension's construction. At present the offshore construction timescales for Thanet Extension is expected to comprise up to 12 months in a two-year period using 4 installation vessels simultaneously and is open to variation from other regional developments. Due to the short nature of Thanet Extension construction period, it is unlikely that this development will contribute to significant cumulative displacement of fishing activity.

Safety Issues for fishing vessels

9.20.35 It is assumed that all wind farm and other offshore developments will implement the same safety standards with respect to fishing vessels and deployed gears as outlined in this ES and therefore the safety issues will be within acceptable limits and therefore there should be no cumulative impact.

Increased steaming times

9.20.36 Advisory safety areas of 500 m are likely to be implemented around infrastructure during the construction period, which could, in theory, increase steaming times. However, this is likely to have little prospect of increasing the cumulative impact due to the small area of the construction site. All fleets have experience of steaming through aggregate dredging areas and operational wind farms so there should not be a cumulative impact on fishing vessels.

Obstacle on the seabed

9.20.37 The legislation governing dropping of objects on the seabed is IMO's Offshore Policy 1996, which prohibits discarding of objects or waste at sea. Therefore, the reporting and recovery of accidentally dropped items is covered by law and as this applies to all offshore infrastructure developments, the impact is predicted to remain within **acceptable** limits.

Interference with fishing activities

9.20.38 All vessels undertaking operations for OWF and other offshore developments are required to comply with COLREGS. Within this legislation there is a strict hierarchy of vessel types based on their ability to move which aims to prevent collisions. There is a requirement for steaming vessels to avoid operational fishing vessels and the need for them to alter course whilst towing. Therefore, no cumulative impact is anticipated.

9.21 Inter-relationships

9.21.1 To complete the assessment of impacts on the receptors from construction, O&M and decommissioning of the project, consideration has been given to inter-related impacts. The impacts on receptors addressed in other ES chapters may potentially further contribute to the impact assessed on commercial fisheries. These are primarily from Volume 2, Chapter 6: Fish and Shellfish Ecology and Volume 2, Chapter 10: Shipping and Navigation chapters. However, no inter-relationships have been identified where an accumulation of residual impacts on commercial fisheries give rise to a need for additional mitigation.

9.22 Mitigation

9.22.1 In addition to the embedded mitigation practices previously listed in this document, and the co-existence strategies detailed in the Fisheries Co-existence Plan (Document reference: 8.8) it is proposed that VWPL will continue the positive communication with the TFA. Regular communication between VWPL and local fishermen would be maintained as outlined in the Fisheries Liaison Co-existence Plan (Document reference: 8.8). This acts as a meaningful forum for engagement throughout the projects lifecycle.

9.22.2 Where impacts cannot easily be mitigated against, the developer will, in coordination with the TFA, investigate gear modification options and the possibility of alternative gear types.

9.22.3 Taking into account the mitigation listed above and the positive and long-standing relationship between TFA and TOWF, there is a possibility that by incorporating further discussions between these parties and where appropriate and justified commercial agreements, the significance for drift nets could be reduced to not significant levels, see Table 9.14.

9.23 Transboundary statement

9.23.1 Thanet Extension is on ground which is accessible to fleets from a number of countries, therefore the impact on fleets from Belgium and France need to be assessed. With regard to the Dutch fleet, whilst they are unable to legally fish within the area of Thanet Extension, there may be some displacement of other excluded vessels into their traditional grounds.

9.23.2 The assessment of transboundary impacts is an integral part of the assessment of potential impacts on commercial fisheries set out above. Further transboundary assessment is not therefore required.

9.24 Summary of effects

9.24.1 A summary of effects from Thanet Extension are presented in Table 9.14.

Table 9.14: Summary of predicted impacts of Thanet Extension

Receptor group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
Construction			
Commercially Exploited fish and shellfish population			Not exceed Minor adverse
UK Drift and Static Netters	Medium	Low	Minor adverse
UK Potters	Medium	Low	Minor adverse
UK Demersal Trawlers (under 10 m)	Medium	Low	Minor adverse
UK Demersal Trawlers (over 10 m)	Low	Negligible	Negligible adverse
UK Dredgers	Low	Negligible	Negligible adverse
Belgium Beam Trawlers	Low	Low	Minor adverse
French Demersal and Pelagic Trawlers	Low	Low	Minor adverse
Dutch Demersal and Pelagic Trawlers	Negligible	Negligible	Negligible adverse
Safety Issues for fishing vessels	N/A	N/A	Within acceptable limits
Increased steaming time to fishing grounds	Low	Low	Minor adverse
Interference with Fishing activities (static gear)	Medium	Low	Minor adverse
Interference with Fishing activities (mobile gear)	Low	Negligible	Negligible adverse
Displacement of fishing activity into other areas	Not exceeding values calculated for temporary loss or restricted access to traditional fishing grounds as previously described in this table.		
Obstacles on the seabed post construction	N/A	N/A	Negligible adverse
O&M			
UK Drift and Static Netters	Medium	Low – Static nets Medium – Drift nets	Minor adverse – Static nets Minor adverse – Drift Nets (general) Moderate adverse – Drift nets (some individuals)
UK Potters	Medium	Low	Minor adverse
UK Demersal Trawlers (under 10 m)	Low	Negligible	Negligible adverse

Receptor group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
UK Demersal Trawlers (over 10 m)	Low	Negligible	Negligible adverse
UK Dredgers	Low	Negligible	Negligible adverse
Belgium Beam Trawlers	Low	Low	Minor adverse
French Demersal and Pelagic Trawlers	Low	Low	Minor adverse
Dutch pulse wing trawlers	Negligible	Negligible	Negligible adverse
Safety Issues for fishing vessels			Within acceptable limits
Increased steaming time to fishing grounds	Low	Negligible	Negligible adverse
Interference with Fishing activities (static gear)	Medium	Low	Minor adverse
Interference with Fishing activities (mobile gear)	Low	Negligible	Negligible adverse
Displacement of Fishing activity into other areas – Belgian, Dutch and French fleet	Negligible	Negligible	Negligible adverse
Displacement of Fishing activity into other areas – UK Trawlers, Dredgers and Potters	Negligible	Negligible	Minor adverse
Displacement of Fishing activity into other areas – UK static netters	Medium	Low	Minor adverse
Displacement of Fishing activity into other areas – UK drift netters	Medium	Medium	Minor adverse
Decommissioning			
Not greater and in all probability will be less than construction values.			
Cumulative effects			
In a regional, national and international context - overall	N/A	N/A	Minor adverse

9.25 References

- Blyth-Skyrme, R.E. (2010) Options and opportunities for marine fisheries mitigation associated with wind farms. *Final report for collaborative offshore wind research into the Environment contract FISH MITIG09*. Cowrie Limited, London;
- Cefas, Marine Consents and Environment Unit (MCEU), Department of Environment, Food and Rural Affairs (DEFRA) and Department of Trade and Industry (DTI) (2004) Offshore Wind farms – Guidance note for Environmental Impact Assessment in respect of FEPA and CPA requirements, Version 2.
- Centre for Environment, Fisheries and Aquaculture Science (Cefas) (2012) Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects. Contract report ME5403, May 2012;
- FLOWW (Fisheries Liaison with Offshore Wind and Wet Renewables Group) Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison: FLOWW (2014);
- International Cable Protection Committee (2009) Fishing and Submarine Cables – Working Together;
- Renewable UK (2013) Cumulative impacts assessment guidelines, guiding principles for cumulative impact assessments in offshore wind farms;
- Seafish Industry Authority and UK Fisheries Economic Network (UKFEN) (2012) Best Practice guidance for fishing industry financial and economic impact assessments; and
- Succorfish Ltd (2017) <http://Succorfishusa.com/>