FOREWIND

DOGGER BANK
TEESSIDE A & B

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Environmental Statement
Chapter 15
Commercial Fisheries

Application Reference: 6.15

Cover photograph: Installation of turbine foundations in the North Sea

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Appendix 15A Commercial Fisheries Technical Report

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1. Introduction

1.1.1. This chapter of the Environmental Statement (ES) describes the existing environment with regard to commercial fisheries and assesses the potential impacts of Dogger Bank Teesside A and Dogger Bank Teesside B, collectively known as Dogger Bank Teesside A & B, during the construction, operation and decommissioning phases. Where the potential for significant impacts is identified, mitigation measures and residual impacts are presented.

1.1.2. Commercial fishing within the North Sea is a diverse and evolving industry, subject to a wide range of legislation and regulation, which is constantly changing and often unpredictable. In addition, other factors, such as fluctuations in the stocks of target species, market forces, operating costs and technical developments have the effect of influencing commercial fisheries baselines over a short time frame. These factors should, therefore, be recognised in the context of the timeframes of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor.

1.1.3. This chapter provides a summary of desk based research and field data collection and analysis undertaken by Brown and May Marine Limited (BMM) and Precision Marine Survey Limited (PMSL). BMM and PMSL also undertook the impact assessment presented in Section 6 to Section 11. The full technical report is available in **Appendix 15A Commercial Fisheries Technical Report**.

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2. Guidance and Consultation

2.1. Legislation, policy and guidance

2.1.1. The assessment of potential impacts upon commercial fisheries has been made with specific reference to the relevant National Policy Statements (NPS). These are the principal decision making documents for Nationally Significant Infrastructure Projects (NSIP). Those relevant to Dogger Bank Teesside A & B are:

- Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a); and
- National Policy Statement for Renewable Energy Infrastructure (EN-3), July 2011.

2.1.2. The specific assessment requirements for commercial fisheries, as detailed in the NPS, are summarised in **Table 2.1**, together with an indication of the paragraph numbers of the ES chapter where each is addressed. Where any part of the NPS has not been followed within the assessment an explanation as to why the requirement was not deemed relevant, or has been met in another manner, is provided.

Table 2.1 NPS assessment requirements

NPS requirement	NPS reference	ES reference
Early consultation should be undertaken with statutory advisors and with representatives of the fishing industry which could include discussion of impact assessment methodologies.	EN-3 section 2.6.127	**Table 2.2**
Where any part of the proposal involves a grid connection to shore, appropriate inshore fisheries groups should be consulted.	EN-3 section 2.6.127 p.50	**Table 2.2**
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 any likely constraints on fishing activity within the project boundaries. Robust baseline data should have been collected and studies conducted as part of the assessment.	EN-3 section 2.6.129 p.50	Section 3 Sections 6 - 9
Where there is a possibility that safety zones will be sought around offshore infrastructure, potential effects should be included in the assessment on commercial fishing.	EN-3 section 2.6.130	Section 7.2, 8.3, 9.3, 11.8

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2.1.3. The principal guidance documents used to inform the assessment of potential impacts on commercial fisheries are as follows (where relevant full details are given in the references section at the end of this chapter):

- DECC. 2011. National Policy Statement for Renewable Energy Infrastructure (EN-3), DECC;
- British Wind Energy Association (BWEA). 2004. BWEA Recommendations for Fisheries Liaison, The British Wind Energy Association;
- Centre for Environment, Fisheries and Aquaculture Science (Cefas), Marine Consents and Environment Unit (MCEU), Department for 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 the Food and Environmental Protection Act 1985 (FEPA) and Coastal Protection Act 1989 (CPA) requirements – Version 2;
- DECC. 2009. UK Offshore Energy – Strategic Environmental Assessment. DECC;
- Department for Business Enterprise & Regulatory Reform (BERR). 2008. Recommendations for Fisheries Liaison: FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group);
- UK Oil and Gas. 2008. Fisheries Liaison Guidelines – Issue 5;
- UK Offshore Operators Association (UKOOA; renamed UK Oil and Gas). 2006. Guidelines to Improve Relations between Oil & Gas Industries and Near-shore Fishermen;
- International Cable Protection Committee. 2006. Fishing and Submarine Cables – Working Together;
- Mackinson, S., Curtis, H., Brown, R., McTaggart, K., Taylor, N., Neville, S. and Rogers, S. 2006. A report on the perceptions of the fishing industry into the potential socio-economic impacts of offshore wind energy developments on their work patterns and income. Science Series. Technical Report no. 133;
- Blyth-Skyrme, R.E. 2010. Options and opportunities for marine fisheries mitigation associated with windfarms. Final report for Collaborative Offshore Wind Research into the Environment contract FISHMITIG09. COWRIE Ltd, London. 125 pp;
- BERR, 2008.Review of Cabling Techniques and Environmental Effects Applicable to the Offshore Wind Farm Industry;
- Planning Inspectorate Scoping Response. 2012; and
- Consultation undertaken with stakeholders and other interested parties.

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2.2. Consultation

2.2.1. To inform the ES, Forewind has undertaken a thorough pre-application consultation process, including the following key stages:

- Scoping Report submitted to the Planning Inspectorate (May 2012);
- Scoping Opinion received from the Planning Inspectorate (June 2012);
- First stage of statutory consultation (in accordance with sections 42 and 47 of the Planning Act 2008) on Preliminary Environmental Information (PEI) 1 (report published May 2012); and
- Second stage of statutory consultation (in accordance with sections 42, 47 and 48 of the Planning Act 2008) on the draft ES designed to allow for comments before final application to the Planning Inspectorate.

2.2.2. In addition, consultation associated with the Dogger Bank Creyke Beck A & B application (Forewind August 2013) has been taken into account for Dogger Bank Teesside A & B where appropriate.

2.2.3. In between the statutory consultation periods, Forewind consulted specific groups of stakeholders on a non-statutory basis to ensure that they had an opportunity to inform and influence the development proposals. Consultation undertaken throughout the pre-application development phase has informed Forewind's design decision making and the information presented in this document. Further information on the consultation process is presented in **Chapter 7 Consultation**. A Consultation Report is also provided alongside this ES, as part of the overall planning submission.

2.2.4. A summary of the consultation carried out at key stages throughout the project of particular relevance to commercial fisheries is presented in **Table 2.2**. This table only includes the key items of consultation that have defined the assessment. A considerable number of comments, issues and concerns raised during consultation have been addressed during consultation meetings and hence have not resulted in changes to the content of the ES. In these cases, the issue in question has not been captured in **Table 2.2**. A full explanation of how the consultation process has shaped the ES, as well as tables of all responses received during the statutory consultation periods, will be provided in the Consultation Report.

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Table 2.2 Summary of consultation and comments received from consultees

Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
Scoping opinion					
Scoping Opinion November 2010	Infrastructure Planning Commission (IPC)	IPC	The Commission wishes to be assured that consultation has been undertaken with appropriate commercial fisheries and, in the light of the number of foreign vessels in the area. The applicant should take account of the comments from Marine Management Organisation (MMO) in this regard, including the need for a monitoring plan. The Commission welcomes that, the assessment coverage would not be limited to the location of the proposed wind turbines and other off-shore infrastructure, but also cover the off-shore cable route corridor. The Commission notes the concern of the MMO to safety zones and the impacts on the fishing industry and advises that these impacts should be assessed. The loss or restricted access to traditional fishing grounds may have subsequent effects on alternative fishing grounds which are fished by smaller vessels. The impacts on alternative fishing grounds should be assessed. Potential cumulative impacts should include the potential impacts of displacing fishing activities on the site and on the region to which fishing would be displaced.	Consultation has been on going, and will continue, with all appropriate commercial fishing interests operating in the vicinity of the proposed development. Forewind have undertaken specific consultation with non-UK fishing interests operating in the area and have requested and received fisheries data from the relevant Member States. The need for a monitoring plan has been addressed in the impact assessment Addressed in the commercial fisheries existing environment description and impact assessments. The study areas have	**Chapter 35 Summary of Monitoring and Mitigation** This chapter Sections 7.3, 7.4, 7.5, 8.2 & 11.2

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
				been selected to cover all relevant infrastructure, including the offshore cable route corridor The impact of safety zones on the fishing industry has been addressed in the impact assessment and is subject to further discussion with the Marine and Coastguard Agency (MCA) Displacement of fishing effort to alternative grounds has been assessed in the impact assessment. Displacement of fishing effort has been discussed in the regional context	
Scoping Opinion November 2010	MMO	MMO	The varieties of fishing methods used in the area are highlighted. The use of safety zones during both the construction and operational phase of the wind farm are of some concern. The fishing industry	All commercial fishing methods recorded in the area of the wind farm and export cable corridor have	This chapter Sections 7.3, 7.4, 7.5, 8.2 & 11.2

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			will be anxious for clarification on this matter and how the developer will view access to the site during the operational phase.	been considered The impacts associated with safety zones on commercial fishing interests during both the construction and operational phases are addressed in the impact assessment and are subject to further consultation with the MCA and fishermen's representatives	
Consultation					
11/03/2010	Mike Park Barrie Deas Dale Rodmell Rory Campbell Henrik Lund Perrine Ducloy Pim Visser Willem d Boer Harald Østensjø	North Sea Regional Advisory Council (NSRAC) – Spatial Planning Working Group (SPWG) Scottish White Fish Producers Association (SWFPA) National Federation of Fishermen's Organisation (NFFO) Scottish Fishermen's Federation (SFF) Danish Fishermen's	Introduction of the Forewind consortium and the Dogger Bank Project. The main comments from industry were: • Important fishing grounds particularly to UK, Danish and Dutch interests; • Environmental Impact Assessment must be evidence based, although it was acknowledged that there are data limitations; • ICES (International Council for the Exploration of the Sea) square spatial scale is an adequate level of resolution to define fishing activity, particularly in relation to turbine siting; • Previous engagement between industry and developers (Rounds 1 and 2) has not been good, a more collaborative	Included in the existing environment description and addressed in the impact assessments. The impact assessment takes into consideration all information and data collected to date to assess receptor sensitivity and magnitude of effect. Forewind has	In this chapter Sections 3.3, 4, 6,7,8, 11.1 & 11.2

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
		Association (DFA) Comité National des Pêches (CNPMEM) VisNed (Netherlands Fishermen's Federations) Dutch Fishing Industry Norwegian Fishermen's Association (NFA)	approach is required; • NSRAC can act as a forum to direct information, however Forewind should undertake independent consultation with all Member State fishermen affected; • Potential for the collaboration with the UK sector on the spatial and temporal scale of fishing activity in the North Sea; and • Cumulative effects of the Dogger Bank development must take into account the effects of other offshore wind farms within the North Sea.	undertaken a series of consultation meetings with the NFFO and is fully aware of this concern Forewind has consulted with representatives of relevant Member States fishermen. This will form part of the objectives of the Fisheries Working Group The cumulative impact assessment includes all planned wind farms and other marine developments in the North Sea	
21/04/2010	Dave Bevan Richard Brewer David McCandless/Paul Lane Andrew Allard Philip MacMullen Tom Rossiter Rob Neale	NFFO Anglo-Scottish Fish Producers Organisation North Eastern Sea Fisheries Committee Jubilee Fishing Seafish Industry Authority Angling Trust	Forewind stakeholder workshop 1. The main comments were; • Size of the development and the impact this may have on access to fishing grounds; • Potential exclusion zones in the wind farm and around the export cable/s; • Whether fishing can continue within the wind farms; • Displacement of fishing to other areas; and	Addressed in the impact assessment The impacts associated with safety zones on commercial fishing interests during both the construction and operational phases	In this chapter Sections 3.3, 4, 6,7 & 8

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			• Long term engagement plan and consultation with the developers.	are addressed in the impact assessment and are subject to further consultation with the MCA and fishermen's representatives Addressed in the impact assessment and will be subject to further collaborative consultation via the Fisheries Working Group	
27/04/2010	Barrie Deas Philip Walsh	NFFO New Under Ten Fishermen's Association (NUTFA)	Forewind stakeholder workshop II. The main comments were: • Displacement from existing fishing grounds; • Exclusion zones in wind farms and along cables; • Need for early and continuous consultation with fishing industry; and • Uncertainties regarding the possible restrictions being put on fishing activities within the Special Area of Conservation (SAC).	Addressed in the impact assessment MCA Consultation has been on-going, and will continue, with fishing interests from all relevant Member States Addressed in the cumulative impact assessment	In this chapter Sections 3.3, 4, 6,7,8, 11.1 & 11.2

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
28/04/2010	Harald Østensjø	Southern Norway Trawler Association	The main comments were: • Uncertainty regarding exclusion zones within the SAC and wind farms/cables; • Displacement from existing fishing grounds; • Willingness to cooperate and engage; • Number of projects, turbines, cable length etc.; • Assessment not able to pick up long term variations in fishing activities; and • Mitigation in case of fishing activities being displaced.	Addressed in the impact assessment	In this chapter Sections 6,7 & 8
28/04/2010	Willem de Boer Henrik Lund	Dutch Fishing Industry	The main comments were: • Uncertainty regarding exclusion zones within the SAC and wind farms/cables; • Displacement from existing fishing grounds; • Willingness to cooperate and engage; • Number of projects, turbines, cable length etc.; • Assessment not able to pick up long term variations in fishing activities; and • Mitigation in case of fishing activities being displaced.	Addressed in the impact assessment	In this chapter Sections 6,7 & 8
28/04/2010	Euan Dunn Mike Hardy	North Sea Regional Advisory Committee Northumberland Sea Fisheries Committee	Forewind stakeholder workshop III. The main comments were: • Uncertainty regarding exclusion zones within the SAC and wind farms/cables; • Displacement from existing fishing grounds; • Willingness to cooperate and engage; • Number of projects, turbines, cable length etc.; • Assessment not able to pick up long term variations in fishing activities; and	Addressed in the impact assessment Will be further addressed through the Fisheries Working Group, ongoing consultation and liaison	In this chapter Sections 6,7 & 8

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			• Mitigation in case of fishing activities being displaced.		
19/07/2010	Registered offshore fisheries stakeholders	NFFO, SFF, SWFPA, Dutch Fishing Industry, Nederlande Vissersbond, Stichting voor Duurzame Visserjontwikkeling (SDVO), CNPMEM, Southern Norway Trawler Association, DFA, Deutscher Fischerei Verband (DFV)	Letter updating fishing industry on Forewind's Dogger Bank development, including: • Introduction of fisheries liaison co-ordinators; • Zone characterisation and survey schedule; • Planned activities; and • Key contacts.	No action required	N/A
22/10/2010	Tom Craeynest, Dany Vlietinck, Geert Degroote	Rederscentrale	• The Dogger Bank Zone is of lesser concern to the Belgian fishing fleet compared to other wind farm sites in the North Sea.	Included in the existing environmental description	In this chapter Sections 3.3 & 4
22/11/2010	Registered nearshore fisheries stakeholders (UK)	Withernsea & Easington Inshore Fishermen, Bridlington and Flamborough Fishermen's Society, Hornsea Inshore Fishermen, NUTFA	Letter updating UK fishing industry on Forewinds' Dogger Bank development, including: • Introduction of Tranche A location; • Introduction of fisheries liaison co-ordinators; • Zone characterisation and survey schedule;	No action required	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			• Scoping opinion; • Fact sheet; • Meeting request; • Planned activities (export cable corridor); and • Key contacts.		
13/12/2010	Henrik Lund, Svend-Erik Andersen, Jesper Juul Larsen, Lone Hansen	Dutch Fishermen's Association DFA	• Concerns were raised over the impact of the Dogger Bank development on sandeel grounds; and • The DFA would prefer turbines to be fully removed once decommissioned.	The final selection of the project boundaries took into account the need to avoid the main sandeel fishing areas The decommissioning of the turbines will be subject to a specific impact assessment, application and marine licence	In this chapter
20/12/2010	Harald Østensjø	Norwegian Fishermen's Association NFA	The main comments were: • Dogger Bank and surrounding waters are important to Norwegian fishermen; • Modification of tidal flows around turbines which may impact habitat, sediments, faunal communities and fish populations; • Would the UK government refuse to consent the development if it was shown to be deleterious to fish and commercial fishing; • The development would, even if co-existence were feasible, increase	Included in the existing environment description Addressed in full in **Chapter 13 Fish and Shellfish Ecology**	In this chapter Sections 3.3, 4, 6,7 & 8 and **Chapter 13 Fish and Shellfish Ecology**

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			steaming times, competition for reduced access and result in displacement to adjacent fishing grounds; • That Forewind should contact WWF Norway; • Whether the wind farms could co-exist in the Dogger Bank SAC and whether Forewind had discussed this with the Joint Nature Conservation Committee (JNCC); and • Would fishermen be included in mitigation in the event that fishing activity is significantly displaced.	Addressed in the impact assessments	
21/02/2011	Kevin Caffrey, Andrew Allard, Fred Normandale, Alan Piggott, Dale Rodmell, Andries de Boer & Ned Clark	NFFO and Anglo-Dutch Fishermen's Association	The main comments were: • The placement of the Dogger Bank Zone and the impact on the fishing industry particularly as the whole site is fished; • Questions were raised over how the proposed Dogger Bank SAC will interact with the wind farm and will this designation prevent fishing within the wind farm; and • How fishermen who will lose access to grounds and who have limited opportunities to fish elsewhere will be compensated.	Addressed in the impact assessment Until the Dogger Bank SAC boundaries and management plans are finalised, it is not possible to fully assess the potential interactions	In this chapter Sections 6, 7 & 8
21/02/2011	Harald Østensjø	Norwegian Fishermen's Association NFA	• The Dogger Bank Zone and surrounding area are considered to be important fishing grounds for Norwegian fishing interests.	Included in the existing environment description	In this chapter Sections 3.3, 4, 6,7 & 8
04/03/2011	Derk Jan T Berends	Nederlandse Vissersbond	• Stated that it would be preferred if the wind farm overlapped with proposed Marine Protected Areas (MPAs) and encouraging fishing in UK wind farms may set a precedent for opening closed wind farm areas to fishing in Dutch	Addressed in the Impact Assessments	Addressed in Sections 6-11 of this chapter.

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			waters.		
04/03/2011	Pim Visser (VisNed), Andries de Boer (Anglo-Dutch), R. de Boer (Anglo-Dutch), Geert Meun (North Sea Fishermens Organisation), W de Boer (DFA), M Brucker, B Dalder, Jan de Boer, Jan F de Boer	Dutch Fishermen's Association	• Dutch activity has significantly reduced due to quota restrictions. • Seven Dutch vessels regularly fish the Dogger Bank Zone and a number of these are UK registered vessels acquired by Dutch interests from Lowestoft. • Concerns were raised given that plaice stocks are currently improving and therefore Dutch fishing activity may increase in the next few years as quota allocations increase. • The main concern expressed by the Dutch representatives was the cumulative loss of fishing grounds, many of which are key to the long term success of the Dutch fisheries.	Included in the Existing Environmental Description and addressed in the impact assessment	In this chapter Sections 3.3, 4, 6,7 & 8
31/03/2011	Dirk Verhaeghe	Researcher at Instituut voor Landbouw-en Visserijonderzoek (ILVO)	• Discussion on fishing in wind farms and that fishing is prohibited within Belgian wind farms.	Included in the existing environmental description	In this chapter Sections 3.3 & 4
01/04/2011	Sofie Vandenriessche	Researcher at ILVO	• General discussion about wind farms and challenges of obtaining Belgian Vessel Monitoring System (VMS) data.	Included in the existing environmental description	In this chapter Sections 3.3 & 4

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
01/04/2011	Emiel Brouckaert, Van Billemont Pascal, Van Torre Louis	Rederscentrale Ostend	Comments were raised regarding the safety of fishing within wind farms and the noise emitted from operational wind farms scaring fish away. Comments were also raised about the cumulative effect of wind farms and MPAs. • The Dogger Bank zone is not considered to be of major concern to the Belgian fishing fleet.	Addressed in **Chapter 13 Fish and Shellfish Ecology** and included in the existing environmental description	In this chapter Sections 3.3 & 4 and **Chapter 13 Fish and Shellfish Ecology**
04/05/2011	NSRAC –SPWG Antony Viera Derk Jan Berends Willem de Boer Dale Rodmell, Barrie Deas & Arnold Locker Pim Visser Fredrik Linberg & Peter Olsson Henrik Lund	CRPMEM Nederlandse Vissersbond Dutch Fishing Industry NFFO Stichting van de Nederlandse Visserij Swedish Fishermen's Federation DFA	The main comments were: • How fishing interests compare to those of other marine users; • Fishing industry was being consulted, but would the real concerns of the industry be acted upon; • Increasing the spacing between turbines would inevitably lead to an increased footprint of the development; • Displacement of fishing as a result of the Dogger Bank wind farms, SAC sites and UK Marine Conservation Zones would concentrate fishing on other areas • Information needed to be shared and made publically available, fishermen would be willing to leave AIS systems on to provide information within the zone; • If fishing was to continue, access and exit corridors would have to be maintained; • Up to date information on the Dogger Bank fisheries must be utilised in the assessment, as the fleets are dynamic and patterns of fishing change over time; • The routing, burial and arrangement of cables is critical if fishing (i.e. trawling) is to continue within wind farms; • Forewind must build a trusting	Addressed in the project impact assessment The potential cumulative impact arising from the construction and operation of the wind farm in addition to the implementation of MPAs have been assessed in the cumulative impact assessment The existing environment description and impact assessments include the most up to date data currently available by the MMO and other Member States fisheries	In this chapter Sections 3.3, 4, 6,7,8, 11.1 & 11.2

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			relationship with the industry, as it is individual fishermen who hold the best data on their activities; and • The loss of the key Dogger Bank fishing grounds would lead to displacement and that in itself would likely lead to increased discarding, as the Dogger Bank fishery is a clean fishery comprising minimal discards.	organisations The displacement of fishing activity to alternative fishing grounds is assessed in the project impact assessment	
20/07/2011 to 21/07/2011	NSRAC – SPWG Dale Rodmell Henrik Lund Pim Visser & Andries de Boer	Dogger Bank Focus Group (DBFG) NFFO DFA Dutch fishing industry	• Workshop to define key components of the Dogger Bank fisheries management proposal. • Discussion centred on available science and data and when data generated by Forewind may be available • Discussion on how the Forewind projects may interact with conservation zones • Follow up workshop tasks and responsibilities were allocated.	Forewind propose to undertake further workshops with fishing interests as the project design is refined	N/A
30/08/2013 to 31/08/2011	NSRAC – SPWG Dale Rodmell Henrik Lund Pim Visser & Andries de Boer	DBFG NFFO DFA Dutch fishing industry	• The NSRAC SPWG formed a special focus group to formulate a fisheries management plan for the international Dogger Bank SAC/SCI. The group selected comprised representatives of the fishing industry and Non-Governmental Organisations; this group is referred to as the DBFG. The meeting outputs included: • Principal objectives for the NSRAC management proposal were defined • Forewind plans for the development of renewable energy on the Dogger Bank were discussed • Data were used to determine a draft	N/A	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			zoning proposal and an outline NSRAC position paper.		
03/09/2011	Pim Visser, Andries de Boer, Cora Seip, J Hakvoort, Derk Jan Berends, R.J de Boer, Pieter Avis van der Vis, F Krijnen, Louwe de Boer, J van Dam, S. van der Vis, Hendrik de Boer, G Groenendijk, J Tanis, G Betsema, M de Boer, L de Boer, J de Boer, J van der Vis, Jan van der Vis & Sandra Beekman	Dutch Fishermen's Association	Meeting with Dutch fishing interests, following a presentation by Forewind. Breakout groups were formed with different Dutch fleet segments. Forewind provided the following responses in relation to comments and questions from the Dutch industry: • Forewind are considering 1km spacing between turbines as a minimum spacing. However, spacing could be larger depending turbine sizes etc. • Forewind are looking at ways to coexist with commercial fisheries. Forewind are not looking at excluding fishing vessels from fishing within a wind farm. Forewind would like to receive as much information as possible regarding areas of fishing and their relative importance, direction of fishing (if gear is mostly towed in the same direction) etc. in order to use this information in deciding where projects are located and orientation of the projects. It is believed that a continuous dialogue with the fishing industry will be beneficial • Health and safety is a focus point for Forewind and parent companies. It is realised that weather and sea conditions make Dogger Bank a challenging environment to operate in for the fishing	N/A	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			industry. It is anticipated that a close dialogue with the fishing industry is needed in order to facilitate a process where joint understanding of health and safety risks would be addressed and highlighted. • As long as the Natura 2000 "no bottom trawling areas" (as identified by the fishing industry) have ground conditions favourable for a wind farm there are no reasons why consideration of co-locating these areas with a wind farm shouldn't be done • Forewind is happy to provide data on wrecks and seabed features (such as large boulders etc.) to the fishermen as soon as this data have been properly quality assured.		
02/11/2011	Peter Breckling	NSRAC – Demersal Working Group DFV	Issues raised included: • Individual consultation after the main meeting; • Request for information in respect to German fishing activity on the Dogger Bank and within the export cable envelope; • Will assist in the collation of German data; • Potential to significantly interact with proposals for Natura 2000 and will impact fishermen extensively; • There is German interest on the UK part of the Dogger Bank; and • When there is more information a meeting would be beneficial, but probably adequate to go through the NSRAC at the present time.	Included in the existing environment description and addressed in the impact assessment	In this chapter Sections 3.3, 4, 6,7 & 8

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
02/11/2011	Fredrik Linberg & Peter Olsson	NSRAC – Demersal Working Group Swedish Fishermen's Federation	Individual consultation after the main meeting; • Request for information in respect to Swedish fishing activity on the Dogger Bank and within the export cable envelope; • Swedish activity not as significant as Danish; • Swedish Ministry will supply VMS and landings data; and • Would like a meeting when there is something to report.	Included in the existing environment description	In this chapter Sections 3.3 & 4
14/11/2011	Tom Craeynest, Emiel Utterwilphe, Johan Hennaert, Steve Savels, Eddy Cattoor	Belgian skippers	• Belgian fishing interests consider it dangerous to trawl between turbines and would prefer turbines to be placed close together to minimise loss of fishing area; • Belgian fishing effort is concentrated to the north of the zone; and • Comments raised that fishing is not high priority in the siting of turbines.	Included in the existing environmental description	In this chapter Sections 3.3 & 4
19/11/2011	Antony Viera, Alexis Maheut, Francois Lambert, Angelique Merlet, Alexiane Brefort, Jean Roult, Marc Perrault, Alexis Hagnere, Jean Louis Sagot	CRPMEM	• French fishing activity occurs along the export cable route.	Included in the existing environment description and addressed in the impact assessments	In this chapter Sections 3.3 & 4
22/11/2011	Henrik Mosegaard	National Institute of Aquatic Resources, Charlottenlund	• Discussion on sandeel.	Included in the existing environment description	In this chapter Sections 3.3 & 4
22/11/2011	Henrik Lund and Sandeel fishers and Danish Seine netters	DFA	• Information gathering and consultation with Danish sandeel and seine fishermen in Thyborøn and visit to	Included in the existing environment	In this chapter Sections 3.3 & 4

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
	in Thyborøn		processing plant.	description	
06/12/2011	Antony Viera	CRPMEM	• General discussion about wind farm and analysing French fishing effort in the vicinity of the Dogger Bank Zone.	Included in the existing environment description and addressed in the impact assessment	In this chapter Sections 3.3 & 4
12/12/2011	Harald Østensjø, Valter Rasmussen, Helge O. Vikshåland, Bjarte Nordtun, Terje Hemnes, Svein Atle Lønning, Ståle Lønning, Kjell T. Eriksen, Anders Klovning	NFA	• Provided an update on the development of projects in Tranche A; • Discussion regarding Norwegian fishing effort on Dogger Bank and it's seasonality; • The fisheries representatives emphasised the importance of making all cables over trawlable; and • Concern was expressed regarding the impact piling noise might have on sandeel and suggested that the piling operations should try to avoid the fishing season.	Included in the existing environment description Addressed in **Chapter 13 Fish and Shellfish Ecology** The final selection of the project boundaries took into account the need to avoid the main sandeel fishing areas	In this chapter Sections 3.3 & 4 and **Chapter 13 Fish and Shellfish Ecology**
13/12/2011	Harald Østensjø	NFA	• Information gathering and consultation with Norwegian sandeel and pelagic fishermen.	Included in the existing environment description	In this chapter Sections 3.3 & 4
31/01/2012	Pim Visser	VisNed	• Dutch and Danish fishing interests have signed up to a 22% closure on the Dogger Bank to bottom towed fishing gear as part of a MPA;	Included in the existing environmental description	In this chapter Sections 3.3 & 4

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			• There are up to 31 Dutch vessels (including UK flagged) operational on the Dogger Bank; and • A large number of Dutch vessels have modified their gear from the traditional beam trawl to pulse and sum wings.		
02/03/2012	Michael Sutherland John Watt	SFF	• The SFF appreciated that Forewind had invited them to discuss the development and are content that they have been given sufficient information.	No action required	N/A
13/03/2012	Andries de Boer	Anglo Dutch fishing Industry	• Email correspondence regarding Dogger Bank Natura 2000 zone and Industry (NSRAC) proposal; and • Following a request for a copy of the industry proposal and specific co-ordinates, Andries de Boer responded to request with the data/information required.	Included in the existing environmental description	In this chapter Sections 3.3 & 4
04/04/2012	Pim Visser	VisNed	• Pulse wing fishing gear can result in fuel saving of 50 to 70%	Included in the existing environmental description	In this chapter Sections 3.3 & 4
June 2012	IPC	IPC	Whilst the Scoping Report states that the Applicant expects the impacts during decommissioning to be similar to those experienced during construction (paragraph 12.1.12), the potential impacts on commercial fisheries during construction are not outlined within this section. The potential impacts on commercial fisheries during the construction period, will relate to displacement from fishing grounds, the presence of physical obstacles, increased pressure over diminished grounds, displacement or reduction in the fish and shellfish resource, and the implementation of	The potential impacts on commercial fisheries during the construction, operation and decommissioning phase have been assessed. The impact of safety zones on commercial fishing	In this chapter Sections 7, 8, 9 and 11.

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			navigational restrictions. The potential impacts on commercial fisheries during the construction phase should be addressed in the ES. The EIA should thoroughly consider the impact of safety zones on commercial fishing and the extent of the zones should be justified within the ES. The loss or restricted access to traditional fishing grounds may have subsequent effects on alternative fishing grounds which are fished by smaller vessels. The impacts on alternative fishing grounds should be assessed. The Secretary of State welcomes the approach taken by the Applicant to ensure close liaison with the national and international fisheries industry. The Applicant is referred to the comments by Guisborough Town Council on the local fishing industry (see Appendix 2).	have been assessed. Displacement of fishing vessels to other fishing grounds has been assessed as part of the cumulative impact assessment.	
June 2012	MMO	MMO	The scoping report is well set out with appropriate consideration of potential impacts on the resident marine community and associated fisheries in the area. The main commercial, ecologically and conservational important species have been identified. It is noted that it has been recognised that any of the three potential cable landfalls will be within a shellfisheries area. Commercial fisheries (UK and international) will be comprehensively covered and potential impacts appropriately assessed.	Comments noted	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			The consultation and maintenance of good communication with local and international fishermen throughout the process has been noted.		
06/07/2012	Michael Sutherland	SFF	• Telecom regarding Scottish sandeel vessels. The Sunbeam is the only Scottish vessel undertaking, on occasions, sandeel fishing in the Dogger Bank, but there was no quota available in 2011.	Included in existing environment description and addressed in the impact assessment	In this chapter Sections 3.3, 4, 6,7 & 8
24/07/2012	Antony Viera, Alexiane Brefort, Marc Perrault	CRPMEM	• French fishing activity occurs along the export cable route. • There are no objections to the cable route providing the cables are buried and fishing can continue.	Included in the existing environment description and addressed in the impact assessment	In this chapter Sections 3.3, 4, 6,7 & 8
25/07/2012	Frank Powell	North East Inshore Fisheries Conservation Authority (NEIFCA) – Intertidal permit holder & salmon fisherman	Telecom consultation on fishing practices, gear specifications and local fishing grounds. Concern expressed as to: • Impacts from disturbance of intertidal zone (cabling) which may interrupt migratory target species and reduce/impact catches; • Nowhere to move to if affected, permitted to fish in a small area; and • Other developments have affected fishing (i.e. sea trout), why should Dogger Bank export cable be any different.	Addressed in **Chapter 13 Fish and Shellfish Ecology**	**Chapter 13 Fish and Shellfish Ecology**
06/08/2012	Fredrik Linberg	Swedish Fishermen's Federation	• Email request for further information regarding Swedish sandeel fishermen, any pelagic activity and flagged vessels. Responded with additional contact details.	No action required	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
06/08/2012	Peter Breckling	DFV	• Email correspondence requesting additional information on German sandeel and herring fishers and the extent of German/Danish flagged vessels operating on the Dogger Bank.	No action required	N/A
09/08/2012	Andrew Sanderson	NEIFCA - Intertidal permit holder & Salmon fisherman	Consultation on fishing practices, gear specifications and local fishing grounds. Concern expressed as to: • Impacts from disturbance of intertidal zone (cabling) which may interrupt migratory target species and reduce/impact catches; • Need to be given adequate warning as to when work will commence to make sure effort is not wasted (i.e. anchor points in intertidal area be given adequate warning as to when work will commence to make sure effort is not wasted i.e. anchor points in intertidal areas); and • Limited opportunities to move if affected, permitted to fish in a small area.	Addressed in **Chapter 13 Fish and Shellfish Ecology**	**Chapter 13 Fish and Shellfish Ecology**
13/08/2012	Fred Normandale	Normandale Trawlers Ltd & Scarborough Inshore Fishermen's Society	Consultation on fishing practices, gear specifications and local fishing grounds. Concerns expressed in respect to: • Displacement and loss of access to important grounds for the local sector, which is already under considerable pressure as a result of regulatory and financial impacts.	Addressed in the impact assessment	In this chapter Sections 6,7 & 8
28/08/2012 to 13/06/2013	Garry Dando	MMO	Series of emails exchanged regarding GIS Data request for UK VMS, Landings and Effort data.	Received 2012 VMS in May 2013. Still awaiting Landings and Effort data	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
04/09/2012	Kevin Caffrey	Grimsby based fishing vessel owner	Consultation on fishing practices, gear specifications and Dogger Bank fishing grounds. Concerns expressed in respect to: • Displacement is an issue as if the Dogger Bank fishing grounds are lost, then so are his fishing opportunities; • Mr Caffrey only fishes the Dogger Bank and his method of fishing (Danish/anchor seine) is not conducive to fishing amongst fixed assets (turbines); and • For the loss of his and the crews livelihoods, discussions will have to be held in respect to how this will be mitigated.	Addressed in the impact assessment	In this chapter Sections 6,7 & 8
18/12/2012 to 29/04/2013	Patrick Berthou Thomas Bouyer	Institut Francais de Recherché pour l'Exploitation de la Mer (IFREMER) Direction des pêches maritimes et de l'aquaculture (DPMA)	• Series of emails exchanged regarding GIS Data request for French VMS, Landings and Effort data.	IFREMER advised to contact DPMA. DPMA were contacted on 8th February 2013. Still awaiting data	N/A
19/12/2012 to 27/03/2013	Dr. Heino O. Fock	Thünen Institute of Sea Fisheries	• Series of emails exchanged regarding GIS Data request for German VMS, Landings and Effort data.	Still awaiting the German datasets	N/A
02/01/2013	James Cross	CEO of MMO	• Email exchange regarding data protection issues UK Landings and Effort data updates for 2013.	None required.	N/A
15/01/2013	Dale Rodmell Ian Rowe	National Federation of Fishermen's Organisation (NFFO)	• NFFO advised that the Dogger Bank Teesside A and Dogger Bank Teesside B locations were worse than Dogger Bank Creyke Beck A & B in terms of impacts on Anglo-Dutch beam trawl fishing.	Comments noted	N/A

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02/02/2013	Pim Visser Cor Daalder Maarten Drijver Andries Vonk Cornelius De Boer Andries De Boer Melle Kakvoort Jelle Romkes Willem Noek	Netherlands Fishermen's Federation (VisNed)	• Advised that VMS (2006-2010) was not representative of the actual fishing effort in the area and that, since 2010, the plaice *Pleuronectes platessa* fishery effort and value had doubled and were expected to keep increasing; and • Advised Dogger Bank Teesside A was the most important of the four project areas shown (Dogger Bank Creyke Beck A and & B and Dogger Bank Teesside A & B), but that Dogger Bank Teesside Project B was also an important fishing ground for them.	Consultation with fishermen undertaken to ensure accurate representation of Dutch fishing grounds and comments noted	N/A
06/02/2013	Fredrik Lindberg Björn Lindblad Karl Johnson	Swedish Pelagic Producers Organisation (PO)	Overview of Dogger Bank Teesside A & B was provided and concerns were raised over; • The effects of EMF on sandeel *Ammodytidae* spp population and health, although it was agreed the areas of concern were mainly in the western boundary of the developable zone rather than in Dogger Bank Teesside A & B. • Forewind advised that it would be addressed in the Environmental Impact Assessment (EIA).	No action required	N/A
20/02/2013	Harald Østensjø Finn Magnus Alvestad Brit Sæle Instebø Knut Klepsvik Jostein Knutsvik Erlend Lønning Svein Atle Lønning Valter Rasmussen Nils Magnar Taranger	Sør-Norges Trǻlerlag Hǻflu Fiskarlaget Vest Østanger Skude Senior Lønningen Trygvason Sør-Norges Trǻlerlag Magnarson Cetus	• The Norwegian fishery has been operational on the Dogger Bank for the past 50 to 60 years and vessels mainly target the sandeel fishery; however it is considered that there is no conflict of interest from Norwegian fishermen for Dogger Bank Teesside A & B.	No action required. However it was requested to keep them updated on the EIA outcomes once completed	N/A

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	Aleksander Vedø				
22/02/2013	Henrik Lund Lars Gammelgård Jesper Juul Larsen Mogens Ørts Jensen Magni Magnussen	Danmarks Fiskeriforening Danmarks Fiskeriforening Vice President Danish Trawlermen Pelagic trawler Pelagic trawler	• Mr Lund advised that there were about 5 to 10 Danish seine fishing vessels on Dogger Bank around the Dogger Bank Teesside A & B boundaries; and • Mr Lund pointed out an area north of Dogger Bank Teesside Project B as an important sandeel fishing site.	Comments noted	N/A
27/02/2013 to 17/06/2013	Sophie Vandendriessche Bart Vanelslander Henrik Lund Peter Lasson Schmidt	Institute for Agricultural and Fisheries Research (Belgium) Danish seine netters	Series of emails exchanged regarding GIS including comments as follows; • Data request for Belgian VMS, Landings and Effort data; • Mr Lasson is the principle Danish seine netter fishing the Dogger Bank; he mainly fishes in the Dogger Bank Creyke Beck A & B project areas but also fishes within the Dogger Bank Teesside A & B boundaries. He is concerned that seine netting will not be able to continue once the wind farm is built; and • Mr Lasson suggested that if turbines were positioned in areas comprising of seine net fasteners (i.e. rocky ground), then co-existence would be easier.	Awaiting data- going to use script provided by the Dutch. Concerns noted Peter to provide a list of fasteners to determine if this is a plausible suggestion	N/A
18/03/ 2013	Antony Viera Patrick Francois	CRPM Nord	For the French fisheries the export cables are the areas they would be concerned about. It was stated that Marine Conservation Zones (MCZs) were of more concern to the French fishing industry than offshore wind farms.	Comments noted and French fishing interests will be kept updated particularly prior to and during the construction phases	N/A

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28/03/2013 to 23/05/2013	Neils Hintzen Sanders Meyns Jean-Francois Verheggen Geert Luickx Dany Vlietinck Rudy Neyts Dirk Degrendele Geert De Groote Emiel Utterwulghe	Institute for Marine Resources and Ecosystem Studies (IMARES) Department of Agriculture & Fisheries Jean Rederscentrale Belgian fishermen	Series of emails exchanged regarding GIS Data request for Dutch VMS, Landings and Effort data for 2012. Concerns were raised regarding; • The effect of underwater noise on fish; and • It was advised that rock placement should be avoided wherever possible, with particular reference to the potential of snagging nets.	Data received on 23rd May, this will be implemented into PEI3. Concerns noted and it was advised that a copy of the PEI3 would be issued to Rederscentrale. They have been encouraged to read it and provide feedback to Forewind	N/A
April 2013	Registered offshore fisheries stakeholders	Registered offshore fisheries stakeholders	Newsletter (Fisheries Update Issue 1) updating fishing industry on Forewind's Dogger Bank development, including: • Details of fisheries liaison co-ordinators; • Survey schedule; • Planned activities; and • Key contacts.	None required	N/A
15/04/2013	Henrik Lund Peter Lasson Schmidt	Danish seine netters	Mr Lasson is the principle Danish seine netter fishing the Dogger Bank has the following comments; • He mainly fishes in the Dogger Bank Creyke Beck A & B project areas but also fishes within the Dogger Bank Teesside A & B boundaries; • He is concerned that seine netting will not be able to continue once the wind farm is built; and • He suggested that if turbines were positioned in areas comprising of seine net fasteners (i.e. rocky ground), then co-existence would be easier.	Comments noted Peter to provide a list of fasteners to determine if this is a plausible suggestion	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
16/04/2013	Henrik Lund Thomas Sørensen	Danish gill netter	• Mr Sorensen fishes Dogger Bank for three months of the year, catching almost his whole quota for turbot within this period; and • He is more concerned about Dogger Bank Teesside A & B than Dogger Bank Creyke Beck A & B, as the majority of his fishing is to the east of the Dogger Bank zone.	Concerns noted	N/A
01/05/2013	Andries de Boer	Dutch Fisherman	• Mr de Boer suggested that rather than having the necklace layout (i.e. the turbines around the outside close together and less turbines inside the area) it would be more beneficial to fishermen to have all turbines with minimum spacing (750m) so that a smaller area is lost.	Concern and idea noted by Anatec.	N/A
02/05/2013	Phil Walsh & Martin Walsh	New Under Ten Fishermen's Association	Comments included: • Provision of fishing information; and • Significant effect as a result of displacement of commercial shipping anchoring up on important local prawn grounds, making fishing difficult to continue. Concern that this will increase as vessels are further concentrated away from export cable corridors.	Information and comments noted	N/A
08/05/2013	Holderness Coast Fishing Industry Group (HCFIG) meeting	Holderness Coast Fishing Industry Group	Comment included: • It can take several weeks to remove gear due to weather, people being away, vessels being out of the water etc. A month's notice would be the minimum required to effectively respond; and • Guard vessels have worked well in the past to keep fishing vessels informed of what is going on and where the safe zones are.	HCFIG to be kept up to date via newsletters	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
11/05/2013	Pim Visser Andries de Boer Pieter de Boer Louwe de Boer M de Boer Jacob Kramer Jan de BoerRendr Johannes de Boer	Netherlands Fishermen's Federation (VisNed)	Fishermen were concerned that: • The data available is only up to 2010; • Mr Visser suggested that IMARES can send VMS data that includes value for areas within the Dogger Bank coordinates; • There may be fishing restrictions if collisions occur within the wind farm. They would prefer large turbines with greater spacing so that fishing can continue within the wind farm; and • If they agree to this and collisions do occur, the wind farm may be closed to fishing. If this happens they will lose a greater fishing area than if the wind farm is built with minimum spacing and fishing could not occur from the beginning.	BMM to continue requesting data updates Pim Visser to send IMARES VMS BMM to relay concerns over collisions within the wind farm once built to determine an outcome	N/A
21/05/2013	Whitby and Scarborough Fishermen	Whitby Fishermen, Normandale Trawlers Ltd & Scarborough Inshore Fishermen's Society and the NFFO	• Newsletters with relevant information are better than meetings at the present, meetings will be required later in the process; and • Export cable corridors lie in important local potting grounds. Fishermen should be sent higher definition charts showing cable corridors and landfall locations.	Comments noted	N/A
22/05/2013	Hartlepool Fishermen	New Under Ten Fishermen's Association	Comments raised for the following areas: • The lack of information/research on the effects of EMF from High Voltage Direct Current (HVDC) cables and how shellfish (prawns) and fish are affected; • How will the effects of heat loss from the export cables during transmission affect fish and shellfish, could the effects significantly impact fishing livelihoods; • The ability to fully protect export cables; • Displacement of commercial shipping on	Concerns noted	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			to key prawn grounds which has already occurred and is now affecting the prawn fishery;Increased construction traffic will affect the local fleet, particularly if Hartlepool/Teesport if to be utilised; and • Prefer frequent meetings		
23/05/2013	Redcar and South Gare Fishermen	Redcar & Tees Bay Fishermen's Association	• Concern raised in respect to an ability to fully protect the export cable; and • Appreciate the level of information/consultation to date and would prefer to maintain the current consultation process.	Comments noted	N/A
23/05/2013 to 28/05/2013	Troels Pade	Ministry of Food, Agriculture and Fisheries Denmark (AGRIFish Agency)	• Series of emails exchanged regarding GIS Data request for Danish VMS, Landings and Effort data.	VMS 12-15m vessels data for 2012 received on 24th May 2013. VMS for Over-15m vessels 2007-2012 received on 24th May 2013 Landings Data received on 28th May 2013. This data will be implemented into Preliminary Environmental Information (PEI3)	N/A
24/05/2013	Redcar and South Gare Fishermen	Redcar & Tees Bay Fishermen's Association	• Appreciate the early opportunity to discuss the projects and the information provided by Forewind.	Comments noted	N/A
12/06/2013	NSRAC Meeting		• NFFO - expressed concern that data had been collected from the Danish seine net fishermen, but not from the UK seine net fishermen (Kevin Caffrey): • NFFO/VisNed - advised that it would be	Curved arrays no longer considered	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			difficult for beam trawlers to trawl in curved arrays, and therefore straight arrays should be considered; and • NFFO/VisNed - advised a SOCG would be joint between the two groups.		
20/06/2013	Kevin Caffrey	Grimsby based fishing vessel owner	Consultation on Dogger Bank fishing grounds. Comments expressed in respect to: • Loss of access to Dogger Bank fishing grounds will result in a loss of fishing opportunities; • Only fishes on the Dogger Bank and cannot fish elsewhere as the method of fishing; (Danish/anchor seine) is not conducive to fishing amongst turbines with small distance between; • For the loss of his and the crews livelihoods, discussions will have to be held in respect to how this will be mitigated; • Guard boat work will very likely be a means to offset the significant loss of fishing opportunities, in the short term at least – has 3 vessels available; and • Fishermen with a track record of working the Dogger Bank should be given the opportunity to provide guard boat services in the first instance.	Comments noted	N/A
04/07/2013	Deutscher Fischerei Verband	Deutscher Fischerei Verband	The DFV appreciated consultation at such an early stage in the development and welcomed future updates; • The German fishing effort used in the assessment is a good reflection of actual German effort and as such no more data is required; • The German fishing industry does not want to lose fishing grounds to offshore	Comments noted	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			wind developments; and • German flag sandeel trawlers are most likely Danish owned and operated.		
Section 42 consultation on the draft ES, statutory11/12/2013	Deutscher Fischerei Verband	Deutscher Fischerei Verband	PMSL email to Deutscher Fischerei Verband. Enquiring whether there were any PEI3 comments or a meeting required. No comments received.	None	N/A
Section 42 consultation on the draft ES, statutory 20/12/2013	NSRAC	NSRAC	It is not clear from the data representation of fishing activity derived from VMS what density of VMS means.		**Chapter 15 Commercial Fisheries** section 3.2.9.
Section 42 consultation on the draft ES, statutory 20/12/2013	NSRAC	NSRAC	Measures to minimise or mitigate for the potential loss of access to the project areas are not sufficiently well defined. An appropriate scheme of mitigation for seine netting should be defined. NFFO want to work towards achieving coexistence.	Forwind will consult with relative fisheries representatives to determine a co-existence plan.	**Chapter 15 Commercial Fisheries** section 9.7.
Section 42 consultation on the draft ES, statutory 20/12/2013	NSRAC	NSRAC	The ability of fisheries to continue within the sites during construction, operation and decommissioning should be assessed.		**Chapter 15 Commercial Fisheries** **Table 3.3** and **Table 3.4** explain the criteria used for assessment of impacts.
Section 42 consultation on the draft ES, statutory 20/12/2013	NSRAC	NSRAC	We acknowledge that publically available data sources do not allow assessments to take into account the degree to which the individual fishing grounds of particular fishing businesses are affected. The ES should clearly acknowledge at relevant points in the document that individual fishing businesses may be affected to greater	Requests for additional, higher resolution data have been sent to Dutch, Danish & UK fisheries	**Chapter 15 Commercial Fisheries** paragraph 3.3.10.

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			levels than are possible to be assessed due to data limitations	representatives.	
Section 42 consultation on the draft ES, statutory 20/12/2013	2013Comité Régional des Pêches Maritimes at des Elevages Marins Nord-Pas de Calais Picarde (CRPMEM)	Nord-Pas de Calis/Picardie Regional Fisheries Committee	Although the activity of the French fishing industry is higher in the Eastern part of the Channel, fishing grounds within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor is very important to French fishermen. Approval of the intention to bury the cable and reference the need for effective consultation during the construction phase.	Concerns noted, Forewind will continue ongoing liaison with CRPMEM.	N/A
Section 42 consultation on the draft ES, statutory 20/12/2013	Swedish Fishermen	Swedish Fishermen	Email stating issues with Dogger Bank Teesside A & B were the same as discussed in the meeting on 6th February 2013 (see above).	Comments noted	N/A
Emails from Forewind requesting PEI3 response or comments	Deutscher- fischerei-verband	German boats and coastal Fishing	No response received, however are included in NSRAC	See NSRAC actions	N/A
Emails from, Forewind requesting PEI3 response or comments	Belgian Fishermens Association	Rederscentrale	No response recieved	N/A	N/A
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	Hartlepool Fishermans Society (HFS)	Section 4 of **Chapter 15 Commercial Fisheries** contains no reference to the inshore environment, nor that of the Dogger Bank Teesside A & B Export Cable Corridor, focusing purely on the main turbine construction area.	Comment noted	**Chapter 15 Commercial Fisheries** section 4.1
Section 42 consultation on the draft ES, statutory	EPIC Regeneration on behalf of HFS	HFS	Fig 4.5 of **Chapter 15 Commercial Fisheries** (surveillance sightings) is reliant on overflights, which do not take place every day. Individual	HFS trawl plots were not available at the time of	**Chapter 15 Commercial Fisheries**

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
20/12/2013			and group trawl plots for HFS members show a much greater trawl effort along the inshore element of the Dogger Bank Teesside A & B Export Cable Corridor than the overflight data suggests	writing.	paragraph 4.4.1 and paragraph 8.1 of **Appendix 15A Commercial Fisheries Technical Report**.
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Para 4.4.1 of **Chapter 15 Commercial Fisheries** - Fishing values and activity may well be low in the actual array zone, but this is not the case for the inshore element of the Dogger Bank Teesside A & B Export Cable Corridor. There is also no reference to otter trawling inshore around the Dogger Bank Teesside A & B Export Cable Corridor landfall area.	Comment noted	**Chapter 15 Commercial Fisheries** paragraph 4.4.1.
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	HFS members pursue a truly mixed fishery.	Comment noted	**Chapter 15 Commercial Fisheries** paragraph 4.5.3, 4.5.15 and paragraph 8.1.2 of **Appendix 15A Commercial Fisheries Technical Report**.
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Inshore potters and crabbers in this area do not, by and large, use small mesh pots and cages and therefore land very few Nephrops – their catch is predominantly lobsters and crabs, with some fin fish as by-catch.	Comment noted	**Chapter 15 Commercial Fisheries** paragraph 4.5.9.
Section 42 consultation on the	EPIC Regeneration	HFS	The effort for the inshore area is greater because skippers are required to spend more	Comment noted	**Chapter 15 Commercial**

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
draft ES, statutory 20/12/2013	on behalf of HFS		days at sea to land sufficient catch to make a living.		**Fisheries** paragraph 4.5.10.
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Nephrops fishing activity may be moderate on a national scale but accounts for 60% of the value of landings made by HFS members	Comment noted	**Chapter 15 Commercial Fisheries** paragraph 3.3.10
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	If the inshore element has to be protected using either rock armour or concrete mattresses due to the presence of igneous rock substrates and outcrops that prevent trenching then the loss of fishing grounds to under 10m trawlers will be for at least the operational lifespan of the wind farm plus the decommissioning period.	This aspect will be discussed further with relevent fisheries stakeholders	**Chapter 15 Commercial Fisheries** paragraph 8.2.14.
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	The worst case scenario for cable protection where burial is not feasible is the use of concrete mattressing, causing a risk of snagging gear. Snagging risks are much greater for small fishing vessels as they do not have the horsepower or winch equipment to pull free of snags in the way that larger fishing boats have.	Comment noted	**Chapter 15 Commercial Fisheries Table 5.1**
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Inshore fishermen are restricted by the safe distances that boats can travel from their home port, and weather and tidal constraints.	Comment noted	**Chapter 15 Commercial Fisheries** paragraph 6.1.4
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Whilst trawling activity along the Dogger Bank Teesside A & B Export Cable Corridor is considered to be at a low level in the wider context of the UK fishing industry, it is at a high level at the micro, local inshore fisheries, level.	Comment noted	**Chapter 15 Commercial Fisheries** paragraph 3.3.10.
Section 42 consultation on the	EPIC Regeneration	HFS	The sensitivity of the Nephrops fishery should be	Comment noted	**Chapter 15 Commercial**

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
draft ES, statutory 20/12/2013	on behalf of HFS		high- the same as the potting fishery.		**Fisheries** paragraph 6.2.27, 6.2.30, 6.2.35 and Figure 6.17A.
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Fig 6.17 of **Chapter 15 Commercial Fisheries** for Nephrops mobile gears value is inaccurate and is only for over-15m vessels.	Comment noted	**Chapter 15 Commercial Fisheries** paragraph 6.2.27, 6.2.30 and Figure 6.17A .
Section 42 consultation on the draft ES, statutory Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	The worst case scenario of a minimum of 687 days construction disruption for Dogger Bank Teesside A and an additional 595 days for Dogger Bank Teesside B would have a significant impact on our clients should Hartlepool be the chosen construction port.	Concerns noted.	N/A
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Hartlepool under 10m trawlers do not have a high level of mobility due to their size, engine and fish storage capacities, and weather and tidal constraints.	Comment noted	**Chapter 15 Commercial Fisheries** paragraph 7.3.8
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Anchorages of large merchant shipping vessels create anchor mounds that are a fishing risk for small inshore trawlers.	Concerns noted.	N/A
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Concerns regarding the impact of HVDC cables on migratory and commercial fishing species, particularly Nephrops.	Concerns noted	**Chapter 13 Fish and Shellfish Ecology** paragraph 7.10
Section 42 consultation on the draft ES, statutory	EPIC Regeneration on behalf of HFS	HFS	Rock armouring and concrete mattresses present significant marine hazards to smaller fishing vessels, creating de facto no-trawl areas.	This aspect will be discussed further with relevant	**Chapter 15 Commercial Fisheries**

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20/12/2013			Cable clips, pipes and half pipes will also create obstacles necessitating the lifting of gear, but are not likely to eradicate fishing grounds in the same way.	fisheries stakeholders	paragraph 8.2.14.
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Measures that are considered "over-fishable" by over 15m vessels are not necessarily over-fishable by smaller inshore vessels, and may therefore impede normal fishing activities to a very significant extent.	Concerns noted and this aspect will be discussed further with relevant fisheries stakeholders.	N/A
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	COLREGs should be enforced during the construction phase.	Comment noted	**Chapter 15 Commercial Fisheries** paragraph 8.4.4
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	With regards to mitigation strategies, small inshore vessels do not have the resilience or capability of larger vessels. Therefore there is no possibility of residual impact being mitigated by them undertaking guard work.	Concerns noted for future discussions.	**Chapter 15 Commercial Fisheries** paragraph 9.7.3 refers to potential mitigation for seine net vessels as they have a moderate adverse impact and may have the capability of undertaking guard boat work.
Section 42 consultation on the draft ES, statutory 20/12/2013	EPIC Regeneration on behalf of HFS	HFS	Strongly contest the notion that existing projects, activities and plans are considered to be part of the existing baseline and are therefore not included in the cumulative assessment.		**Chapter 15 Commercial Fisheries** paragraph 11.1.10

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
email correspondence between Forewind and EPIC Regeneration 23/12/2013 to 10/01/2014	EPIC Regeneration on behalf of HFS	EPIC Regeneration on behalf of HFS	Requesting charts missing from the PEI3 response email. Asking for details on the plotter data charts sent		N/A
Section 42 consultation on the draft ES, statutory 20/12/2013	Dale Rodmell	NFFO	It is not clear from the data representation of fishing activity derived from VMS what density of VMS means.		**Chapter 15 Commercial Fisheries** section 3.2.9.
Section 42 consultation on the draft ES, statutory 20/12/2013	Dale Rodmell	NFFO	Measures to minimise or mitigate for the potential loss of access to the project areas are not sufficiently well defined. An appropriate scheme of mitigation for seine netting should be defined. NFFO want to work towards achieving coexistence.	Forewind will consult with relative fisheries representatives to determine a co-existence plan.	**Chapter 15 Commercial Fisheries** section 9.7
Section 42 consultation on the draft ES, statutory 20/12/2013	Dale Rodmell	NFFO	The ability of fisheries to continue within the sites during construction, operation and decommissioning should be assessed.		**Chapter 15 Commercial Fisheries** Table 3.3 and Table 3.4 explain the criteria used for assessment of impacts.
Section 42 consultation on the draft ES, statutory 20/12/2013	Dale Rodmell	NFFO	We acknowledge that publically available data sources do not allow assessments to take into account the degree to which the individual fishing grounds of particular fishing businesses are affected. The ES should clearly acknowledge at relevant points in the document that individual fishing businesses may be affected to greater levels than are possible to be assessed due to	Requests for additional, higher resolution data have been sent to Dutch, Danish & UK fisheries representatives.	**Chapter 15 Commercial Fisheries** paragraph 3.3.10

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			data limitations		
Section 42 consultation on the draft ES, statutory 20/12/2013	MMO	MMO	**Chapter 15 Commercial Fisheries**, Figure 6.17, UK commercial fisheries distribution, Nephrops mobile gear (2007-2011). It is assumed that this figure shows the activity of commercial fisheries based on Vessel Monitoring System (VMS) data, but this is not clear and should be confirmed. If it is based on VMS data, it would be useful to also include a map showing the landings by International Council for the Exploration of the Sea (ICES) rectangle in order to better describe the <10m fleet trawling for Nephrops.		**Chapter 15 Commercial Fisheries** paragraph 6.2.30. An additional figure has been included to differentiate between over-15m vessels and under-15m vessels fishing activity.
Section 42 consultation on the draft ES, statutory 20/12/2013	MMO	MMO	Pots are also used to catch a small amount of whelks in the area.		**Chapter 15 Commercial Fisheries**, **Table 4.1**.
Section 42 consultation on the draft ES, statutory 20/12/2013	MMO	MMO	Nephrops is caught primarily using otter trawls and is subject to TAC.		**Chapter 15 Commercial Fisheries**, paragraph 4.2.7 and 4.5.3
Section 42 consultation on the draft ES, statutory 20/12/2013	MMO	MMO	Hartlepool fishremen concerned regarding HVDC and heat and magnetic fields impacts on Nephrops.		Addressed in **Chapter 13 Fish and Shellfish Ecology** paragraph 7.10
06/01/2014	Neils Hintzen	IMARES	Meeting at IMARES requesting higher resolution dataset to determine impacts on individual vessels. 'Stress level analysis' data for Dutch vessels could be produced for Dogger Bank	Ongoing discussions in place with IMARES with respect to	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
	Pim Visser	VisNed	Creyke Beck A & B and Dogger Bank Teesside A & B should this be considered of value.	further supplies of data	
05/11/2013	Pim Visser Henrik Lund Dale Rodmell	VisNed Danish Fishermens Association NFFO	PEI3 meeting with Danish, Dutch and UK fisheries representatives. Concerns were raised that although on a national scale an impact may be low, to certain individuals/vessels it may be higher.	Individual vessel VMS data requested to determine higher impacts on individuals.	**Chapter 15 Commercial Fisheries** paragraph 3.3.10
05/11/2013	Alan Daniels, K Clarke, G Burrows, C Barnes, M Preston, A Turnbull, C Fretter, C Easton, Will Scott,	Redcar and Tees Bay Fishermen's Association Independent Fishermen	PEI3 meeting with Redcar and Tees Bay Fishermen's Association. Fishermen expressed concern over the number and size of the export cables and duration of installation. Concern was expressed in respect to burial depth and electro-magnetic effects.	Forewind to keep all fishermen informed irrespective of whether they were members of a fishermen's association or representing themselves. PMSL to send out Distribution list to Redcar & Tees Bay Fishermen's Association (actioned 15th November 2013). All other concerns noted	Addressed in **Chapter 13 Fish & Shellfish Ecology** paragraph 7.10
18/11/2013	Henrik Lund & Jesper Juul Larsen	Danish Fishermen's Association	Statement of Common Ground (SoCG) meeting for Dogger Bank Creyke Beck. Zonal aspects of SoCG applied to Dogger Bank	Comments noted.	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
			Teesside A & B where applicable		
	Phil Walsh EPIC Regeneration Emma Dixon-Lack	HFS EPIC Regeneration MMO	PEI3 meeting Hartlepool fishermen. All correspondance to be sent via EPIC Regeneration. Fishermen consider that it will not be feasible to bury the cables inside 12 miles and this will therefore require rock dumping or similar cable protection. Concern was also expressed with regard to cumulative impacts. There will be increased displacement of commercial shipping from the anchorage onto key *Nephrops* grounds and this will significantly impact local fishermen. Concern over the ability to trawl over areas of cable protection, such areas would be lost to the local fleet. Given the concerns of the fishermen, Forewind should investigate moving the Teesside C & D export cable further south to mitigate the impacts to traditional *Nephrops* grounds. EPIC Regeneration will provide fishing data for the whole Hartlepool fleet to Forewind.	Concerns noted. in discussion with EPIC Regeneration to obtain further fishing data if available.	N/A
13/11/2013	Phil Walsh Ronnie Buglass, Martin Walsh, Shaun Waller, Paul Widdowfield, Gary	MMO HFS Hartlepool	Fishermen considered that the impact significance was not medium as defined in Forewind's assessment, in their view the effect would be major adverse. Hartlepool fleet is not nomadic, but very much restricted to the local	In discussions with EPIC Regeneration for additional fishing data for Hartleppol fleet	**Chapter 15 Commercial Fisheries** parargraph 6.2.30.

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
	Owen, Keith Fletcher, Stan Rennie & C Bartolo Emma Dixon-Lack	Fishermen EPIC Regeneration	fishing grounds. The assessment is extensive, but too much for fishermen to take in and to respond in an appropriate manner. The Dogger Bank Teesside C & D export cable further south to mitigate the impacts to traditional Nephrops grounds. Epic Regeneration will provide fishing data for the whole Hartlepool fleet to Forewind.	All other concerns noted.	
03/12/2013	Harald Østensjø	Norwegian Fishermen's Association Fiskebåt	SoCG meeting for Dogger Bank Creyke Beck A & B. Zonal aspects of SoCG applied to Dogger Bank Teesside A & B where applicable Few concerns with the Dogger Bank Teesside A & B developments as the majority of Nowegian sandeel trawling takes place on the western boundary of the Dogger Bank Zone. FA and Fiskebåt are impressed with the project and the amount of work being undertaken to inform the impact assessments.	Comments noted.	N/A
03/12/2013	Harald Østensjø	Norwegian Fishermen's Association Fiskebåt	PEI3 meeting Norwegian fishermens representative. Concerns were expressed in respect to burial depths and cable protection. The Norwegians are reliant on information from the Danish fishermen as this is a significant fishery for them. The representatives considered that Norwegians may not wish to fish inside the turbine array, even if there were no restrictions.	Concerns noted.	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
December 2013	Patrick Wintz	MMO	Series of emails querying MMO 2011 Effort data.	2011 & 2012 Effort and Landings data reissued in January 2014 with effort data corrected.	N/A
June 2013 to December 2013	Sophie Vandendriessche Bart Vanelslander	Institute for Agricultural and Fisheries Research (Belgium)	Series of emails exchanged regarding GIS Data requested for Belgian VMS, Landings and Effort data.	Awaiting data. Using script/data provided by Dutch.	N/A
June 2013 to October 2013	Patrick Wintz	MMO	Series of emails requesting MMO landings and effort data for 2011 & 2012.	Received October 2013 and integrated into PEI3	N/A
18/11/2103 to 28/11/2013	Troels Pade	Ministry of Food, Agriculture and Fisheries Denmark	Series of emails requesting individual vessel VMS for Dogger Bank Zone	Received data 28th November 2013.	N/A
16/12/13	Pim Visser Dale Rodmell	VisNed NFFO	Dogger Bank Creyke Beck SoCG meeting Key concerns discussed were: • overall cumulative impact including MCZs and aggregate dredging and other offshore wind farm developments • turbine spacing, alignment and feasibility of resuming fishing within the operational wind farm sites • the need for higher resolution VMS to be provided to Forewind • whilst the overall impact on the Dutch beam trawl fleet may be minor, it may be greater for individual vessels.	Comments noted where applicable on a zonal level, cumulative level and relevant to Dogger Bank Teesside A & B	N/A

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
04/12/2103	Pim Visser	VisNed	Dogger Bank Creyke Beck SoCG meeting Key concerns discussed were: • overall cumulative impact including MCZs and aggregate dredging and other offshore wind farm developments • turbine spacing, alignment and feasibility of resuming fishing within the operational wind farm sites • the need for higher resolution VMS to be provided to Forewind • Whilst the overall impact on the Dutch beam trawl fleet may be minor, it may be greater for individual vessels.	Comments noted where applicable on a zonal level, cumulative level and relevant to Dogger Bank Teesside A & B	N/A
18/12/2013	James Wood	North Eastern Inshore Fisheries and Conservation Authority (NEIFCA)	Inshore vessels (those less than 15m) are often overlooked in commercial fisheries impact assessments, partly because these vessels are not required to use vessel monitoring systems and therefore fishing activity is difficult to ascertain. NEIFCA would encourage the applicant to appoint a fisheries liaison officer for the duration of the project to establish a dialogue with local fishermen, obtain a more accurate picture of the inshore fishing landscape and ensure that any industry related concerns are addressed in a timely manner.	Figure 8.14 and 8.16 of **Appendix 15A Commercial Fisheries Technical Report** show landings values and effort (days fished) by vessel category and is utilised to detail the extent of fishing grounds for the under 15m fleet. Also section 8.4 of **Appendix 15A Commercial Fisheries Technical Report** details fishing grounds and vessel specifications as	See Sections 4.4 and 4.5 of this chapter.

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Date	Consultee	Organisation	Summary of consultation	Action taken	ES Reference
				depicted by local fishermen through consultation. Forewind have maintained a local fisheries liaison officer to ensure well maintained dialogue with local fishermen.	
18/12/2013	James Wood	NEIFCA	The export cable route is a busy inshore fishing area for crustacean that has already been subject to displacement due to the EDF Teesside wind farm. The main potting season runs between May and October. In order to minimise gear displacement and disruption to the potting industry, it would be prudent to conduct the construction stage of the inshore cable route outside of the main potting season.	Consultation is ongoing with local potting fishermen to minimise disruption.	N/A
18/12/2013	James Wood	NEIFCA	Trawling activity occurs within the inshore cable corridor and we suggest efforts should be made to limit above ground cable armouring that may pose an obstruction to mobile gear activities. Where armouring is necessary, materials that encourage sediment deposition, such as concrete mattresses integrated with frond mats, should be used to minimise risk of damage to gear.	Cables will be buried where feasible and where burial is not feasible, will be protected and will endeavour to be designed to be over trawlable.	**Chapter 5 Project Description** section 3.10.

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3. Methodology

3.1. Study area

3.1.1. Data and evidence has been presented for application to assessments in the national/trans-boundary, regional and local contexts. In addition to the Regional fishery area which is the area covered by the Dogger Bank Zone, three project specific study areas have also been defined (**Figure 3.1**). For the purposes of this assessment the Dogger Bank Teesside A & B Export Cable Corridor has been divided into the Offshore Export Cable Corridor and the Inshore Export Cable corridor. This is due to pronounced differences in fishing patterns between inshore and offshore areas as well as differences in the fisheries statistics relating to larger offshore vessels and smaller inshore vessels. The specific study areas include:

- The Regional fishery area is the area of the North Sea in which the Dogger Bank Zone lies;
- Wind Farm, Dogger Bank Teesside A & B – ICES rectangles 38F2 and 39F2;
- Offshore Dogger Bank Teesside A & B Export Cable Corridor– ICES rectangles 38F0 and 38F1; and
- Inshore Dogger Bank Teesside A & B Export Cable Corridor – ICES rectangles 38E8 and 38E9.

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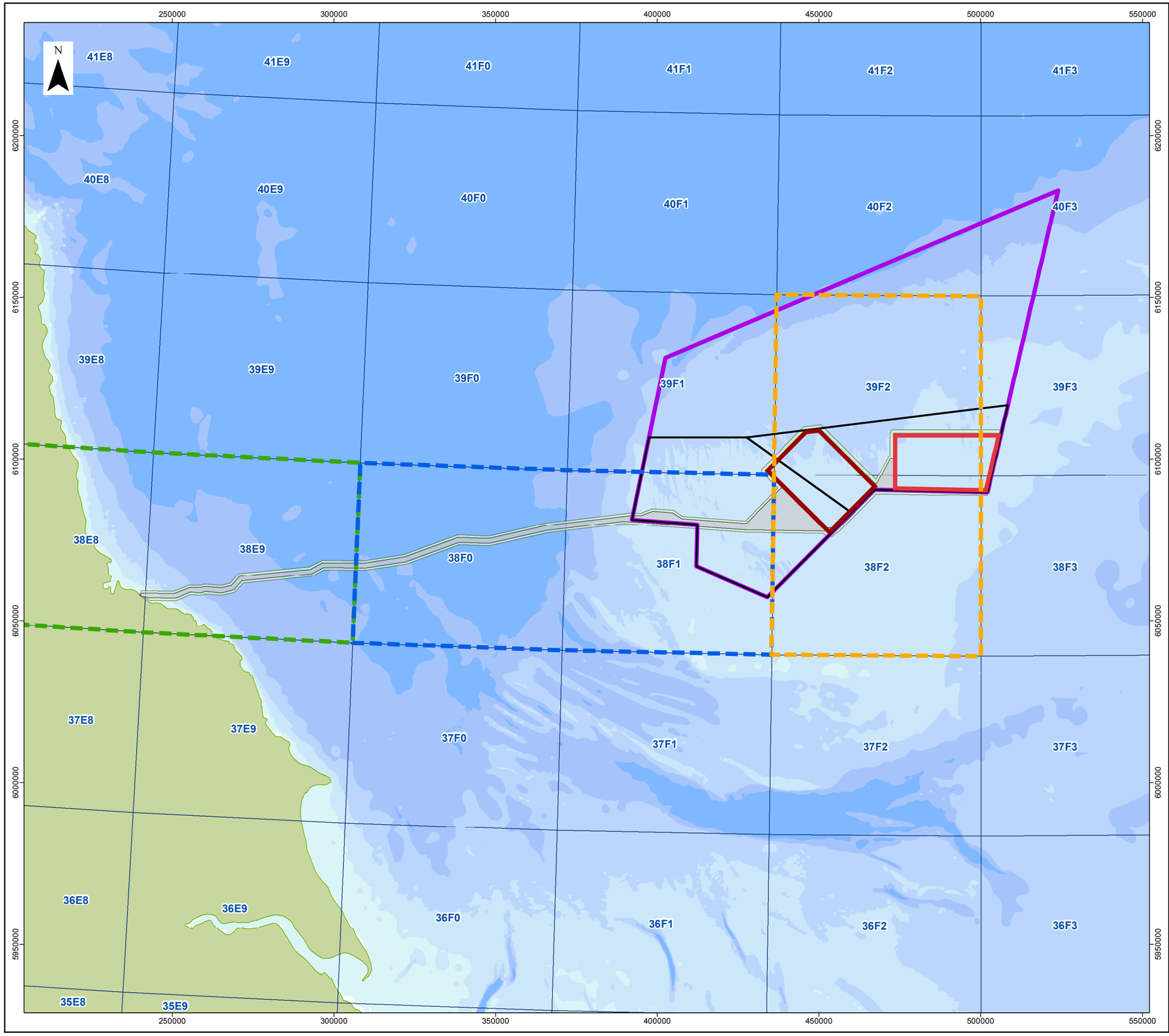

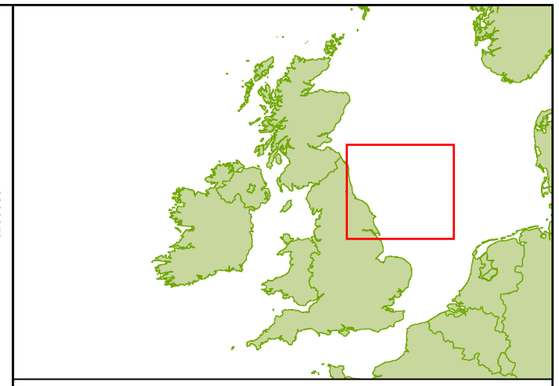

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles
- Wind farm study area
- Inshore cable route study area
- Offshore cable route study area

0 10 20 40
Kilometres

Data Source:
Study Areas © Brown & May Marine 2013
ICES Rectangles © ICES 2012
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 3.1 Dogger Bank Teesside A & B and export cable corridor study areas

VER	DATE	REMARKS	Drawn	Checked
1	22/08/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	07/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-500

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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3.2. Characterisation of the existing environment – methodology

Data limitations

3.2.1. There is no single data source or recognised model for establishing commercial fisheries baselines. An approach is therefore required that incorporates a number of different data and information sources, each subject to varying sensitivities and limitations, which are described below.

3.2.2. Since the ratification of the EU (European Union) Common Fisheries Policy (CFP) in 1983, vessels, along with their licences, from various Member States have been purchased by interests in other Member States for the purposes of gaining access to grounds and quota. These vessels are commonly known as 'flagged' boats, being registered to one Member State but owned and operated by interests from another. In terms of fishing activities in the general Dogger Bank area, this is particularly the case with UK beam trawlers, the majority of which are UK registered but owned and operated by Dutch interests and are, to all intents and purposes, Dutch fishing vessels. Due to their being registered in the UK, however, the fisheries statistics, surveillance and VMS data for these vessels are collected and collated by the UK's MMO. Assessment of these vessels' activity is, therefore, considered alongside their Dutch counterparts.

Sources of data and information

Fisheries Statistics

3.2.3. With the exception of France, fisheries statistics were provided by the relevant national fisheries agencies for a ten year period between 2001 and 2012. A full description of the datasets and years provided are in section 5.0 of **Appendix 15A.** The principal datasets used relate to fishing values and effort (days fished) to evaluate:

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

3.2.4. **Table 3.1** summarises the sources of data from a variety of national and international agencies used in this assessment. There are however differences in the availability of comprehensive datasets and the manner in which they have been collected and interpreted.

3.2.5. In order to ensure that all fishing activities over a sufficiently long period were identified ten years of data were initially analysed where available. Subsequent to this, and in order to more accurately reflect recent activity when averaging years, data sets covering a five year period have been used.

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Other data and information sources are described in **Table 3.1** and in the following sections.

Table 3.1 Summary of sources of information used in the assessment by nationality

Nationality	Fisheries data provider	Data provided	Notes
UK	MMO Inshore Fisheries Conservation Authorities (IFCAs)	VMS data Landings data Surveillance sightings	VMS provided by value Value provided in £
Netherlands	Landbouw Economisch Instituut (LEI) IMARES	VMS	VMS provided by value and effort combined with log book data
Denmark	Ministry of Food, Agriculture and Fisheries	VMS data Landings values (Provided by ICES sub-area IV)	VMS provided by value Value provided in Krone (Kr)
Belgium	ILVO	VMS data Landings values and effort data	VMS provided by value Value provided in €
France	IFREMER	VMS data (Dogger Bank Zone only)	VMS charts provided by value and effort
Germany	Federal Office for Agriculture and Food - Bundesanstalt fur Landwirtschaft und Ernahrung (BLE)	VMS data Landings values (central North Sea only)	VMS by value Value provided in €
Sweden	Agency for Marine and Water Management	VMS data Landings values (central North Sea only)	VMS provided by value Value provided in Krona (Kr)
Norway	Fisheries Monitoring Centre (FMC)	VMS data Landings values	VMS by value Value provided in €

3.2.6. With respect to statistics, ICES rectangles are used for the collation of fisheries data for EU Member States. However, the fishing activity within these spatial units is unlikely to be uniform over the whole area.

3.2.7. Vessels under 10m in length are not currently required to submit daily EC log sheets, although voluntary submissions can be made. For the under 10m fleet, two schemes have been introduced: the Shellfish Entitlement Scheme (2004) and the Registration of Buyers and Sellers of First Sale Fish and the

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Designation Auction Site Scheme (2005). Since these schemes are relatively recent, data collected prior to this period may be an underestimation of landings. Further details on the Registration scheme can be found in **Appendix 15A**.

Surveillance sightings data

3.2.8. Fisheries surveillance sightings of all vessel sizes and nationalities within the UK Exclusive Economic Zone (EEZ) are recorded by fishery protection aircraft and surface craft as a means of policing fisheries legislation. This type of data provides an indication of the relative distribution of fishing activity by method and nationality only.

Satellite tracking (VMS) data

3.2.9. VMS data is currently the most comprehensive fisheries data set available for identifying the fishing intensity of over-15m fishing vessel activity in the vicinity of the Dogger Bank Zone. Since January 2005, all EC vessels over-15m have been fitted with equipment which transmits the vessels' position at a minimum of every two hours to the relevant Member States' fisheries authority. As of 2012, European Union (EU) legislation will require all Member State vessels over-12m in length to have VMS installed. This data has however not yet been made available. VMS density is taken as the number of individual vessel position transmissions within a given area during a given unit of time.

3.2.10. The MMO monitors all UK vessels and all foreign vessels within the UK EEZ. Information regarding non-UK vessels cannot be disclosed by the MMO without prior permission from the vessels national regulating body.

3.2.11. The disclosure by the MMO of vessels' VMS identities is restricted under the Data Protection Act (1998). As a result of this the MMO has not been able to provide the same high definition VMS data for UK registered vessels as that provided, for example, by the Dutch authorities. The MMO has, therefore, only provided the aggregated number of position plots by general gear type (towed or static) in a grid of rectangles of approximately 5.3 nm^2 for the years 2008 to 2012 (see **Appendix 15A**). This data has been cross-referenced with landings values.

3.2.12. Any rectangles which record less than five transmissions are not included in the data. Vessels that are stationary in port have also not been included in the data set and it should be noted that the VMS data does not differentiate between vessels fishing and steaming. Data has therefore been filtered by speed; with vessels travelling at speeds of between 1 and 6 knots included (Lee *et al*. 2010).

Marine Scotland data

3.2.13. In addition to the MMO, Marine Scotland has provided VMS data (2007 to 2011) to BMM. The data was produced by applying VMS records to the Fisheries Information Network (FIN), which is the Scottish Government's sea fisheries database. FIN holds information on voyages (catches gear and mesh size) and landings (weight, price at sale). Logtime (the date and time of each VMS transmission) identifies each vessel's voyage and enables the location of a vessel during each trip to be linked to the gear used and the weight of the landings (Holmes *et al*. 2011). The data is separated into groups representing

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key sectors such as crab, lobster, squid, Nephrops (mobile and static), demersal (mobile and static), scallop and pelagic fisheries (mackerel and herring) (Kafas *et al*. 2012).

3.2.14. As with the MMO data set, the data has been filtered by speed with vessels travelling at speeds of between 1 and 6 knots presumed to be fishing (Lee *et al*. 2010). As previously stated, VMS records do not capture vessels under-15m and in some cases and therefore may not fully represent the true extent of fishing activities within a given area.

3.2.15. The most comprehensive VMS dataset made available for this assessment has been provided by the Dutch authorities for the years 2008 to 2012. This integrates VMS with landings values for the fleet by gear type. Differences in datasets for the other nationalities should be noted: Danish, German, Swedish and Norwegian VMS data has been provided by density only. Belgian VMS in the vicinity of the Dogger Bank Zone and Dogger Bank Teesside A & B Export Cable Corridor has been provided in chart format for beam and demersal trawling, which has not been integrated with values but gives an indication of the relative distribution of Belgian fishing activity. French VMS in the vicinity of the Dogger Bank Zone and Dogger Bank Teesside A & B Export Cable Corridor has been provided in chart format for all French vessels by number of vessels, effort and value.

3.3. Assessment of impacts – methodology

General approach

3.3.1. In simple terms, the assessment of impacts involves (a) the definition of magnitude of the effect; (b) the definition of the sensitivity of any receptor; and (c) the interaction between these two parameters to produce the overall impact (refer to definitions and matrix at the bottom of this section).

3.3.2. Whilst this approach is appropriate for the assessment of some impacts (namely loss of, or restricted access to, traditional fishing areas, interference to fishing activities and displacement effects), it is less so for the assessment of the impact of obstacles on the seabed, safety issues and increased steaming times. In these instances, the significance criteria are not applied and instead a risk is assessed to be within or outside of acceptable limits. A risk is considered to be outside of acceptable limits if it is in excess of those reasonably accepted during the course of normal fishing activities. Risks which are acceptable are considered not significant in terms of EIA Regulations, while risks which are outside of acceptable limits are considered significant. This approach is discussed in full in **Chapter 16 Shipping and Navigation** and, where appropriate, the chapter is cross-referenced when assessing the impacts. The use of the term acceptable in this instance is used specifically as a qualitative assessment of the impacts noted above in relation to fisheries. It is not a reflection of the acceptability of the project as a whole.

3.3.3. A limitation with the longer term assessment of impacts upon commercial fishing activities is the level of uncertainty as to how the existing environment may change over time. This could be influenced by a number of factors unrelated to the development, many of which are difficult to predict, such as:

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- Fluctuations in the conditions of target species stocks (for example the collapse of the North Sea herring fishery in the 1970s);
- Changes in legislation and management policies;
- Economic factors; and
- Technical developments.

3.3.4. The impacts assessed are as specified in the Cefas/MCEU (2004) Guidelines, namely:

- Complete loss or restricted access to traditional fishing grounds;
- Obstacles on the seabed post-construction;
- Interference with fishing activities;
- Safety issues for shipping, including fishing vessels;
- Increased steaming times to fishing grounds; and
- Adverse impacts upon commercially exploited fish species.

3.3.5. In addition to the aspects listed above, the following effect was identified during consultation with stakeholders as detailed in **Table 2.2**:

- Displacement of fishing activity into other areas.

3.3.6. Since displacement effects are a consequence of loss of fishing areas, these are considered in the loss of fishing area assessment.

3.3.7. Safety issues for shipping, including fishing vessels, are addressed in **Chapter 5 Project Description** and increased steaming times to fishing grounds are addressed in **Chapter 16**. Impacts on fish and shellfish, including commercially exploited species are included in **Chapter 13 Fish and Shellfish Ecology**.

3.3.8. The potential impacts have been assessed separately for Dogger Bank Teesside A and Dogger Bank Teesside B and for the Dogger Bank Teesside A & B Export Cable Corridor as well as for the two projects combined (Dogger Bank Teesside A & B). In instances where the differences between fishing patterns in Dogger Bank Teesside A and Dogger Bank Teesside B are not significantly different, the impacts associated with Dogger Bank Teesside B have not been reassessed and commentary has been provided to this effect. This is followed by the cumulative assessments with other projects.

Receptor sensitivity

3.3.9. The receptors considered for each impact identified in paragraph 3.3.4 are provided in **Table 3.2**.

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Table 3.2 Receptors for each impact assessed

Impact assessed	Receptor
Adverse impacts upon commercially exploited species	Individual species (as assessed in **Chapter 13 Fish and Shellfish Ecology**)
Temporary/Complete loss or restricted access to traditional fishing grounds	Individual fisheries (as identified in **Appendix 15A Commercial Fisheries Technical Report**)
Safety issues for fishing vessels	Impacts on static or mobile fisheries
Interference with fishing activities	Impacts on static or mobile fisheries
Increased steaming times to fishing grounds	All fisheries combined
Obstacles on the seabed post-construction	All fisheries combined
Displacement of fishing activity	Individual fisheries (as identified in **Appendix 15A Commercial Fisheries Technical Report**)

3.3.10. Although it is recognised in some instances that vessels within a given receptor group will spend a varying amount of time fishing different grounds, such as those in proximity to Dogger Bank Teesside A & B, it is not within the scope of this assessment to consider the extent of an impact on a vessel by vessel basis. It is therefore acknowledged that at national and fleet metier scales the impact of the development may be low, but for certain individual vessels the impact may be higher. This is primarily a consequence of national data protection restrictions which prevent the release of vessel specific VMS data and fisheries statistics. Negotiations are, however, ongoing with fishermen's representatives and national data agencies to obtain higher resolution data and statistics.

3.3.11. The characteristics used to define the sensitivity of each of the receptor groups identified in **Table 3.2** in terms of adaptability, tolerance, recoverability and value (dependence) are summarised in **Table 3.3**.

Table 3.3 Definition of terms relating to sensitivity of generic receptors

Sensitivity	Definition
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 fishing 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.

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Sensitivity	Definition
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 a moderate number of fishing grounds. • High recoverability due to ability to mitigate loss of fishing area by operating in range of alternative areas of the North Sea.

Magnitude of effect

3.3.12. The definition of the magnitude of effect takes account of the impacts associated with exclusion from traditional fishing grounds. It also recognises that the magnitude of effect will differ between receptor groups as a consequence of the proportional extent of fishing areas affected.

3.3.13. Due to the high seasonality of certain fisheries, it is not possible to standardise the definition of duration of effects. For example, whilst an effect may be of short duration, if it coincides with the entire period of a valuable seasonal fishery, the consequences will differ from when an effect occurs during a year round fishery.

3.3.14. The characteristics used to define the magnitude of effect are given in **Table 3.4** below. The generic approach to assessing impacts is not appropriate for the assessment of some impacts (i.e. obstacles on the seabed, safety issues and increased steaming times). Therefore, the levels of magnitude defined below are only appropriate when assessing impacts for which the generic approach is applicable (i.e. loss of fishing grounds, interference to fishing activities and displacement effects).

Table 3.4 Magnitude of effect

Characteristic	Magnitude	Definition
Extent/Severity	High	A high proportion of traditional fishing grounds occupied by the infrastructure or construction activities.
	Medium	A large proportion of traditional fishing grounds occupied by the infrastructure or construction activities.
	Low	A small proportion of traditional fishing grounds occupied by the infrastructure or construction activities.
	Negligible	A very small proportion of traditional fishing grounds occupied by the infrastructure or construction activities.

3.3.15. The magnitude of effect associated with Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor installation phases in respect of complete loss of, or restricted access to, traditional fishing grounds will differ between receptor groups.

3.3.16. The spatial context is essentially the proportion of a receptor group's fishing area, which is located where exclusion or restricted access could occur. The temporal context is the duration and frequency of exclusion or restricted access. Severity is defined as the relative importance (value) of the area(s) and period(s) of exclusion.

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3.3.17. Unfortunately, due to the differences and limitations in the fisheries data and information available it is not possible to undertake a reliable and consistent comparative quantitative assessment of magnitude across the various receptor groups. The assessment of magnitude is, therefore, qualitative and assessed using professional judgement and experience of the fishing industry.

3.3.18. For the purposes of assessment, taking a precautionary worst case, the maximum overall period during which construction could occur within the boundaries of one project e.g. Dogger Bank Teesside A is six years, while the minimum is three years. The worst case is assumed that, for the entire period of the construction phase, all fishing vessels will be excluded from Dogger Bank Teesside A. It is also assumed that fishermen will elect to keep out of the projects during the construction phase, regardless of whether or not the whole site is covered by exclusion zones.

Significance matrix

3.3.19. Due to the inherent differences in the various national fisheries datasets and the variability of information obtainable through consultation, the following assessments are to a large extent qualitative. Where appropriate (see explanation of general approach above), a two dimensional matrix approach has been used to derive the significance of impacts on the basis of receptor sensitivities and the magnitude of effect (**Table 3.5**).

3.3.20. For the purposes of this impact assessment, the term 'no discernible impact' has been used to describe the lowest perceived impacts as a result of the construction, operation and decommissioning of Dogger Bank Teesside A & B. This differs from other chapters within this ES. Therefore for this assessment, any impacts described as 'minor' or 'no discernible impact' are both considered to be not significant under the EIA regulations.

Table 3.5 Overall impact resulting from each combination of receptor sensitivity and the magnitude of the effect upon it

Receptor sensitivity	Magnitude of effect			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Minor
Low	Moderate	Minor	Minor	No discernible impact

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4. Existing Environment

4.1. Background

4.1.1. The following paragraphs provide a brief overview of the factors which have had an influence on the current commercial fisheries operations in the Dogger Bank area (defined as the area covered by ICES rectangles 38F2 and 39F2 – see Section 3.1).

4.1.2. Herring *Clupea harengus* was once the single most important fishery in the area with principal landing ports being Lerwick, Lowestoft and Great Yarmouth. The highest catch occurred in 1913 between September and December when 242,000 tonnes were landed into Great Yarmouth and Lowestoft. After three stock failures in the 1960's and 1970's the fishery was completely closed in 1977. High demand for human consumption and industrial requirements were seen as the cause for the decline. Although there was a limited reopening in 1983 the pelagic fleet began to target mackerel as the main source of income instead (Keltz and Bailey 2010).

4.1.3. The demand for herring as fishmeal encouraged the Danish fishery to begin targeting stocks as 'waste' fish on Skaggerak grounds in 1939 and industrial fishing for herring commenced on the Dogger Bank in 1948. The high catch rates incurred by both fisheries was thought to be a major cause of the herring decline in the 1970's (Hodgson 1957). After the closure of the herring fishery the Danish fishing operations turned to sandeel *Ammodytidae* spp as a source of fishmeal.

4.1.4. In the 1960's heavy beam trawls were used by Dutch and Belgian fleets to target sole *Solea solea* and small plaice *Pleuronectes platessa* in the southern North Sea. In contrast the English plaice fishery caught medium to large plaice in the general area of Dogger Bank. Later beam trawlers replaced the traditional otter trawls for this fishery but by 2004 the last of the Lowestoft based beam trawlers, their licences and quota, had been transferred to Dutch ownership (Robb 2010). Virtually all the UK registered North Sea beam trawlers targeting sole and plaice are Dutch owned and operated and known as the Anglo-Dutch fleet.

4.1.5. In addition to the historical influences the development and implementation of the CFP, especially with regard to the allocation of species quotas based on historical rights to fish for the main species, has had a significant effect on the current structure of fishing in the North Sea.

4.1.6. Commercial fishing at Hartlepool can be traced back as far as the early 14th Century, when the port was of importance in respect to herring fishing. However, over subsequent centuries, the relative importance of Hartlepool as a fishing port has fluctuated considerably, particularly with the rise of adjacent ports such as North Shields, Whitby and Scarborough. In the 1920's and 1930's, Hartlepool had a distant water fleet operating throughout the North Sea

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and further afield. Since the 1970's there has been a progressive decline in the size of the fishing fleet.

4.1.7. In 1996, 22 vessels over 10m were operating from Hartlepool and by 2001 this had declined to 12, further declining to 5 over 10m vessels registered to the port. In the 1990's and early 2000's there was a move from larger vessels to smaller under 10m fishing boats. In 2001 there were 45 under 10m vessels registered to Hartlepool varying in length between 5.6m – 9.9m. Since 2001, however, this number has declined to 26 vessels.

4.1.8. The Hartlepool inshore fleet, targets a mixed fishery of mainly *Nephrops*, whiting, cod, haddock and flatfish species such as plaice, rays, sole and various other species of round fish.

4.2. Current legislation

Common fisheries policy

4.2.1. Commercial fishing within European waters ultimately falls under the management policies of the CFP. The stated objective of the CFP is the long term maintenance of sustainable fish stocks.

4.2.2. The management of fisheries legislation and controls such as quotas is undertaken by the relevant Member States fisheries body. As of 2009, the CFP has been under review and changes to the Policy have come into legislation in 2013. The proposals are wide-ranging and cover all aspects of fisheries management and objectives, but the key proposals are;

- Transferable fishing concessions - make it obligatory for Member States to introduce individual transferable fishing rights for all vessels over-12m and towed gear vessels under-12m;
- Discards - introduction of a gradual discards ban in three steps: pelagic species in 2014, the most valuable species (cod *Gadus morhua*, hake *Merluccius merluccius* and sole) in 2015 and other species in 2016;
- Conservation of fish stocks - apply the precautionary approach to fisheries management and aim to set fishing levels so that they restore and maintain fish populations above levels which can produce maximum sustainable yield;
- Regionalisation of decision making - to decrease the dependency for fine-detailed decision making taken in Brussels, to allow for more flexibility in local and regional involvement in fisheries management; and
- Social sustainability - to ensure the viability of the fisheries sector and particularly coastal communities by promoting economic growth and jobs (EC 2012).

4.2.3. In addition to fisheries management at European and national levels, regional organisations such as the IFCAs in England have authority on a regional and local scale (out to 6nm).

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Vessel licences

4.2.4. EU and national fleet size and structure are controlled through vessel licences. Licences also limit the engine size and power under Vessel Capacity Units (VCU's)

Territorial fishing limits

4.2.5. The territorial fishing limits of EU Member States extend out to 22km (12nm), within which only the vessels of that Member State or vessels from other Member States with historic rights are entitled to fish. Vessels from all Member States are entitled to fish outside of 22km (12nm) limits providing they have quota to do so.

4.2.6. Historic fishing rights between the UK's 11km (6nm) and 22km (12nm) limits are shown in **Figure 4.1**. It can be seen that France has access to fish for herring between Spurn Head and Flamborough Head, and the Netherlands have access to fish between Flamborough Head and Whitby High. Since herring is a migratory species, the fishery is seasonal, occurring principally in October and November. Fishing is only permitted within the UK's 6nm limit by UK vessels.

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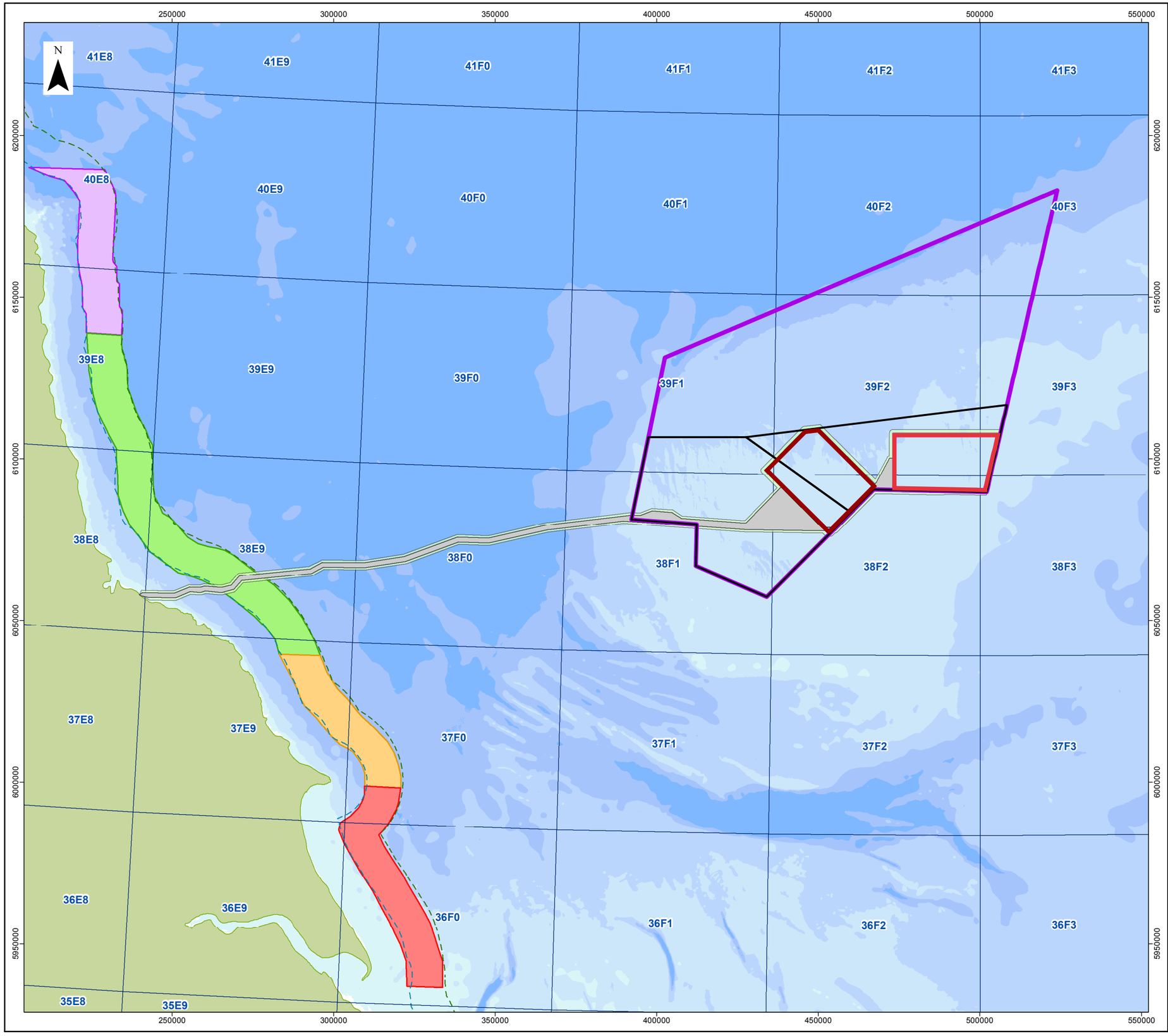

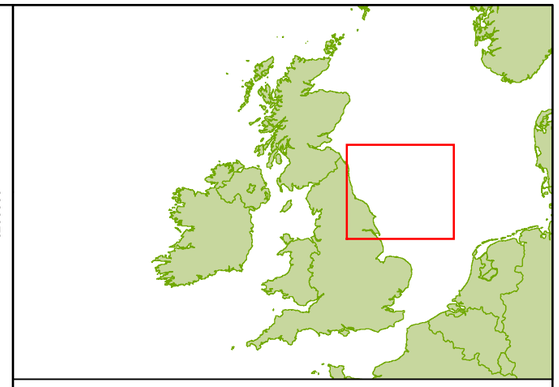

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles
- 6nm limit
- 12nm Territorial boundary

Historic fishing right

- France for herring
- Germany and Netherlands for herring
- Germany, France, Belgium and Netherlands for herring
- Netherlands for herring

0 10 20 40
Kilometres

Data Source:
Fishing Rights © EC CFP Rights, 2012
ICES Rectangles © ICES 2012
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.1 Historic fishing rights between UK's 6nm to 12nm limits

VER	DATE	REMARKS	Drawn	Checked
1	22/08/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	07/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-501

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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Pressure stock quotas

4.2.7. Total Allowable Catches (TACs) for pressured stock species are set annually by the EC on the basis of scientific advice and a degree of political negotiation. There has been a reduction in the TAC for herring (for ICES areas IIa,IV and VIIa) from 405,000 tonnes in 2012 to 14,400 tonnes in 2013. The TAC (ICES IIa,IIIa and IV) for plaice, mainly for human consumption and targeted in the general area of the Dogger Bank, has progressively increased since 2009 to 97,070 tonnes in 2013, the major proportion of which (60990 tonnes) is allocated to the Netherlands and UK. Of the 2013 sandeel TAC of 286,424 tonnes, 249,006 tonnes were allocated to Denmark. It is of note that between 2006 and 2013 annual TACs for *Nephrops* varied between 28,147 tonnes and 17,350 tonnes with the lowest TAC being implemented in 2013. Current TAC's are shown in **Appendix 15A** Figure 6.2. Quotas are assigned to vessels of over 15m and are defined by historical rights.

'Flagged' vessels

4.2.8. As well as being the principle factor in determining the size and structure of the fleets of individual Member States, the EU also limits access to fishing grounds and species in given areas (ICES area and sub-area). In order to gain access to grounds and quota which had not previously been available, fishing interests from several EU countries have bought up vessel licences of other Member States. These vessels are commonly known as 'flagged' boats.

4.2.9. In terms of fishing activities around the Dogger Bank this is the case with the UK North Sea beam trawl fleet which are, to all intents and purposes, Anglo-Dutch.

Shellfish entitlements

4.2.10. Since 2004, vessels landing more than 25 crabs or five lobsters *Homarus homarus* per day must hold a shellfish entitlement. Under these arrangements, shellfish entitlements allowing unrestricted landings of crab and lobster were issued to owners of licenced vessels that have the required track record of landings. It is a requirement for vessels of under 10m with shellfish entitlements to submit log sheets for crab and lobster landings to their local fishery office. It is a requirement for vessels of under 10m with shellfish entitlements to submit monthly log sheets for crab and lobster landings to their local fishery office. Data captured by the monthly shellfish activity returns were not included in the MMO landings data until 2006. However since 2009, the landings data has been sourced from the buyers and sellers records, not the monthly shellfish activity returns.

Scallop dredge restrictions

4.2.11. Limits the landings of scallops *Pectinidae* spp by size, number of dredges, area closures and distance of operation from the coast.

Marine protected areas

4.2.12. In the UK, a network of MPAs is being developed with the stated objective of conserving marine biodiversity, in particular species and habitats of European and national importance. MCZs are a type of MPA designed to protect habitats, species and geology of national importance.

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4.2.13. SACs are also a type of MPA, proposed to protect habitats and species listed under the Habitats Directive. In UK territorial and offshore waters, there are currently 107 SACs with marine components for marine habitats or species. The location of the Dogger Bank cSAC (Candidate Special Area of Conservation) and also the fishing industry's preference for the locations of fisheries management sectors within the Dogger Bank cSAC is shown in **Figure 4.2**. It is possible that demersal towed fishing gears may be excluded from the cSAC (including areas of Dogger Bank Teesside A & B) due to restrictions implemented under Natura 2000.

4.2.14. The UK is in the process of establishing MCZs. There are 18 recommended MCZ's in the North Sea, seven of which are in the vicinity of Dogger Bank Teesside A & B. Three of these in the North Sea have been put forward for designation in 2013, the Aln Estuary, Swallow Sand and Rock Unique.

4.2.15. The remaining recommended MCZs of relevance to Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are Runswick Bay, Compass Rose, Holderness Inshore, Markham's Triangle, Lincs Belt and Silver Pit. These proposed designations remain the subject of ongoing consultation (DEFRA, Marine Conservation Zones: Consultation on proposals for designation in 2013). For details of the location of proposed MCZs, recommended MCZs and SACs within UK waters (see **Appendix 15A** Figure 6.4**)**.

4.2.16. MPA's including MCZ's and SACs have the potential to restrict or prohibit certain types of fishing activities.

4.3. Summary of fishing methods

4.3.1. **Figure 4.3** shows the surveillance sightings of all fishing vessels (all nationalities), by fishing method, between 2001 and 2010. Surveillance sightings record all types of fishing vessel within the UKCS; therefore, they have been used to identify the fishing methods, by nationality, occurring in the vicinity of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor (All Study Areas). The principal fishing methods identified are:

- Trawling;
- Beam trawling;
- Potting/ whelking;
- Demersal trawling;
- Industrial trawling for sandeels;
- Gill netting;
- Scallop dredging;
- Bottom seining; and
- Pelagic trawling.

4.3.2. Almost 93% of all recorded sightings are vessels registered in the UK, Denmark and the Netherlands between 2003 and 2012. 77% of the sightings are UK

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registered vessels and a major proportion within Dogger Bank Teesside A & B have been identified as being within the 'Anglo-Dutch' fleet (registered in the UK but owned by Dutch operators). This is followed by Denmark (12%), The Netherlands (4%), Belgium (2%), Sweden (2%) and Norway (1%) (MMO 2013) (**Appendix 15A**, Table 7.1). The following sections provide an overview of fishing activities for different nationalities.

4.3.3. The surveillance data indicates that overall, the areas of the Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor have a history of being fished by vessels registered under the following nationalities:

- UK;
- Netherlands;
- Denmark;
- Belgium;
- France;
- Germany;
- Sweden; and
- Norway (MMO 2011).

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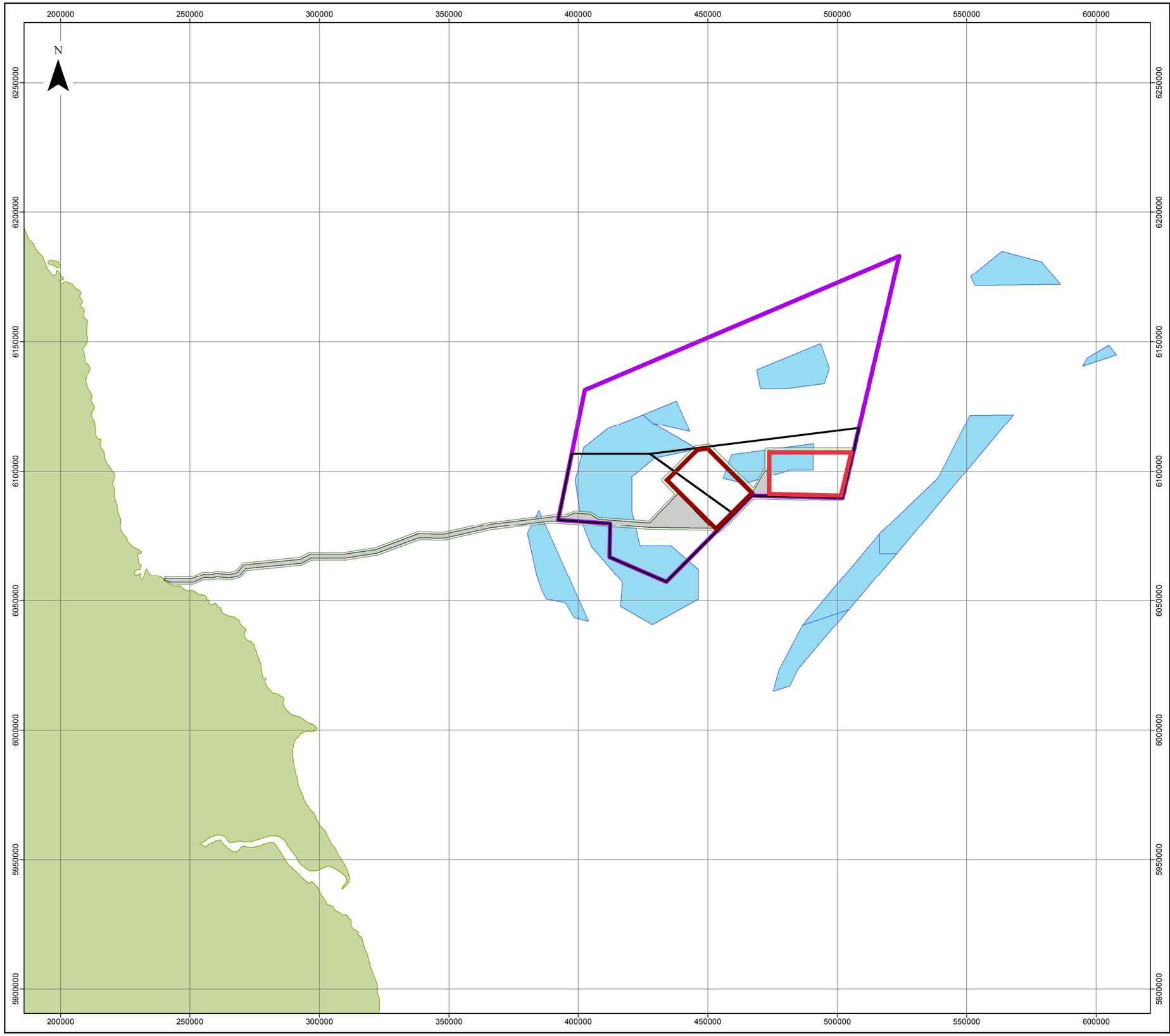

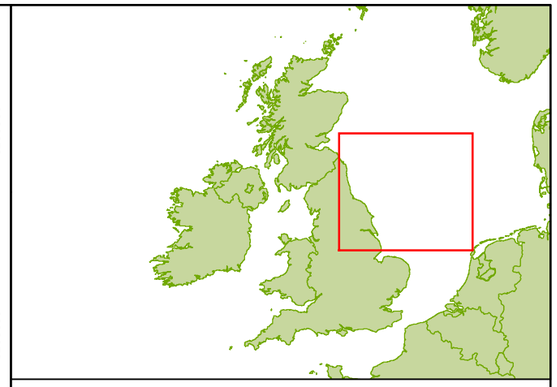

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- cSAC proposed no trawl zones

0 10 20 40
Kilometres

Data Source:
Management Sectors © NFFO 2012
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.2 Proposed fisheries management sectors within Dogger Bank cSAC

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-502

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,500,000	A3	WGS84	UTM31N

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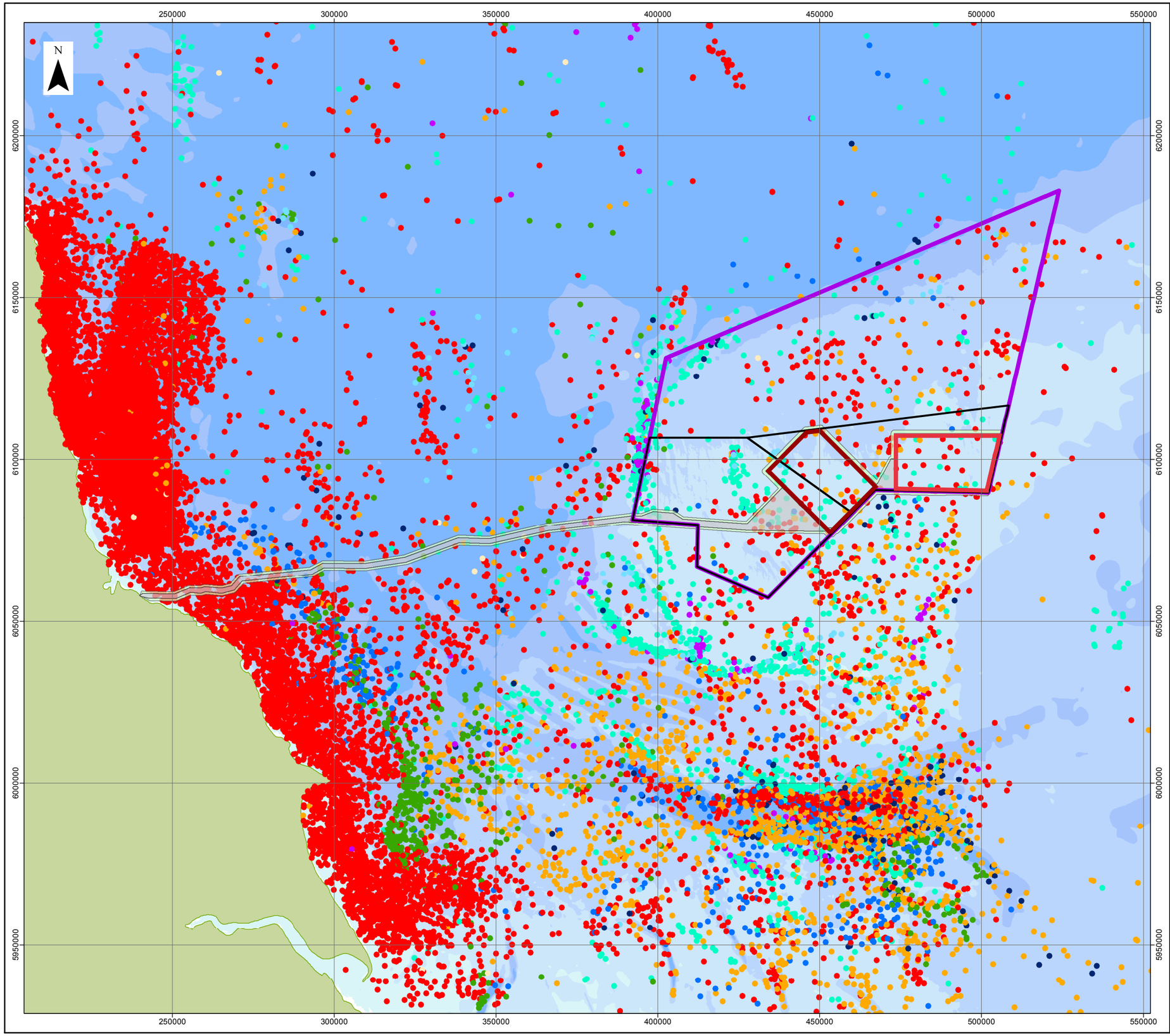

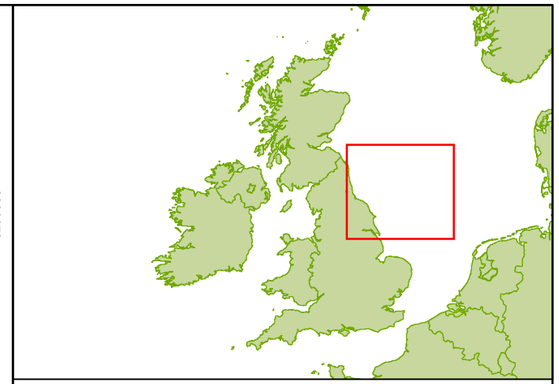

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area

Surveillance sightings by nationality

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

0 10 20 40
Kilometres

Data Source:
Sightings © MMO 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.3 Surveillance sightings by nationality in the vicinity of Dogger Bank Teesside A and B (all fishing methods, 2003 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-503

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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4.4. UK registered vessels

4.4.1. The extent of UK fishing activity (all methods) recorded by VMS (by value) is shown in **Figure 4.4**. VMS is only able to record vessels over 15m in length therefore to incorporate the activities of fishing vessels of all sizes surveillance sightings data is used (**Figure 4.5**). Surveillance sightings provide a good indication of the range of fleet segments operational in the vicinity of the Dogger Bank Zone. This shows that in comparison to other areas in the UK, fishing values and activity are low within the Dogger Bank Zone and within Dogger Bank Teesside A & B. The majority of UK vessels are located within inshore areas, with substantially reduced numbers further offshore. The highest number of sightings were recorded by vessels trawling (unspecified trawling) concentrated to the north of the Dogger Bank Teesside A & B Export Cable Corridor, with patchy distribution to the west of the Dogger Bank Zone and a cluster further south of Dogger Bank Teesside A & B.

4.4.2. During consultation with representatives of the Hartlepool Fishermen's Society Ltd (December 2013), it was stated that charts showing specific vessels trawl towing tracks would be provided. These however have not been included in this report due to confidentiality and the time they were received, however the information provided will be used in ongoing consultation. Lower levels of trawling are recorded within the immediate vicinity of the inshore section of the Dogger Bank Teesside A & B Export Cable Corridor. It should be noted that during the inshore trawl survey of the Dogger Bank Teesside A & B Export Cable Corridor, undertaken by PMSL, a number of stations had to be abandoned due to the high density of static fishing gears, whilst others had to be relocated due to the trawl snagging static gears. It is therefore assumed that trawling does not routinely occur within the inshore static gear fishing grounds. As shown by **Figure 4.5** the highest concentrations of potting activity occurs adjacent to Bridlington and to the south of the Dogger Bank Teesside A & B Export Cable Corridor and with a second important potting area well to the north of the Dogger Bank Teesside A & B Export Cable Corridor. Beam trawlers have been identified in offshore areas including Dogger Bank Teesside A, Dogger Bank Teesside B and areas to the south of the project boundaries. Seine netters are recorded in small numbers to the west of Dogger Bank Teesside B and scallop dredgers have been observed fishing inshore grounds to the south of the Dogger Bank Teesside A & B Export Cable Corridor.

4.5. UK fishing methods and catch data

4.5.1. The species commercial fishing vessels can land is restricted by EU quotas as well as gear type and operational range. The following section briefly describes the type of gear utilised and the species caught by the majority of UK registered vessels (for details see **Appendix 15A**).

Beam trawling

4.5.2. The overall distribution of landings values of the main species caught in Dogger Bank Teesside A & B indicates that beam trawling within the immediate area of the Wind Farm Study Area (ICES Rectangles 38F2 and 39F2) is moderate in

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comparison to adjacent areas, the Channel, Western Approaches and Celtic Sea (See **Appendix 15A** Figure 8.3). Plaice are shown to have the highest landings figures for this gear type, followed by lemon sole *Microstomus kitt*, turbot *Scophthalmus maximus* and sole.

Demersal otter trawling

4.5.3. This method is used within both the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area and within the Wind Farm Study Area. The principal species caught within the Dogger Bank Zone was plaice and most landings for plaice are predominantly by the Anglo-Dutch fleet. Demersal trawling is the principal method used to target *Nephrops* along the Dogger Bank Teesside A & B Export Cable Corridor (see **Appendix 15A** Figure 8.4). Landings within the inshore section of the Dogger Bank Teesside A & B Export Cable Corridor indicate a more mixed fishery than the Dogger Bank Zone comprising of *Nephrops*, cod, haddock and whiting.

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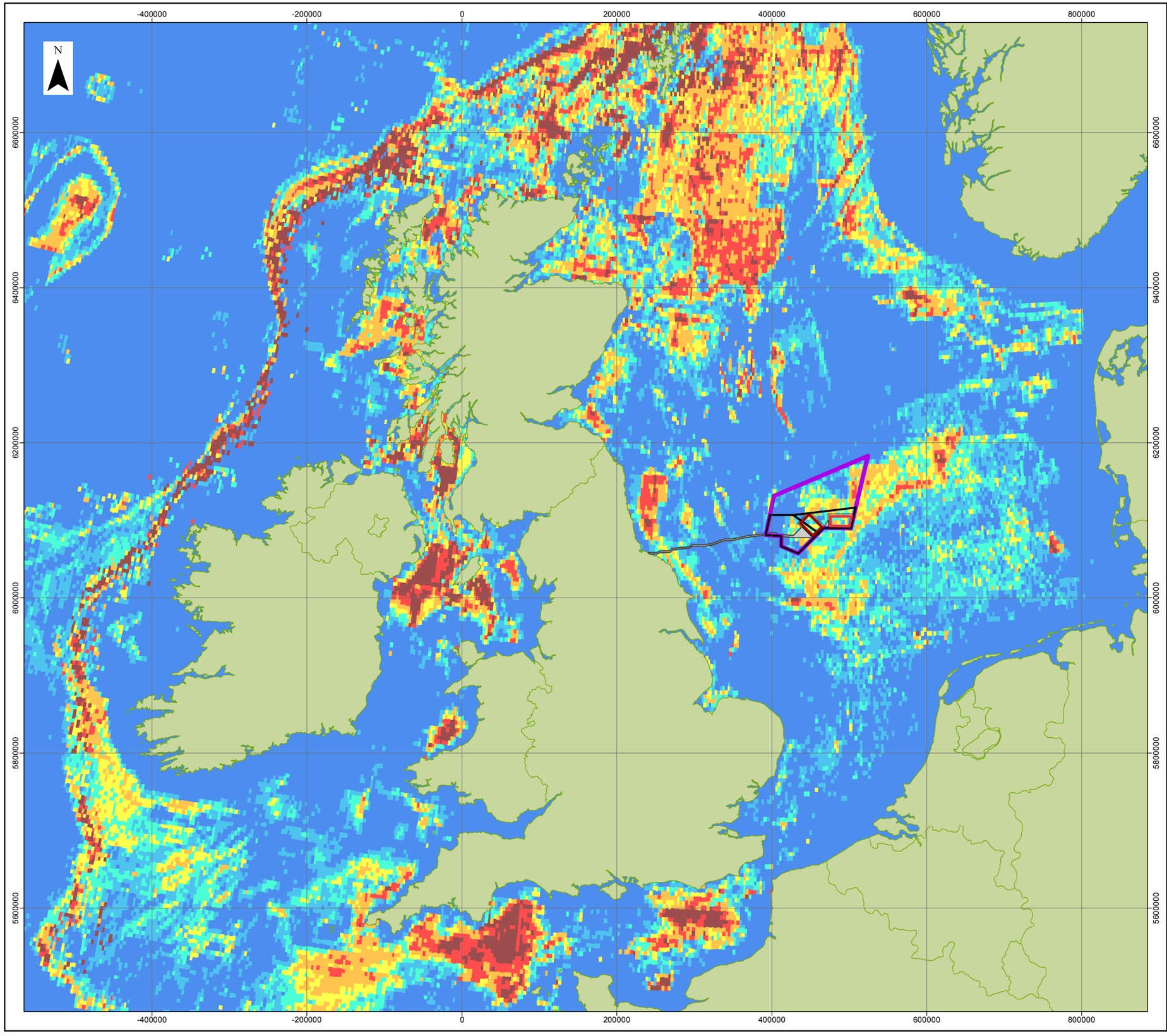

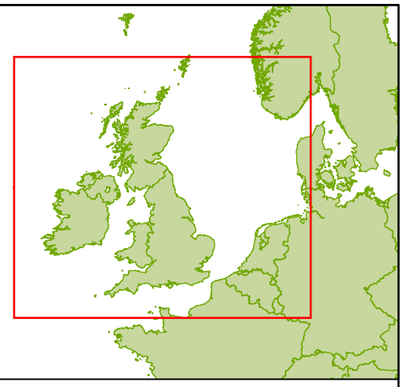

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export cable corridor
- Temporary works area

UK VMS by value

- Less than £1,000
- £1,000 - £3,000
- £3,000 - £6,000
- £6,000 - £10,000
- £10,000 - £20,000
- £20,000 - £35,000
- More than £35,000

0 25 50 100
Kilometres

Data Source:
VMS © MMO 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.4 UK national VMS by value (average 2008-2012)

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	07/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-504

SCALE	PLOT SIZE	DATUM	PROJECTION
1:5,000,000	A3	WGS84	UTM31N

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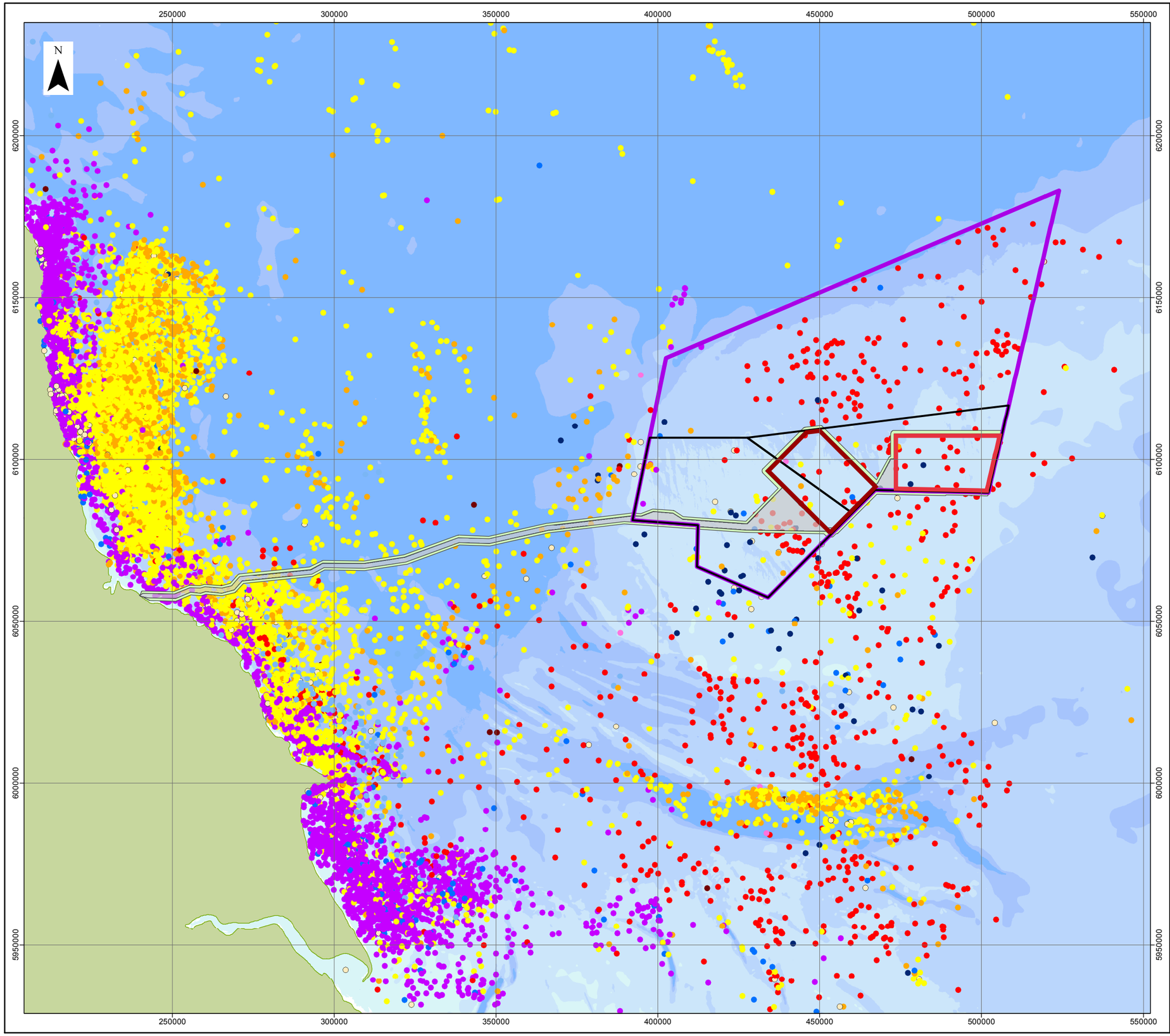

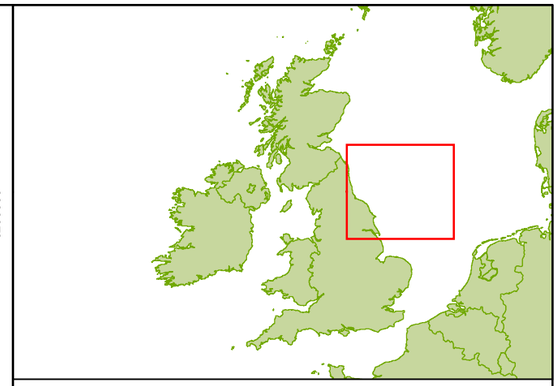

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Tesside A & B Export Cable Corridor
- Temporary works area

Surveillance sightings by method

- Beam trawler
- Demersal trawler
- Gill netter
- Industrial trawler (sandeeler)
- Pelagic trawler
- Potter
- Scallop dredger
- Seine netter
- Trawler (unspecified)
- Other methods

0 10 20 40
Kilometres

Data Source:
Sightings © MMO 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.5 Surveillance sightings of UK vessels (all fishing methods, 2003 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-505

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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Seine netting

4.5.4. Netting is mainly for plaice around the Dogger Bank Zone (Regional Fishery Area) and the value of the catch is generally low (see **Appendix 15A** Figure 8.5).

Pelagic/Industrial trawling

4.5.5. This activity is minimal within Dogger Bank Teesside A & B (Wind Farm Study Area) and activity is also low along the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area (see **Appendix 15A** Figure 8.6).

Scallop dredging

4.5.6. No landings from scallop dredging have been recorded within the Wind Farm Study Area and very low landings are recorded along the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. Scallop landings are generally very low compared to elsewhere in the UK (see **Appendix 15A** Figure 8.7).

Potting

4.5.7. This mainly occurs to the south of the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area where vessels from Bridlington record the highest landings by value (see **Appendix 15A** Figure 8.8). To a lesser extent, pots are utilised to target whelks and *Nephrops*.

Netting

4.5.8. Landings from static nets (gill and trammel nets) between 2006 and 2010 were relatively low in the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area in comparison to the highest values which have been recorded in the south and south west of England (see **Appendix 15A** Figure 8.9). Netting is also used to catch salmon and sea trout and the value of landings between 2006 and 2010 were generally high within the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area compared to other areas in the UK especially within ICES rectangle 38E8 (value of £34,812) (see **Appendix 15A** Figure 8.10).

Summary of fishing activity Dogger Bank Teesside A & B and Dogger Bank Teesside A & B Export Cable Corridor

4.5.9. Landing values for all species are generally higher in the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area with lobster accounting for the highest percentage catch by value followed by edible crab *Cancer pagurus* which is caught in pots in the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. The landings value has increased considerably between 2006 and 2010 (see **Appendix 15A** Figure 8.11). Landings for lobsters (potting) are highest between July and October, whereas *Nephrops* landings are highest between October and March. Within the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area bottom otter trawlers targeting demersal species generally fish throughout the year peaking in October and November, whereas twin-rig trawlers are found mainly in late

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autumn and winter. Gillnet landings in the same area peak in January. Whilst trawling is the predominant method for the capture of *Nephrops*, this species is also caught in pots albeit at substantially lower levels.

4.5.10. Within the Wind Farm Study Area the highest value species caught using beam trawls are plaice, with lower value landings for lemon sole, turbot and sole. In the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area plaice has also been the highest value species with the exception of 2008 when herring landings in ICES rectangles 38F0 and 38F1 were higher. Within the Wind Farm Study Area the majority of vessels are over 15m, whereas inshore the majority are under 10m. Effort data (days at sea) between 2008 and 2012 suggests fishing effort is greater in the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area than in Wind Farm Study Area, due, in part, to larger vessels having higher catch rates than smaller under 10m inshore vessels (see **Appendix 15A** Figure 8.16 and Figure 8.17). VMS data from Marine Scotland shows value by demersal gears (all mobile methods) is moderate within the Wind Farm Study Area with a short section of the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area recording higher values. This is further illustrated by MMO data (see **Appendix 15A** Figure 8.20 and 8.21).

4.5.11. Four of the top five ports which record landings from UK registered vessels from the Wind Farm Study Area are in the Netherlands (Harlingen, Urk, Scheveningen, and an unspecified port) with 90% of the catch being landed from ICES rectangles 38F2 and 39F2 (see **Appendix 15A** Table 8.1). This reflects the predominance of UK registered Dutch owned and operated vessels working within Wind Farm Study Area. In contrast, the majority of ports recording landings from the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area are in the UK (North Shields, Whitby, Hartlepool, Blyth and Amble (see **Appendix 15A** Table 8.2)

4.5.12. Within the Wind Farm Study Area the annual value of landings by species and fishing methods in rectangles 38F2 and 39F2 (2003 to 2012) is greatest for plaice caught using beam trawls. Beam trawling predominated between 2003 and 2005 but this changed to demersal otter trawling in 2010 reflecting the conversion of some beam trawlers to more fuel efficient methods of fishing. This is supported by the decreasing landing values of beam trawling between 2003 and 2012 from £2,579,208 to £1,334,297 (see **Appendix 15A** Figure 8.22). Sandeel landings increased from zero to values of £56,755 in 2008, returning to zero in 2012. These landings are presumed to originate from a single UK registered and owned fishing vessel.

4.5.13. In general the majority of all fishing activity in the Wind Farm Study Area takes place between April and September with the highest values recorded during May, June and July during a five year period 2008 - 2012 (see **Appendix 15A** Figure 8.25 and Figure 8.26).

Summary of vessels, gear, operating patterns and practices

4.5.14. Information obtained during consultation with fishermen and their representative organisations regarding gear types and vessels currently in use within the Wind Farm Study Area and the Inshore and Offshore Dogger Bank Teesside A & B

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Export Cable Corridor Study Area, can be found in **Appendix 15A** Section 8.3. There are currently 15 Anglo-Dutch vessels fishing in the vicinity of the Dogger Bank Zone the majority operating beam trawls. In terms of specific fishing areas, Anglo-Dutch beam trawlers within the Wind Farm Study Area tend to move around depending on target fish density and location. The UK registered over 15m otter trawlers generally fish in the vicinity of the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area (see Section 3.1 for definition of areas) and in the deeper waters of the north western and northern edges of the Dogger Bank (**Figure 4.6**).

4.5.15. The demersal otter trawl fleet (under 15m) fish in the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area all year (**Figure 4.7** - produced in consultation with Hartlepool Fishermen's Society Ltd.). The fleet targets a wide range of species including *Nephrops* and between October and April species such as cod, haddock and whiting are also important. The only UK registered and operated anchor seine netter fishes in the vicinity of the Dogger Bank Zone from April to October for plaice and turbot and at other times pursues other activities such as guard vessel work. There were only two Scottish registered pelagic vessels reported by Fisheries Liaison Representatives (FLRs) within the Regional fishery area, one of which, (registered at Fraserburgh) had a quota allocation for sandeel (Scottish Pelagic Fishermens' Association consultation 2012).

4.5.16. There is no specific data available on the number and size of UK vessels active in the scallop fishery along the east coast. At present there are no vessels from Bridlington active in this fishery, although there is evidence that three or four Scarborough and Whitby based vessels may seasonally target scallops 4nm to 5nm from the Castle grounds, directly north east of Scarborough within the six mile limit (pers. comm. James Wood, NEIFCA, October 2012).

4.5.17. Other scallop dredge vessels active along the Yorkshire coast are over-15m in length and largely nomadic. The fishing grounds for these vessels in the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area are generally not productive on the scale of grounds in the English Channel, Irish Sea and Scottish waters. It is probable that activity may be opportunistic by vessels transiting between more distant scallop grounds.

4.5.18. The main gear used to catch crab and lobster are parlour pots which are predominantly used in the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. Standard fleets comprise 20 to 40 pots with a distance of between 15m and 24m between each pot. Inshore vessels, working between 200 and 600 pots, revisit a fleet of pots every two or three days, based on hauling 140 pots per day. Larger vessels working in excess of 1,000 pots can take over a week to revisit all of its pots. Seasonal variations in landings are noted in section 4.5.9. There are currently 20 under 10m vessels operating out of Hartlepool, 27 out of Whitby and 30 from Redcar, South Gare, Saltburn and Skinningrove (information from consultation and fishing surveys) (see **Appendix 15A** Table 8.9).

4.5.19. Netting vessels operating in the area of the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area are based at Redcar,

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Hartlepool, South Gare, Saltburn and Skinningrove. Whitby fishermen are understood not to use gill or trammel nets in the vicinity of the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area (Consultation meeting Whitby 21st May 2013). NEIFCA (2011) data indicate that 14 boats operating from Hartlepool are licenced to fish for whitefish using gill or trammel nets. Whilst there are 20 vessels based at South Gare, Redcar and Saltburn who target fish using a combination of gillnets and trammels. These vessels are also engaged in shellfish potting throughout the year or peak season.

4.5.20. Static net fishermen target cod, pollock *Pollachius pollachius* and a range of flatfish in the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area during the autumn, winter and early spring months (October to April).

4.5.21. A small number of static gear vessels based at Hartlepool, target turbot in the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area between May and September. These vessels also place trammel nets in close proximity to wrecks targeting cod, pollack and ling *Molva molva*.

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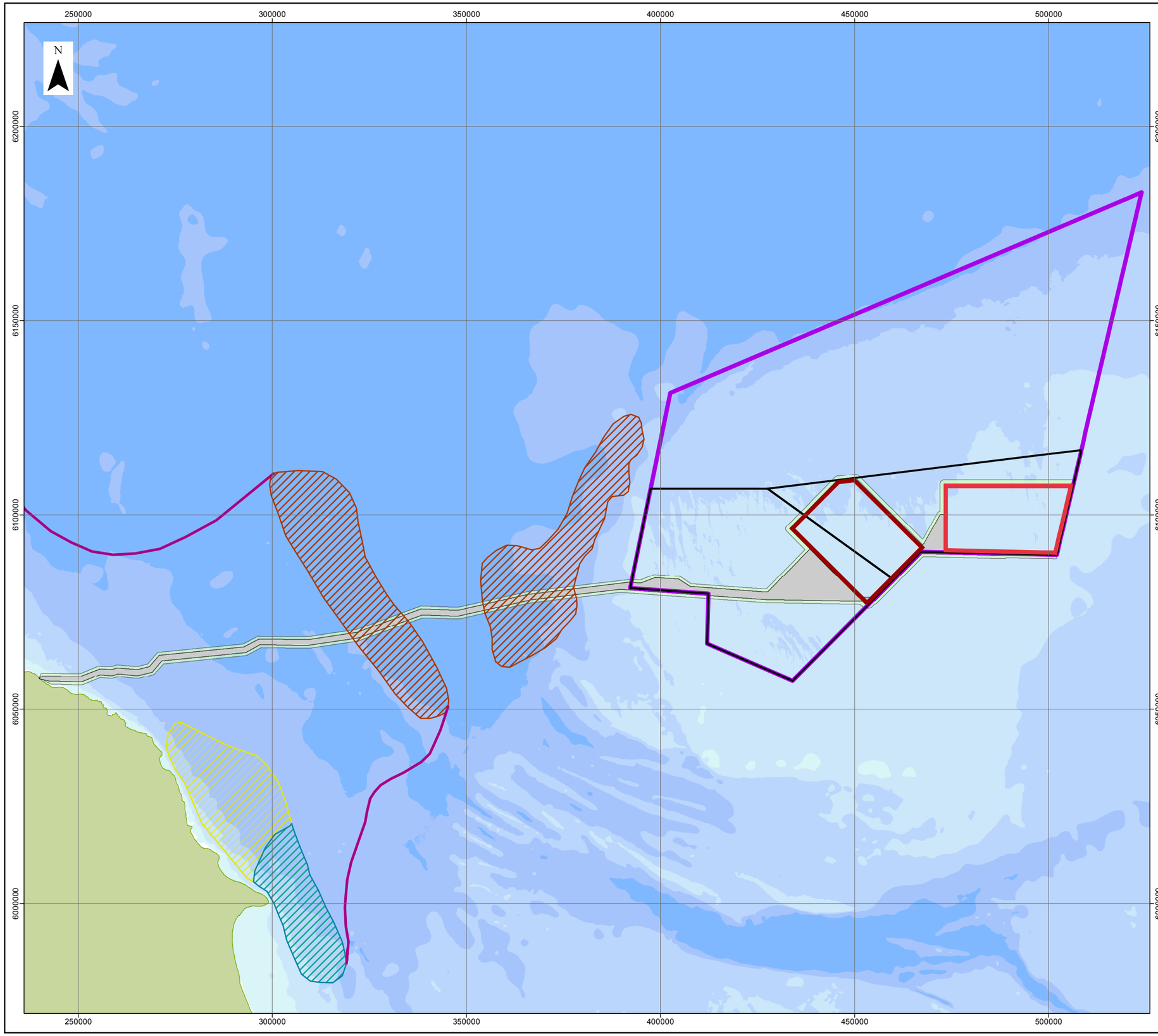

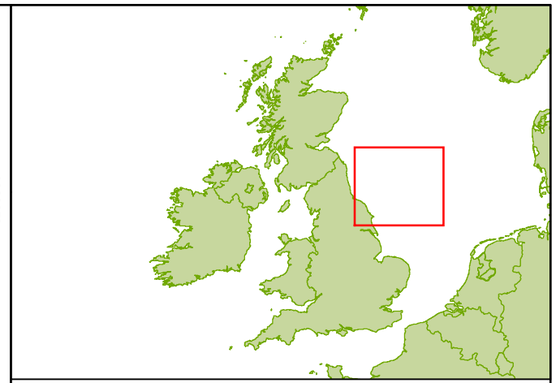

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Main Yorkshire coast trawl ground extent
- Key ground <10m vessel (pair trawling)
- Key ground >10m vessel
- Key ground >10m vessel (pair trawling)

0 5 10 20
Kilometres

Data Source:
Trawling activity © F. Normandale, provided by PMSL 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.6 Over-15m fleet fishing grounds

VER	DATE	REMARKS	Drawn	Checked
1	22/08/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	07/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-506

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,000,000	A3	WGS84	UTM31N

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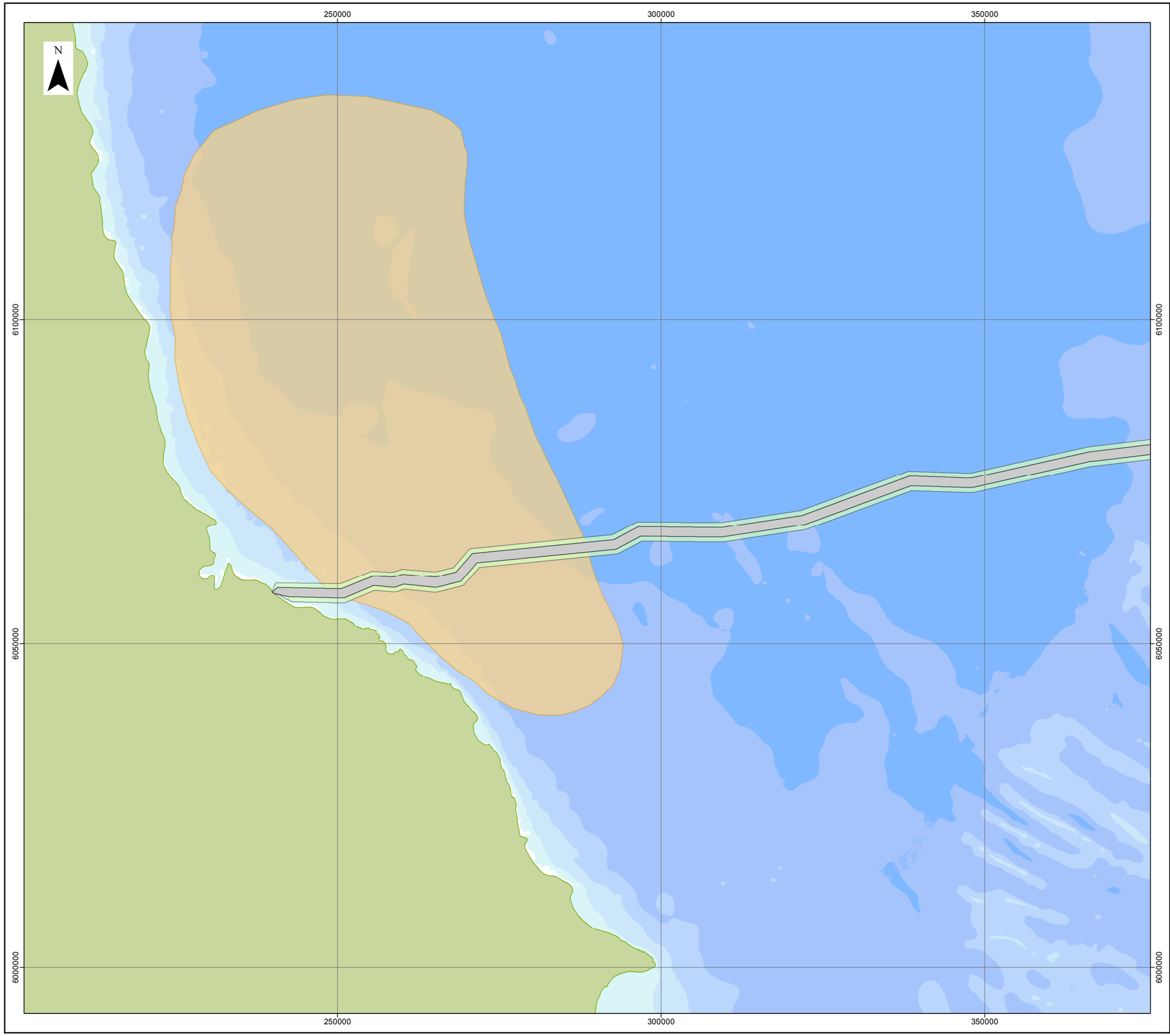

LEGEND

- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Teesside main trawl area (Hartlepool vessels)

0 5 10 20
Kilometres

Data Source:
Trawl area - P. Walsh. 22nd May 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.7 Key fishing grounds for the under-10m otter trawling fleet based at Hartlepool

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	07/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-507

SCALE	1:600,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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4.5.22. The northeast salmon net fishery is one of the most important commercial salmonid fisheries in England and Wales and is subject to an Environment Agency Net Limitation Order (NLO). The NLO offers compensation to fishermen who surrender licences in order to gradually phase out the net fishery which exploits mixed stocks. Using drift and beach nets (T & J nets - fixed engine type of beach net) this fishery has targeted migratory salmonids in the coastal waters for over 100 years, although as a result of the NLO's the number of licences have been reduced from 142 in 1993 to just 14 in 2012. The extent of the drift net fishery is shown in **Figure 4.8** and shows the degree to which the Export Cable Corridor intersects District 2 (south Northumberland fishery) and part of District 3. In District 3 there were no licences issued for either drift or T & J nets in 2012 in contrast to 2011 when a single licence was issued in the south Northumberland area whereas 38 were issued in the Yorkshire fishery

4.5.23. Atlantic salmon *Salmo salar* and sea trout *Salmo trutta* catch data for fish within the Northumbria and Yorkshire districts is shown in (**Appendix 15A** Table 8.11) and indicates a peak catch of over 9000 individuals in August when fish are moving into the estuaries ready to migrate up river. The northern part of north-east Northumbria fishery produces the greatest amount of salmon (annual average of 8858 fish) and sea trout (annual average of 18626). Compared to these figures, the catch of salmonids from the southern north-east Northumbria district is comparatively low (68 salmon and 751 sea trout). There are currently no drift net licences issued for the southern Northumberland fishery and little evidence for fishing in or near to the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas.

4.6. Dutch fishing methods and catch data

4.6.1. Dutch registered vessels predominantly fish areas to the south of the Dogger Bank Zone with relatively low numbers recorded by MMO surveillance sightings within Dogger Bank Teesside A & B. Low numbers are also recorded within the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area (**Figure 4.9**). The main methods used by Dutch registered vessels include beam and demersal otter trawls. For both methods of fishing low landing values have been recorded for Dutch vessels in the ICES rectangles within the Wind Farm Study Area and Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area (**Figure 4.10**).

4.6.2. Satellite tracking and VMS data confirms that Dutch fishing activity within the Wind Farm Study Area and the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas is relatively low (see **Appendix 15A**, Figures 9.2 - 9.3). Annual patterns of activity tend to mirror that of the Anglo-Dutch fleet and data recorded indicates a general decline in landings values for beam trawlers from over €2 million in 2003 to approximately €170,000 in 2010. In comparison, landings values from otter trawling have increased with the greatest value recorded in 2010 (€449,887), although this may be due in part to the conversion of a small number of beam trawlers to otter trawling from 2003. A similar pattern is seen in the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area although in the latter area the activity is generally higher for both methods (**Appendix 15A** Figure 9.13 - Figure 9.15).

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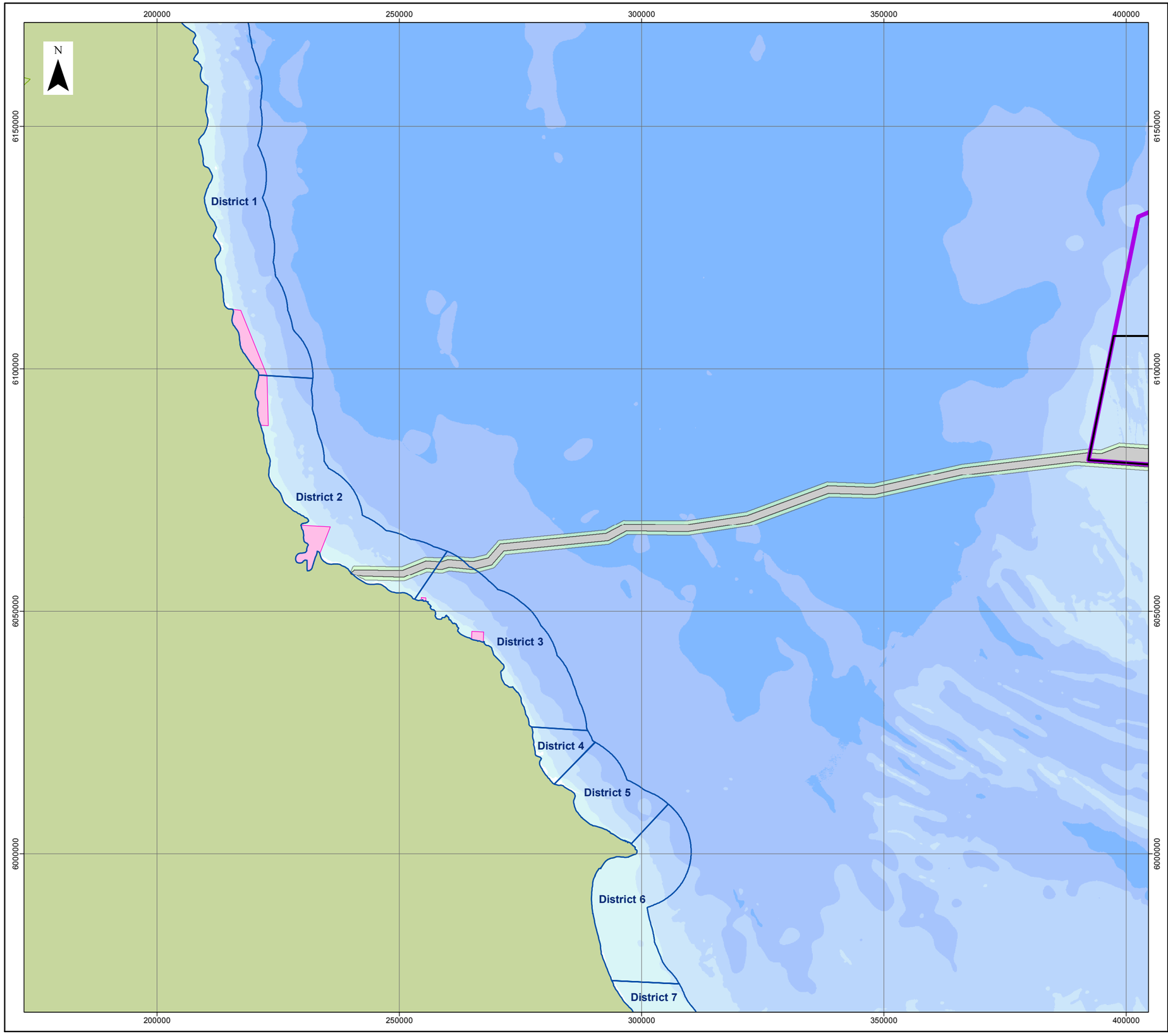

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- North east coast salmonid netting districts
- Conservation zone

0 5 10 20
Kilometres

Data Source:
Drift net fishery © Environment Agency, 2012
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.8 North east drift net fishery for salmon and sea trout

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	07/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-508

SCALE	1:800,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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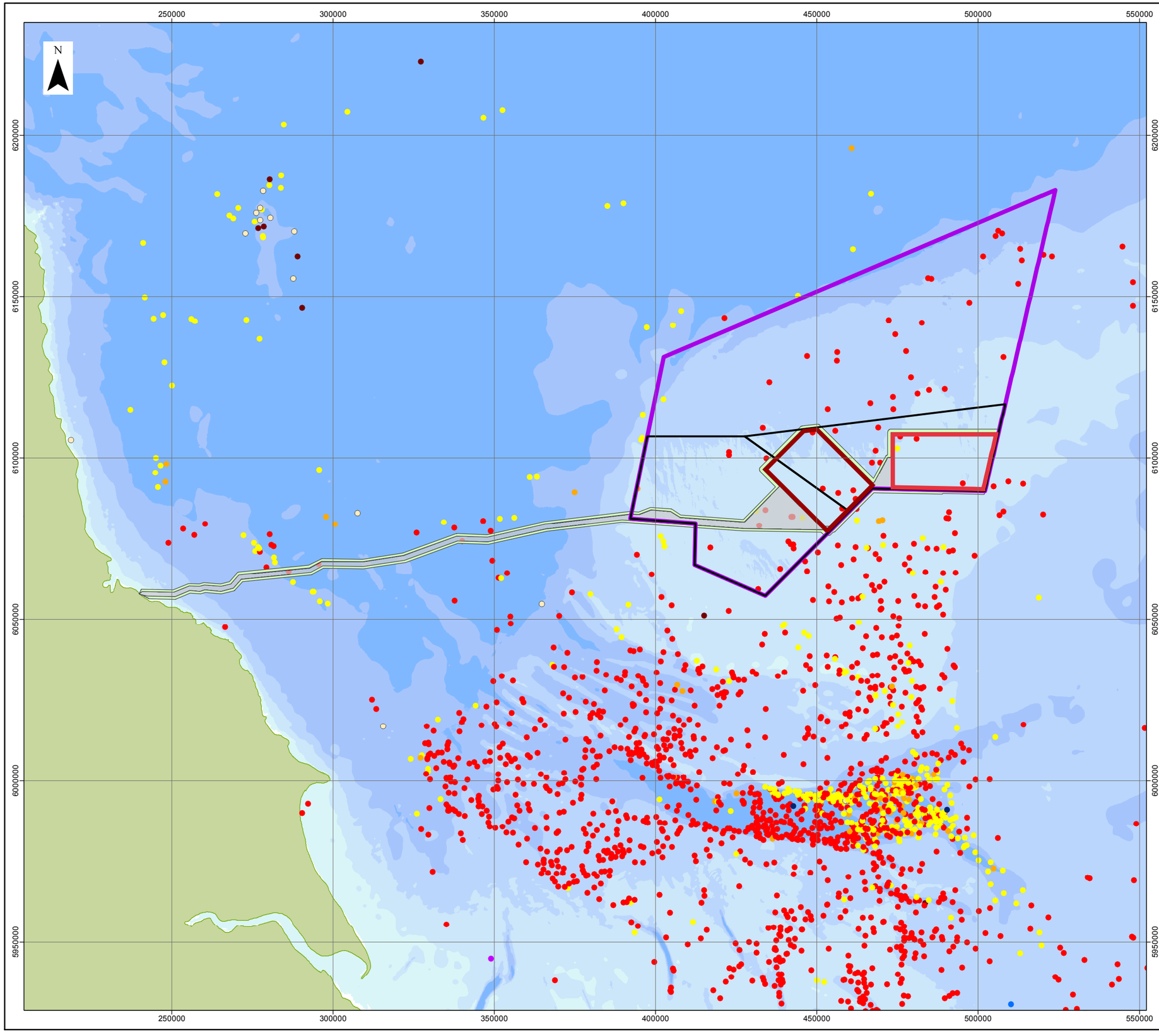

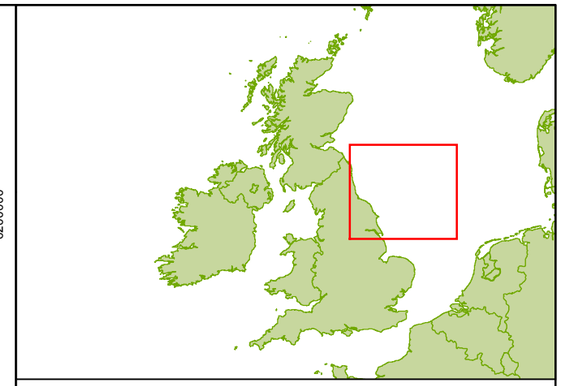

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Tesside A & B Export Cable Corridor
- Temporary works area

Surveillance sightings by method

- Beam trawler
- Demersal trawler
- Gill netter
- Pelagic trawler
- Potter
- Scallop dredger
- Seine netter
- Trawler (unspecified)
- Other methods

0 10 20 40
Kilometres

Data Source:
Sightings © MMO 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.9 Surveillance sightings of Dutch vessels (all fishing methods, 2003 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-509

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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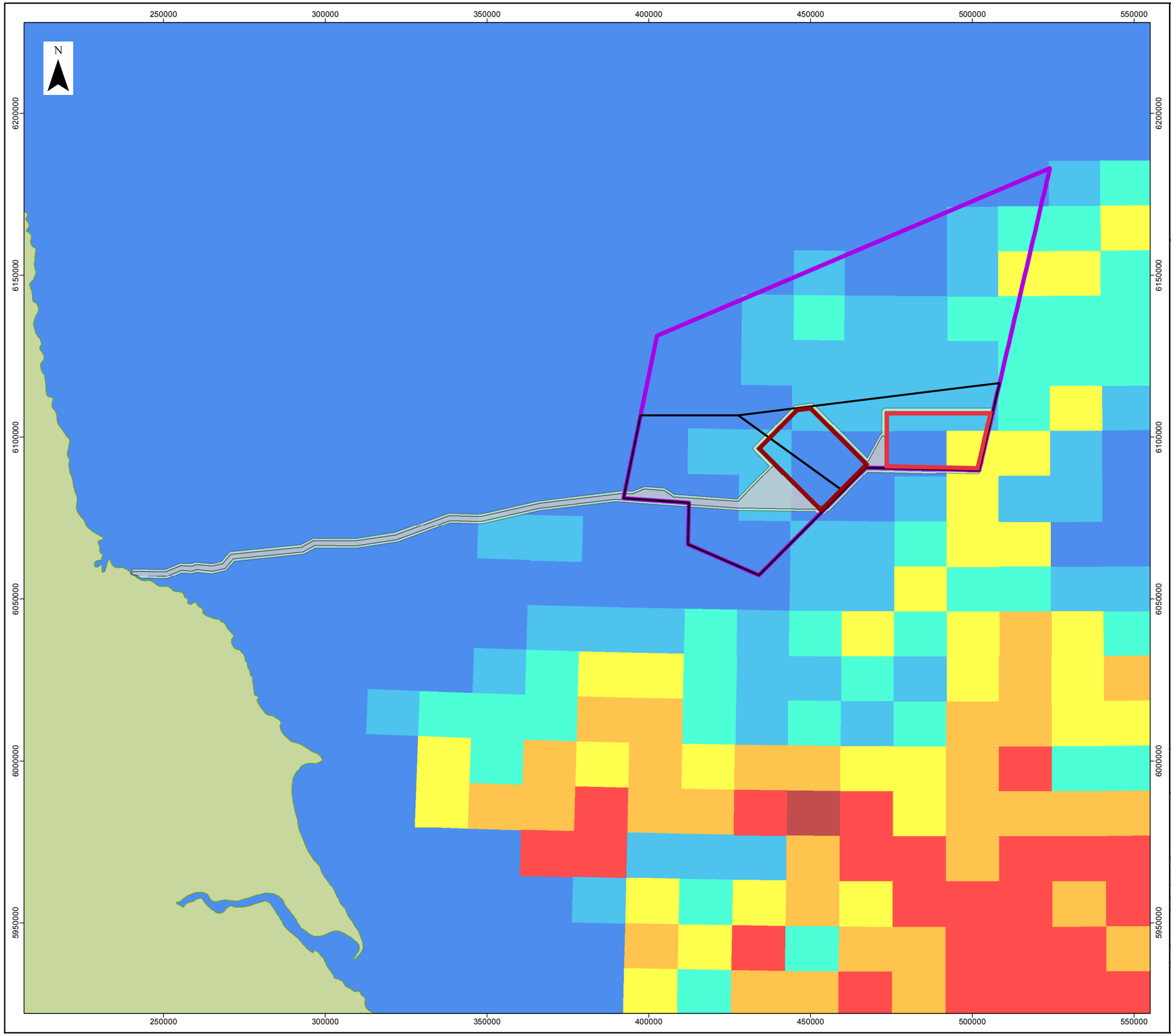

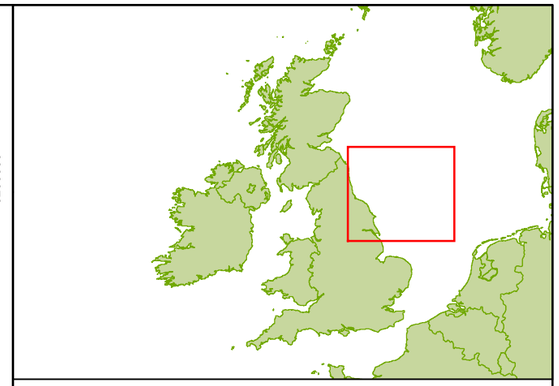

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export cable corridor
- Temporary works area

Dutch beam trawl VMS by value

- Up to €5,000
- €5,000 to €20,000
- €20,000 to €50,000
- €50,000 to €100,000
- €100,000 to €200,000
- €200,000 to €500,000
- More than €500,000

0 10 20 40
Kilometres

Data Source:
VMS © IMARES 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.10 National Dutch beam trawl VMS by value (€) (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER: **F-OFL-MA-609**

SCALE	PLOT SIZE	DATUM	PROJECTION
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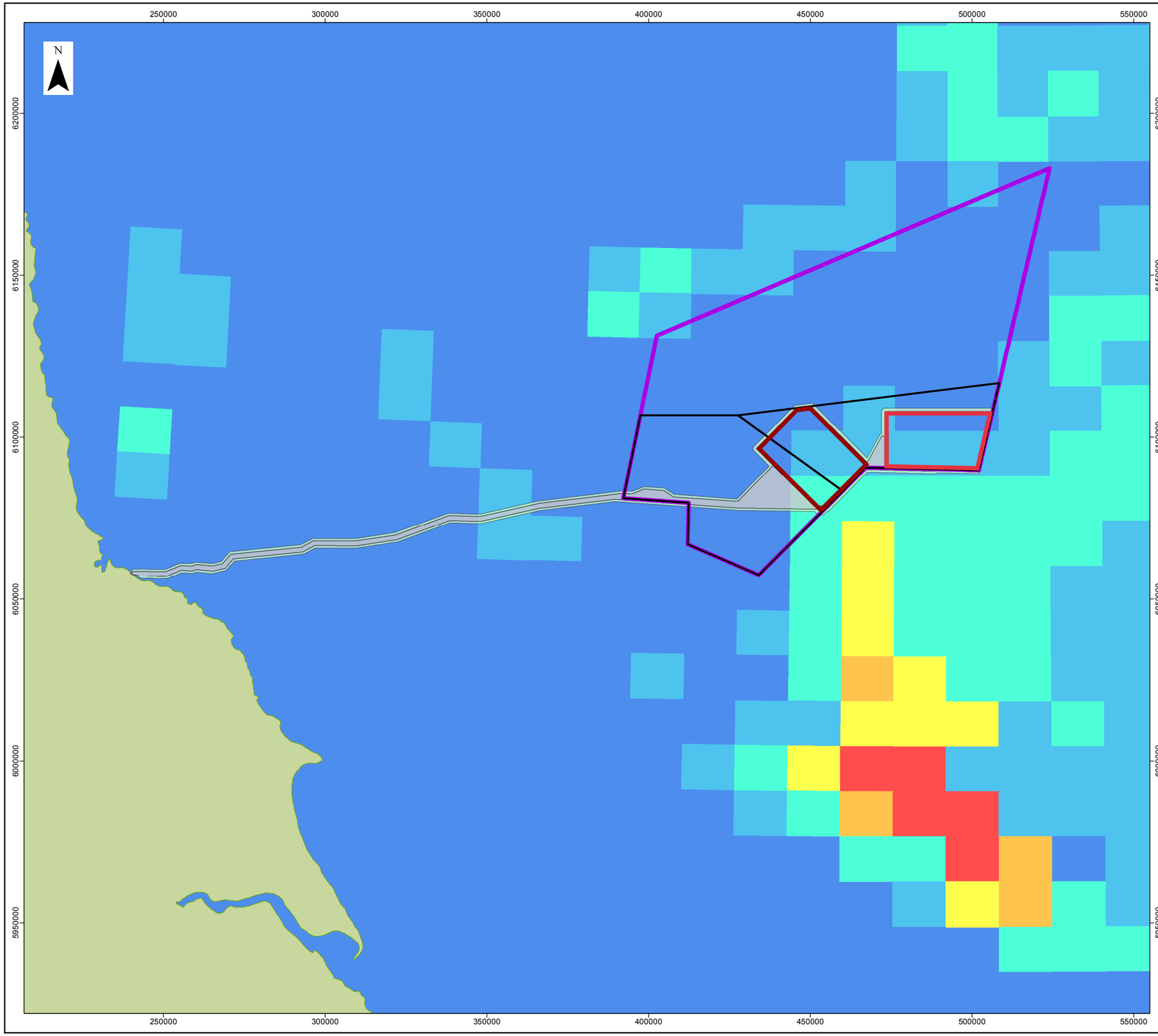

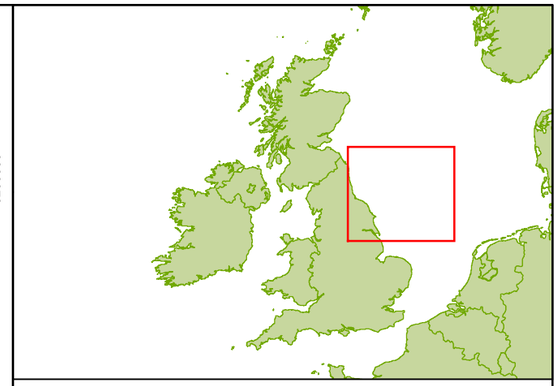

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export cable corridor
- Temporary works area

Dutch demersal otter trawl VMS by value

- Up to €5,000
- €5,000 to €20,000
- €20,000 to €50,000
- €50,000 to €100,000
- €100,000 to €200,000
- €200,000 to €500,000
- More than €500,000

0 10 20 40
Kilometres

Data Source:
VMS © IMARES 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.11 National Dutch demersal otter trawl VMS by value (€) (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER: **F-OFL-MA-611**

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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4.7. Danish fishing methods and catch data

4.7.1. Surveillance sightings of Danish registered vessels within the Wind Farm Study Area and Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas by the MMO identified three categories of Danish fishing vessel, namely industrial trawlers (sandeel), seine netters and gill netters (**Figure 4.12**).

4.7.2. The distribution of industrial trawlers targeting sandeel is shown in **Figure 4.13** and indicates a greater density of vessels on the western boundary of the Dogger Bank Zone with relatively lower activity within the Wind Farm Study Area.

4.7.3. Seine netting activity, mainly targeting plaice, is moderate within the Wind Farm Study Area and other areas to the east of the Dogger Bank Zone, gill netting activity is minimal by comparison (targeting mainly turbot with a by-catch of plaice and cod) over the same areas (**Appendix 15A** Figure 10.3 and Figure 10.4). Monthly landing values show sandeel fishing to peak between April and June which is the time sandeels leave the seabed to feed in the water column. Higher landing values are recorded for herring between August and September and extending to December for sprat *Sprattus sprattus*. Landings of cod and plaice show less variation throughout the year (**Appendix 15A** Figure 10.10).

4.7.4. **Appendix 15A** Figure 10.5 - Figure 10.7 show that, with the exception of a very small area in the north-west corner of Dogger Bank Teesside Project B, the VMS data provided suggests that only minimal levels of industrial trawling for sandeel occurs within the Wind Farm Study Area or within the Inshore and Offshore Dogger Bank Teesside A & B Cable Corridor Study Area. There is a moderate level of Danish seine netting activity in the Wind Farm Study Area, with some small areas of higher activity within Dogger Bank Teesside A & B. No Danish gill netting activity was observed in Dogger Bank Teesside B between 2008 and 2012, and only minimal levels in a small area along the eastern boundary of Dogger Bank Teesside A.

4.7.5. The majority of Danish trawlers targeting sandeel are between 35- 60m in length and operate out of the ports of Esberg, Thyborøn, Skagen and Hirtshals. Consultation with the DFA indicates that there are presently 25 Danish trawlers targeting sandeel in comparison to approximately 40 in the early 2000's. The DFA also reported that there are currently ten Danish seine netters, which to varying degrees, operate in the Dogger Bank Zone (DFA 2011; 2013). The principal target species is plaice, comprising approximately 95% of catches, with small quantities dab *Limanda limanda*, turbot and brill *Scophthalmus rhombus* also being caught.

4.8. Belgian fishing methods and catch data

4.8.1. Surveillance and VMS data suggest there is generally very little activity by Belgian beam or otter trawlers within the Wind Farm Study Area although a cluster of activity was identified in the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area (**Appendix 15A** Figure 11.1). In the North

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Sea context landings are low to moderate in both the Wind Farm Study Area and Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas (**Appendix 15A** Figure 11.2 - Figure 11.4). The principal species targeted by trawlers include lemon sole and plaice. Lemon sole is reported to be caught by Dutch owned, but Belgian registered vessels with landing values being higher for flatfish species in the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas.

4.8.2. Fishing activity within the Wind Farm Study Area tends to peak between May and July with almost all activity spread between April and October. Within the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area the majority of beam trawling for lemon sole, plaice and sole takes place between October and November in comparison to September and December for the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area.

4.8.3. Consultation with Belgian skippers indicated that there are 70 active trawlers in the fleet using mainly beam trawls with occasional use of otter trawls, but not within the Wind Farm Study Area and the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas.

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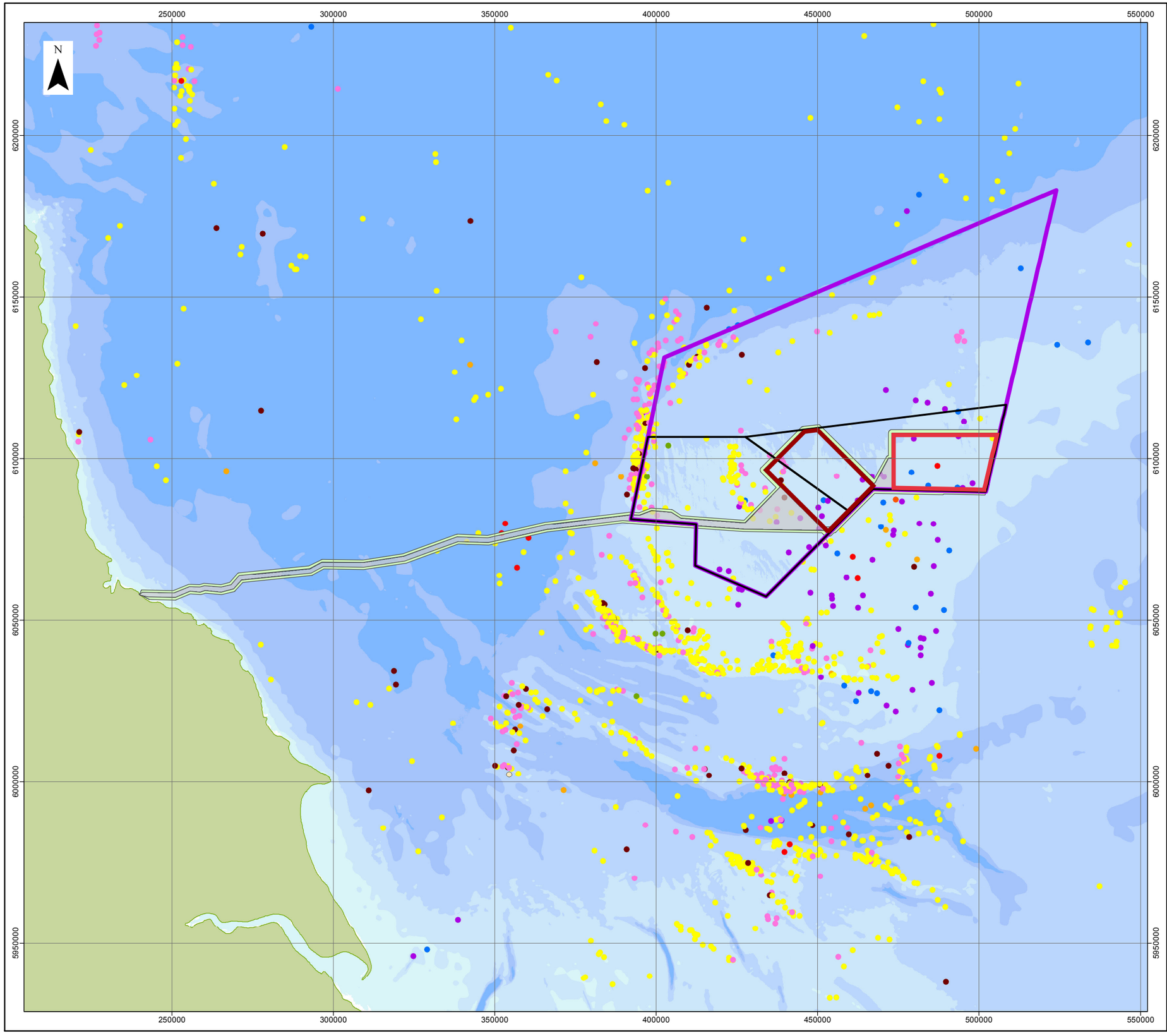

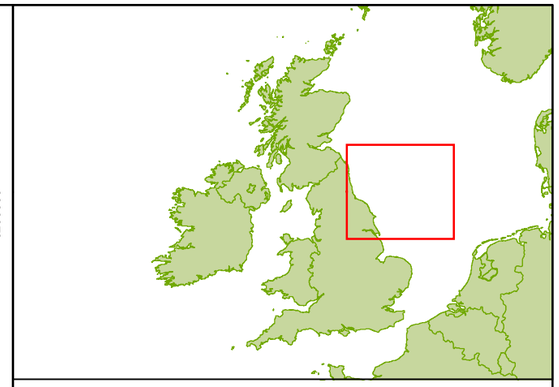

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Tesside A & B Export Cable Corridor
- Temporary works area

Surveillance sightings by method

- Beam trawler
- Demersal trawler
- Gill netter
- Industrial trawler (sandeeler)
- Longliner
- Pelagic trawler
- Seiner netter
- Suction dredger
- Trawler (unspecified)
- Unknown

0 10 20 40
Kilometres

Data Source:
Sightings © MMO 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.12 Surveillance sightings of Danish vessels (all fishing methods, 2003 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-511

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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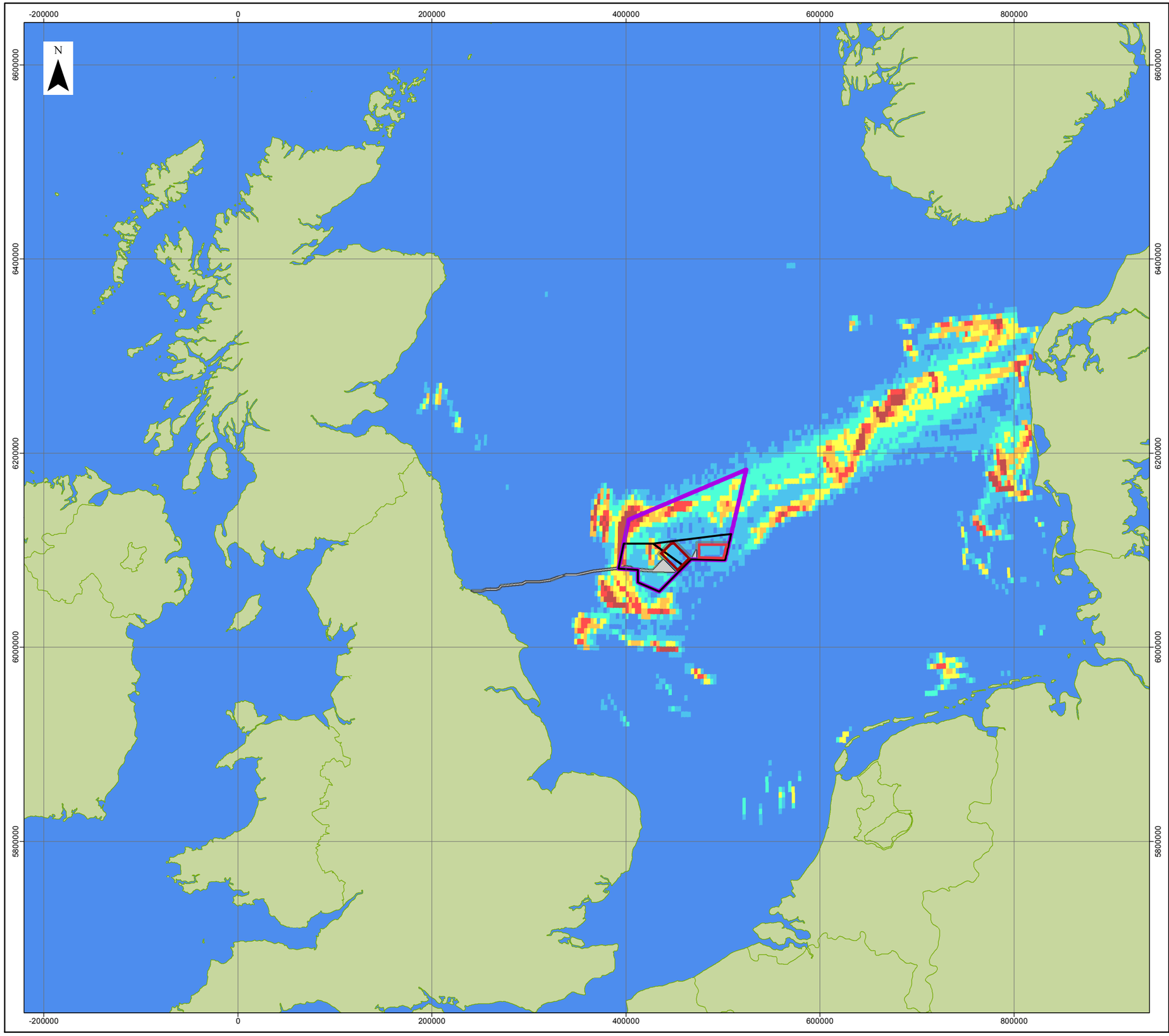

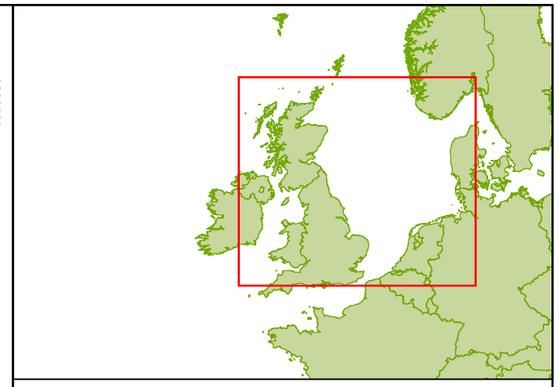

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area

Danish sandeel satellite (VMS) density

- 0 - 2
- 3 - 5
- 6 - 10
- 11 - 20
- 21 - 40
- 41 - 80
- over 80

0 25 50 100
Kilometres

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.13 Danish distribution of sandeel activity (VMS) by denisty (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	07/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-512

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,000,000	A3	WGS84	UTM31N

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4.9. French fishing methods and catch data

4.9.1. There was a general lack of VMS data from the French authorities on French fishing in the area. However through MMO surveillance sightings, IFREMER charts and consultation with French skippers the following information was gathered.

4.9.2. There is currently no French fishing vessel activity within the Wind Farm Study Area and the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas. A low level of activity was recorded along the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas in 2008 (less than five vessels). Most vessels in the fleet are larger stern trawlers (22-25m) operating out of Boulogne and targeting whiting and mackerel *Scombrus scombrus* to the south of the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas (see **Appendix 15A** Figure 12.1 - Figure 12.8)

4.10. German fishing methods and catch data

4.10.1. Both surveillance sighting data and VMS data indicate activity by German registered vessels has not been recorded within the boundaries of either Dogger Bank Teesside A or Dogger Bank Teesside B. Only a few sightings of German vessels have been recorded in the vicinity of the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas (see **Appendix 15A** Figure 13.1 - Figure 13.3).

4.10.2. Within the ICES rectangles in which Dogger Bank Teesside A & B is located sandeels and plaice represent the majority of landing values, whereas over the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas, landings appear to comprise mainly of herring and to a lesser extent sandeels.

4.10.3. Activity within the Wind Farm Study Area is recorded as unspecified bottom otter, seine netting and beam trawling, whilst over the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas activity is entirely unspecified bottom otter trawling. However most of the activity is outside of the Wind Farm Study Area as shown in **Figure 4.14** with the exception of a small cluster of low density activity within the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. In this area high landings of herring were recorded in 2006 (value over €6million), but this reduced considerably to €270,000 in 2008. Most herring is caught by German vessels between September and December and sandeel between April and June.

4.10.4. The majority of German registered trawlers are between 27 - 41m in length and are most likely to be trawling for sandeel under a German flag, but owned and operated by Danish companies or individuals. The herring fishery is targeted by pelagic vessels and only one has been sited within the Dogger Bank Zone.

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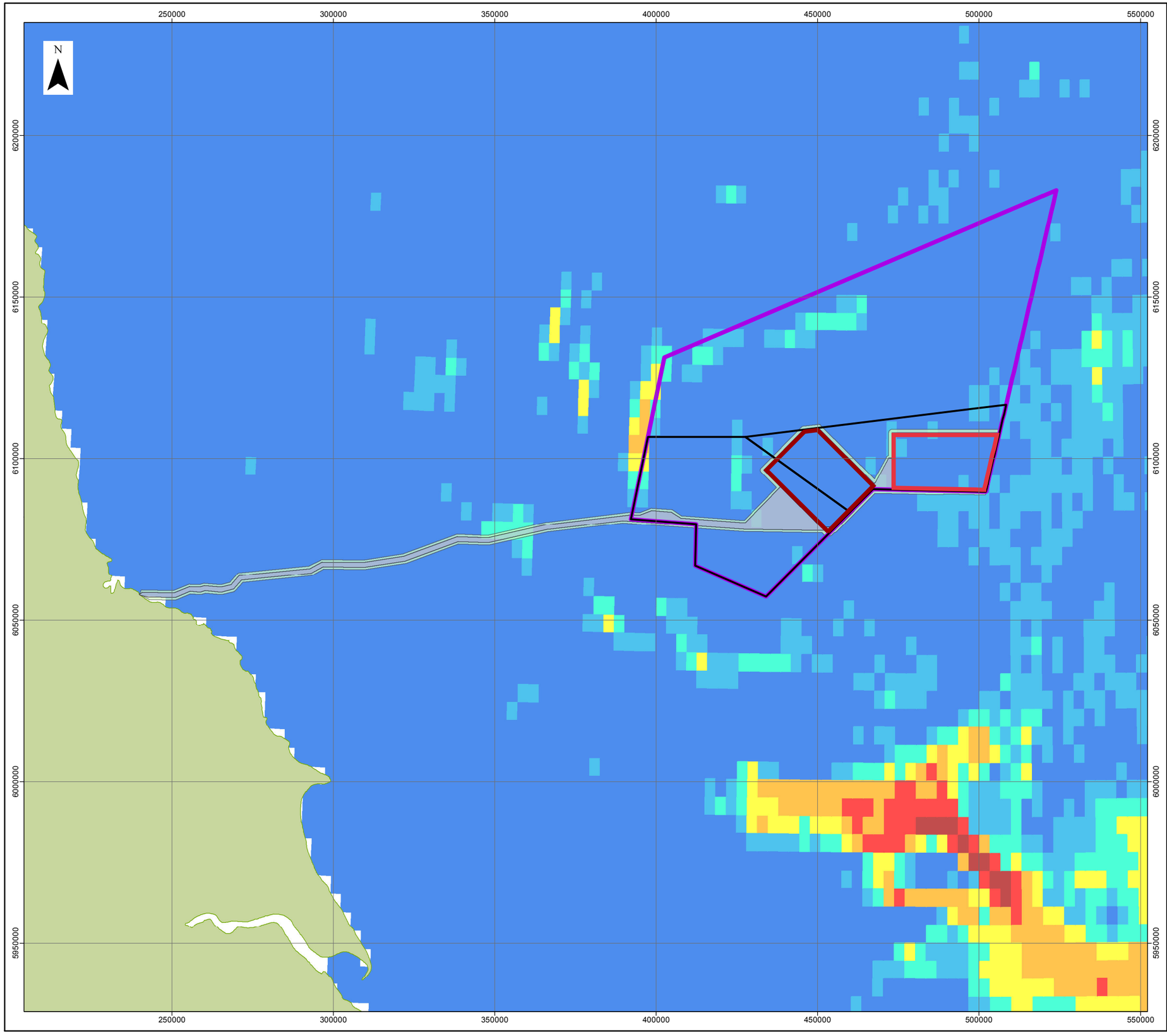

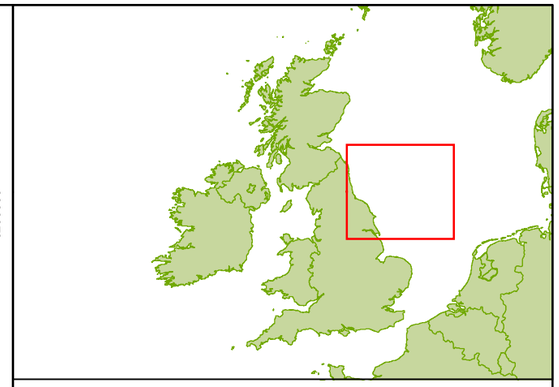

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area

German satellite (VMS) density

- 0 to 2
- 2 to 5
- 5 to 10
- 10 to 20
- 20 to 40
- 40 to 80
- Over 80

0 10 20 40
Kilometres

Data Source:
VMS © BLE, 2012

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.14 German VMS by density (average 2007 to 2011)

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	07/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-513

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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4.11. Swedish fishing methods and catch data

4.11.1. MMO surveillance sightings and VMS data show that the Swedish fishing activity within the Wind Farm Study Area and Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area is of low density. The main fishing methods include industrial, unspecified and pelagic trawling (see **Appendix 15A** Figure 14.1 and Figure 14.2). Landings in ICES rectangles 38F1 and 39F1 are predominantly sandeel by value, but the main fishing areas are generally outside the boundaries of the Wind Farm Study Area. Data collected revealed that sandeel landings have declined substantially since 2004 and there were no landings recorded in 2009 in this area. The Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area, which passes through ICES rectangle 38F0, has recorded relatively low herring landings but this activity is predominantly to the north of the area and only between 2006 and 2008 (**Appendix 15A** Figures 14.3 - 14.6).

4.11.2. There are currently 10-12 Swedish registered vessels (37- 44m) which fish for sandeel on the Dogger Bank and all are registered to Gothenburg. In addition there are 12 vessels targeting herring during September to December. At other times these same vessels may be catching sandeel.

4.12. Norwegian fishing methods and catch data

4.12.1. The Norwegian fishing fleet ranges over large areas of the North Sea including the Dogger Bank Zone, MMO surveillance sighting data shows these vessels are industrial trawlers fishing for sandeel, seine netters fishing for horse mackerel (mainly purse seiners) or demersal otter trawls fishing for plaice. There are generally low numbers of trawlers concentrated along the western boundary of the Dogger Bank Zone and no sightings have been recorded within the Wind Farm Study Area since 2003, although a few industrial trawlers have been seen in the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. The majority of landings from the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area are caught by mid- and bottom otter trawling mainly for sandeel with vessels ranging from 27- 65m in length. Further offshore 12 Norwegian purse seiners were recorded fishing for horse mackerel *Trachurus trachurus* and plaice within the Dogger Bank Zone during 2011 whereas none were recorded for 2012.

4.13. General overview of the fisheries

4.13.1. The sections above have described the activities of fishing fleets from different nationalities within Europe. However one fish population may be targeted by several nationalities using the same fishing gear and class of vessel. **Table 4.1** below provides a more comprehensive picture of the importance one fish stock may have for several nationalities.

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Table 4.1 Summary of commercial fishery activities by fishery

Fishery	National registration	Principal target species	Level of activity
Flatfish fishery	Dutch	Plaice, some sole	Activity is concentrated to the south of the Dogger Bank Zone, in the southern North Sea. Relatively low levels of activity are recorded in the Wind Farm Study Area and Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas.
	UK	Large plaice, some turbot and lemon sole	Activity has been recorded in the Dogger Bank Zone, including the Wind Farm Study Area. Activity is moderate on a national scale, and includes activity by Anglo-Dutch vessels (included within the UK datasets). There are also some UK registered vessels otter trawling along the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area, with low to moderate levels of activity recorded along the length of the corridor.
	Belgium	Beam trawling for sole and otter trawling for lemon sole	Activity is concentrated in the English Channel and southern North Sea. Relatively low beam trawl activity has been recorded in the vicinity of the Dogger Bank Zone, with slightly higher landings recorded by otter trawlers to the north of the Zone, outside of the Wind Farm Study Area. There is also some beam trawling activity along the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area, although at relatively low levels.
	Germany	Beam trawling for plaice and turbot	Some activity in the Dogger Bank Zone, but at relatively low levels.
	Norway	Otter twin trawling for plaice and turbot	Recorded to the south of Wind Farm Study Area. Activity is relatively low on a national scale.
Sandeel fishery	Denmark	Sandeel	The fishery on the Dogger Bank is one of the most important sandeel areas in the North Sea. The majority of activity is recorded along the western edge of the Dogger Bank Zone, including a portion of the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. Some activity has also been recorded along the western edge of Dogger Bank Teesside B.
	Norway	Sandeel	
	Germany	Sandeel	

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Fishery	National registration	Principal target species	Level of activity
	Sweden	Sandeel	
	UK	Sandeel	
Seine net fishery	UK	Mainly plaice and turbot	Activity has been recorded in the Dogger Bank Zone, including the Wind Farm Study Area. One UK registered and owned vessel has reported spending 100% of its time fishing the Dogger Bank Zone between April and October. There are also reported to be six Anglo-Dutch vessels seine netting in the vicinity of the Dogger Bank Zone
	Denmark	Plaice, with dab and turbot as by-catch	Activity has been recorded in Dogger Bank Teesside A & B. This activity is moderate to high on a national scale, with activity recorded to the east of the Dogger Bank Zone in Danish waters. Vessels are restricted by the substrate type on which their fishing gears can operate
Whitefish trawl fishery	UK	Cod, whiting and haddock	Activity is concentrated along both the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas. The majority of activity in the inshore area is by vessels which are under-15m in length and restricted in their operational range. These vessels will generally target grounds in the vicinity of the Export Cable Corridor landfall site. Activity further offshore is generally by vessels over-15m in length which are able to target grounds elsewhere in addition to those along the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas. Activity by the over-15m fleet along the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area is low to moderate on a national scale
	France	Whiting, cod, haddock, mackerel	Relatively low activity in inshore areas, including along the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area.
Nephrops trawl fishery	UK	*Nephrops*	Landings have been recorded in inshore areas to the north of the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas. Activity levels are moderate on a national scale, with the highest value grounds located off the east coast of Scotland
Scallop dredge fishery	UK	King scallops	Landings have been recorded in inshore areas to the south of the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas, activity is low compared to grounds elsewhere

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Fishery	National registration	Principal target species	Level of activity
Pelagic fishery	UK	Herring	Relatively low levels of activity recorded along the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas. The majority of pelagic activity is recorded around the coast of Scotland
	Germany	Herring	Activity recorded along the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. Activity is relatively low on a national scale
	Sweden	Herring	Activity recorded along the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. Activity is relatively low on a national scale
	Norway	Herring	Activity recorded along the Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. Activity is relatively low on a national scale
Potting fishery	UK	Crab,, lobster and whelk	Activity is generally recorded along the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area. Relatively moderate levels of activity have been recorded and vessels fishing here will be limited in their operational range
Gillnet fishery	UK	Cod, pollack and flatfish species	Activity is generally recorded in inshore areas, including along the Inshore and Offshore Dogger Bank Teesside A & B Export Cable Corridor Study Areas. Relatively low levels of activity have been recorded however vessels fishing here will be limited in their operational range
	Denmark	Turbot	Activity has been recorded offshore in the area of the Dogger Bank Zone, including along the eastern edge of Dogger Bank Teesside A. Activity is low compared to that recorded in non-UK waters

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5. Assessment of Impacts – Worst Case Definition

5.1. General

5.1.1. This section establishes the realistic worst case scenario for each category of effect as a basis for the subsequent impact assessment. This involves both a consideration of the relative timing of the construction and operation of the two projects, as well as the particular design parameters of each project that define the Rochdale Envelope for this particular assessment.

5.1.2. Full details of the range of development options being considered by Forewind are provided within **Chapter 5**. For the purpose of the commercial fisheries impact assessment, the key project parameters which form the realistic worst case are set out in **Table 5.1**.

5.1.3. Only those design parameters with the potential to influence the level of impact are identified.

5.1.4. In terms of the assessment of impacts upon commercial fisheries the principal factor in determining the design parameters which will constitute the realistic worst case is the consideration of how the fishing activities described in the baseline will be most adversely affected. This could occur in two ways: the first is the potential for the wind farm development to cause adverse impacts to fish and shellfish of commercial importance, which could then indirectly affect commercial fishing activities. Whilst this potential effect is summarised in this assessment, it is fully assessed in **Chapter 13** and **Appendix 15A**.

5.1.5. The second is the potential for the wind farm development to constitute a physical obstacle and/or safety risk to the continuation of normal fishing activities as described in Section 4. Accepting that the fish and shellfish assessment will identify and assess the worst case parameters for potential effects upon fish and shellfish species, it is the second factor which has determined the worst case parameters for commercial fisheries.

5.1.6. The realistic worst case scenarios identified here are also applied to the Cumulative Impact Assessment (CIA). When the worst case scenarios for the project in isolation do not result in the worst case for cumulative impacts, this is addressed within the cumulative section of this chapter (see Section 11 and summarised in **Chapter 33 Cumulative Impact Assessment**.

5.2. Construction scenarios

5.2.1. There are a number of key principles relating to how the projects will be built, and that form the basis of the Rochdale Envelope (see **Chapter 5**). These are:

- The two projects may be constructed at the same time, or at different times;

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- If built at different times, either project could be built first;
- If built at different times, the duration of the gap between the end of the first project to be built, and the start of the second project to be built may vary;
- Offshore construction will commence no sooner than 18 months post consent, but must start within seven years of consent (as an anticipated condition of the Development Consent Order); and
- The worst case sequential duration of impact is, 'Build A (six years), start building B after five years and six months with a six month overlap, taking six years. Total duration 11 years and six months with a six month overlap.

5.2.2. To determine which offshore construction scenario is the worst realistic case for a given receptor, two types of effect exist with the potential to cause a maximum level of impact on a given receptor:

- Maximum duration effects; and
- Maximum peak effects.

5.2.3. To ensure that the Rochdale Envelope incorporates all of the possible construction scenarios (as outlined in **Chapter 5**), both the maximum duration effects and the maximum peak effects have been considered for each receptor. Furthermore, the option to construct each project in isolation is also considered ('Build Dogger Bank Teesside A in isolation' and 'Build Dogger Bank Teesside B in isolation'), enabling the assessment to identify any differences between the two projects. The three construction scenarios for Dogger Bank Teesside A & B considered within the commercial fisheries assessment are, therefore:

- Build A or Build B in isolation;
- Build A and B concurrently – provides the worst 'peak' impact and maximum working footprint; and
- Build A (six years), start building B after five years and six months with a six month overlap, taking six years. Total duration 11 years and six months with a six month overlap.

5.2.4. Any differences between the two projects, or differences that could result from the manner in which the first and the second projects are built (concurrent or sequential and the length of any gap) are identified and discussed in the impact assessment sections of this chapter (Sections 6 to 9).

5.2.5. For each potential impact only the worst case construction scenario for two projects is presented, i.e. either concurrent or sequential. The justification for what constitutes the worst case is provided in the impact assessment discussion (Section 6).

5.2.6. As such, the construction scenarios presented within the impact assessment sections of this chapter (Sections 6 to 9) are:

i) Single project; and

ii) Two projects – concurrent or sequential.

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Operation scenarios

5.2.7. **Chapter 5** provides details of the operational scenarios for Dogger Bank Teesside A & B. Flexibility is required to allow for the following three scenarios:

- Dogger Bank Teesside A to operate on its own;
- Dogger Bank Teesside B to operate on its own; and
- For the two projects to operate concurrently.

5.2.8. Unless otherwise stated, there is not considered to be a material difference between either Dogger Bank Teesside A or Dogger Bank Teesside B operating on its own. As such, only one assessment for the single project scenario is presented and is considered representative for whichever project is operating in isolation.

Decommissioning scenarios

5.2.9. **Chapter 5** provides details of the decommissioning scenarios for Dogger Bank Teesside A & B. Exact decommissioning arrangements will be detailed in a Decommissioning Plan (which will be drawn up and agreed with DECC prior to construction); however, for the purpose of this assessment it is assumed that decommissioning of Dogger Bank Teesside A & B could be conducted separately, or at the same time.

Assessment sequence

5.2.10. The sequence of assessments undertaken below by impact and receptor group for the construction, operational and decommissioning phases is as follows:

- Dogger Bank Teesside A;
- Dogger Bank Teesside B (where different);
- Dogger Bank Teesside A & B; and
- Dogger Bank Teesside A & B Export Cable Corridor.

5.2.11. The cumulative assessment follows an additive sequence namely:

- Dogger Bank Teesside A & B, Dogger Bank Creyke Beck and Dogger Bank Teesside C & D (including their respective Export Cable Corridors);
- Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck (including their respective Export Cable Corridors) and other planned or consented offshore wind farms and their export cables; and
- Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck (including their respective Export Cable Corridors), other planned or consented offshore wind farms and their export cables and other regulated activities and possible areas of marine conservation.

5.3. Realistic worst case scenarios

5.3.1. **Table 5.1** identifies the key design parameters that form the realistic worst case scenarios for the assessment of impacts on commercial fisheries. The parameters identified have been derived from a desktop review and consultation

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Table 5.1 Key design parameters forming the realistic worst case scenarios

Effect	Key design parameters	Rationale
Construction		
Adverse impacts on commercially exploited fish and shellfish populations	See **Chapter 13 Fish and Shellfish Ecology**	
Temporary loss or restricted access to fishing grounds	For Dogger Bank Teesside A & B combined: • Maximum number of partially installed infrastructure in Dogger Bank Teesside A & B with 50m safety zones around them; • Maximum number of 500m safety zones around works vessels installing the export and inter array (including inter platform) cables or other infrastructure and 500m safety zones around guard vessels protecting unburied sections of cables or areas of the cable where post-installation surveys have not taken place; • Over-trawlable surveys are not carried out until post-installation of export and inter array cables resulting in a progressive exclusion from the area of both Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor; • Exclusion of all fishing activities (due to safety risks associated with unburied cables or buried cables where post-installation surveys have not taken place) from Dogger Bank Teesside A then Dogger Bank Teesside B or ½ Dogger Bank Teesside A and ½ Dogger Bank Teesside B followed by the remaining halves for the duration of the construction phase. Maximum construction period is 6 years in both instances; • Maximum area of 1153km² covered by Dogger Bank Teesside A & B; and Ongoing export cable installation, burial and protection works throughout the installation phase leading to exclusion from cable corridor for 3.5 years (1,282 days for Dogger Bank Teesside A & B**).**	If Dogger Bank Teesside A and Dogger Bank Teesside B are built at the same time, ½ Dogger Bank Teesside A and ½ Dogger Bank Teesside B will be constructed in years 1 to 3 and the second half would be constructed in years 4 to 6, therefore there will be a gradual loss of fishing grounds. Fishing will not resume until the post installation survey takes place once both Dogger Bank Teesside A and Dogger Bank Teesside B are completed in full. If Dogger Bank Teesside A and Dogger Bank Teesside B are built one after another, there will also be a gradual loss of fishing grounds with a maximum combined construction duration of 11.5 years. Areas of seabed where cables are not buried or buried cables have not been tested for over-trawlability will prevent fishing activities from resuming and therefore will result in temporary loss of fishing area. Works vessels, guard vessels and partially installed infrastructure will have safety zones around them which will result in a temporary loss of fishing area.

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Effect	Key design parameters	Rationale
Safety issues for fishing vessels	See **Chapter 5 Project Description**. The commercial fisheries assessment also considers for Dogger Bank Teesside A & B combined: • Maximum of 400 6MW turbines with jacket foundations; and • Maximum number of other infrastructure (10 met masts, 10 mooring buoys per project (with 6m diameter), 8 collector platforms, 4 accommodation platforms and 2 converter platforms).	Jacket foundations without safety zones have increased snagging risks. The maximum number of turbines and other infrastructure will result in increased safety risks.
Interference with fishing vessels	For Dogger Bank Teesside A & B combined: • Maximum number of construction vessels potentially transiting through fishing grounds (132); and • Location of construction port.	Maximum of 66 works vessels for each project and therefore up to 132 works vessels steaming to and from the Dogger Bank Zone and along the Dogger Bank Teesside A & B Export Cable Corridor and impacting fishing. As the construction port is not currently known, a conservative assumption is taken that the port will be located in an area where transits to and from the Dogger Bank Zone and the Dogger Bank Teesside A & B Export Cable Corridor will pass through fishing grounds with the highest levels of activity.
Increased steaming times	See **Chapter 16 Shipping and Navigation.** The commercial fisheries assessment also considers for Dogger Bank Teesside A & B combined: • Installation of ½ Dogger Bank Teesside A and ½ Dogger Bank Teesside B followed by the remaining halves for the duration of the construction phase (6 years); • Maximum number of turbines (400 6MW); • Maximum number of partially installed infrastructure in Dogger Bank Teesside A & B with 50m safety zones around them; • Maximum number of other infrastructure (10 met masts, 10 mooring buoys per project (with 6m diameter), 8 collector platforms, 4 accommodation platforms and 2 converter platforms); and • Maximum number of construction vessels with 500m safety zones (132).	If Dogger Bank Teesside A & B are built at the same time, it may lead to increased steaming times to fishing areas. Maximum number of turbines, infrastructure, partially installed infrastructure with 50m safety zones or construction vessels with 500m safety zones will potentially result in increased steaming times to fishing areas.
Displacement of fishing activity into other areas	See 'Temporary Loss or Restricted Access to Fishing Grounds'.	Maximum duration and extent of fishing exclusion.

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Effect	Key design parameters	Rationale
Operation		
Adverse impacts on commercially exploited fish and shellfish populations	See **Chapter 13 Fish and Shellfish Ecology**	
Complete loss or restricted access to fishing grounds	Dogger Bank Teesside A & B combined: • Maximum number of turbines (400 6MW) and other infrastructure (10 met masts, 10 mooring buoys per project (with 6m diameter), 8 collector platforms, 4 accommodation platforms and 2 converter platforms); • Minimum spacing between turbines of 750m; • Minimum spacing between turbines and met masts of 334m; • No minimum distances for buoys relative to other infrastructure; • Jacket/gravity foundations; and • Maximum number of 500m safety zones around maintenance vessels.	Maximum number of turbines and other infrastructure will result in a loss of fishing area. Minimum spacing may inhibit fishing practices between turbines. Met masts and Project Buoys are an exception the minimum spacing of 750m. With a 6MW turbine (blade diameter up to 167m) the distance would typically be 334m to 668m for met masts. No minimum distances for the buoys relative to any offshore structures. Jacket foundations may lead to increased snagging risks. Gravity based foundations will lead to a larger area of fishing grounds being completely lost. Maximum number of maintenance vessels with 500m safety zones will result in temporary loss of fishing area.
Safety issues for fishing vessels	See **Chapter 5 Project Description**. For Dogger Bank Teesside A & B combined: • Jacket foundations with no safety zones; • Maximum length of inter cables (1900km) minimum burial depth of 0m and an indicative maximum burial depth of 3m and highest percentage of unburied cables protected by other means of 20%; • Maximum length of export cables (573km for Dogger Bank Teesside A and 484km for Dogger Bank Teesside B) with a minimum burial depth of 0m and an indicative maximum burial depth of 3m and highest length of unburied cables protected by other means (319.4km (assuming two unbundled cables), Dogger Bank Teesside A = 168.5km, Dogger Bank Teesside B = 150.9km); and • Use of mattressing to protect unburied cables.	Jacket foundations may lead to increased snagging risks, especially if there are no safety zones. If cable protection is used where burial is not feasible, concrete mattressing is assessed as the worst case for snagging risk. It is acknowledged that the snagging risks associated with fastenings on any subsea object or structure may be greater for smaller vessels with a lower horsepower than for larger high powered offshore trawlers.

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Effect	Key design parameters	Rationale
Interference with fishing vessels	For Dogger Bank Teesside A & B combined: • Location of operation and maintenance port and maximum number of operation and maintenance works vessels (132) resulting in the highest number of works vessels transiting identified fishing grounds.	As the operation and maintenance port is currently unknown, the conservative assumption has been taken that maintenance vessels will transit through fishing grounds which record the highest levels of activity. The maximum number operation and maintenance vessels will result in a higher probability of conflicts with fishing vessels or gears.
Increased steaming times	See **Chapter 16 Shipping and Navigation**. For Dogger Bank Teesside A & B combined: • Maximum number of infrastructure; and • Maximum number of operation and maintenance works vessels (132) with 500m safety zones.	The maximum number of infrastructure will result in the maximum disruption to established steaming routes. The maximum number of operation and maintenance works vessels with 500m safety zones may result in temporary increases in steaming times.
Objects on the Seabed Post-construction	For Dogger Bank Teesside A & B combined: • Any obstacles left on the seabed post-construction, including accidentally/deliberately dropped objects and foundation spoil from cable trenching.	Has the potential to result in safety risks associated with the snagging or fastening of fishing gear.
Displacement of fishing activity into other areas	See 'Complete Loss or Restricted Access to Fishing Grounds'.	Maximum restriction of resumption of normal fishing activities within the operational project.
Decommissioning		
During decommissioning the worst case parameters are not expected to exceed those of the construction phase, and are therefore assumed to have the same worst case scenario.		

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6. Assessment of Impacts – defining sensitivity of receptors to loss of fishing area

6.1. Introduction

6.1.1. **Table 4.1** provides an indication of the fisheries which have the potential to be affected by the construction, operation and decommissioning of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor:

Dogger Bank Teesside A & B

- Flatfish fishery;
- Sandeel fishery;
- Seine net fishery; and
- Gillnet fishery.

Dogger Bank Teesside A & B Export Cable Corridor

- Flatfish fishery;
- Sandeel fishery;
- Whitefish trawl fishery;
- *Nephrops* fishery;
- Scallop fishery;
- Pelagic fishery;
- Potting fishery; and
- Gillnet fishery.

6.1.2. The loss of fishing area was the issue of most concern expressed during consultation with fishermen and their representatives. Fishing effort is not uniformly distributed over the North Sea and the main factors determining the density of effort are:

- Fish migration patterns;
- The substrate specificity of target species;
- The nature of the seabed with respect to the feasibility of towing or deploying gears over it; and
- Spatially restrictive legislation.

6.1.3. Whilst it may be argued that loss of fishing area directly relates to loss of catch for highly substrate specific species such as sandeel and *Nephrops*, this is not necessarily the case for more mobile species which are only temporarily resident in areas of exclusion.

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6.1.4. Furthermore, as frequently stated by fishermen, the main factors currently restricting their ability to catch fish are quotas and, in some cases, days at sea restrictions. In addition to which, vessel decommissioning schemes and aggregation of quota onto fewer vessels has led to a reduction in the numbers of vessels operating in the North Sea over the past ten years. In the case of smaller inshore fishing vessels, weather and tidal conditions will be more restrictive than for larger offshore vessels.

6.2. Defining Receptor sensitivity

6.2.1. As previously stated, loss of fishing area was the issue of most concern expressed during consultation with fishermen and their representatives. Fishing effort is not uniformly distributed over the North Sea and the main factors determining the density of effort are:

- Fish migration patterns;
- The substrate specificity of target species;
- The nature of the seabed with respect to the feasibility of towing or deploying gears over it; and
- Spatially restrictive legislation.

6.2.2. It is possible that the nature of the commercial fishing activities within the areas of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor may change over time. Given the many different influencing factors it is however not possible to predict future patterns. The justification for the sensitivity assigned to each receptor is provided below.

6.2.3. The characteristics determining receptor sensitivity provided previously in **Table 3.3** are primarily functions of the size and design of the vessels, the gears operated and the licences and quotas held. Within the spatial and temporal contexts of Dogger Bank Teesside A & B, these are effectively fixed and are therefore the same for each of the projects and the associated Dogger Bank Teesside A & B Export Cable Corridor.

6.2.4. **Table 4.1** provides the principle receptor groups (fisheries) identified as operating within Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor.

Flatfish fishery

Dogger Bank Teesside A & B

6.2.5. Vessels registered under the following nationalities, operating beam and otter trawls for flatfish in the vicinity of Dogger Bank Teesside A & B, are:

- Dutch;
- UK;
- Belgian;
- German; and
- Norwegian.

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6.2.6. Low to negligible levels of Dutch registered beam and otter trawl activity have been recorded in Dogger Bank Teesside A & B. Moderate levels of UK activity have been recorded, however the majority of this activity is by Dutch owned, UK flagged vessels (Anglo-Dutch). The operational ranges of Anglo-Dutch vessels cannot be distinguished from the UK VMS data; however ICES landing data shows where landings by UK beam and otter trawlers are recorded as being landed into Dutch ports (**Figure 6.1**). It should be noted that limitations to this data extraction will apply (i.e. vessels may be UK registered and owned and still landing into Dutch ports).

6.2.7. As shown in **Figure 6.1** and **Figure 6.2** the operational ranges of Anglo-Dutch vessels, Dutch registered otter and beam trawlers and UK registered vessels deploying demersal gears, which includes both beam and otter trawlers, are extensive.

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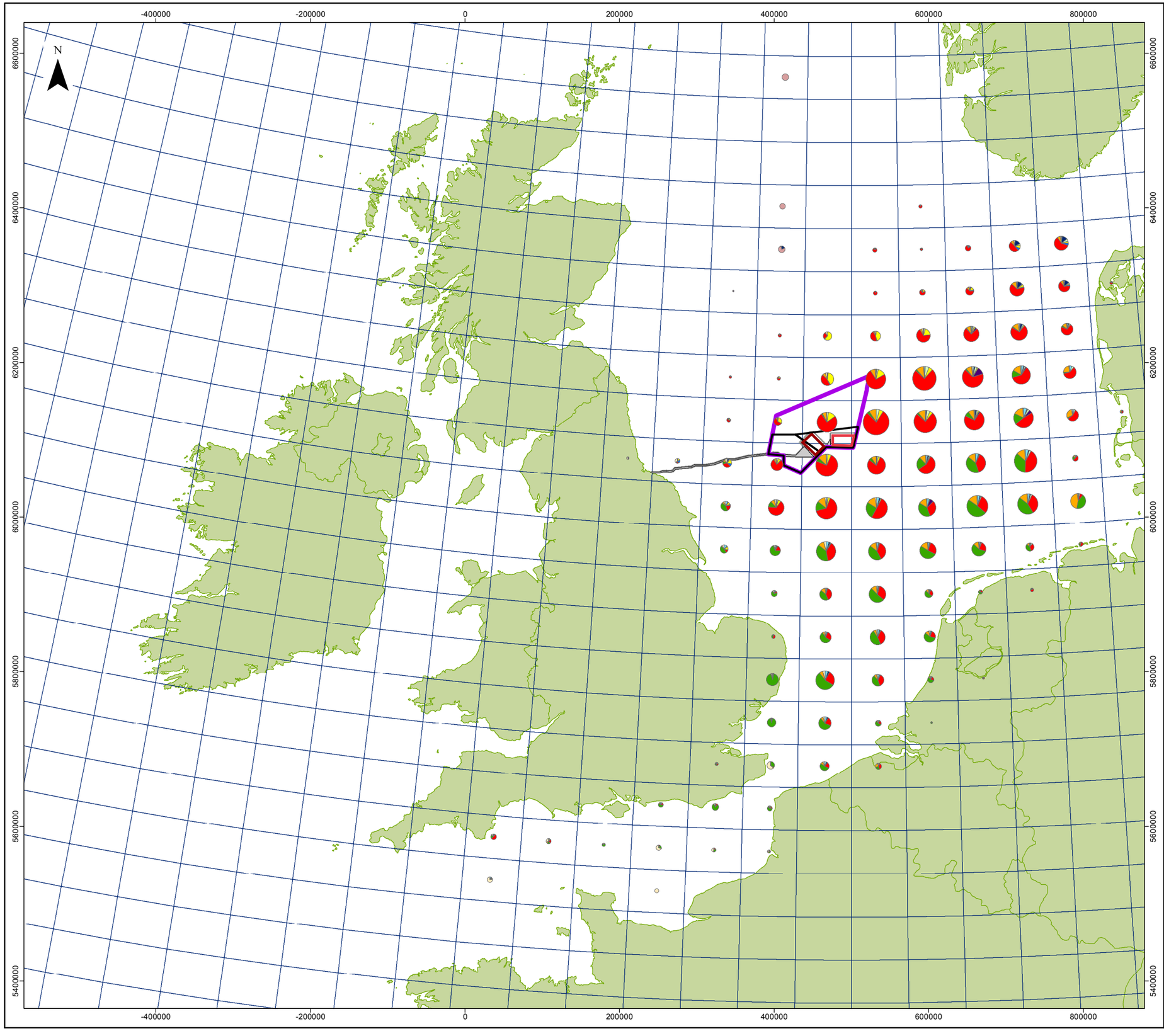

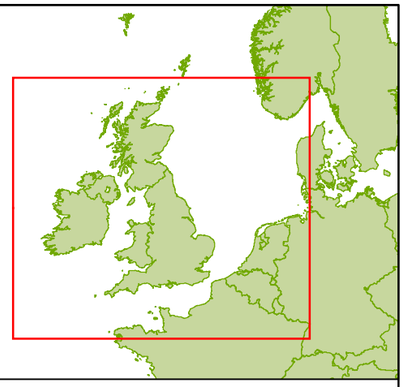

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

Landing values by species

- Brill
- Cod
- Dabs
- Herring
- Lemon sole
- Monks or anglers
- Nephrops
- Plaice
- Sole
- Turbot
- Other species

0 25 50 100
Kilometres

Data Source:
Landings data © MMO, 2011

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.1 Relative landings values by species of UK registered vessels landing into Dutch ports (average 2006 to 2010)

VER	DATE	REMARKS	Drawn	Checked
1	19/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-514

SCALE	PLOT SIZE	DATUM	PROJECTION
1:5,000,000	A3	WGS84	UTM31N

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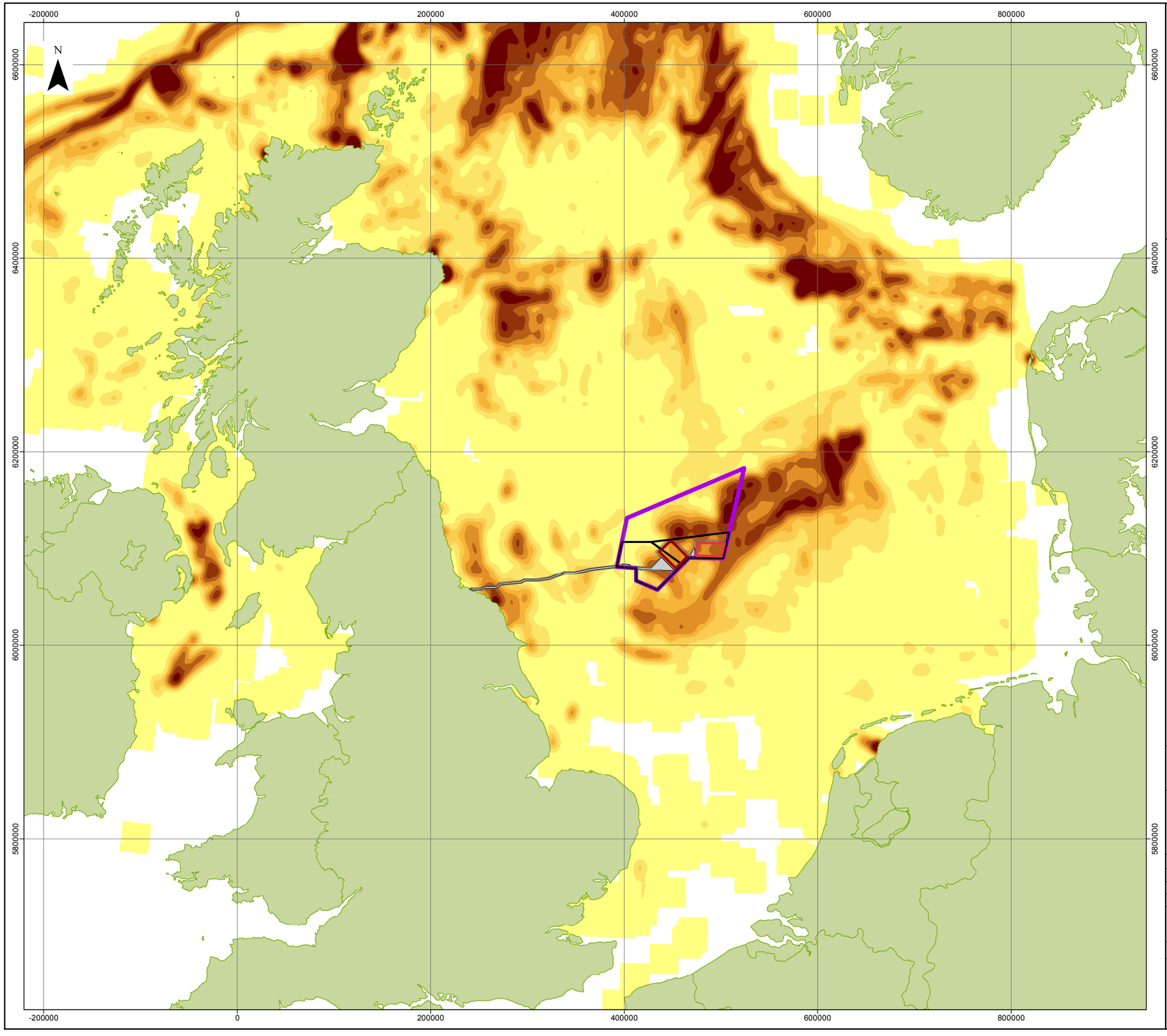

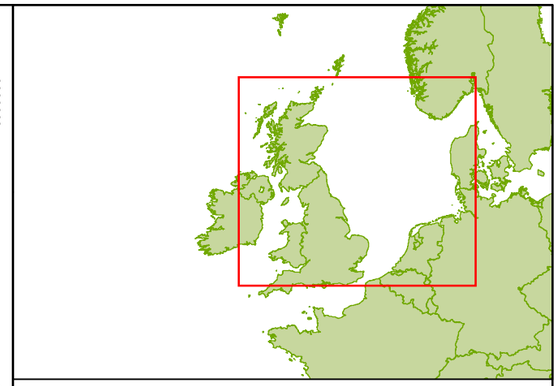

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area

Demersal mobile gears value 2007-2011

- Low
- High

0 25 50 100
Kilometres

Data Source:
Mobile Gear © Marine Scotland, 2011

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.2 Distribution of fishing values of UK vessels operating demersal all mobile gears (average 2007-2011; over-15m only)

VER	DATE	REMARKS	Drawn	Checked
1	25/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-517

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,000,000	A3	WGS84	UTM31N

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6.2.8. Comparatively low levels of Belgian, German and Norwegian otter and beam trawling for flatfish species (principally plaice for the German and Norwegian fleets, although the Belgian otter trawlers mainly target lemon sole) have been recorded within the vicinity of Dogger Bank Teesside A & B. The available grounds of these fisheries are shown in **Figure 6.3** - **Figure 6.5**.

6.2.9. Beam trawlers have, in the past, generally been restricted to deploying one gear type, although some vessels have more recently been converted to operate seine nets (fly-shooting) and otter trawls. Beam trawlers have, on occasion, also pair trawled for pelagic species. They also have the capacity to fish over differing seabed types due to the heavy duty gears utilised. The recent introduction of Pulse and Sum Wing beam trawls has also increased the gear utilisation and diversity of beam trawlers although the Pulse Wing gear is more suited to catching sole, rather than plaice (pers. comm. VisNed April 2013).

6.2.10. Otter trawlers also have some capacity to deploy differing gear types and have the ability to fish a range of seabed types. A significant number of the larger UK trawlers have also diversified into undertaking guard vessel and survey work for the offshore oil and gas, wind farm and cable industries.

6.2.11. As a consequence of their adaptability, tolerance and recoverability, the flatfish fishery receptor group is assigned a low sensitivity (as per the definition in **Table 3.3**).

Dogger Bank Teesside A & B Export Cable Corridor

6.2.12. As shown in **Figure 6.1**, **Figure 4.10**, **Figure 4.11** and **Figure 6.6**, relatively low levels of UK, Dutch and Belgian otter and beam trawling have been recorded in the immediate area of the Dogger Bank Teesside A & B Export Cable Corridor. As a consequence of this versatility and the extent of the fishing grounds, the UK, Dutch and Belgian otter and beam trawling fishery is assigned a low sensitivity. Obtained data and information suggest German and Norwegian vessels do not target a flatfish fishery along the Dogger Bank Teesside A & B Export Cable Corridor.

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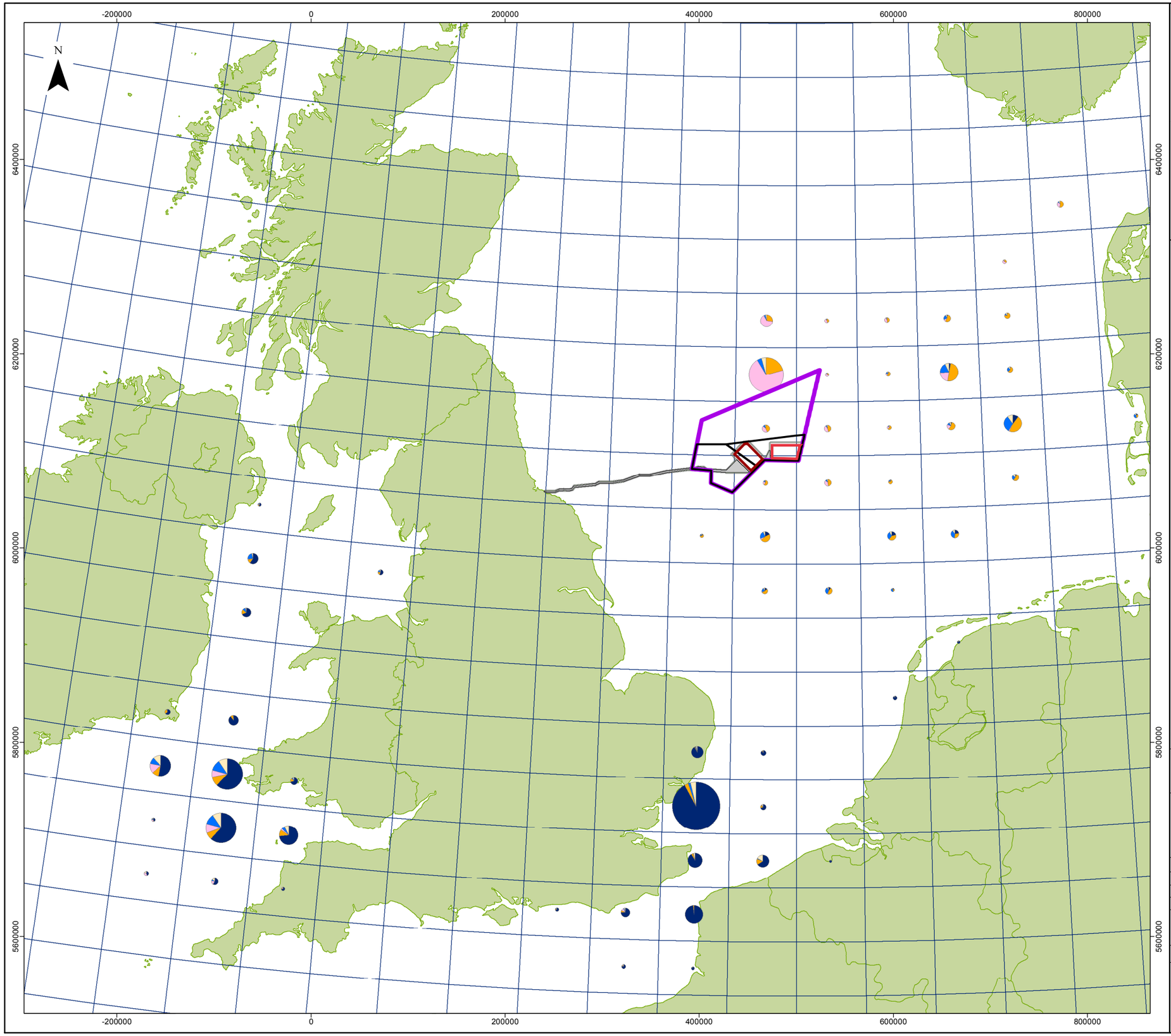

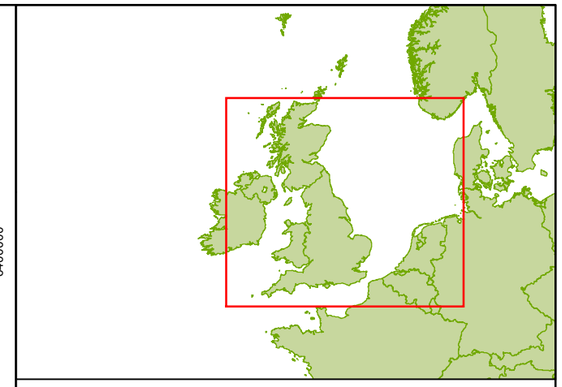

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

Belgain demersal trawl landings values by species

- €10,000
- €50,000
- €100,000
- €500,000
- €1,000,000

- Sole
- Plaice
- Lemon sole
- Turbot
- Other flatfish

0 25 50 100
Kilometres

Data Source:
Landings data © ILVO, 2011

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.3 Belgian demersal trawler landings values (€) by species (average 2006 to 2010)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-518

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,000,000	A3	WGS84	UTM31N

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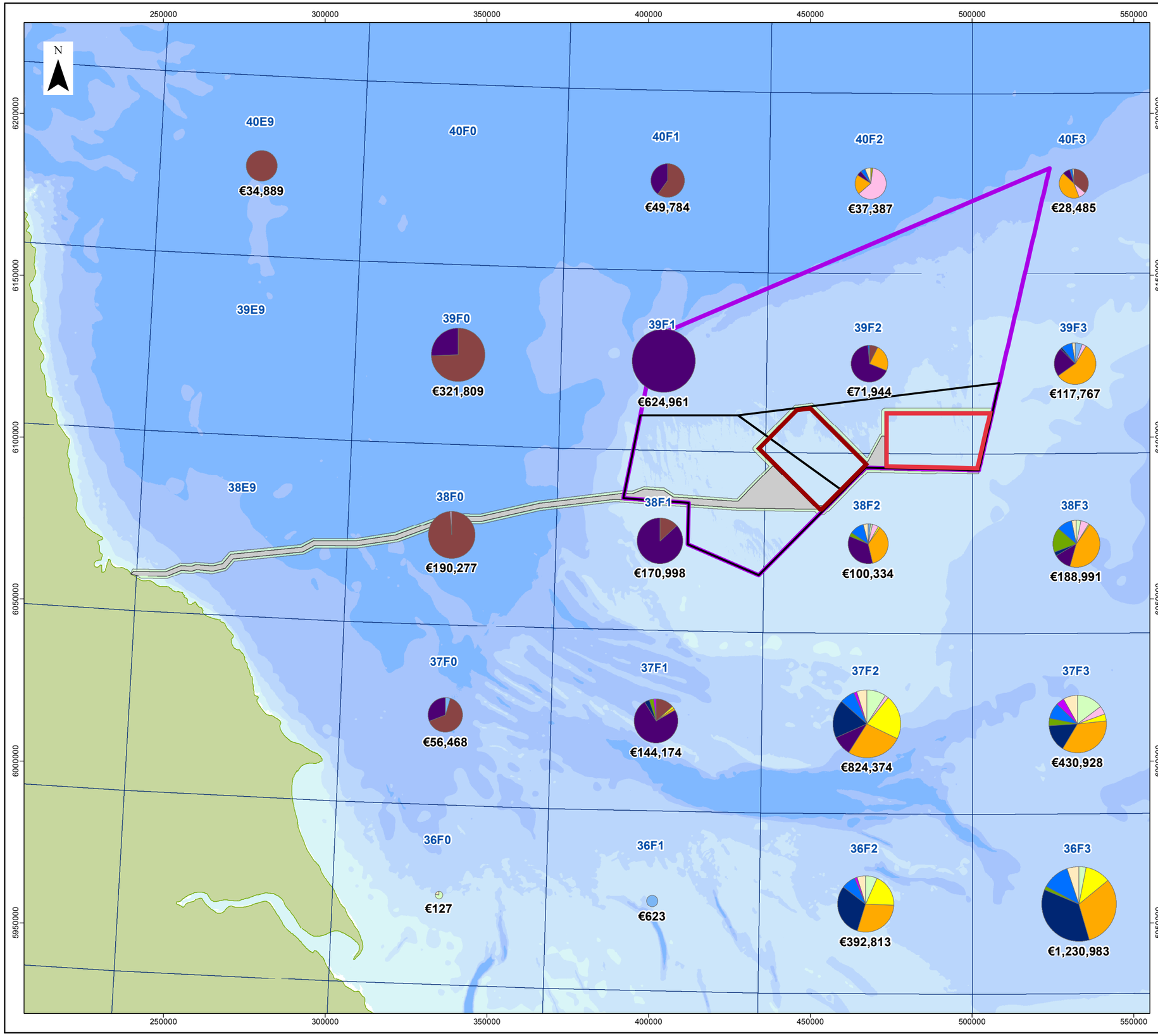

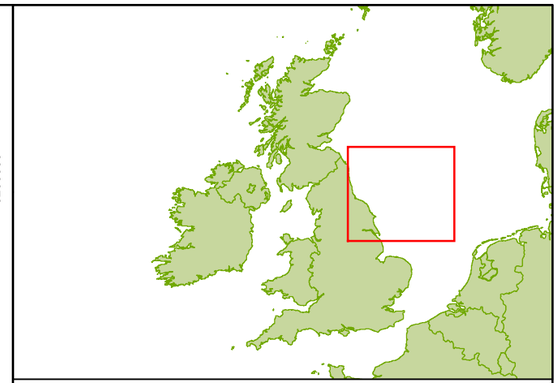

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

Landings values (€) by species

- Angler
- Common shrimp
- Cod
- Herring
- Lemon sole
- Nephrops
- Plaice
- Sandeel
- Sole
- Sprat
- Turbot
- Whiting
- Other

0 10 20 40
Kilometres

Data Source:
Landings data © BLE, 2012
ICES Rectangles © ICES 2012
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.4 German registered vessel landings values (€) by species (average 2007 to 2011)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER: **F-OFL-MA-519**

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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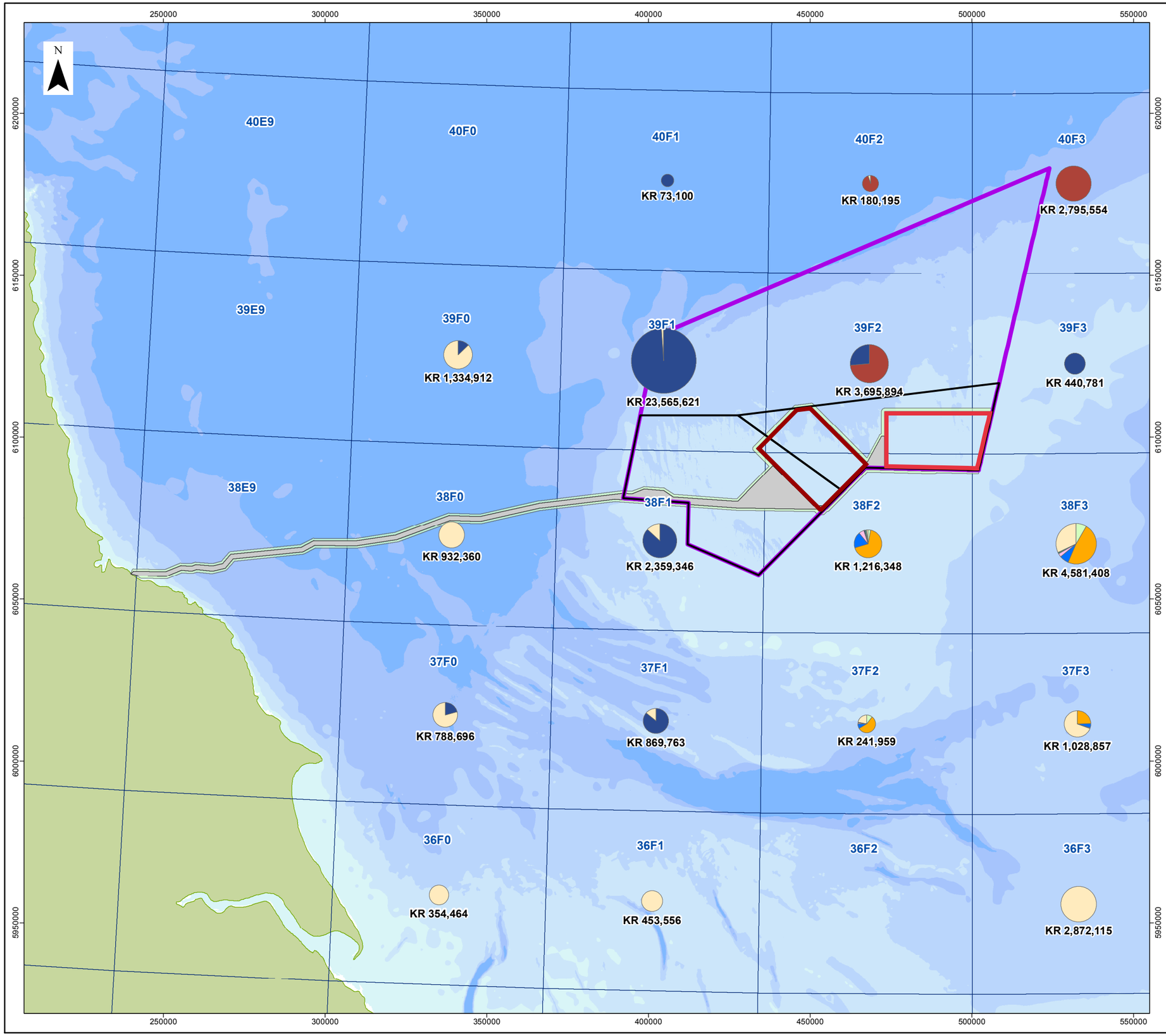

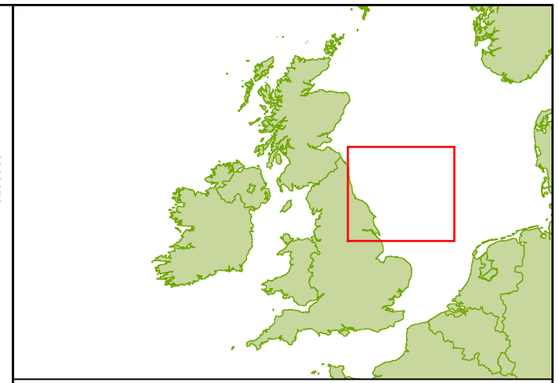

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

Landing alues (Kr) by species

- Horse Mackerel
- Sandeels
- Cod
- Plaice
- Turbot
- Lemon Sole
- Sole
- Dab
- Other Species

0 10 20 40
Kilometres

Data Source:
Landings data © Norwegian FMC, 2012
ICES Rectangles © ICES 2012
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.5 Norwegian landings values (Kr) by species (average 2007 to 2011)

VER	DATE	REMARKS	Drawn	Checked
1	17/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-520

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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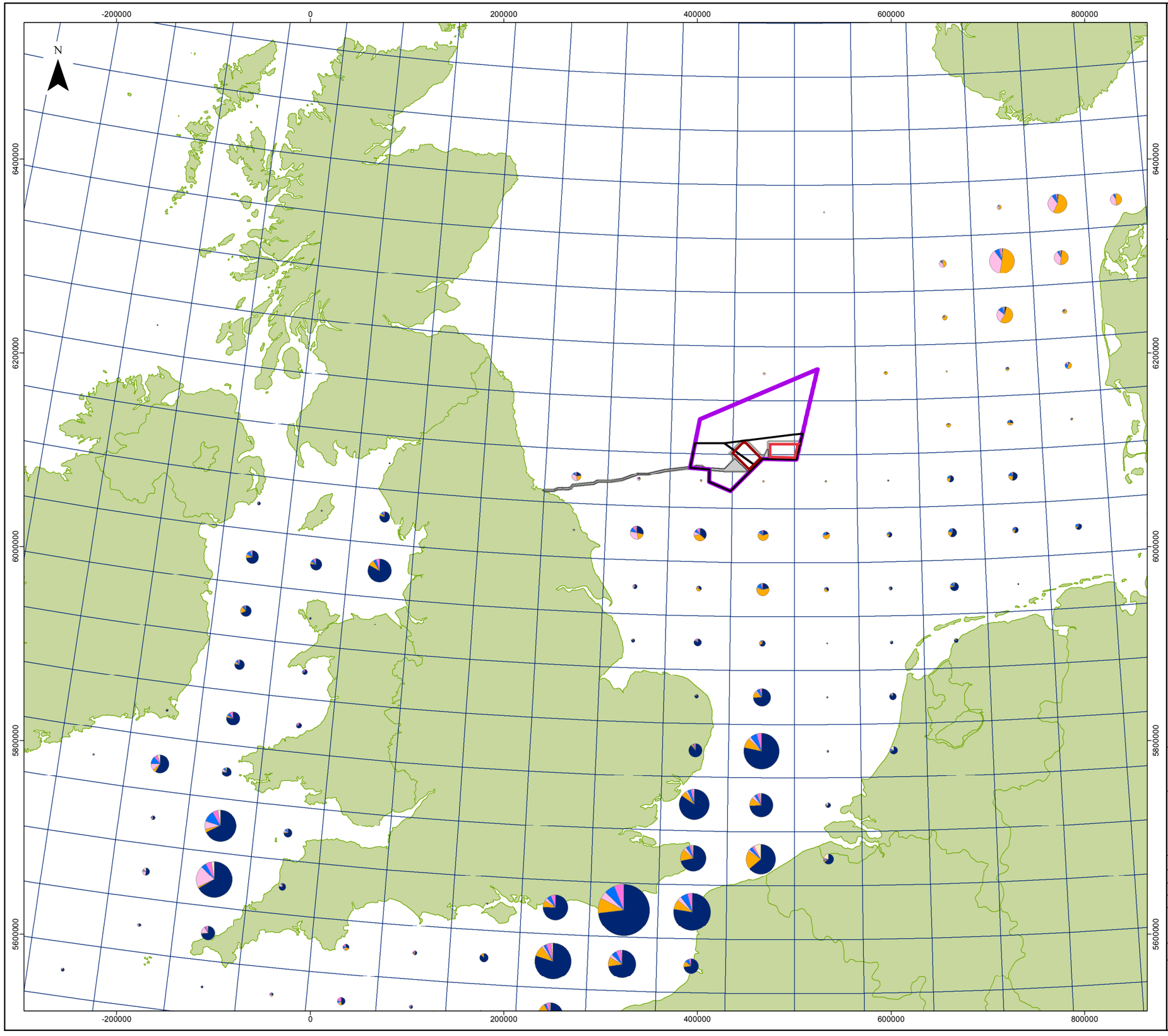

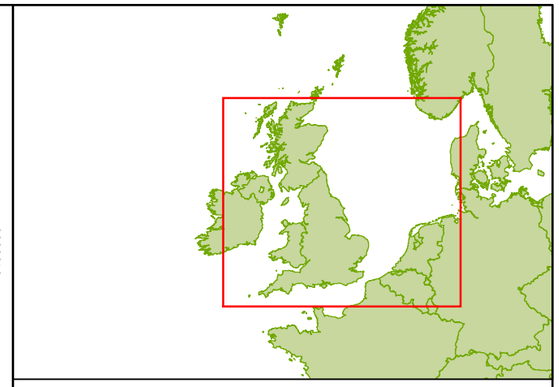

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

Belgain beam trawl landings values by species

- €10,000
- €100,000
- €500,000
- €1,000,000
- €10,000,000

- Sole
- Plaice
- Lemon sole
- Turbot
- Brill
- Other flatfish

0 25 50 100
Kilometres

Data Source:
Landings data © ILVO, 2011

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.6 Belgian beam trawler landings values (€) by species (average 2006 to 2010)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-521

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,000,000	A3	WGS84	UTM31N

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FOREWIND

Sandeel fishery

Dogger Bank Teesside A & B and Dogger Bank Teesside A & B Export Cable Corridor

6.2.13. As shown previously in **Table 4.2**, the nationalities targeting the sandeel fishery on the Dogger Bank include:

- Denmark;
- Norway;
- Germany;
- Sweden; and
- UK.

6.2.14. Grounds are targeted both in the vicinity of Dogger Bank Teesside A & B and in the Dogger Bank Teesside A & B Export Cable Corridor area by the above nationalities; however it is considered that these grounds constitute the same fishery and therefore receptor sensitivity is provided below for both areas.

6.2.15. The spatial extent of the sandeel fishery is largely determined by the substrate specificity of sandeel which is discussed in detail in **Chapter 13**. Extensive Danish sandeel fishing grounds which are, in view of the Danish dominance in this fishery, indicative of the overall operational ranges of sandeel fishing vessels are shown in **Figure 6.7**. Furthermore, vessels designed specifically to target sandeel will, on occasion, fish for other high volume species such as sprat. This is more so the case with the larger pelagic vessels which fish for other species such as mackerel and herring both in the northern North Sea and other areas. As a consequence, the sandeel fishery receptor group is considered to be of low sensitivity.

Seine net fishery

Dogger Bank Teesside A & B

6.2.16. The majority of anchor seine netting activity on the Dogger Bank is by Danish registered vessels, with one UK boat being reported as regularly fishing within the Dogger Bank Zone and six Anglo-Dutch vessels reported as occasionally targeting grounds in the area.

6.2.17. By virtue of the method of gear deployment, vessels engaged in this fishery have limited spatial tolerance due to a reliance on fishing areas devoid of potential fasteners. As shown by **Figure 6.8**, whilst not as extensive as those of the two receptor groups discussed above, taking the lower numbers of vessels involved, the seine netting grounds appear comparatively extensive. As such the seine net fishery has been assigned a medium sensitivity.

Netting fishery

Dogger Bank Teesside A & B

6.2.18. **Table 4.1** shows that gillnet fishing grounds located within the vicinity of Dogger Bank Teesside A & B are fished by Danish vessels targeting turbot only.

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6.2.19. There are low numbers of Danish gillnet vessels, which on occasions, fish the Dogger Bank area (**Figure 6.9**). During consultation it was stated that fishing occurs within Dogger Bank Teesside A & B only in the summer months targeting turbot. **Figure 6.10** shows the Dogger Bank fishing areas of a Danish gillnet vessel targeting turbot. Vessels targeting this species are generally large and able to target grounds elsewhere outside of the Dogger Bank area; therefore the sensitivity of this receptor group is low.

Dogger Bank Teesside A & B Export Cable Corridor

6.2.20. Netting fishing grounds within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor are targeted by UK vessels only, targeting cod, pollock, salmon and sea trout and flatfish species.

6.2.21. Based on MMO statistics low level static netting activity by the inshore fleet occurs in the area of the Dogger Bank Teesside A & B Export Cable Corridor (**Figure 6.11**).

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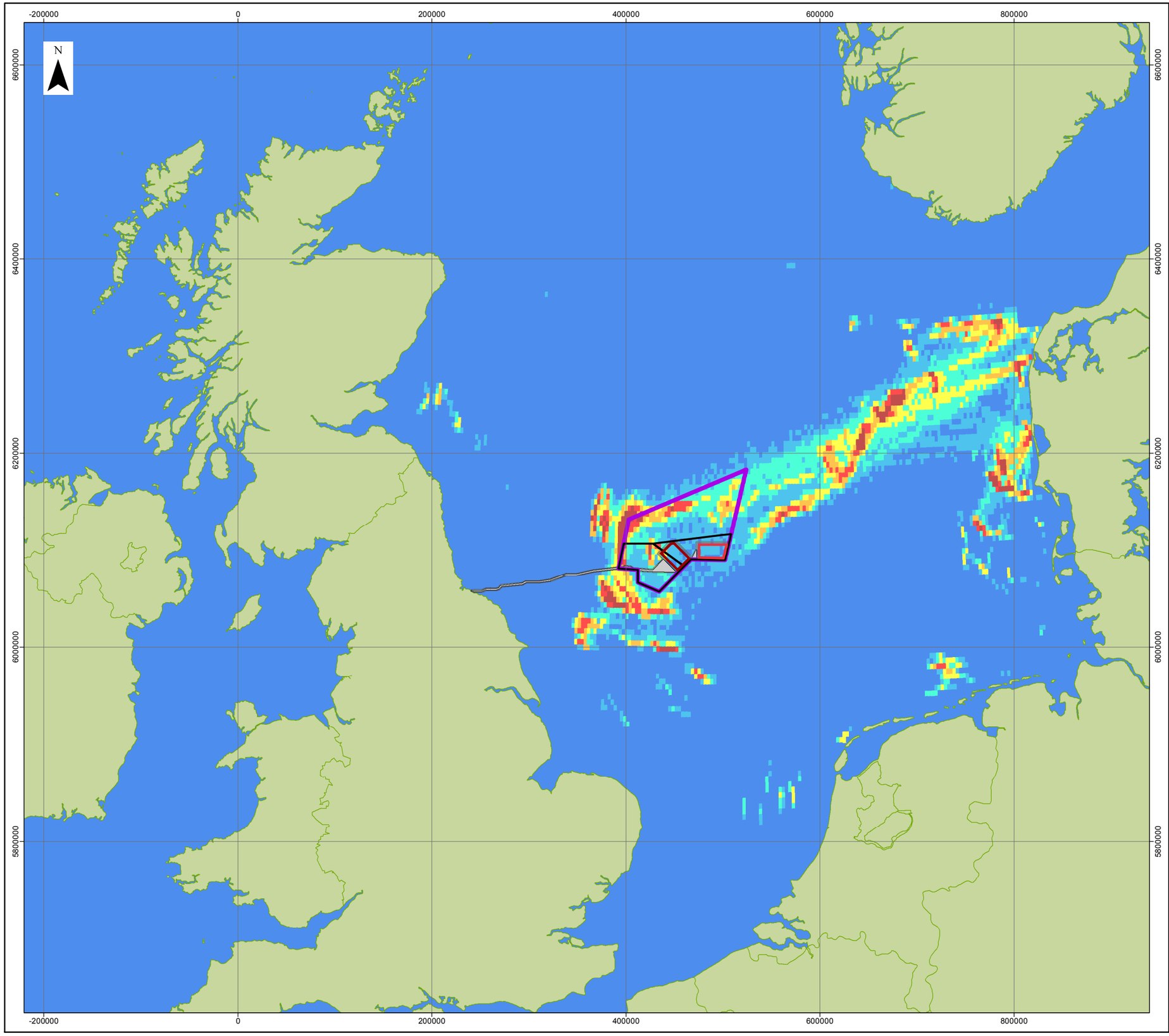

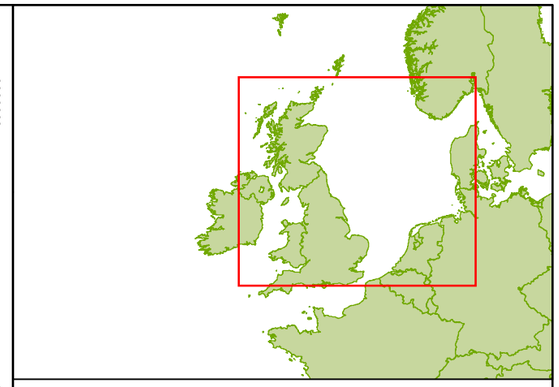

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area

Danish sandeel satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

0 25 50 100
Kilometres

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.7 Extent of Danish sandeel trawling grounds, VMS (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-522

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,000,000	A3	WGS84	UTM31N

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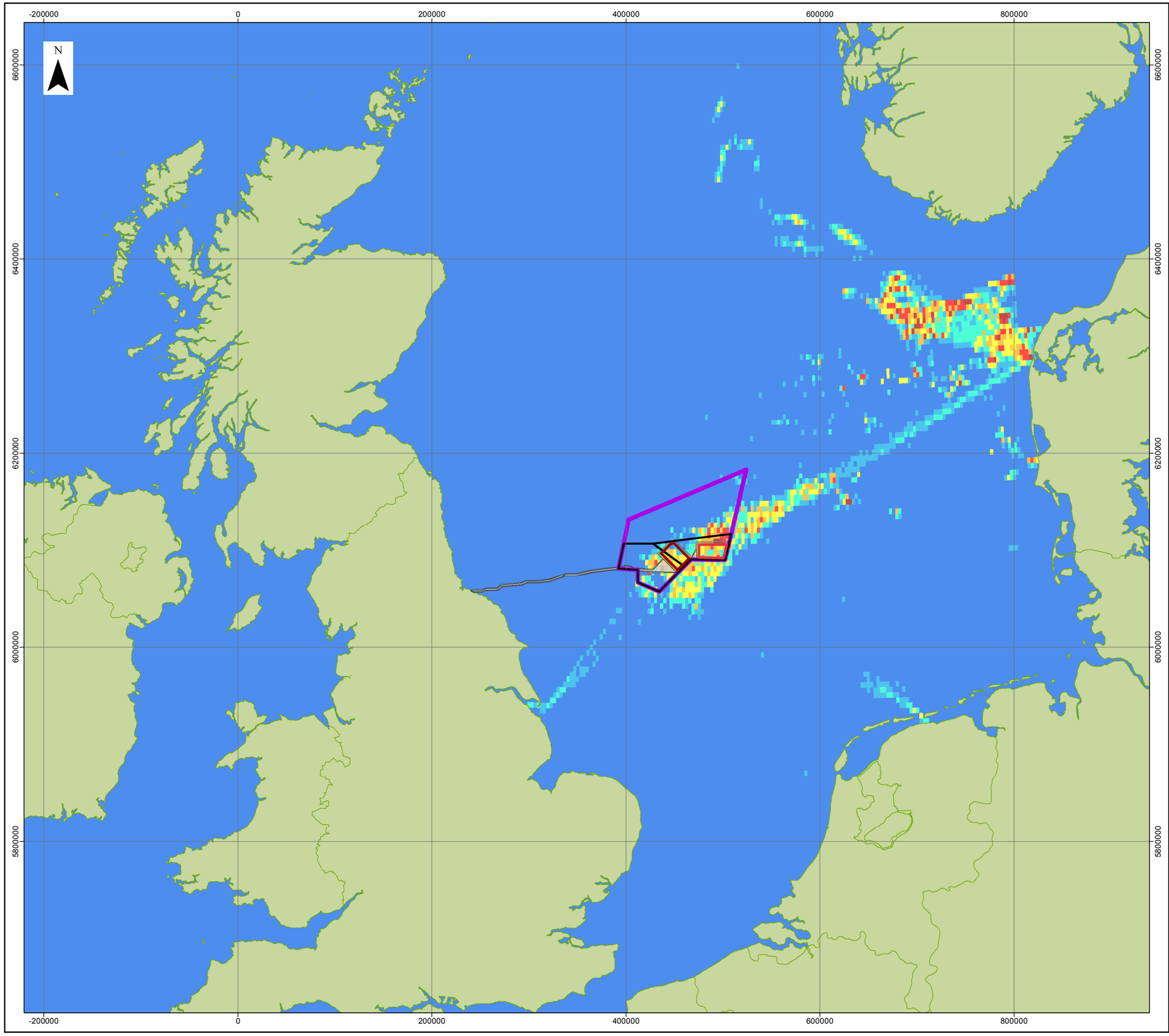

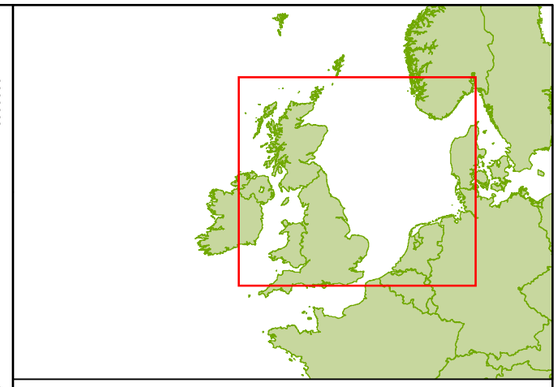

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export cable corridor
- Temporary works area

Danish seine satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

0 25 50 100
Kilometres

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.8 Danish distribution of seine net fishing grounds, VMS (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-523

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,000,000	A3	WGS84	UTM31N

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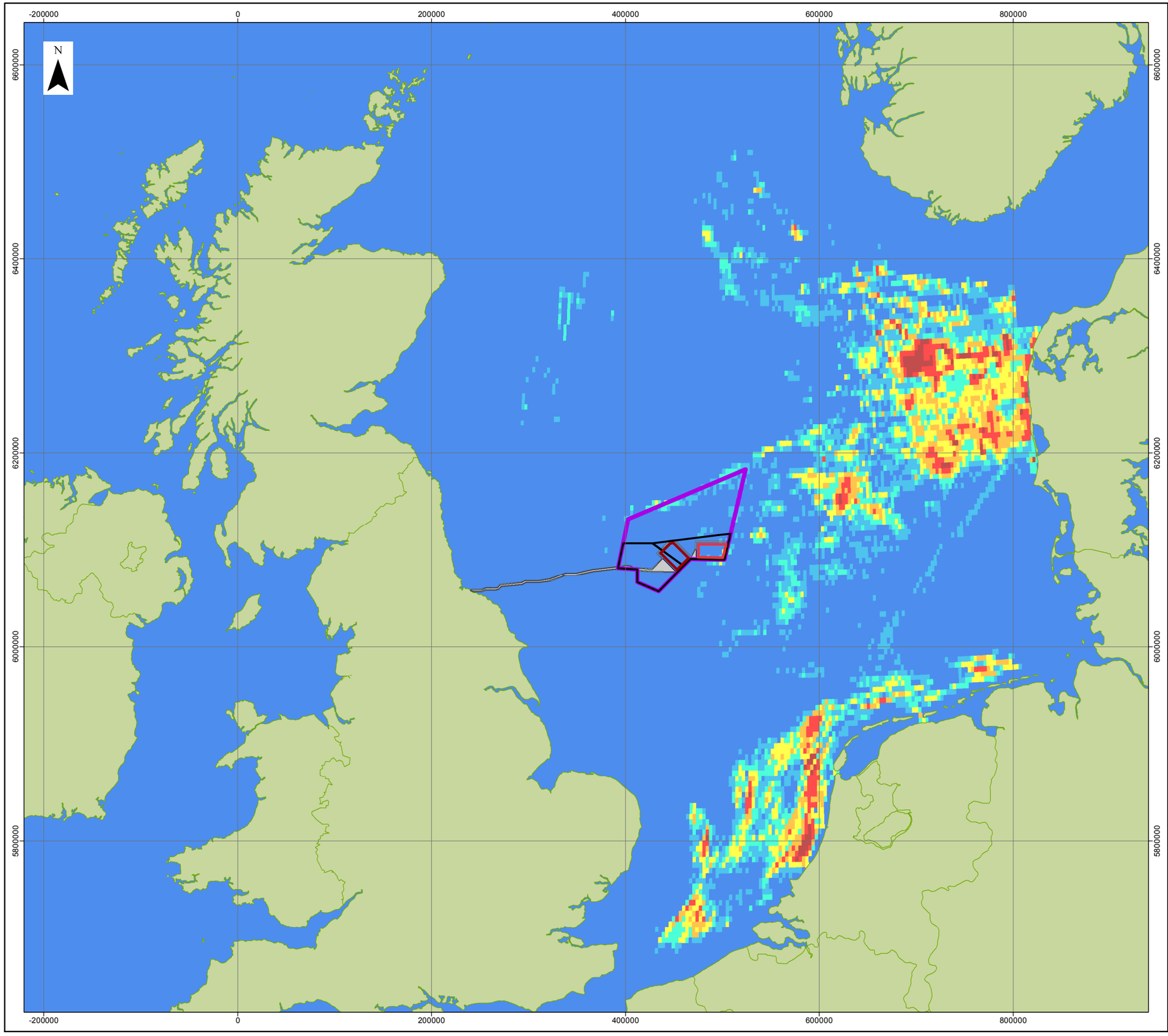

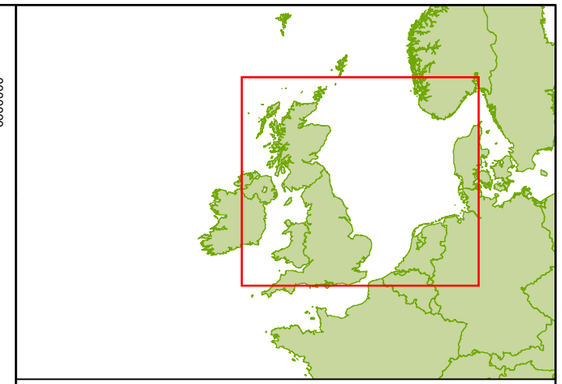

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area

Danish gill net satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

0 25 50 100
Kilometres

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.9 Danish distribution of gill and trammel net activity (VMS) by density (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-524

SCALE	1:4,000,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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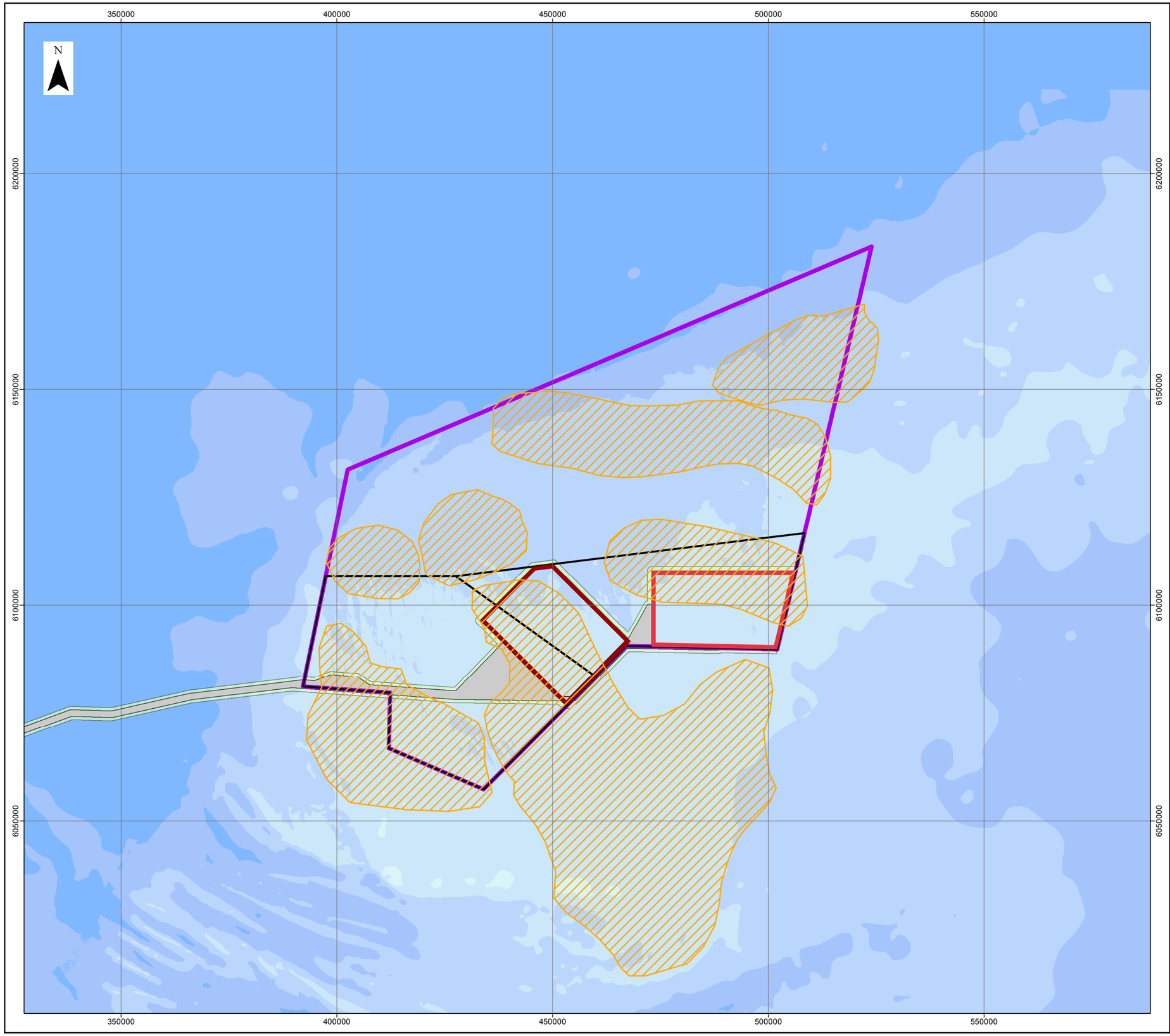

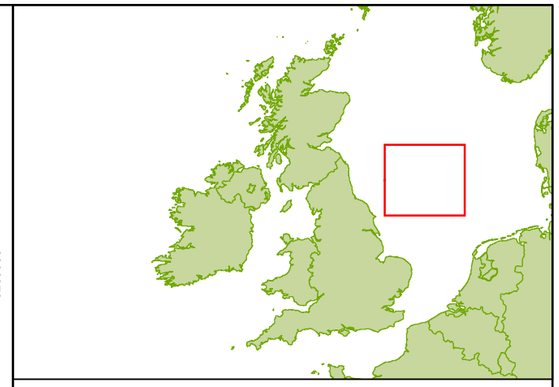

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Danish gillnet fishing ground

0 5 10 20
Kilometres

Data Source:
Fishing ground © Brown & May Marine 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.10 Dogger Bank fishing areas of the annette dahl, Danish gill net vessel

VER	DATE	REMARKS	Drawn	Checked
1	17/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER: **F-OFL-MA-525**

SCALE	1:900,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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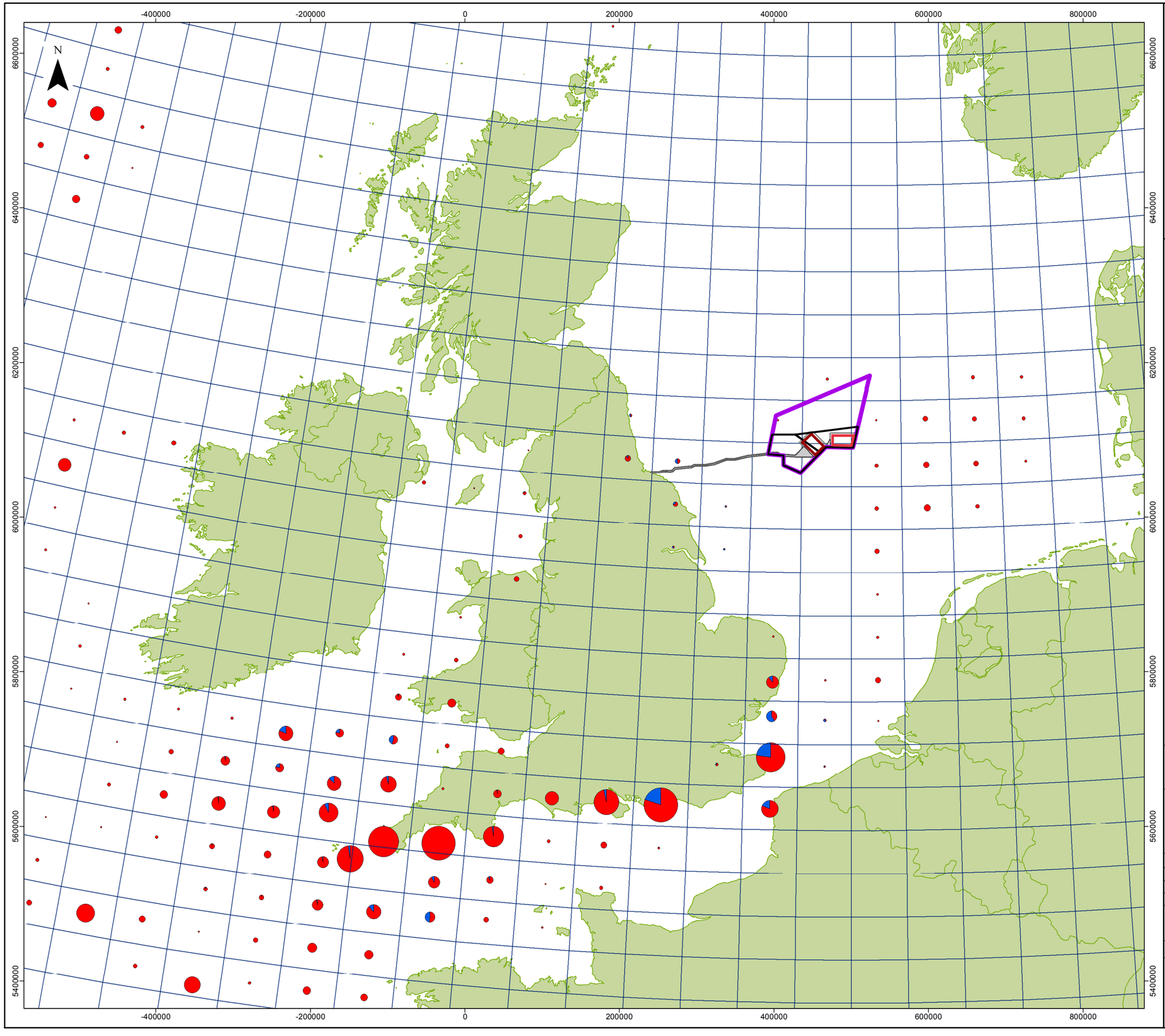

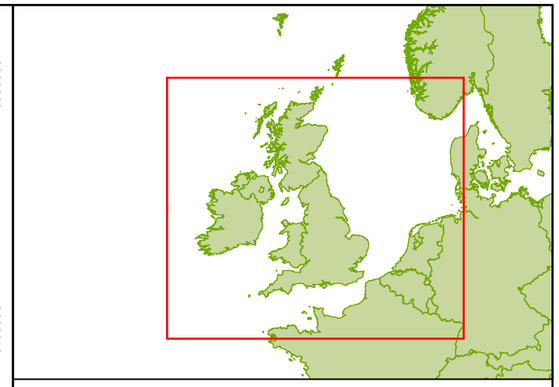

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

UK static netting landings values by method*

- 10,000
- 50,000
- 100,000
- 500,000
- 1,000,000

- Gillnets
- Trammel nets

* Rectangles < £5,000 total removed for display purposes

0 25 50 100
Kilometres

Data Source:
Landings data © MMO, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.11 UK netting landings values (£) by method (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-526

SCALE	PLOT SIZE	DATUM	PROJECTION
1:5,000,000	A3	WGS84	UTM31N

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FOREWIND

6.2.22. Drift netting for salmon and sea trout in the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor is the largest commercial coastal salmonid fishery in England and Wales (**Figure 6.12**). In 2012, 35 salmon net licences were issued in the northern Northumbria district. No licences were issued in the southern Northumbrian district in 2012, and only one T net licence was issued in 2011 (Environment Agency & Cefas 2012). Environment Agency data indicates that the highest numbers of salmon and sea trout are caught in the northern Northumbria region (District 1). Catches from the southern region (District 2) which the Dogger Bank Teesside A & B Export Cable Corridor passes through are significantly lower (Environment Agency & Cefas 2012) (For further information on the numbers of salmon sea trout catches from these fisheries see **Appendix 15A**).

6.2.23. Drift netting is restricted to the intertidal and shallow subtidal region and since the exact location of areas fished is not known, it is assumed that some activity may occur within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor. Due to the spatially restricted nature of the fishery and the limited operational range of the vessels, the sensitivity of this receptor group is medium. Whilst the static net vessels also have limited operational ranges, it is understood that the majority of the boats concerned target a variety of species using a number of netting methods. The sensitivity of this receptor group is therefore considered to be medium.

Whitefish trawl fishery

Dogger Bank Teesside A & B Export Cable Corridor

6.2.24. Grounds within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor are fished for whitefish species, principally cod, haddock and whiting (**Table 4.1**). Both UK and French registered vessels fish these grounds, although smaller, under-15m UK registered vessels will fish grounds closer to the coast whereas over-15m UK and French registered vessels will fish grounds further offshore.

6.2.25. Fishing activity by the local, under-15m UK fleet is concentrated on the inshore section of the Dogger Bank Teesside A & B Export Cable Corridor at a low to moderate levels (**Figure 6.13**). Whilst under 10m vessels in particular are more restricted by their operational ranges, they catch a range of species. The sensitivity of this fishery is therefore considered to be medium being of lower sensitivity than the inshore potting vessels targeting shellfish as discussed in Section 6.2.35 below.

6.2.26. **T**he fishing grounds for the over-15m UK whitefish fleet are located to the north, off the coast of Scotland and are extensive and therefore the sensitivity of this fishery is low.

6.2.27. During consultation with French fishermen and their representatives it was apparent that their fishing areas are wide ranging, targeting a variety of fisheries. Fishing activity by French vessels targeting whitefish is low within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor. This receptor group is therefore assigned a low sensitivity.

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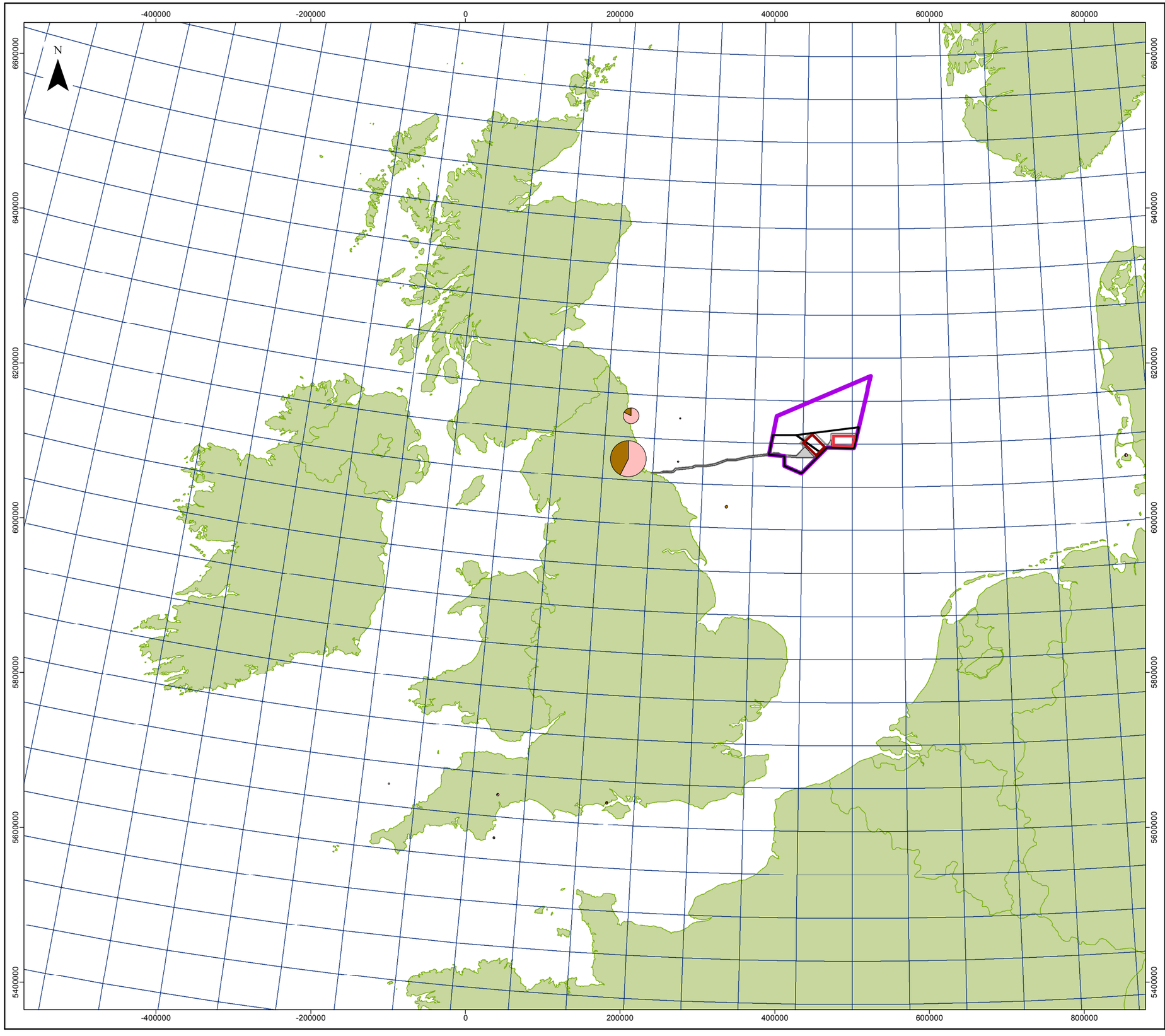

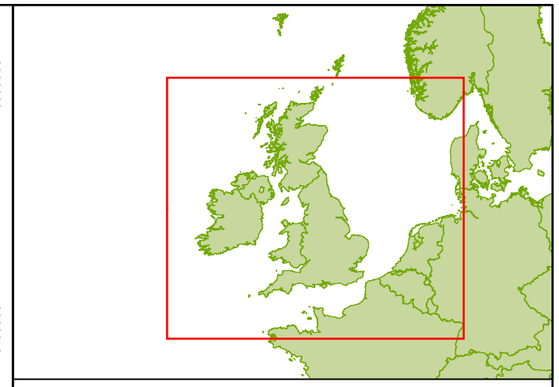

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

UK drift net landings values for Salmon & Sea Trout*

- 100
- 500
- 1,000
- 5,000
- 10,000

- Salmon
- Sea Trout

* Rectangles < £100 total removed for display purposes

0 25 50 100
Kilometres

Data Source:
Landings data © MMO, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.12 UK Salmon and Sea Trout landings values (£) (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	17/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-527

SCALE	PLOT SIZE	DATUM	PROJECTION
1:5,000,000	A3	WGS84	UTM31N

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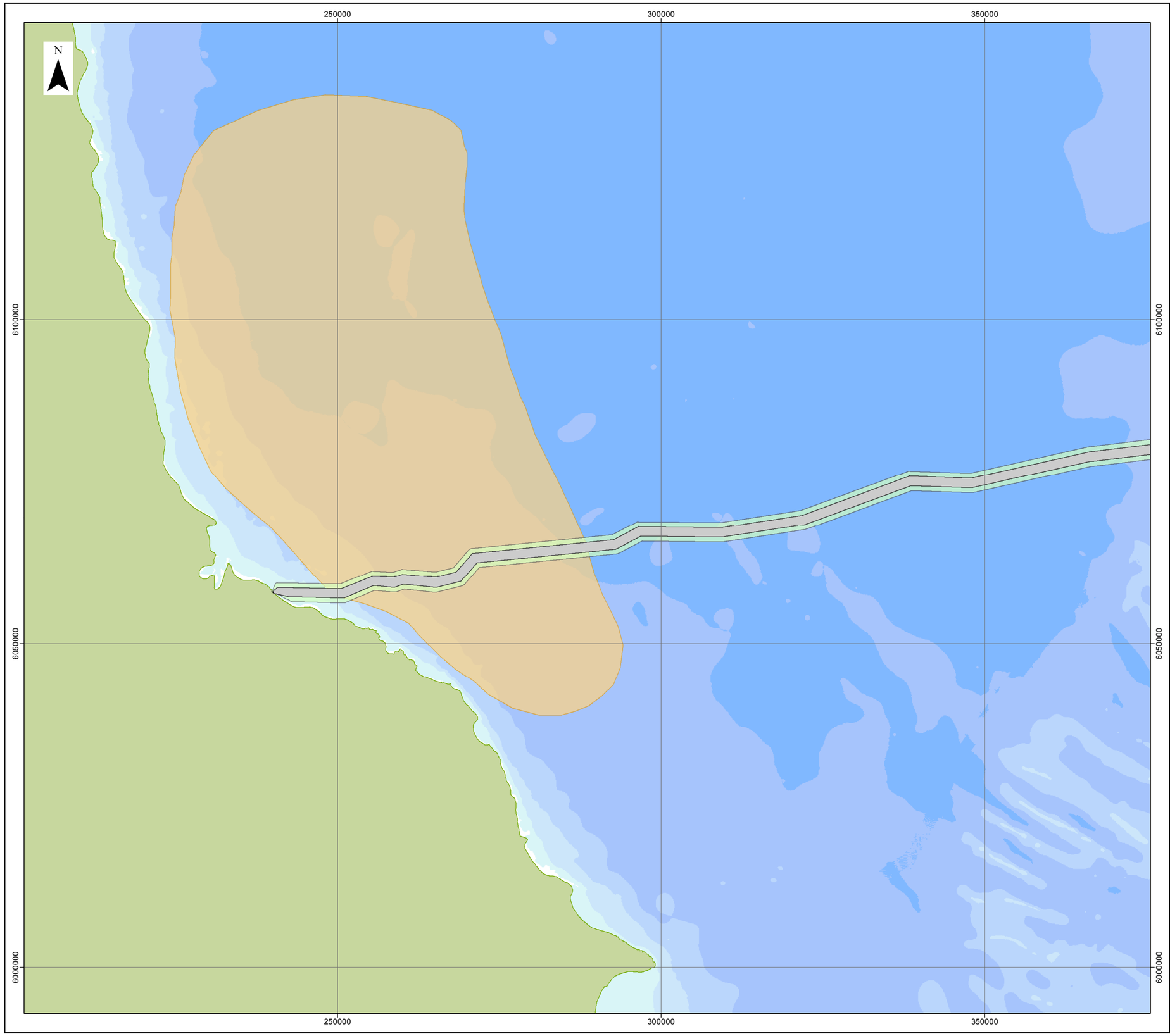

LEGEND

- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Teesside main trawl area (Hartlepool vessels)

0 5 10 20
Kilometres

Data Source:
Trawl area - P. Walsh. 22nd May 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.13 Key fishing grounds for the under-15m otter trawling fleet based at Hartlepool

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-528

SCALE	1:600,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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Dogger Bank Teesside A & B Export Cable Corridor

6.2.28. The *Nephrops* fishery is the highest value fishery within the general area of the Inshore Dogger Bank Teesside A & B Export Cable Corridor. The majority of vessels fishing for *Nephrops* within the vicinity of the area of Inshore Dogger Bank Teesside A & B Export Cable Corridor are under-15m in length and based at Hartlepool. **Figure 6.14** shows the distribution of activity by vessels deploying *Nephrops* mobile gears in the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor utilising VMS data provided by Marine Scotland (over-15m vessels only). **Figure 6.15** shows the total landings values for *Nephrops* from all vessels by size category. Landings from the under 10m fleet constitute approximately 50% of *Nephrops* landings from ICES rectangle 38E8. However, as *Nephrops* are a substrate specific species, it is assumed that the grounds targeted by the under-15m (including under 10m) will be broadly similar to those depicted in **Figure 6.15**. As these grounds within ICES rectangle 38E8 are located to the north of the Dogger Bank Teesside A & B Export Cable Corridor, it is not expected that the Dogger Bank Teesside A & B Export Cable Corridor will intersect these *Nephrops* fishing grounds. It is understood from consultation that the *Nephrops* grounds in the general vicinity of Dogger Bank Teesside A & B Export Cable Corridor are located in widely dispersed pockets of soft sediment which support a lower order of density of *Nephrops* than in the main grounds to the north of the Dogger Bank Teesside A & B Export Cable Corridor. Due to the size of the vessels they are restricted by time at sea and gear flexibility and therefore have restricted operational ranges. As a result the sensitivity of the inshore *Nephrops* fishery is considered to be medium.

Scallop fishery

Dogger Bank Teesside A & B Export Cable Corridor

6.2.29. The scallop fishery located within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor is targeted by nomadic scallop dredge vessels which are able to target grounds over a very wide area, such as in the Irish Sea and the English Channel (**Figure 6.16**). As a result, the scallop fishery has been assigned a low sensitivity.

Pelagic fishery

Dogger Bank Teesside A & B Export Cable Corridor

6.2.30. Pelagic vessels fish grounds along the Dogger Bank Teesside A & B Export Cable Corridor, targeting herring. Vessels registered under the following nationalities are engaged in this fishery include:

- UK;
- Germany;
- Sweden; and
- Norway.

6.2.31. **Figure 6.4** (German), **Figure 6.5** (Norwegian), **Figure 6.17** (Swedish) and **Figure 6.18** (UK) illustrate the extent of the fishing areas of pelagic vessels. It can be seen that herring is targeted by these vessels in the Offshore Dogger

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Bank Teesside A & B Export Cable Corridor area. It should be recognised that the German, Norwegian and Swedish data does not include activity in the Baltic Sea or parts of the Northern North Sea, where the vessels also operate. Using the UK data however, it is apparent that grounds are widespread, with the majority of activity concentrated off the coast of Scotland and west coast of Ireland.

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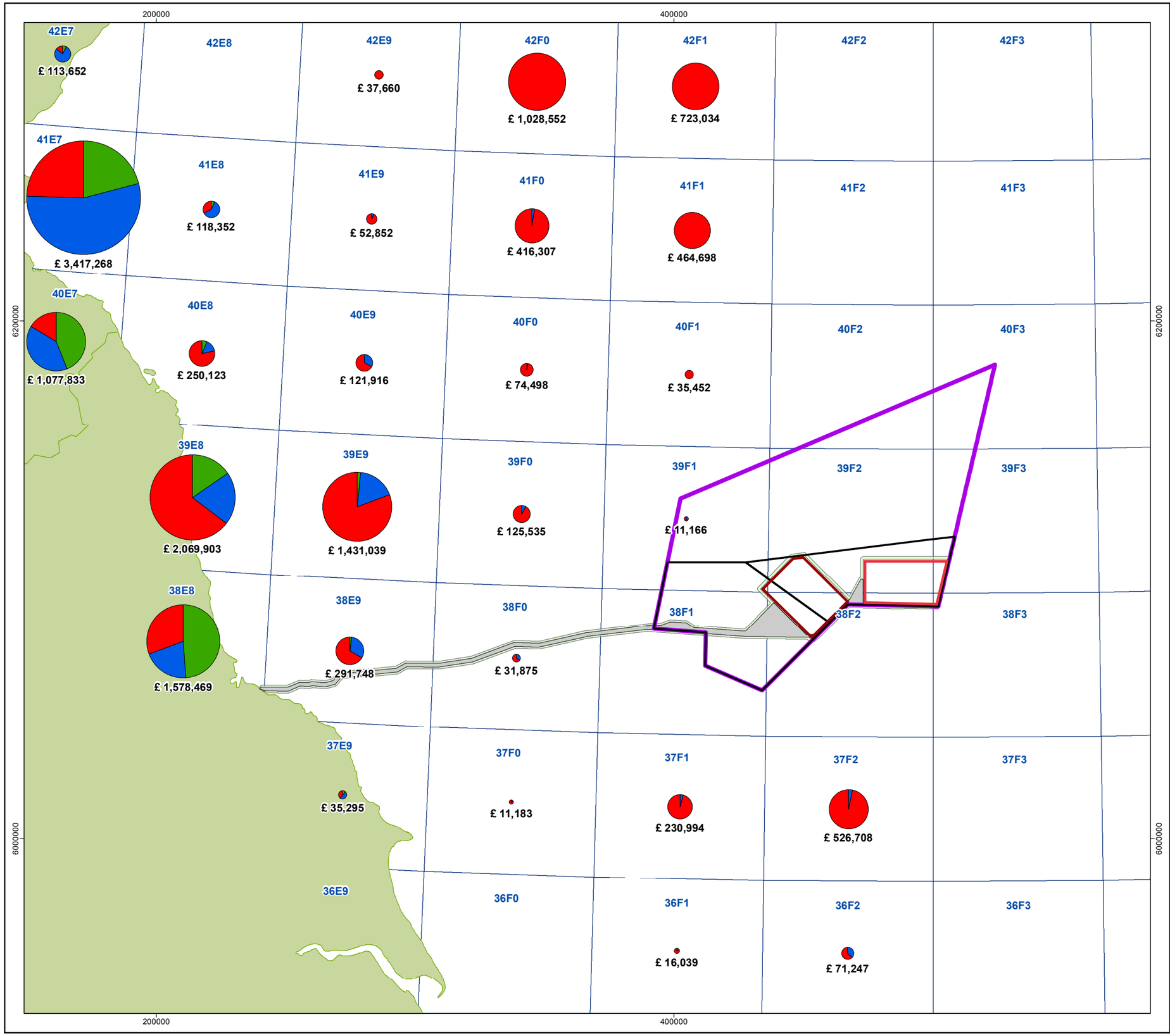

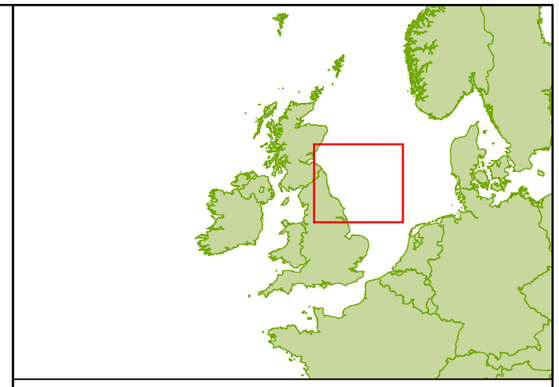

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

Nephrops landings value by vessel size*

- Under 15m vessels
- 10m to 15m vessels
- 15m and over vessels

* Rectangles < £10,00 total removed for display purposes

0 10 20 40
Kilometres

Data Source:
Landings data © MMO, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.14 UK only Nephrops mobile gear by vessel size category (2008-2012)

VER	DATE	REMARKS	Drawn	Checked
1	13/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-527

SCALE	1:1,500,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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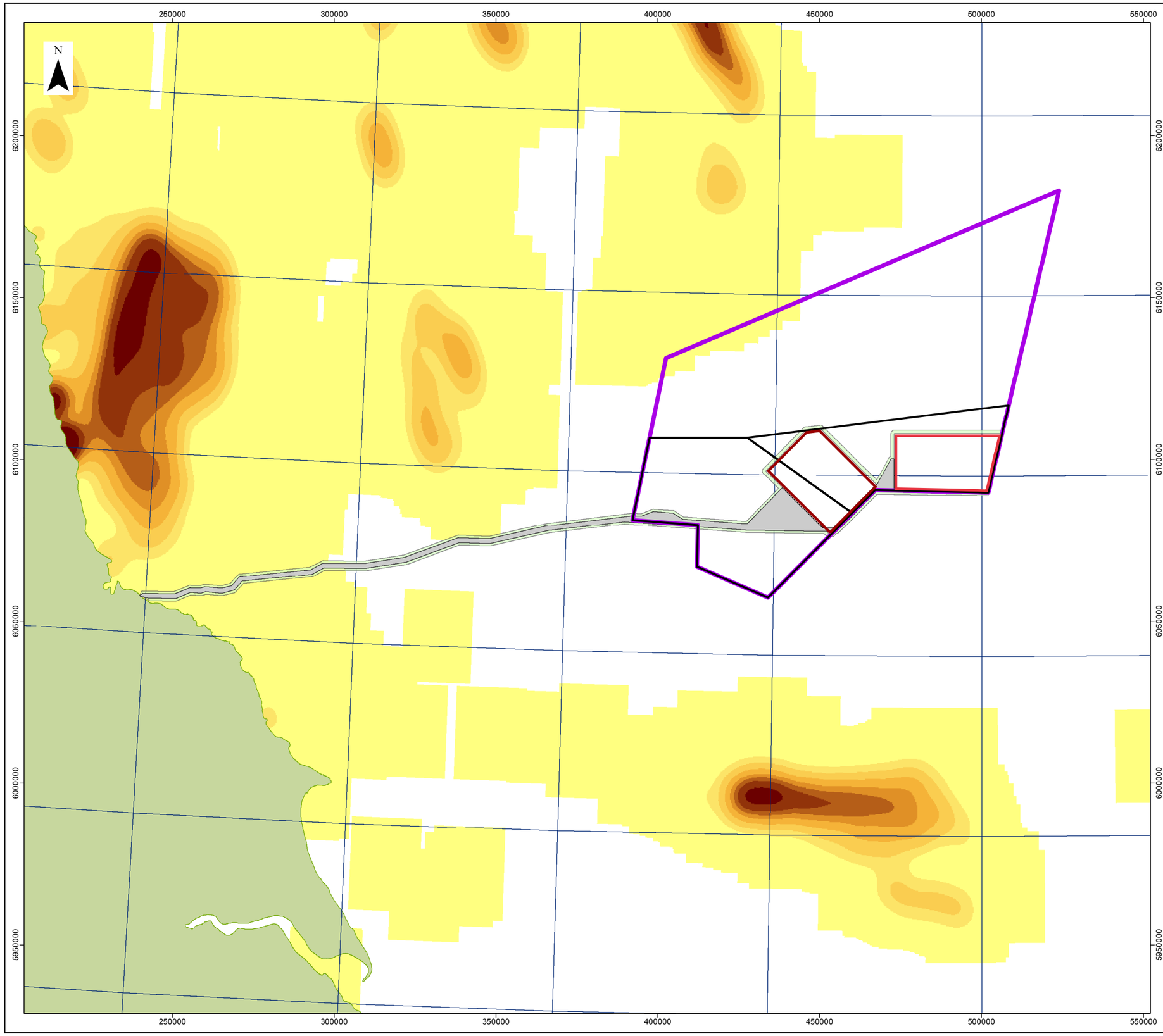

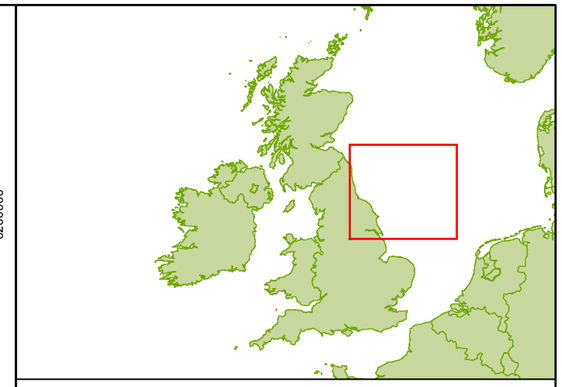

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

Nephrops mobile gears value 2007-2011

- Low
- High

0 10 20 40
Kilometres

Data Source:
Mobile Gear © Marine Scotland, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.15 UK commercial fisheries distribution, nephrops mobile gear (2007-2011)

VER	DATE	REMARKS	Drawn	Checked
1	25/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-530

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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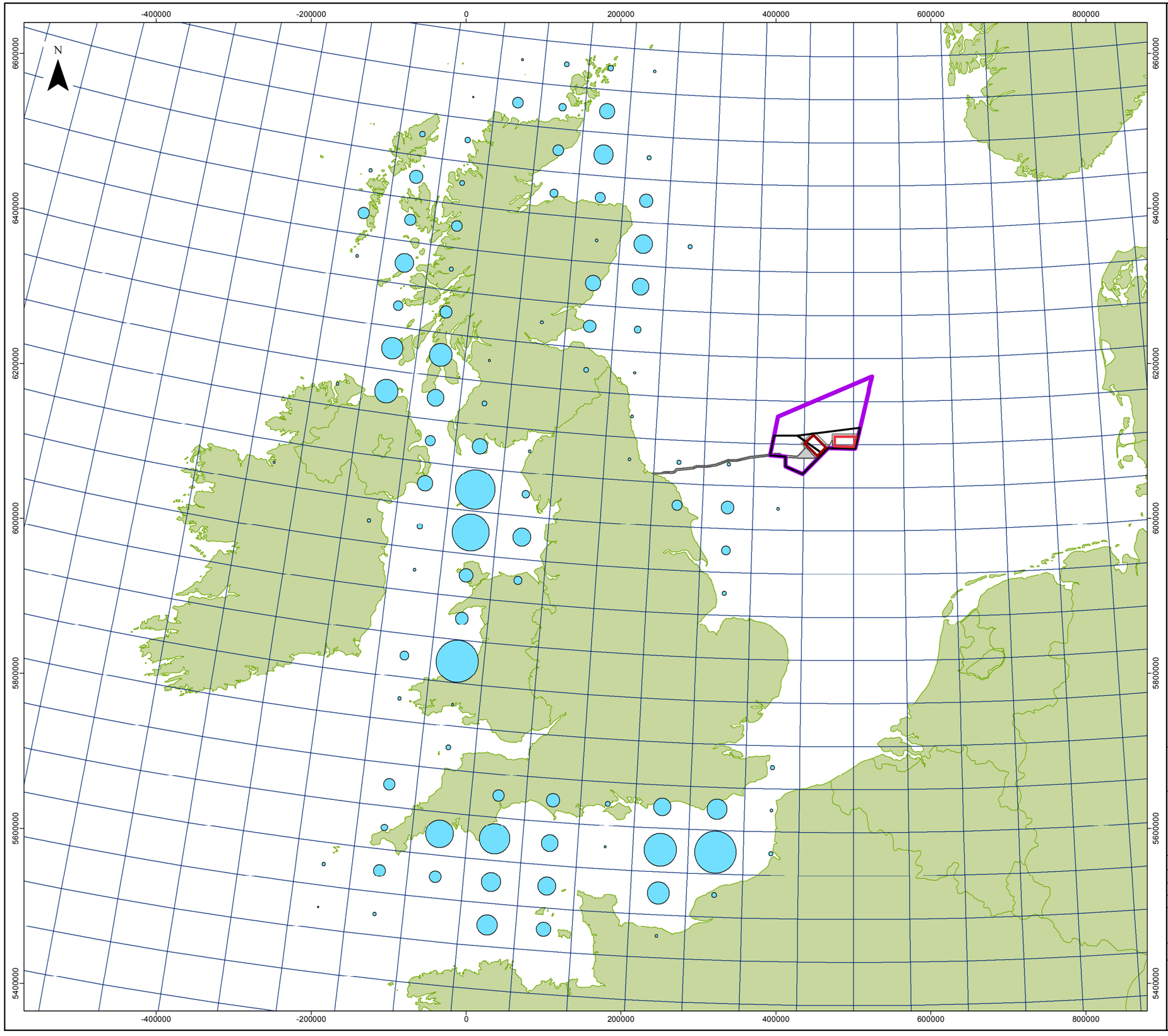

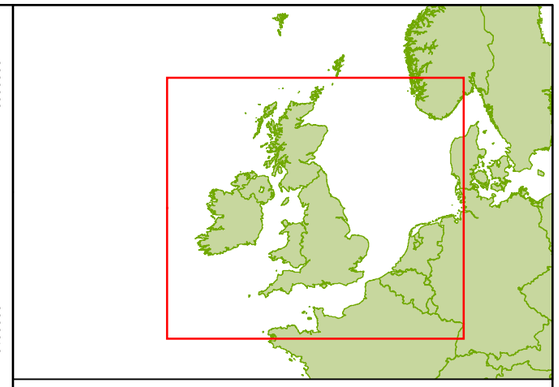

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

UK scallop dredging landings values

- 10,000
- 50,000
- 100,000
- 500,000
- 1,000,000

* Rectangles < £10,000 total removed for display purposes

0 25 50 100
Kilometres

Data Source:
Landings data © MMO, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.16 UK scallop dredging landings values (£) (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-531

SCALE	1:5,000,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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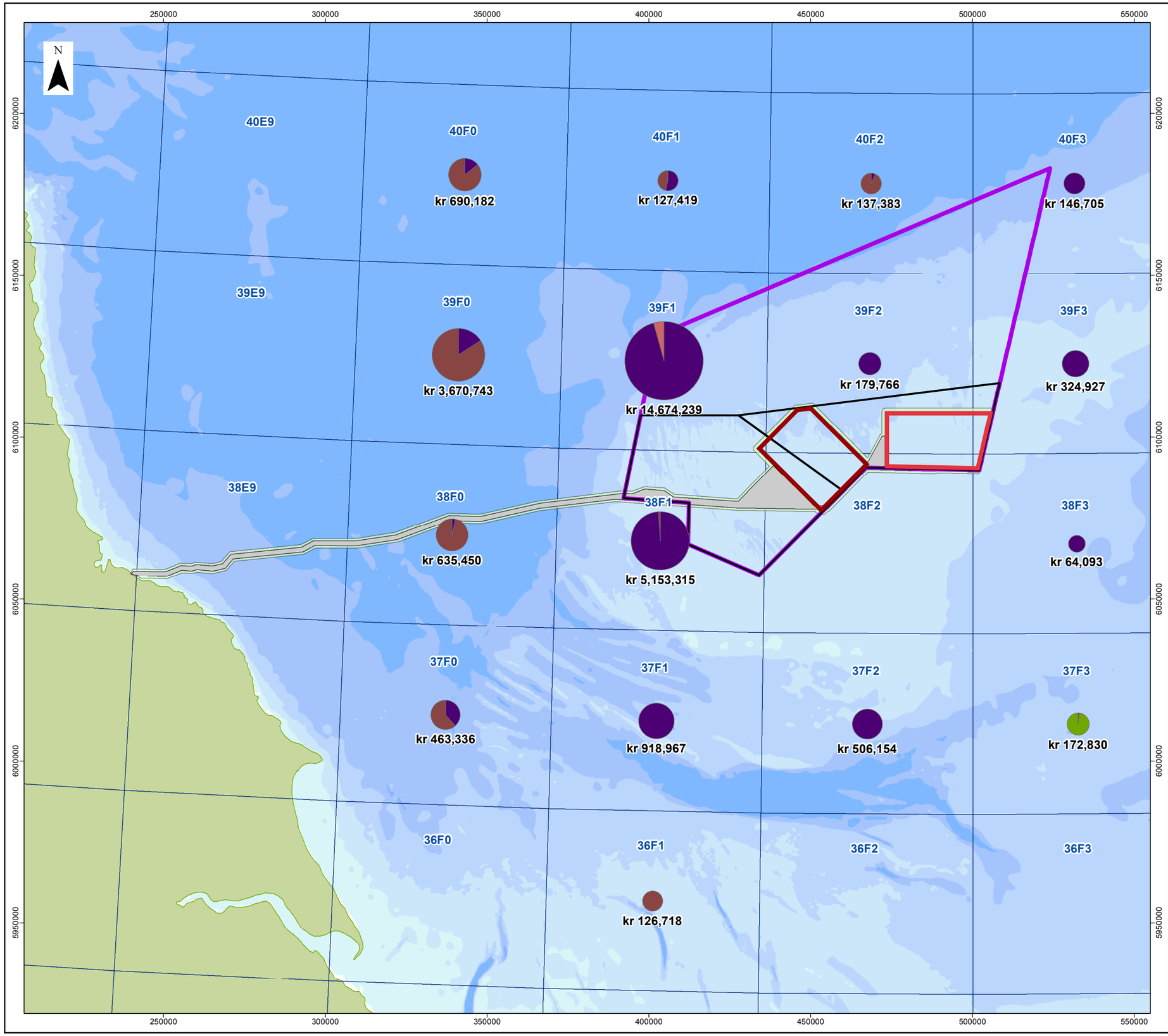

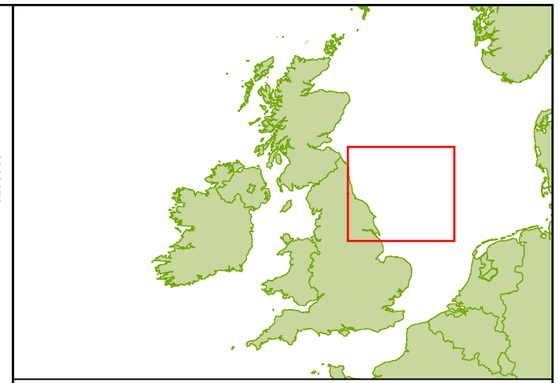

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

Landings values by species

- Sandeel
- Herring
- Catfish
- Sprat
- Other

0 10 20 40
Kilometres

Data Source:
Landings data © Havs och Vatten Myndigheten, 2011
ICES Rectangles © ICES 2012
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.17 Swedish landings values (kr) by species (average 2006 to 2010)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-532

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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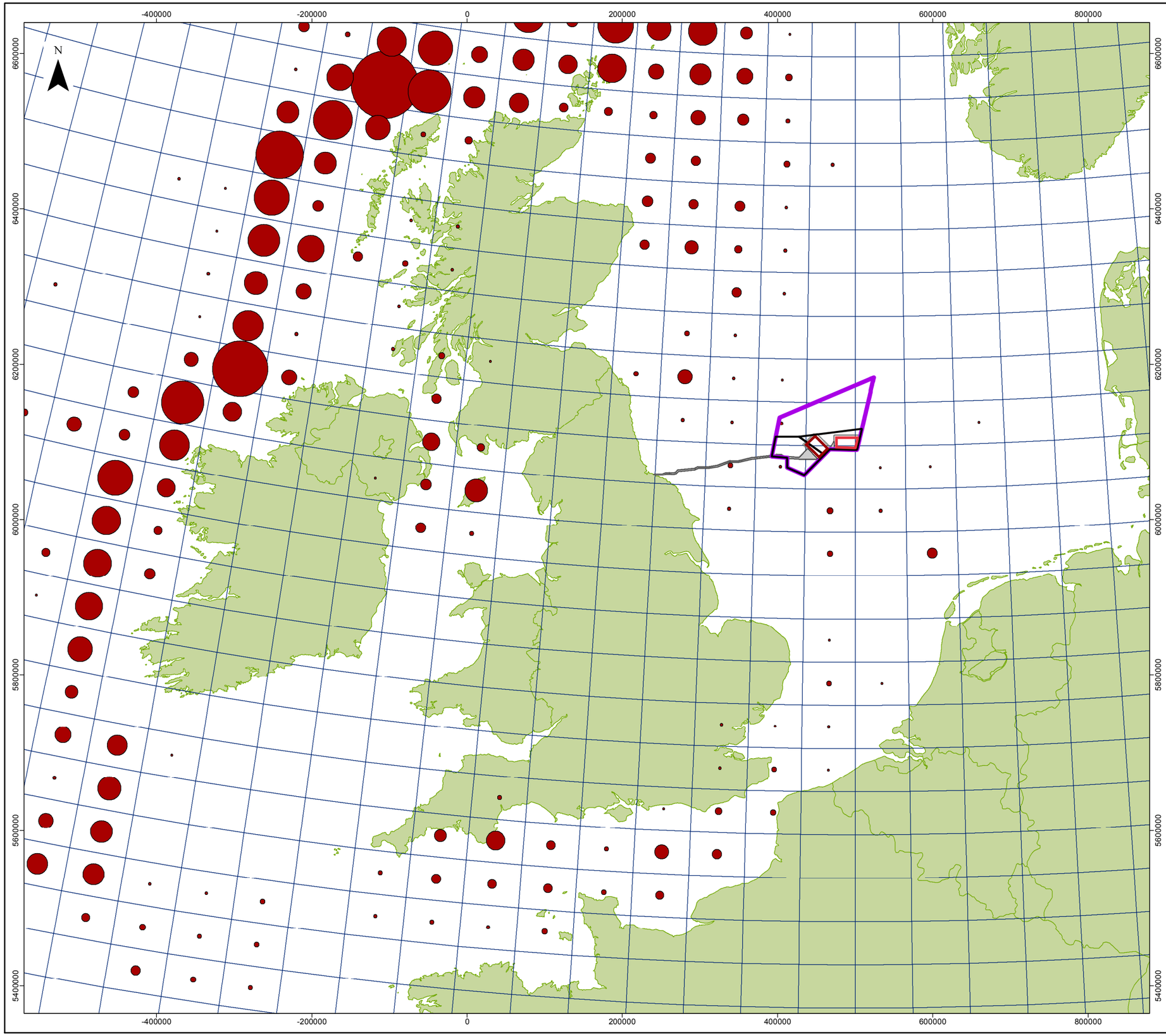

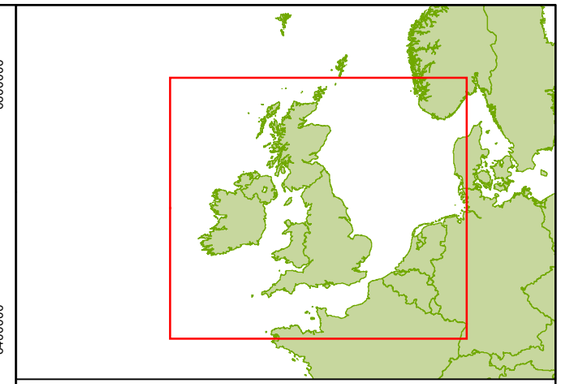

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

UK pelagic methods landings values

- 10,000
- 100,000
- 500,000
- 1,000,000
- 10,000,000

* Rectangles < £10,000 total removed for display purposes

0 25 50 100
Kilometres

Data Source:
Landings data © MMO, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.18 UK pelagic trawling landings values (£) (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	17/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-533

SCALE	1:5,000,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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6.2.32. Furthermore, vessels have operational flexibility targeting other species in alternative areas such as mackerel, blue whiting and sprat. These vessels have, therefore, been ascribed low sensitivity

Potting fishery

Dogger Bank Teesside A & B Export Cable Corridor

6.2.33. The potting fishery occurs within the Inshore Dogger Bank Teesside A & B Export Cable Corridor area (**Figure 6.19**). A significant proportion of the inshore potting vessels are between 5 and 7m in length, being beach launched with comparatively low engine capacities. Although potting grounds are widespread, due to these limitations and the requirement to land live catches, most of the vessels are restricted to being at sea for a maximum of two tidal cycles and therefore have limited operational ranges (**Figure 6.20**).

6.2.34. Vessels are also confined by gear versatility which may limit them to targeting shellfish species, with little scope for fishing other species. Hence, the vessels within the potting fishery are assigned a high sensitivity.

6.2.35. **Table 6.1** provides a summary of all receptor sensitivities.

Table 6.1 Receptor sensitivities

Fishery	Dogger Bank Teesside A & B	Dogger Bank Teesside A & B Export Cable Corridor
Flatfish fishery	Low	Low
Sandeel fishery	Low	N/A
Seine net fishery	Medium	N/A
Netting fishery	Low	Medium
Over 15m Whitefish fishery	N/A	Low
Under 15m Whitefish fishery	N/A	Medium
Nephrops fishery	N/A	Medium
Scallop fishery	N/A	Low
Pelagic fishery	N/A	Low
Potting fishery	N/A	High

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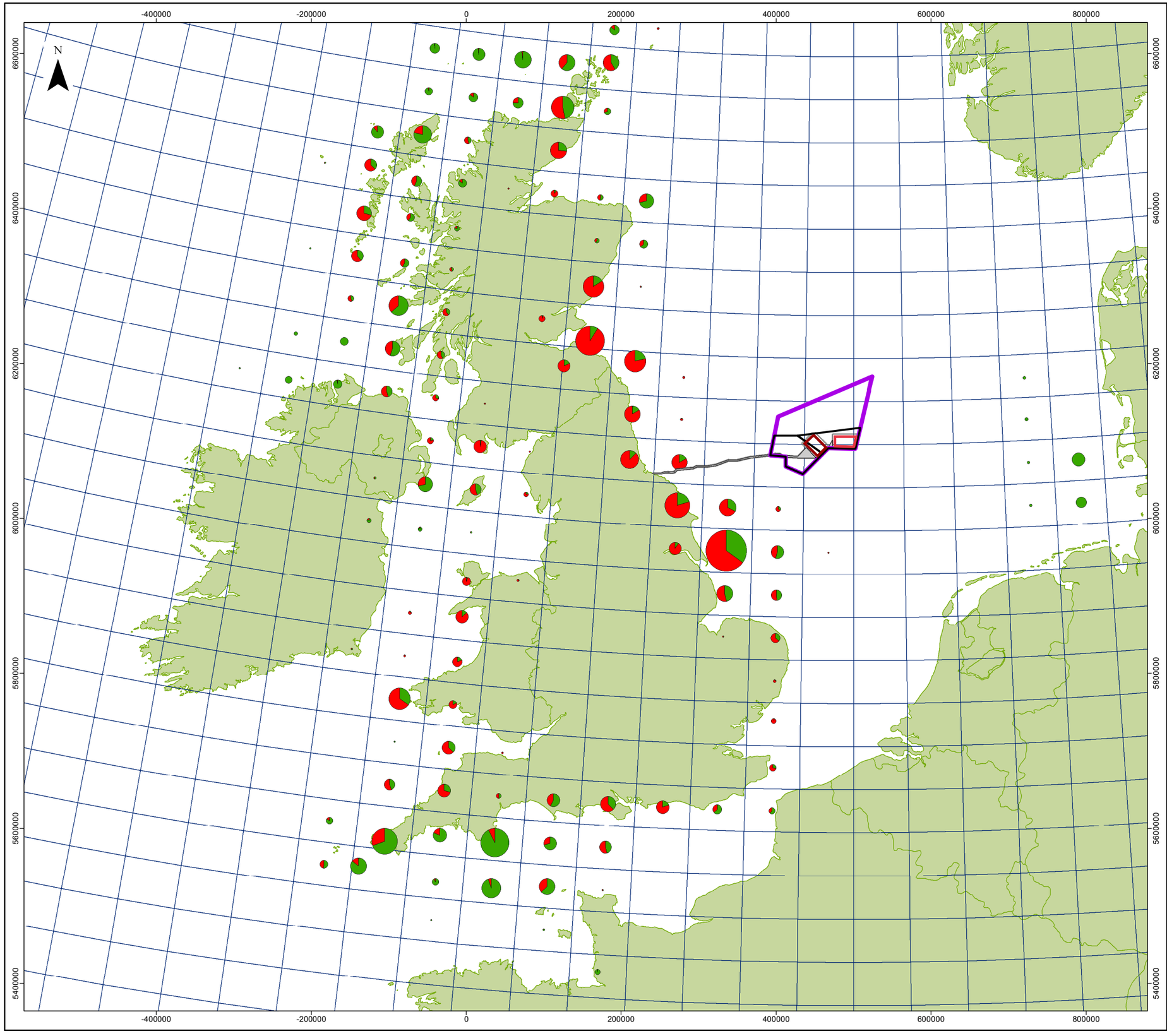

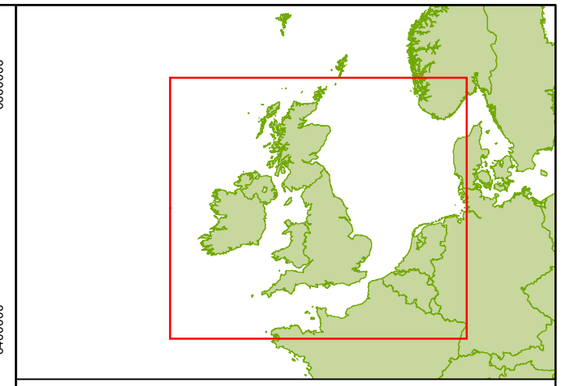

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES rectangles

UK potting landings values by species

- 10,000
- 50,000
- 100,000
- 500,000
- 1,000,000

- Edible Crabs
- Lobsters

* Rectangles < £10,000 total removed for display purposes

0 25 50 100
Kilometres

Data Source:
Landings data © MMO, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.19 UK potting landings values (£) by species (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-534

SCALE	PLOT SIZE	DATUM	PROJECTION
1:5,000,000	A3	WGS84	UTM31N

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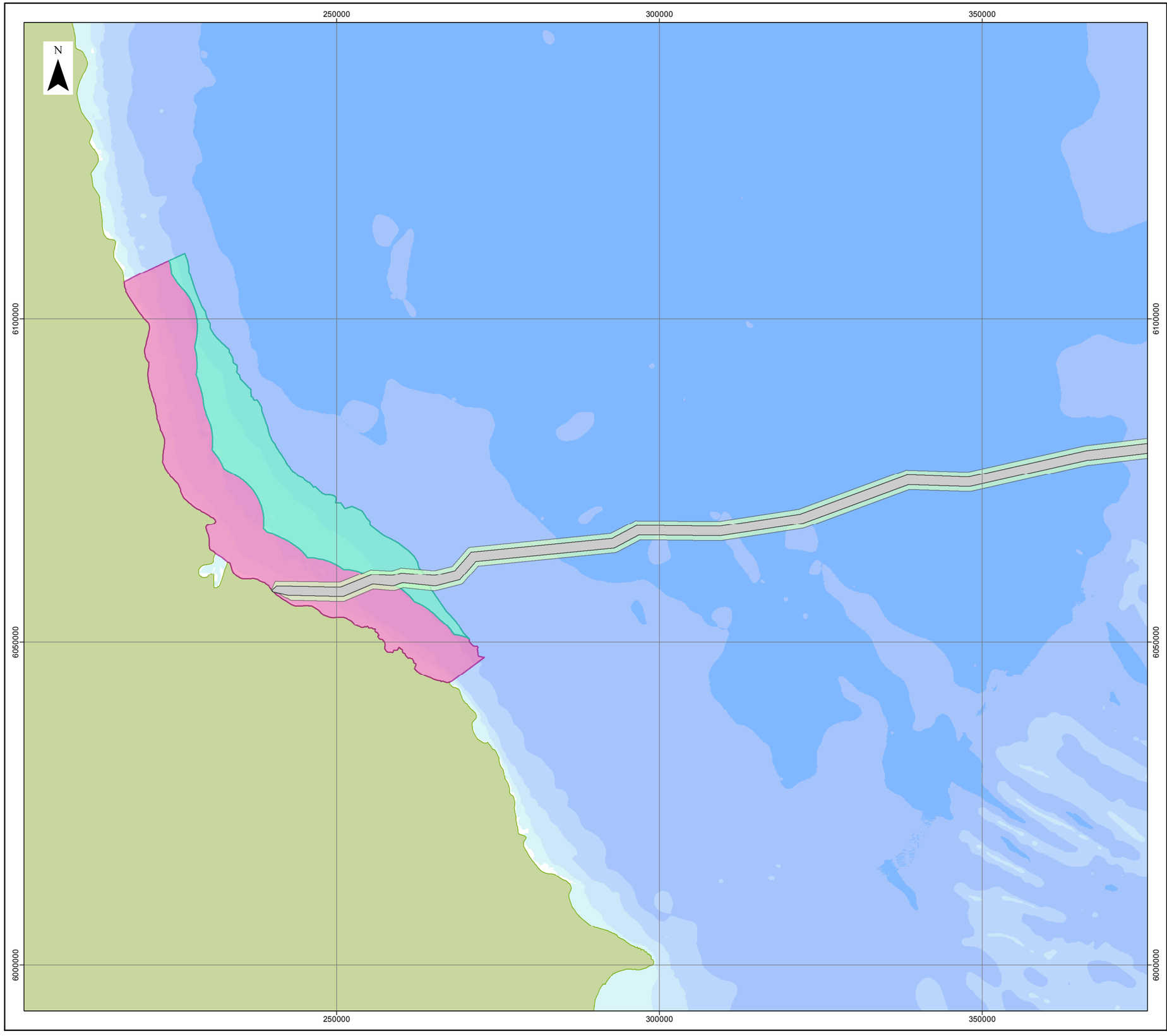

LEGEND

- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area

Teesside potting groud (Newcastle to Whitby)

- Teesside inshore potting ground
- Teesside inshore potting ground (higher intensity)

0 5 10 20
Kilometres

Data Source:
Potting grounds © PMSL, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 6.20 Principal potting grounds in the vicinity of Teesside export cable corridor

VER	DATE	REMARKS	Drawn	Checked
1	17/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-535

SCALE	1:600,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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7. Assessment of Impacts during Construction

7.1. Adverse impacts upon commercially exploited species

7.1.1. The principal commercial species targeted in the vicinity of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are:

- Plaice;
- Turbot;
- Sole;
- Lemon sole;
- Sandeel;
- Herring;
- Whiting;
- *Nephrops*;
- Scallops;
- Cod;
- Haddock;
- Horse mackerel;
- Lobster; and
- Edible crab.

7.1.2. Impacts upon commercially exploited species during the construction and operation of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are discussed and assessed in full in **Chapter 13**.

7.2. Temporary/complete loss or restricted access to traditional fishing grounds

7.2.1. The magnitude of effect associated with Dogger Bank Teesside A & B and the export cable installation phases in respect of complete loss or restricted access to traditional fishing grounds will differ between receptor groups.

7.2.2. The spatial context of magnitude of effect is essentially the proportion of a receptor groups fishing area affected where exclusion or restricted access could occur. The temporal context is the duration and frequency of exclusion or restricted access. Severity is taken as the relative importance (value) of the area(s) and period(s) of exclusion.

7.2.3. Unfortunately, due to the differences and limitations in the fisheries data and information available, it is not possible to undertake a reliable and consistent comparative quantitative assessment of magnitude of effect across the various

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receptor groups. The assessment of magnitude of effect is, therefore, to a large extent qualitative.

7.2.4. For the purposes of assessment, taking a precautionary worst case, the maximum overall period during which construction could occur within the boundaries of Dogger Bank Teesside A or Dogger Bank Teesside B is six years and three years and six months for the Dogger Bank Teesside A & B Export Cable Corridor. The worst case assumes there will be a progressive increase in the extent of exclusion over the six year period, from both Dogger Bank Teesside A & B and for three years and five months along the Dogger Bank Teesside A & B Export Cable Corridor.

Dogger Bank Teesside A

Flatfish fishery

7.2.5. The sensitivity of the flatfish fishery is considered to be low (see Section 6) due to the low levels of activity recorded by the Belgian, German and Norwegian fleets in the vicinity of Dogger Bank Teesside A. The Dutch, UK and Anglo-Dutch data is considered to represent the extent of fishing grounds for this fishery.

7.2.6. In the spatial context, as shown by **Figure 4.10, Figure 4.11** and **Figure 6.2**, the proportions of the overall Anglo-Dutch and Dutch beam and otter trawling and UK mobile gear fishing grounds occupied by Dogger Bank Teesside A are very small.

7.2.7. Taking the above into account, the magnitude of effect for complete loss, or restricted access to, fishing grounds for the flatfish fishery is considered to be low.

7.2.8. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the flatfish fishery as a result of the construction of Dogger Bank Teesside A is therefore **minor adverse**.

Sandeel fishery

7.2.9. As previously stated, the sensitivity of the vessels fishing the sandeel fishery is considered to be low.

7.2.10. In comparison to the extent of sandeel fishing areas within the North Sea, the area of Dogger Bank Teesside A is negligible (**Figure 6.7**). Whilst it is accepted that sandeel distribution, and therefore fishing activity, is highly patchy and localised, **Figure 7.1** illustrates that only minimal levels of activity occur within the boundary of Dogger Bank Teesside A.

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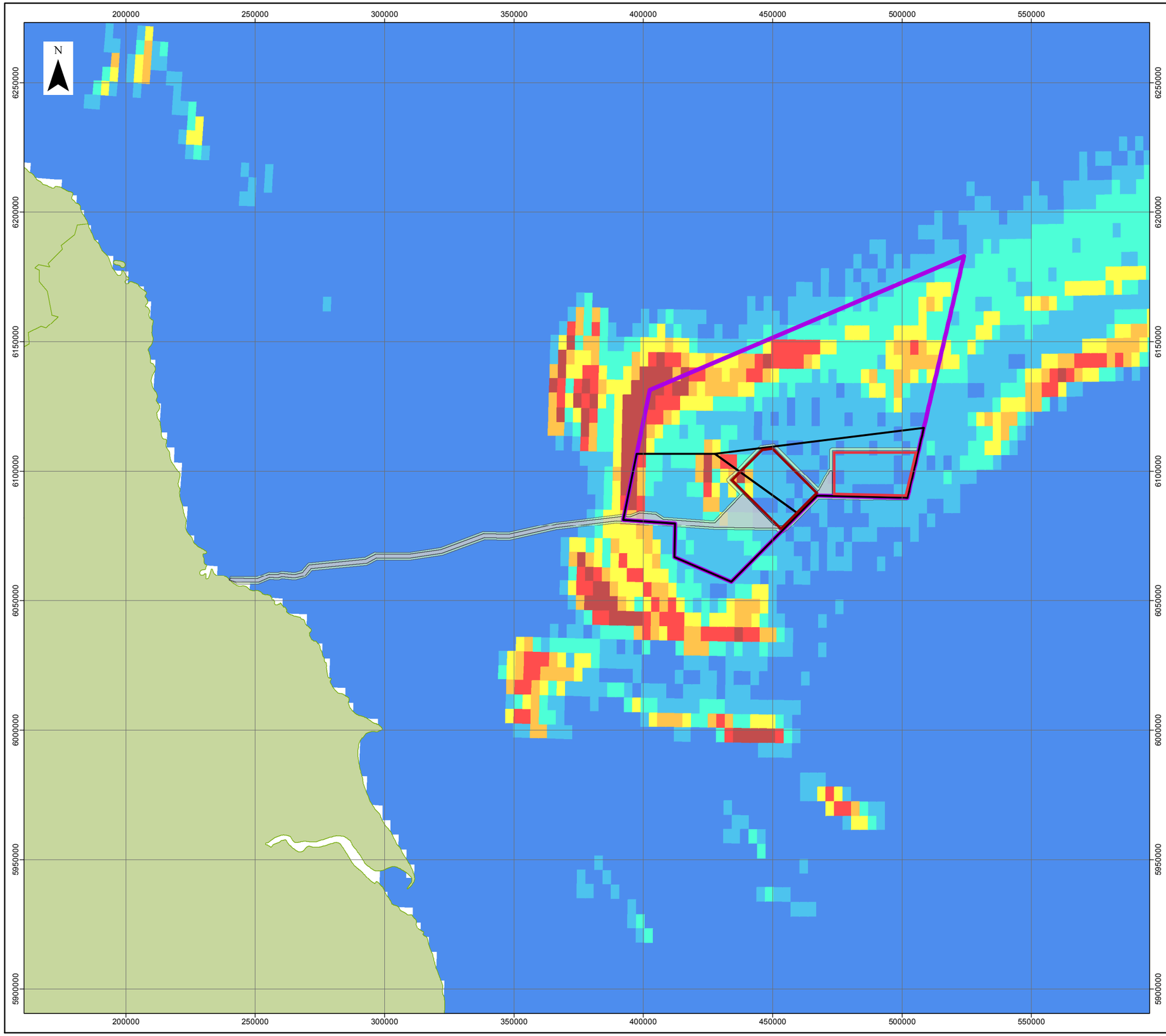

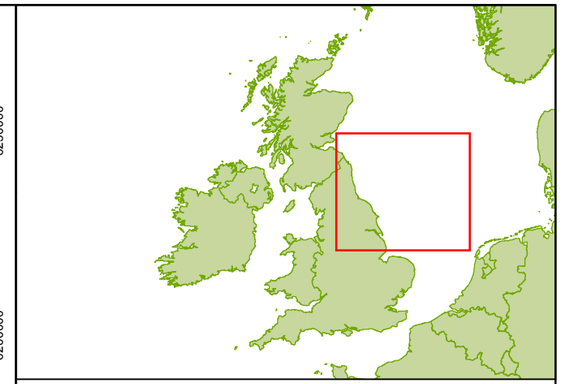

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export cable corridor
- Temporary works area

Danish sandeel satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

0 10 20 40
Kilometres

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 7.1 Danish sandeel fishing VMS by density (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-536

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,500,000	A3	WGS84	UTM31N

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7.2.11. Unfortunately, the Danish authorities were unable to provide sandeel fishing values by ICES rectangle which precludes discussion of the value of sandeel fishing in the local area.

7.2.12. Due to the extent of available fishing area in comparison to the area of Dogger Bank Teesside A, where this is very low fishing intensity, the magnitude of effect for complete loss or restricted access to traditional fishing grounds associated with exclusion during construction of Dogger Bank Teesside A is considered to be low.

7.2.13. Using the matrix defined in **Table 3.5**, the impact of loss of fishing area on vessels targeting the sandeel fishery as a result of the construction of Dogger Bank Teesside A is therefore **minor adverse**.

Seine net fishery

7.2.14. The sensitivity of the seine net fishery is assigned as medium.

7.2.15. Seine netting on the Dogger Bank is undertaken by a limited number of Danish vessels, a single UK vessel and six Anglo-Dutch vessels. Whilst grounds are less extensive than, for example, the otter and beam trawl or sandeel fishing grounds, taking the limited numbers of vessels involved, the area of Dogger Bank Teesside A relative to the overall fishing area is small.

7.2.16. Seine netting recorded within Dogger Bank Teesside A is concentrated in the north eastern corner; however moderate levels of seine net activity are recorded throughout the site (**Figure 7.2**). **Figure 7.3** shows a Danish seine vessel plotter, which indicates that fishing is concentrated within Dogger Bank Teesside A. Once construction commences, seine netting will be progressively excluded from the project, and it is unlikely to be able to resume during the operational phase. Due to the proportion of seine net grounds within Dogger Bank Teesside A compared to the availability of grounds elsewhere the magnitude effect relating to loss of fishing area is considered to be medium.

7.2.17. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on Danish and UK seine netters as a result of the construction of Dogger Bank Teesside A is therefore anticipated to be **moderate adverse** for the limited number of vessels involved.

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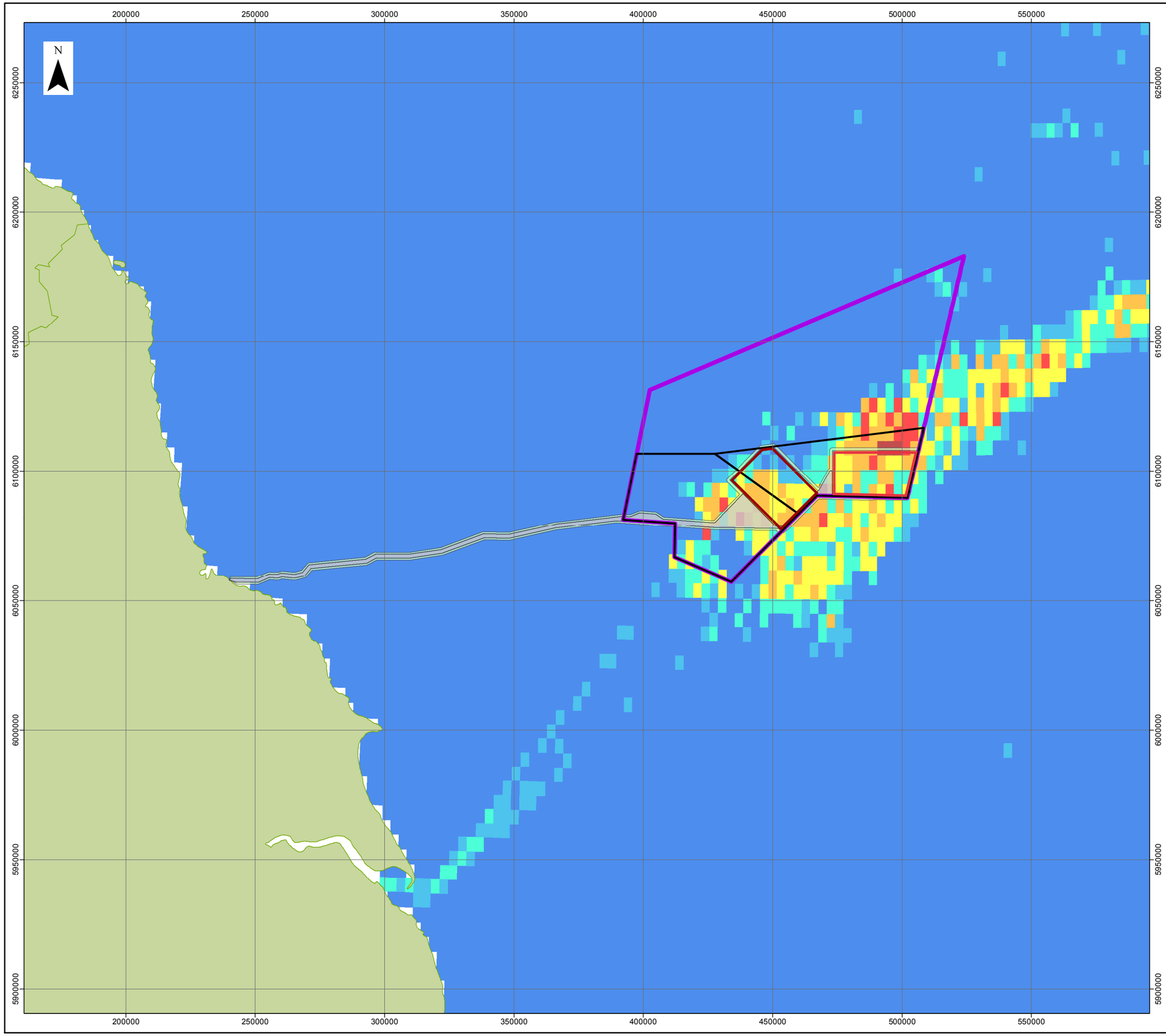

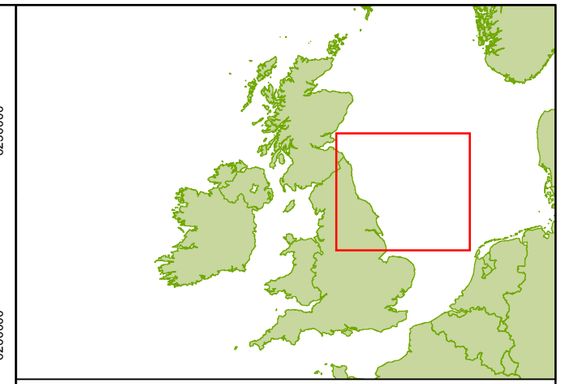

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export cable corridor
- Temporary works area

Danish seine satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

0 10 20 40
Kilometres

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 7.2 Danish seine netting VMS by density (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-537

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,500,000	A3	WGS84	UTM31N

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FOREWIND

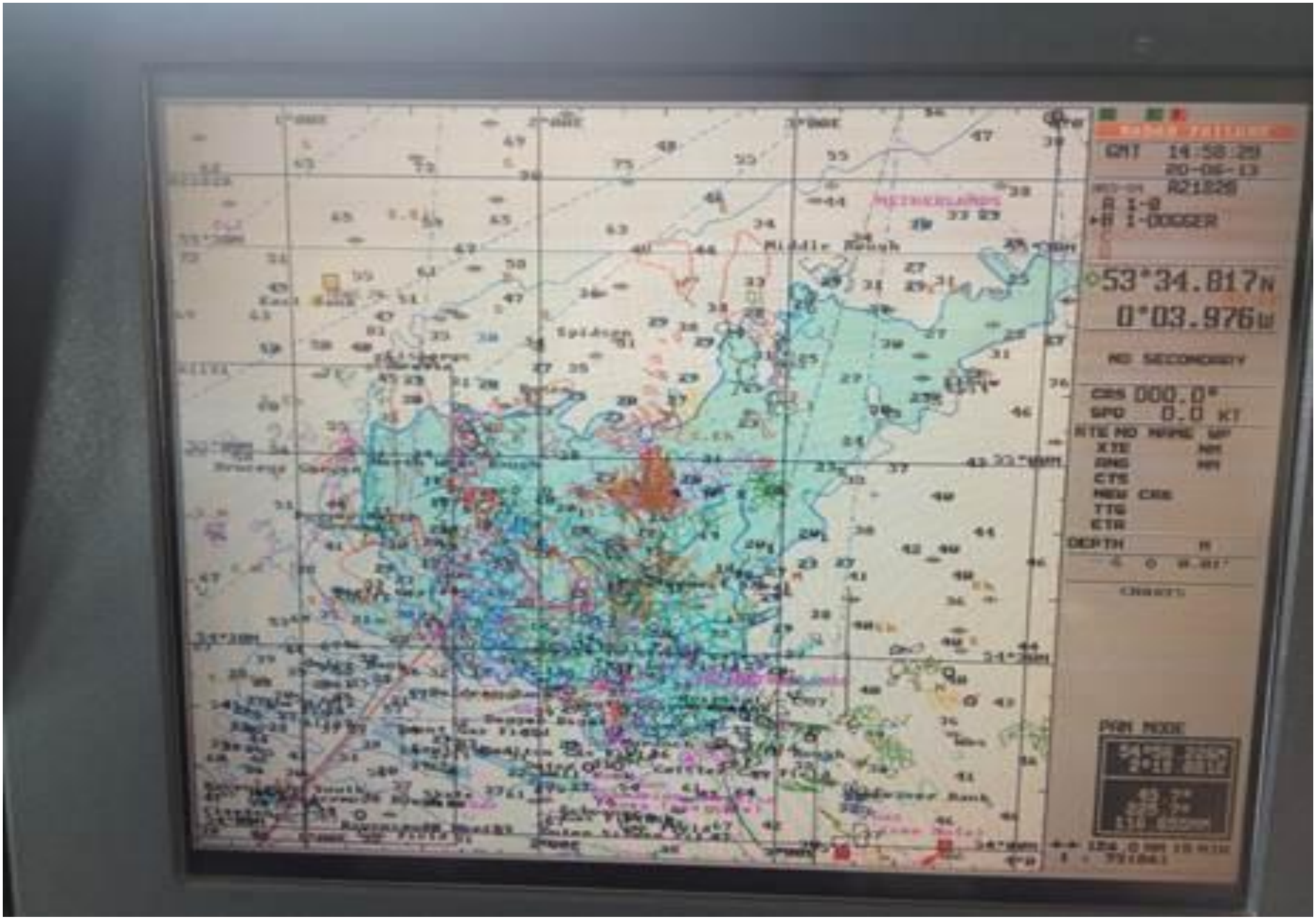

Figure 7.3 Photograph of seine netter plotter – E95 (Source: BMM 2013)

Gillnet fishery

7.2.18. The sensitivity of the gillnet fishery within Dogger Bank Teesside A is considered to be low.

7.2.19. The Danish gillnet vessels fish within Dogger Bank Teesside A during the summer months (pers. comm. Danish gill netter, March 2013) (**Figure 7.2**).

7.2.20. The extent of the available fishing area in comparison to the area of Dogger Bank Teesside A, within which there is low fishing intensity is large (**Figure 6.11**). Therefore the magnitude of effect for complete loss, or restricted access to, traditional fishing grounds associated with exclusion during construction of Dogger Bank Teesside A is considered to be low.

7.2.21. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the flatfish fishery as a result of the construction of Dogger Bank Teesside A is anticipated to be **minor adverse**.

Impact significance

7.2.22. **Table 7.1** summarises the potential impact of complete loss or restricted access to traditional fishing grounds associated with the construction phase of Dogger Bank Teesside A.

Table 7.1 Impact significance of complete loss or restricted access to traditional fishing grounds during the Dogger Bank Teesside A construction phase

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance	Residual Impact Significance
Flatfish Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Sandeel Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Seine Net Fishery	Medium	Medium	**Moderate adverse**	**Moderate adverse**
Gillnet Fishery	Low	Low	**Minor adverse**	**Minor adverse**

Dogger Bank Teesside B

7.2.23. As detailed in **Chapter 5**, the infrastructure to be installed in Dogger Bank Teesside B, in terms of the worst case scenario for complete loss or restricted access to traditional fishing grounds, and the duration of construction will be the same as Dogger Bank Teesside A.

7.2.24. The receptors for Dogger Bank Teesside B are the same as defined for Dogger Bank Teesside A.

Flatfish fishery

7.2.25. As explained in Section 6, the sensitivity of the flatfish fishery is assessed as low.

7.2.26. As with Dogger Bank Teesside A, as shown by **Figure 6.1** - **Figure 6.4**, the area occupied by Dogger Bank Teesside B is extremely small in comparison to the total flatfish fishing grounds. It is apparent that the levels of effort and landing values in Dogger Bank Teesside B are very similar to those occurring in Dogger Bank Teesside A, with slightly more fishing activity shown by the Dutch VMS. The effect is therefore assigned to be of low magnitude.

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7.2.27. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the flatfish fishery as a result of the construction of Dogger Bank Teesside B is therefore **minor adverse**.

Sandeel fishery

7.2.28. The sensitivity of the sandeel fishery is assigned as low.

7.2.29. **Figure 7.1** suggests that slightly more sandeel fishing activity occurs within the area of Dogger Bank Teesside B than in Dogger Bank Teesside A, with activity located along the north western boundary of Teesside B. It is of note that the western boundary of Dogger Bank Teesside A & B is to the east of an area where highly concentrated sandeel fishing effort takes place. Avoiding this area was a consideration in the project selection process.

7.2.30. Whilst sandeel fishing activity within Dogger Bank Teesside B is slightly higher than Dogger Bank Teesside A, **Figure 6.9** shows the area of fishing within Dogger Bank Teesside A & B is low compared to grounds along the western edge of the Dogger Bank Zone and extremely low relative to the extent of sandeel fishing grounds within the North Sea. As a consequence, the effect is considered to be of low magnitude.

7.2.31. Using the matrix defined in **Table 3.5**, impact of loss of fishing area on vessels targeting the sandeel fishery as a result of the construction of Dogger Bank Teesside B is anticipated to be **minor adverse**.

Seine net fishery

7.2.32. The sensitivity of the seine net fishery is considered to be medium.

7.2.33. **Figure 7.2** indicates that the levels and values of seine net fishing within Dogger Bank Teesside B are similar to those recorded in Dogger Bank Teesside A. The magnitude of effect is therefore assessed as medium.

7.2.34. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the seine net fishery as a result of the construction of Dogger Bank Teesside B is **moderate adverse** for the limited number of vessels involved.

Gillnet fishery

7.2.35. The sensitivity of the gillnet fishery is assessed as low.

7.2.36. As shown in **Figure 6.12**, the Danish gillnet activity within Dogger Bank Teesside B is similar to that recorded in Dogger Bank Teesside A. The magnitude of effect during construction of Dogger Bank Teesside B is therefore considered to be low.

7.2.37. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the gillnet fishery as a result of the construction of Dogger Bank Teesside A is therefore **minor adverse**.

Impact significance

7.2.38. A summary of the potential impacts on each receptor group, in respect of complete loss or restricted access to traditional fishing grounds associated with the construction phase of Dogger Bank Teesside B are given in **Table 7.2**.

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Table 7.2 Impact significance of complete loss or restricted access to traditional fishing grounds during the Dogger Bank Teesside B construction phase

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance	Residual Impact Significance
Flatfish Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Sandeel Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Seine Net Fishery	Medium	Medium	**Moderate adverse**	**Moderate adverse**
Gillnet Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Flatfish Fishery	Low	Low	**Minor adverse**	**Minor adverse**

Dogger Bank Teesside A & B

7.2.39. Potential impacts associated with the construction of Dogger Bank Teesside A & B in isolation have been provided previously. The worst sequential duration of impact is build Dogger Bank Teesside A (six-years), start building Dogger Bank Teesside B after five years six months with a six month overlap, taking six years. Total duration 11 years six months with a six month overlap. There is also a possibility that both projects could be built at the same time therefore an assessment of Dogger Bank Teesside A & B together is therefore required.

Flatfish fishery

7.2.40. As explained in Section 6, the sensitivity of the flatfish fishery is assessed to be low.

7.2.41. **Figure 6.1** - **Figure 6.4** above show that the combined area of the two projects is small in comparison to the overall fishing areas of the flatfish fishery. Furthermore, as discussed above, both projects sustain only very low levels of effort and record very low landings values. The magnitude of effect for the effect is, therefore, expected to be low.

7.2.42. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the flatfish fishery as a result of the construction of Dogger Bank Teesside A & B is therefore **minor adverse**.

Sandeel fishery

7.2.43. The sensitivity of the vessels targeting the sandeel fishery is considered to be low.

7.2.44. The combined areas of the Dogger Bank Teesside A & B constitute an extremely small proportion of the overall North Sea sandeel fishing areas and Dogger Bank Teesside A & B spans an area of low activity and value with the result that the effect on the sandeel fishery will be of low magnitude.

7.2.45. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the vessels targeting the sandeel fishery as a result of the construction of Dogger Bank Teesside A & B is therefore **minor adverse**.

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Seine net fishery

7.2.46. As explained in Section 6.1, the sensitivity of the seine net fishery is assessed to be medium.

7.2.47. **Figure 7.2** shows that seine net activity is similar for both Dogger Bank Teesside A and Dogger Bank Teesside B, with only a slightly higher density within Dogger Bank Teesside A. Although the construction of both Dogger Bank Teesside A and Dogger Bank Teesside B will result in a higher spatial context, the area covered by the two projects is still relatively small compared to grounds available elsewhere. As such, the magnitude of effect for Dogger Bank Teesside A & B combined is medium.

7.2.48. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on seine netters as a result of the construction of Dogger Bank Teesside A & B is therefore **moderate adverse**. Forewind are however committed to engaging with the stakeholder fishermen concerned, to explore the principle of proactive mitigation with the objective of mitigating the potential impact to an acceptable level during the construction phase.

Gillnet fishery

7.2.49. The sensitivity of the gillnet fishery is assigned as low.

7.2.50. As shown in **Figure 6.12**, the levels of gillnet activity within Dogger Bank Teesside A & B are similar (i.e. very low), however the combined areas constitute a very small proportion of grounds available. It is therefore considered that the magnitude of effect is low.

7.2.51. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the gillnet fishery as a result of the construction of Dogger Bank Teesside A & B is therefore **minor adverse**.

Impact significance

7.2.52. **Table 7.3** provides a summary of the impact on receptors of complete loss or restricted access to fishing grounds during construction.

Table 7.3 Impact significance of complete loss or restricted access to traditional fishing grounds during Dogger Bank Teesside A & B construction phases.

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance	Residual Impact Significance
Flatfish fishery	Low	Low	**Minor adverse**	**Minor adverse**
Sandeel Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Seine Net Fishery	Medium	Medium	**Moderate adverse**	**Moderate adverse**
Gillnet fishery	Low	Low	**Minor adverse**	**Minor adverse**

Dogger Bank Teesside A & B Export Cable Corridor

7.2.53. There is to be one export cable circuit per project (two cables bundled or unbundled) installed between Dogger Bank Teesside A & B and the landfall with a total length of 573km from Dogger Bank Teesside A and 484km from Dogger

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Bank Teesside B. The fisheries identified as occurring along the Dogger Bank Teesside A & B Export Cable Corridor are:

- Flatfish fishery;
- Sandeel fishery;
- Whitefish fishery;
- *Nephrops* fishery;
- Scallop fishery;
- Pelagic fishery;
- Potting fishery; and
- Netting fishery.

7.2.54. For the purposes of assessment, the worst case scenario is taken as exclusion of fishing activity from the entire cable corridor (inclusive of a 1km temporary work area either side of the corridor).

7.2.55. It is also assumed that rolling safety zones of 500m will be in place either side of any unburied sections of cable during installation operations. These zones will be communicated to fishing interests through the appropriate channels.

7.2.56. The period required for laying, burial and/or protection of the cables is currently projected to be 687 days for Dogger Bank Teesside A and 595 days for Dogger Bank Teesside B with a total of 1,282 days (three years and six months), during which fishing activities could be excluded.

Flatfish fishery

7.2.57. As explained in Section 6, the sensitivity of the flatfish fishery is considered to be low.

7.2.58. **Figure 4.10, Figure 6.2** and **Figure 6.6** show activity by the flatfish fishery for Dutch, UK and Belgian registered vessels, respectively. Dutch beam and otter trawling occurs at low levels over a short, isolated, offshore section of the Dogger Bank Teesside A & B Export Cable Corridor, whilst the majority of UK demersal gear activity has been recorded along the inshore section of the Dogger Bank Teesside A & B Export Cable Corridor, where a notably higher density of activity occurs. Belgian activity occurs along the majority of the Dogger Bank Teesside A & B Export Cable Corridor at low levels. The exclusion width for the Dogger Bank Teesside A & B Export Cable Corridor however represents only a small fraction of the overall fishing area available.

7.2.59. With regards to the duration of the effect, whilst rolling safety zones could be, in the worst case scenario, in place along the entire Dogger Bank Teesside A & B Export Cable Corridor for up to three years and six months, the presence of such safety zones will require only comparatively minor adjustments of normal towing patterns. The magnitude of the effect is expected to be low.

7.2.60. Using the matrix defined in **Table 3.5** the impact of loss of fishing area on the flatfish fishery as a result of the installation of the export cable is, at worst, **minor adverse**.

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Sandeel fishery

7.2.61. The sensitivity of the vessels targeting the sandeel fishery is assessed to be low (Section 6).

7.2.62. As shown by **Figure 7.1**, sandeel fishing activity occurs over the offshore section of the Dogger Bank Teesside A & B Export Cable Corridor adjacent to the Dogger Bank Zone. The area involved however represents a very small area of the overall sandeel fishing grounds available and recorded activity is relatively low. The magnitude of effect for the short term loss of fishing area is therefore low.

7.2.63. Using the matrix defined in **Table 3.5**, the anticipated impact of loss of fishing area on vessels targeting the sandeel fishery as a result of the installation of the export cable is therefore **minor adverse**.

Whitefish fishery

7.2.64. The whitefish fishery is divided into two fisheries along the Dogger Bank Teesside A & B Export Cable Corridor, the inshore fishery fished by under 15m, local vessels and the offshore fishery fished by over 15m vessels from both the UK and France. The sensitivity of the inshore fishery is considered to be medium, whereas the sensitivity of the offshore fishery is low.

7.2.65. Fishing activity by the local under 15m UK fleet on the inshore grounds through which the Dogger Bank Teesside A & B Export Cable Corridor passes is, in comparison to other adjacent areas, at low to moderate levels (**Figure 6.13**).. Whilst these grounds are not widespread, due to the short term duration of the installation of the export cables, the magnitude of effect is considered to be low.

7.2.66. Using the matrix defined in **Table 3.5**, the impact of loss of fishing area on under 15m UK vessels targeting the whitefish fishery as a result of the installation of the export cable is therefore anticipated to be **minor adverse**.

7.2.67. **Figure 6.2** shows the fishing grounds for the over-15m UK fleet are extensive. During consultation with French fishermen and their representatives it was apparent that their fishing areas are wide ranging, targeting a variety of fisheries. Fishing activity by French vessels targeting whitefish is also very low within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor (**Figure 7.4**). Due to the short term nature of the impact and the very low percentage of grounds transected by the Dogger Bank Teesside A & B Export Cable Corridor, the magnitude of effect is considered to be negligible.

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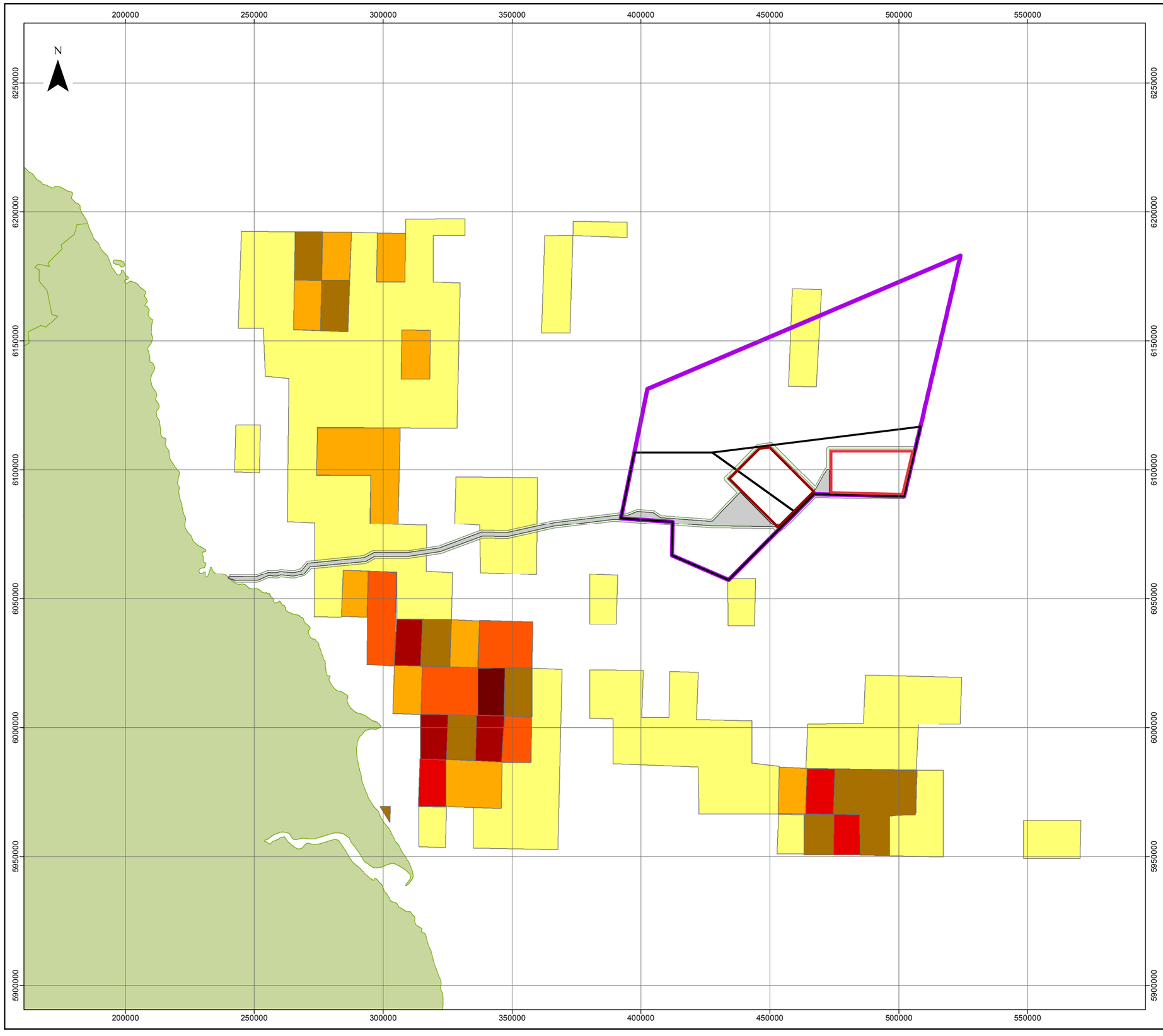

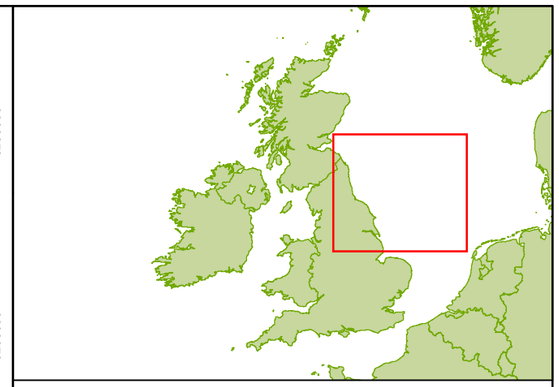

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area

French VMS by value (€)

- €0 to €10,000
- €10,000 to €25,000
- €25,000 to €50,000
- €50,000 to €75,000
- €75,000 to €100,000
- €100,000 to €250,000
- €250,000 to €500,000

0 10 20 40
Kilometres

Data Source:
VMS © CNPMEM, 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 7.4 French VMS by value (average 2007 to 2011)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-538

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,500,000	A3	WGS84	UTM31N

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7.2.68. The impact of loss of fishing area on over-15m UK and French vessels targeting the whitefish fishery as a result of the installation of the export cable is considered to have **no discernible impact**.

Nephrops fishery

7.2.69. The sensitivity of the vessels targeting the *Nephrops* fishery within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor is assessed to be medium.

7.2.70. As shown by **Figure 6.14**,and **Figure 6.15** the Inshore Dogger Bank Teesside A & B Export Cable Corridor Study Area is located to the south of the southern extremity of the main *Nephrops* fishing grounds. Whilst it is noted that certain segments of these grounds record high levels of activity, they are not transected by the Dogger Bank Teesside A & B Export Cable Corridor, as suggested in the Environmentally Responsible Fisheries Project (Cefas-SeaFish, 2010). As stated above, it is appreciated that there may be small isolated pockets of soft mud supporting low densities of *Nephrops*, in comparison to the grounds further north the relative importance of these is low. As such, the magnitude of the effect is therefore expected to be low.

7.2.71. From the matrix defined in **Table 3.5**, the impact of loss of fishing area on vessels targeting the *Nephrops* fishery associated with the installation of the export cable is therefore **minor adverse**.

Scallop fishery

7.2.72. The sensitivity of the vessels targeting the scallop fishery is assessed to be low.

7.2.73. As shown by **Figure 6.16**, the scallop landings values within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor are low in comparison to areas in the Irish Sea and off the coast of Scotland, which will also be fished by the nomadic fleet. As shown by **Figure 7.5** the Dogger Bank Teesside A & B Export Cable Corridor does not pass through identified scallop grounds and therefore the magnitude of the effect is considered to be **negligible**.

7.2.74. Taking the matrix defined in **Table 3.5**, the impact of loss of fishing area on vessels targeting the scallop fishery as a result of the installation of the export cable is considered to have **no discernible impact**.

Pelagic fishery

7.2.75. The sensitivity of the vessels targeting the pelagic fishery within the vicinity of the Dogger Bank Teesside A & B Export Cable Corridor is assessed to be low.

7.2.76. **Figure 6.4**, **Figure 6.5**, **Figure 6.17** and **Figure 6.18** illustrate the extent of the fishing areas of German, Norwegian, Swedish and UK pelagic vessels, respectively. It can be seen that herring is targeted by these vessels along the offshore section of the Dogger Bank Teesside A & B Export Cable Corridor. In comparison to the wider areas available to the herring fishery however, the area covered by the Dogger Bank Teesside A & B Export Cable Corridor is small. The magnitude of the effect is therefore expected to be low.

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7.2.77. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on vessels targeting the pelagic fishery as a result of the installation of the export cable is **minor adverse**.

Potting fishery

7.2.78. As described in Section 6, the sensitivity of the vessels targeting the potting fishery is assessed to be high.

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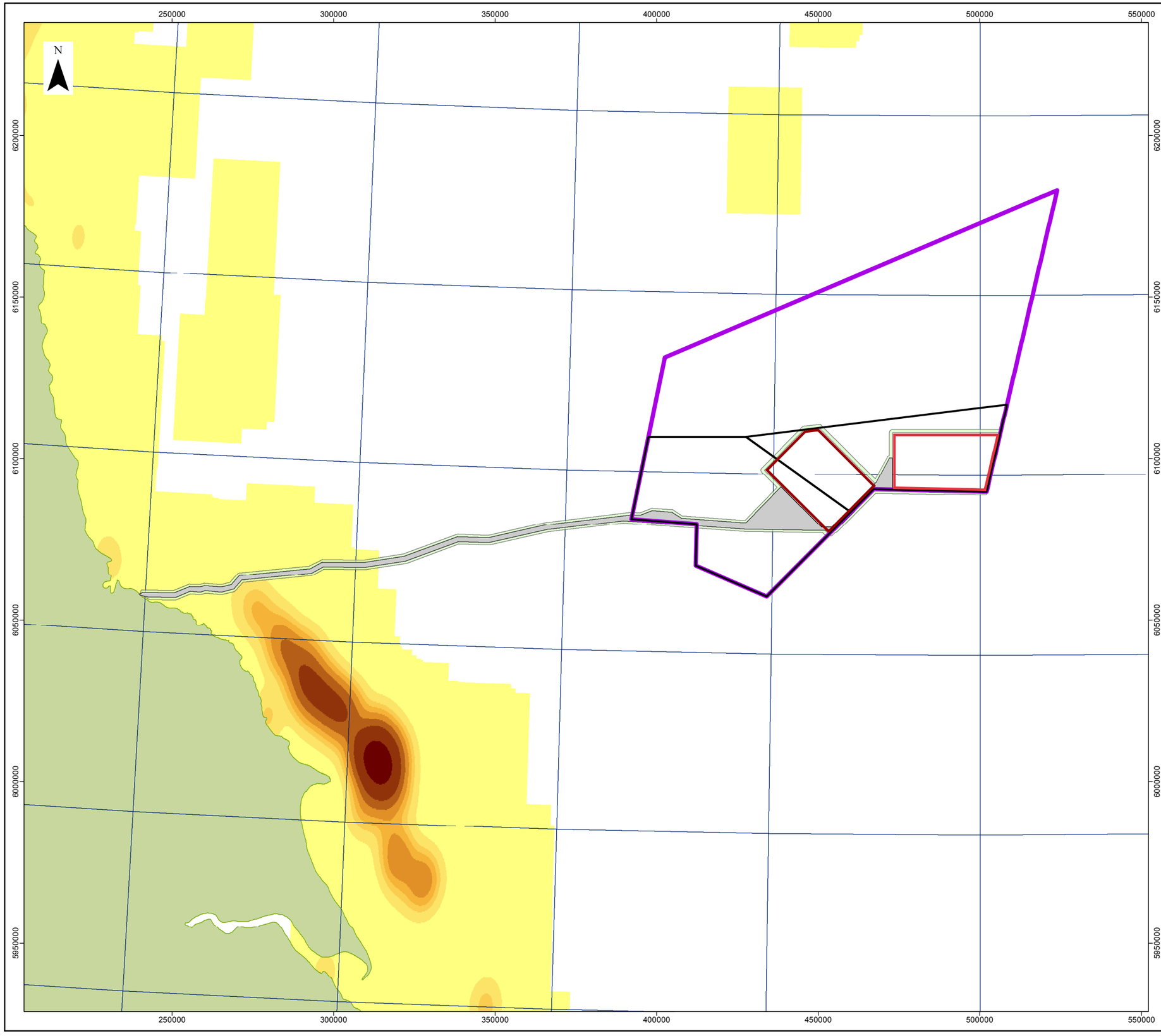

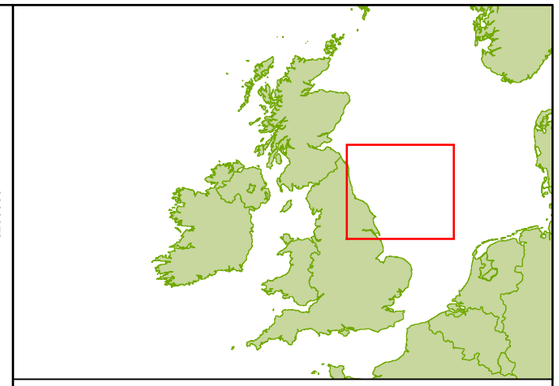

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- ICES Rectangles

Scallop dredge gear value 2007-2011

- Low
- High

0 10 20 40
Kilometres

Data Source:
Scallop Gear © Marine Scotland, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 7.5 UK commercial fisheries distribution scallop dredge gear (2007 to 2011)

VER	DATE	REMARKS	Drawn	Checked
1	25/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-539

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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7.2.79. Potting for crab and lobster has been identified over a small section of the inshore Dogger Bank Teesside A & B Export Cable Corridor (**Figure 6.20**). There are high landings for crab and lobster within the ICES rectangle through which the Export Cable makes landfall (38E8), these are worth £797,981 a year (average 2006-2010). Landings to the south of the Dogger Bank Teesside A & B Export Cable Corridor are higher than those within the vicinity of the Export Cable Corridor, with the highest landings for lobster and crab in the UK recorded in ICES rectangle 36F0 (**Figure 6.19**). However, pots are only deployed over a small inshore section of the Dogger Bank Teesside A & B Export Cable Corridor, therefore the duration of the impact will only be for a small proportion of the total cable installation period. Therefore the impact will be of a temporary nature, and any disruption to normal fishing activity during the construction period will be short term. As a result, the magnitude of effect is expected to be negligible.

7.2.80. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on vessels targeting the potting fishery as a result of the installation of the export cable is therefore **minor adverse**.

Netting fishery

7.2.81. The sensitivity of the vessels netting is considered to be medium.

7.2.82. A very low level of static netting activity, including wreck netting, by the UK inshore fleet operating from Hartlepool, Redcar and South Gare has been identified in the area of the Dogger Bank Teesside A & B Export Cable Corridor (**Figure 6.11** and **Figure 7.6**). This activity is understood to take place over a very short inshore section of the Dogger Bank Teesside A & B Export Cable Corridor (**Figure 7.7**). Any temporary loss of fishing area will therefore be of low magnitude.

7.2.83. Drift netting for salmon and sea trout is undertaken by a small number of vessels. Despite there being high landings values for salmon and sea trout in the Northumbria district during consultation, it was stated that there are no drift net fishermen operating out of Tees Bay and one fishermen operating T and J nets out of South Gare (Redcar. 23rd May 2013) (A. Daniels Pers. Comm. 17th June 2013). Therefore the amount of drift net fishing which could occur is likely to only take place over a very short inshore section of the Dogger Bank Teesside A & B Export Cable Corridor. Any temporary loss of fishing area will therefore be of low magnitude.

7.2.84. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on vessels netting as a result of the installation of the export cable is therefore **minor adverse**.

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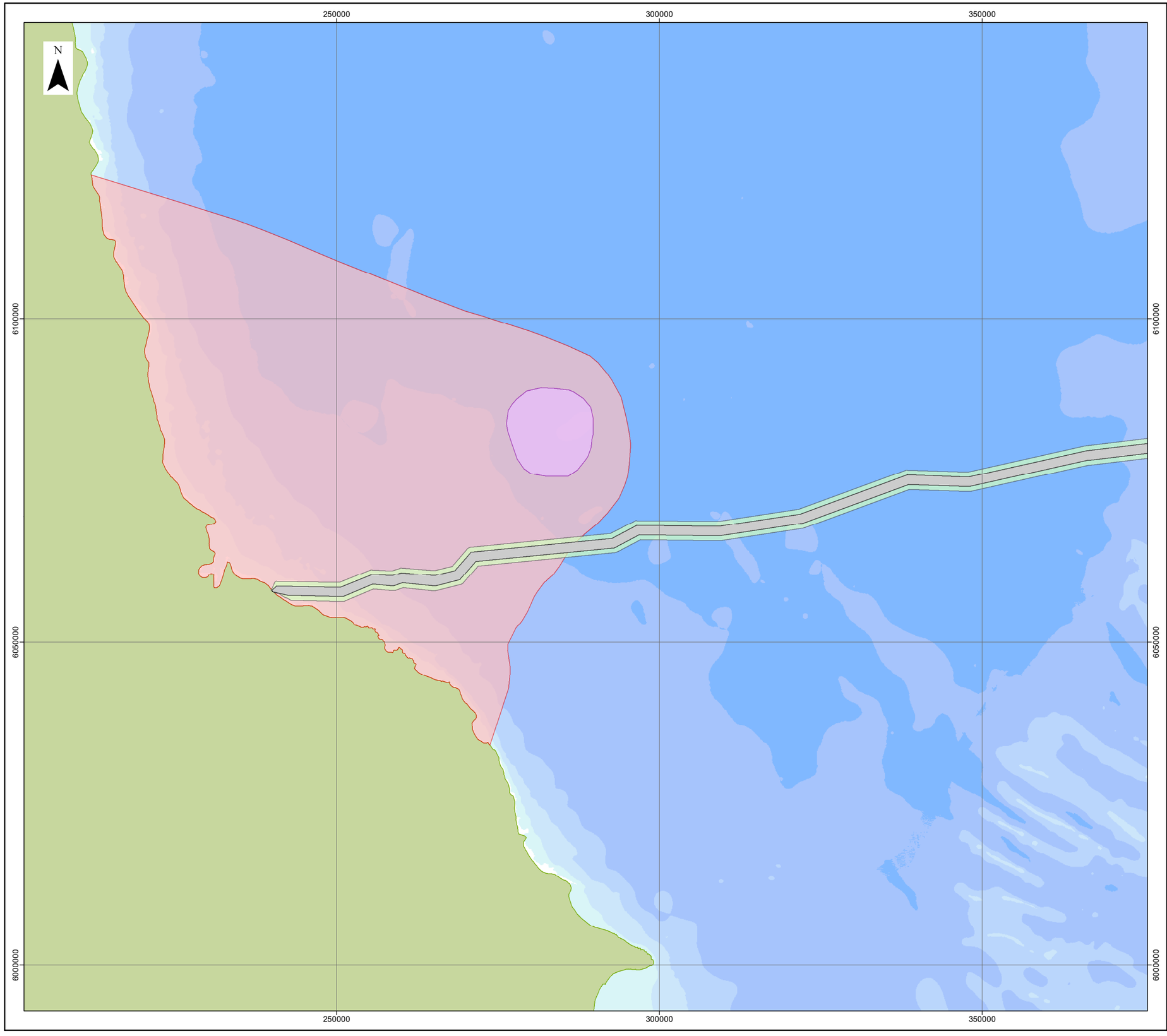

LEGEND

- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Turbot gill netting ground
- Wreck netting ground

0 5 10 20
Kilometres

Data Source:
Netting ground - Hartlepool Fishermen 22nd May 2013 © PMSL, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 7.6 Principal fishing grounds for wreck and turbot fisheries

VER	DATE	REMARKS	Drawn	Checked
1	17/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-540

SCALE	1:600,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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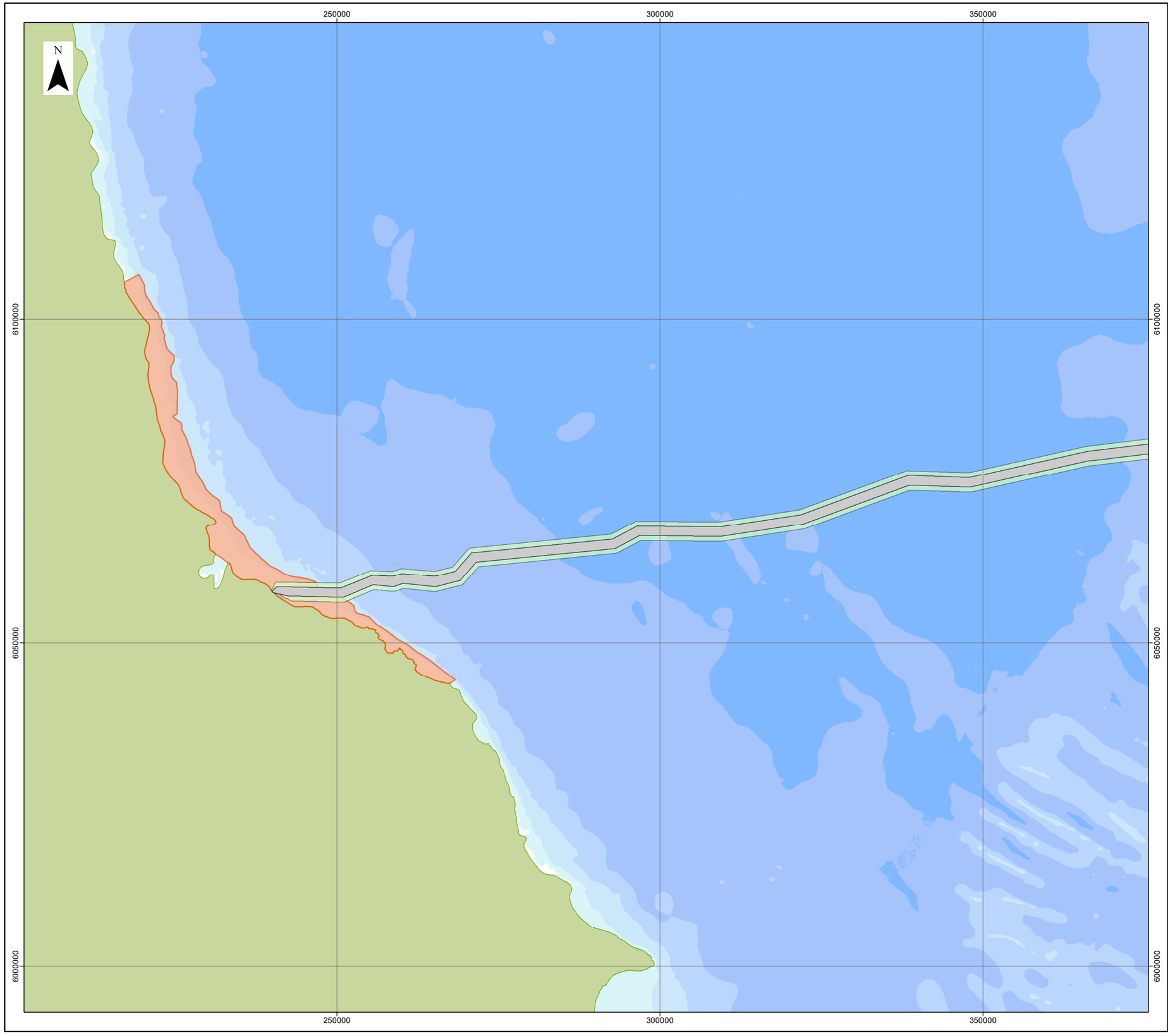

LEGEND

- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Teesside inshore netting ground (Newcastle to Whitby)

0 5 10 20
Kilometres

Data Source:
Netting ground - Redcar and Tees Bay Fishermen's Association © PMSL, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 7.7 Principal fishing grounds for net fisheries

VER	DATE	REMARKS	Drawn	Checked
1	17/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-541

SCALE	1:600,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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Impact significance

7.2.85. The predicted impact of complete loss or restricted access to traditional fishing during the installation of the export cables are given in **Table 7.4** below.

Table 7.4 Impact significance of complete loss or restricted access to traditional fishing grounds during the export cable installation.

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
Flatfish Trawling	Low	Low	**Minor adverse**
Sandeel Fishery	Low	Low	**Minor adverse**
Whitefish fishery – Under-15m	Medium	Low	**Minor adverse**
Whitefish fishery – Over-15m	Low	Negligible	**No discernible impact**
Nephrops fishery	Medium	Negligible	**Minor adverse**
Scallop fishery	Low	Negligible	**No discernible impact**
Pelagic fishery	Low	Low	**Minor adverse**
Potting Fishery	High	Negligible	**Minor adverse**
Netting Fishery	Medium	Low	**Minor adverse**

7.3. Safety issues for fishing vessels

7.3.1. Safety issues for fishing vessels during the construction of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are discussed in full in **Chapter 16** and summarised below.

7.3.2. The assessment of the safety issues for fishing vessels during the construction phase principally focuses on Dogger Bank Teesside A & B and along the Dogger Bank Teesside A & B Export Cable Corridor. It is however recognised that fishing vessels may also be affected by impacts occurring outside of fishing vessels.

7.3.3. There will be a safety zone of up to 500m around each major construction activity, from which all non-construction associated vessels would be excluded for the duration of the construction phase. Infrastructure partially or completely installed will be marked and appropriately lit. In addition, the required liaison and distribution of notices will be undertaken to make fishermen fully aware of the schedules and locations of safety zones and partially installed infrastructure. Risks to fishing vessels and their gears would therefore only occur if infringements of safety zones occurred or if the appropriate liaison regarding the infrastructure is not undertaken. In line with standard maritime policy, the ultimate responsibility with regards to safety lies with the master of a vessel.

7.3.4. Cables surface laid prior to burial and trenching could pose temporary fishing gear fastening risks. If such situations were to occur, the appropriate liaison will be undertaken and, if necessary, the implementation of temporary safety zones and the provision of guard vessels until rectification procedures have been undertaken.

7.3.5. With compliance with the implemented safety measures and policies, the safety risks to fishing vessels and their gears should be within acceptable limits.

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Interference with fishing activities

7.3.6. The potential impacts discussed above could be considered to cause interference to fishing activities. A further impact however is the potential for navigational conflicts arising between fishing vessels and transiting construction vessels (works vessels). This could include the fouling of static gear marker buoys and dhans or towed gear vessels being required to alter towing direction whilst fishing.

7.3.7. It should also be recognised that in order to minimise gear losses, static gear fishermen avoid deploying their gears in shipping routes and areas of high shipping activity. Transiting Forewind works vessels will also fully comply with the international regulations (International Regulations for Preventing Collisions at Sea (COLREGS)) to negate the requirement for fishing vessels engaged in fishing to alter course or to pose any risk to fishing gears being towed.

7.3.8. Hartlepool under 10m trawlers have the capacity to operate widely within their traditional fishing grounds. According to the information supplied by local Hartlepool fishermen the temporary loss of access to the area in which the Dogger Bank Teesside A & B Export Cable Corridor will be located amounts to less than 3% of their total fishing grounds (**Appendix 15A** Figure 8.45). Taking into account the mobility of towed gear vessels targeting the fisheries in Dogger Bank Teesside A & B and along the Dogger Bank Teesside A & B Export Cable Corridor, their sensitivity is considered to be low. Recognising the static nature of the potting and netting fisheries, set in water for periods of several days, these fisheries are considered to have less tolerance and adaptability and therefore are considered to be of medium sensitivity.

7.3.9. The magnitude of effect is largely determined by the location of the construction port(s) and transit routes to the projects, which at the current time are unknown. As a result, a conservative assumption has been made that works vessel transits will be in the vicinity of static and towed gear grounds. However, policies will be in place with respect to transit routes so that works vessels comply with COLREGS in respect of fishing vessels engaged in fishing activities and to avoid conflicts with any static gears deployed at sea. The magnitude of the effect is therefore expected to be negligible.

7.3.10. Using the matrix provided in **Table 3.5**, the significance of impact on mobile gear vessels is considered to be of no discernible impact, whereas the impact on static gear vessels is considered to be **minor adverse**.

Summary of impacts

7.3.11. The predicted impact of interference to fishing activities during the construction of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are given in **Table 7.5.**

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Table 7.5 Impact of interference to fishing activities during the construction of Dogger Bank A & B and the Dogger Bank Teesside A & B Export Cable Corridor

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance	Residual Impact Significance
Mobile Gear	Low	Negligible	**No discernible impact**	**No discernible impact**
Static Gear	Medium	Negligible	**Minor adverse**	**Minor adverse**

7.4. Increased steaming times to fishing grounds

7.4.1. Increased steaming times to fishing grounds during the construction of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are discussed and assessed in full in **Chapter 16** and summarised below.

Dogger Bank Teesside A & B

7.4.2. The implementation of 500m safety zones around major installation works and 50m safety zones around partially installed infrastructure during the construction phase could, in theory, result in some temporary small deviations from traditional routes to and from fishing grounds.

7.4.3. As shown by the VMS and fisheries statistics given in Section 4 - Existing Environment, the main fishing grounds relative to base ports for the vessels targeting grounds in the vicinity of Dogger Bank Teesside A & B are such that there would be minimal or no requirement for vessels to alter traditional steaming routes to reach the majority of their fishing grounds. The single UK seine netter and vessels targeting some of the sandeel fishing grounds adjacent to the sites may, on occasion, be required to deviate around safety zones or partially installed infrastructure. Such required deviations would however be relatively infrequent and small. It should also be recognised that in the normal course of fishing, vessels have to frequently make deviations to steaming routes to, for example, avoid collisions with other vessels, other infrastructure and also due to weather conditions. Taking this and the small scale of deviations required, it is therefore considered that there will be **no discernible impact** on steaming times for all categories of fishing vessel as these would fall within what is typically expected to occur within normal fishing operations.

Dogger Bank Teesside A & B Export Cable Corridor

7.4.4. During cable installation there will be temporary and transitory safety zones around installation vessels, which steaming vessels will have to avoid. Taking the size of the zones and their very short duration at any one location into account, it is not expected that the installation of the export cables will have any material impact on fishing vessel steaming times. A commitment to undertaking post installation surveys and that the appropriate survey programme will be developed in conjunction with the relevant authorities.

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7.5. Displacement of fishing activity

7.5.1. Comments were made during consultation with fishermen and their representatives that any loss or restricted access to fishing grounds as a result of wind farm development could result in increased competition for grounds outside of the site. This might result in either conflict between vessels competing for the same resource, or between different fishing methods (i.e. static and towed gear vessels).

7.5.2. The scale of displacement will be a direct function of the complete loss or restricted access to traditional fishing grounds during the construction period for both Dogger Bank Teesside A & B and the installation of the export cable. As a consequence, the impact identified previously for complete loss or restricted access to traditional fishing grounds during the construction of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor will apply here.

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8. Assessment of Impacts during Operation

8.1. Adverse impacts upon commercially exploited species

8.1.1. Adverse impacts upon commercially exploited species during the operation of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are discussed and assessed in full in **Chapter 13**.

8.1.2. As assessed in **Chapter 13**, the impacts on the commercially exploited species during the operational phase does not exceed **minor adverse** and are therefore not assessed further.

8.2. Temporary/complete loss or restricted access to traditional fishing grounds

8.2.1.1. The recent history of fishing within the North Sea has seen a substantial reduction in the numbers of operational fishing vessels over the past 50 years, as well as changes in the levels of fishing effort.

8.2.2. Factors such as depth and substrate type, which influence fishing patterns, are unlikely to materially change over the lifespan of Dogger Bank Teesside A & B. The conditions of fish stocks and fisheries legislation may, however, have a significant impact on both the levels and locations of effort. It is also inevitable that there will be further developments in fishing technology, particularly those aimed at reducing the extent to which fishing gears penetrate the seabed, to both reduce fuel costs and as a consequence of future conservation related legislation. Whilst speculative, the assumption is made that the future impacts of the operation of Dogger Bank Teesside A & B will not be of greater significance than currently assessed.

8.2.3. Whilst all mobile commercial fishing methods are currently prohibited from Danish, Dutch and Belgian operational wind farms, at present there is no legislation in place to prevent commercial fishing activity within operational wind farms in UK waters.

8.2.4. The extent to which fishing resumes within the operation of Dogger Bank Teesside A will therefore be based on whether skippers elect to do so and it is recognised that skippers may decide fishing within the operational project is impractical. This is recognised by the National Policy Statement for Renewable Energy Infrastructure (EN-3) which states:

> *"Whilst the footprint of the offshore wind farm and any associated infrastructure may be a hindrance to certain types of commercial fishing activity such as trawling and long-lining, other fishing activities may be able to take place within operational wind farms without unduly disrupting or compromising navigational safety"*.

8.2.5. It is possible that other factors outwith Forewind's control may result in demersal towed fishing gears being excluded from Dogger Bank Teesside A & B such as

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restrictions implemented under Natura 2000 (described in detail in **Chapter 8 Designated Sites**). **Figure 8.1** is a chart reproduced from a paper prepared on behalf of the Danish, Dutch, English and German fishermen organisations (DFA, CVO, NFFO and DFV) titled "Fisheries Spatial Management Measures for the Dogger Bank SAC: Fishing Industry Amendment Proposal".

8.2.6. The sectors marked in purple are those proposed by the fishing industry to be under fisheries management within which towed bottom gears are prohibited from operating. As shown, the proposed sectors overlap a proportion of both Dogger Bank Teesside A & B. It should be recognised however that the areas proposed by the fishing industry may not necessarily be adopted.

8.2.7. The management sectors proposed by the fishing industry align to the areas which national VMS and UK surveillance data suggest sustain only very low levels of fishing activity.

8.2.8. Whilst the worst case is that all skippers will elect never to fish within the operational project, it is probable that some and possibly a majority of skippers will assess that it is safe and feasible to do so, providing they are not excluded by Natura 2000 legislation.

8.2.9. The minimum wind turbine spacing of 750m with wind turbines in straight rows should allow trawl gears to be towed between wind turbines, given the operational widths of trawl gears as shown in **Table 8.1** below.

Table 8.1 Indicative operational widths of fishing gears

Fishing Activity	Indicative Gear Spread
Beam Trawling	40m between beam trawl outer shoes
Demersal Otter Trawling	220m between otter boards
Industrial Sandeel Trawling	120m between otter boards
Seine Netting	2.9km² per operation

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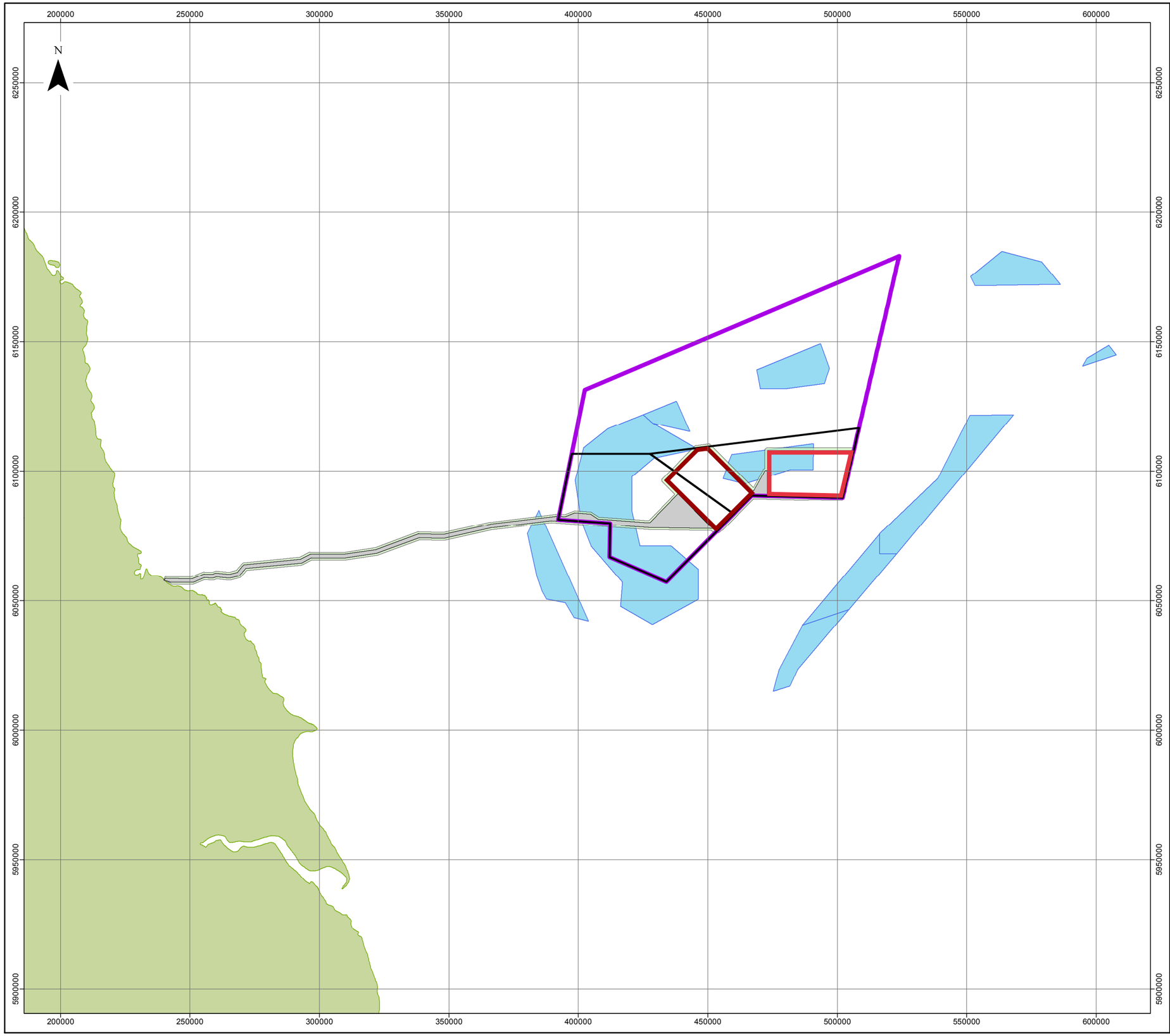

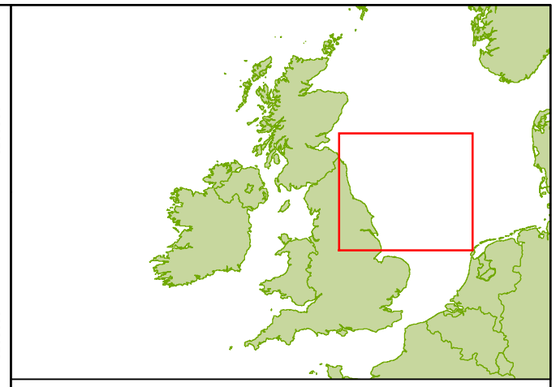

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- cSAC proposed no trawl zones

0 10 20 40
Kilometres

Data Source:
Management Sectors © NFFO 2012
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 8.1 Proposed fisheries management sectors within Dogger Bank cSAC

VER	DATE	REMARKS	Drawn	Checked
1	04/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-542

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,500,000	A3	WGS84	UTM31N

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Figure 8.2 Trawling in an operational wind farm (Source: BMM 2013)

8.2.10. During consultation with Dutch fishermen and their representatives, it was stated that their vessels were sufficiently manoeuvrable to be able to trawl within operational wind farms (VisNed 2011). Also, post-construction fish surveys undertaken by BMM using a commercial otter trawler, have demonstrated that it is feasible to tow otter trawls between the wind turbines of an operational wind farms, including Barrow Offshore Wind Farm with turbine spacing of 500m and Walney Offshore Wind Farm with minimum turbine spacing of 749m (**Figure 8.2**). Commercial fishing activities have also been observed (BMM 2011) being undertaken in the operational Kentish Flats Offshore Wind Farm, which has 700m between turbines. Fishing interests also requested that there should be sufficient space between projects within the Dogger Bank Zone. As discussed in the cumulative assessment, this is to be the case.

8.2.11. For demersal trawling to resume within the operational project, it will be necessary for the inter-array cables to be buried or protected where cable burial is not feasible so they do not represent a fastening risk to fishing gears. A primary objective of Forewind is to ensure protection of the cables from risk of damage (including from fishing gears).

8.2.12. **Table 8.2** reproduced from Linnane *et al.* (2000), summarises research into the penetration depths of otter and beam trawl gears into various seabed types. As shown, the research was undertaken between 1970 and 1992. As a result of significant increase in fuel costs there has been a focus on reducing the fuel consumption of trawlers with the development and usage of reduced drag trawl doors and beam trawls. This is the case with the recent development of the Sum and Pulse Wing beam trawls used by Dutch and Belgian vessels which have significantly less seabed contact and therefore less drag than conventional beam trawls. The Danish government is also supporting research into developing sandeel trawl gears aimed at reducing contact with the seabed (DTU Aqua 2012).

Table 8.2 Fishing Gear Seabed Penetration Depths

Penetration Depth	Reference	Gear Type	Substratum
100mm to 150mm	Arntz and Weber 1970	Otter boards	Muddy fine sand
A thin layer of top substrate	Bridger 1970	Otter trawl ticklers	Sand
80mm to 100mm	Margetts and Project Bridger 1971	Beam trawls	Muddy sand
100mm to 200mm	Houghton *et al*., 1971	Beam trawls	Sand
0mm to 27mm	Bridger 1932	Beam trawls	Mud
Rather limited	De Clerck and Hovart 1972	Beam trawls	Rough ground
Few centimetres	Caddy 1973	Otter boards	Sandy sediment
10mm to 30mm	De Groot 1984	Beam trawls	Mud, sand
200mm	Khandriche *et al*. 1986	Otter boards	Mud
A few centimetres	Blom 1990	Beam trawls	Sand
Approximately 60mm	Bergman *et al*. 1990	Beam trawls	Fine to medium hard sand
5mm to 200mm 20mm to 50mm	Krost *et al*. 1990	Otter boards Rollers on foot rope	Mud sand
200mm	Laane *et al*., 1990	Beam trawls	Mud, sand

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Penetration Depth	Reference	Gear Type	Substratum
20mm to 300mm	Rauck 1998	Beam trawls	Mud, sand
5mm to 170mm	Rumohr (in Krost *et al*. 1990)	Otter boards	Mud, sand
40mm to 70mm	Laban and Lindeboom 1991	Beam trawls	Fine sand
50mm to 60mm	BEON 1991	Beam trawls	Fine sand
Few centimetres to 300mm	Jones 1992	Otter boards	Deepest in soft mud
20mm to 40mm	Santbrink and Project Bergman 1994	Beam trawls	Fine to medium sand sediment
15mm to 70mm	De Groot 1995	Beam trawls	Substratum dependant
Approximately 140mm	Lindeboom and de Groot (edit.) 1998	Otter boards	Mud

8.2.13. As described in **Chapter 5**, it is possible that whilst the overriding objective is for complete cable burial, due to seabed conditions this may not be totally achievable. If this were the case other protective measures, which have proved effective in the North Sea, will be used where feasible. At present the measures to be applied have not been defined, the final selection being dependent upon further evaluation. Those currently under consideration include:

- Rock placement;
- Concrete mattresses;
- Cable clip;
- Pipes; and
- Half pipes.

8.2.14. As part of the detailed design phase for selecting the most appropriate measures, Forewind will engage with the relevant fishing interests to discuss the techniques to be used and wherever possible, will endeavour to make these designs over trawlable.

Dogger Bank Teesside A

Flatfish fishery

8.2.15. As explained in Section 6, the sensitivity of the flatfish fishery is assessed to be low.

8.2.16. The spatial extent of the effect will be the same as assigned for the construction phase previously, however the duration will be longer. Taking the very low loss of proportional area into account, the increased duration of the effect will not have a directly proportional influence on magnitude.

8.2.17. It is accepted that fishing will be restricted by the presence of infrastructure, which Forewind will chart. If however, skippers elect to resume fishing within Dogger Bank Teesside A, the magnitude of effect will be further reduced. As such, the magnitude of the effect is expected to be low.

8.2.18. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the flatfish fishery as a result of the operation of Dogger Bank Teesside A is therefore **minor adverse**.

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Sandeel fishery

8.2.19. The sensitivity of the vessels targeting the sandeel fishery is considered to be low.

8.2.20. In respect of the sandeel fishery, the same considerations as discussed above for the flatfish fishery apply, giving an effect of a low magnitude.

8.2.21. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on vessels targeting the sandeel fishery as a result of the operation of Dogger Bank Teesside A is therefore **minor adverse**.

Seine net fishery

8.2.22. The sensitivity of the seine net fishery is assessed as medium.

8.2.23. In view of the mode of operation of seine netting as currently practised, it is assumed that it will not be able to occur within the operational project. Again, whilst the duration of the effect is long, the proportion of seine netting grounds within the project compared to outside is such that the magnitude of the effect will be no greater than medium.

8.2.24. Using the matrix defined in **Table 3.5** above, the impact of loss of fishing area on the seine net fishery as a result of the operation of Dogger Bank Teesside A is therefore **moderate adverse**. Forewind is however committed to the principle of working with any seine net fishermen who may be affected during the operational phase with the objective of exploring potential options to mitigate the impact.

Gillnet fishery

8.2.25. The sensitivity of the gillnet fishery is assigned as low.

8.2.26. The spatial extent of the effect will be the same as that assessed for the construction phase previously. Since the loss of fishing area is low in comparison to the total area used the increased duration of the effect will not have a directly proportional influence on magnitude.

8.2.27. It is accepted that fishing should be able to resume within Dogger Bank Teesside A once operational, therefore the magnitude of effect will be further reduced. As such, the magnitude of the effect is expected to be negligible.

8.2.28. Using the matrix defined in **Table 3.5**, the impact of loss of fishing area on the gillnet fishery as a result of the operation of Dogger Bank Teesside A is therefore considered to be of **no discernible impact**.

Impact significance

8.2.29. **Table 8.3** provides a of the potential impact of complete loss or restricted access to traditional fishing grounds associated with the operational phase of Dogger Bank Teesside A.

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Table 8.3 Impact significance of complete loss or restricted access to traditional fishing grounds during Dogger Bank Teesside A operational phase

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
Flatfish Fishery	Low	Low	**Minor adverse**
Sandeel Fishery	Low	Low	**Minor adverse**
Seine Net Fishery	Medium	Medium	**Moderate adverse**
Gillnet Fishery	Low	Negligible	**No discernible impact**

Dogger Bank Teesside B

8.2.30. The magnitude of the effect relating to potential loss or restricted access to traditional fishing grounds in respect of the operational phase of Dogger Bank Teesside B will be the same as described for Dogger Bank Teesside A. The operational phase will not represent a greater worst case in terms of size, infrastructure type and layout and the levels of fishing are approximately the same (or slightly higher in the case of the sandeel fishery) than those occurring in Dogger Bank Teesside A. Although the activity by vessels targeting sandeels is slightly higher in Dogger Bank Teesside B compared to Dogger Bank Teesside A the area fished within the development is small relative to the extent of sandeel fishing grounds (**Figure 6.7**) within the North Sea. Consequently, the effect will remain of low magnitude and the impact anticipated to be **minor adverse**.

Table 8.4 Impact significance of complete loss or restricted access to traditional fishing grounds during Dogger Bank Teesside B operational phase

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
Flatfish Fishery	Low	Low	**Minor adverse**
Sandeel Fishery	Low	Low	**Minor adverse**
Seine Net Fishery	Medium	Medium	**Moderate adverse**
Gillnet Fishery	Low	Negligible	**No discernible impact**

Dogger Bank Teesside A & B

8.2.31. For the operational phase, the same considerations apply in respect of the size and importance of the combined areas of Dogger Bank Teesside A & B, relative to the overall extent and values of the various receptor groups fishing areas, as discussed for the operational phases above.

8.2.32. Whilst the spatial extent of the effect will be greater if both of the projects became operational, it is of note that a proportion of the areas of both projects fall within the management sectors which the fishing industry is proposing and from which trawling could be excluded (**Figure 8.1**).

8.2.33. Since some fishing may resume within both operational projects, the impacts of potential complete loss or restricted access to traditional fishing grounds will not be greater than assessed for the construction phase. It is likely however that seine netting activities will be permanently excluded from the projects from construction onwards, as it is unlikely that the activity can resume in the operational projects. However the area of the combined projects remains small

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relative to the extent of seine net fishing grounds and, as a consequence, the magnitude of effect is considered to be medium and the impact is therefore anticipated to be **moderate adverse**. However, as with the construction phase, Forewind is committed to the principle of engagement with the relevant stakeholder fishermen to explore proactive management options.

Dogger Bank Teesside A & B Export Cable Corridor

8.2.34. Export cables will be buried or protected by other measures at locations where burial might not be feasible and where the cable crosses existing pipelines and cables. Subject to successful burial of the export cables confirmed by post-installation surveys it is considered that fishing activities will be able to resume within the operational Dogger Bank Teesside A & B Export Cable Corridor.

8.2.35. As discussed above, a number of measures in common use in the North Sea are currently under consideration, with a primary objective being that the measures selected should be “over-fishable” and should not constitute a hazard to fishing gears. It is therefore considered that the operational export cables will not impede normal fishing activity to any substantial extent and, with the exception of any direct impact on commercial species, the specific impact on the fishing activities are not considered further.

8.3. Safety issues for fishing vessels

8.3.1. Safety issues for shipping, including fishing vessels, during the operation of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are discussed in **Chapter 16** and summarised below.

8.3.2. It is recognised that fishing vessels may be affected by impacts occurring both inside and outside of the boundaries of the projects, such as potential collision risks between Forewind works vessels and fishing vessels.

8.3.3. With the completion of cable burial and/or appropriate protection measures where cable burial is not feasible, it is not envisaged that the inter-array and export cables will constitute significant fastening risks to fishing gears which in turn could affect the stability of fishing vessels. In order for fishermen to be fully aware of the status of installed cables the coordinates and conditions of the cables will be publicised through appropriate liaison, notifications and publications.

8.3.4. There is the potential for fishing gear to fasten on foundations. In order to minimise this risk, the appropriate liaison and information distribution will be undertaken to make fishermen fully aware of the locations and designs of all underwater infrastructure which might represent such a risk. Furthermore, in line with standard offshore practice fishermen will be made fully aware of the procedures to be adopted in the event of a fastening incident.

8.3.5. Assuming compliance with the implemented safety measures and policies, the safety risks to fishing vessels and their gears should be within acceptable limits.

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8.4. Interference with fishing activities

8.4.1. As with the construction phase there is the potential for navigational conflicts arising between fishing vessels and transiting operation and maintenance vessels (works vessels). This could include the fouling of static gear, marker buoys and dhans or towed gear from vessels altering towing direction whilst fishing.

8.4.2. Transiting works vessels will fully comply with the COLREGS to avoid fishing vessels having to alter course or fishing gear being towed.

8.4.3. The sensitivity of mobile gear vessels is assessed as low, whereas the sensitivity of static gear vessels is considered to be medium.

8.4.4. The conservative assumption is that works vessel transits will be in the vicinity of static and towed gear grounds. Policies will be implemented to which contractors will be bound with the objective that, conflicts with fishing activities and gear are avoided. The magnitude of the effect is therefore expected to be negligible.

8.4.5. Using the matrix provided in **Table 3.5**, the impact on mobile gear vessels is considered to be **minor adverse**. Liaison will be undertaken and operational policies implemented to ensure that transiting project works vessels have **no discernible impact** on static gear fishing operations.

Impact significance

8.4.6. The impact significance of interference to fishing activities during the operation of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are given in **Table 8.5.**

Table 8.5 Summary of impact significance of interference to fishing activities during the operation of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
Mobile Gear	Low	Negligible	**No discernible impact**
Static Gear	Medium	Negligible	**Minor adverse**

8.5. Increased steaming times to fishing grounds

8.5.1. Increased steaming times to fishing grounds during the operation of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are discussed and assessed in full in **Chapter 16** and summarised below.

Dogger Bank Teesside A & B

8.5.2. The main fishing grounds relative to base ports for the vessels targeting grounds in the vicinity of Dogger Bank Teesside A & B are such that there would be minimal or no requirement for vessels to alter traditional steaming routes to reach the majority of their fishing grounds. Furthermore, spacing between turbines will be sufficient for vessels to transit through the operational wind farm site in appropriate conditions but this would be at the skippers discretion.

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Dogger Bank Teesside A & B Export Cable Corridor

8.5.3. Once installed the export cables will not impede the navigation of fishing vessels.

8.6. Obstacles on the seabed post-construction

Dogger Bank Teesside A & B

8.6.1. Obstacles on the seabed post-construction which could represent a fastening risk to fishing gears can be broadly categorised as follows:

- Objects accidentally dropped or deliberately discarded from construction or maintenance vessels;
- Cable trenching and foundation installation spoil; and
- Cable protection measures.

8.7. Accidentally dropped or discarded objects

8.7.1. Contractors will be obliged not to discard any objects or waste overboard from their vessels, and this will be monitored by client representatives. Accidently dropped objects which cannot be immediately recovered will be marked for subsequent recovery following appropriate risk assessments and where practicably feasible. The distribution of the appropriate notices and liaison with fishermen's representatives will also be undertaken. With full compliance there should be no obstacles on the seabed which could have an impact on normal commercial fishing activities.

8.8. Displacement of fishing due to cable trenching and foundation spoil

8.8.1. With current jetting and simultaneous lay and backfill ploughs there is generally little spoil after completion of cable installation activities. There may be a requirement for the use of other methods, as described in **Chapter 5**, which may lead to the temporary deposition of spoil. During the construction phase, the required safety exclusion zones will be in place, which will not be removed until the appropriate rectification measures have been undertaken. As such, the fastening risks to fishing gears should be within acceptable limits.

Cable protection measures

8.8.2. The crossing protection techniques which could be adopted, as described in detail in **Chapter 5**, are:

- Rock burial;
- Concrete mattresses;
- Steel bridging; and
- Concrete bridging.

8.8.3. It is also possible that, as a worst case, up to 20% of the total inter-array and inter-platform cable length of each project may require protection measures

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other than burial. The measures which could be adopted, as described in detail in **Chapter 5** are:

- Rock burial;
- Concrete mattresses;
- Pipe and half pipes; and
- Cable clip.

8.8.4. A primary objective of the selected measure will be that it will not represent a significant impediment to fishing operations.

8.8.5. Whilst it is the intention to bury the entire lengths of the export cable, taking the worst case approach, it is assumed that up to 319.4km of the cable (combined Dogger Bank Teesside A & B cables) could require remedial protection. The measures currently under consideration are as outlined above for protection of inter-array cables.

8.8.6. As with the inter-array cables, an over-riding objective is that the selected protection measures should not significantly impede fishing gears and part of the detailed design consultation will be undertaken with fishermen's representatives.

8.8.7. The scale of displacement will be a direct function of the complete loss or restricted access to traditional fishing grounds during the operation period for both Dogger Bank Teesside A & B. As a consequence, the impact identified previously for complete loss or restricted access to traditional fishing grounds during the operation of Dogger Bank Teesside A & B will apply here.

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9. Assessment of impacts during decommissioning

9.1. Adverse impacts upon commercially exploited species

9.1.1. It is assumed that any impacts derived from the decommissioning phase will at worst be of no greater significance that those derived from the construction phase (see **Chapter 13**).

9.2. Temporary/complete loss or restricted access to traditional fishing grounds

Dogger Bank Teesside A

9.2.1. **Chapter 5** outlines the procedures for the decommissioning of Dogger Bank Teesside A & B.

9.2.2. During the actual decommissioning works it is assumed all fishing vessels will be excluded from the entire project area. Therefore, those vessels which engaged in fishing within the operational project will temporarily lose fishing area. Since the duration of the decommissioning phase will not exceed that of the construction phase, the impact should not be greater than that assessed for the construction phase.

9.2.3. If, however, the project is designated within a Natura 2000 management area, as proposed by the fishing industry, trawling will have already been excluded and therefore, in the case of trawlers, there will be no impact attributable to the project.

9.2.4. It is possible that some structures will be left *in situ* (see **Chapter 5**). It is however assumed that decommissioning will require an environmental impact assessment to fully address the implications of the selected decommissioning options in respect of potential loss of fishing area.

Dogger Bank Teesside B

9.2.5. The same considerations as given for Dogger Bank Teesside A will apply to the decommissioning of Dogger Bank Teesside B.

Dogger Bank Teesside A & B

9.2.6. The same considerations as given above will apply to the decommissioning of Dogger Bank Teesside A & B.

Dogger Bank Teesside A & B Export Cable Corridor

9.2.7. As with decommissioning of the wind farms, the decommissioning of the export cables will require a specific environmental impact assessment. It is likely that by the time decommissioning occurs the existing environment may have changed. However, it is not expected that the temporal and spatial contexts will exceed those of the installation phase.

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9.3. Safety issues for fishing vessels

9.3.1. Taking the same safety requirements and obligations to be applied to the construction phase, the safety risks to fishing vessels during decommissioning will not exceed those of the construction phase. This is discussed in more detail in **Chapter 16**.

9.4. Interference with fishing activities

9.4.1. The interference to fishing activities during the decommissioning phase is not expected to be greater than that assessed for the construction phase.

9.5. Increased steaming times to fishing grounds

9.5.1. It is not expected that the effects of the decommissioning phase will be materially different from those assessed for the construction phase, whilst accepting that the fisheries baseline and indeed fishing grounds and steaming patterns may have changed by the time decommissioning commences.

9.6. Displacement of fishing activity

9.6.1. Assuming that the same safety zone requirements will be implemented at the time of decommissioning it is not expected that decommissioning will have a greater impact on commercial fishing than the construction phase in terms of displacement effects.

9.7. Potential mitigation and residual impact - Seine net fishery

9.7.1. With the exception of the seine net fishery, the impacts on commercial fisheries are not anticipated to exceed **minor adverse** and therefore do not require mitigation. The following mitigation for the seine net fishery is proposed during construction with the objective of reducing the impacts to levels which would not be significant in EIA terms.

9.7.2. During consultation with Danish seine fishermen, it was stated that guard vessel work would be a suitable mitigation for temporary/ complete loss of fishing grounds (pers. com. Peter Lassen April 2013). It is also understood from consultation (pers. com Kevin Caffery, 20th June 2013) that the UK seine netter which has been identified as fishing within the Dogger Bank Zone regularly undertakes guard vessel work.

9.7.3. The provision of fishing vessels for guard and survey work constitutes the majority of the income for the UK fisherman's federations and their affiliated members through their subsidiaries, SFF (Services Ltd) and NFFO (Services Ltd). The 2011 accounts of SFF (Services Ltd) filed with Companies House, show a turnover for the year of £13,279,000, the majority of which is from guard vessel work.

9.7.4. Whilst NFFO (Services Ltd) submits only abbreviated accounts, those for 2011 show trade debtors at the year-end of £1,798,687, which assuming normal credit terms would indicate a similarly high level of turnover. In addition, a

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number of UK fishing vessels and Producer Organisations (PO) also undertake guard vessel and survey work directly with offshore oil and gas, cable and wind farm developers and operators.

9.7.5. It is therefore apparent that the offshore industries provide a significant source of income to fishing vessels. This has also been the case for Forewind's Dogger Bank developments, where fishing vessels have been employed for survey work to a value of £603,200 to date.

9.7.6. During the wind farm construction and the export cable installation phases, it is likely that there will be a requirement for guard vessels, and consideration will be given to those vessels identified as being significantly affected by the construction of Dogger Bank Teesside A & B. It is also probable that fishing vessels will be engaged in further survey work in the future.

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10. Inter-Relationships

10.1. Introduction

10.1.1. An assessment of the impacts to commercial fisheries arising from construction, operation and decommissioning of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor demonstrates that there are inter-relationships between multiple impacts upon individual receptors. Indeed, none of the impacts assessed should be considered in isolation because of the potential for fishing activities to be affected by all of the impacts. For example, it follows that safety risks identified as unacceptable to fishing vessels would result in the loss of fishing area.

10.1.2. In addition, the assessment has demonstrated the linkages between different chapters in the ES. For example, potential adverse impacts to fish and shellfish species of commercial importance are assessed in **Chapter 13**, although they are referenced in this chapter. Where linkages occur, they have been fully referenced. **Table 10.1** provides details of where linkages occur in the assessment.

Table 10.1 Commercial Fisheries Inter-relationships

Inter-relationship	Relevant Sections	Linked Chapter
Safety issues for fishing vessels	Sections 7.3, 8.3, 9.3	**Chapter 5 Project Description** **Chapter 16 Shipping and Navigation**
Increased steaming times to fishing grounds	Sections 7.4, 8.5, 9.5	**Chapter 16 Shipping and Navigation**
Adverse impacts upon commercially exploited species	Section 7.1, 8.1, 9.1	**Chapter 10 Marine Water and Sediment Quality** **Chapter 9 Marine Physical Processes** **Chapter 12 Marine and Intertidal Ecology** **Chapter 13 Fish and Shellfish Ecology**

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11. Cumulative Impact Assessment

11.1. Cumulative impact assessment strategy and screening

11.1.1. The cumulative impact assessment (CIA) for commercial fisheries, taking into consideration other plans, projects and activities, is provided below. A summary of the CIA is presented in **Chapter 33**.

11.1.2. Forewind has developed a strategy (the 'CIA Strategy') for the assessment of offshore cumulative impacts in consultation with statutory stakeholders including the MMO, JNCC, Natural England and Cefas. Further details of the approach to CIA are provided in **Chapter 4 EIA Process** and **Chapter 33.**

11.1.3. The CIA Strategy involves consideration of:

- Whether impacts on a receptor can occur on a cumulative basis between the wind farm project(s) subject to the application(s) and other wind farm projects, plans and activities in the Dogger Bank Zone (either consented or forthcoming); and
- Whether impacts on a receptor can occur on a cumulative basis with other plans, projects and activities outwith the Dogger Bank Zone (e.g. other offshore wind farm developments), for which sufficient information regarding location and scale exist.

11.1.4. The strategy recognises that data and information sufficient to undertake an assessment will not be available for all potential plans, projects and activities and/or parameters, and seeks to establish the 'confidence' in the data and information available.

11.1.5. There are two key steps to the Forewind CIA strategy, which both involve 'screening' in order to provide an appropriate list of other plans, projects and activities to take forward in the assessment.

11.1.6. The first step in the CIA for commercial fisheries involved an appraisal of the key impacts relevant to each of the receptors that have been identified (**Table 11.1**). For each impact, the potential for impacts to occur on a cumulative basis has been identified, both within and beyond the Dogger Bank Zone. The confidence in the data and information available to inform the CIA has been appraised (following the methodology set out in **Chapter 4**); and the other activities that could contribute to these impacts has been identified.

11.1.7. Where the first step indicates the potential for cumulative impacts, the second step in the CIA for commercial fisheries involves the identification of the individual plans, projects and activities within those broad industry levels for inclusion in the CIA. In order to inform this, Forewind has produced a comprehensive list of plans, projects and activities within areas encompassing the operating areas of the various fisheries stakeholder groups (referred to as the 'CIA project list', see **Chapter 4**).

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Table 11.1 Potential cumulative impacts (impact screening)

Impact	Potential Cumulative Impact in the Zone and Export Cable Corridor	Potential Cumulative Impact outside the Zone	Data Confidence (Zone and Export Cable Corridor)	Data Confidence (outside the Zone)
Adverse impacts upon commercially exploited species	Yes	Yes	High	Medium
Complete loss or restricted access to traditional fishing grounds	Yes	Yes	High	High
Safety issues for fishing vessels	Yes	Yes	High	Medium
Interference with fishing activities	Yes	Yes	High	Medium
Increased steaming times	Yes	Yes	High	Medium
Obstacles on the seabed post-construction	Yes	Yes	High	Medium
Displacement of fishing activities	Yes	Yes	High	Medium

11.1.8. **Table 11.2** below gives those projects taken forward for cumulative assessment on the basis of their distance from Dogger Bank Teesside A & B, and the levels of confidence in their details and data. The information provided covers a large range of projects to reflect the large area of the North Sea fishing vessels may cover during fishing operations.

11.1.9. The CIA adopts an additive approach whereby the cumulative effects of the following interactions are progressively assessed:

- The cumulative impacts associated with Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor and Dogger Bank Creyke Beck and Dogger Bank Teesside C & D, including their respective Export Cable Corridors;
- The cumulative effects of Dogger Bank Teesside A & B, Dogger Bank Creyke Beck and Dogger Bank Teesside C & D with other planned, consented or under construction wind farm developments outside of the Dogger Bank Zone;
- The cumulative effects of Dogger Bank Teesside A & B, Dogger Bank Creyke Beck and Dogger Bank Teesside C & D with other planned, consented or under construction wind farm developments outside the Dogger Bank Zone and other future installations, regulated activities such as aggregate dredging and possible marine conservation areas which may exclude or restrict commercial fishing activities.

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11.1.11. It should also be noted that:

- Where Forewind is aware that a plan, project or activity could take place in the future, but has no information on how the plan, project or activity will be executed, it has been scoped out of the assessment;
- Existing projects, activities and plans are considered to be a part of the existing baseline to which fishermen have, or will have, adapted to prior to the onset of construction. As such, the effects of existing projects are reflected by the data and information sources used in the production of the existing baseline against which the following cumulative assessment is made (**Appendix 15A**). Therefore existing project activities and plans are not included in the cumulative assessment;
- Military exercise and firing ranges are also considered to be part of the existing environment to which fishermen have adapted and have, therefore, also not been assessed;
- With the exception of Dogger Bank Teesside A & B and Dogger Bank Creyke Beck, detailed existing baseline descriptions, impact assessments and measures being considered are not available for every development included in the CIA project list; and
- Only those fisheries receptor groups identified as fishing within Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor have been considered as receptors which could potentially be subjected to cumulative effects.

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Table 11.2 Cumulative impact assessment screening for commercial fisheries (project screening)

Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Offshore Wind farm (UK)	Beatrice	Pre-consent	2014-2017	489	Medium	Medium	Yes
Offshore Wind farm (UK)	Dogger Bank – Creyke Beck A	Pre-consent	Post 2016	47	High	High	Yes
Offshore Wind farm (UK)	Dogger Bank – Creyke Beck B	Pre-consent	Post 2016	53	High	High	Yes
Offshore Wind farm (UK)	Dogger Bank – Teesside C	Pre-consent	Post 2017	46	High	Medium	Yes
Offshore Wind farm (UK)	Dogger Bank – Teesside D	Pre-consent	2016-2021	51	High	Medium	Yes
Offshore Wind farm (UK)	Dudgeon	Consented	2016	209	High	High	Yes
Offshore Wind farm (UK)	East Anglia Project One	Pre-consent	Post 2015	309	High	Medium	Yes
Offshore Wind farm (UK)	East Anglia Three	Pre-consent	Post 2016	261	Medium	Medium	Yes
Offshore Wind farm (UK)	East Anglia Four	Pre-consent	Post 2016	242	Medium	Medium	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Offshore Wind farm (UK)	Firth of Forth Phase 1 Alpha	Pre-consented	Post 2015	324	Medium	Medium	Yes
Offshore Wind farm (UK)	Firth of Forth Phase 1 Bravo	Pre-consented	Post 2015	314	Medium	Medium	Yes
Offshore Wind farm (UK)	Firth of Forth Phase 2 Charlie	Concept/ Early planning	Unknown	303	Medium	High	Yes
Offshore Wind farm (UK)	Firth of Forth Phase 2 Delta	Concept/ Early planning	Unknown	295	Medium	High	Yes
Offshore Wind farm (UK)	Firth of Forth Phase 2 Echo	Concept/ Early planning	Unknown	287	Medium	High	Yes
Offshore Wind farm (UK)	Firth of Forth Phase 3 Foxtrot	Concept/ Early planning	Unknown	315	Medium	High	Yes
Offshore Wind farm (UK)	Firth of Forth Phase 3 Golf	Concept/ Early planning	Unknown	300	Medium	High	Yes
Offshore Wind farm (UK)	Hornsea Zone Project One	Pre-consent	Post 2015	134	High	Medium	Yes
Offshore Wind farm (UK)	Hornsea Zone Project Two	Pre-consent	Post 2015	134	Medium	Medium	Yes
Offshore Wind farm (UK)	Humber Gateway	Consented	2013-2014	210	High	High	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Offshore Wind farm (UK)	Inch Cape	Pre-consent	2015-2019	338	Medium	Medium	Yes
Offshore Wind farm (UK)	Kentish Flats Extension	Consented	2015	407	Medium	Medium	Yes
Offshore Wind farm (UK)	Lincs	Operational	2011 - 2013	242	High	High	Yes
Offshore Wind farm (UK)	London Array Phase 1	Fully commissioned	unknown	383	High	High	Yes
Offshore Wind farm (UK)	London Array Phase II	Consented (subject to a Grampian condition)	2014 - 2015	380	High	High	Yes
Offshore Wind farm (UK)	Methil	Consented	Expected March 2013	371	High	High	Yes
Offshore Wind farm (UK)	Moray Firth – Telford, Stevenson and MacColl	Pre-consent	2015-2019	473	Medium	Medium	Yes
Offshore Wind farm (UK)	Moray Firth Western Development	Pre-planning	unknown	482	Medium	Medium	Yes
Offshore Wind farm (UK)	Neart na Gaoithe	Pre-consent	2014-2017	330	Medium	Medium	Yes
Offshore Wind farm	Race Bank	Consented	2017	222	Medium	Medium	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
(UK)							
Offshore Wind farm (UK)	Teesside Offshore Windfarm (Redcar)	Operational	2012 - 2013	235	High	High	Yes
Offshore Wind farm (UK)	Triton Knoll	Consented	2017-2021	202	High	Medium	Yes
Offshore Wind farm (UK)	Westermost Rough	Consented	2014-2015	204	High	High	Yes
Offshore Wind farm (Non-UK)	Belgium	Various/Pre-consent	N/A	328	Medium/Low	Medium/Low	Yes
Offshore Wind farm (Non-UK)	Denmark	Various/Pre-consent	N/A	315	Medium/Low	Medium/Low	Yes
Offshore Wind farm (Non-UK)	France	Various/Pre-consent	N/A	444	Medium/Low	Medium/Low	Yes
Offshore Wind farm (Non-UK)	Burger-windpark Butendiek (Germany)	Consented	Post 2012	148	High	High	Yes
Offshore Wind farm (Non-UK)	Netherlands	Various/Pre-consent	N/A	194	Medium/Low	Medium/Low	Yes
Offshore Wind farm (Non-UK)	Norway	Various/Pre-consent	N/A	178	Low	Low	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
SACs with Marine Components	Dogger Bank	Potential cSAC	In consultation	0	Medium	Medium	Yes
SACs with Marine Components	North Norfolk Sandbanks & Saturn Reef	Potential cSAC	In consultation	104	Medium	Medium	Yes
Nature Conservation	NG 12, Compass Rose	Potential Netgain rMCZ	In consultation	80	Medium	High	Yes
Nature Conservation	RA 10, Compass Rose RA	Potential Netgain rRA	In consultation	90	Medium	High	Yes
Nature Conservation	NG 11, Runswick Bay	Potential Netgain rMCZ	In consultation	139	Medium	High	Yes
Nature Conservation	NG 9, Holderness Offshore	Potential Netgain rMCZ	In consultation	117	Medium	High	Yes
Nature Conservation	NG 8, Holderness Inshore	Potential Netgain rMCZ	In consultation	141	Medium	High	Yes
Nature Conservation	Doggersbank pSCI	Potential SCI designation	Not known	47	Medium	Medium	Yes
Nature Conservation	NG 7, Markham's Triangle	Potential Netgain rMCZ	In consultation	84	Medium	High	Yes
Nature Conservation	Klaverbank pSCI	Potential SCI designation	Unknown	74	High	Medium	Yes
Nature Conservation	NG 6, Silver Pit	Potential Netgain rMCZ	In consultation	136	Medium	High	Yes
Nature Conservation	NG 5, Lincs Belt	Potential Netgain rMCZ	In consultation	162	Medium	High	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Nature Conservation	RA 6, Dogs Head Sandbanks	Potential Netgain rRA	In consultation	204	Medium	High	Yes
Nature Conservation	NG 2, Cromer Shoal Chalk Beds	Potential Netgain rMCZ	In consultation	188	Medium	High	Yes
Nature Conservation	RA 1, North Norfolk Blue Mussel Beds	Potential Netgain rRA	In consultation	196	Medium	High	Yes
Nature Conservation	NG 1b, Orford Inshore	Potential Netgain rMCZ	In consultation	280	Medium	High	Yes
Nature Conservation	Outer Banks/Zeeuwse Banken	Potential Dutch MPA's	In consultation	327	Low	High	Yes
Nature Conservation	Coastal Sea/Kustzee	Potential Dutch MPA's	In consultation	280	Low	High	Yes
Nature Conservation	Brown Ridge	Potential Dutch MPA's	In consultation	212	Low	High	Yes
Nature Conservation	RA 7, Seahenge Peat and Clay	Potential Netgain rRA	In consultation	210	Medium	High	Yes
Nature Conservation	RA 5, Blakeney Seagrass	Potential Netgain rRA	In consultation	198	Medium	High	Yes
Nature Conservation	Frisian Front	Potential Dutch MPA's	In consultation	171	Medium	High	Yes
Nature Conservation	Borkham Reef	Potential Dutch MPA's	In consultation	266	Low	High	Yes
Nature Conservation	Central Oyster Grounds	Potential Dutch MPA's	In consultation	112	Low	High	Yes
Nature	Gas Leaks	Potential Dutch MPA's	In consultation	157	Low	High	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Conservation							
Nature Conservation	NG 10, Castle Ground	Potential Netgain rMCZ	In consultation	134	Medium	High	Yes
Nature Conservation	NG 16, Swallow Sand	Potential Netgain rMCZ	Put forward for designation in 2013	49	Medium	High	Yes
Nature Conservation	NG 13, Coquet to St Mary's	Potential Netgain rMCZ	In consultation	181	Medium	High	Yes
Nature Conservation	NG 14, Farnes East	Potential Netgain rMCZ	In consultation	169	Medium	High	Yes
Nature Conservation	RA 12, Farnes Clay	Potential Netgain rRA	In consultation	178	Medium	High	Yes
Nature Conservation	NG 15, Rock Unique	Potential Netgain rMCZ	Put forward for designation in 2013	139	Medium	High	Yes
Nature Conservation	RA 13, Rock Unique RA	Potential Netgain rRA	In consultation	149	Medium	High	Yes
Nature Conservation	NG 17, Fulmar	Potential Netgain rMCZ	In consultation	110	Medium	High	Yes
Nature Conservation	Scottish MCZ project A	MCZ recommendation for site designations	In consultation	205	Medium	Low	Yes
Nature Conservation	Scottish MCZ project B	MCZ recommendation for site designations	In consultation	325	Medium	Low	Yes
Nature Conservation	Scottish MCZ project C	MCZ recommendation for site designations	In consultation	535	Medium	Low	Yes
Nature Conservation	Scottish MCZ project D	MCZ recommendation for site designations	In consultation	594	Medium	Low	Yes
Nature Conservation	RA 6, Dogs Head Sandbanks	Potential Netgain rRA	In consultation	178	Medium	High	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Nature Conservation	Western Fladen (WFL)	Proposed Nature Conservation MPA	In consultation	435	Medium	High	Yes
Nature Conservation	South-east Fladen (SEF)	Proposed Nature Conservation MPA	In consultation	372	Medium	High	Yes
Nature Conservation	North-east Faroe Shetland Channel (NEF)	Proposed Nature Conservation MPA	In consultation	845	Medium	High	Yes
Nature Conservation	Faroe-Shetland sponge belt (FSS)	Proposed Nature Conservation MPA	In consultation	719	Medium	High	Yes
Nature Conservation	Norwegian boundary sediment plain (NSP)	Proposed Nature Conservation MPA	In consultation	342	Medium	High	Yes
Nature Conservation	Turbot Bank (TBB)	Proposed Nature Conservation MPA	In consultation	338	Medium	High	Yes
Nature Conservation	East of Gannet and Montrose Fields (EGM)	Proposed Nature Conservation MPA	In consultation	258	Medium	High	Yes
Nature Conservation	Firth of Forth Banks Complex (FOF)	Proposed Nature Conservation MPA	In consultation	301	Medium	High	Yes
Nature Conservation	Southern Trench (STR)	MPA search location	In consultation	413	Medium	High	Yes
Nature Conservation	BANCS DES FLANDRES	Potential SCI designation	In consultation	428	Medium	High	Yes
Nature Conservation	Pobie Bank Reef	Candidate SAC	In consultation	636	Medium	High	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Aggregates Application Area	North West Rough (466)	Application	Ongoing/uncertain	3	Medium	Medium	Yes
Aggregates Application Area	Southernmost Rough (485)	Application	Ongoing/uncertain	23	Medium	Medium	Yes
Aggregates Application Area	Humber 4 and 7 (506)	Application	Ongoing/uncertain	98	Medium	Medium	Yes
Aggregates Application Area	Humber 5 (483)	Application	Ongoing/uncertain	112	Medium	Medium	Yes
Aggregates Application Area	Humber 3 (484)	Application	Ongoing/uncertain	129	Medium	Medium	Yes
Aggregates Application Area	Sole Pit (492)	Application	Ongoing/uncertain	121	Medium	Medium	Yes
Aggregates Application Area	New Sand Hole and Humber Extension (448/449)	Application	Ongoing/uncertain	147	Medium	Medium	Yes
Aggregates Application Area	Humber Overfalls (493)	Application	Ongoing/uncertain	164	Medium	Medium	Yes
Aggregates Application Area	North Dowsing (400)	Application	Ongoing/uncertain	167	Medium	Medium	Yes
Aggregates Application	Inner Dowsing (439)	Application	Ongoing/uncertain	172	Medium	Medium	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Area							
Aggregates Application Area	Lowestoft Extension (495)	Application	Ongoing/uncertain	226	Medium	Medium	Yes
Aggregates Application Area	North Cross Sands (494)	Application	Ongoing/uncertain	221	Medium	Medium	Yes
Aggregates Application Area	TBC (511 - 513)	Application	Ongoing	233	High	Medium	Yes
Aggregates Application Area	North Inner Gabbard (498)	Pre Application	Ongoing	289	Medium	Medium	Yes
Aggregates Application Area	Shipwash (507)	Application	Ongoing	291	High	Medium	Yes
Aggregates Application Area	Longsand (508 - 510)	Application	Ongoing	316	High	Medium	Yes
Aggregates Application Area	North Falls East (501)	Pre Application	Ongoing	329	Medium	Medium	Yes
Aggregates Application Area	Area 106/1 Humber Aggregate Region	Application	Ongoing	218	Medium	Medium	Yes
Aggregates Application Area	Area 106/2 Humber Aggregate	Application	Ongoing	217	Medium	Medium	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
	Region						
Aggregates Application Area	Area 106/3 Humber Aggregate Region	Application	Ongoing	221	Medium	Medium	Yes
Aggregates Application Area	Area 107 Humber Aggregate Region	Application	Ongoing	234	Medium	Medium	Yes
Aggregates Application Area	Area 197 Humber Aggregate Region	Application	Ongoing	224	Medium	Medium	Yes
Aggregates Application Area	Area 514/1 (was 448) Humber Aggregate Region	Application	Ongoing/uncertain	213	Medium	Medium	Yes
Aggregates Application Area	Area 514/3 (was 449) Humber Aggregate Region	Application	Ongoing/uncertain	206	Medium	Medium	Yes
Aggregates Application Area	Area 514/4 (was 105) Humber Aggregate Region	Application	Ongoing	202	Medium	Medium	Yes
Aggregates Application Area	Area 282 East Coast Region	Application	Ongoing		Medium	Medium	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Aggregates Application Area	Area 240 East Coast Region	Application	Ongoing	275	Medium	Medium	Yes
Aggregates Application Area	Area 242 East Coast Region	Application	Ongoing	274	Medium	Medium	Yes
Aggregates Application Area	Area 328/1 East Coast Region	Application	Ongoing	269	Medium	Medium	Yes
Aggregates Application Area	Area 328/2 East Coast Region	Application	Ongoing	272	Medium	Medium	Yes
Aggregates Application Area	Area 328/3 East Coast Region	Application	Ongoing	274	Medium	Medium	Yes
Aggregates Application Area	Area 361/1 East Coast Region	Application	Ongoing	273	Medium	Medium	Yes
Aggregates Application Area	Area 361/2 East Coast Region	Application	Ongoing	275	Medium	Medium	Yes
Aggregates Application Area	Area 361/3 East Coast Region	Application	Ongoing	276	Medium	Medium	Yes
Aggregates Application Area	Area 511 (was 319/251) East Coast Region	Application	Ongoing	281	Medium	Medium	Yes
Aggregates Application Area	Area 512 (was 251/454) East Coast Region	Application	Ongoing	282	Medium	Medium	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Aggregates Application Area	Area 513/1 (was 360) East Coast Region	Application	Ongoing	275	Medium	Medium	Yes
Aggregates Application Area	Area 513/2 (was 251/454) East Coast Region	Application	Ongoing	279	Medium	Medium	Yes
Aggregates Application Area	Area 498 Thames Region	Application	Ongoing		Medium	Medium	Yes
Aggregates Application Area	Area 501/1 Thames Region	Application	Ongoing	376	Medium	Medium	Yes
Aggregates Application Area	Area 501/2 Thames Region	Application	Ongoing	374	Medium	Medium	Yes
Aggregates Application Area	Area 507/1 (was 118/2) Thames Region	Application	Ongoing	343	Medium	Medium	Yes
Aggregates Application Area	Area 507/2 (was 452A) Thames Region	Application	Ongoing	337	Medium	Medium	Yes
Aggregates Application Area	Area 507/3 (was 452E) Thames Region	Application	Ongoing	342	Medium	Medium	Yes
Aggregates Application Area	Area 507/4 (was 239/1) Thames Region	Application	Ongoing	341	Medium	Medium	Yes
Aggregates Application Area	Area 507/5 (was 452D) Thames Region	Application	Ongoing	334	Medium	Medium	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Aggregates Application Area	Area 507/6 (was 452C) Thames Region	Application	Ongoing	339	Medium	Medium	Yes
Aggregates Application Area	Area 508 (was 108/3) Thames Region	Application	Ongoing	371	Medium	Medium	Yes
Aggregates Application Area	Area 509/1 (was 257) Thames Region	Application	Ongoing	361	Medium	Medium	Yes
Aggregates Application Area	Area 509/2 (was 257) Thames Region	Application	Ongoing	364	Medium	Medium	Yes
Aggregates Application Area	Area 509/3 (was 109/1) Thames Region	Application	Ongoing	371	Medium	Medium	Yes
Aggregates Application Area	Area 510/1 Thames Region	Application	Ongoing	371	Medium	Medium	Yes
Aggregates Application Area	Area 510/2 Thames Region	Application	Ongoing	368	Medium	Medium	Yes
Aggregates Option Areas	Southernmost Rough (485)	Extended Option	Ongoing	19	High	High	Yes
Aggregates Option Areas	Humber 3 (484)	Extended Option	Ongoing	120	High	High	Yes
Aggregates Option Areas	Humber 4 (490)	Extended Option	Ongoing	97	High	High	Yes
Aggregates Option Areas	Humber 5 (483)	Extended Option	Ongoing	106	High	High	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Aggregates Option Areas	Humber 7 (491)	Extended Option	Ongoing	97	High	High	Yes
Aggregates Option Areas	Sole Pit (492)	Extended Option	Ongoing	120	High	High	Yes
Aggregates Option Areas	Humber Overfalls (493)	Application	Ongoing/uncertain	164	Medium	Medium	Yes
Aggregates Option Areas	Inner Dowsing (481)	Licence Option	Ongoing	158	High	High	Yes
Aggregates Option Areas	Lowestoft Extension (495)	Extended Option	Ongoing	226	High	High	Yes
Aggregates Option Areas	North Cross Sands (494)	Extended Option	Ongoing	222	High	High	Yes
Aggregates Option Areas	Benacre (496)	Extended Option	Ongoing	266	High	High	Yes
Aggregates Option Areas	Cutline (446/447)	Licence Option	Ongoing	294	High	High	Yes
Aggregates Option Areas	North Inner Gabbard (498)	Standard Option	Ongoing	290	High	High	Yes
Aggregates Option Areas	North Falls East (501)	Extended Option	Ongoing	324	High	High	Yes
Carbon Capture Storage	National Grid CCS	Unknown	Unknown	71	Medium	Medium	Yes
Oil & Gas	Cygnus Alpha and Bravo	In development	Post 2012	23	Medium	Medium	Yes
Oil & Gas	Tommeliten Alpha (256)	Development likely but not clarified	Unknown	159	Low	High	Yes
Oil & Gas	2/7-29 (258)	Development is not very likely	Unknown	155	Low	High	Yes

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Type of Project	Project Title	Project Status	Predicted Construction/Development Period	Distance from Dogger Bank Teesside A & B (km)	Confidence in Project Details	Confidence in Project Data	Carried Forward to Cumulative Impact Assessment?
Oil & Gas	2/7-2 (260)	Development is not very likely	Unknown	153	Low	High	Yes
Oil & Gas	2/7-22 (259)	Development is not very likely	Unknown	156	Low	High	Yes
Oil & Gas	Freja (264)	Existing licence with planned new developments	Ongoing	171	Low	Low	No
Oil & Gas	Dagny (272)	In Planning	Unknown	386	Low	High	Yes
Oil & Gas	Alpha (273)	Development likely but not clarified	Unknown	364	Low	High	Yes
Oil & Gas	E/13-1 (295)	Undeveloped	Unknown	83	N/A	Low	Yes
Oil & Gas	E/13-2 (296)	Undeveloped	Unknown	85	N/A	Low	Yes
Oil & Gas	Kinnoull (279)	Under development	Unknown	345	Low	High	Yes
Oil & Gas	Rochelle (285)	Under development	2012-	334	High	High	Yes
Oil & Gas	Huntington (290)	Under development	Unknown	275	Low	High	Yes
Oil & Gas	Ensign (298)	Under development	2012-	115	High	High	Yes
Oil & Gas	Clipper S (299)	Under development	Unknown	137	High	High	Yes
Oil & Gas	Katy (267)	Under development	Unknown	48	Low	High	Yes

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11.1.12. The fisheries occurring in the vicinity of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor are:

- Flatfish fishery;
- Sandeel fishery;
- Seine net fishery;
- Gillnet fishery;
- Whitefish fishery (under-15m and over-15m);
- *Nephrops* fishery;
- Pelagic fishery;
- Scallop fishery; and
- Potting fishery.

11.2. Cumulative impact of Dogger Bank Teesside A & B, Dogger Bank Creyke Beck and Dogger Bank C & D

11.2.1. Dogger Bank Creyke Beck will comprise two wind farms, each with a generating capacity of up to 1.2GW, and will connect to the existing National Grid substation at Creyke Beck, in the East Riding of Yorkshire. Dogger Bank Creyke Beck will have a total generating capacity of up to 2.4GW. Dogger Bank Teesside A & B comprise two wind farms, each with a generating capacity of up to 1.2GW, which will connect into the national grid at Lackenby substation. Dogger Bank Teesside A & B has a total generating capacity of up to 2.4GW. Dogger Bank Teesside C & D will comprise two wind farms, each with a generating capacity of up to 1.2GW, which will connect into the national grid just south of the Tees Estuary. Dogger Bank Teesside C & D will have a total generating capacity of up to 2.4GW.

Adverse impacts upon commercially exploited species

11.2.2. The discussion of cumulative effects on commercially exploited species is given in **Chapter 13**. In summary, impacts do not exceed **minor adverse**.

Complete loss or restricted access to traditional fishing grounds

11.2.3. A number of construction schedules are under consideration for the six potential wind farm developments within the Dogger Bank Zone, involving various combinations of sequential and simultaneous construction.

Construction phases – wind farms

Flatfish fishery

11.2.4. As previously stated, the sensitivity of the Dutch, UK and Anglo-Dutch vessels engaging in the flatfish fishery is considered to be low.

11.2.5. **Figure 11.1** - **Figure 11.3** relates to the zonal impact of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck. It can be seen that a very low density of fishing activity by the Dutch registered fleet occurs within Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and

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Dogger Bank Creyke Beck. **Figure 11.3** shows that the effort by the UK registered fleet (including Anglo-Dutch) is higher than that of the Dutch, but still at a low level, particularly in Dogger Bank Teesside C and Dogger Bank Creyke Beck B. Figure 8.1 of **Appendix 15A** and **Figure 11.15** and **Figure 11.16** below, shows that on a national scale, Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck represent a small proportion of the overall fishing area of the vessels targeting the flatfish fishery. Dutch and UK registered vessels have also been shown to trawl over relatively short sections of the Export Cable Corridors. This also represents a very small proportion of the overall fishing area available.

11.2.6. Whilst the spatial extent and/or durations of effects will be greater than assessed for the construction of just Dogger Bank Teesside A & B, in view of the relatively low levels of activity within the Dogger Bank Zone as a whole, the magnitude of the effect is expected to be low.

11.2.7. Taking the low sensitivity of this receptor group, the cumulative impact of loss of fishing area on Dutch, UK and Anglo-Dutch vessels targeting the flatfish fishery is therefore predicted to be **minor adverse**.

Sandeel fishery

11.2.8. As explained previously, the sensitivity of the vessels targeting the sandeel fishery is low.

11.2.9. Vessels registered under a number of nationalities target the sandeel fishery on the Dogger Bank. Due to the predominance of the Danish activity and the quality of the Danish VMS dataset, this has been used to assess the cumulative impact on the sandeel fishery. **Figure 11.4** indicates that activity within all of the Dogger Bank projects is low in comparison to that occurring in adjacent areas. Of the six projects, Dogger Bank Teesside C & D sustain the most activity, with lower levels in Dogger Bank Creyke Beck and Dogger Bank Teesside B, and negligible activity recorded in Dogger Bank Teesside A. Activity along the Export Cable Corridors is similarly at very low to negligible levels with the exception of small sections of the cable corridors close to the Dogger Bank Zone western boundary.

11.2.10. In the national context, it is apparent that sandeel fishing effort within the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck is at comparatively very low levels and occupies only a small proportion of the overall fishing area available (Figure 10.2 of **Appendix 15A**: and **Figure 11.18** below). The contribution to the magnitude of temporary loss or restricted access to traditional fishing grounds associated with exclusion during construction of Dogger Bank Teesside A & B, Dogger Bank Creyke Beck and Dogger Bank Teesside C & D will therefore be low, resulting in a **minor adverse** impact.

Seine net fishery

11.2.11. As explained previously, due to the constraints of the mode of operation, the sensitivity of the vessels engaging in seine netting is assessed as medium.

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11.2.12. Whilst seine netting activity is almost entirely by Danish registered vessels, one UK registered vessel has also been identified as seine netting on the Dogger Bank. Danish VMS data has been used to assess the cumulative impact on seine netting.

11.2.13. As shown by **Figure 11.5**, only minimal levels of seine netting activity appear to occur within Dogger Bank Creyke Beck and Dogger Bank Teesside C & D. Higher densities of activity are however shown to occur in Dogger Bank Teesside A & B.

11.2.14. Taking into account the very low levels of activity within Dogger Bank Creyke Beck and Dogger Bank Teesside C & D, the contribution of these developments to the magnitude of the cumulative effect will be negligible.

11.2.15. **Figure 11.19** below however shows that Dogger Bank Teesside A & B occupy an area where higher levels of activity occur. The unmitigated magnitude of the cumulative effect on the Danish seine netting fishery is considered to be no greater than that identified for Dogger Bank Teesside A & B in isolation (i.e. medium).

11.2.16. The site specific assessments give the impact of temporary or permanent loss of fishing area on seine netting vessels as **moderate adverse**, **Figure 11.19** and **Figure 11.28**, indicate that at present there are no other planned wind farms outside of the Dogger Bank Zone located within seine netting areas and one conservation area. As such, the overall cumulative effect associated with Dogger Bank Teesside A & B is not expected to exceed that assessed for the site specific impact, namely **moderate adverse**.

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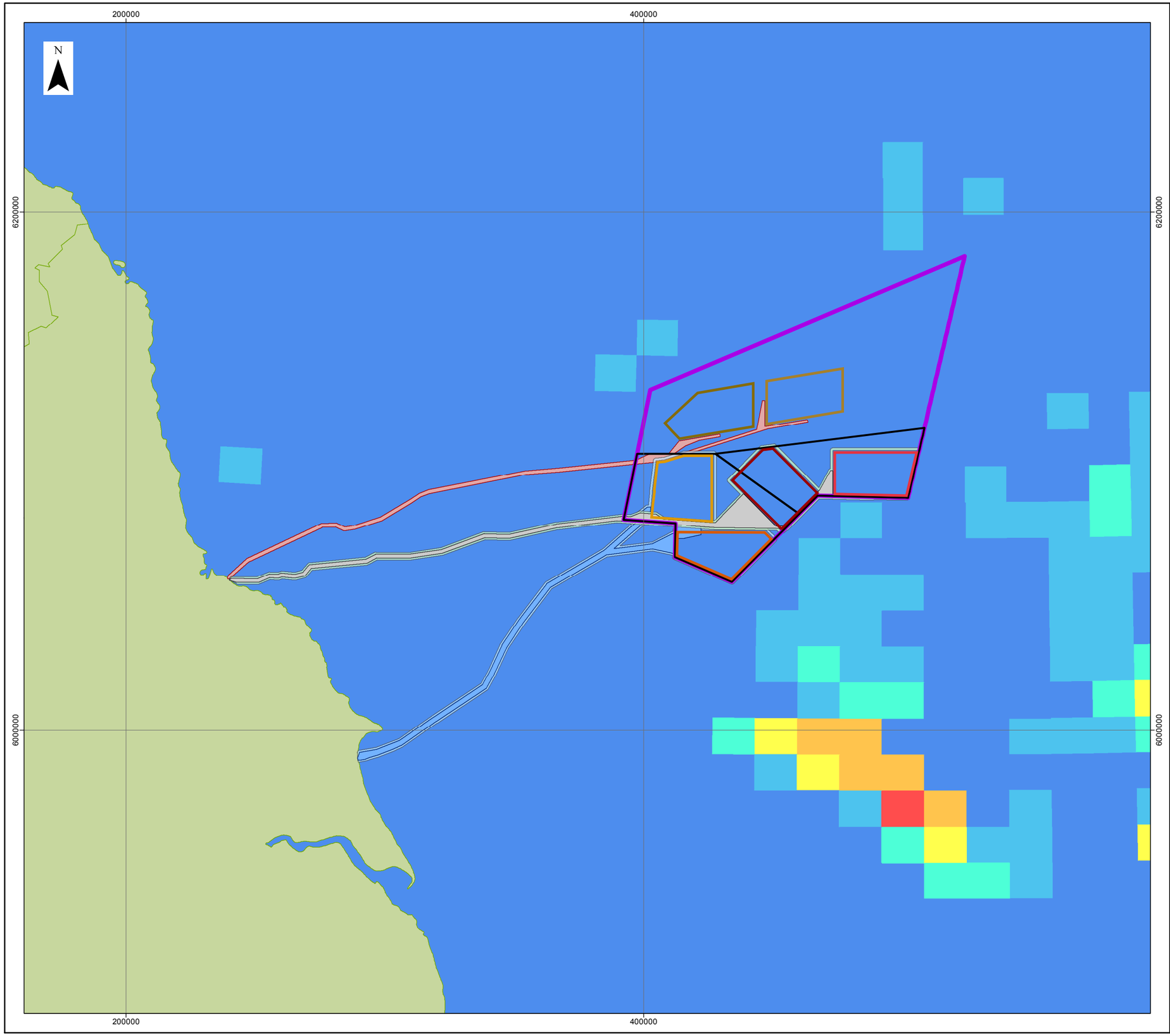

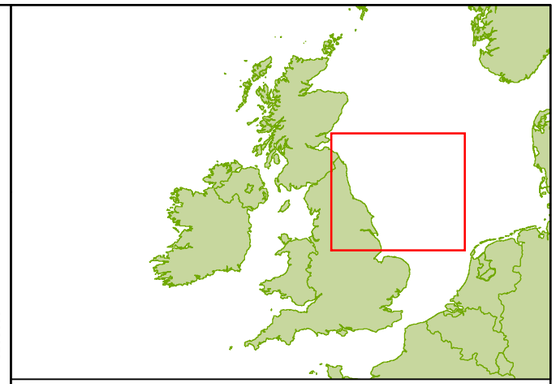

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Dutch VMS by effort (otter trawl only)

- Less than 5 days
- 6 to 10 days
- 11 to 20 days
- 21 to 50 days
- 51 to 100 days
- 101 to 200 days
- More than 200 days

0 10 20 40
Kilometres

Data Source:
VMS © IMARES, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.1 Extent of Dutch otter trawler VMS by effort (days fished) (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	09/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-543

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,500,000	A3	WGS84	UTM31N

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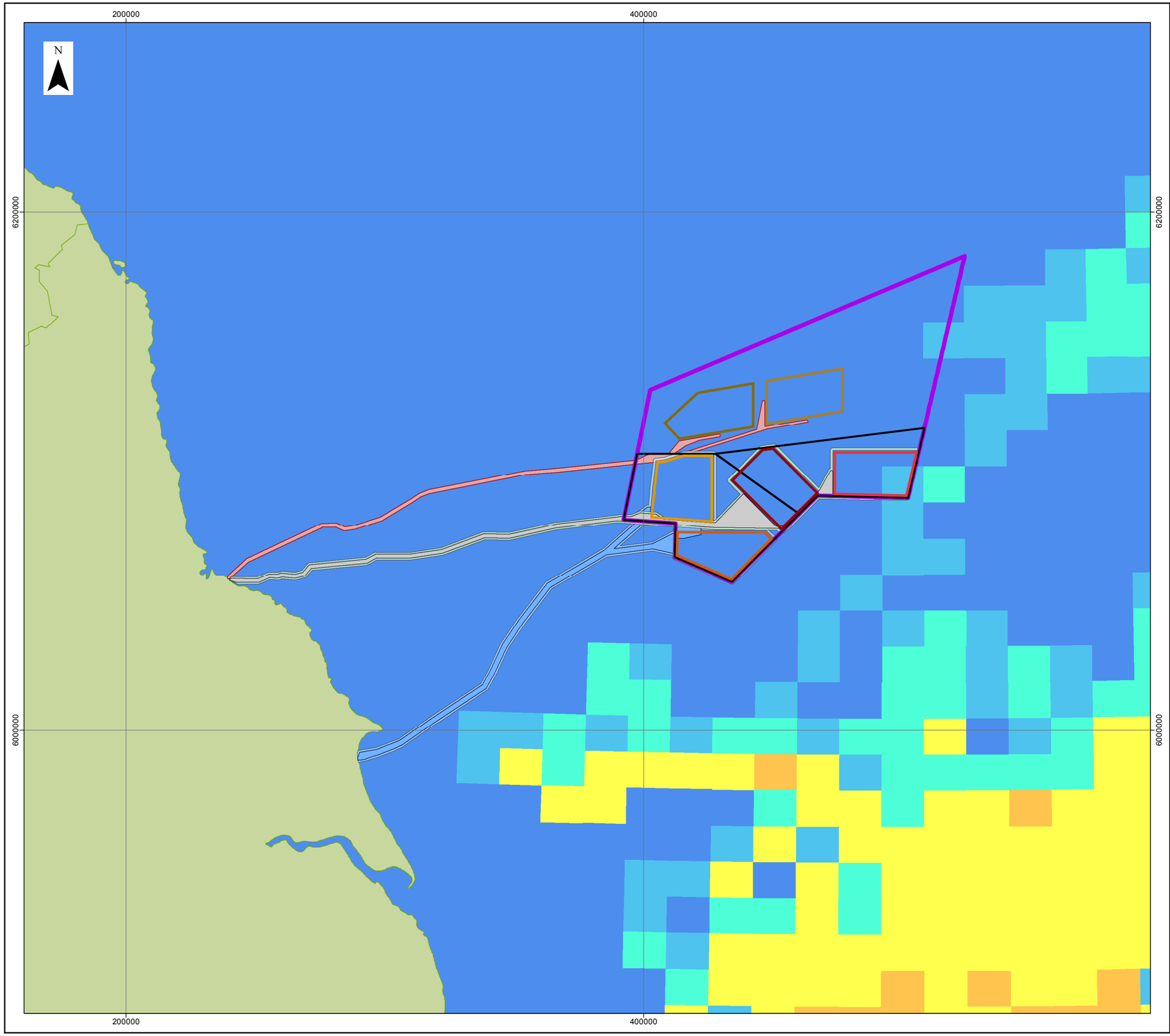

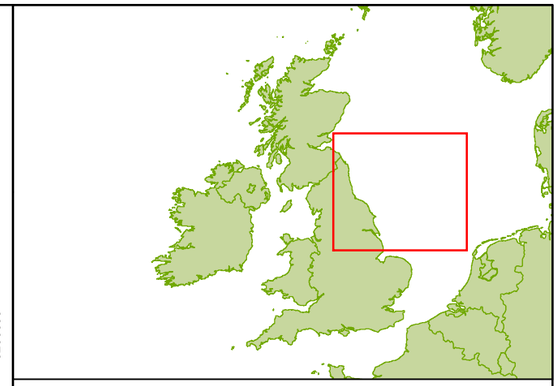

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Dutch VMS by effort (beam trawl only)

- Less than 5 days
- 6 to 10 days
- 11 to 20 days
- 21 to 50 days
- 51 to 100 days
- 101 to 200 days
- More than 200 days

0 10 20 40
Kilometres

Data Source:
VMS © IMARES, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.2 Extent of Dutch beam trawler VMS by effort (days fished) (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	09/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-544

SCALE	1:1,500,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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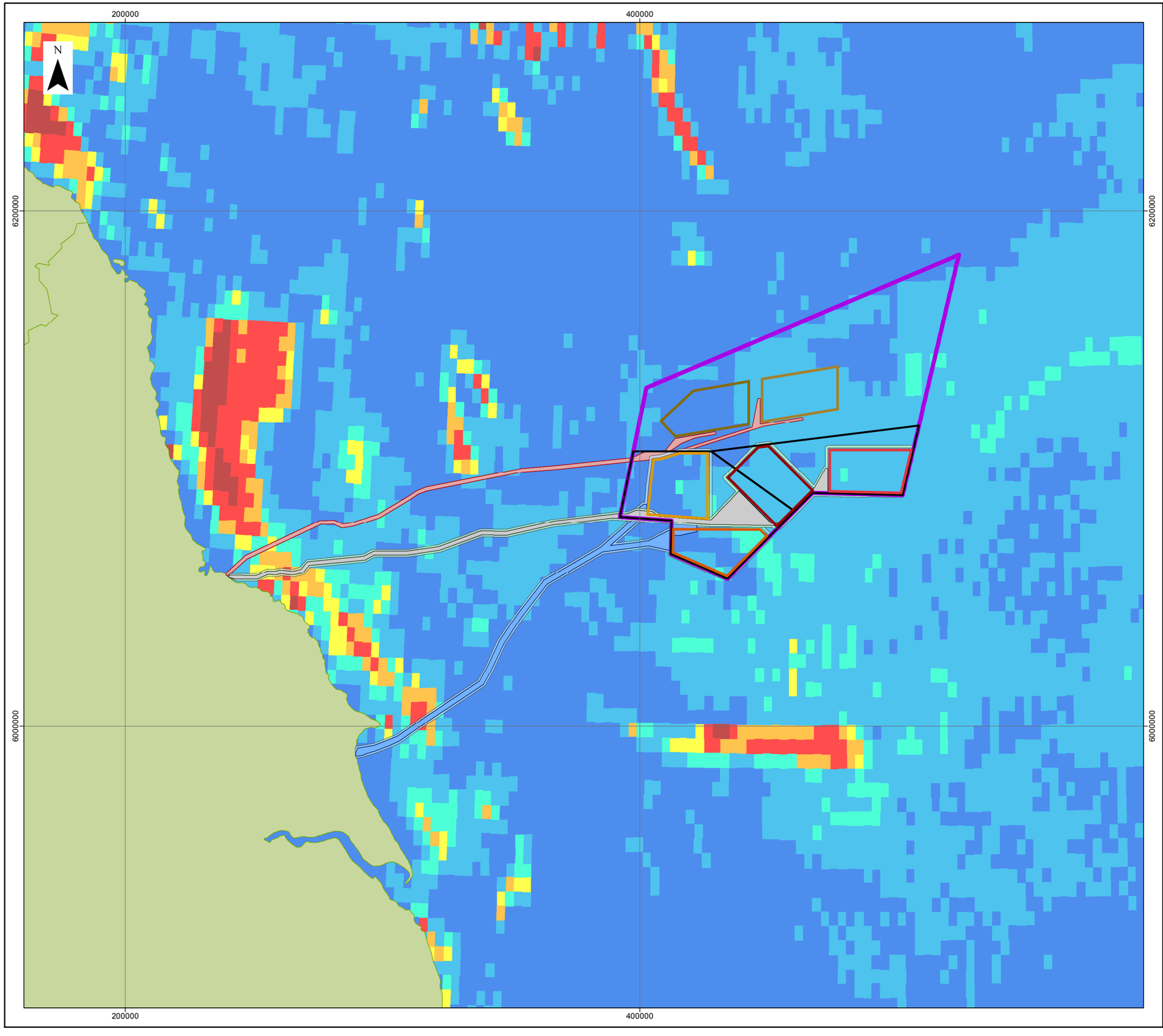

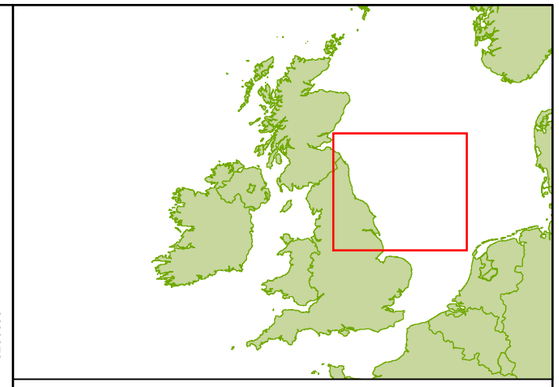

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

UK VMS by effort (hours fished)

- Less than 100 hours
- 100 to 1,000 hours
- 1,000 to 2,000 hours
- 2,000 to 3,000 hours
- 3,000 to 5,000 hours
- 5,000 to 10,000 hours
- More than 10,000 hours

0 10 20 40
Kilometres

Data Source:
VMS © MMO, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.3 UK mobile fishing gear VMS by effort (hours fished) (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	09/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-545

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,500,000	A3	WGS84	UTM31N

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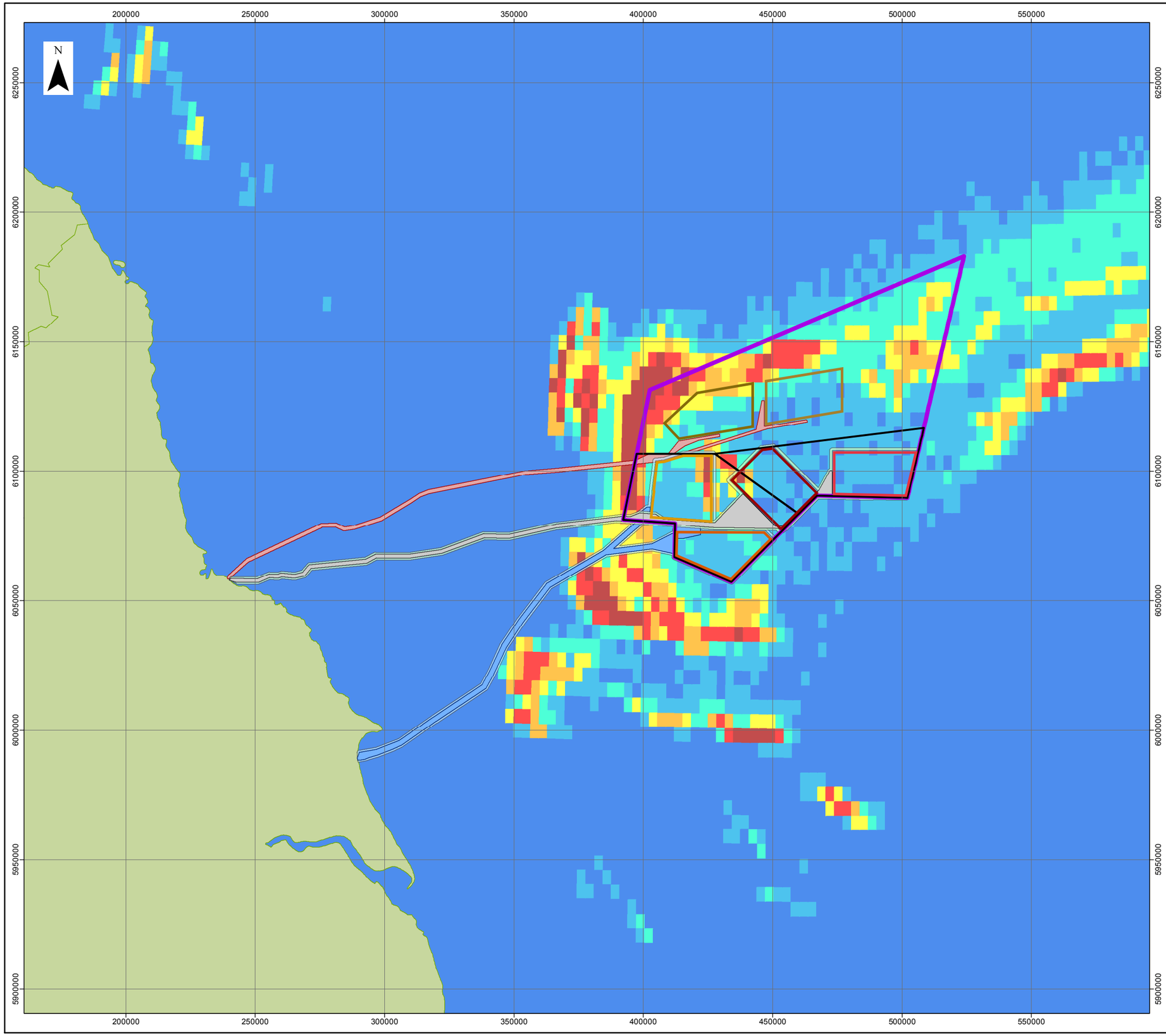

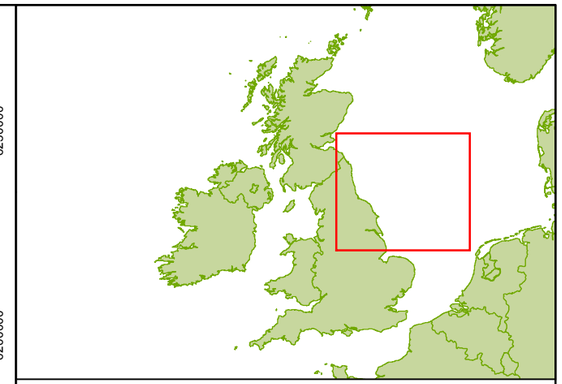

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Danish sandeel satellite (VMS) density

- 0 - 2
- 3 - 5
- 6 - 10
- 11 - 20
- 21 - 40
- 41 - 80
- over 80

0 10 20 40
Kilometres

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.4 Danish distribution of sandeel activity (VMS) by density (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	09/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

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SCALE	PLOT SIZE	DATUM	PROJECTION
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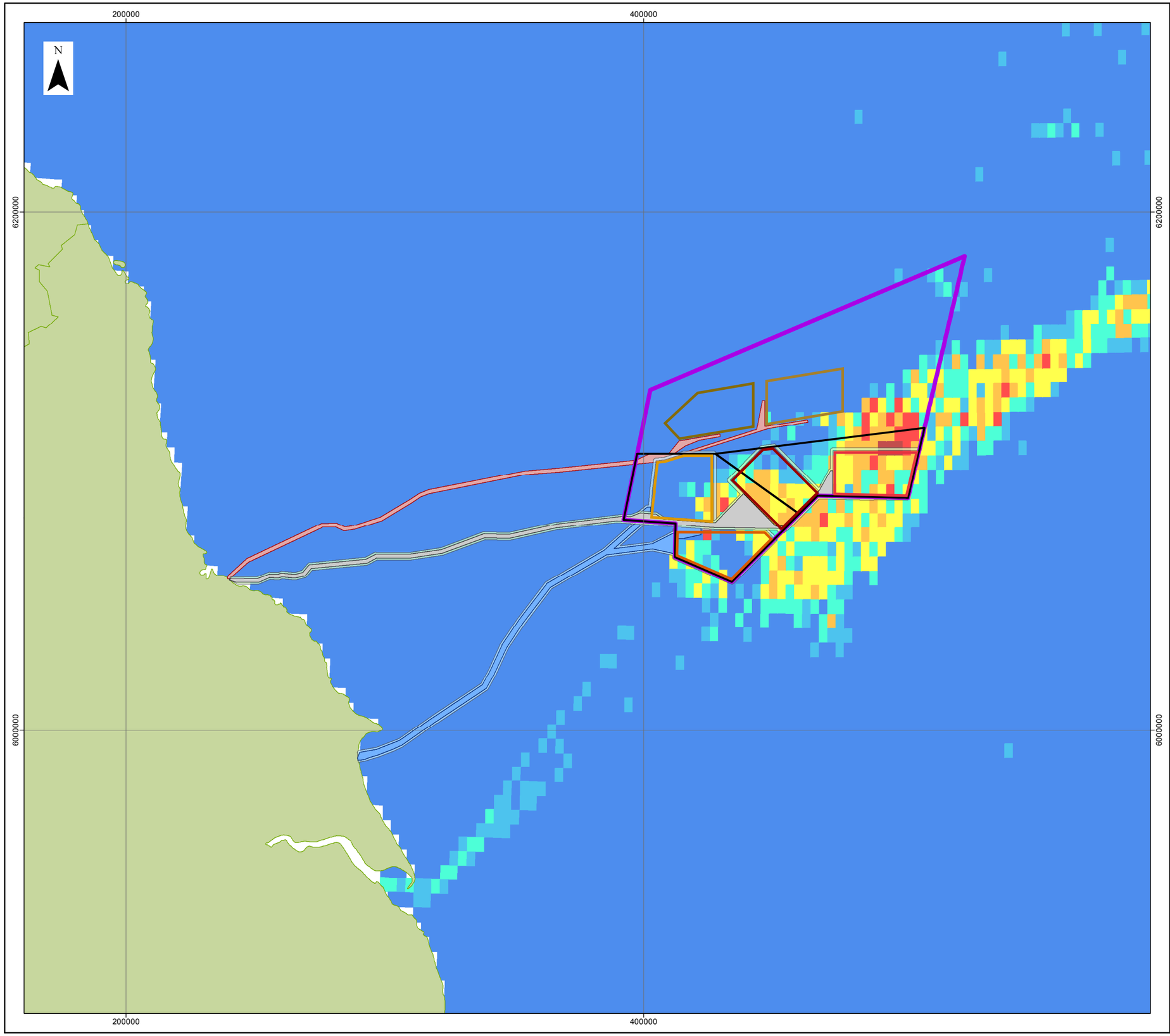

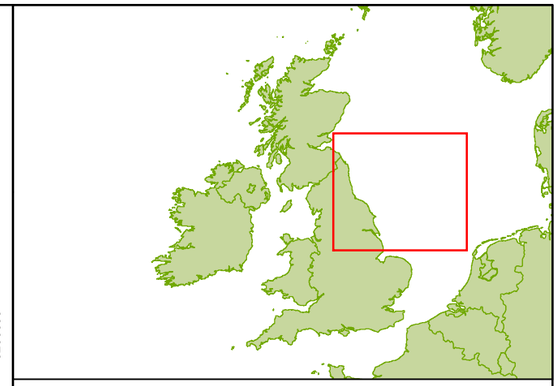

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Danish seine satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

0 10 20 40
Kilometres

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.5 Danish distribution of seine net activity (VMS) by density (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-547

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,500,000	A3	WGS84	UTM31N

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Gillnet fishery

11.2.17. As with the sandeel and seine net fisheries, static gill netting activity on the Dogger Bank is recorded as being almost entirely by Danish vessels The Danish VMS dataset has again been used to assess the cumulative impact on gill netting activities (**Figure 11.6**).

11.2.18. As shown by **Figure 11.6**, Danish gill netting activity only appears to occur, at low levels within the boundary of Dogger Bank Teesside A, with an absence of activity in the other five Dogger Bank projects (Dogger Bank Teesside B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck A & B). In the national context, as shown by **Figure 11.20** the extent of available fishing area in comparison to the area of Teesside A is very large. The contribution of the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck developments to the magnitude of the cumulative effect of temporary loss or restricted access to traditional fishing grounds is therefore expected to be, at worst low, and possibly negligible.

11.2.19. As the sensitivity of the vessels engaged in gill netting is assessed as low, the contribution of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck developments to the cumulative impact is expected to be **minor adverse.**

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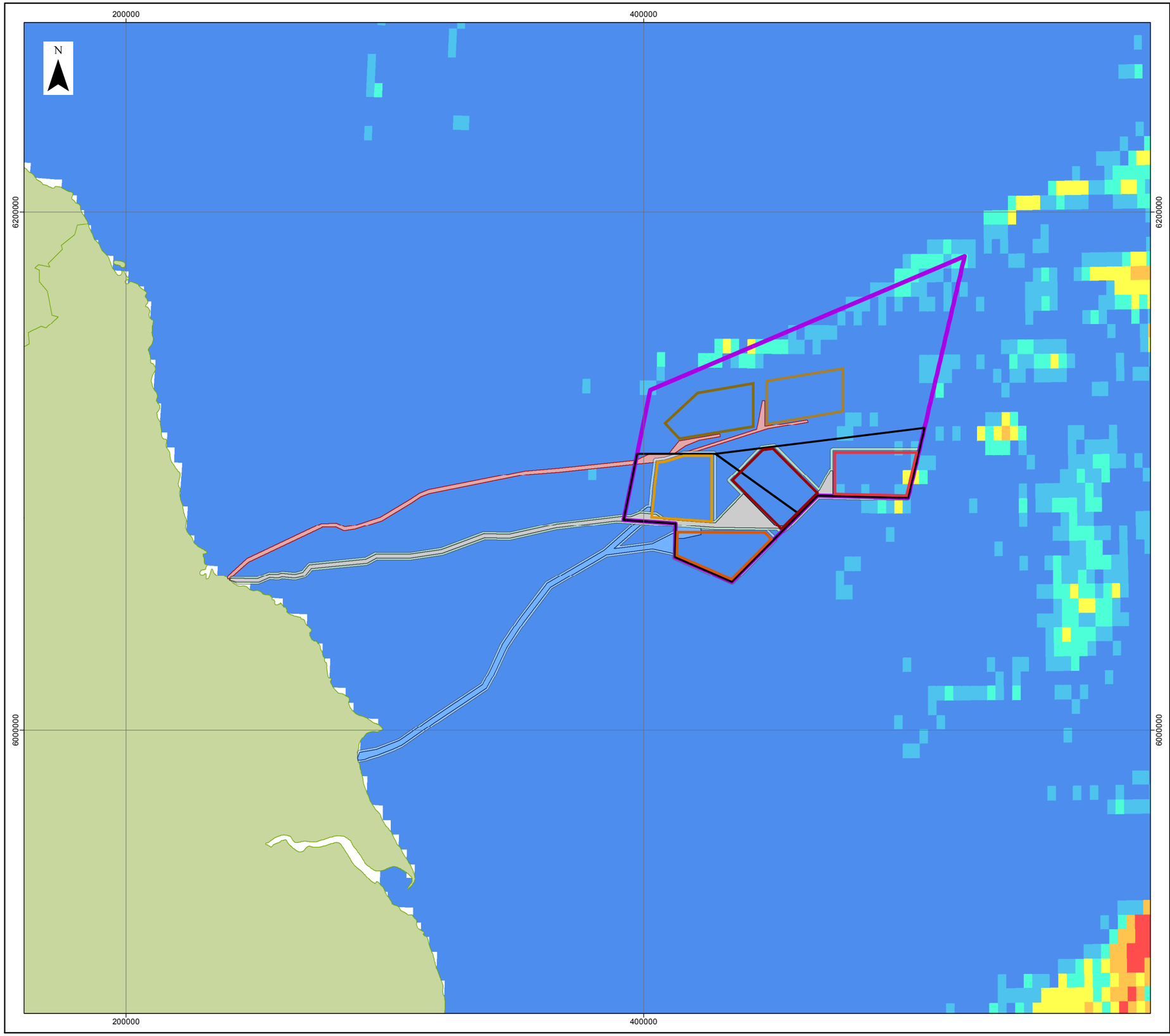

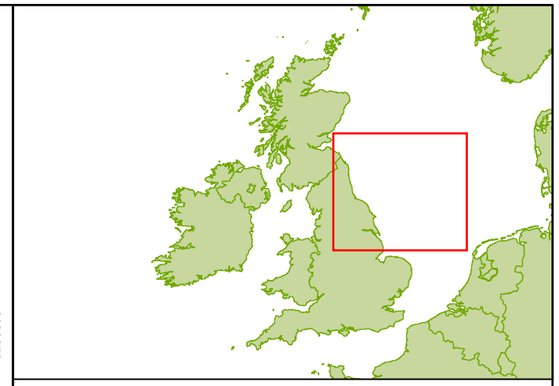

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Danish gill net satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

0 10 20 40
Kilometres

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.6 Danish distribution of gill and trammel nets (VMS) by density (average 2008 to 2012)

VER	DATE	REMARKS	Drawn	Checked
1	09/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-548

SCALE	1:1,500,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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FOREWIND

Cumulative impact - loss or restricted access to, traditional fishing grounds during construction

11.2.20. Provided in **Table 11.3** below are the assessed significance, by receptor group, of the potential cumulative impacts of complete loss or restricted access to, traditional fishing grounds associated with the construction phases of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck.

Table 11.3 Cumulative impact of complete loss or restricted access to traditional fishing grounds during Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck construction phases

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance	Residual Impact Significance
Flatfish Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Sandeel Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Seine Net Fishery	Medium	Medium	**Moderate adverse**	**Moderate adverse**
Gill Net Fishery	Low	Low	**Minor adverse**	**Minor adverse**

11.3. Operational phase – wind farms

Flatfish fishery

11.3.1. As illustrated by the VMS data (**Figure 11.1** - **Figure 11.3**) Dutch, UK and Anglo-Dutch beam and otter trawling within Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck occurs at relatively low levels. During the operational phase it is also likely that skippers may elect to fish within the project areas. The proportional loss of fishing area is therefore sufficiently small to largely negate the long duration of the effect, with the result that the cumulative magnitude of the effect is expected to be low. It is also noted that Dutch and UK registered trawlers fish along the Export Cable Corridors. However it is expected that during operation, providing the appropriate post-installation surveys and, if necessary and where possible, rectification measures have been undertaken to ensure fishing is safe, fishing will be able to resume within the Export Cable Corridors due to the burial of cables and/or protection of the cables where burial is not feasible. Cable protection measures are discussed further in **Chapter 5.** As it is expected that fishing will be able to continue, operational export cables will not contribute to a cumulative impact on Dutch and UK trawling activities.

11.3.2. Taking the low sensitivity of the receptor group, the cumulative impact of loss of fishing area on the flatfish fishery as a result of the operation of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck is therefore predicted to be **minor adverse**.

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Sandeel fishery

11.3.3. As previously stated, the sensitivity of the vessels targeting the sandeel fishery is considered to be low.

11.3.4. As with the flatfish fishery, relatively low levels of sandeel trawling activity is shown to occur in Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck (**Figure 11.4**). Any loss of fishing area may also be reduced if fishing resumes within the operational sites. The magnitude of the potential cumulative effect is therefore considered to be low. It is also assumed that the operational Export Cable Corridors will not materially impact fishing activities.

11.3.5. The impact of loss of fishing area on vessels targeting the sandeel fishery associated with the operation of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck is therefore **minor adverse**.

Seine net fishery

11.3.6. Unlike the other methods, due to the operational constraints of the activity, seine netting could be excluded from all of the projects for the duration of the operational phases. Due to the duration of exclusion being long, with the proportional loss of area, the magnitude of the effect will be medium.

11.3.7. The impact of loss of fishing area on the seine net fishery as a result of the operation of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck is therefore **moderate adverse**. As previously stated Forewind is committed to the principle of engaging with effected stakeholders to minimise the potential site specific impact and therefore the contribution to the cumulative impact.

Gillnet fishery

11.3.8. As the gill net fishery is a static fishery, it will be able to continue once the wind farm is operational. As a result the magnitude of the potential cumulative effect is considered to be low.

11.3.9. The impact of loss of fishing area on vessels targeting the gillnet fishery associated with the operation of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck is therefore **minor adverse**.

Impact significance

11.3.10. Provided in **Table 11.4** are the assessed significance, by receptor group, of the potential cumulative impact of complete loss or restricted access to traditional fishing grounds associated with the operational phases of Dogger Bank Teesside A & B, Dogger Bank Creyke Beck and Dogger Bank Teesside C & D.

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Table 11.4 Cumulative impact of complete loss or restricted access to traditional fishing grounds during Dogger Bank Teesside A & B, Dogger Bank C & D and Dogger Bank Creyke Beck operational phases

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance	Residual Impact Significance
Flatfish fishery	Low	Low	**Minor adverse**	**Minor adverse**
Sandeel Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Seine Net Fishery	Medium	Medium	**Moderate adverse**	**Moderate adverse**
Gill Net Fishery	Low	Low	**Minor adverse**	**Minor adverse**

11.4. Decommissioning phase - wind farms

11.4.1. Where it is deemed safe and of less impact to remove infrastructure than to leave it in place, sequential decommissioning and removal of infrastructure will take place. However, as the infrastructure may act as fish aggregation devices and create new habitats for marine species, some infrastructure such as cable protection may be left *in-situ*. Nonetheless, it is assumed that the decommissioning of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck will not result in greater cumulative spatial and temporal effects than will occur during the construction phases.

11.4.2. It is therefore taken that the impacts of decommissioning will not be of greater significance than those assessed for the construction phase.

11.5. Dogger Bank Export Cable Corridors - construction phase

11.5.1. The flatfish fishery and fishing for sandeel occurs both within the vicinity of the Dogger Bank Zone and the Export Cable Corridors and have therefore been assessed for cumulative impacts arising from the entire development in the previous relevant sections.

Whitefish fishery – over 15m UK and French

11.5.2. As previously stated, the sensitivity of the over 15m UK and French demersal fishing gear targeting whitefish along the Export Cable Corridor is considered to be low. **Figure 11.7** illustrates that relatively very low levels by the UK over-15m vessels engaged in the whitefish fishery occur over all three of the Export Cable Corridors. **Figure 11.8** however shows higher levels of localised activity by the French over-15m fleet over the mid-section of the Dogger Bank Creyke Beck Export Cable Corridor (thereafter known as Creyke Beck Export Cable Corridor). During consultation with French fishermen, it was stated that their whitefish trawl grounds are extensive. As a result of the relatively small proportion of grounds transected by the Export Cable Corridors, the magnitude of the potential cumulative effect is considered to be low.

11.5.3. The impact of loss of fishing area on vessels targeting the whitefish fishery associated with the installation of Dogger Bank Teesside A & B, Dogger Bank

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Teesside C & D and Dogger Bank Creyke Beck Export Cables is therefore expected to be **minor adverse**.

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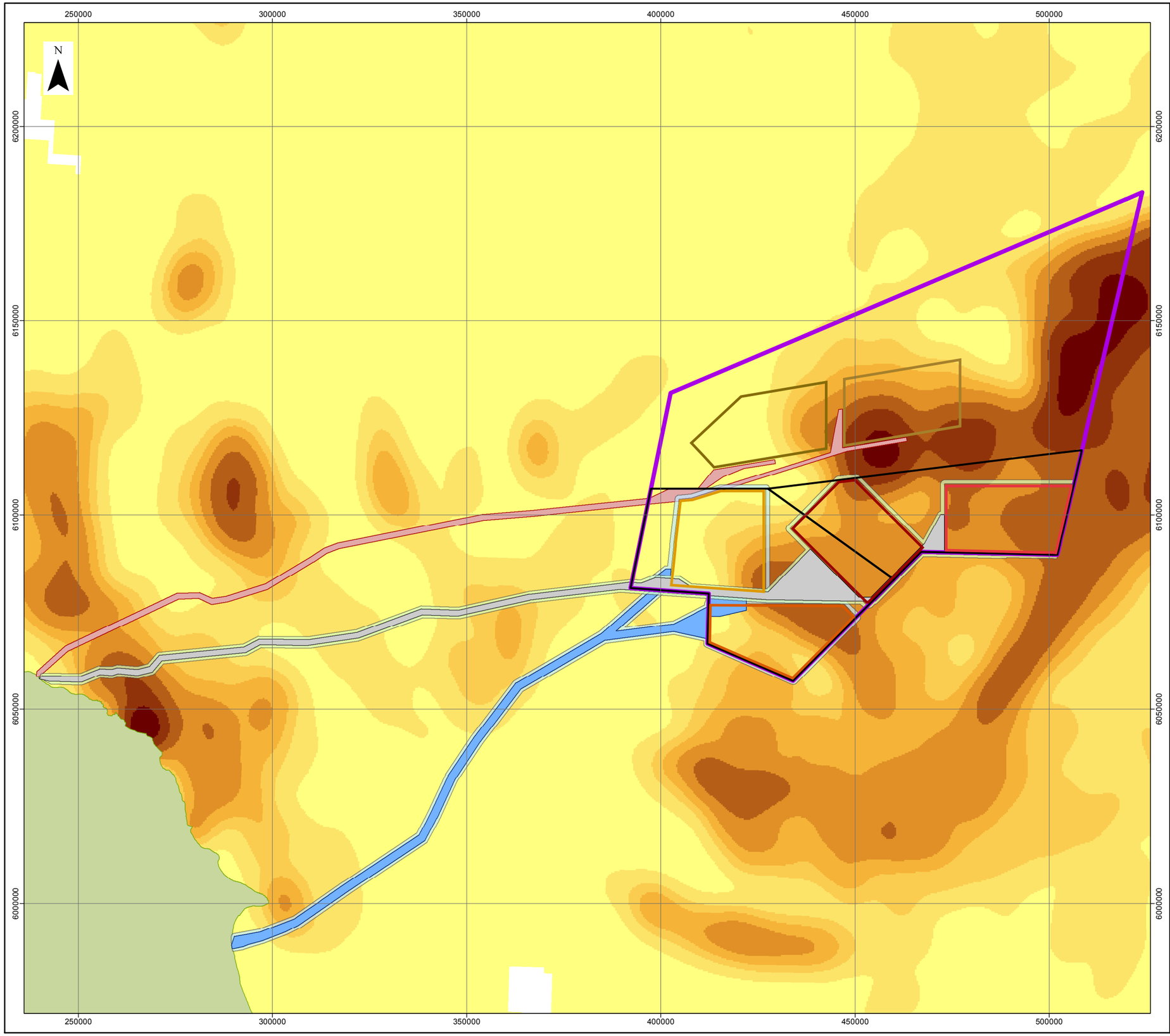

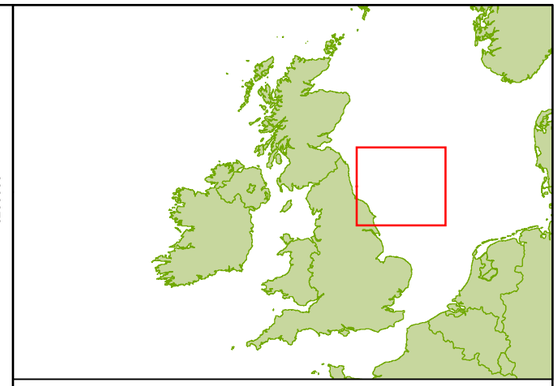

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Demersal mobile gears value 2007-2011

- Low
- High

0 10 20 40
Kilometres

Data Source:
Mobile gear © Marine Scotland, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.7 Distribution of fishing values of UK vessels operating demersal mobile gears (average 2007-2011; over-15m only)

VER	DATE	REMARKS	Drawn	Checked
1	25/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-549

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,000,000	A3	WGS84	UTM31N

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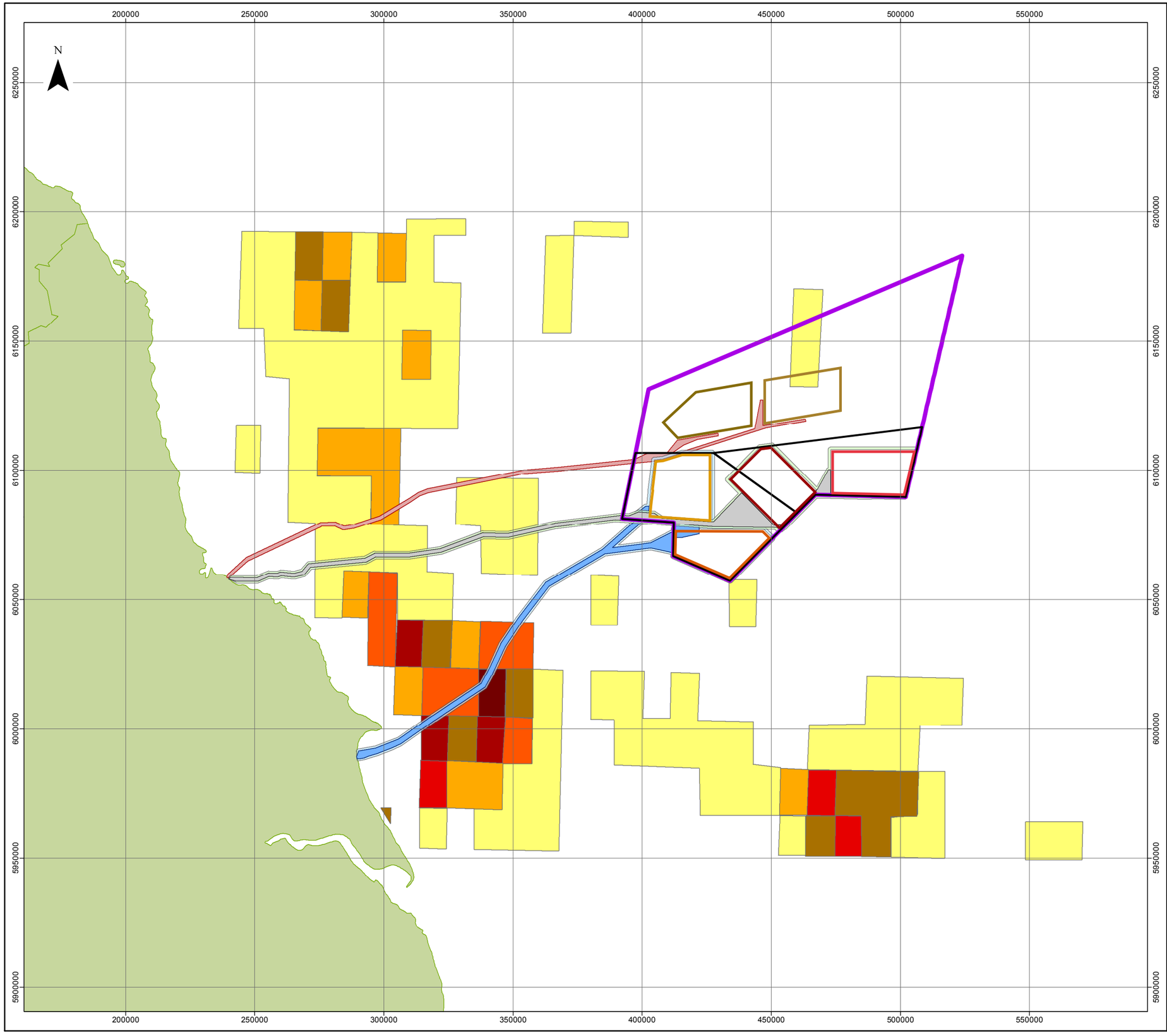

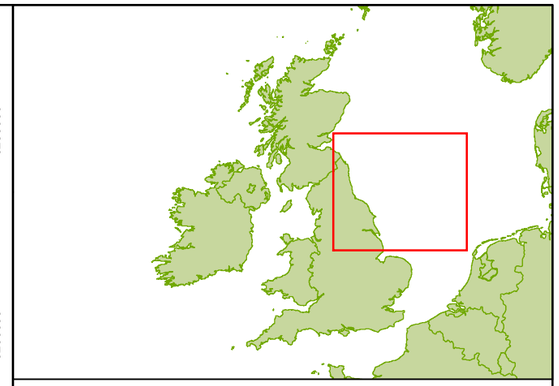

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

French VMS by value (€) (2008 only)

- €0 to €10,000
- €10,000 to €25,000
- €25,000 to €50,000
- €50,000 to €75,000
- €75,000 to €100,000
- €100,000 to €250,000
- €250,000 to €500,000

0 10 20 40
Kilometres

Data Source:
VMS © CNPMEM, 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.8 French VMS by value (€) (2008 only)

VER	DATE	REMARKS	Drawn	Checked
1	09/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-550

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,500,000	A3	WGS84	UTM31N

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FOREWIND

Whitefish fishery – under-15m UK

11.5.4. As previously stated, the sensitivity of the UK under 15m vessels targeting the whitefish fishery is considered to be medium.

11.5.5. **Figure 11.9** represents fishing grounds of the local, under 15m UK fleet as depicted by local fishermen during consultation, through which the Dogger Bank Teesside A & B and Dogger Bank Teesside C & D Export Cable Corridors and the Dogger Bank Creyke Beck Export Cable Corridor pass. Whilst these fishing grounds are not widespread, and the operational ranges of the vessels are limited, due to the short term duration of the installation of the export cables, the magnitude of effect is considered to be low.

11.5.6. Taking the sensitivity of the receptor group, the contribution of the installation of the export cables is predicted to be **minor adverse.**

Nephrops fishery

11.5.7. As previously stated, the sensitivity of the vessels targeting the *Nephrops* fishery is considered to be medium.

11.5.8. As stated above the Dogger Bank Teesside A & B Export Cable Corridor passes to the south of the main *Nephrops* fishing grounds. The Dogger Bank Teesside C & D Export Cable Corridor, as shown in **Figure 11.10**, also appears to be to the south of the main *Nephrops* grounds targeted by over-15m vessels. Due to the substrate specificity of *Nephrops* and the focus of *Nephrops* activity in the general area, it is reasonable to assume that the main fishing grounds of over-15m vessels represent the areas in which *Nephrops* are found in commercially viable densities. Additional small, isolated areas with lower densities of *Nephrops* may occur and be targeted by smaller inshore multi-species vessels for which Nephrops comprises a significant proportion of landings value. However the findings of the Environmentally Sustainable Fisheries Project (Cefas-Seafish, 2010) indicated that the Dogger Bank Teesside C & D Export Cable Corridor passes through a minimal proportion of such grounds. As a consequence, it is considered that the combined magnitude of effect is low.

11.5.9. Taking the sensitivity of the receptor group, the impact of the contribution of the installation of the export cables is predicted to be **minor adverse**.

Scallop fishery

11.5.10. As previously stated, the sensitivity of the vessels targeting the scallop fishery is considered to be low.

11.5.11. **Figure 11.11** suggests scallop dredging over an inshore section of the Dogger Bank Creyke Beck Export Cable Corridor is relatively high compared to that of the Dogger Bank Teesside A & B and Dogger Bank Teesside C & D Export Cable Corridors. It is considered however that the areas where short term exclusion may occur are small in comparison to the extent of grounds available to scallop dredgers around the UK. The magnitude of any cumulative effect which may occur is therefore considered to be low, which in conjunction with the low receptor for sensitivity gives a cumulative impact that is **minor adverse**.

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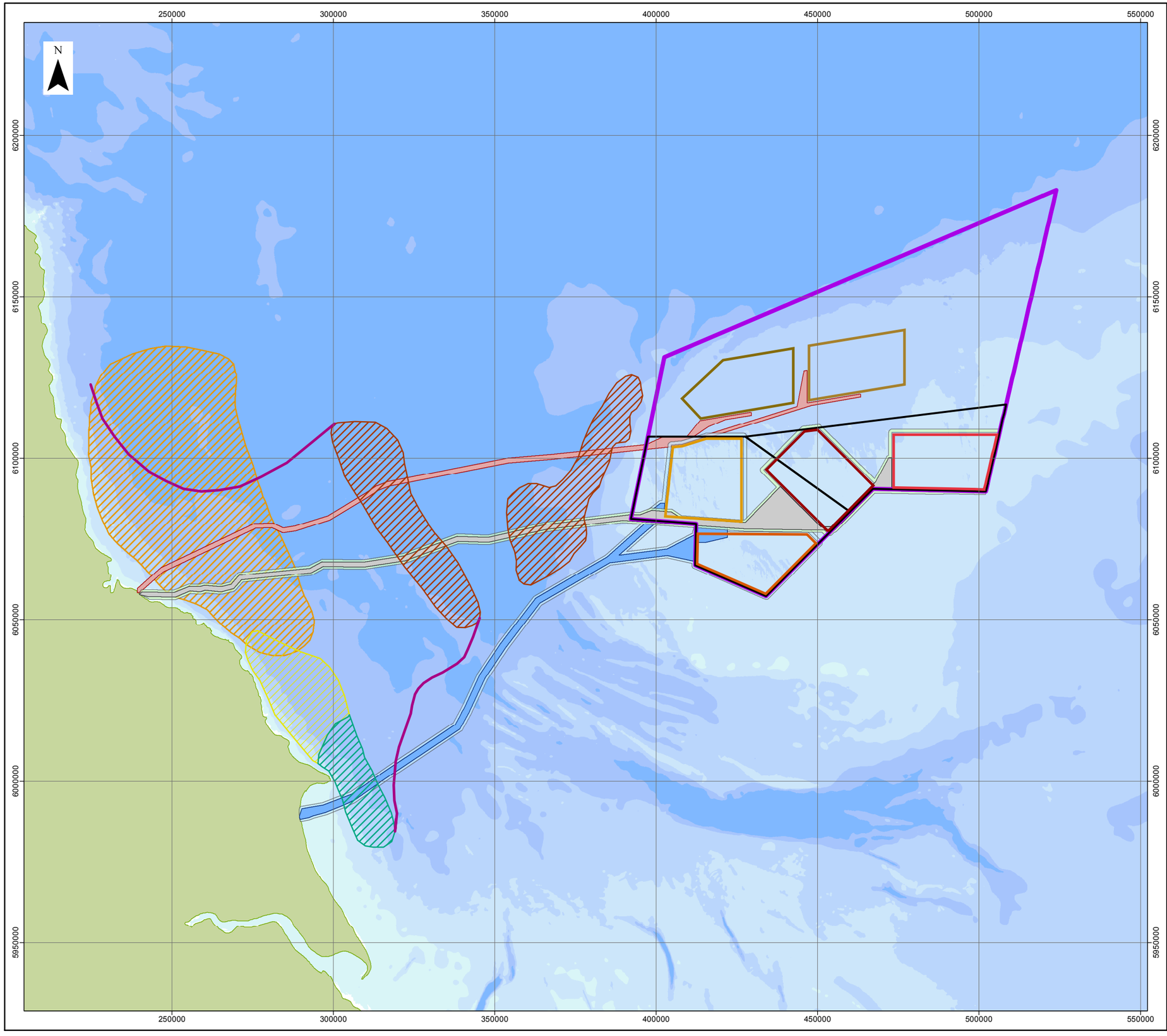

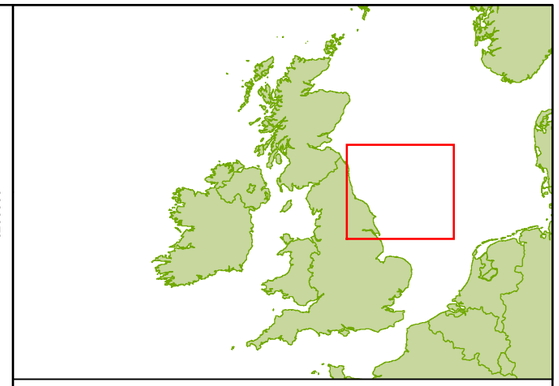

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- Main Yorkshire coast trawl ground extent
- Key ground <10m vessel (pair trawling)
- Key ground >10m vessel
- Key ground >10m vessel (pair trawling)
- Teesside main trawl area (Hartlepool vessels)

0 10 20 40
Kilometres

Data Source:
Main trawl area © PMSL, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.9 UK under-15m vessel key trawl areas

VER	DATE	REMARKS	Drawn	Checked
1	09/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-551

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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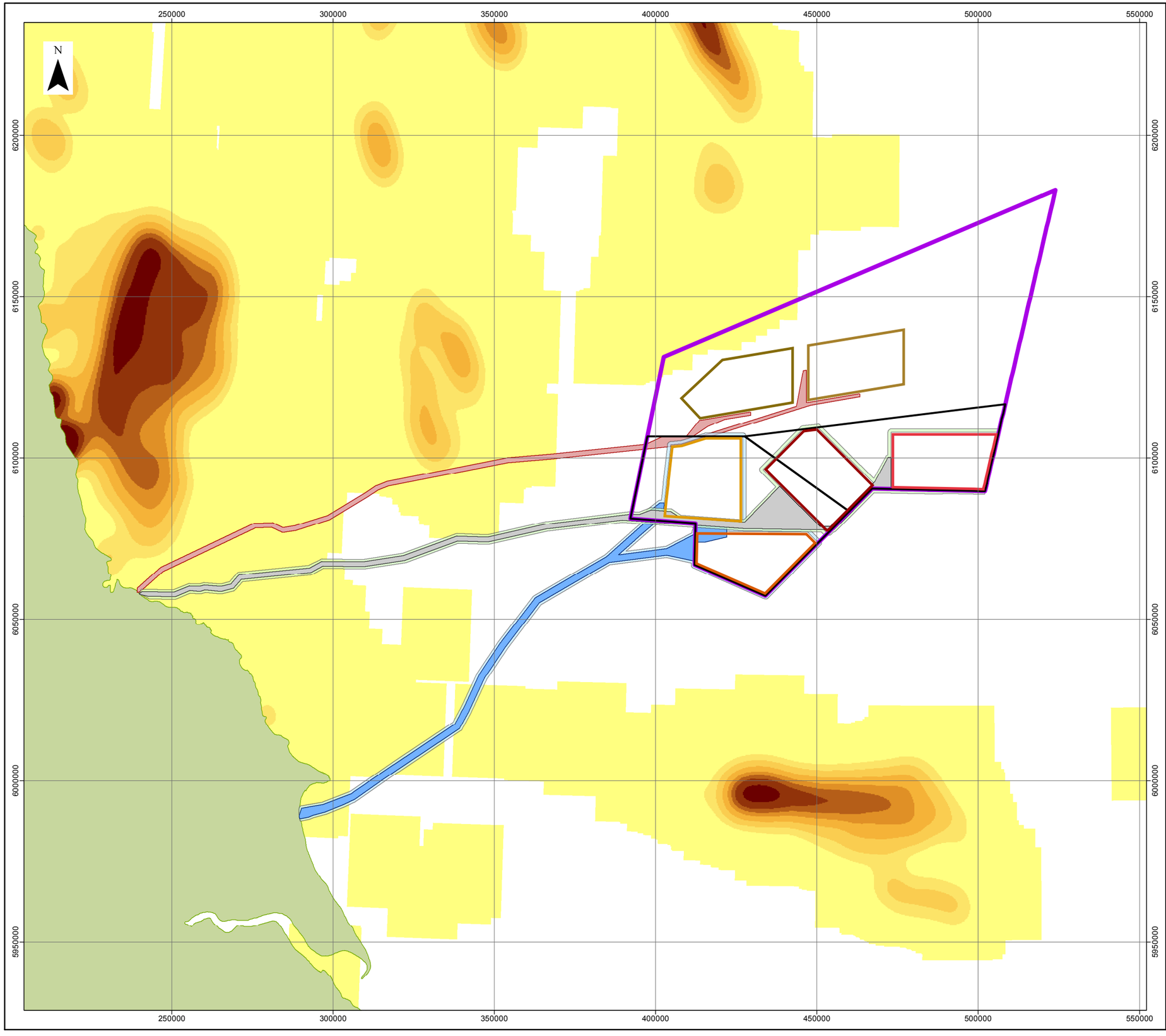

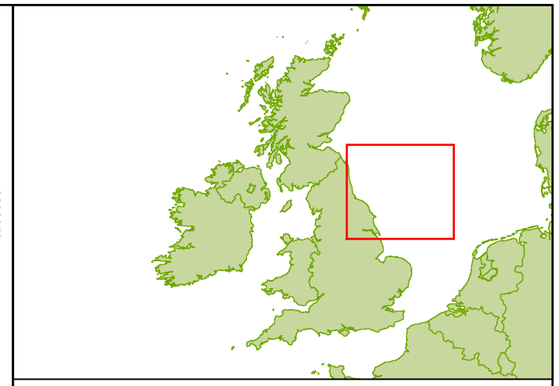

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Nephrops mobile gears value 2007-2011

- Low
- High

0 10 20 40
Kilometres

Data Source:
Mobile gear © Marine Scotland, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.10 Distribution of fishing values of UK vessels operating nephrops gear (average 2007-2011)

VER	DATE	REMARKS	Drawn	Checked
1	25/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-552

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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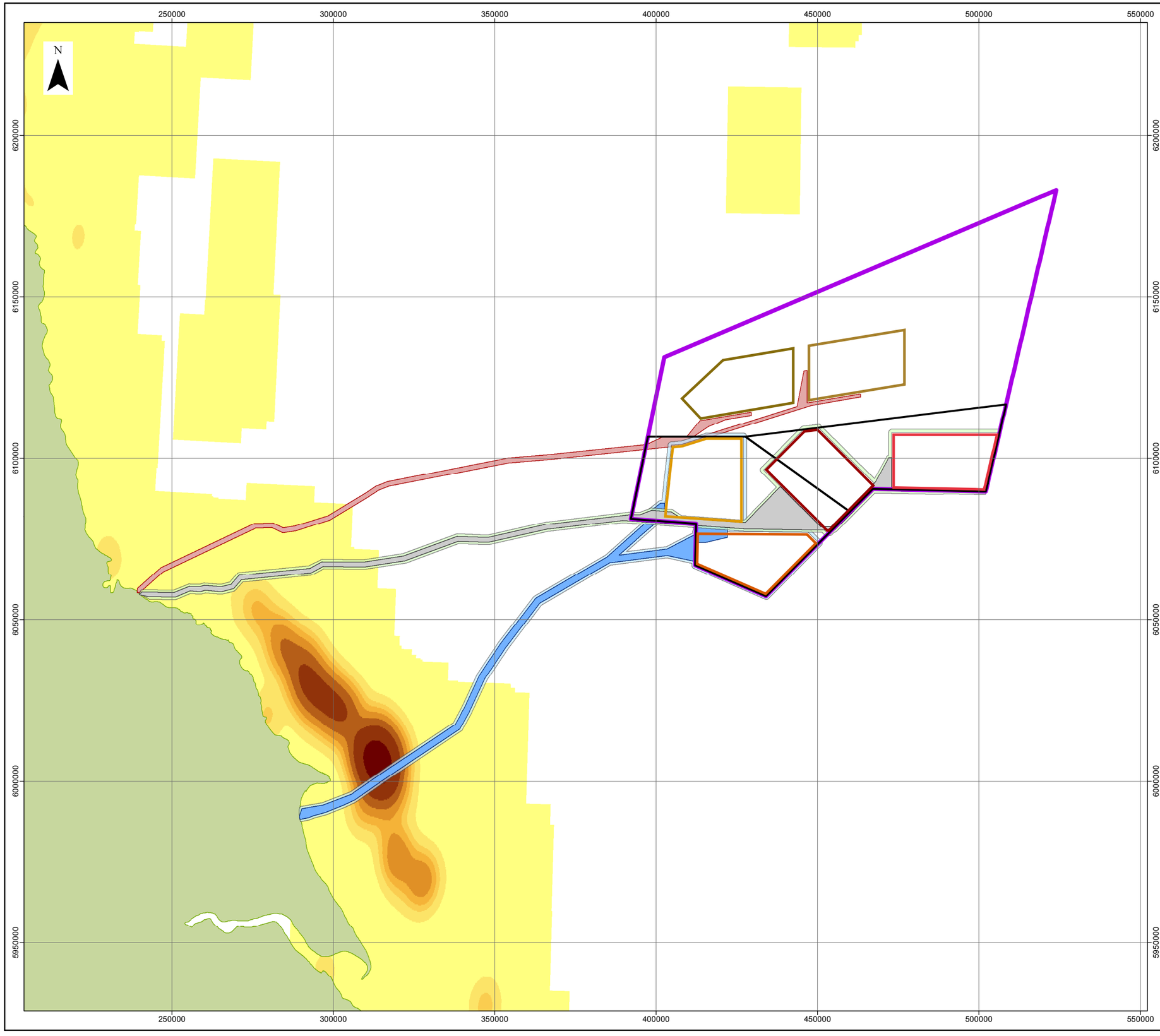

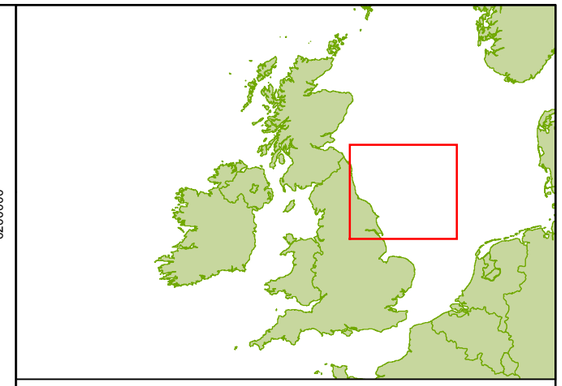

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Scallop dredge gear value 2007-2011

- Low
- High

0 10 20 40
Kilometres

Data Source:
Mobile gear © Marine Scotland, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.11 Distribution of fishing values of UK vessels operating scallop dredgers (average 2007-2011)

VER	DATE	REMARKS	Drawn	Checked
1	25/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

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SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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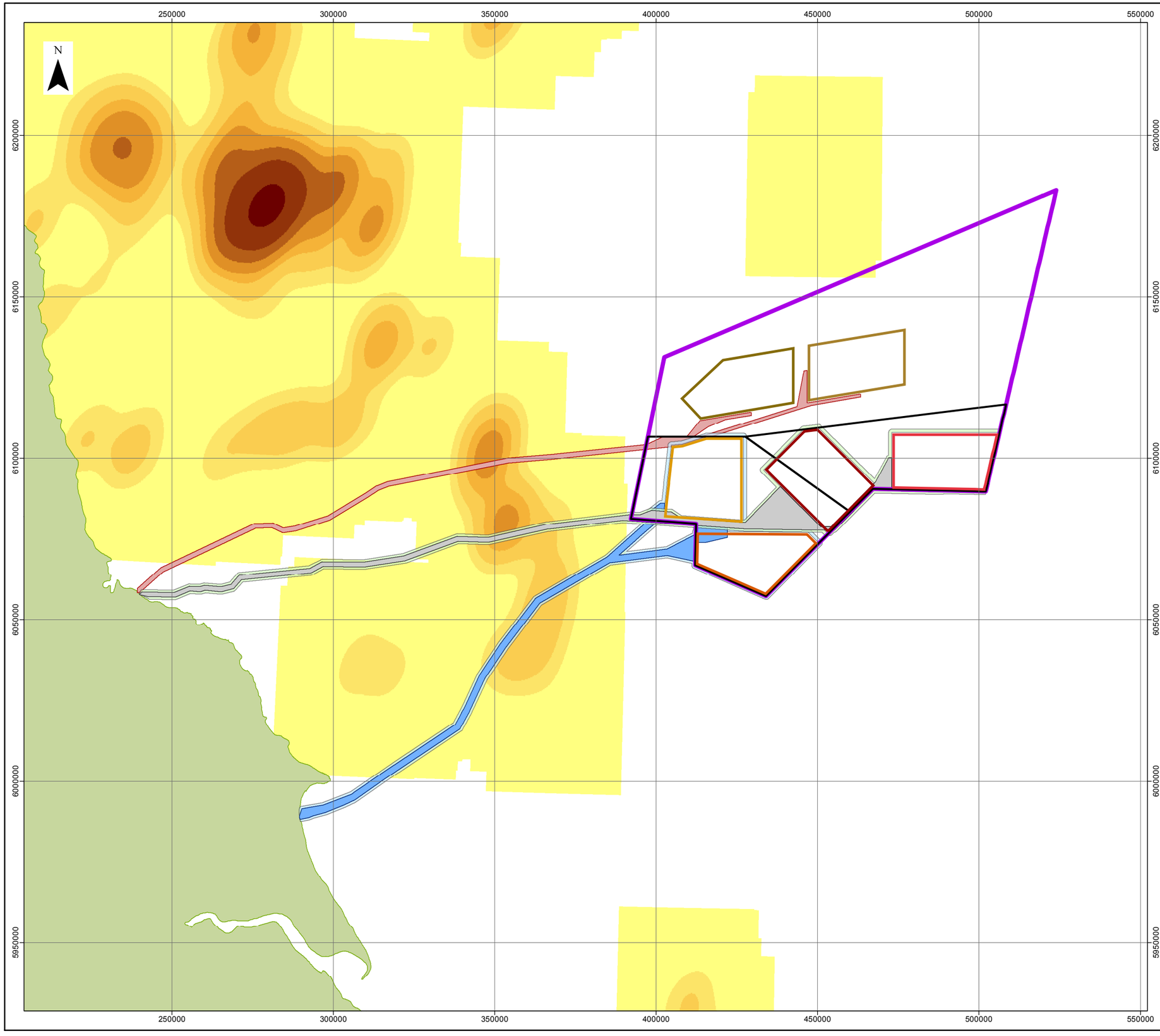

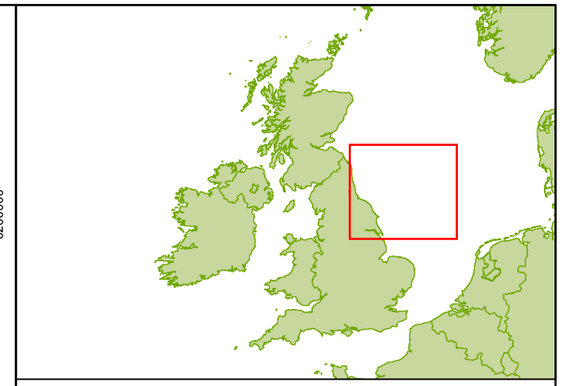

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Herring value 2007-2011

- Low
- High

0 10 20 40
Kilometres

Data Source:
Mobile gear © Marine Scotland, 2013

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.12 Distribution of fishing values of UK herring (average 2007-2011)

VER	DATE	REMARKS	Drawn	Checked
1	25/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

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SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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FOREWIND

Pelagic fishery

11.5.12. The sensitivity of the vessels targeting the pelagic fishery within the vicinity of the Export Cable Corridors is assessed to be low.

11.5.13. **Figure 11.12** illustrates the extent of the fishing areas of UK pelagic vessels targeting herring. It is assumed that German, Swedish and Norwegian fishing activity targeting herring is located in similar grounds in addition to grounds elsewhere, such as the Baltic Sea and north of Scotland. In comparison to the wider areas available for the herring fishery and due to the short duration of impacts on pelagic vessels which are able to manoeuvre around installation works, the magnitude of the effect is considered to be low.

11.5.14. The impact of loss of fishing area on vessels targeting the pelagic fishery associated with the installation of the Dogger Bank Teesside A & B and Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cables is therefore **minor adverse**.

11.5.15. It is also of note that the 2013 herring quota for the area in which the Dogger Bank Zone is located has been reduced to 14,400 tonnes, compared to previous annual quotas of between 164,300 tonnes and 454,751 tonnes.

Potting fishery

11.5.16. As shown by **Figure 11.13,** potting for crabs and lobsters occurs along a small inshore section of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cable Corridors. The majority of the vessels targeting this fishery are limited in their operational range and have therefore been assigned a high sensitivity.

11.5.17. The actual area of seabed occupied by the three Dogger Bank Export Cable Corridors is comparatively small to the area available to potting vessels. Due to pots being deployed over a small section of the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cable Corridors, and the period that the vessels might be displaced from this small area during construction will be short. As a result, the magnitude of effect is expected to be negligible.

11.5.18. The impact of loss of fishing area on vessels targeting the potting fishery as a result of the installation of the export cable corridors for Dogger Bank Creyke Beck, Dogger Bank Teesside A & B and Dogger Bank Teesside C & D is therefore **minor adverse**.

Netting fishery

11.5.19. Relatively low static netting values have been recorded in the general areas of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cable Corridors (**Figure 11.14**). Drift netting for salmon and sea trout is undertaken by a small number of vessels and is concentrated in the inshore section of the Export Cable Corridors. In light of this, the cumulative impact of all three Export Cable Corridors is expected to be no higher than that for Dogger Bank Teesside A & B Export Cable Corridor in isolation.

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11.5.20. In view of the size of the vessels partaking in the netting fishery and their limited fishing ranges, it is considered unlikely that individual vessels will deploy their gears over Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cable Corridors. The magnitude of the cumulative effect is therefore predicted to be negligible, which, associated with the receptor groups medium sensitivity, will result in a **minor adverse** cumulative impact.

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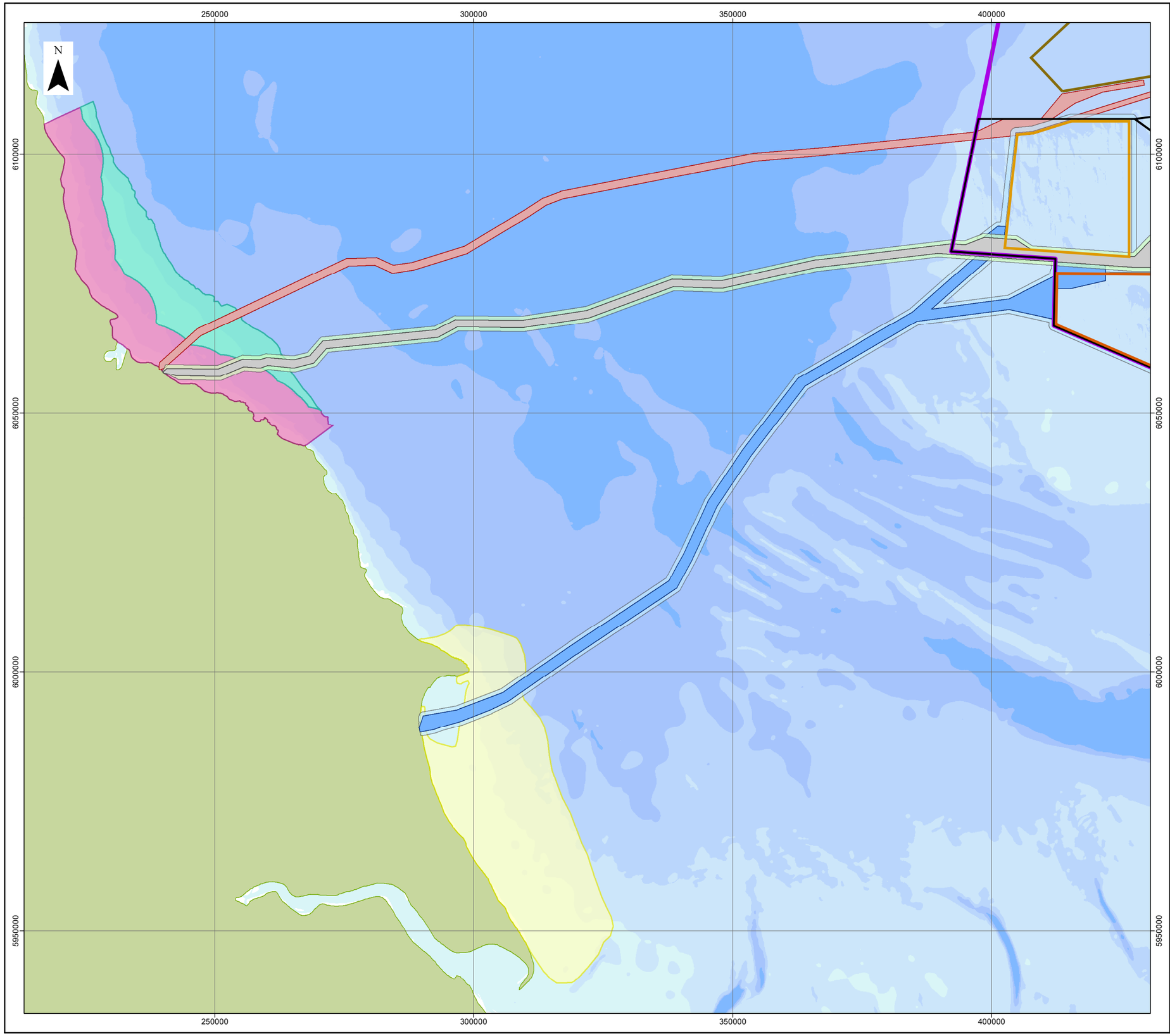

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside C
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- East Yorkshire key potting ground

Teesside potting groud (Newcastle to Whitby)

- Teesside inshore potting ground
- Teesside inshore potting ground (higher intensity)

0 5 10 20
Kilometres

Data Source:
Potting grounds © PMSL, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.13 UK potting vessels key fishing grounds

VER	DATE	REMARKS	Drawn	Checked
1	17/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-555

SCALE	1:750,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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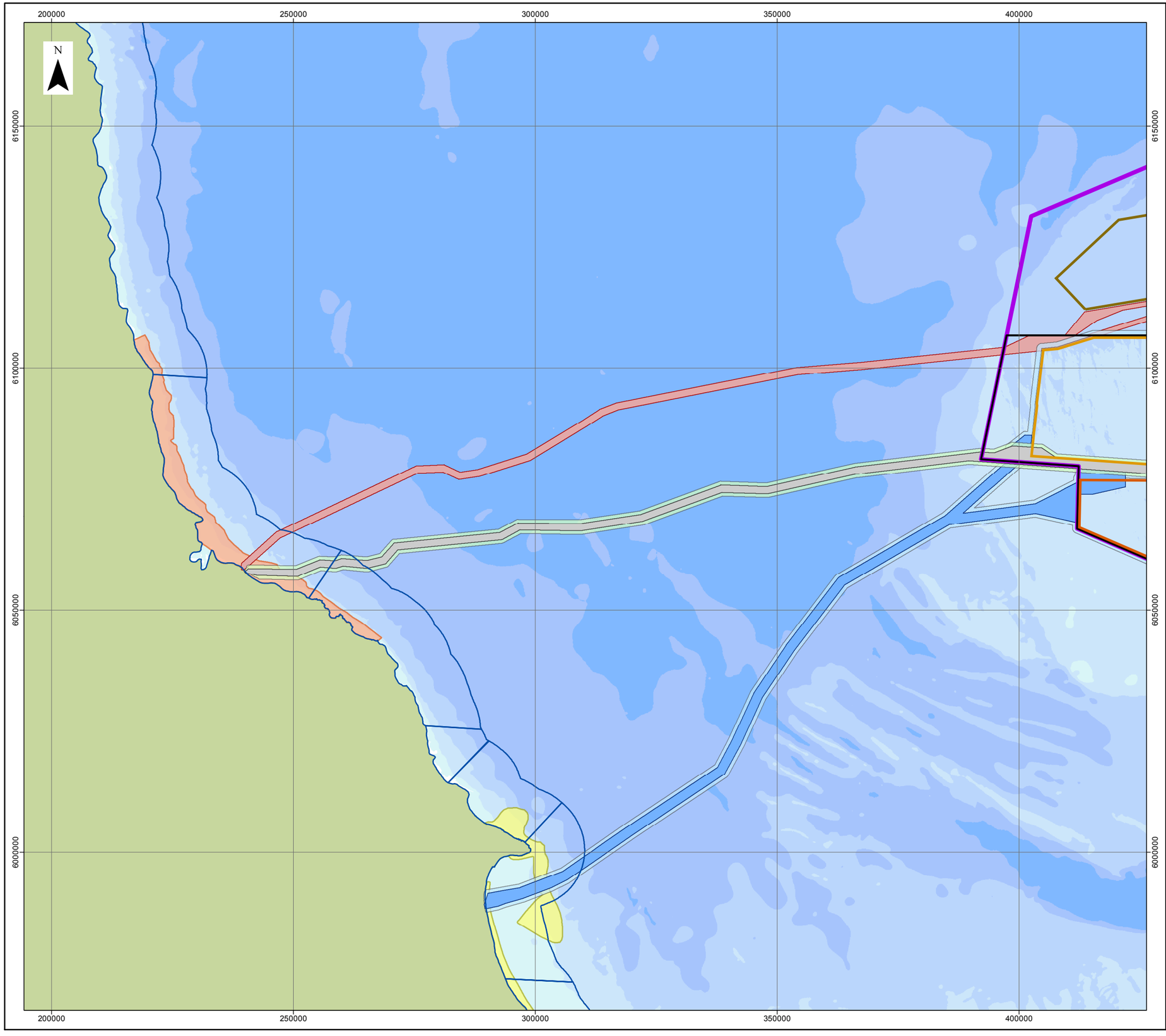

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside C
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- North east coast salmonid netting districts
- Teesside inshore netting ground (Newcastle to Whitby)
- East Yorkshire inshore netting ground

0 5 10 20
Kilometres

Data Source:
Drift net fishery © Environment Agency, 2012
Netting ground - Redcar and Tees Bay Fishermen's Association © PMSL, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.14 UK static and drift net fishing areas

VER	DATE	REMARKS	Drawn	Checked
1	17/09/2013	Draft	LW	TR
2	03/10/2014	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-556

SCALE	1:800,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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Cumulative impact - complete loss of, or restricted access to, traditional fishing grounds (operation)

11.5.21. Provided in **Table 11.5** are the assessed impacts, by receptor group, of the potential cumulative impacts of complete loss of, or restricted access to, traditional fishing grounds associated with the installation phases of the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cable Corridors.

Table 11.5 Cumulative impact of complete loss or restricted access to traditional fishing grounds during installation of the Dogger Bank Teesside A & B and Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cables.

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance	Residual Impact Significance
Whitefish Fishery (over-15m)	Low	Low	**Minor adverse**	**Minor adverse**
Whitefish Fishery (under-15m)	Medium	Negligible	**Minor adverse**	**Minor adverse**
Nephrops Fishery	Medium	Low	**Minor adverse**	**Minor adverse**
Scallop Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Pelagic Fishery	Low	Low	**Minor adverse**	**Minor adverse**
Potting Fishery	High	Low	**Minor adverse**	**Minor adverse**
Netting Fishery	Medium	Negligible	**Minor adverse**	**Minor adverse**

11.6. Dogger Bank Export Cable Corridors – operational phase

11.6.1. It is considered that during operation, providing the appropriate post-installations surveys and, if necessary, rectification measures have been undertaken, fishing will be able to resume along the length of the Export Cable Corridors unimpeded due to the burial of cables and/or protection of the cables where cable burial is not feasible. The operational phase of the Export Cable Corridors will not, therefore, contribute to a cumulative impact on fishing activities and is not considered further.

11.7. Dogger Bank Export Cable Corridors - decommissioning

11.7.1. As with the decommissioning of the projects, it is not expected that either the cumulative spatial extent or the durations of effects associated with export cable decommissioning will be greater than for the installation phases, therefore the impacts will not exceed those given for the installation phases.

Safety issues for fishing vessels

11.7.2. With simultaneous construction of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck, the spatial scope for safety risks is increased, while with sequential construction the duration is longer.

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11.7.3. It is considered however that the same obligations will apply in respect of safety zones regardless of their number and likewise the same objectives will apply to the protection measures on all cables.

11.7.4. With compliance with the implemented safety measures, policies and objectives, the cumulative safety risks to fishing vessels and their gears should also be within acceptable limits.

Interference with fishing activities

11.7.5. It is accepted that the construction and operation of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck within the Dogger Bank Zone and the installation of the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cable Corridors will result in a greater number of construction and maintenance vessel transits. In the case of vessels towing mobile gear, due to their comparatively low levels of activity and the fact that, under COLREGS, works vessels will take the appropriate action so as not to require fishing vessels to alter course when towing their gears. As a consequence, the cumulative impacts are expected to be of **minor adverse** impact in respect of interference with mobile gear fishing activities.

11.7.6. Similarly, with the appropriate fisheries liaison, and conflict avoidance policies, there should be **no discernible impact** on the static gear fisheries.

Increased steaming times

11.7.7. With the simultaneous construction of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck developments there could potentially be an increase in the number of 500m safety zones than would occur with the Dogger Bank Teesside A & B construction phases alone. With sequential construction, whilst the number of potential safety zones would not increase, the duration of their implementation would be longer.

11.7.8. The main fishing grounds relative to the base ports of the vessels targeting fishing grounds on the Dogger Bank are such that there would be a minimal requirement for traditional steaming routes to be altered. As discussed in **Chapter 16**, in appropriate conditions, it should be possible for vessels to steam through the operational sites.

Obstacles on the seabed post-construction

11.7.9. As stated in the Dogger Bank Teesside A & B assessment, accidently dropped objects, foundation and inter-array and export cable spoil and cable protection measures could constitute fastening risks to fishing gears.

11.7.10. In the case of accidently dropped objects, the same obligations will apply to construction and maintenance contractors involved with each of the project developments to prevent construction related objects being left on the seabed. The effects will therefore be within acceptable limits.

11.7.11. Similarly, with trenching spoil for the inter-array and export cables, the same measures will be applied to all of the cable installations to ensure that the effects of spoil will be within acceptable limits.

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11.7.12. With regards to cable protection measures, for all of the installations, the same objective shall apply that where feasible the selected protection measures will not significantly impede the operation of fishing gears and that as part of the detailed design, consultation will be undertaken with fishermen's representatives. As such the effects are within acceptable limits.

Displacement of fishing activity

11.7.13. With the construction of more than one project, there may be a cumulative displacement impact. As mentioned previously, the scale of displacement will be a direct function of the complete loss or restricted access to traditional fishing grounds during the construction period for Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck and the installation of the export cables. As a consequence, the cumulative impact significance identified previously for complete loss or restricted access to traditional fishing grounds will apply.

11.8. The cumulative impact of Dogger Bank Teesside A & B, and Dogger Bank Teesside C & D, Dogger Bank Creyke Beck and other wind farm developments

Flatfish fishery

11.8.1. The locations of other wind farm development boundaries have been overlaid onto the VMS charts of Dutch otter and beam trawlers in **Figure 11.15** and **Figure 11.16** and UK towed methods in **Figure 11.17**. As shown, the main areas of concentrated Dutch beam and otter trawling activity is to the south of the Dogger Bank Zone. The levels of Dutch otter and beam trawling activity within Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck sites are substantially lower than those recorded within the boundaries of other potential wind farm developments.

11.8.2. Similarly, **Figure 11.17** shows that in comparison to other areas, the activity of UK towed gear vessels, which includes otter trawlers, within the vicinity of the Dogger Bank Zone is also very low. It is therefore apparent that the Dogger Bank Zone developments will make only a proportionally very small contribution to the overall cumulative impacts associated with other offshore wind farm developments in the North Sea on the flatfish fishery.

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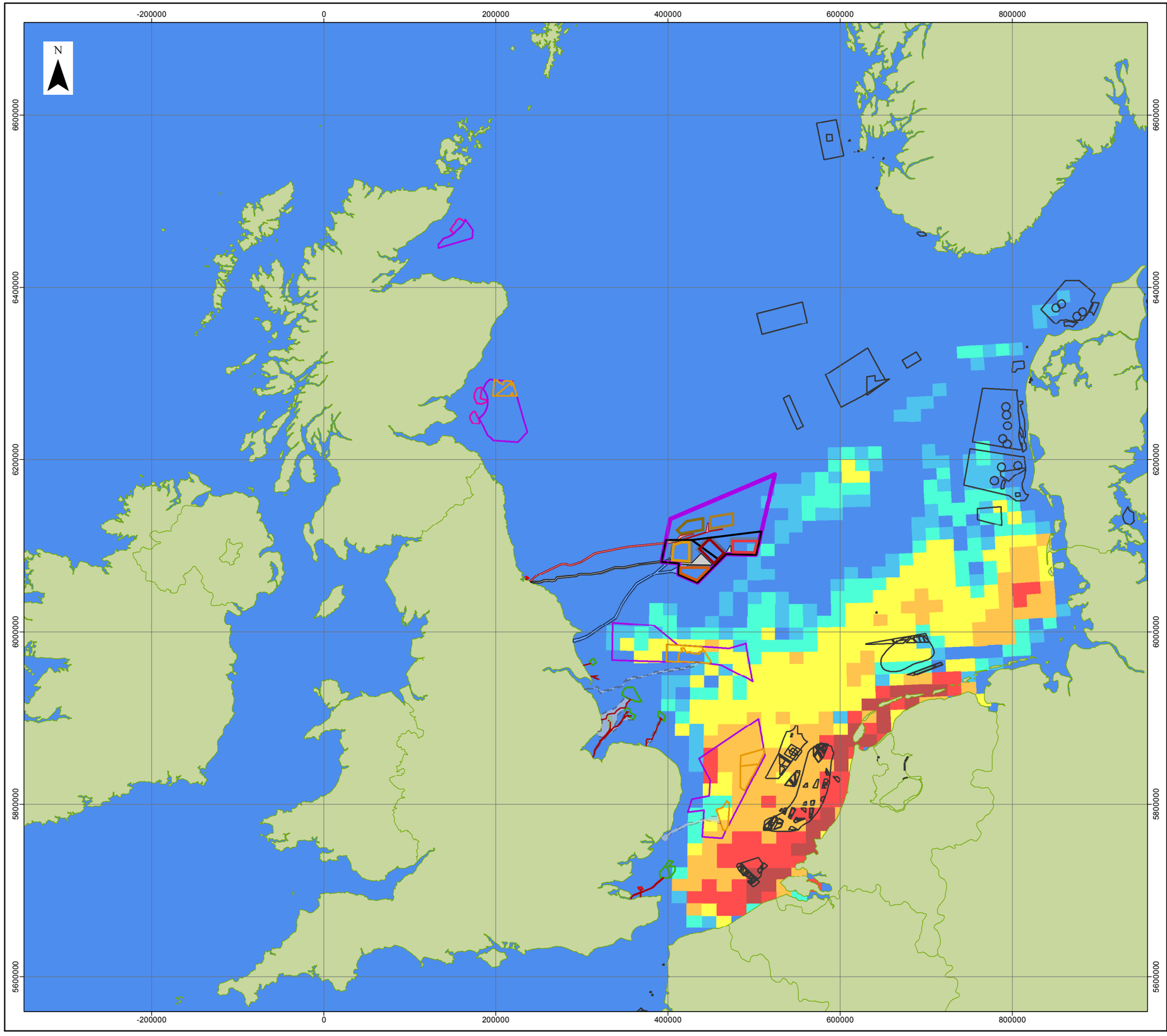

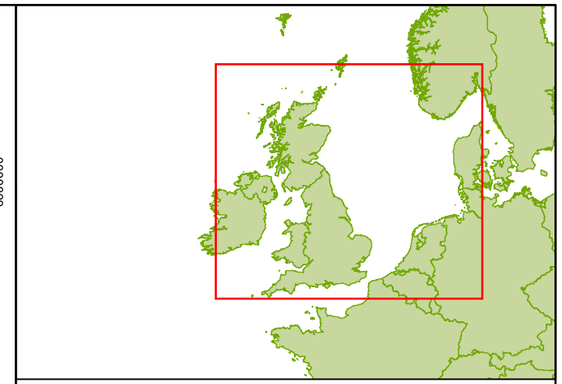

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Wind energy project

- Round 1
- Round 2
- Round 3
- Round 3 zone
- Demonstration
- Scottish territorial waters site
- Non-UK wind farm development
- North Sea wind farm cable corridor
- North Sea wind farm export cable route

Dutch VMS by effort (beam trawl only)

- Less than 5 days
- 6 to 10 days
- 11 to 20 days
- 21 to 50 days
- 51 to 100 days
- 101 to 200 days
- More than 200 days

0 25 50 100
Kilometres

Data Source:
VMS © IMARES, 2013
Non-UK wind farm projects © Marine Find, 2013
Offshore wind farm boundaries © The Crown Estate, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.15 Other potential wind farm developments and Dutch beam trawl activity

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-557

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,500,000	A3	WGS84	UTM31N

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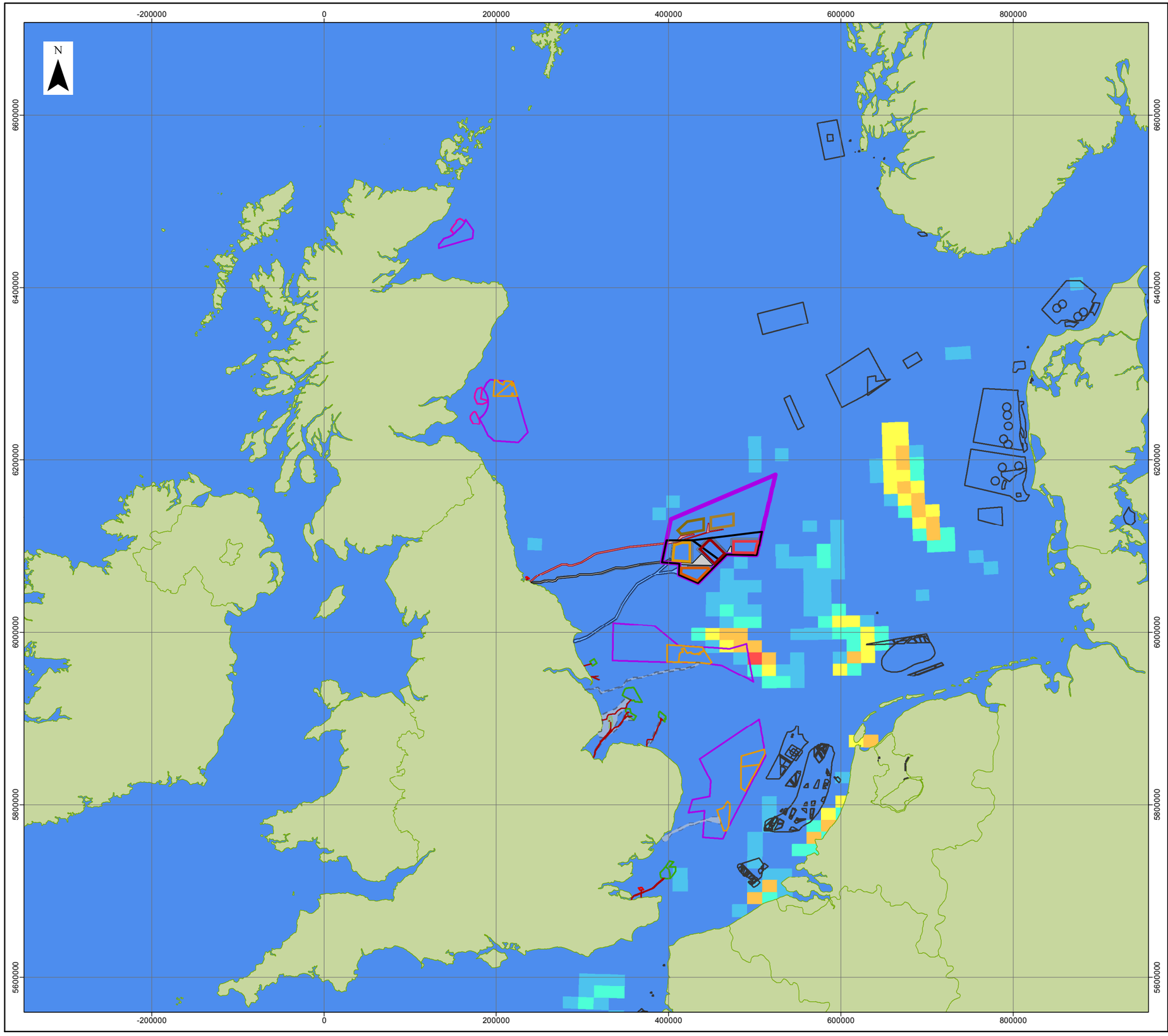

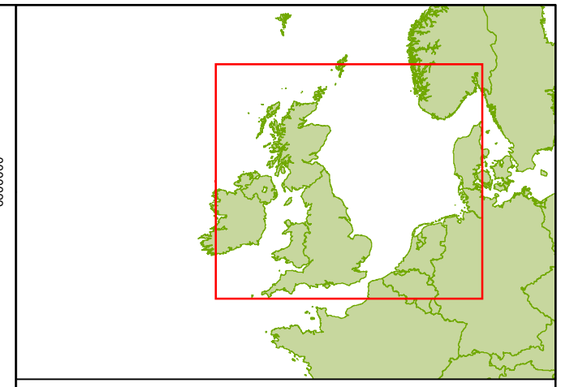

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Wind energy project

- Round 1
- Round 2
- Round 3
- Round 3 zone
- Demonstration
- Scottish territorial waters site
- Non-UK wind farm development
- North Sea wind farm cable corridor
- North Sea wind farm export cable route

Dutch VMS by effort (otter trawl only)

- Less than 5 days
- 6 to 10 days
- 11 to 20 days
- 21 to 50 days
- 51 to 100 days
- 101 to 200 days
- More than 200 days

0 25 50 100
Kilometres

Data Source:
VMS © IMARES, 2013
Non-UK wind farm projects © Marine Find, 2013
Offshore wind farm boundaries © The Crown Estate, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.16 Other potential wind farm developments and Dutch otter trawl activity

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

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SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,500,000	A3	WGS84	UTM31N

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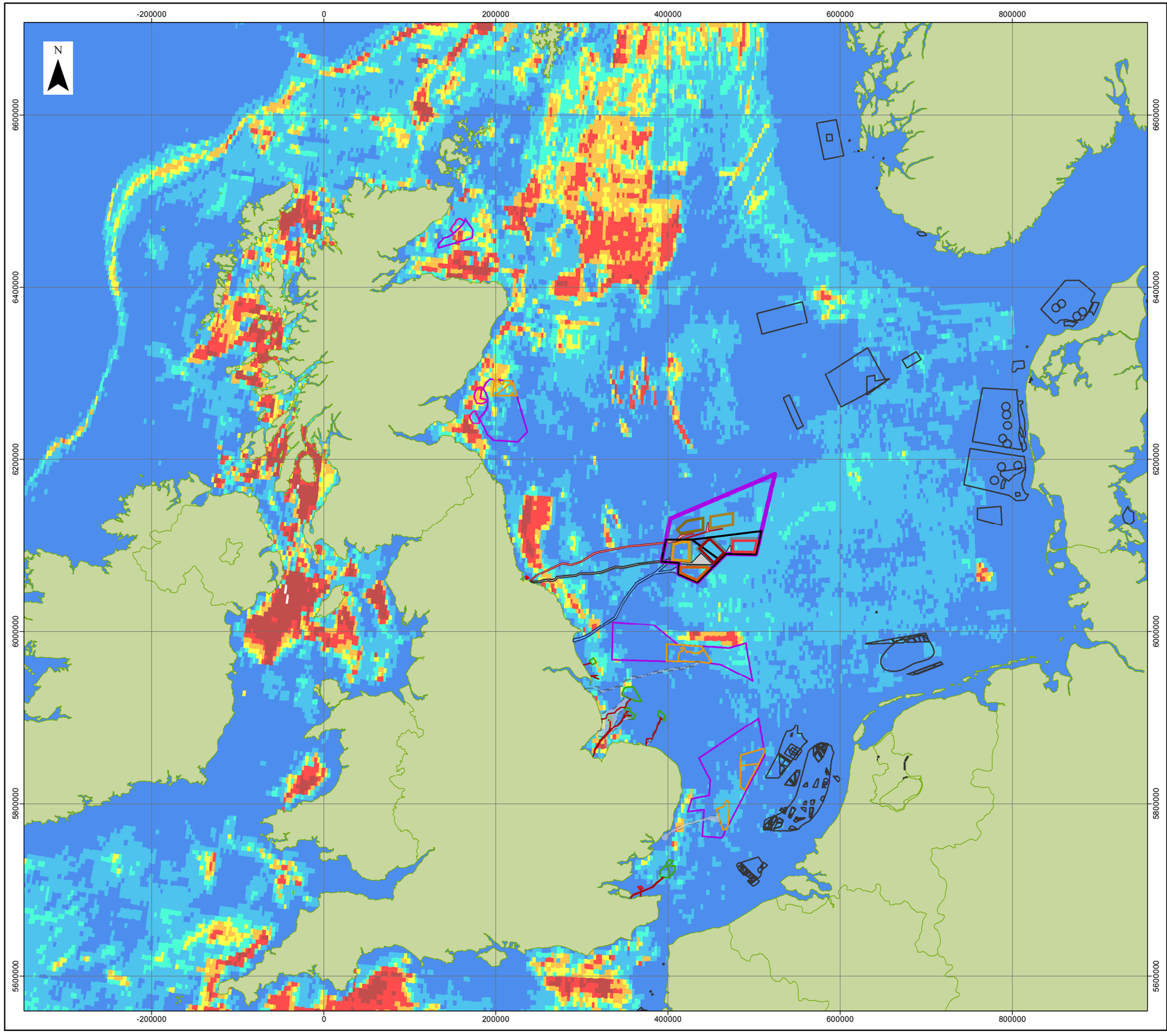

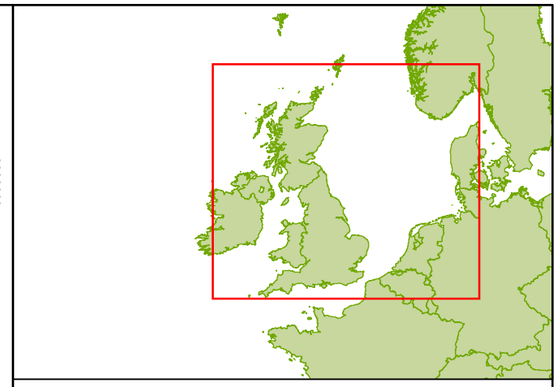

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Wind energy project

- Round 1
- Round 2
- Round 3
- Round 3 zone
- Demonstration
- Scottish territorial waters site
- Non-UK wind farm development
- North Sea wind farm cable corridor
- North Sea wind farm export cable route

UK VMS by effort (hours fished)

- Less than 100 hours
- 100 to 1,000 hours
- 1,000 to 2,000 hours
- 2,000 to 3,000 hours
- 3,000 to 5,000 hours
- 5,000 to 10,000 hours
- More than 10,000 hours

0 25 50 100
Kilometres

Data Source:
VMS © MMO, 2013
Non-UK wind farm projects © Marine Find, 2013
Offshore wind farm boundaries © The Crown Estate, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.17 Other potential wind farm developments and UK mobile fishing activity

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-559

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,500,000	A3	WGS84	UTM31N

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Sandeel fishery

11.8.3. As shown by **Figure 11.18**, sandeel fishing grounds are extensive, being widely distributed over the Central North Sea. It is also apparent that, with the potential exception of certain areas of the Hornsea Zone, potential wind farm developments in UK territorial waters are unlikely to make a significant contribution to cumulative impacts on the sandeel fishery. Some of the non-UK developments may however contribute to the cumulative impacts.

Seine net fishery

11.8.4. From **Figure 11.19**, it is considered that there will not be a significant cumulative effect on the seine net fishery from future wind farm developments outside of the Dogger Bank Zone.

Gillnet fishery

11.8.5. From **Figure 11.20** it is apparent that static gillnet fishing grounds are extensive and mainly located in non-UK waters and the activity recorded in the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck projects is very low in comparison. With the potential exception of certain areas of the East Anglia Zone, potential UK wind farm developments are unlikely to make a significant contribution to cumulative impacts on the gillnet fishery.

Fisheries along the Dogger Bank Export Cable Corridors

11.8.6. Due to the very short term and temporary nature of the installation of the export cables, it is considered unlikely that significant cumulative impacts will be sustained by most fisheries as a result of other wind farm installations in both UK and non-UK waters.

11.8.7. The exception may be inshore potting and netting, as the vessels that target these fisheries are limited in their operational ranges and therefore cannot seek alternative fishing grounds.

UK potting, netting and trawling

11.8.8. The cumulative effects on the different fleet segments that operate within the inshore area of the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cable Corridors may vary by virtue of their operational range, the localised nature of the fishing grounds, vessel capability and the nature of the activity. **Figure 11.21** - **Figure 11.23** illustrate the export cable installations where such an effect could occur and the relevant fishing grounds.

11.8.9. It is acknowledged that where export cables make a landfall in close proximity to each other, there may be cumulative impacts on smaller UK vessels.

11.8.10. The Dogger Bank Teesside A & B Export Cable Corridor transits through locally important shellfish grounds, particularly those utilised by vessels operating out of Redcar and Whitby. The vessels from Whitby are under-12m and, as a consequence, are classified as day boats. The Redcar vessels, are under 10m beach launched vessels, and therefore have a further reduced operational range.

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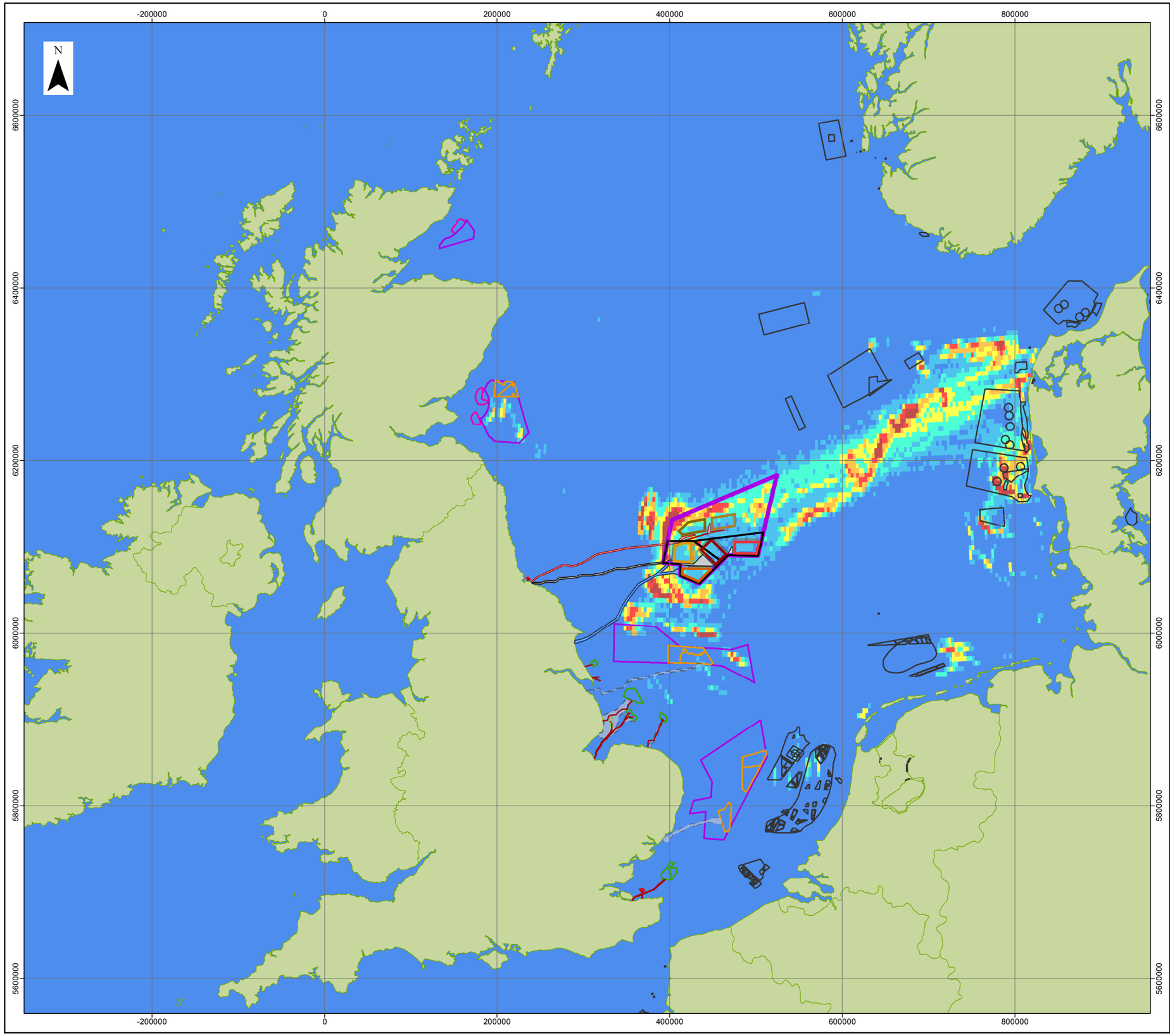

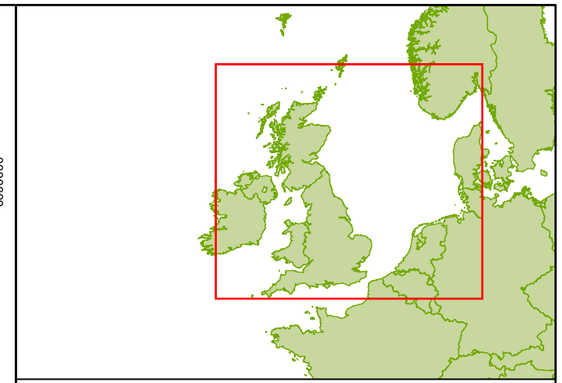

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Wind energy project

- Round 1
- Round 2
- Round 3
- Round 3 zone
- Demonstration
- Scottish territorial waters site
- Non-UK wind farm development
- North Sea wind farm cable corridor
- North Sea wind farm export cable route

Danish sandeel satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- over 80

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014
Non-UK wind farm projects © Marine Find, 2013
Offshore wind farm boundaries © The Crown Estate, 2014

0 25 50 100
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.18 Other potential wind farm developments and Danish sandeel activity

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-560

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,500,000	A3	WGS84	UTM31N

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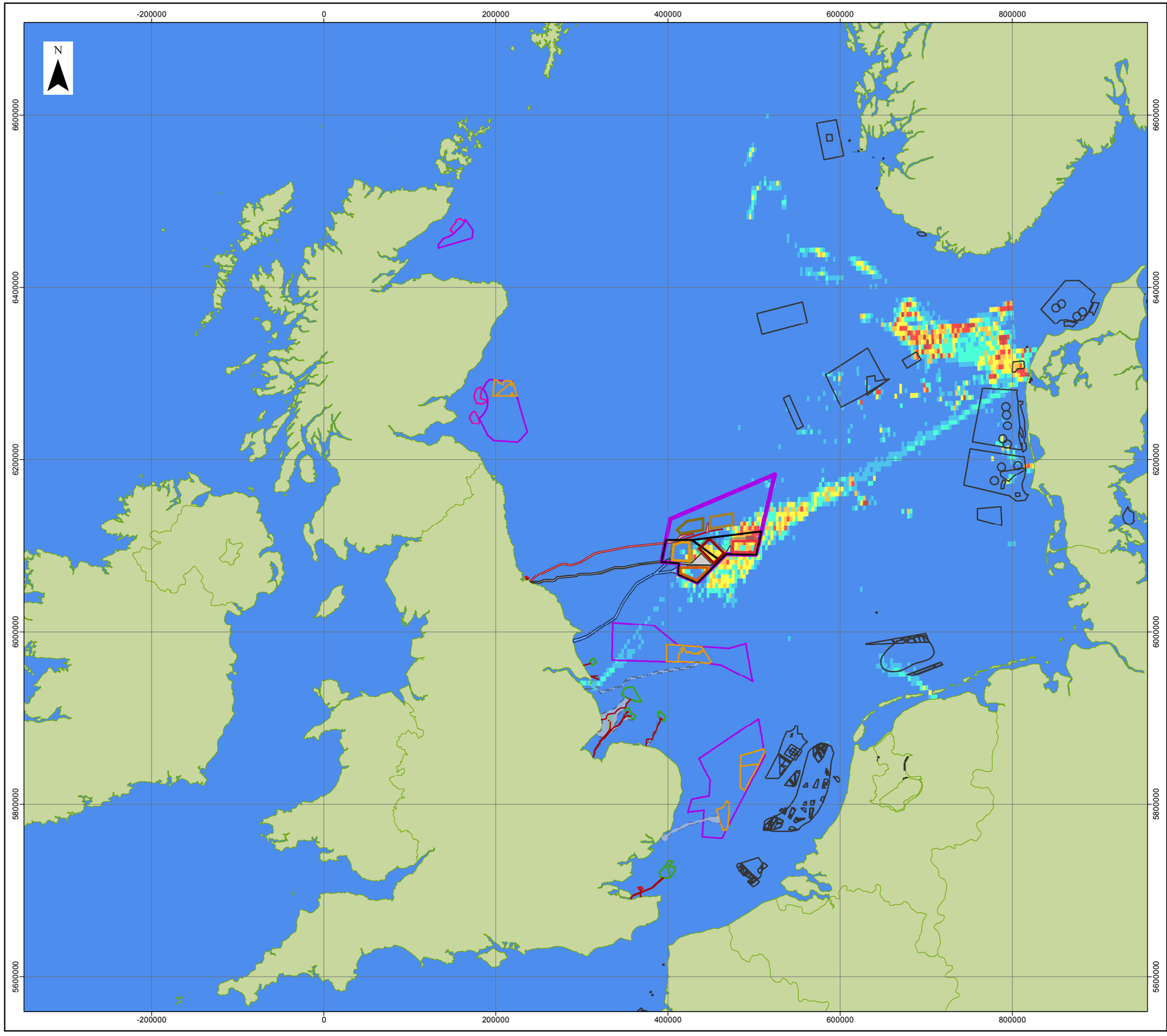

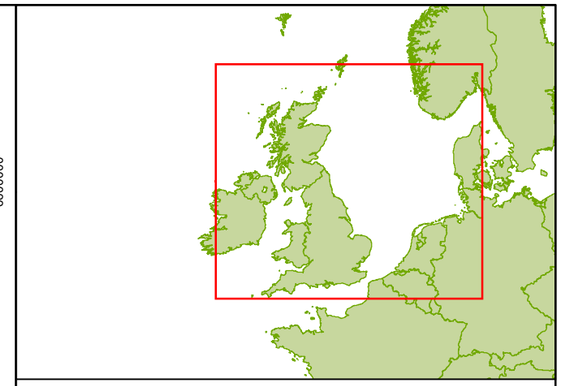

LEGEND

- Dogger Bank Zone
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- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Wind energy project

- Round 1
- Round 2
- Round 3
- Round 3 zone
- Demonstration
- Scottish territorial waters site
- Non-UK wind farm development
- North Sea wind farm cable corridor
- North Sea wind farm export cable route

Danish seine satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014
Non-UK wind farm projects © Marine Find, 2013
Offshore wind farm boundaries © The Crown Estate, 2014

0 25 50 100
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.19 Other potential wind farm developments and Danish seine netting activity

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
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DRAWING NUMBER:

F-OFL-MA-561

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,500,000	A3	WGS84	UTM31N

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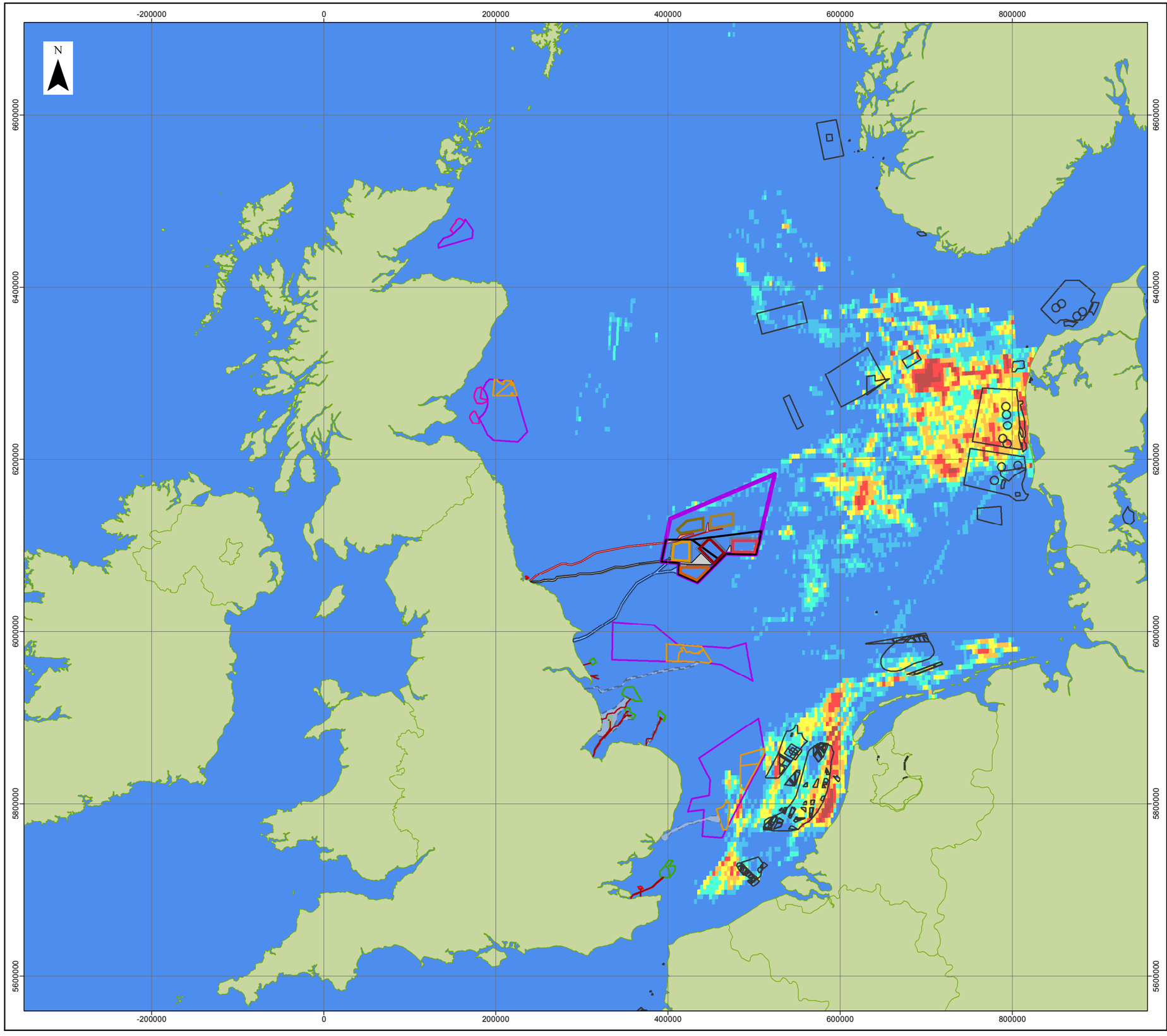

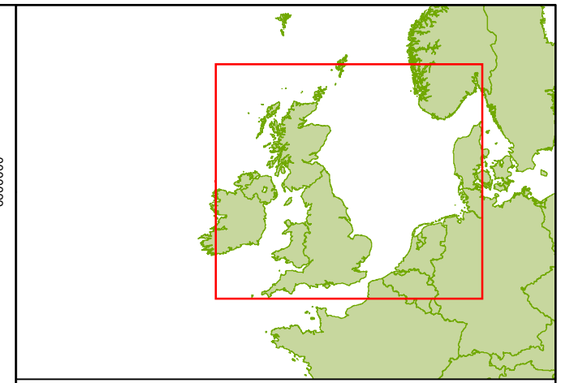

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor

Wind energy project

- Round 1
- Round 2
- Round 3
- Round 3 zone
- Demonstration
- Scottish territorial waters site
- Non-UK wind farm development
- North Sea wind farm cable corridor
- North Sea wind farm export cable route

Danish gill net satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

Data Source:
VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014
Non-UK wind farm projects © Marine Find, 2013
Offshore wind farm boundaries © The Crown Estate, 2014

0 25 50 100
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.20 Other potential wind farm developments and Danish gill and trammel netting activity

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-562

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,500,000	A3	WGS84	UTM31N

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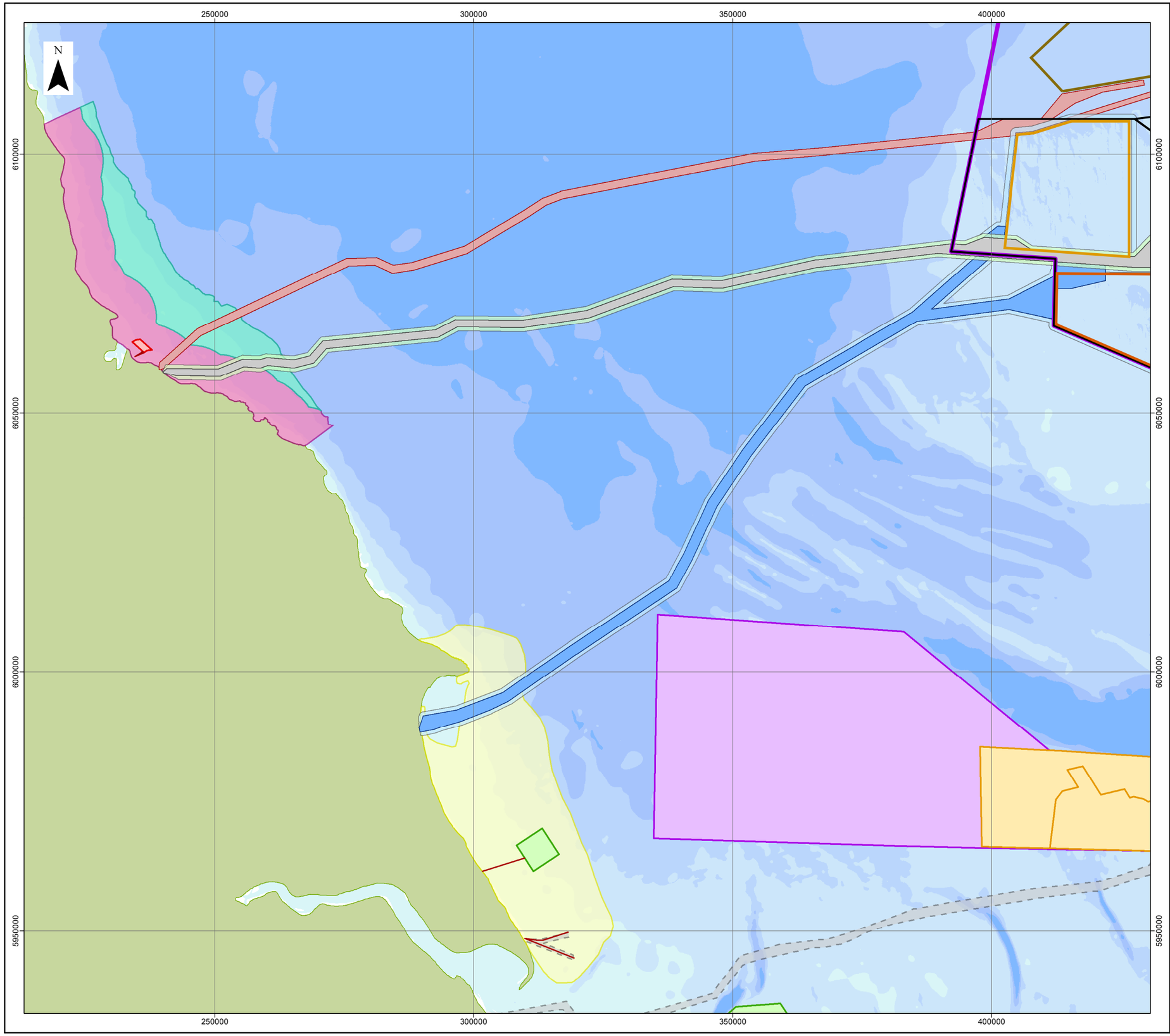

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside C
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- East Yorkshire key potting ground

Teesside potting groud (Newcastle to Whitby)

- Teesside inshore potting ground
- Teesside inshore potting ground (higher intensity)

Wind energy project

- Round 1
- Round 2
- Round 3
- Round 3 zone
- North Sea wind farm export cable route
- North Sea wind farm cable corridor

0 5 10 20
Kilometres

Data Source:
Potting grounds © PMSL, 2013
Offshore wind farm boundaries © The Crown Estate, 2014
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.21 Inshore marine developments and potting activity

VER	DATE	REMARKS	Drawn	Checked
1	19/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-563

SCALE	1:750,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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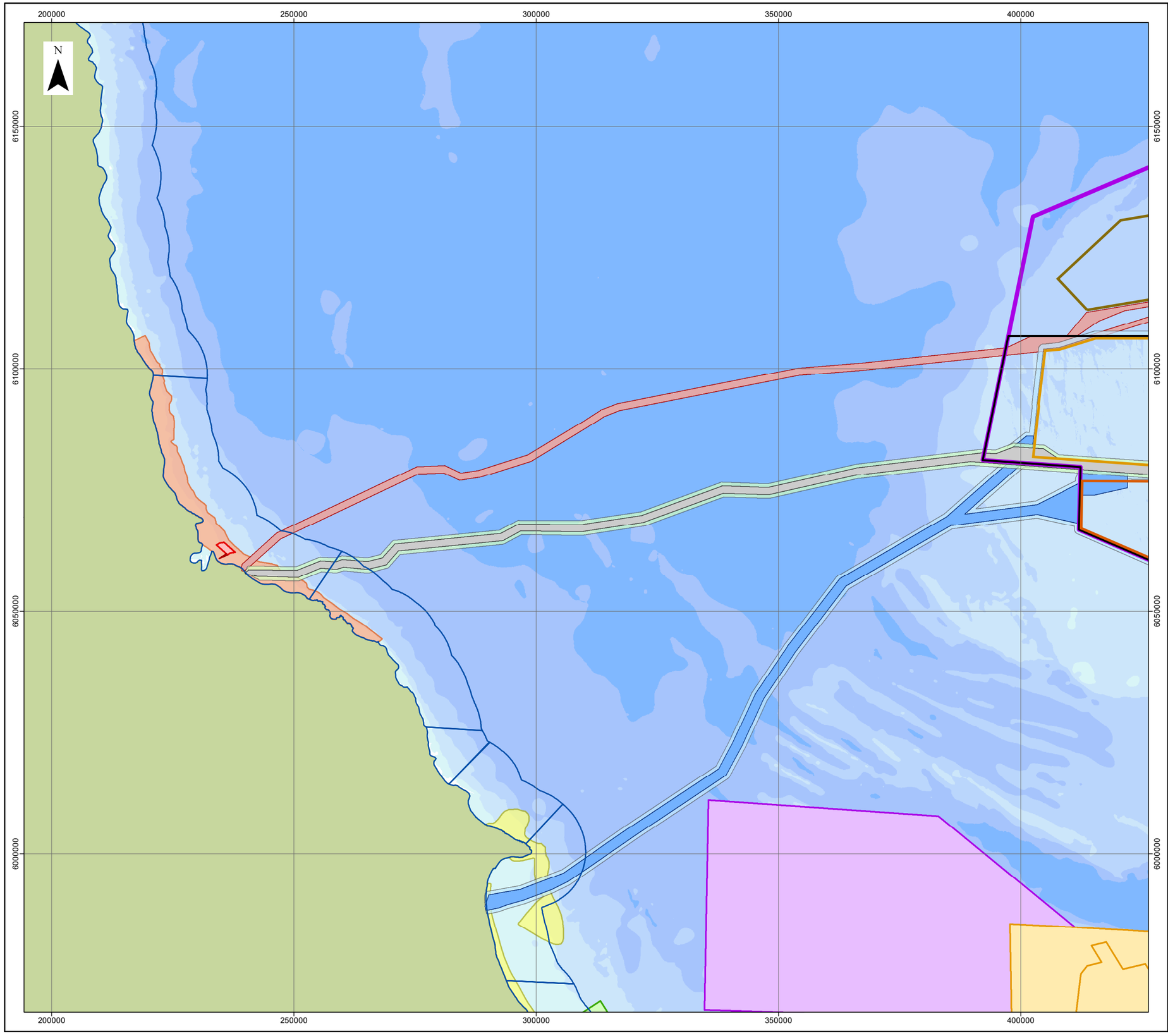

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside C
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- North east coast salmonid netting districts
- Teesside inshore netting ground (Newcastle to Whitby)
- East Yorkshire inshore netting ground

Wind energy project

- Round 1
- Round 2
- Round 3 zone
- North Sea wind farm export cable route

0 5 10 20
Kilometres

Data Source:
Drift net fishery © Environment Agency, 2012
Netting ground - Redcar and Tees Bay Fishermen's Association © PMSL, 2013
Offshore wind farm boundaries © The Crown Estate, 2014
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.22 Inshore marine developments and netting activity

VER	DATE	REMARKS	Drawn	Checked
1	19/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER: **F-OFL-MA-564**

SCALE	1:800,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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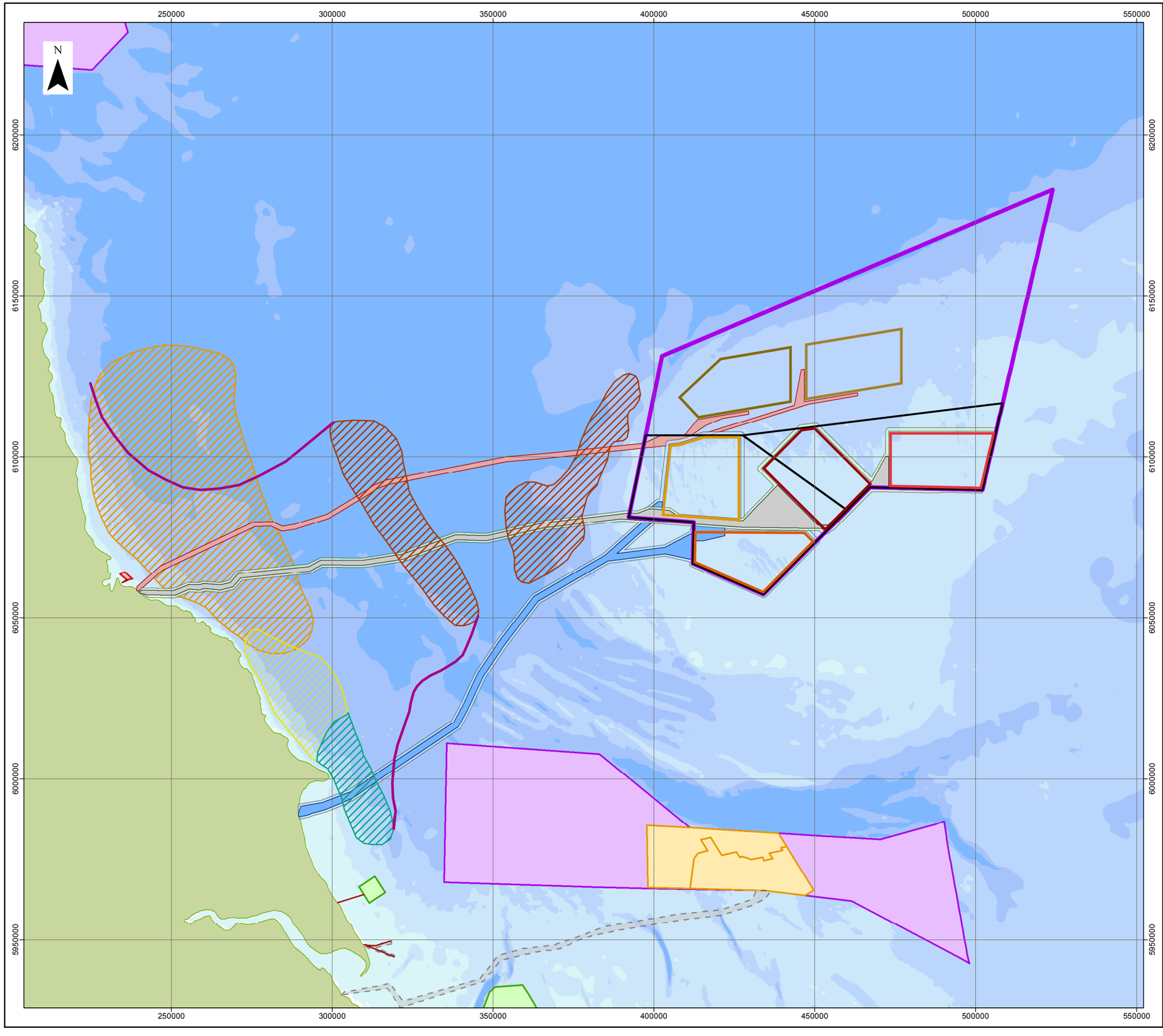

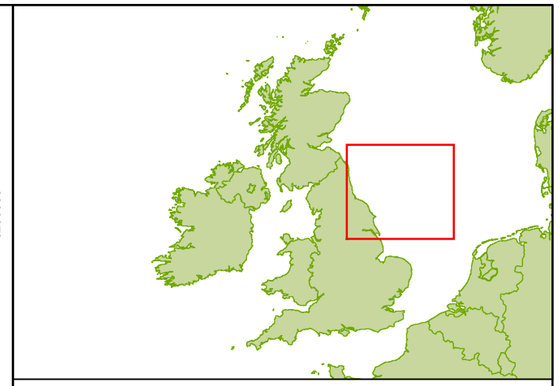

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Teesside C & D Export Cable Corridor
- Main Yorkshire coast trawl ground extent
- Key ground <10m vessel (pair trawling)
- Key ground >10m vessel
- Key ground >10m vessel (pair trawling)
- Teesside main trawl area (Hartlepool vessels)

Wind energy project

- Round 1
- Round 2
- Round 3
- Round 3 zone
- North Sea wind farm export cable route
- North Sea wind farm cable corridor

0 10 20 40
Kilometres

Data Source:
Main trawl area © PMSL, 2013
Offshore wind farm boundaries © The Crown Estate, 2014
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.23 Inshore marine developments and trawling activity

VER	DATE	REMARKS	Drawn	Checked
1	09/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	10/02/2014	DCO Submission	LW	TR

DRAWING NUMBER: **F-OFL-MA-565**

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,200,000	A3	WGS84	UTM31N

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11.8.11. However, given the restricted extension of the inshore shellfish fleet operations, it is anticipated that there will be no cumulative impact as a result of any interaction between the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck Export Cable Corridors and the Hornsea Project One. Similarly, the inshore shellfish fleet operating in the region of the Dogger Bank Creyke Beck Export Cable Corridors and the Hornsea Project One are limited in their operational range and as a consequence there is no interaction between the North Yorkshire/Cleveland inshore shellfishery and that of the Holderness inshore fishery.

11.8.12. Where vessels are engaged solely in netting i.e. wreck and turbot netters operating from Hartlepool, the extremely localised nature of the fishery e.g. fishing wrecks, dictates that the cumulative effects of other projects will not be significant.

11.8.13. The trawling fleet are mostly day boats and although their operational range is greater than static potting vessels, as a result of landing catch daily, they are still restricted by their working area. Inshore fishermen have provided information on their fishing grounds, and this clearly indicates that there is no interaction between vessels operating within the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and the Dogger Bank Creyke Beck Export Cable Corridor or the Hornsea Round 3 projects **Figure 11.23**.

11.8.14. There is a small overlap between inshore trawling vessels operating from Whitby and Scarborough on the key Hartlepool grounds and Dogger Bank Creyke Beck Export Cable Corridor **Figure 11.23**. Given the low number of vessels involved and the necessity to land daily, it is considered that there will be no significant cumulative impacts to the inshore mobile gear sector.

11.8.15. The assessment of cumulative impacts on inshore shellfisheries, static net fisheries and inshore trawlers, demonstrates that due to the limited operational range of vessels involved, there will be no significant cumulative impact arising from the interaction and or displacement from the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D, Dogger Bank Creyke Beck Export Cable Corridors, and the Hornsea Round 3 projects. Fishing activity surveys within the inshore area of the Dogger Bank Teesside A & B Export Cable Corridor clearly indicate that static gear activity is of a significantly lower scale compared to that observed within the Holderness fishery and as a consequence any displacement of fishing effort will be of low. Should displacement occur, it will be short term and spatially limited. Once the cable installation phase is completed, fishing will be able to resume.

11.9. The cumulative impact of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck and other wind farms and other installations, activities and conservation areas

11.9.1. As shown by **Figure 11.24** - **Figure 11.29**, there is a potential for cumulative impact on the fisheries identified as occurring within Dogger Bank Teesside A &

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B, if all of the other potential developments, regulated activities and conservation areas were to be implemented.

11.9.2. Under Natura 2000, the UK Marine and Coastal Access Act (2009) and other Member States Directives, it is proposed that a series of conservation areas are to be put in place within the North Sea. The final boundaries have yet to be defined and at present many of the published boundaries, such as the cSAC over the Dogger Bank, are indicative of the maximum extent of the areas under consideration. The boundaries shown in the following charts therefore show the largest potential extent (worst case) of the conservation areas. Furthermore, the associated management policies with regards to commercial fishing have also to be agreed.

11.9.3. Over the operational lives of the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck developments it is also possible that decommissioning and removal of oil and gas infrastructure could make a small contribution to reducing the cumulative impact,

11.9.4. In the case of future aggregate dredging activities, as shown, even if all concessions were exploited, the combined sea areas affected would be substantially smaller than the combined sea area of conservation zones or offshore wind farms.

11.9.5. Taking the worst case scenarios, commercial fishing could potentially sustain a significant cumulative loss of fishing area as a result of the various developments and conservation measures which may be implemented within the North Sea. Nonetheless, the contribution of the Forewind wind farm developments (Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck) and other developments in the North Sea to the cumulative impact of loss of fishing area will be small.

11.9.6. A summary of the cumulative impact assessment is provided in **Table 11.6** below.

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Table 11.6 Summary of cumulative impact assessment

Description of impact	Residual impact of Dogger Bank Teesside A & B	Projects with potential for cumulative impact	Cumulative impact	Details
Construction phase				
Complete loss or restricted access to traditional fishing grounds (wind farm construction)	**Minor adverse**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Flatfish Fishery. The spatial extent and/or durations of effects will be greater than assessed for the Dogger Bank Teesside A & B construction, but the very low levels of activity within Dogger Bank Teesside C and Dogger Bank Creyke Beck B means the magnitude of the effect is expected be low.
	Minor adverse	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Sandeel fishery. The low intensity of sandeel fishing effort within Dogger Bank Teesside B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck, and negligible intensity within Dogger Bank Teesside B, and the extent of available fishing areas beyond the sites, means the magnitude of temporary loss of, or restriction to, traditional fishing grounds during construction of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck is considered to be low.
	Moderate adverse	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Moderate adverse**	Seine net Fishery. Minimal levels of seine netting activity appear to occur within Dogger Bank Creyke Beck and Dogger Bank Teesside C & D. High densities of activity are however shown to occur in Dogger Bank Teesside A & B. Taking into account the very low levels of activity within Dogger Bank Creyke Beck and Dogger Bank Teesside C & D, the impact will be no greater than Dogger Bank Teesside A & B being assessed in isolation. Forewind are committed to engaging with stakeholder fishermen to explore the principle of proactive mitigation.
Complete loss or restricted access to traditional fishing grounds (wind farm construction)	**Minor adverse**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Gillnet Fishery. Gill net fishing is predominantly within Teesside A with negligible levels in Teesside B, Teesside C & D and Creyke Beck A & B. The extent of available fishing area in comparison to the area of Teesside A is very large, and so the cumulative effect is no greater than that of Dogger Bank Teesside A & B in isolation.

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Description of impact	Residual impact of Dogger Bank Teesside A & B	Projects with potential for cumulative impact	Cumulative impact	Details
Complete loss or restricted access to traditional fishing grounds (cable route installation)	**Minor adverse**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Whitefish Fishery. Over-15m vessels fish at very low levels over Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and the Creyke Beck Export Cable Corridors. Accounting for the very small area of exclusion during installations, the short time frames and the overall extent of the operational areas of the larger vessels the impact is expected to be minor. Under-15m vessels fish at a low to moderate level over Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and the Dogger Bank Creyke Beck Export Cable Corridors. Although the fishing grounds are not wide spread, the operational ranges of the under-15m vessels are limited. However, as the duration of installation within the fishing grounds will be short, the impact will be minor.
	Minor adverse	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	*Nephrops* fishery. Valuable *Nephrops* fishery to the north of Dogger Bank Teesside A & B, however, low levels along Teesside A & B, Dogger Bank Teesside C & D and the Dogger Bank Creyke Beck Export Cable Corridors, therefore minor impact.
	Minor adverse	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Scallop fishery. Low fishing activity occurs to the south of Dogger Bank Teesside A & B Export Cable Corridor, and transects Dogger Bank Creyke Beck Export Cable Corridor in a small section. Therefore cumulative impact is no greater than Dogger Bank Teesside A & B assessed in isolation.
	Minor adverse	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Pelagic fishery. Minimal fishing effort in this area. Fishing activity occurs over small sections of the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and the Dogger Bank Creyke Beck Export Cable Corridors, therefore the impact is minor.
	Minor adverse	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Potting fishery. Vessels potting for crab and *Nephrops* are a geographically limited inshore fishery. However, as the impact is temporary and short term impact during installation, the impact will be minor.

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Description of impact	Residual impact of Dogger Bank Teesside A & B	Projects with potential for cumulative impact	Cumulative impact	Details
	Minor adverse	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Netting fishery. Low numbers of vessels static netting and drift netting for salmon. It is unlikely that vessels fishing grounds will cover Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and the Dogger Bank Creyke Beck Export Cable Corridors, therefore the cumulative impact is no greater than Teesside A & B assessed in isolation, i.e. minor.
Interference with fishing activities	**No discernible impact**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**No discernible impact**	In the case of vessels towing mobile gear, due to their comparatively low levels of activity and the fact that, under COLREGS, Forewind works vessels will take the appropriate action so as not to require fishing vessels to alter course when towing their gears. With the appropriate fisheries liaison, and conflict avoidance policies, there should be no interference impacts on the static gear fisheries.
Safety issues for fishing vessels	**Within acceptable limits**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Within acceptable limits**	With compliance with the implemented safety measures, policies and objectives, the cumulative safety risks to fishing vessels and their gears should also be within acceptable limits.
Increased steaming times	Refer to **Chapter 16 Shipping & Navigation**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	N/A	The main fishing grounds relative to the base ports of the vessels targeting fishing grounds on the Dogger Bank are such that there would be a minimal requirement for traditional steaming routes to be altered.
Adverse impacts upon commercially exploited species	This is discussed in **Chapter 13 Fish and Shellfish Ecology**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	N/A	N/A
Displacement of fishing activities	**Minor adverse**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	The scale of displacement will be a direct function of the complete loss or restricted access to traditional fishing grounds during the construction period for Dogger Bank Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck.

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Description of impact	Residual impact of Dogger Bank Teesside A & B	Projects with potential for cumulative impact	Cumulative impact	Details
Operation phase				
Complete loss or restricted access to traditional fishing grounds (wind farm)	**Minor adverse**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Flatfish fishery. Fishing activity in Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck occurs at only low levels. It is also likely that skippers may elect to fish within the operational projects.
	Minor adverse	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Sandeel fishery. The combined levels of activity within Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck boundaries are such that the cumulative proportional loss of fishing area remains small.
	Moderate adverse	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Moderate adverse**	Seine netting. Due to their mode of operation Danish seine netting is expected to be excluded from Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck for the duration of the operational phases as well as during the construction phases.
Complete loss or restricted access to traditional fishing grounds (wind farm)	**Minor adverse**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**Minor adverse**	Gillnet fishery. Gillnetting is a static fishery within Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck and fishing will therefore be able to continue once the wind farm is operational, and cumulative impact of the operational wind farms is minor.
Complete loss or restricted access to traditional fishing grounds (cable route)	N/A	N/A	N/A	N/A
Interference with fishing activities	**No discernible impact**	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	**No discernible impact**	No discernible cumulative impact expected for trawlers and/ or static gear.
Increased steaming times	Refer to **Chapter 16 Shipping & Navigation**	Dogger Bank Teesside C & D	N/A	N/A

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Description of impact	Residual impact of Dogger Bank Teesside A & B	Projects with potential for cumulative impact	Cumulative impact	Details
		Dogger Bank Creyke Beck		
Decommissioning phase				
All impacts identified at construction phase	Expected to be similar to but not exceed effects associated with construction	Dogger Bank Teesside C & D Dogger Bank Creyke Beck	N/A	N/A

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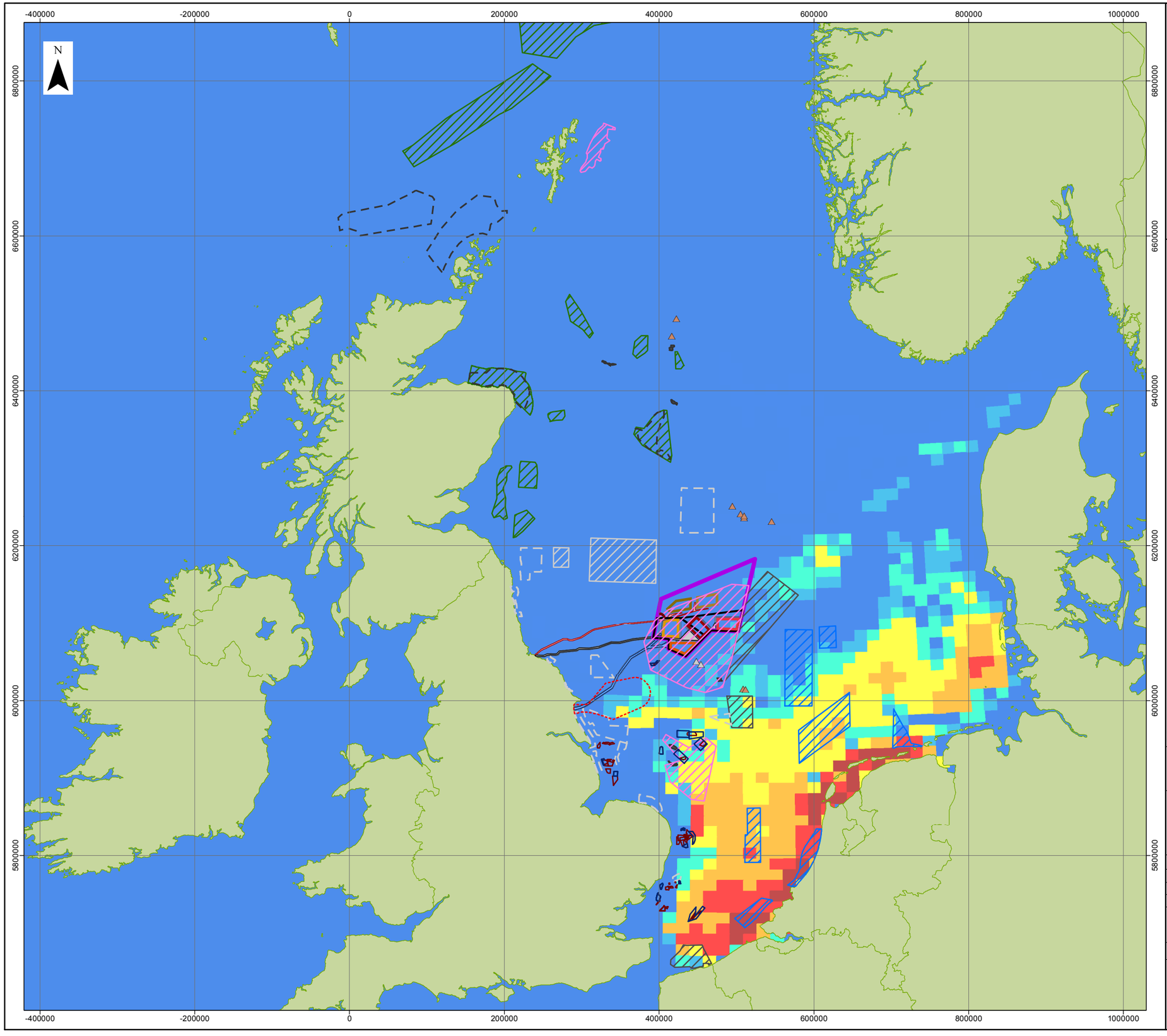

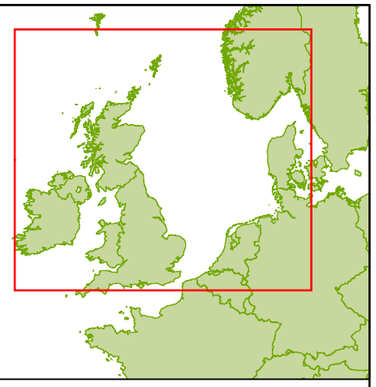

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- Aggregate application area
- Aggregate option area
- England designated MCZ
- England recommended MCZ
- Scotland proposed MCZ
- Scotland proposed MPA
- UK offshore cSAC
- Potential Dutch MPA
- Potential SCI
- Humber CCS search area
- UK oil & gas field
- UK oil & gas platform
- European oil & gas platform

Dutch VMS by effort (beam trawl only)

- Less than 5 days
- 6 to 10 days
- 11 to 20 days
- 21 to 50 days
- 51 to 100 days
- 101 to 200 days
- More than 200 days

Data Source:
VMS © IMARES, 2013
SACs © JNCC, 2013
MCZ © Natural England, 2013,
Proposed MPAs © Scottish Natural Heritage, 2013
Oil and Gas © UKDeal 2013
Offshore wind farm boundaries & aggregate areas © The Crown Estate, 2014

0 25 50 100
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.24 Potential regulated activities and conservation measures and the Dutch beam trawl fishery

VER	DATE	REMARKS	Drawn	Checked
1	19/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-566

SCALE	PLOT SIZE	DATUM	PROJECTION
1:5,000,000	A3	WGS84	UTM31N

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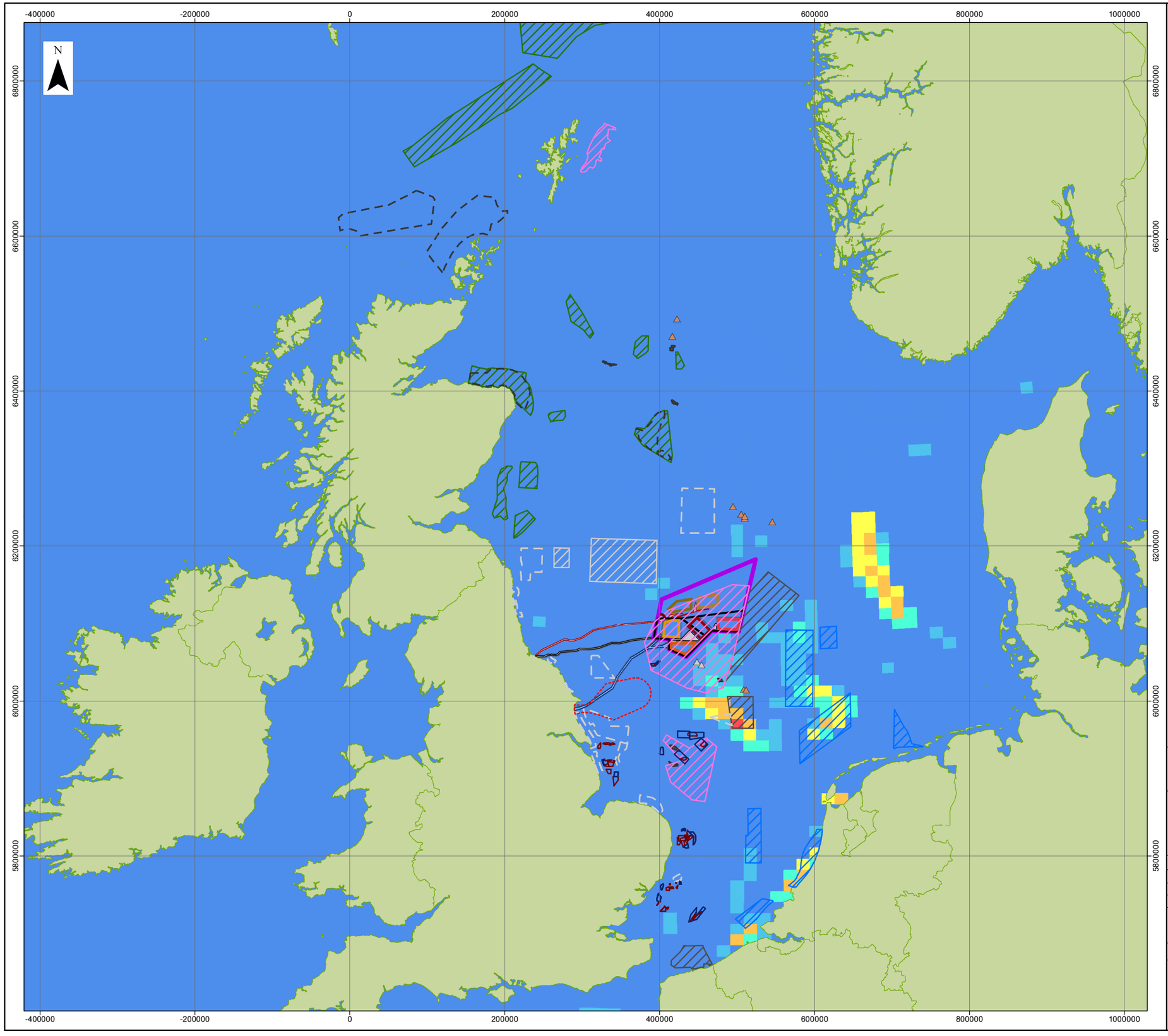

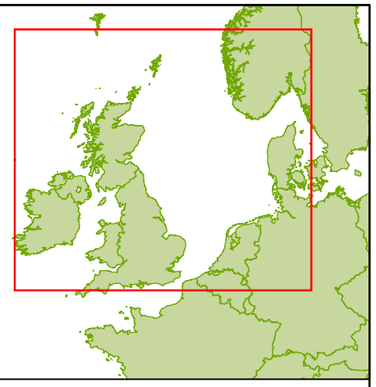

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- Aggregate application area
- Aggregate option area
- England designated MCZ
- England recommended MCZ
- Scotland proposed MCZ
- Scotland proposed MPA
- UK offshore cSAC
- Potential Dutch MPA
- Potential SCI
- Humber CCS search area
- UK oil & gas field
- UK oil & gas platform
- European oil & gas platform

Dutch VMS by effort (otter trawl only)

- Less than 5 days
- 6 to 10 days
- 11 to 20 days
- 21 to 50 days
- 51 to 100 days
- 101 to 200 days
- More than 200 days

Data Source:
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MCZ © Natural England, 2013,
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0 25 50 100
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.25 Potential regulated activities and conservation measures and the Dutch otter trawl fishery

VER	DATE	REMARKS	Drawn	Checked
1	19/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-567

SCALE	1:5,000,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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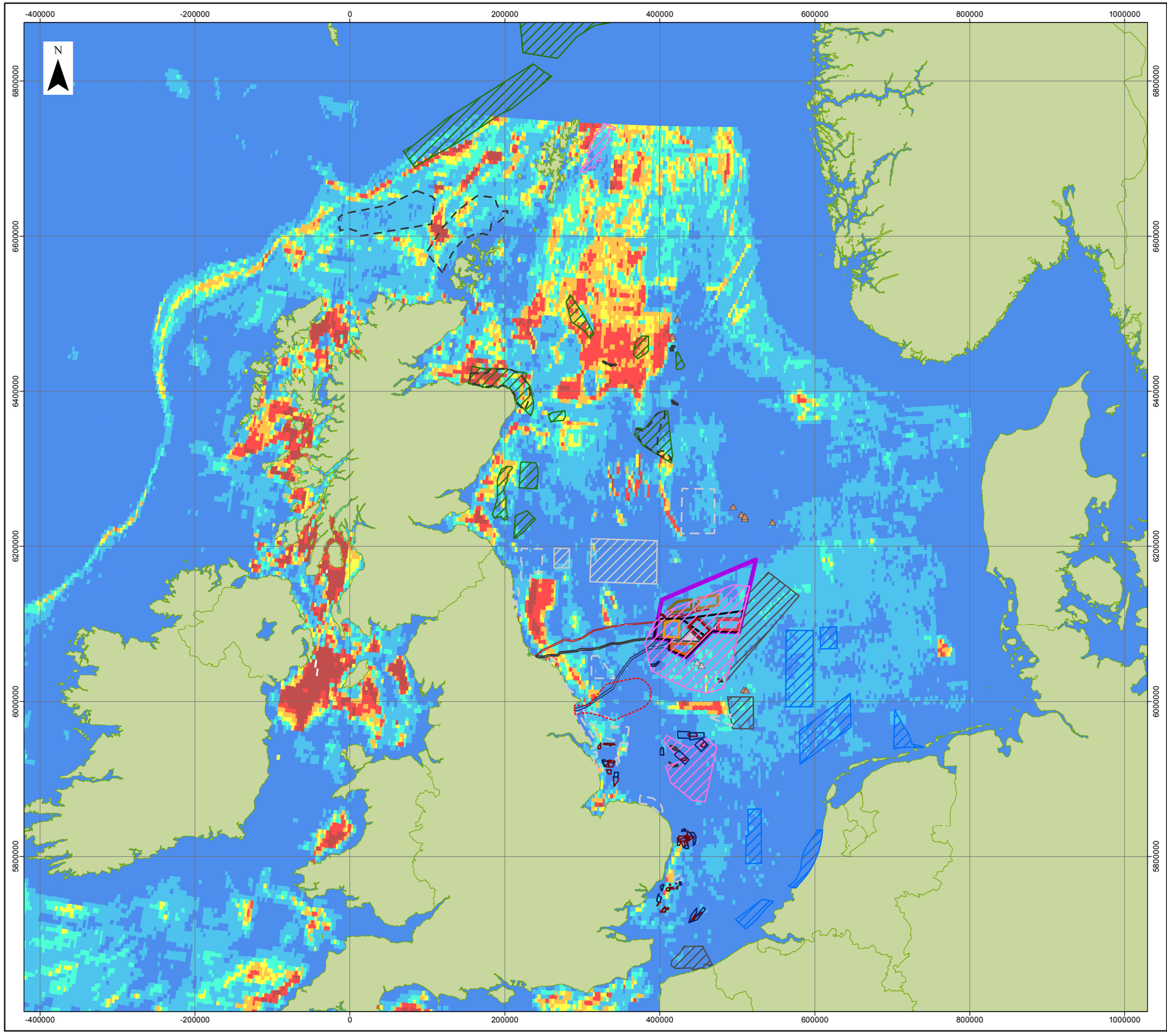

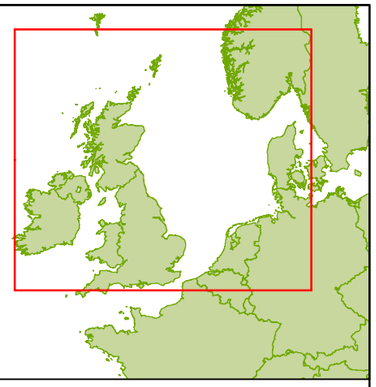

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- Aggregate application area
- Aggregate option area
- England designated MCZ
- England recommended MCZ
- Scotland proposed MCZ
- Scotland proposed MPA
- UK offshore cSAC
- Potential Dutch MPA
- Potential SCI
- Humber CCS search area
- UK oil & gas field
- UK oil & gas platform
- European oil & gas platform

UK VMS by effort (hours fished)

- Less than 100 hours
- 100 to 1,000 hours
- 1,000 to 2,000 hours
- 2,000 to 3,000 hours
- 3,000 to 5,000 hours
- 5,000 to 10,000 hours
- More than 10,000 hours

Data Source:
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MCZ © Natural England, 2013,
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Oil and Gas © UKDeal 2013
Offshore wind farm boundaries & aggregate areas © The Crown Estate, 2014

0 25 50 100
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.26 Potential regulated activities and conservations measures and UK mobile fishing activity

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-568

SCALE	1:5,000,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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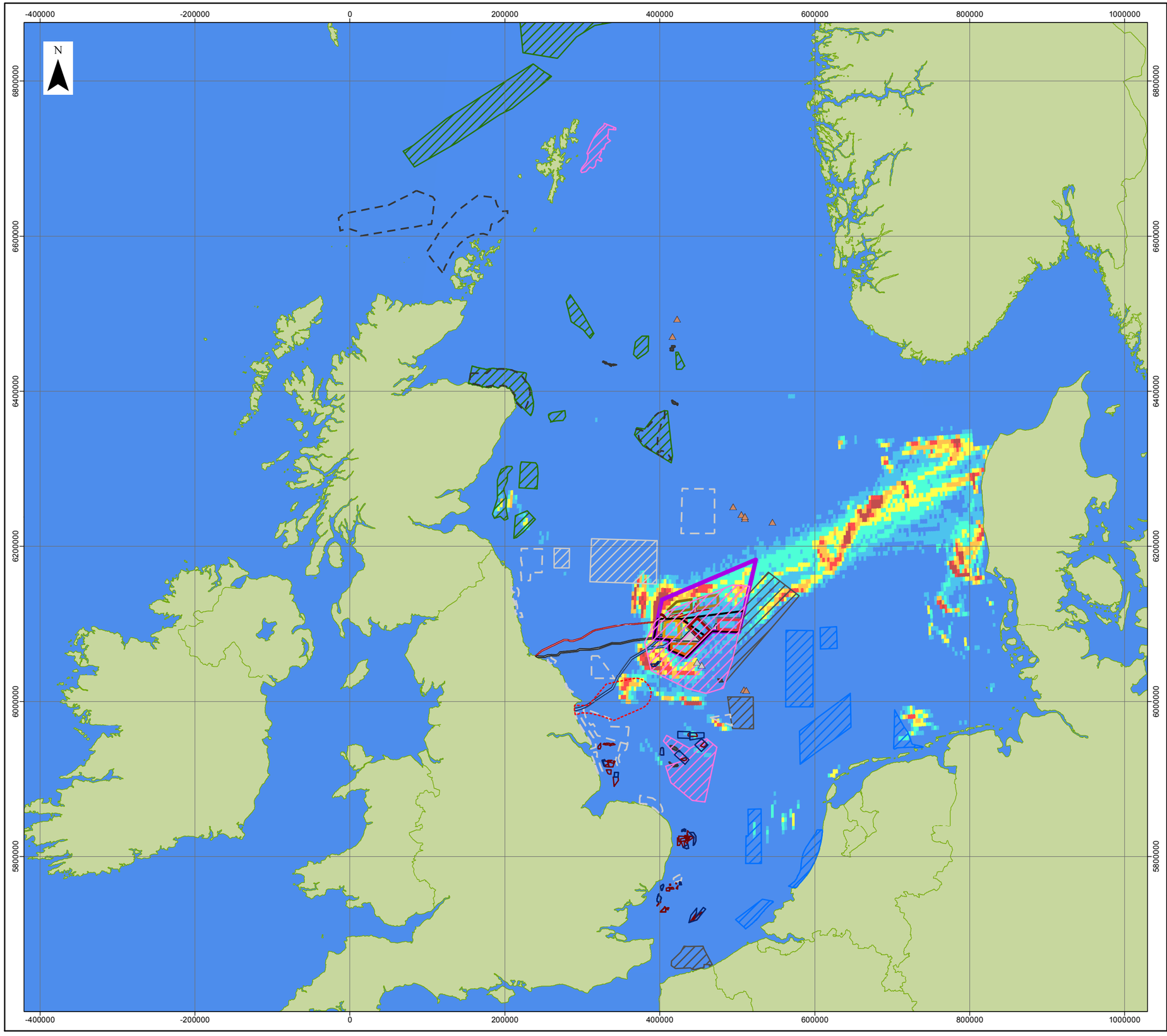

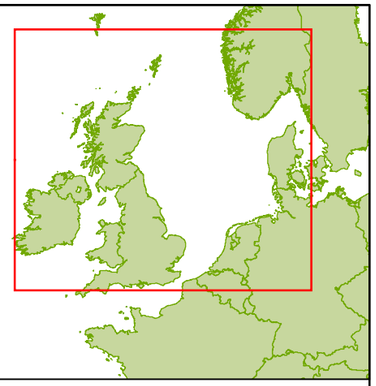

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- Aggregate application area
- Aggregate option area
- England designated MCZ
- England recommended MCZ
- Scotland proposed MCZ
- Scotland proposed MPA
- UK offshore cSAC
- Potential Dutch MPA
- Potential SCI
- Humber CCS search area
- UK oil & gas field
- UK oil & gas platform
- European oil & gas platform

Danish sandeel satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- over 80

Data Source:
VMS © VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014
SACs © JNCC, 2013
MCZ © Natural England, 2013,
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Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.27 Potential regulated activities and conservation measures and Danish sandeel fishery

VER	DATE	REMARKS	Drawn	Checked
1	19/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-569

SCALE	1:5,000,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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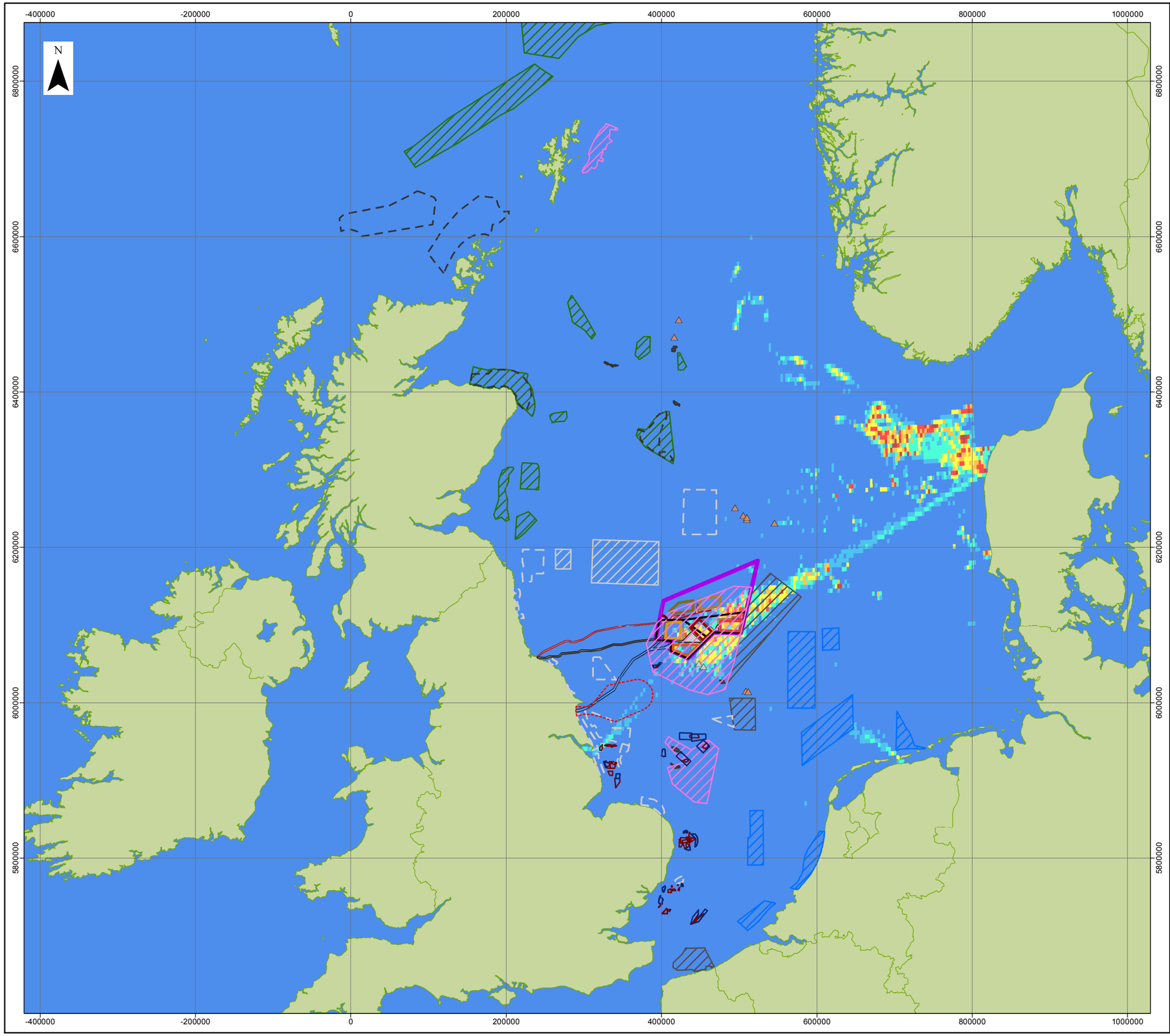

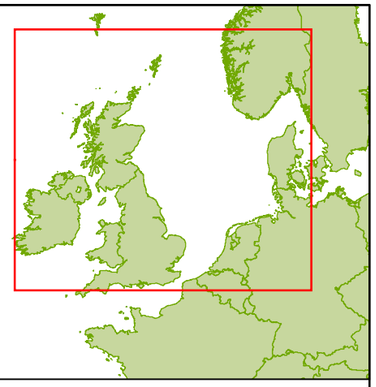

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- Aggregate application area
- Aggregate option area
- England designated MCZ
- England recommended MCZ
- Scotland proposed MCZ
- Scotland proposed MPA
- UK offshore cSAC
- Potential Dutch MPA
- Potential SCI
- Humber CCS search area
- UK oil & gas field
- UK oil & gas platform
- European oil & gas platform

Danish seine satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

Data Source:
VMS © VMS © Ministeriet for Fødevarer, Landbrug og Fiskeri, 2014
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MCZ © Natural England, 2013,
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Oil and Gas © UKDeal 2013
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0 25 50 100
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.28 Potential regulated activities and conservation measures and Danish seine net fishery

VER	DATE	REMARKS	Drawn	Checked
1	19/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-570

SCALE	1:5,000,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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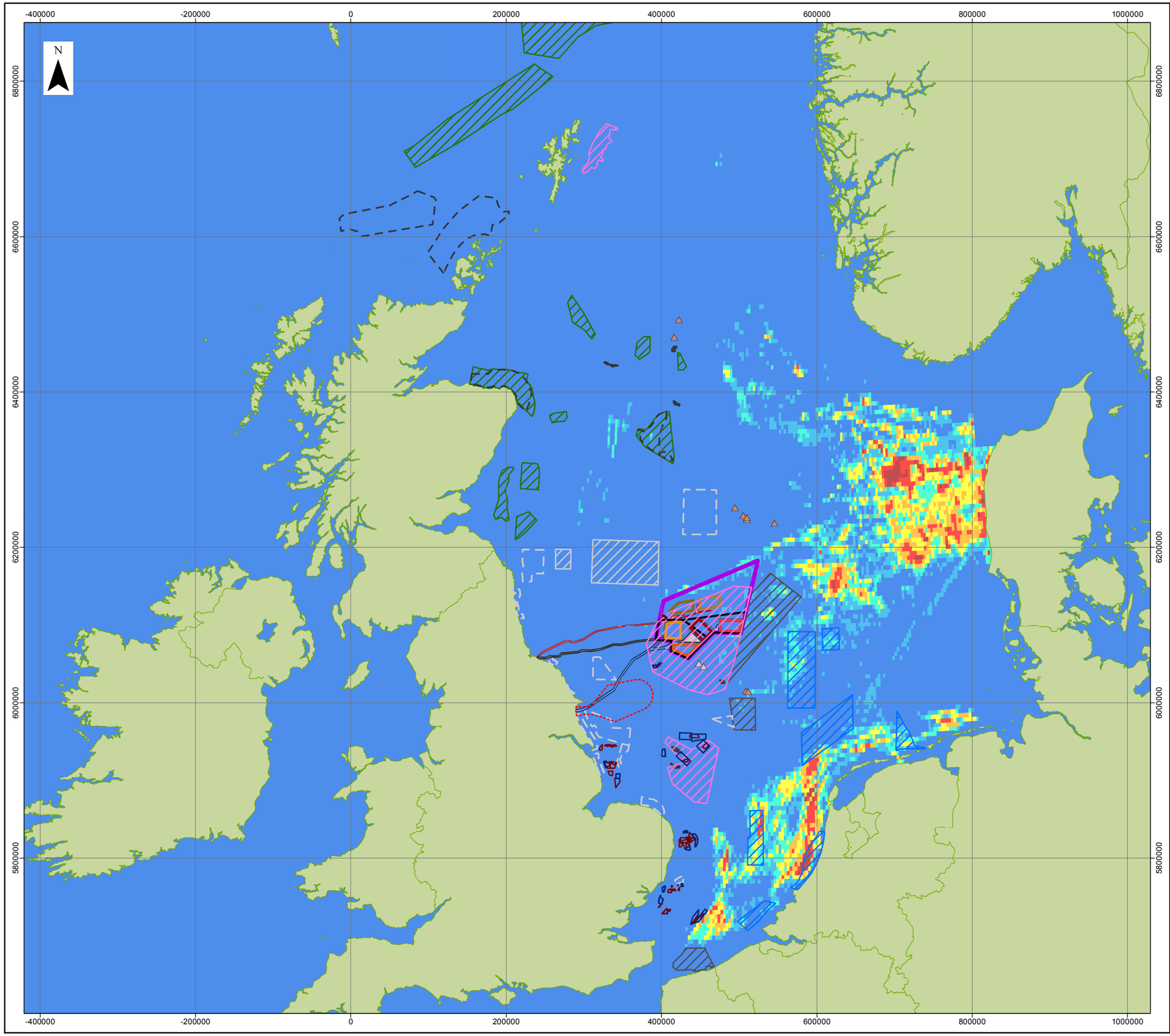

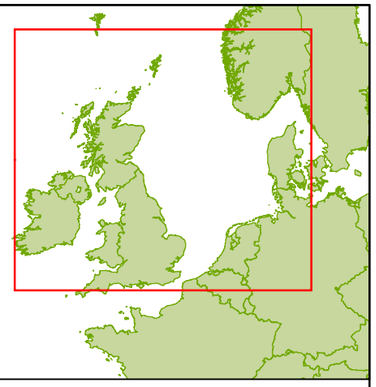

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable Corridor
- Dogger Bank Teesside A & B temporary works area
- Dogger Bank Creyke Beck Export Cable Corridor
- Dogger Bank Creyke Beck temporary works area
- Dogger Bank Teesside C & D Export Cable Corridor
- Aggregate application area
- Aggregate option area
- England designated MCZ
- England recommended MCZ
- Scotland proposed MCZ
- Scotland proposed MPA
- UK offshore cSAC
- Potential Dutch MPA
- Potential SCI
- Humber CCS search area
- UK oil & gas field
- UK oil & gas platform
- European oil & gas platform

Danish gill net satellite (VMS) density

- 0 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- 21 to 40
- 41 to 80
- Over 80

Data Source:
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0 25 50 100
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 11.29 Potential regulated activities and conservation measures and Danish gill and trammel net fishery

VER	DATE	REMARKS	Drawn	Checked
1	19/09/2013	Draft	LW	TR
2	03/10/2013	PEI3	LW	TR
3	12/02/2014	Pre-DCO Submission	LW	TR

DRAWING NUMBER:

F-OFL-MA-571

SCALE	PLOT SIZE	DATUM	PROJECTION
1:5,000,000	A3	WGS84	UTM31N

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12. Transboundary Effects

12.1.1. The commercial fisheries interests of other European Economic Area (EEA) states have been considered throughout the impact assessment due to the multi-national nature of commercial fisheries in the North Sea. Therefore the effects of construction, operation and decommissioning of Dogger Bank Teesside A & B on foreign fisheries vessels which are addressed in this chapter can also be considered to be transboundary issues.

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13. Summary

13.1.1. Fishing vessels from the UK, the Netherlands, Denmark, Germany, Belgium, Norway, France and Sweden target several commercial species of fish and shellfish, with a variety of fishing gears, in the Dogger Bank Zone and the Export Cable Corridors. The peripheral areas to the west of the Dogger Bank Zone are particularly important for sandeel fishing, whilst potting for lobster and crab predominates in the nearshore parts of the Dogger Bank Teesside A & B Export Cable Corridor.

13.1.2. **Table 13.1** below summarises all potential impacts during the construction and operation of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor. As can be seen, with the exception of the seine net fishery, the impacts are **minor adverse**, as expected from the overall comparatively very low levels of fishing activities that have been recorded within Dogger Bank Teesside A & B and along the Dogger Bank Teesside A & B Export Cable Corridor. The potential impacts on fishing activities as a result of construction, operation and decommissioning of Dogger Bank Teesside A & B have been assessed for UK and other EU fishing fleets. Potential impacts include:

- The temporary or complete loss of, or restricted access to, traditional fishing grounds;
- Interference of fishing activity;
- Displacement of fishing activity;
- Fastening risk (including from spoil, accidentally dropped or discarded objects, and cable protection measures);
- Safety issues for fishing vessels (considered in detail in **Chapter 16**);
- Increased steaming times to fishing grounds (considered in detail in **Chapter 16**); and
- Impacts on commercially exploited species of fish and shellfish (considered in detail in **Chapter 13**).

13.1.3. The only significant impact on inshore commercial fishing interests is considered to be the potential loss of fishing area for the seine net fishery during construction and operation.

13.1.4. The cumulative impact assessment has considered impacts on commercial fishing activities occurring as a result of the development of Dogger Bank Teesside A & B, as well as other plans, projects and activities within known fishing ranges. No significant cumulative impacts have been identified, with the exception of the seine net fishery during construction and operation, due to the extensive range of the nets when deployed. However, the actual contribution resulting from the construction of Dogger Bank Teesside A & B to the wider cumulative impact is expected to be relatively small.

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Table 13.1 Summary of all potential impacts during the construction and operation of Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor

Receptor Group	Impact Significance	Mitigation	Residual Impact
Adverse Impacts upon Commercially Exploited Species (Dogger Bank Teesside A & B and Dogger Bank Teesside A & B Export Cable Corridor; construction and operation)			
All Receptors	Not exceeding minor as discussed in: **Chapter 13 Fish and Shellfish Ecology**	None Required	
Complete Loss or Restricted Access to Traditional Fishing Grounds			
Dogger Bank Teesside A Construction and Decommissioning			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside B Construction and Decommissioning			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside A & B Construction and Decommissioning			

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Receptor Group	Impact Significance	Mitigation	Residual Impact
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside A & B Export Cable Corridor Installation and Decommissioning			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Whitefish Fishery – Under-15m	**Minor adverse**	None Required	**Minor adverse**
Whitefish Fishery – Over-15m	**No discernible impact**	None Required	**No discernible impact**
Nephrops Fishery	**Minor adverse**	None Required	**Minor adverse**
Scallop Fishery	**No discernible impact**	None required	**No discernible impact**
Pelagic Fishery	**Minor adverse**	None Required	**Minor adverse**
Potting Fishery	**Minor adverse**	None Required	**Minor adverse**
Netting Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside A Operation			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**

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Receptor Group	Impact Significance	Mitigation	Residual Impact
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside B Operation			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside A & B Operation			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Safety Issues for Fishing Vessels (Dogger Bank Teesside A and Dogger Bank Teesside B and Dogger Bank Teesside A & B Export Cable Corridor; construction and operation)			
All Receptors	Acceptable, discussed in **Chapter 5 Project Description**	None Required	**Within acceptable limits**
Interference with Fishing Activities			
Construction/Installation and Decommissioning			
Mobile Gear	**No discernible impact**	None Required	**No discernible impact**

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Receptor Group	Impact Significance	Mitigation	Residual Impact
Static Gear	**Minor adverse**	None Required	**Minor adverse**
Operation			
Mobile Gear	**No discernible impact**	**None Required**	**No discernible impact**
Static Gear	**Minor adverse**	**None Required**	**Minor adverse**
Increased Steaming Times to Fishing Grounds (Dogger Bank Teesside A & B and Dogger Bank Teesside A & B Export Cable Corridor; construction and operation)			
All Receptors	**Within acceptable limits**	None Required	**Within acceptable limits**
Removal of Obstacles on the Seabed Post-Construction (Dogger Bank Teesside A and B and Dogger Bank Teesside A & B Export Cable Corridor; construction and operation)			
All Receptors	**Within acceptable limits**	None Required	**Within acceptable limits**
Displacement of Fishing Activity			
Dogger Bank Teesside A Construction and Decommissioning			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside B Construction and Decommissioning			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**

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Receptor Group	Impact Significance	Mitigation	Residual Impact
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	Yes	**Minor adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside A and B Construction and Decommissioning			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside A & B Export Cable Corridor Installation and Decommissioning			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Whitefish Fishery – Under-15m	**Minor adverse**	None Required	**Minor adverse**
Whitefish Fishery – Over-15m	**No discernible impact**	None Required	**No discernible impact**
Nephrops Fishery	**Minor adverse**	None Required	**Minor adverse**
Scallop Fishery	**No discernible impact**	None Required	**No discernible impact**

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Receptor Group	Impact Significance	Mitigation	Residual Impact
Pelagic Fishery	**Minor adverse**	None Required	**Minor adverse**
Potting Fishery	**Minor adverse**	None required	**Minor adverse**
Netting Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside A Operation			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside B Operation			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**
Dogger Bank Teesside A & B Operation			
Flatfish Fishery	**Minor adverse**	None Required	**Minor adverse**
Sandeel Fishery	**Minor adverse**	None Required	**Minor adverse**

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Receptor Group	Impact Significance	Mitigation	Residual Impact
Seine Net Fishery	**Moderate adverse**	To be explored	**Moderate adverse**
Gillnet Fishery	**Minor adverse**	None Required	**Minor adverse**

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