East Anglia ONE North Offshore Windfarm

Chapter 13

Commercial Fisheries

Environmental Statement
Volume 1

Applicant: East Anglia ONE North Limited
Document Reference: 6.1.13
SPR Reference: EA1N-DWF-ENV-REP-IBR-000350 Rev 01
Pursuant to APFP Regulation: 5(2)(a)

Author: Brown and May Marine Limited
Date: October 2019
Revision: Version 1

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Revision Summary				
Rev	**Date**	**Prepared by**	**Checked by**	**Approved by**
01	08/10/2019	Paolo Pizzolla	Ian Mackay	Helen Walker

Description of Revisions			
Rev	**Page**	**Section**	**Description**
01	n/a	n/a	Final for submission

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13.2	Commercial Fisheries Technical Report

Glossary of Acronyms

ALARP	As Low As Reasonably Practicable
BMM	Brown and May Marine Limited
BWEA	British Wind Energy Association
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CFP	Common Fisheries Policy
COLREGS	International Regulations for Preventing Collisions at Sea
CPA	Coastal Protection Act
CRPMEM	Comité Régional des Pêches Maritimes et des Élevages Marins
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DTI	Department of Trade and Industry
EC	European Commission
EEZ	Exclusive Economic Zone
EIFCA	Eastern Inshore Fisheries Conservation Authority
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
FEPA	Food and Environmental Protection Act
FLO	Fisheries Liaison Officer
FLOWW	Fishing Liaison with Offshore Wind and Wet Renewables Group
HFA	Harwich Fishermen Association
HP	Horsepower
ICES	International Council for the Exploration of the Seas
IFCA	Inshore Fisheries and Conservation Authority
IFREMER	L'Institut Français de Recherche pour l'Exploitation de la Mer
IMARES	Institute for Marine Resources and Ecosystem Studies
ILVO	Institute for Agricultural and Fisheries Research
LEI	Landbouw Economisch Instituut
MCEU	Marine Consents and Environment Unit
MCA	Maritime Coastguard Agency
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MPA	Marine Protected Area
NFFO	National Federation of Fishermen's Organisations
NPS	National Policy Statement
NtM	Notice to Mariners
OFLO	Offshore Fisheries Liaison Officer
PEIR	Preliminary Environmental Information Report
PIDs	Public Information Days
PO	Producer Organisation
SAC	Special Area of Conservation
SPA	Special Protection Area
UKFEN	UK Fisheries Economic Network
UKHO	UK Hydrographic Office
VisNED	Dutch Fisherman's Federation
VMS	Vessel Monitoring System

Glossary of Terminology

Applicant	East Anglia ONE North Limited.
Beam Trawl	A trawl net whose lateral spread is maintained by a beam across its mouth
Beam trawl -Pulse Wing Trawling	Advanced adaptation of conventional beam trawling where the tickler chains and chain mat of the beam trawl are removed and replaced with trailing electrodes.
Construction, operation and maintenance platform	A fixed structure required for construction, operation and maintenance personnel and activities.
Demersal fish	Fish living on or near the sea bed.
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction operation, and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
Flatfish	Fish of the order Heterosomata of marine typically bottom-dwelling bony fishes such as soles, place and turbots, that as adults swim on one side of the laterally compressed body and have both eyes on the upper side.
ICES rectangle	Spatial unit used for the collection of fisheries statistics which covers an area of approximately 900nm^2, aligned to 30' latitude by 1° longitude.
Inter-array cables	Offshore cables which link the wind turbines to each other and the offshore electrical platforms, these cables will include fibre optic cables.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Longlining	Fishing method that involves setting out short lines carrying hooks, which are attached to a longer main line at regular intervals. The short lines are suspended horizontally at a predetermined depth with the help of surface floats.
Monitoring buoys	Buoys to monitor *in situ* condition within the windfarm, for example wave and metocean conditions.
Marking buoys	Buoys to delineate spatial features / restrictions within the offshore development area.
Offshore cable corridor	This is the area which will contain the offshore export cable between offshore electrical platforms and landfall jointing bay, these cables will include fibre optic cables.
Offshore development area	The East Anglia ONE North windfarm site and offshore cable corridor (up to Mean High Water Springs).
Offshore electrical infrastructure	The transmission assets required to export generated electricity to shore. This includes inter-array cables from the wind turbines to the offshore electrical platforms, offshore electrical platforms, platform link cables and export cables from the offshore electrical platforms to the landfall.
Offshore electrical platform	A fixed structure located within the windfarm area, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore export cables	The cables which would bring electricity from the offshore electrical platforms to the landfall, these cables will include fibre optic cables.
Offshore infrastructure	All of the offshore infrastructure including wind turbines, platforms, and cables.

Offshore platform	A collective term for the offshore construction, operation and maintenance platform and the offshore electrical platforms.
Otter trawl	Nets which have otter boards fastened to the sides. When in motion under water, the boards pull away from each other resulting in the net opening up in a horizontal direction. Demersal fisheries as well as pelagic fisheries can apply this technique.
Pelagic fish	The term pelagic fish covers species found mainly in shoals in midwater or near the surface of the sea.
Platform link cable	An electrical cable which links one or more offshore platforms, these cables will include fibre optic cables.
Potting	Fishing method which uses baited traps (posts) to target shellfish species, most commonly lobsters and crabs. Pots have a tapered entrance that makes it easy for shellfish to enter, but very difficult for them to find the way out.
Safety zones	A marine area declared for the purposes of safety around a renewable energy installation or works / construction area under the Energy Act 2004.
Seine netting	A method of fishing that employs a Seine or dragnet. The net hangs vertically in the water with the bottom edge held down by weights and the top edge buoyed by floats.

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13 Commercial Fisheries

13.1 Introduction

1. This chapter of the Environmental Statement (ES) describes the current commercial fisheries baseline and provides an assessment of the potential impacts of the proposed East Anglia ONE North project on commercial fishing. The areas of the proposed East Anglia ONE North project that are of relevance to this assessment include the East Anglia ONE North windfarm site and the offshore cable corridor. Collectively these are referred to as the offshore development area.

2. For the purposes of this assessment commercial fishing is defined as fishing activity undertaken by licenced fishing vessels for the legitimate capture and sale of fish and shellfish. This chapter is focused on fishing fleets that are active in areas relevant to the offshore development area. These include local inshore vessels and larger vessels that operate further offshore and have homeports in the UK and other European countries.

3. This chapter is supported by ***Appendix 13.2 Commercial Fisheries Technical Report***, where detailed information on the commercial fisheries baseline is provided.

4. Other chapters of the ES which cover impacts that are related to those addressed in this chapter include:

   - ***Chapter 10 Fish and Shellfish Ecology*** and
   - ***Chapter 14 Shipping and Navigation***.

5. This chapter has been produced by Brown and May Marine Limited (BMM).

13.2 Consultation

6. Consultation is a key feature of the Environmental Impact Assessment (EIA) process, and continues throughout the lifecycle of a project, from its initial stages through to consent and post-consent.

7. To date, consultation regarding commercial fisheries has been undertaken through the East Anglia ONE North Scoping Report (ScottishPower Renewables (SPR) 2017), the East Anglia ONE North Preliminary Environmental Information Report (PEIR) (SPR 2019) and direct consultation with fisheries stakeholders. Feedback received through this process has been considered in preparing the ES where appropriate and this chapter has been updated for the final assessment submitted with the Development Consent Order (DCO) application.

8. The responses received from stakeholders with regard to the Scoping Report and the PEIR are summarised in ***Appendix 13.1***, including details of how these have been taken account of within this chapter.

9. Direct consultation carried out to date with fisheries stakeholders through face to face meetings, telephone calls and email correspondence is summarised in ***Table 13.1.*** Consultation with individual fishermen is to a large extent informal and therefore there are differences in the number of fishermen recorded as being consulted for the proposed East Anglia ONE North and East Anglia TWO projects. This is because on a number of occasions only one of the projects was discussed.

10. In addition to the consultation outlined above, a number of meetings have been held with fisheries stakeholders as part of the already established Commercial Fisheries Working Group (CFWG), which covers liaison in respect to East Anglia ONE, East Anglia THREE, East Anglia ONE North and East Anglia TWO Members of the CFWG include representatives from all local ports of relevance to the proposed East Anglia ONE North project (i.e. Sizewell, Orford, Aldeburgh, Harwich, Felixstowe, Lowestoft and Southwold). Meetings of the CFWG relevance to the proposed East Anglia ONE North project have taken place on the following dates:

- 26th April 2016;
- 2nd June 2016;
- 11th January 2017;
- 27th September 2017;
- 16th November 2017;
- 30th January 2018;
- 9th March 2018;
- 25th October 2018; and
- 24th April 2019.

11. Consultation with fisheries stakeholders is on-going and will continue after submission of the DCO application.

Table 13.1 Fisheries Stakeholders Consulted to Inform the Commercial Fisheries ES

Consultee	Role/ Organisation/ Country	Consultation Date
Eastern IFCA	Eastern IFCA	16/08/2017
VisNed	VisNed, the Netherlands	19/10/2017
Rederscentrale	Rederscentrale, Belgium	31/10/2017
NFFO	NFFO, UK	13/11/2017 01/11/2018
CRPMEM,	CRPMEM, France	12/01/2018

Consultee	Role/ Organisation/ Country	Consultation Date
Fisherman 1	Sizewell fisherman, UK	7/2/2018; 16/3/2018
MMO	Marine Management Organisation	23/7/2018
Fisherman 2	Orford fisherman, UK	17/7/2018
Fisherman 3	Orford fisherman, UK	17/7/2018
Fisherman 4	Southwold fisherman, UK	27/7/2018
Fisherman 5	Southwold fisherman, UK	27/7/2018
Fisherman 6	Southwold fisherman, UK	27/7/2018
Fisherman 7	Southwold fisherman, UK	27/7/2018
Fisherman 8	Aldeburgh fisherman, UK	27/7/2018
Fisherman 9	Lowestoft fishermen, UK	Contacted on 17/07/2018 Consultation meeting declined
Fisherman 10		
Fisherman 11		
Fisherman Representative 1	Harwich Fishermen Association (HFA)	Contacted on 17/07/2018. Consultation meeting declined
Fishermen Representative 3	Felixstowe Ferry Fishermen's Association	Contacted on 16/07/18 and 25/07/18 Consultation meeting not arranged

12. Public consultation has been conducted through a series of Public Information Days (PIDs) and Public Meetings. PIDs have been held throughout Suffolk in November 2017, March 2018, and June / July 2018 and February / March 2019. A series of stakeholder engagement events were also undertaken in October 2018 as part of phase 3.5 consultation. Consultation phases are explained further in ***Chapter 5 EIA Methodology***.

13. ***Table 13.2*** shows public consultation feedback pertaining to commercial fisheries. Full details of the proposed East Anglia ONE North project consultation process has been presented in the Consultation Report, which has been submitted as part of the DCO application (document reference 5.1).

Table 13.2 Consultation Responses relevant to Commercial Fisheries

Topic	Response / where addressed in the ES
Phase 1	
• Effects on commercial fisheries • Rock dumping interfering with trawling activities	Potential impacts on commercial fisheries are assessed in ***section 13.6***
Phase 2	
• Fishing activity affected by piling • Construction of offshore cable corridor in fishermen's pulling grounds	Potential impacts on fishing activity during the construction phase are assessed in ***section 13.6.1***
Phase 3	
None	n/a
Phase 3.5	
• Impact on fishing industry – compensation necessary	The requirement for any compensatory agreements between the Applicant and fishermen will be determined post consent through the established Commercial Fisheries Working Group.
Phase 4	
• Impacts on fishermen accessing valuable potting grounds and general fishing areas whilst the windfarm is in operation and possibly longer. • Work will prohibit drift netting and anchor netting in a large area in the short term and potentially in the long term should the sea bed be irrevocably disturbed. Following previous experience on how past and ongoing windfarm projects have been managed, further areas will become un-fishable whilst the proposed windfarm is in operation and possibly longer**.**	The potential impact of a complete loss or restricted access to traditional fishing grounds is assessed in ***section 13.6.2.2***. The potential impact of interference with fishing activity is assessed in ***section 13.6.2.5.***

13.3 Scope

13.3.1 Study Area

14. The offshore development area is located in International Council for the Exploration of the Sea (ICES) Division IVc (Southern North Sea). Fisheries data and information within each ICES Division are collected and analysed by ICES statistical rectangle. The study area used for assessment of commercial fisheries

activity has therefore been defined with reference to the ICES rectangles within which the offshore development area falls (***Figure 13.1***). These are as follows:

- ICES rectangle 33F1, where the inshore section of the offshore cable corridor is located, and
- ICES rectangle 33F2, where the offshore section of the offshore cable corridor and the East Anglia ONE North windfarm site are located.

15. The study area defined above has been used to identify fisheries active in areas relevant to the proposed East Anglia ONE North project and the levels of fishing that the offshore development area sustains. Where relevant, however, data and information have been analysed from wider areas to provide context and describe the full extent of the fishing activity of the fleets identified.

13.3.2 Worst Case

16. The design of the proposed East Anglia ONE North project (including number of wind turbines, layout configuration, requirement for scour protection, electrical design, etc.) is not yet fully determined, and may not be known until sometime after the DCO has been granted. Therefore, in accordance with the requirements of the Project Design Envelope (also known as the Rochdale Envelope) approach to EIA (Planning Inspectorate 2018) (as discussed in ***Chapter 5 EIA Methodology***), realistic worst case scenarios in terms of potential effects upon commercial fisheries are adopted to ensure a precautionary and robust impact assessment is undertaken.

17. The realistic worst case scenarios with regard to commercial fisheries are presented by impact in ***Table 13.3***. The worst case assumptions take into account the project design options described in ***Chapter 6 Project Description*** and the embedded mitigation measures identified in respect of commercial fisheries (see ***section 13.3.3***).

Table 13.3 Worst Case Assumptions

Impact	Parameter	Rationale
Construction		
Impact 1: Potential impacts on commercially exploited fish and shellfish species	Worst case scenario parameters in respect of fish and shellfish species during construction, including those of commercial importance, are provided in ***Chapter 10 Fish and Shellfish Ecology***.	
Impact 2: Temporary loss or restricted access to traditional fishing grounds.	Rolling 500m safety zones around construction works, 50m safety zones around installed or partially installed infrastructure and 500m advisory safety zones along exposed sections of cables (i.e. cables awaiting burial or protection). This would lead to a theoretical worst case under which all fishing activities would be excluded from the entirety of the East Anglia ONE North windfarm site and the offshore cable corridor towards the latter stages of construction. Offshore construction works occurring over an approximate 27-month window.	This represents the assumed duration and extent of potential fishing exclusion throughout the construction phase and hence the greatest potential to restrict access to fishing grounds.
Impact 3: Displacement of fishing activity into other areas	As described above for temporary loss or restricted access to traditional fishing grounds.	This represents the assumed duration and extent of potential fishing exclusion throughout the construction phase and hence the greatest potential for displacement of fishing activity into other areas.
Impact 4: Increased steaming times to fishing grounds	Presence of 500m safety zones around construction works and 50m safety zones around installed or partially installed infrastructure over the course of the 27-month construction period.	Represents the assumed potential disruption to established steaming routes.

Impact	Parameter	Rationale
Impact 5: Interference with fishing activity (navigational conflict)	Maximum of 74 construction vessels simultaneously operating on site Maximum number of vessel trips during the construction phase: 3,335 Assumes that construction vessel transit routes overlap with fishing grounds Approximate duration of offshore construction activity of 27 months	The assumed duration of offshore construction activity, maximum number of vessels on site at any one time and maximum number of vessel transits during construction would result in the greatest potential for interference with towed / static fishing gear.
Impact 6: Safety issues for fishing vessels	Safety issues as a result of potential interactions between fishing vessels, fishing gear and cables: • Maximum length of cables: • Inter-array cables: 200km; • Platform link cables: 75km; and • Export cables: 152km (2 cables 76km each). • Assumes cables will be surface laid before being buried/protected; • Maximum length of cables requiring cable protection: • Inter-array cables: 10% of their length (20km) due to ground conditions and protection at up to 25 crossings (160m per crossing); • Platform link cables: 10% of their length (7.5km) due to ground conditions and protection at up to 49 crossings (160m per crossing); and • Export cables: 5% of their length (15.2km) due to ground conditions and protection at up to 34 crossings (160m per crossing). Safety risks as a result of potential Interactions between fishing vessels and gear and project infrastructure:	Given the large number of cables, crossings, wind turbines, platforms etc covering much of the site and export cable route, the worst case assumes the potential for safety issues (e.g. snagging and manoeuvrability risks) across the offshore development area.

Impact	Parameter	Rationale
	Manoeuvrability and snagging risk issues associated with the presence of installed and partially installed infrastructure as a result of the installation of: • Up to 67 wind turbines (minimum spacing between turbines: (minimum spacing between turbines: 800m in-row and 1,200m inter-row); • Up to 4 offshore electrical platforms; • Up to 1 construction, operation and maintenance platform; and • Up to 1 met mast. Safety issues for fishing vessels associated with the potential for collision with construction vessels and allision with infrastructure are described and assessed in ***Chapter 14 Shipping and Navigation***.	
Impact 7: Sea bed obstacles	Offshore works such as construction anchoring, jack up legs or cable trenching can produce sea bed obstructions which can represent a potential fastening risk and damage to fishing gears. Potential for objects to be dropped on the sea bed during construction related activities.	The presence of sea bed obstacles may result in potentially unacceptable safety risks to fishing vessels
Operation		
Impact 1: Potential impacts on commercially exploited fish and shellfish species	Worst case scenario parameters in respect of fish and shellfish species during operation, including those of commercial importance, are provided in *Chapter 10 Fish and Shellfish Ecology*.	
Impact 2: Complete loss or restricted access to traditional fishing grounds	Maximum area lost/restriction to fishing as a result of the following: • Up to 67 wind turbines; • Up to 4 offshore electrical platforms; • Up to 1 construction, operation and maintenance platform; and	This represents the greatest extent of potential fishing exclusion throughout the operation phase and hence the greatest potential to restrict access to fishing grounds.

Impact	Parameter	Rationale
	• Up to 1 met mast. Safety zones of 500m around major operation and maintenance works; Maximum length of cables: • Inter-array cables: 200km; • Platform link cables: 75km; and • Export cables: 152km (2 cables 76km each). Minimum spacing between turbines: 1,200m inter-row and 800m in-row Cables will be buried to a minimum of 1m where possible and protected where burial is not possible (i.e. due to hard ground or at cable crossings); Maximum length of cables requiring protection: • Inter-array cables: 10% of their length (20km) due to ground conditions and protection at up to 25 crossings (160m per crossing); • Platform link cables: 10% of their length (7.5km) due to ground conditions and protection at up to 49 crossings (160m per crossing); and • Export cables: 5% of their length (15.2km) due to ground conditions and protection at up to 34 crossings (160m per crossing).	
Impact 3: Displacement of fishing activity into other areas	As above for impact of complete loss or restricted access to traditional fishing grounds	This represents the greatest extent of potential fishing exclusion throughout the operation phase hence the greatest potential for displacement of fishing activity into other areas.

Impact	Parameter	Rationale
Impact 4: Increased steaming times to fishing grounds	Presence of the following: • Up to 67 wind turbines; • Up to 4 offshore electrical platforms; • Up to 1 construction, operation and maintenance platform; and • Up to 1 met mast. Safety zones of 500m around major operation and maintenance works. Minimum spacing between turbines: 800m in-row and 1,200m inter-row.	Results in the maximum potential disruption to established steaming routes.
Impact 5: Interference with fishing activity (navigational conflict)	Up to 647 vessel round trips per year Assumes transit routes cross mobile and static gear fishing grounds.	The maximum number of vessel transits during operation and maintenance results in the greatest potential for conflict between operation and maintenance vessels and fishing gear.
Impact 6: Safety issues for fishing vessels	Safety risks as a result of potential interactions between fishing vessels and gear and cables: • Maximum length of cables (as above for complete loss or restricted access to fishing grounds); • Cables buried to a minimum depth of 1m where possible and protected where burial is not possible (i.e. due to hard ground or at cable crossings); • Maximum extent of cables requiring protection (as above for complete loss or restricted access to fishing grounds) Safety risks as a result of potential Interactions between fishing vessels and gear and project infrastructure:	The maximum scenario for potential causes of fishing vessel collision and gear snagging which could lead to safety risks

Impact	Parameter	Rationale
	• Manoeuvrability and snagging risk issues associated with the presence of installed infrastructure (as above for Safety issues for fishing vessels in the construction phase). Safety issues for fishing vessels associated with the potential for collision with operation vessels and infrastructure are detailed and assessed in ***Chapter 14 Shipping and Navigation***.	
Sea bed obstacles	Presence of obstacles on the sea bed that may represent a fastening/safety risk to fishing vessels	Presence of obstacles on the sea bed with potential to result in unacceptable risks to fishing vessels
Decommissioning		
As decommissioning schedules and methodologies are not available, decommissioning works and implications for commercial fisheries are considered analogous with those assessed for construction.		

13.3.3 Mitigation and Best Practice

18. Where applicable, relevant mitigation measures are incorporated as part of the proposed East Anglia ONE North project design process and are referred to as embedded mitigation. The embedded mitigation measures relevant to commercial fisheries are considered when assessing potential impacts to receptors and are described below.

19. In instances when fishing gear may need to be temporarily relocated due to construction activities, appropriate evidence-based mitigation, as specified in FLOWW Guidelines (FLOWW 2014; 2015) will be applied. Additional mitigation of relevance to commercial fisheries is detailed below.

20. The Applicant is committed to working closely with commercial fisheries stakeholders. The appropriate liaison will be undertaken with all relevant fishing interests to ensure they are fully informed of all construction, maintenance and decommissioning activities. In order to ensure and maintain regular communication, a CFWG has been established to cover liaison in respect to East Anglia ONE, East Anglia THREE, East Anglia ONE North and East Anglia TWO. The CFWG has a representative from each local port which could potentially be impacted by the proposed East Anglia ONE North project (Orford, Aldeburgh, Harwich, Felixstowe, Lowestoft and Southwold). Based on the available fisheries statistics and information provided during consultation, it is considered that vessels fishing from areas further north of Lowestoft do not regularly fish in the study area, therefore these ports are not represented on the CFWG.

21. The CFWG aims to identify and develop co-existence strategies during a project's lifecycle. A Fisheries Liaison and Co-existence Plan (FLCP) will be produced for the proposed East Anglia ONE North project, post-consent. It is expected that the CFWG will also be used to discuss any mitigation necessary for the proposed East Anglia ONE North project where appropriate.

22. The Applicant has appointed a Fisheries Liaison Officer (FLO) to work with the fishing industry across all East Anglia projects including the proposed East Anglia ONE North project.

23. As secured under Conditions of the draft DCO and Deemed Marine Licences (DMLs), a cable laying plan and cable monitoring plan will be produced post consent. Additionally, the construction of the project will be undertaken against an agreed 'dropped objects procedure' that will require the Applicant to notify the MMO of any dropped objects and agreement over their recovery, where required. Dropped objects will be reported to the MMO using the Dropped Object Procedures Form outlined in the draft DCO.

24. The FLCP, discussed above, will also include protocols for the 'snagging' or loss/damage of fishing gear associated with the project infrastructure.

25. Timely and efficient Notices to Mariners (NtMs), Kingfisher and other navigational warnings will be issued to the fishing industry prior to all survey and construction works through a project specific marine co-ordination system.

26. In addition, appropriate communication with the fishing industry will be undertaken in the event that cables become unburied during the operational phase of the project (i.e. through the FLO and appropriate channels such as the Kingfisher Information Service).

27. The UK Hydrographic Office (UKHO) will be informed of both the progress and completion of the proposed windfarm.

13.3.4 Monitoring

28. Post-consent, the final detailed design of the proposed East Anglia ONE North project will refine the worst-case parameters assessed in this ES. It is recognised that monitoring is an important element in the management and verification of the actual impacts based on the final detailed design however as stated in the In Principle Monitoring Plan (document reference 8.13) no monitoring is currently planned for commercial fisheries subject to agreement with the MMO and relevant stakeholders.

13.4 Assessment Methodology

13.4.1 Guidance and Legislation

29. The assessment of potential impacts on commercial fisheries as a result of the proposed East Anglia ONE North project has been undertaken with specific reference to guidance from the relevant National Policy Statement (NPS) and policy outlined in the East Inshore and East Offshore Marine Plans (DEFRA, 2014) (***Table 13.4 and Table 13.5***).

Table 13.4 National Policy Statement Guidance Relevant to the Proposed East Anglia ONE North project. NPS for Renewable Energy Infrastructure (EN-3)

NPS Guidance	NPS Reference	Where addressed in ES
The construction and operation of offshore windfarms can have both positive and negative effects on fish and shellfish stocks.	EN-3 section 2.6.122	The potential impacts of the proposed East Anglia ONE North project on fish and shellfish species, including those of commercial importance, is presented in ***Chapter 10 Fish and Shellfish Ecology.*** In order to inform this chapter, reference has been made to the findings of ***Chapter 10 Fish and Shellfish Ecology*** where relevant.

NPS Guidance	NPS Reference	Where addressed in ES
Whilst the footprint of the offshore windfarm and any associated infrastructure may be a hindrance to certain types of commercial fishing activity such as trawling and longlining, other fishing activities may be able to take place within operational windfarms without unduly disrupting or compromising navigational safety. Consequently, the establishment of a windfarm can increase the potential for some fishing activities, such as potting, where this would not compromise any safety zone in place. The Planning Inspectorate should consider adverse or beneficial impacts on different types of commercial fishing on a case by case basis.	EN-3 section 2.6.123	Consideration has been given within this chapter to the potential for the presence of project infrastructure to result in loss or restricted access to fishing grounds and potential for displacement on a fleet by fleet basis (***section 13.6.1.2 and section 13.6.2.2***).
In some circumstances, transboundary issues may be a consideration as fishermen from other countries may fish in waters within which offshore windfarms are sited.	EN-3 section 2.6.124	Consideration has been given to the potential impacts of the proposed East Anglia ONE North project on both UK and non-UK fleets ***(section 13.4.5, section 13.6 and section 13.7)***.
Early consultation should be undertaken with statutory advisors and with representatives of the fishing industry which could include discussion of impact assessment methodologies. Where any part of the proposal involves a grid connection to shore, appropriate inshore fisheries groups should be consulted.	EN-3 section 2.6.127	To date consultation with regard to commercial fishing has been carried out through the Scoping exercise, the PEIR (***Appendix 13.1***) and via direct consultation with statutory and non-statutory fisheries stakeholders, including individual local fishermen that target inshore areas relevant to the offshore cable corridor (***Table 13.1)***.
Where a number of offshore windfarms have been proposed within an identified zone, it may be beneficial to undertake such consultation at a zonal, rather than a site specific, level.	EN-3 section 2.6.128	A zonal approach to consultation was taken as part of the East Anglia Round 3 Zonal Appraisal and Planning (ZAP) process. ***section 13.2*** describes stakeholder consultation which has been undertaken to inform this chapter.
The assessment by the Applicant should include 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	EN-3 section 2.6.129	A detailed assessment of the impacts of the proposed East Anglia ONE North project on fish and shellfish receptors is provided in ***Chapter 10 Fish and Shellfish Ecology***. This takes account of the results of fish surveys carried out in the area.

NPS Guidance	NPS Reference	Where addressed in ES
and studies conducted as part of the assessment.		The likely constraints on fishing associated with the proposed East Anglia ONE North project are considered in the assessment presented in ***section 13.6***.
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	Consideration has been given in the assessment presented in ***section 13.6*** to the implication of the implementation of safety zones on commercial fisheries receptors.
Where the precise extents of potential safety zones are unknown, a realistic worst case scenario should be assessed. Applicants should consult the MCA. Exclusion of certain types of fishing may make an area more productive for other types of fishing. The assessment by the Applicant should include surveys of the effects on fish stocks of commercial interest and the potential reduction or increase in such stocks that will result from the presence of the windfarm development and of any safety zones.	EN-3 section 2.6.131	Consideration has been given to the implementation of advisory safety zones for definition of the worst-case scenario and assessment of potential impacts on commercial fisheries (***section 13.6***). Consideration is given in this assessment to the potential impacts of the proposed East Anglia ONE North project on commercially exploited fish and shellfish populations (***section 13.6***). A detailed assessment of the impacts of the proposed East Anglia ONE North project on fish and shellfish species, including those of commercial importance, is provided in ***Chapter 10 Fish and Shellfish Ecology.***

Table 13.5 East Inshore and East Offshore Marine Plans Policy relevant to Commercial Fishing

East Inshore and East Offshore Marine Plans	Plan Policy Reference	Reference
Within areas of fishing activity, proposals should demonstrate in order of preference: • That they will not prevent fishing activity on, or access to fishing grounds • How, if there are adverse impacts on the ability to undertake fishing activities or access to fishing grounds, they will minimise them • How, if adverse impacts cannot be minimised, they will be mitigated • The case of proceeding with their proposal if it is not possible to minimise or mitigate the adverse impacts	Policy FISH1	The Applicant is committed to working closely with commercial fisheries stakeholders and promote co-existence. A Fisheries Liaison and Co-existence Plan (FLCP) is secured in the draft DCO and will be produced post-consent. The appropriate liaison will be undertaken with all relevant fishing interests to ensure they are fully informed of all construction, maintenance and decommissioning activities. In order to ensure and maintain regular communication, a Commercial Fisheries Working Group (CFWG) has been established to cover liaison in respect to East Anglia ONE North, East Anglia TWO, East Anglia ONE and East Anglia THREE. The CFWG aims to identify and develop co-existence strategies during a project's lifecycle. It is expected that the CFWG will also be used to discuss any mitigation necessary for the proposed East Anglia ONE North project where appropriate.
Proposals should demonstrate, in order of preference: • That they will not have an adverse impact upon spawning and nursery areas and any associated habitat • How, if there are adverse impacts upon the spawning and nursery areas and any associated habitat, they will minimise them • How, if adverse impacts cannot be minimised they will be mitigated • The case of proceeding with their proposals if it is not possible to minimise or mitigate the adverse impacts	Policy FISH2	The potential impacts of the proposed East Anglia ONE North project on fish and shellfish species, including consideration of potential impacts on spawning and nursery grounds, are assessed in ***Chapter 10 Fish Ecology.*** Significant impacts (i.e. above minor adverse significance) have not been identified in relation to fish spawning/nursery grounds in ***Chapter 10.***

30. In addition to the NPS guidance, the following guidance documents have been used to inform the assessment of potential impacts on commercial fisheries:

- Centre for Environment, Fisheries and Aquaculture Science (Cefas) (2012) Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects. Contract report: ME5403, May 2012;
- 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 FEPA and CPA requirements, Version 2;
- RenewableUK (2013) Cumulative impact assessment guidelines, guiding principles for cumulative impacts assessments in offshore windfarms;
- Sea Fish Industry Authority and UK Fisheries Economic Network (UKFEN) (2012) Best practise guidance for fishing industry financial and economic impact assessments;
- 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;
- FLOWW Best Practice Guidance for Offshore Renewables Developments. Recommendations for Fisheries Liaison. FLOWW (2014);
- FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds. FLOWW (2015);
- UK Oil and Gas (2015) Fisheries Liaison Guidelines - Issue 6; and
- International Cable Protection Committee (2009) Fishing and Submarine Cables - Working Together.

13.4.2 Data Sources

31. The principal sources of data and information used to inform this chapter are outlined in ***Table 13.6***. A detailed description of these can be found in ***Appendix 13.2 Commercial Fisheries Technical Report.***

Table 13.6 Data Sources

Data type	Source	Year	Description
Fisheries Statistics (landings values and fishing effort)	MMO	2013 to 2017	Landings value and effort data for UK vessels landing into UK and European ports and non-UK vessels landing into UK ports.
Surveillance Sightings	MMO	2011 to 2017	Sightings of vessels recorded in UK waters, providing location, nationality and fishing method information. Data is collected by weekly surveillance fly overs during daylight hours.
Vessel Monitoring System (VMS) Data	MMO	2013 to 2017	Satellite tracking of all UK fishing vessels over 15m in Europoean waters. Data are cross-referenced with landings information to provide data at 0.05° by 0.05° scale.
Fisheries Statistics (landings value and effort data)	Belgian Institute for Agricultural and Fisheries Research (ILVO)	2010 to 2014	Landings values (€) and effort of all over-10m Belgian fishing vessels.
VMS Data	Belgian ILVO	2010 to 2014	Satellite tracking for over-15m Belgian vessels. The data has been filtered by speed to eliminate transiting vessels.
VMS and Integrated Landings Data	Netherlands, Institute for Marine Resources and Ecosystem Studies (IMARES) and LEI	2014 to 2018	Satellite tracking of Dutch fishing vessels combined with logbook data of values, effort for Dutch fishing vessels in the North Sea. A grid is defined based on 1/16th of an ICES rectangle. The data is filtered by speed.
Fisheries Statistics (landings value and effort data)	IMARES	2014 to 2018	Landings value and effort data for over 10m Dutch vessels landing into Europoean ports.
VMS data	Comité National des Pêches Maritimes et des Elevages Marin (CNPMEM)	2008	VMS charts provided by effort (days fished)
Fishing Effort Data	French L'Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER)	2014	VMS charts provided by effort for Central (IVb) and Southern North Sea (IVc).
VMS data	German Federation of Agriculture and Food	2011 to 2015	Satellite tracking by vessel density in the North Sea.
VMS data	Danish Ministeriet for Fødevarer, Landbrug og Fiskeri (MFLF)	2011 to 2015	VMS effort data)for over 15m Danish fishing vessels.

32. Further to analysis of the fisheries datasets described in ***Table 13.6,*** information gathered through consultation with fisheries stakeholders (***Table 13.1***) has also been used to inform this chapter. This has included information on fishing grounds, operating practices, vessel and gear specifications as well as key concerns in relation to the proposed East Anglia ONE North project.

13.4.3 Impact Assessment Methodology

33. The assessment of the potential impacts of the proposed East Anglia ONE North project on commercial fisheries receptors considers relevant aspects specified in the Cefas and MCEU (2004) guidelines for offshore wind developments and takes account of the feedback received during consultation with fisheries stakeholders.

34. The impact assessment is presented separately for the construction, operation and decommissioning phase for each potential impact. In addition, it considers potential cumulative and transboundary impacts.

35. The assessment is undertaken on a fleet by fleet basis, taking account of the nationalities and fishing methods identified in the study area from consultation and analysis of fisheries data and information.

36. Where inter-relations with other topics may occur, the outcomes of the assessments carried out in other chapters are cross referenced as required. As previously mentioned, other ES chapters that provide information and assessments of relevance to commercial fisheries are ***Chapter 10 Fish and Shellfish Ecology*** and ***Chapter 14 Shipping and Navigation.***

13.4.3.1 Sensitivity

37. The criteria used to define the sensitivity of commercial fisheries receptors are provided in ***Table 13.7.***

Table 13.7 Definitions of Sensitivity Levels for Commercial Fisheries Receptors

Sensitivity	Definition
High	Limited operational range and ability to deploy only one gear type. High dependence upon a single fishing ground.
Medium	Moderate extent of operational range and / or ability to deploy an alternative gear type. Dependence upon a limited number of fishing grounds.
Low	Extensive operational range and / or ability to deploy a number of gear types or to modify gears. Ability to fish a number of fishing grounds.
Negligible	Extensive operational range and very high method versatility in terms of gear types. Vessels are able to exploit a large number of fishing grounds.

13.4.3.2 Magnitude

38. The criteria used to define impact magnitude on commercial fisheries are provided in ***Table 13.8***.

39. The magnitude of an effect is considered for each predicted impact on an individual fleet basis and is defined taking account of the spatial and temporal extent of the impact. This is considered in the context of the relative level of importance to each fleet of the area affected by the potential impact (i.e. the level of fishing in the area with reference to the extent of alternative grounds that the fleet is able to exploit).

40. With respect to the duration of potential impacts, those which relate to construction are considered to be short to medium term; with the overall offshore construction programme for the proposed East Anglia ONE North project anticipated to be 27 months (see ***section 13.3.2***). Impacts associated with operation are longer term, throughout the operational life of the proposed East Anglia ONE North project.

Table 13.8 Definitions of Magnitude for Commercial Fisheries Receptors

Magnitude	Definition
High	The area affected by the impact sustains high levels of activity by the fleet and covers a large or moderate extent of its grounds; and/or The effect is permanent.
Medium	The area affected by the impact sustains moderate/high levels of activity by the fleet and covers a small/moderate extent of its grounds; and/or The effect is long term.
Low	The area affected by the impact sustains low/moderate levels of activity by the fleet and covers a small extent of its grounds; and/or The effect is short to medium term.
Negligible	The area affected by the impact sustains low/ negligible activity by the fleet and covers a small/negligible extent of its grounds; and/or The effect is short term.

13.4.3.3 Impact Significance

41. The significance of an impact is identified taking account of the magnitude of effect and the sensitivity of the receptor following the impact significance matrix shown in ***Table 13.9***. On this basis potential impacts are assessed as of negligible, minor, moderate or major significance. Those impacts which are of moderate or major significance are considered significant in EIA terms. Impact significance definitions are provided in ***Table 13.10.***

42. It should be noted that the definition of impact significance, whilst guided by the significance criteria matrix (***Table 13.9),*** is largely qualitative and based on professional judgement.

Table 13.9 Impact Significance Matrix

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

Table 13.10 Impact Significance Definitions

Value	Definition
Major	Very large or large change to fishing activity and/or fishing opportunities for a given receptor.
Moderate	Intermediate change to fishing activity and/or fishing opportunities for a given receptor.
Minor	Small change to fishing activity and/or fishing opportunities for a given receptor.
Negligible	No discernible change to fishing activity and/or fishing opportunities for a given receptor.

13.4.3.4 Safety risks

43. Where the proposed East Anglia ONE North project poses a potential safety risk to fishing vessels and crews, the significance criteria outlined previously are not considered appropriate. In these instances, impacts are assessed in terms of potential risks. In line with the significance ranking definitions outlined in the Navigational Risk Assessment presented in ***Appendix 14.2*** (***Table 13.11***), the assessment presented in this chapter evaluates whether risks are within acceptable limits (i.e. broadly acceptable / tolerable) or outside acceptable limits (i.e. unacceptable) taking account of the embedded mitigation measures outlined in ***section 13.3.3***.

44. This chapter deals with potential safety issues associated with gear snagging/manoeuvrability. A detailed risk assessment with regard to potential for collision/allision with other vessels and project infrastructure is provided separately in ***Chapter 14 Shipping and Navigation***.

Table 13.11 Significance Ranking Definitions (Source: *Appendix 14.2 Navigational Risk Assessment)*

Ranking	Definition
No impact	No impact on receptors
Broadly Acceptable	Risk ALARP with no additional mitigations or monitoring required above embedded mitigation. Includes impacts that have no perceptible effect (effect would not be noticeable to receptors).
Tolerable	Risk acceptable but may require additional mitigation measures and monitoring in place to control and reduce to ALARP
Unacceptable	Significance risk mitigation or design modification required to reduce to ALARP

13.4.4 Cumulative Impact Assessment

45. Projects / activities which have been considered in the cumulative assessment have been selected on the basis of the level of available information and their proximity to the proposed East Anglia ONE North project. Given the extent of the operational range of some of the fleets active in areas relevant to the proposed East Anglia ONE North project, projects/activities located in the North Sea and the English Channel have been included for assessment of cumulative impacts (see ***section 13.7***).

13.4.5 Transboundary Impact Assessment

46. The potential impacts on both UK and foreign fleets are taken into account in this impact assessment. Transboundary impacts are therefore integrated within the impact assessment.

13.5 Existing Environment

13.5.1 Overview

47. An overview of the principal fishing fleets and methods operating in the study area is given in this section based on analysis of MMO surveillance sightings from 2011 to 2017 by method and nationality ***(Table 13.12***, ***Figure 13.2*** and ***Figure 13.3***).

48. In rectangle 33F1, where the inshore section of the offshore cable corridor is located, most surveillance sightings are of UK vessels, principally potters / whelkers, followed by trawlers, long liners and netters. French trawlers and Belgian beam trawlers have also been observed in this inshore rectangle in some numbers with vessels from other nationalities showing negligible records. In this context it is important to note that both French and Belgian vessels hold historic fishing rights within this rectangle, being allowed to fish within the UK's 6 and 12nm limit in this area (***Figure 13.4).***

49. In rectangle 33F2, where the offshore section of the offshore cable corridor and the East Anglia ONE North windfarm site are located, the majority of surveillance sightings are of Dutch and Belgian vessels, primarily beam trawlers and trawlers (unspecified).

50. Albeit at comparatively lower levels, sightings of vessels from various other nationalities have also been recorded in the study area in areas beyond the UK's12nm limit, particularly German beam trawlers and Danish trawlers (***Table 13.12).***

Table 13.12 Surveillance Sightings from 2011 to 2017 (MMO, 2019) by Vessel Nationality and Method in the Study Area

ICES Rectangle	Nationality	Fishing method	Number of sightings	% of total sightings in ICES rectangle
33F1	United Kingdom	Potter/whelker	59	24.6%
		Trawler (all)	37	15.4%
		Stern trawler (pelagic/demersal)	23	9.6%
		Beam trawler	17	7.1%
		Long liner	13	5.4%
		Gill netter	11	4.6%
		Unspecified	11	4.6%
		Demersal stern trawler	8	3.3%
		Other	10	4.2%
	France	Trawler (all)	19	7.9%
		Stern trawler (pelagic/demersal)	4	1.7%
	Belgium	Beam trawler	22	9.2%
	Netherlands	Beam trawler	4	1.7%
	Denmark	Beam trawler	1	0.4%
		Suction dredger	1	0.4%
33F2	Netherlands	Beam trawler	95	42.2%
		Gill netter	3	1.3%
		Trawler (all)	1	0.4%
	Belgium	Beam trawler	70	31.1%

ICES Rectangle	Nationality	Fishing method	Number of sightings	% of total sightings in ICES rectangle
		Unspecified	2	0.9%
		Trawler (all)	3	1.3%
	United Kingdom	Beam trawler	5	2.2%
		Potter/whelker	9	4.0%
		Scallop dredger	2	0.9%
		Stern trawler (pelagic/demersal)	2	0.9%
		Trawler (all)	3	1.3%
	Germany	Beam trawler	12	5.3%
		Gill netter	6	2.7%
		Stern trawler (pelagic/demersal)	1	0.4%
	Denmark	Gill netter	1	0.4%
		Pair trawler (all)	2	0.9%
		Trawler (all)	4	1.8%
	Norway	Trawler(all)	2	0.9%
	France	Trawler (all)	1	0.4%
	Russian Federation	Stern trawler (pelagic/demersal)	1	0.4%

13.5.2 Dutch Fishing Vessels

13.5.2.1 Overview

51. The principal fishing activity undertaken by Dutch vessels in the study area is beam trawling for flatfish species such as sole *Solea solea* and plaice *Pleuronectes platessa*. Dutch seine netters are also active, however to a much lesser extent (***Figure 13.5*** and ***Figure 13.6***). As described in ***Appendix 13.2,*** other fishing methods used by the Dutch fleet in the Southern North Sea are recorded at very low levels in the study area.

52. Dutch fishing vessels have no historic fishing rights within the 6 and 12nm limit off the East Anglian coast. Therefore, the areas of the offshore development area of relevance to the Dutch fleet are the sections of the offshore cable corridor located beyond the 12nm limit and the East Anglia ONE North windfarm site.

13.5.2.2 Dutch Beam Trawling

53. There has been a progressive conversion from the use of traditional beam trawls to the use of pulse wing trawls over the last ten years amongst the Dutch beam trawl fleet. The majority of Dutch beam trawlers operating in the study area use pulse wing gear and are of the larger size category (approx. 40m in length). From consultation with VisNed it is understood that between 10 and 15 beam trawlers operate in areas relevant to the proposed East Anglia ONE North project, many of which are based in Texel or part of the Lowestoft Producers Organisation (PO). It should be noted that the latter, whilst UK registered, are Dutch owned and operated.

54. Fishing using pulse wing trawls is permitted over a wide area of the North Sea, including ICES Division IVc (Southern North Sea) and ICES Division IVb (Central North Sea) to the south of 55°N.

55. It should be noted, that as part of the overhaul of EU fishing regulations, and as a consequence of lobbying by French, Belgian and UK fishermen, the European Parliament voted to ban pulse fishing. Subsequently, a full EU ban to pulse fishing was approved in February 2019. The ban will be phased in with 42 of the current 84 pulse fishing licences to be withdrawn in 2019 and the remaining 42 by July 2021.

56. In a Brexit scenario, regardless of EU regulations, it is anticipated that, under the Common Fisheries Policy and Aquaculture (Amendment) (EU Exit) Regulations 2019, EU vessels will no longer be able to carry out electric pulse fishing in UK waters.

57. VMS data (2014 -2018) indicate that Dutch beam trawling occurs at moderate to high levels across wide sections of the Southern North Sea. However, within the offshore development area, activity occurs at comparatively lower levels.. Some fishing activity also occurs further north, over large areas of the Central North Sea, albeit at relatively low levels (***Figure 13.7*** and ***Figure 13.8***). It should be noted that as highlighted by VisNed in their response to the PEIR (***Appendix 13.1***) there is no bream trawl activity for fish within the Plaice Box (an area within the North Sea, established reduce the discarding of undersized plaice in nursery areas, to enhance recruitment). It is understood that for the most part activity shown in ***Figure 13.7*** and ***Figure 13.8*** within the Plaice Box area relates to the brown shrimp fishery, rather than to beam trawlers targeting fish.

58. It should also be noted that Dutch fishermen have agreed to avoid fishing using pulse wing gear within various discrete areas off the east coast of England through a voluntary Interim Spatial Separation Agreement with UK East coast fishermen. The no-pulse areas agreed for 2019 are illustrated in ***Figure 13.9***. As

shown, one of these areas overlaps with the section of the offshore cable corridor which is located beyond the 12nm limit.

13.5.2.3 Dutch Seine Netting

59. Fishing activity by Dutch seine netters occurs at considerably lower levels than beam trawling and for the most part concentrates in the English Channel and to a lesser extent in parts of the Central North Sea and the Southern North Sea. Activity by this method in the offshore development area occurs at low levels (***Figure 13.10*** and ***Figure 13.11***).

60. As shown in ***Figure 13.5***, landings by this method make a very small contribution to the overall landing values from Dutch vessels in the study area.

13.5.2.4 Other Dutch Fishing Methods

61. Fishing activity by other Dutch fishing methods, including pelagic trawlers, demersal otter trawlers, nets, traps and dredgers, occurs at very low/negligible levels within the study area (***Figure 13.12*** to ***Figure 13.18***).

13.5.3 Belgian Fishing Vessels

13.5.3.1 Overview

62. The principal methods used by the Belgian fleet in the study area are beam trawling and to a lesser extent demersal otter trawling (***Figure 13.10).*** It is understood that some vessels are able to operate both gears (***Apendix 13.1 Commercial Fisheries Technical Report***). Belgian vessels in this area target a range of species, primarily sole, but also other flatfish species such as plaice, turbot *Scophthalmus maximus* and brill *Scophthalmus rhombus*, as well as skates and rays (***Figure 13.20).***

63. Belgian vessels have historic fishing rights in the study area between the UK's 6 and 12nm limits (***Figure 13.4***).

13.5.3.2 Belgian Beam Trawling

64. Belgian beam trawlers have wide operational ranges, targeting grounds in the Southern North Sea, the English Channel, the Celtic Sea and the Irish Sea (***Figure 13.21 and Figure 13.22).***

65. The highest levels of activity by these vessels concentrate off the coast of Belgium and in the English Channel. Fishing activity in the study area occurs at low to medium levels. Within the offshore development area for the most part activity is focused around the East Anglia ONE North windfarm site and the section of the offshore cable corridor immediately to its west (***Figure 13.21*** and ***Figure 13.22)***.

13.5.3.3 Belgian Demersal Otter Trawling

66. Activity by Belgian demersal otter trawlers occurs at lower levels than beam trawling, and takes place over wide areas of the Central and Southern North Sea, the English Channel, the Celtic Sea and the Irish Sea. Fishing activity by these vessels in the offshore development area occurs at very low levels both across the offshore cable corridor and the East Anglia ONE North windfarm site (***Figure 13.23 and Figure 13.24***).

13.5.4 United Kingdom Fishing Vessels

13.5.4.1 Overview

67. The majority of local UK vessels active in the vicinity of the offshore development area are of under 10m in length. Many of these are multipurpose having the ability to deploy multiple gears. The principal methods used by these vessels include potting, netting, long lining and trawling and target shellfish species (lobster *Homarus gammarus*, edible crab *Cancer pagurus* and whelk *Buccinum undatum*) as well as fish species such as sole, plaice, rays, cod *Gadus morhua* and bass. By virtue of their small size and associated limited operational range, these vessels primarily operate within the 12nm limit (and mostly within the 6nm limit) and therefore in areas relevant to of the inshore section of the offshore cable corridor (within rectangle 33F1) ***(Figure 13.25, Figure 13.26*** and ***Plate 13.1)***.

68. Various vessels are however known to target areas further offshore, including areas as far out as the East Anglia ONE North windfarm site. However, in offshore areas within the study area (rectangle 33F2), the majority of landings are from larger vessels (over 15m), mainly beam trawlers targeting flatfish species such as sole and plaice (***Figure 13.26, Figure 13.27*** and ***Plate 13.2)***.

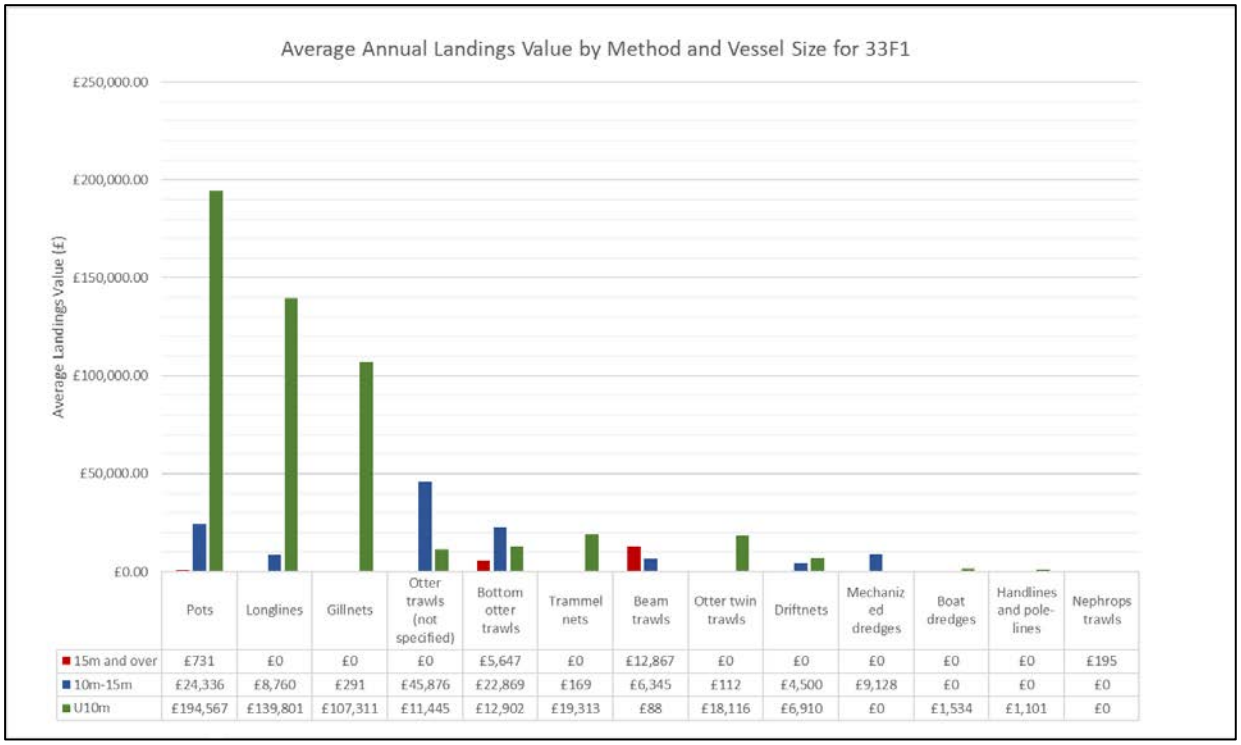

Plate 13.1 Average UK landings values (2013 to 2017) by method and vessel length in ICES rectangle 33F1 (MMO, 2019)

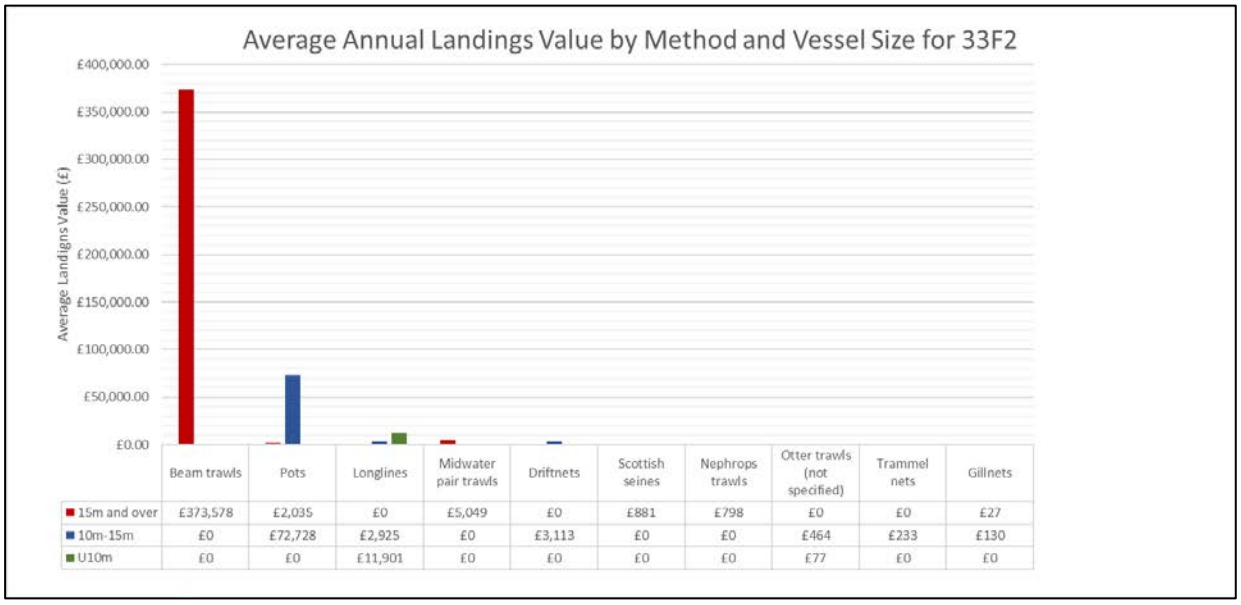

Plate 13.2 Average UK landings values (2013 to 2017) by method and vessel length in ICES rectangle 33F2 (MMO, 2019)

13.5.4.2 Local UK Inshore Fleet

69. The extent of the fishing grounds used by local vessels is illustrated in ***Figure 13.27 to Figure 13.30***, based on information gathered during consultation.

70. Local potting, trawling and longlining grounds are located primarily inshore, including in areas relevant to the offshore cable corridor, however some vessels are known to target grounds as far out as the East Anglia ONE North windfarm site (***Figure 13.27, Figure 13.28 and Figure 13.29***).Netting grounds (***Figure 13.30***) extend over a relatively extensive area, including the offshore cable corridor and the East Anglia ONE North windfarm site and the wider area to its north and south.

13.5.4.3 Other UK vessels

71. In areas relevant to the proposed East Anglia ONE North project, activity by UK vessels other than those part of the local inshore fleets, is primarily by beam trawlers (***Appendix 13.2 Commercial Fisheries Technical Report***). It is understood that the majority of these whilst UK registered are actually Dutch owned and operated (see ***section 13.5.2***). These are referred to as "Anglo-Dutch" beam trawlers.

72. In addition to activity by Anglo-Dutch vessels, UK owned and operated beam trawlers from ports in the south west of the UK such as Brixham, Penzance and Newlyn, may also fish occasionally in the study area. However, these vessels for the most part target grounds in the Celtic Sea, Western Approaches and English Channel rather than in areas relevant to the proposed East Anglia ONE North project.

73. Analysis of VMS data (***Figure 13.31 and Figure 13.32***) suggests that beam trawling activity by UK registered beam trawlers occurs at relatively low levels across the study area, including areas along the offshore cable corridor and within the East Anglia ONE North windfarm site.

13.5.5 French Fishing Vessels

13.5.5.1 Overview

74. In the study area, French vessels have fishing rights to fish between the UK's 6 and 12nm limit (***Figure 13.4***).

75. During consultation with the Comité Régional des Pêches Maritimes et des Elevages Marins (CRPMEM) Hauts de France (***Table 13.1***), it was noted that French fishing activity levels in the offshore development area are relatively low, with between 1 and 10 vessels operating in the area, mainly in areas relevant to the offshore cable corridor. All vessels coming from the Haut de France area are demersal otter trawlers, a proportion of which also carry pelagic gear to target mackerel. These vessels are primarily based in Boulogne and Etaples and fish in

this area in spring for one or two months, targeting mainly whiting *Merlangius merlangus* and squid *Loligo sp*. There are also pelagic freezer trawlers based in Fecamp (Normandie), which target grounds in the area.

76. It was also noted during consultation that some vessels steam through the area to target grounds further north.

77. In line with the above, analysis of available VMS data for demersal and pelagic French trawlers (***Figure 13.33 to Figure 13.36***) suggest that the offshore development area sustains relatively low levels of French fishing, with the majority of activity concentrating in areas south of the proposed East Anglia ONE North project towards the English Channel.

13.5.6 Danish Fishing Vessels

13.5.6.1 Overview

78. In the vicinity of the proposed East Anglia ONE North project, Danish fishing activity is primarily by trawlers, including industrial sandeel trawlers and pelagic trawlers.

79. Analysis of VMS data for the sandeel fleet (***Figure 13.37***) suggests that activity by sandeel industrial trawlers is mainly concentrated in areas such as the Dogger Bank (Central North Sea) and the Norwegian coast (Northern North Sea). Although not restricted to these areas activity is considerably lower in the Southern North Sea. In the offshore development area activity by these vessels occurs at negligible levels.

80. Similarly, activity by pelagic trawlers also concentrates north of the offshore development area in the Central North Sea, particularly off the coast of Denmark. As for industrial sandeel trawlers, activity by pelagic trawlers in the offshore development area occurs at negligible levels (***Figure 13.38***).

13.5.7 German Fishing Vessels

13.5.7.1 Overview

81. In areas in the vicinity of the proposed East Anglia ONE North project, sightings of German vessels are primarily of beam trawlers (***Table 13.12***). It is understood, that a number of these, whilst German registered, are Dutch owned and operated (***Appendix 13.2 Commercial Fisheries Technical Report)***.

82. Analysis of available VMS data for the German fleet (***Figure 13.39***) suggests that activity by these vessels occurs at very low levels in the offshore development area with fishing activity by this fleet for the most part concentrating in the Central North Sea off the German, Danish and Dutch coasts.

13.5.8 Climate Change and Natural Trends

83. Over time, it is anticipated that global climate change will result in changes to the marine environment, including on fish and shellfish populations of commercial importance (Tripathi et al., 2016, Cheung et al., 2012). This may in turn result in modifications to commercial fisheries practices in order to respond to potential changes in species distribution abundance and/or seasonal trends.

84. In addition, changes in other factors such as fisheries legislation and regulations (i.e. quota and effort allocation, closed areas, gear restrictions) may also influence the future fisheries baseline. In this context, the potential effects of Brexit on the existing fishing baseline should be recognised, including the potential changes to fishing access to non-UK fleets within UK waters. At this stage, however, it is not possible to predict whether or not these changes may occur and what they may entail.

13.6 Potential Impacts

85. The assessment of the potential impacts on commercial fishing activities as a result of the construction, operation and decommissioning of the proposed East Anglia ONE North project are described in this section. The guidance outlined in ***section 13.4.1*** provides the basis for impacts taken forward for assessment. The opinions of regulators and stakeholders identified from scoping and direct consultation (see ***Appendix 13.1)*** have also been considered within the assessment.

13.6.1 Potential Impacts during Construction

13.6.1.1 Impact 1: Potential Impacts on Commercially Exploited Fish and Shellfish Populations

86. There may be potential for the construction of the proposed East Anglia ONE North project to result in impacts on commercially exploited fish and shellfish species. This could in turn indirectly affect the productivity of the fisheries that target them.

87. The potential impacts of the proposed East Anglia ONE North project on fish and shellfish species, including those of commercial importance are assessed in ***Chapter 10 Fish and Shellfish Ecology*** and are not expected to exceed minor adverse significance. Consequently, any impacts associated with this on the commercial fisheries that target them are also not expected to exceed ***minor adverse*** significance***.***

13.6.1.2 Impact 2: Temporary Loss or Restricted Access to Traditional Fishing Grounds

88. The assessment of temporary loss or restricted access to traditional fishing grounds is discussed below on a fleet by fleet basis. Due to data limitations, it is not possible to assess the impacts on individual vessels. It is however recognised that the level and distribution of fishing activity and dependence on fishing

grounds within the offshore development area will vary between individual vessels within the same fleets.

89. During construction, restricted access or loss of traditional fishing grounds would be a consequence of the implementation of temporary safety zones around:

- Construction activities;
- Partially installed infrastructure; and
- Exposed sections of cables.

90. As construction progresses, this would lead to a theoretical worst case under which all fishing activities would be excluded from the entirety of East Anglia ONE North windfarm site and the offshore cable corridor. Offshore construction works, and therefore potential for fishing to be excluded, would last over a period of 27 months, within which export cable installation would likely occur over two six month periods(***Table 13.3)***.

91. It should be noted, however, that the total area from which fishing may be excluded may change depending on the level of works being carried out and the level of infrastructure installed or partially installed at a given time. With regard to installation of offshore cables, the actual area and duration of potential exclusion may change depending on the installation method used. For example, simultaneous lay and burial techniques, as used on many previous windfarm projects, could shorten the period of exclusion.

13.6.1.2.1 Dutch Fishing Vessels

Dutch beam trawlers

92. The majority of Dutch beam trawlers active in the study area are of the larger class of vessels (i.e. up to 43m in length and main engines of up to 2,000hp). Given their size and engine power these vessels have wide operational ranges and fishing opportunities. In addition, they have the ability to operate in weather conditions which would prevent other fishing vessels from operating. Based on the above, Dutch beam trawlers are considered of low sensitivity to loss of fishing grounds.

93. VMS data (2014 -2018) indicate that Dutch beam trawling activity occurs at moderate to high levels across wide sections of the Southern North Sea (***Figure 13.7 and Figure 13.8***).

94. However, within the offshore development area, beam trawling by Dutch vessels takes place at comparatively low levels. In addition, the offshore development area represents a small area in the context of the extent of grounds available to these vessels.

95. With this in mind and taking account of the temporary nature of the construction phase, the magnitude of the effect is considered to be low.

96. Taking the low receptor sensitivity and the low magnitude of effect, the significance of the impact of temporary loss or restricted access to fishing grounds during construction is considered to be **minor adverse.**

Dutch seine netters

97. Dutch seine netters have wide operational ranges with their fishing opportunities extending over a large area, from the north of Denmark, south to the English Channel towards the Western Approaches. Taking account of their operational range and availability of grounds, they are considered receptors of low sensitivity.

98. Fishing activity by Dutch seine netters in the Southern and Central North Sea occurs at considerably lower levels than beam trawling. The highest levels of activity concentrate south of the offshore development area, around the English Channel.

99. Activity by this method in the offshore development area occurs at low levels (***Figure 13.10 and Figure 13.11***). In addition, the offshore development area represents a small area in the context of the extent of grounds available to these vessels. With this in mind and taking account of the temporary nature of the construction phase, the magnitude of the effect is considered to be low.

100. This combined with the low sensitivity of the receptor, results in an impact of **minor adverse** significance.

Other Dutch fishing methods

101. Other fishing methods deployed by Dutch vessels include pelagic trawls, demersal otter trawls, nets, traps and dredges. Vessels operating pelagic trawls and demersal otter trawls have wide operational ranges whilst those operating nets, traps and dredges have a more restricted operational range. In view of the more limited areas that nets, traps and dredges may be able to exploit they are considered of medium sensitivity to loss of fishing grounds, whilst vessels deploying pelagic trawls and demersal otter trawls are considered to be of low sensitivity.

102. It should be noted that fishing within the offshore development area occurs at very low / negligible levels by all these methods (***Figure 13.12*** to ***Figure 13.18***). Taking this into account together with the temporary nature of the construction phase the magnitude of the effect is considered to be negligible.

103. This, in combination with the sensitivity of the receptors identified above results in an impact of **minor adverse** significance.

13.6.1.2.2 Belgian Fishing Vessels

Belgian beam trawlers

104. The fishing grounds of Belgian beam trawlers cover substantial areas of the Southern North Sea, English Channel, Celtic Sea and parts of the Central North Sea and the Irish Sea. Given their wide operational range and fishing opportunities their sensitivity to loss of fishing grounds is considered to be low.

105. Within the study area, the highest levels of fishing activity are recorded immediately to the north and south of the offshore cable corridor. However, in both the East Anglia ONE North windfarm site and along the offshore cable corridor, activity by these vessels is comparatively low (***Figure 13.21 and Figure 13.22***). Considering this, together with the small proportion of the overall grounds available to these vessels that the offshore development area represents and the temporary and short nature of construction activities, the magnitude of the effect is assessed as low.

106. Taking the low sensitivity of the receptor and low magnitude of the effect, the impact of temporary loss or restricted access to fishing grounds for the Belgian beam trawl fleet is assessed to be of **minor adverse** significance.

Belgian demersal otter trawlers

107. The operational range and associated fishing opportunities of the Belgian demersal otter trawl fleet is similar to that described above for beam trawlers. On this basis they are also considered of low sensitivity to temporary loss of restricted access to fishing grounds.

108. Analysis of VMS data for demersal otter trawlers (***Figure 13.22 and Figure 13.23***) indicates that activity by these vessels in the offshore development area occurs at very low levels, with activity for the majority concentrating south of the offshore development area and in discrete areas of the Central North Sea. Considering the large operational range of these vessels, the relatively small area occupied by the offshore development area and the temporary nature of the construction phase, the magnitude of the effect is assessed as negligible.

109. Taking the low sensitivity of the receptors and the negligible magnitude of effect the impact of loss or restricted access to fishing grounds for the Belgian demersal otter trawl fleet during construction is considered to be of **negligible** significance.

13.6.1.2.3 United Kingdom Fishing Vessels

Local inshore vessels

110. The majority of local UK vessels active in the vicinity of the offshore development area are less than 10m. Whilst a number of the vessels have multipurpose capabilities, being able to deploy pots, trawls nets and/or lines, given their small size and associated limited operational ranges, their sensitivity to loss of fishing grounds is considered to be medium.

111. The available data and information obtained during consultation in respect of the location of fishing grounds of local UK vessels suggest that the majority of activity in areas relevant to the offshore development area occurs across the offshore cable corridor (***Figure 13.27 to Figure 13.30)***. Potential loss of fishing grounds to the UK local inshore fleet during construction would therefore for the most part be a result of export cable installation activities. It is however recognised that some vessels may also target grounds within the East Anglia ONE North windfarm site and therefore may also be affected by construction works undertaken in the windfarm site.

112. Considering the short term and temporary nature of construction activities and the relatively small extent of the offshore development area in the context of the grounds available to this fleet overall, the magnitude of the impact is assessed to be low. It is however recognised, that depending on their degree of dependence on grounds in the offshore development area, for some individual vessels the magnitude of the impact may be medium.

113. In general terms, taking the medium sensitivity of the local fleets and the low magnitude of the effect for the overall fleet, the impact significance is considered **minor adverse**.

114. In respect of the potential impact on individual vessels for which the magnitude of the effect may be medium, the significance of the impact is **moderate adverse** and therefore significant in EIA terms. It should be noted, however, that in instances when fishing gear may need to be temporarily relocated due to construction activities, appropriate evidence-based mitigation, as specified in the FLOWW Guidelines (FLOWW 2014; 2015) will be applied. With the implementation of the above, the residual impact on these vessels would be reduced to **minor adverse**.

Other UK vessels

115. With regard to UK vessels other than those that form part of the local inshore fleet, as mentioned in ***section 13.5.2***, in areas relevant to the proposed East Anglia ONE North project, activity is primarily by beam trawlers. It is understood that the majority of these, whilst UK registered, are Dutch owned and operated (Anglo Dutch). As such, these vessels are effectively Dutch beam trawlers and therefore are assigned the same sensitivity as described above for the Dutch beam trawl fleet (***section 13.6.1.2.1***), namely low.

116. In the case of UK owned beam trawlers operating from south-west ports, these predominantly target grounds in the Celtic Sea, Western Approaches and English Channel. In view of their wide operational range and associated fishing opportunities, they are also considered of low sensitivity to loss or restricted access to fishing grounds.

117. Analysis of VMS data (***Figure 13.31 and Figure 13.32***) suggests that beam trawling activity by UK registered beam trawlers occurs at relatively low levels across the study area, with low levels of activity recorded within the offshore development area. Considering this together with the small proportion of the overall grounds available to these vessels that the offshore development area represents and the temporary nature of the construction phase, the magnitude of the effect is assessed as low. This is considered to be the case in respect of Anglo-Dutch vessels.

118. In the particular case of UK owned and operated beam trawlers for south-west ports, it is understood that only a limited number of these vessels may occasionally target sole off the coast of East Anglia on a seasonal basis. Considering the comparatively low levels of activity by these vessels in areas relevant to the project, the magnitude of the effect is assessed as negligible.

119. Taking the above into account the impact of temporary loss or restricted access to fishing grounds during construction is considered to be of **minor adverse** significance in the case of Anglo-Dutch beam trawlers and of **negligible** significance in the case of UK beam trawlers from south-west ports.

13.6.1.2.4 French Fishing Vessels

120. French demersal and pelagic trawlers target a variety of species and have wide operational ranges, exploiting grounds from the Central North Sea to the English Channel and on occasions to the Western approaches. Taking account of their wide operational range and fishing opportunities they are considered of low sensitivity to temporary loss or restricted access to fishing grounds.

121. From consultation and the data that has been made available (***Appendix 13.2***) it is apparent that French fishing activity levels in the offshore development area are relatively low, with the majority of activity concentrating in areas south of the offshore development area towards the English Channel (***Figure 13.33*** to ***Figure 13.36)***.

122. Considering this, together with the small proportion of the overall grounds available to French vessels that the offshore development area represents and the temporary nature of the construction phase, the magnitude of the effect is assessed as low.

123. Taking the above into account the impact of temporary loss or restricted access to fishing grounds during construction is considered to be of **minor adverse** significance.

13.6.1.2.5 Danish Fishing Vessels

124. Danish sandeel and pelagic trawlers have wide operational ranges and fishing opportunities being active over wide areas of the Central North Sea and therefore their sensitivity to loss of fishing grounds is considered to be low.

125. Analysis of VMS data for the sandeel and pelagic fisheries (***Figure 13.37*** and ***Figure 13.38***) indicates that fishing activity by these vessels occurs at negligible levels in the offshore development area.

126. Considering this and the temporary nature of the construction phase, the magnitude of the effect is assessed as negligible.

127. This, combined with the low sensitivity of both fleets results in an impact of **negligible** significance.

13.6.1.2.6 German Fishing Vessels

128. It is understood that German fishing activity in the vicinity of the offshore development area is mainly by beam trawlers. Some of these are German registered fishing German quotas but Dutch owned and operated. These vessels have wide operational ranges and therefore, as previously described for other beam trawl fleets, they are considered of low sensitivity to loss of fishing grounds.

129. Analysis of available VMS data for German vessels (***Figure 13.39***) suggests very low levels of fishing activity in areas relevant to the offshore development area, with activity concentrating for the most part in the Dutch and Danish Sector of the Central North Sea. Considering this together with the temporary nature of the construction phase, the magnitude of the effect is assessed as negligible.

130. Taking the low sensitivity of the receptor and low magnitude of the effect, the impact of temporary loss or restricted access to fishing grounds during construction is considered to be of **negligible** significance.

13.6.1.3 Impact 3: Displacement of Fishing Activity into other Areas

131. There is the potential for temporary loss of access to fishing grounds during construction to lead to a temporary relocation of fishing activity which in turn could result in increased competition for fishing grounds in other areas.

132. It is possible that static gears operated by local inshore vessels could be displaced during the construction phase whereby gears are required to be relocated, particularly during installation of export cables. This, in turn could result in competition for grounds elsewhere between local inshore vessels. However, considering the number of static gear that a relatively small area such as the cable corridor can viably support, the number of static gear units capable of causing a displacement effect would be limited. Furthermore, as stated above in respect of loss of fishing area, in instances where static gear needs to be

relocated appropriate procedures as specified in FLOWW Guidelines (FLOWW 2014; 2015) would be implemented.

133. There may also be potential for larger trawlers to be displaced into areas where static gears are deployed. As described in ***section 13.5.4,*** the majority of the static gear vessels operate within the 12nm limit (and mostly within the 6nm limit). Activity in areas relevant to the proposed East Anglia ONE North project beyond the 12nm is predominantly by Dutch and Anglo Dutch beam trawlers. By virtue of their main engine power and gear sizes these vessels are not permitted to fish within the UK's 12nm. In the case of Belgian and French vessels, the larger class of these vessels are also prohibited from fishing within the UK's 12nm limit. However, it is acknowledged that the small class with engines of less than 300hp can fish between the 6 and 12nm limits due to historic fishing rights. Activity by the remaining towed gear fleets in the offshore development area is relatively low and occurs beyond the 12nm limit (i.e. Danish, German vessels).

134. From the information provided above, it is apparent that there is little potential for competition for fishing grounds to occur between local inshore vessels. Similarly, it is apparent that there is little potential for conflicts between local inshore and larger towed gear vessels to occur. Therefore the magnitude of the effect of displacement on the local inshore fishing fleet is considered to be low. In view of the limited operational range of local inshore vessels, as for the assessment of temporary loss or restricted access to fishing grounds, their sensitivity to displacement is considered to be medium.

135. Taking into account the medium sensitivity of the local inshore fleet and the low magnitude of the effect, the impact of displacement is assessed to be of **minor adverse** significance.

136. In addition to the above, it is recognised that there could be potential for displacement of fishing vessels into other areas to result in competition for grounds between different fleets that operate towed gear.

137. For the most part these fleets have wide operational ranges relative to the potential loss of grounds associated with the construction phase. Therefore, any increased competition between these vessels arising from displacement would be expected to be minimal. Whilst it is difficult to predict where fishing activity may be displaced to and how this may affect individual vessels, in all cases, the level of displacement would be a function of the temporary loss or restricted access to fishing grounds. It is therefore considered that the sensitivity of receptors, magnitude of effect and resulting impact significance in respect of displacement would, at worst, be as identified in relation to temporary loss or restricted access to fishing grounds for towed gear fleets. As shown in ***Table***

13.13 below this would result in an impact of **negligible** to **minor adverse** significance depending on the towed gear fleet under consideration.

Table 13.13 Impact Significance of Displacement of Fishing Activity into Other Areas for Towed Gear Fleets

Receptor Group		Receptor sensitivity	Magnitude of Effect	Impact Significance
Dutch Beam Trawlers		Low	Low	**Minor adverse**
Dutch Seine Netters		Low	Low	**Minor adverse**
Other Dutch Methods	Demersal (otter) trawls	Low	Negligible	**Negligible**
	Nets, traps and dredges	Medium	Negligible	**Minor adverse**
Belgian Beam Trawlers		Low	Low	**Minor adverse**
Belgian Demersal Otter Trawlers		Low	Negligible	**Negligible**
UK Beam Trawlers (Anglo-Dutch)		Low	Low	**Minor adverse**
UK Beam Trawlers (Southwest ports)		Low	Low	**Negligible**
French demersal and pelagic trawlers		Low	Low	**Minor adverse**
Danish sandeel industrial trawlers and pelagic trawlers		Low	Negligible	**Negligible**
German fishing vessels		Low	Negligible	**Negligible**

13.6.1.4 Impact 4: Increased Steaming Times to Fishing Grounds

138. During construction, the implementation of safety zones could result in increased steaming distances and times and therefore increased operational costs for some fishing vessels.

139. The majority of steaming routes of towed gear vessels from the Netherlands, Belgium, UK, France and other nations between primary fishing grounds and home ports do not go through the offshore development area. Therefore, there would be little potential for changes to steaming routes caused by temporary safety zones associated with the construction of the proposed East Anglia ONE North project. With this in mind, the sensitivity of these receptors is considered to be negligible.

140. In the case of local inshore vessels, fishing activity for the most part does not extend to areas offshore of the East Anglia ONE North windfarm site and mainly concentrates in areas along the offshore cable corridor. In general terms, it is therefore expected that there would be few occasions when there would be a

requirement to change existing steaming routes to avoid safety zones. It is recognised however that in the case of inshore vessels operating from ports in the immediate vicinity of the landfall site, the degree of potential interaction with safety zones may be higher. Therefore, the sensitivity of this fleet is considered to be low.

141. Given the relatively small footprint of the safety zones that may be applied during construction and their short term and temporary nature, the magnitude of the effect is considered to be low (for both the local inshore fleet and the rest of the fleets).

142. Considering the sensitivities identified above (low for the local inshore fleet and negligible for the remaining fleets) and the low magnitude of the effect, the impact of increased steaming times to fishing grounds is considered to be of **minor adverse** significance for the local inshore fleet and of **negligible** significance for the rest of the fleets.

13.6.1.5 Impact 5: Interference with Fishing Activity

143. During construction, there may be potential for the transit of construction vessels to result in interference with fishing activities in the study area.

144. In relation to the local UK inshore vessels operating static gear, interference with fishing activity would mainly result from fouling of static gear markers by construction vessels such as crew transfer vessels which would be transiting through the offshore development area. The majority of gear markers used by fishermen operating gear within 12nm of the coast are unlit, without radar reflectors and often simple markers such as plastic bottles or footballs. Thus, these markers are not visible in all conditions. With this in mind and taking account of the non-mobile nature of the gear used by the local static gear fleet the sensitivity to interference of UK vessels operating static gear is considered medium.

145. As described in ***section 13.3.3***, appropriate fisheries liaison will be undertaken with relevant fishing interests to ensure they are fully informed of construction activities. This will include provisions for enabling awareness of construction vessels crews of the locations of static gears and fishermen's awareness of construction vessel transit routes. In addition, a Marine Coordinator will provide up to date information to onshore Fisheries Liaison Officers that can be relayed to local fishermen. With the implementation of the above, the magnitude of the effect for the local static gear fleet is considered low, and the impact significance is assessed as **minor adverse**.

146. In the case of fleets operating towed gears, taking account of their mobility, the sensitivity to interference is considered to be low. Transiting construction vessels

will fully comply as required under the International Regulations for Preventing Collisions at Sea (COLREGS). Such compliance would negate the requirement for fishing vessels engaged in fishing to alter course or pose any risk to fishing gears being towed. With the above in mind the magnitude of the impact in respect of fleets operating towed gear is considered to be negligible, resulting in an impact of **negligible** significance.

13.6.1.6 Impact 6: Safety Issues for Fishing Vessels

147. With regard to safety issues for fishing vessels, as outlined in ***section 13.4.3.4***, the use of the standard impact assessment matrix is not considered appropriate. Safety risks are therefore discussed in terms of being within or outside of acceptable limits in line with the approach adopted in ***Chapter 14 Shipping and Navigation***.

148. The potential risk of fishing gear snagging and the manoeuvrability of vessels specifically with relation to safety issues is assessed below.

149. The progressive installation of wind turbine foundations during the construction phase would result in increasing potential for manoeuvrability risks to fishing vessels. In addition, snagging risks may arise as a result of sections of cables remaining exposed on the sea bed whilst awaiting burial or protection measures.

150. Safety zones will be in place around construction works and partially installed and installed infrastructure. In addition, in areas where cables are awaiting burial or protection, localised advisory safety zones would be implemented to prevent fishing gear snagging and the subsequent risks to both the cables and fishing vessels and their gears.

151. Potential risks to fishing vessels would be minimised by the required levels of communication through the specific channels of the Kingfisher Information System, Notices to Mariners, as well as direct liaison with fishermen and their representatives. This would ensure the required level of awareness of potential construction related risks and the locations and periods of safety exclusion zones amongst fishing vessel owners and crews. Guard vessels and Offshore Fishing Liaison Officers (OFLOs) would be employed, where necessary, to further aid liaison.

152. In conclusion, with the application of the liaison and information distribution discussed above and the required compliance by fishermen, safety issues for fishing vessels should remain **within acceptable limits**.

153. A separate assessment of potential safety issues associated with sea bed obstacles is provided in ***section 13.6.1.7*****.** Safety risks associated with potential for collisions with construction vessels and allision with project infrastructure are addressed in ***Chapter 14 Shipping and Navigation***.

13.6.1.7 Impact 7: Sea bed Obstacles

154. Obstacles on the sea bed during construction could potentially cause damage to, or complete loss of fishing gears. In addition, activities associated with construction works such as construction vessel anchoring, jack up legs or cable trenching could produce spoil or mounds onto which fishing gears could fasten.

155. It should be noted, that offshore policy (IMO, 1996) prohibits the discarding of objects or waste at sea. The reporting and recovery of any accidentally dropped object is also required. Dropped objects will be reported to the MMO using the Dropped Objects Procedures Form outlined in the draft DCO.

156. In order to assess the sea bed status, post-lay and burial inspection surveys will be undertaken after installation of cables, as discussed in ***section 13.3.3.***

157. With the above procedures in place, safety issues to fishing vessels associated with obstacles on the sea bed would be **within acceptable limits**.

13.6.2 Potential Impacts during Operation

158. The potential impacts during operation should be considered in the context of the design life of the proposed East Anglia ONE North project.

159. The same receptor sensitivities identified for the construction phase apply for assessment of impacts during operation. Therefore, where relevant, reference is made to relevant sections within the impact assessment presented for the construction phase (***section 13.6.1***).

13.6.2.1 Impact 1: Potential Impacts on Commercially Exploited Fish and Shellfish Populations

160. There may be potential for the operational phase of the proposed East Anglia ONE North project to result in impacts on commercially exploited fish and shellfish species. This could in turn indirectly affect the productivity of the fisheries that target them.

161. The potential impacts of the proposed East Anglia ONE North project on fish and shellfish species, including those of commercial importance are assessed in ***Chapter 10 Fish and Shellfish Ecology*** and are not expected to exceed minor adverse significance. Consequently, any impacts associated with this on the commercial fisheries that target them are also not expected to exceed **minor adverse** significance***.***

13.6.2.2 Impact 2: Complete Loss or Restricted Access to Traditional Fishing Grounds

162. Existing UK legislation does not prevent fishing from occurring in operational windfarms. It is therefore expected that for the most part, fishing would be able to resume within the East Anglia ONE North windfarm site during the operational phase.

163. As described in ***Table 13.3,*** the worst case assumption in respect of loss or restricted access to traditional fishing grounds during operation takes account of the installation of 67 wind turbines with a minimum in-row spacing of 800m and a minimum inter-row spacing of 1,200m offshore.

164. In view of the worst case parameters noted above in respect of minimum spacing, it anticipated that the majority of vessels deploying towed and static gear would be able to operate within the East Anglia ONE North windfarm site. It is however recognised that some methods such as longlining or netting may need to adapt their operating practices to resume fishing in the operational site and that in the case of seine netting, fishing may not be possible.

165. Offshore cables (inter-array, platform link and export cables) will be buried where possible to at least 1m. Where burial is not possible (i.e. due to hard ground or at cable crossings) cables would be protected. In line with standard practice in the North Sea oil and gas industry, measures would be undertaken to ensure that where cable protection is required, the protection methods used are compatible with fishing activities where practically possible. Therefore, it is assumed that during the operational phase, the presence of offshore cables would for the most part not result in a material loss of fishing grounds as normal fishing activity would occur in areas where cables are installed except in instances when temporary maintenance works are required.

166. As such, the focus of the assessment of loss or restricted access to fishing grounds presented below is focused on impacts associated with the presence of infrastructure other than cables (i.e. wind turbines and offshore platforms) all of which are to be located within the East Anglia ONE North windfarm site.

13.6.2.2.1 Dutch Fishing Vessels

Beam trawlers

167. As previously mentioned, Dutch beam trawling activity occurs at moderate to high levels across a wide section of the Southern North Sea, however, activity within the East Anglia ONE North windfarm site is comparatively low.

168. Loss or restricted access to fishing grounds during operation would be long term, however, Dutch beam trawlers would be able regain access for fishing to most of the East Anglia ONE North windfarm site. Therefore the magnitude of the effect is considered to be low.

169. As discussed before for the construction phase (***section 13.6.1.2.1***) the sensitivity of Dutch beam trawlers to loss of fishing grounds is considered to be low. This combined with the low magnitude of the effect described above results in an impact of **minor adverse** significance.

Seine netting

170. As previously mentioned, it may not be possible for Dutch seine netters to resume fishing within the operational East Anglia ONE North windfarm site. However, fishing activity by these vessels in the in the East Anglia ONE North windfarm site occurs at very low levels. The majority of activity is concentrated in other areas of the Southern North Sea and the English Channel. In addition, the area that the East Anglia ONE North windfarm site occupies relative to the fishing grounds available to this fleet is small. Considering the above whilst acknowledging the long term duration of the operational phase, the magnitude of the effect is considered to be low resulting in an impact of **minor adverse** significance.

Other Dutch fishing methods

171. Fishing within the East Anglia ONE North windfarm site by Dutch fishing vessels, other than beam trawlers and seine netters (pelagic trawlers, demersal otter trawlers, nets, traps and dredges) occurs at very low/negligible levels (***Figure 13.12 to Figure 13.17***). Considering the limited levels of activity of these vessels in the site, the magnitude of the effect is assessed as negligible.

172. As discussed for the construction phase (***section 13.6.1.2.1***), the sensitivity of pelagic trawlers and demersal otter trawlers to loss of fishing grounds is considered to be low, whilst for nets, traps and dredges the sensitivity is considered medium. This, in combination with the negligible magnitude of the effect results in an impact of **negligible to minor adverse** significance.

13.6.2.2.2 Belgian Fishing Vessels

Beam trawling

173. The highest levels of activity by Belgian beam trawlers concentrate off the coast of Belgium and in the English Channel. Fishing activity in the study are occurs at low to medium levels including in the area of the East Anglia ONE North windfarm site (***Figure 13.21 and Figure 13.22***).

174. Loss or restricted access to fishing grounds during operation would be long term, however, Belgian beam trawlers would be able regain access for fishing to most of the East Anglia ONE North windfarm site. Therefore the magnitude of the effect is considered to be low.

175. As discussed before for the construction phase (***section 13.6.1.2.2***) the sensitivity of Belgian beam trawlers to loss of fishing grounds is considered to be low. This combined with the low magnitude of the effect described above results in an impact of **minor adverse** significance.

Demersal (otter) trawling

176. Activity by Belgian demersal otter trawlers occurs at very low levels in the East Anglia ONE North offshore windfarm site (***Figure 13.23 and Figure 13.24***).

177. Whilst the long term duration of the operational phase is recognised, considering the limited level of activity of these vessels in the site and the fact that they would be able regain access for fishing to most of the East Anglia ONE North windfarm site, the magnitude of the effect is assessed as negligible.

178. As discussed for the construction phase (***section 13.6.1.2.2***), the sensitivity of demersal trawlers to loss of fishing grounds is considered to be low. This, in combination with the negligible magnitude of the effect results in an impact of **negligible significance.**

13.6.2.2.3 United Kingdom Fishing Vessels

Local inshore vessels

179. The available data and the information obtained during consultation in respect of the location of fishing grounds of local inshore UK vessels, suggest that the majority of activity in areas relevant to the offshore development area occurs across the offshore cable corridor (***Figure 13.27 to Figure 13.30)***. The local inshore fleet would be able to resume fishing activity along the export cables during the operational phase and therefore in general terms the magnitude of the impact on local inshore fishing vessels is considered to be negligible.

180. It is recognised, however, that a portion of the inshore fleet, in addition to targeting areas relevant to the offshore cable corridor may also target grounds further offshore, including the area where the East Anglia ONE North windfarm site is located (***Figure 13.27*** to ***Figure 13.30***). It is anticipated that for the most part, these vessels would be able to resume fishing within the operational site, although it is recognised that some changes to their mode of operation may be required. In the case of vessels operating longlines and nets. Whilst the long term nature of the operational phase is recognised, considering the above, the magnitude of the effect on the local vessels that operate in areas relevant to the East Anglia ONE North windfarm site is considered to be low.

181. As discussed before for the construction phase (***section 13.6.1.2.3***) the sensitivity of local inshore UK vessels to loss of grounds is considered to be medium. This, in combination with the magnitude of effect identified above would result in an impact of **negligible** significance for the local inshore fleet in general and of **minor adverse** significance for those vessels that may be active in areas relevant to the East Anglia ONE North windfarm site.

Other UK vessels

182. Analysis of VMS data (***Figure 13.31 and Figure 13.32***) suggests that beam trawling activity by UK registered beam trawlers occurs at relatively low levels across the study area, with relatively low levels of activity recorded within the East Anglia ONE North windfarm site. In addition, UK registered beam trawlers would be able regain access for fishing to most of the East Anglia ONE North windfarm

site. Whilst the long term nature of the operational phase is recognised, considering the above, the magnitude of the effect is assessed to be low. This is considered to be the case in respect of Anglo-Dutch beam trawlers.

183. In the particular case of UK owned and operated beam trawlers from south-west ports, it is understood that only a limited number of these vessels may occasionally target sole off the coast of East Anglia on a seasonal basis. Considering the comparatively low levels of activity by these vessels in areas relevant to the East Anglia ONE North windfarm site, the magnitude of the effect is assessed as negligible.

184. As discussed before for the construction phase (***section 13.6.1.2.3***) the sensitivity of UK registered beam trawlers (both Anglo Dutch and south-west ports vessels) to loss of fishing grounds is low.

185. The impact of temporary loss or restricted access to fishing grounds during operation is therefore considered to be of **minor adverse** significance in the case of Anglo-Dutch beam trawlers and of **negligible** significance in the case of UK owned and operated beam trawlers.

13.6.2.2.4 French Fishing Vessels

186. Fishing activity levels by French demersal and pelagic trawlers in the East Anglia ONE North windfarm site is low with the majority of activity concentrating in areas to the south towards the English Channel (***Figure 13.33*** to ***Figure 13.36)***.

187. Loss or restricted access to fishing grounds during operation would be long term, however, French demersal and pelagic trawlers would be able regain access for fishing to most of the East Anglia ONE North windfarm site. Therefore the magnitude of the effect is considered to be low.

188. As discussed before for the construction phase (***section 13.6.1.2.4***) the sensitivity of French demersal and pelagic trawlers to loss of fishing grounds is low. This, combined with the low magnitude of the effect identified above results in an impact of **minor adverse** significance.

13.6.2.2.5 Danish Fishing Vessels

189. Activity by sandeel and pelagic Danish trawlers occurs at negligible levels within the East Anglia ONE North windfarm site (***Figure 13.37*** and ***Figure 13.38***). Whilst the long term nature of the operational phase is recognised, in view of the above, the magnitude of the effect is considered to be negligible.

190. As discussed before for the construction phase (***section 13.6.1.2.5***) the sensitivity of sandeel and pelagic Dutch trawlers to loss of fishing grounds is low. This, combined with the negligible magnitude of the effect identified above results in an impact of **negligible** significance

13.6.2.2.6 German Fishing Vessels

191. Analysis of available VMS data for German vessels (***Figure 13.39***) suggests very low levels of fishing activity occur in areas relevant to the East Anglia ONE North offshore windfarm site, with activity concentrating for the most part in the Dutch and Danish Sector of the Central North Sea.

192. Loss or restricted access to fishing grounds during operation would be long term, however, German vessels would be able regain access for fishing to most of the East Anglia ONE North windfarm site. Therefore the magnitude of the effect is considered to be negligible.

193. As discussed before for the construction phase (***section 13.6.1.2.6***) the sensitivity of German beam trawlers to loss of fishing grounds is low. This, combined with the negligible magnitude of the effect identified above results in an impact of **negligible** significance.

13.6.2.3 Impact 3: Displacement of Fishing Activity into Other Areas

194. The majority of activity by local UK inshore vessels around the offshore development area occurs within the 12nm limit, and therefore in areas relevant to the offshore cable corridor. As export cables would be buried, with the exception of some vessels that operate in areas further offshore including in areas relevant to the East Anglia ONE North windfarm site, for the most part fishing by local inshore vessels would be able to continue as it occurred prior to cable installation. The potential for conflicts between these vessels associated with displacement would therefore be limited. Similarly, the potential for conflicts between local inshore vessels and larger towed gear vessels would be limited as the latter would be able to regain access to most of the East Anglia ONE North windfarm site and would be able to fish along the offshore cable corridor. With this in mind the magnitude of the effect is considered to be low.

195. As discussed for the construction phase (***section 13.6.1.3***) the sensitivity of the local inshore fleet to displacement is considered to be medium. Taking this and the low magnitude of the effect identified above, the significance of the impact is considered to be **minor adverse**.

196. In respect of vessels operating towed gear, as outlined for the construction phase (***section 13.6.1.3***), it is considered that the sensitivity of the receptors, magnitude of the effect and resulting impact significance would, at worst, be as identified in relation to complete loss or restricted access to fishing grounds. As summarised in ***Table 13.14***, this would result in an impact of **negligible** to **minor adverse** significance, depending on the fleet under consideration.

Table 13.14 Impact Significance of Displacement of Fishing Activity into Other Areas for Vessels Operating Towed Gears

Receptor Group		Receptor sensitivity	Magnitude of Effect	Impact Significance
Dutch Beam Trawling		Low	Low	**Minor adverse**
Dutch Seine Netting		Low	Low	**Minor adverse**
Other Dutch Methods	Demersal (otter) trawls	Low	Negligible	**Negligible**
	Nets, traps and dredges	Medium	Negligible	**Minor adverse**
Belgian Beam Trawling		Low	Low	**Minor adverse**
Belgian Demersal Otter Trawling		Low	Negligible	**Negligible**
UK Beam Trawling (Anglo-Dutch)		Low	Medium	**Minor adverse**
UK Beam Trawling (Southwest ports)		Low	Negligible	**Negligible**
French demersal and pelagic trawlers		Low	Low	**Minor adverse**
Danish sandeel industrial trawling and pelagic trawlers		Low	Negligible	**Negligible**
German fishing vessels		Low	Negligible	**Negligible**

13.6.2.4 Impact 4: Increased Steaming Times to Fishing Grounds

197. During operation, the presence of installed infrastructure could potentially result in increases in steaming times for some fishing vessels.

198. As described in ***Chapter 14 Shipping and Navigation***, it is anticipated that fishing vessels will be able to steam through the operational East Anglia ONE North windfarm site. Therefore, the magnitude of the effect is considered to be negligible.

199. As discussed for the construction phase (***section 13.6.1.4***), for local inshore vessels, the sensitivity to increased steaming times is considered to be low and for the remaining fleets is considered to be negligible. This, in combination with the negligible magnitude of the effect identified above results in an impact of **negligible** significance for both the local inshore fleet and the remainder fleets.

13.6.2.5 Impact 5: Interference with Fishing Activity

200. During the operational phase there may be potential for transiting operation and maintenance vessels to result in interference with fishing activities through navigational conflict.

201. As discussed for the construction phase (***section 13.6.1.5***), the sensitivity to interference is considered to be medium for local vessels operating static gear and low for towed gear vessels.

202. The appropriate two-way liaison with local fishermen described for the construction phase would continue during the operational phase to minimise risks of interference with static gears.

203. In the case of towed gear vessels, the same obligations in respect of COLREGS as specified for the construction phase (***section 13.6.1.5***) will apply to operation and maintenance vessels.

204. Considering the above the magnitude of the effect is assessed to be low in respect of static gear vessels and negligible in respect of both vessels operating towed gear. This combined with the sensitivity of the receptors results in an impact of **minor adverse** significance for static gear vessels and of **negligible** significance in the case of towed gear vessels

13.6.2.6 Impact 6: Safety Issues for Fishing Vessels

205. During operation, the presence of infrastructure would result in increased potential for snagging and manoeuvrability risks for fishing vessels. In addition, snagging risks may arise as a result of sections of inter-array, platform link and export cables becoming exposed or as a result of interactions between fishing gear and protected sections of cables.

206. In order to assess the sea bed status, post-lay and burial inspection surveys will be undertaken after installation of cables. A cable laying plan and cable monitoring plan will be required as part of the Deemed Marine Licence, as discussed in ***section 13.3.3***.

207. In addition, the location of cable protection and crossings would be made available to fishing stakeholders and in line with standard oil and gas industry practice, in instances where cable protection is required, procedures would be carried out to ensure that the protection methods used are compatible with fishing activities where feasible and practical.

208. Furthermore, as described in ***section 13.3.3*** the required levels of information distribution would be undertaken through the channels of the Kingfisher Information System and Notices to Mariners, along with direct liaison with fishermen and their representatives. This would primarily be carried out to ensure the appropriate awareness of potential risks amongst fishing vessel owners and crews (***section 13.3.3)***.. This will include appropriate communication with the fishing industry in the event that sections of cables become unburied during the operational phase.

209. In conclusion, with the implementation of the measures and on-going liaison with fishermen and information distribution as discussed above, safety issues for fishing vessels are considered to be **within acceptable limits**.

210. Safety risks arising from the potential for collision with operation and maintenance vessels and allision with project infrastructure are addressed in ***Chapter 14 Shipping and Navigation***. A separate assessment of potential safety issues associated with sea bed obstacles is provided in ***section 13.6.2.7***.

13.6.2.7 Impact 7: Sea bed Obstacles

211. As discussed above for the construction phase (***section 13.6.1.7***), providing the obligations, monitoring and policies are complied with, risks associated with obstacles on the sea bed should remain **within acceptable limits.** In instances of objects accidently dropped overboard the standard requirements of reposition recording and recovery will apply. In addition, snagging and loss of gear protocols will be developed by the Applicant, as discussed in ***section 13.3.3.***

13.6.3 Potential Impacts during Decommissioning

212. The scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and would most likely involve the accessible installed components. Offshore this is likely to include; all of the wind turbine components, part of the foundations (those above sea bed level) and the sections of the inter-array and platform link cables close to the offshore structures, as well as sections of the export cables.

213. With regard to offshore cabling, general UK practice would be followed i.e. buried cables would simply be cut at the ends and left in-situ.

214. It is therefore anticipated that the impacts during decommissioning will be temporary and similar as those identified for the construction phase, that is:

- Impact 1: Potential impacts on commercially exploited fish and shellfish populations;
- Impact 2: Temporary loss or restricted access to traditional fishing grounds;
- Impact 3: Displacement of fishing activity into other areas;
- Impact 4: Increased steaming times to fishing grounds;
- Impact 5: Interference with fishing activity;
- Impact 6: Safety issues for fishing vessels; and
- Impact 7: Obstacles on the sea bed.

215. Throughout decommissioning the sensitivity of receptors is assumed to be the same as for the construction phase. The magnitude of effect is considered to be the same as, and in all likelihood less, than that assigned for the construction

phase. Consequently, potential impacts to fishing fleets during decommissioning are expected to be no greater, and probably less than those assessed for the construction phase.

13.7 Cumulative Impacts

216. The following section provides an assessment of the potential cumulative impacts of the operation, construction and decommissioning phase of the proposed East Anglia ONE North project with other marine developments.

217. The potential impacts considered for cumulative assessment are in line with those described above for assessment of the proposed East Anglia One North project alone and include the following:

- Impact 1: Potential impacts of commercially exploited fish and shellfish species;
- Impact 2: Loss or restricted access to traditional fishing grounds;
- Impact 3: Displacement of fishing activity into other areas.
- Impact 4: Increased steaming times to fishing grounds;
- Impact 5: Interference with fishing activities;
- Impact 6: Safety issues; and
- Impact 7: Obstacles on the sea bed.

218. The potential for cumulative impacts to occur would depend on the operating patterns of and the location of preferred fishing grounds of each fleet in relation to other marine developments. Given the large operational range of some fishing fleets, this assessment considers other marine developments over a wide area, including the wider North Sea and English Channel.

219. Marine projects/activities with potential to result in cumulative impacts on commercial fisheries include other offshore windfarms, aggregate dredging, oil and gas activity and fishing restrictions associated with the introduction of Marine Protected Areas (MPAs).

220. For the purposes of this assessment it is taken that currently operational offshore windfarms, active licenced activities and implemented measures are part of the existing environment, as commercial fishing activity would already be adapted to them. This follows the approach outlined in the Planning Inspectorate Advice Note 17 (the Planning Inspectorate 2015) and in ***Chapter 5 EIA Methodology***. In addition, any effect they might have had would be reflected in the baseline characterisation used to inform this chapter (***Appendix 13.2***).

221. With regard to oil and gas activity it should be noted that whilst new areas are being licenced there is currently no information on if or when these blocks will be

developed. In addition, a significant amount of oil and gas infrastructure is entering decommissioning and removal phases which, once complete, may lead to some increase in fishable areas. Given the limitations noted above, oil and gas activities have not been included in the cumulative assessment.

222. In the case of aggregate dredging areas, it should be recognised that only a small percentage of these areas would be actively dredged at any one time.

223. Offshore windfarms and aggregate dredging areas considered in the cumulative assessment are outlined in ***Table 13.15*****.**

224. With regard to MPAs, from information provided by NFFO / VisNed during the examination phase for the Norfolk Vanguard project, and from responses from NFFO / Visned to the East Anglia ONE North project PEIR (***Appendix 13.1***), it is understood that the closures to fishing within MPAs which are of key concern to fisheries stakeholders include those proposed in the following MPAs in UK, German and Dutch waters:

- Dogger Bank Special Area of Conservation (UK, Dutch and German sites);
- Inner Dowsing, Race Bank and North Ridge SAC (UK);
- North Norfolk Sandbanks and Saturn Reef SAC (UK);
- Haisborough, Hammond and Winterton SAC (UK);
- Swallow Sands Marine Conservation Zone (MCZ) (UK);
- North East Farnes Deep MCZ (UK);
- Sylt Outer Reef SAC (Germany);
- Borkum Reef Ground SAC (Germany); and
- Cleaver Bank SAC (The Netherlands).

225. In addition, NFFO/VisNed have expressed concern in relation to additional potential closures in Dutch waters under the Marine Strategy Framework Directive (MSFD).

226. It should be noted that the proposals for closed areas in UK offshore waters are still open for amendment as they only become final once they are submitted to the European Commission and ratified following scrutiny. On the basis of the information available at the time of writing, it is understood that all other Member States with an active fishing interest have not yet consented to proposals for closed areas in UK waters and this has prevented the UK from submitting proposals to the European Commission. The proposals for closed areas in the Dogger Bank SAC (which includes proposals within the UK, Dutch and German sites) is an exception to this. In this case, the proposal has been agreed by all

interested Member States and it is anticipated that it will be submitted to the European Commission in the near future (DEFRA, pers.comm., 10.04.2019).

227. From information provided by NFFO/VisNed (***Appendix 13.1***), it is understood that the proposals for closures in German waters were submitted by the German Government to the European Commission in February 2019 and that these are expected to be implemented in 2019. The closures proposed in Dutch waters are at a similar stage to those in German waters and are expected to come into force in December 2019.

228. As shown, the proposals for closed areas listed above are progressed at varying degrees. For the purposes of the cumulative assessment a conservative approach has been taken and it has been assumed that all the current proposals for closed areas will be approved and implemented and that their boundaries will remain as currently proposed.

229. The location of the offshore wind farm projects, aggregate dredging areas and proposals for closed areas to fishing included for assessment is illustrated in ***Figure 13.40 and Figure 13.41***.

230. The same receptor sensitivities identified for assessment of the proposed East Anglia ONE North project alone apply for assessment of cumulative impacts. Therefore, reference is made to the sensitivity levels identified for assessment of East Anglia ONE North alone (***Section 13.6***) across the cumulative assessment as appropriate.

Table 13.15 Summary of Offshore Wind Farm Projects and Aggregate Dredging Areas Considered for the CIA

Project	Project status	Distance from site (km)
UK Offshore Windfarms		
East Anglia TWO	Application submitted	10
Beatrice	Under Construction	720
Moray East (MORL Stevenson, Telford and MacColl)	Under Construction	661
Hornsea Project Two	Under Construction	162
East Anglia One	Under Construction	1
Hornsea Project One	Under Construction	154
East Anglia THREE	Consented	17
Dogger Bank Teeside A	Consented	281

Project	Project status	Distance from site (km)
Sophia (Formerly Dogger Bank Teeside B)	Consented	249
Dogger Bank Creyke Beck A	Consented	271
Dogger Bank Creyke Beck B	Consented	267
Triton Knoll	Consented	140
Inch Cape	Consented	529
Seagreen Alpha-Bravo	Consented	519
Neart na Gaoithe	Consented	511
Moray West	Consented	710
Blyth Array 3A&4	Consented	383
Hornsea Project Three	In determination	141
Norfolk Boreas	Application accepted	51
Norfolk Vanguard	In determination	38
Thanet Extension	In determination	102
Hornsea Project Four	In planning (scoped)	167
German Offshore Windfarms		
Albatros I	Under Construction	207
Deutsche Bucht	Under Construction	184
Hohe See	Under Construction	334
Trianel Windpark Borkum II	Under Construction	311
Kaskasi	Consented	408
EnBW He Dreiht	Consented	318
OWP West	Consented	183
Gode Wind 03	Consented	215
Gode Wind 04	Consented	215
Borkum Riffgrund West I	Consented	195
Borkum Riffgrund 2	Consented	192

Project	Project status	Distance from site (km)
Danish Offshore Windfarms		
Horns rev 3	Under Construction	304
Vesterhavet Syd/Nord	Application Submitted	359
Belgian Offshore Windfarms		
Norther	Under Construction	56
Rentel	Pre Construction	52
Seastar	ConsentedPre Construction	48
Mermaid	Pre-Construction	44
Northwester 2	Pre Construction	44
Dutch windfarms		
Borssele Site I and II	Pre Construction	49
Borssele Site III and IV	Pre Construction	42
Borssele Site V -Leeghwater	Consented	47
Hollandse Kust Zuid Holland I and II – Chinook	Consented	58
French Offshore Windfarms		
Parc eolien en mer de Fecamp	Consented	183
Parc Eolien en mer de du Calvados	Consented	152
Parc Eolien en mer de Dieppe – le treport	Consented	230
Project Eolien en mer de la Baie de Saint-Brieuc	Consented	511
Aggregate Dredging Areas (Exploration and Option Areas)		
Outer OTE	Exploration and Option Area	85
Thames D	Exploration and Option Area	64
Colbart	Exploration and Option Area	160
EEC 1 (former 503)	Exploration and Option Area	229

Project	Project status	Distance from site (km)
West Wight	Exploration and Option Area	326
New 495	Exploration and Option Area	14

13.7.1 Cumulative Impacts during Construction

231. The assessment of cumulative impacts during the construction phase takes account of the potential increase in the spatial extent of the impact (where construction at various projects occurs concurrently) but also of the potential increase in the duration of the impact (where construction at different projects occurs sequentially).

13.7.1.1 Impact 1: Potential Impacts on Commercially Exploited Fish and Shellfish Populations

232. There may be potential for the construction of the proposed East Anglia ONE North project in conjunction with construction activities at other projects to result in cumulative impacts on fish and shellfish populations. This could in turn indirectly affect the productivity of the fisheries that target them. The potential cumulative impacts of construction of the proposed East Anglia ONE North project on fish and shellfish species, including those of commercial importance, are assessed in ***Chapter 10 Fish and Shellfish Ecology*** and are not expected to exceed minor adverse significance. Consequently, any cumulative impacts on the commercial fisheries that target them are also not expected to exceed **minor adverse** significance.

13.7.1.2 Impact 2: Loss or Restricted Access to Traditional Fishing Grounds

13.7.1.2.1 Dutch Fishing Vessels

Dutch beam trawling

233. Fishing activity by Dutch beam trawlers occurs at relatively high intensity across a wide section of the Southern North Sea. Some activity also occurs in the Central North Sea, however at lower levels *(**Figure 13.7*** and ***Figure 13.8**).*

234. Construction activities in offshore windfarm projects, aggregate dredging activity and fishing restrictions associated with MPAs in these areas ***(Figure 13.42*** and ***Figure 13.43***), would therefore have the greatest potential to add to cumulative impacts with regard to loss of fishing grounds on this fleet. Recognising the increased area potentially affected /duration of the impact when considering other projects/activities in the North Sea and taking account of the wide extent of fishing grounds available to this fleet, the magnitude of the cumulative effect is considered medium.

235. As discussed for the proposed East Anglia ONE North project alone, the sensitivity of Dutch beam trawlers to loss of fishing grounds is low (***section 13.6***) This, combined with the medium magnitude of effect results in a cumulative impact of **minor adverse** significance.

Dutch seine netting

236. Dutch seine netting activity is widespread throughout the North Sea from the northern coast of Denmark and is highest in the English Channel ***(Figure 13.10*** and ***Figure 13.11***). Construction activities in offshore windfarm projects, aggregate dredging activity and fishing restrictions associated with MPAs in these areas (***Figure 13.44*** and ***Figure 13.45***) would have the greatest potential to add to cumulative impacts in respect of loss of fishing grounds to this fleet.

237. Acknowledging the increase in the area of grounds potentially lost and/or in the duration of exclusion when considering other projects/activities, but recognising the wide operational range and extent of grounds of this fleet, the magnitude of the effect is considered to be medium.

238. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the Dutch seine netting fleet to loss of fishing grounds is low. This combined with the medium magnitude of effect identified above results in a cumulative impact of **minor adverse** significance.

Other Dutch fishing methods

239. Activity by Dutch vessels operating demersal otter trawls, pelagic trawls, dredges, nets and traps is very low/absent in the vicinity of the offshore development area (***Figure 13.12*** to ***Figure 13.18***). Consequently, the potential contribution of construction works in the proposed East Anglia ONE North project to any cumulative impact on this fleet would be minimal. With this in mind the magnitude of the effect is considered to be negligible.

240. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of vessels operating demersal and pelagic trawls is considered to be low. In the case of vessels operating dredges, nets and traps, the sensitivity is considered medium.

241. Taking this together with the negligible magnitude of the effect identified above, the cumulative impact of loss of grounds is considered to be of **minor adverse** significance.

13.7.1.2.2 Belgian Fishing Vessels

Belgian beam trawling

242. The fishing grounds of Belgian beam trawlers cover substantial areas of the Southern North Sea, English Channel and Celtic Sea and parts of the Central North Sea and the Irish Sea (***Figure 13.21*** to ***Figure 13.22***).

243. Construction activities in windfarm projects, aggregate dredging activity and fishing restrictions associated with MPAs, particularly in areas of high fishing intensity, would have the greatest potential to contribute to cumulative impacts in respect of loss of fishing grounds on this fleet. Acknowledging the increase in the area of grounds potentially lost and/or in the duration of exclusion, when taking account of other projects/activities (***Figure 13.46 and Figure 13.47***), but recognising the wide operational range and extent of grounds of this fleet, the magnitude of the effect is considered to be medium.

244. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the Belgian beam trawlers to loss of fishing grounds is low. This combined with the medium magnitude of effect identified above results in a cumulative impact of **minor adverse** significance.

Belgian demersal otter trawling

245. Activity by Belgian otter trawlers takes place over wide areas of the Central and Southern North Sea, the English Channel, the Celtic Sea and the Irish Sea and occurs at very low levels in the offshore development area (***Figure 13.23*** and ***Figure 13.24***). Consequently, the potential contribution of construction works in the proposed East Anglia ONE North project to any cumulative impact on this fleet would be minimal. With this in mind the magnitude of the effect is considered to be negligible.

246. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the Belgian otter trawlers to loss of fishing grounds is low. This combined with the negligible magnitude of effect identified above results in a cumulative impact of **negligible** significance.

13.7.1.2.3 United Kingdom Fishing Vessels

Local inshore fleet

247. The majority of local UK vessels active in the vicinity of the offshore development area are of under 10m in length and primarily exploit grounds within the 12nm (and mostly within the 6nm limit). Therefore, construction activities at other offshore windfarms located in the proximity of the proposed East Anglia ONE North project (i.e. East Anglia THREE and East Anglia TWO), particularly export cable installation, would have the greatest potential to contribute to cumulative impacts on this fleet (***Figure 13.41***) (both whether construction occurs concurrently or sequentially).

248. In this context it is important to note, however, that in line with the approach taken for the proposed East Anglia ONE North project, it would be assumed that where relocation of gear during construction is required for other projects, evidence-based mitigation following FLOWW guidelines would also be applied.

249. In addition to works at other offshore windfarms, there may be potential for aggregate dredging activity in areas in the proximity of the offshore development area (***Figure 13.41*** and ***Table 13.15***) to add to cumulative impacts on this fleet. Any loss of grounds associated with aggregate dredging would however be expected to be short term and localised as discussed in ***paragraph 225.*** Given the static nature of the gear used by the majority of the inshore fleet, it is unlikely that restrictions to fishing associated with MPAs would add significantly to cumulative impacts, as the focus of these restrictions tends to be on vessels operating towed rather than static gear.

250. With the above considerations in mind the magnitude of the cumulative effect on the local inshore fleet is considered to be low.

251. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)*** the sensitivity of local inshore vessels to loss of fishing grounds is considered to be medium. This combined with the low magnitude of the effect identified above, results in a cumulative impact of **minor adverse** significance***.***

Other UK Vessels

252. With regard to UK vessels other than those that form part of the local inshore fleet, as mentioned in ***section 13.5.2***, in areas relevant to the proposed East Anglia ONE North project activity is primarily by beam trawlers. The majority of these are Anglo-Dutch vessels which operate over wide areas in the Southern and Central North Sea (***Figure 13.31*** and ***Figure 13.32***). Construction activities in other projects, aggregate dredging activity and fishing restrictions associated with MPAs in these areas (***Figure 13.48*** and ***Figure 13.49***) would therefore have the greatest potential to contribute to cumulative impacts.

253. Acknowledging the potential increase in the area of grounds potentially lost and/or in the duration of exclusion, when taking account of other projects/activities, but recognising the wide operational range and extent of grounds of the Anglo-Dutch fleet, the magnitude of the effect is considered to be medium.

254. In the case of beam trawlers operating from south-west ports, given the minimal activity of these vessels in the study area, the potential contribution of construction works in the proposed East Anglia ONE North project to any cumulative impact on this fleet would be minimal. With this in mind the magnitude of the effect is considered to be negligible for these vessels.

255. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the UK beam trawlers (both Anglo-Dutch and south-west ports vessels) to loss of fishing grounds is low. This combined with the magnitude of effect identified above results in a cumulative impact of **minor adverse**

significance in the case of Anglo-Dutch vessels and of **negligible** significance in the case of beam trawlers from south-west ports.

13.7.1.2.4 French Fishing vessels

256. From consultation and available data (***Appendix 13.2***) it is apparent that French fishing activity levels in the offshore development area are relatively low with the majority of activity concentrating in areas south of the proposed East Anglia ONE North project towards the English Channel. Construction activities in other windfarm projects, aggregate dredging activity and fishing restrictions associated with MPAs in these areas would therefore have the greatest potential to contribute to cumulative impacts on this fleet (***Figure 13.50*** to ***Figure 13.53***).

257. Recognising the increase in the area of grounds potentially lost and/or in the duration of exclusion when taking account of other projects / activities, but recognising the wide operational range and extent of grounds of this fleet, the magnitude of the effect is considered to be medium.

258. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)*** the sensitivity of French pelagic and demersal trawlers to loss of fishing grounds is considered to be low. This combined with the medium magnitude of the effect identified above, results in a cumulative impact of **minor adverse** significance***.***

13.7.1.2.5 Danish Fishing Vessels

259. Activity by both Danish pelagic trawlers and sandeel trawlers is widespread throughout the North Sea with high areas of activity on the Danish coast and Central North Sea. By comparison (***Figure 13.37 and Figure 13.38***), activity levels by these fleets is very low in the study area.

260. Consequently, the potential contribution of construction works in the proposed East Anglia ONE North project to any cumulative impact on this fleet would be minimal. With this in mind the magnitude of the effect is considered to be negligible.

261. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the Danish sandeel and pelagic trawlers to loss of fishing grounds is low. This combined with the negligible magnitude of effect identified above results in a cumulative impact of **negligible** significance.

13.7.1.2.6 German Fishing Vessels

262. Analysis of available VMS data for German vessels (***Figure 13.39***) suggests very low levels of fishing activity occur in areas relevant to the East Anglia ONE North offshore windfarm site, with activity concentrating for the most part in the Dutch and Danish Sector of the Central North Sea. Consequently, the potential contribution of construction works in the proposed East Anglia ONE North project

to any cumulative impact on this fleet would be minimal. Therefore, the magnitude of the effect is considered to be negligible.

263. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the German beam trawlers to loss of fishing grounds is low. This combined with the negligible magnitude of effect identified above results in a cumulative impact of **negligible** significance.

13.7.1.3 Impact 3: Displacement of Fishing Activity into Other Areas

264. During construction, loss of fishing grounds to local inshore vessels could result in displacement of fishing activity into other areas. This in turn, could cause an increase in competition between local inshore vessels for fishing grounds.

265. Given that the activity of local UK vessels is predominately focussed inshore and their operational range is relatively small, for the most part construction activities at other offshore windfarms located in the proximity of the proposed East Anglia ONE North project (i.e. East Anglia THREE and East Anglia TWO), particularly export cable installation, would have the greatest potential to result in cumulative impacts on this fleet (***Figure 13.41***) (both whether construction occurs concurrently or sequentially).

266. As mentioned above in respect of loss of grounds, however, it should be noted that in line with the approach taken for the East Anglia ONE North project, it would be expected that where relocation of gear during construction is required for other projects, evidence-based mitigation following FLOWW Guidelines (FLOWW 2014; FLOWW 2015) would be applied.

267. In addition to works at other offshore windfarms, there may be potential for aggregate dredging activity in areas in the proximity of the offshore development area (***Figure 13.41***) to add to cumulative impacts on this fleet. Any loss of grounds and associated displacement as a result of aggregate dredging activity would however be expected to be short term and localised. Given the static nature of the gear used by the majority of the inshore fleet, it is unlikely that restrictions to fishing associated with MPAs would add significantly to cumulative impacts in respect of displacement, as the focus of these restrictions tends to be on vessels operating towed rather than static gear. Furthermore, restrictions associated with this would be expected to be only implemented in discrete areas (i.e. where sensitive features are present), rather than across the totality of the MPAs.

268. With the above considerations in mind the magnitude of the cumulative effect on the local inshore fleet is considered to be low.

269. As discussed for the proposed East Anglia ONE North project alone (***section 13.6),*** the sensitivity of local inshore vessels to displacement is considered to be

medium. This combined with the low magnitude of the effect identified above results in a cumulative impact of **minor adverse** significance.

270. In respect of vessels operating towed gear, as outlined for the proposed East Anglia ONE North project alone (***section 13.6)***, it is considered that the sensitivity of the receptors, magnitude of the effect and resulting impact significance would, at worst, be as identified in relation to cumulative loss or restricted access to fishing grounds (***section 13.7.1.2).*** As summarised in ***Table 13.16,*** this would result in an impact of **negligible to minor adverse** significance, depending on the fleet under consideration.

Table 13.16 Impact Significance of Cumulative Displacement of Fishing Activity into Other Areas for Towed Gear Fleets During Construction

Receptor Group		Receptor sensitivity	Magnitude of Effect	Impact Significance
Dutch Beam Trawling		Low	Medium	**Minor adverse**
Dutch Seine Netting		Low	Medium	**Minor adverse**
Other Dutch Methods	Demersal (otter) trawls	Low	Negligible	**Negligible**
	Nets, traps and dredges	Medium	Negligible	**Minor adverse**
Belgian Beam Trawling		Low	Medium	**Minor adverse**
Belgian Demersal Otter Trawling		Low	Negligible	**Negligible**
UK Beam Trawling (Anglo-Dutch)		Low	Medium	**Minor adverse**
UK Beam Trawling (Southwest ports)		Low	Negligible	**Negligible**
French demersal and pelagic trawlers		Low	Medium	**Minor adverse**
Danish sandeel industrial trawlers and pelagic trawlers		Low	Negligible	**Negligible**
German fishing vessels		Low	Negligible	**Negligible**

13.7.1.4 Impact 4: Increased Steaming Times to Fishing Grounds

271. There is potential for the safety zones applied during construction of the proposed East Anglia ONE North project together with those associated with other projects included in the cumulative assessment (***Table 13.15, Figure 13.40*** and ***Figure 13.41***) to result in increased steaming times for fishing vessels.

272. Whilst the potential increase in areas with safety zones in place at any given time due to construction activities at other projects is recognised, considering the relatively small footprint of these zones the magnitude of the impact is considered to be low.

273. As discussed for the proposed East Anglia ONE North project alone (***section 13.6),*** the sensitivity of local inshore vessels to increased steaming times is considered to be low, whilst for the remaining fleets it is considered to be negligible. This, combined with the magnitude of effect identified above, results in an impact of **minor adverse** significance for the local inshore fleet and of **negligible** significance for the remaining of the fleets.

13.7.1.5 Impact 5: Interference with Fishing Activities

274. The increase in vessel movements associated with the construction phase of the proposed East Anglia ONE North project together with other projects could result in cumulative impacts in terms of interference with fishing activities.

275. It should be noted, however, that it in line with the approach proposed for the proposed East Anglia ONE North project, it would be expected that appropriate liaison enabling awareness to vessels in transit on the location of static gear and fishermen's awareness of vessel transit routes, would be undertaken at the other projects included in the assessment to minimise potential interference. In the case of towed gears, the same obligations in respect of COLREGS outlined in ***section 13.6,*** would also apply to other projects. Whilst the relative increase in the level of vessel transits resulting from the proposed East Anglia ONE North project in conjunction with other projects is recognised, with the appropriate two way liaison with fishermen and adherence to COLREGs obligations as outlined above, the magnitude of the effect is considered to be low.

276. As discussed for the proposed East Anglia ONE North project alone (***section 13.6),*** the sensitivity of vessels operating static gear is considered to be medium and that of vessels operating towed gear is considered to be low. This, in combination with the magnitude of effect identified above results in a cumulative impact of **minor adverse** significance.

13.7.1.6 Impacts 6 and 7: Safety Issues and Obstacles in the Sea bed

277. It is recognised that in addition to the construction works associated with the East Anglia ONE North project, other projects and activities included for assessment of cumulative impacts, particularly other offshore wind farms, could result in additional safety issues and sea bed obstacles for fishing vessels.

278. It should be noted, however, that the same factors and obligations with regard to safety and sea bed obstacles applied to the proposed East Anglia ONE North project would also apply to other projects/activities. Safety risks in a cumulative context would therefore remain as assessed for the project alone; **within acceptable limits.**

13.7.2 Cumulative Impacts during Operation

13.7.2.1 Impact 1: Potential Impacts on Commercially Exploited Fish and Shellfish Populations

279. There may be potential for the operational phase of the proposed East Anglia ONE North project in conjunction with other projects to result in cumulative impacts on fish and shellfish populations. This could in turn indirectly affect the productivity of the fisheries that target them. The potential cumulative impacts of the operational phase of the proposed East Anglia ONE North project on fish and shellfish species, including those of commercial importance, are assessed in ***Chapter 10 Fish and Shellfish Ecology*** and are not expected to exceed minor adverse significance. Consequently, any impacts on the commercial fisheries that target them are also not expected to exceed **minor adverse** significance.

13.7.2.2 Impact 2: Loss or Restricted Access to Traditional Fishing Grounds

13.7.2.2.1 Dutch Fishing Vessels

Dutch beam trawling

280. The operational phase of offshore wind farm projects, particularly in the case of projects located in areas that sustain high levels of beam trawling activity, will cumulatively add to loss of grounds on this fleet. This will be of greater relevance in the case of offshore windfarm projects off the Dutch and Belgian coast, as fishing within operational windfarms is prohibited in these countries. An additional important contribution to potential cumulative impacts would come from potential restrictions on towed gear fishing implemented in MPAs. As shown in ***Figure 13.42 and 13.43,*** current proposals for towed gear closures cover considerable areas and sections of these overlap with grounds targeted by Dutch beam trawlers.

281. Recognising the increased area potentially affected and the long term nature of the impact, particularly when taking account of potential closed areas to fishing and future offshore wind farm development in countries where fishing is not permitted within offshore windfarm sites (***Figure 13.42*** and ***Figure 13.43***) the magnitude of the cumulative effect is considered high.

282. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of Dutch beam trawlers to loss of fishing grounds is considered to be low. This, together with the high magnitude of the effect identified above results in an impact of **moderate adverse** significance and therefore significant in EIA terms.

283. In the context of this assessment it is important to note that beam trawling will be able to resume within the East Anglia ONE North wind farm site. Taking this into account and the comparatively low levels of activity by this fleet in the immediate area of the wind farm site, the contribution of the proposed East Anglia ONE North project to the overall cumulative impact would be very small (see ***section***

13.6.1.2.1). Impact significance would remain moderate adverse regardless of whether or not the proposed East Anglia ONE North project was considered in the cumulative assessment.

Dutch seine netting

284. Fishing activity by Dutch seine netters in the Southern and Central North Sea occurs at considerably lower levels than beam trawling. The highest levels of activity concentrate south of the offshore development area, around the English Channel. Other windfarm projects, aggregate dredging activity and fishing restrictions associated with MPAs, particularly in these areas would therefore have the greatest potential to add to cumulative impacts with regard to loss of fishing grounds ***(Figure 13.44 and Figure 13.45***).

285. As shown in ***Figure 13.44 and Figure 13.45***, there is little overlap between seine netting grounds in the Channel and other projects/activities that could result in cumulative impacts. However, in a North Sea context, particularly when taking account of offshore windfarm development and the extent of proposals for closed areas to fishing in Dutch and German waters, the level of overlap is considerable. In this context, it is important to note that it is not considered likely that this method will be able to resume within operational wind farms. With this in mind and assuming that some vessels rely on grounds in the North Sea at times, the magnitude of the impact is considered to be high.

286. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of Dutch seine netters to loss of fishing grounds is considered to be low. This, together with the high magnitude of the effect identified above results in a cumulative impact of **moderate adverse** significance and therefore significant in EIA terms.

287. In the context of this assessment it is important to note that the East Anglia ONE North windfarm site supports seine netting activity at low levels. Therefore, the contribution of the proposed East Anglia ONE North project to the cumulative impact on this fleet would be very small (see ***section 13.6.1.2.1***). The conclusion of moderate adverse significance would apply regardless of whether or not the project was considered in the assessment.

Other Dutch fishing methods

288. Activity by Dutch vessels operating demersal otter trawls, pelagic trawls, nets, dredges, nets and traps is very low/absent in the vicinity of the offshore development area (***Figure 13.12 to Figure 13.18***). Consequently, the potential contribution of the operational phase of the proposed East Anglia ONE North project to any cumulative impact on this fleet would be minimal. With this in mind the magnitude of the effect is considered to be negligible.

289. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of vessels operating demersal and pelagic trawls is considered to be low. In the case of vessels operating dredges, nets and traps, the sensitivity is considered medium.

290. Taking this together with the negligible magnitude of the effect identified above, the cumulative impact of loss of grounds is considered to be of **negligible** significance.

13.7.2.2.2 Belgian Fishing Vessels

Belgian beam trawling

291. The fishing grounds of Belgian beam trawlers cover substantial areas of the Southern North Sea, English Channel and Celtic Sea and parts of the Central North Sea and the Irish Sea (***Figure 13.21 to Figure 13.22***). Other windfarm projects, aggregate dredging activity and fishing restrictions associated with MPAs in these areas would therefore have the greatest potential to add to cumulative impacts with regard to loss of fishing grounds ***(Figure 13.46 and Figure 13.47***).

292. With the exception of windfarms in countries where fishing in operational sites is not permitted (i.e. Holland and Belgium) or where restrictions on towed gear fishing inside operational sites may be applied, Belgian beam trawlers would be expected to have access to offshore windfarms once operational. Note that activity by this fleet is higher in the southern section of the Southern North Sea and the English Channel, therefore the principal fishing grounds of this fleet would largely remain unaffected by the current proposals for closed areas to fishing in MPAs (for the most part located north of the proposed East Anglia ONE North project) (***Figure 13.46 and Figure 13.47***).

293. Taking the increased area potentially affected and long term nature of the operational phase but considering the extent of fishing grounds available to this fleet and location of other projects/activities the magnitude of the impact is considered to be medium (***Figure 13.46 and Figure 13.47***).

294. As discussed for the proposed East Anglia ONE North project alone (***Section 13.6)***, the sensitivity of the Belgian beam trawlers to loss of fishing grounds is low. This combined with the medium magnitude of effect identified above results in a cumulative impact of **minor adverse** significance.

Belgian demersal otter trawling

295. Activity by Belgian otter trawlers takes place over wide areas of the Central and Southern North Sea, the English Channel, the Celtic Sea and the Irish Sea and occurs at very low levels in the offshore development area (***Figure 13.23 and Figure 13.24***). Consequently, the potential contribution of the operational phase of the proposed East Anglia ONE North project to any cumulative impact on this

fleet would be minimal. With this in mind the magnitude of the effect is considered to be negligible.

296. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the Belgian otter trawlers to loss of fishing grounds is low. This combined with the negligible magnitude of effect identified above results in a cumulative impact of **negligible** significance.

13.7.2.2.3 United Kingdom Fishing Vessels

Local inshore fleet

297. The majority of activity by local inshore vessels is within 12nm of the UK coast (and mostly within 6nm). Offshore windfarms, aggregate dredging activity and MPAs in these areas, would therefore have the greatest potential to contribute to cumulative loss of fishing grounds to this fleet.

298. In respect of other offshore windfarms, key projects with potential to result in cumulative impacts on the local inshore fleet are those in the vicinity of the proposed East Anglia ONE North project, namely East Anglia ONE, East Anglia TWO and East Anglia THREE (***Figure 13.41***). It should be noted, however, that once operational, fishing by local inshore vessels would be expected to able to resume over the export cables of these windfarms. Similarly, fishing would be able to resume within the windfarm arrays, although it is recognised that some methods, such as longlining and netting, may need to modify their mode of operation.

299. With regard to aggregate dredging activity, whilst it could contribute to cumulative impacts, as previously mentioned, its temporary and localised nature should be acknowledged.

300. Given the static nature of the gear used by the majority of the inshore fleet, it is unlikely that restrictions to fishing associated with MPAs would add significantly to cumulative impacts, as the focus of these restrictions tends to be on vessels operating towed rather than static gear.

301. With the above considerations in mind, the magnitude of the cumulative impact is considered to be low.

302. As discussed for the proposed East Anglia ONE North project alone (***section 13.6***), the sensitivity of the local inshore fleet to loss of fishing grounds is medium. This, in combination with the low magnitude of effect identified above, results in a cumulative impact of **minor adverse** significance.

Other UK Vessels

303. With regard to UK vessels other than those that form part of the local inshore fleet, as mentioned in ***section 13.5.2***, in areas relevant to the proposed East

Anglia ONE North project activity is primarily by beam trawlers. The majority of these are Anglo-Dutch vessels which operate over wide areas in the Southern and Central North Sea (***Figure 13.31*** and ***Figure 13.32***).

304. Offshore windfarms and aggregate dredging activity, particularly in the Central North Sea, where activity by these vessels is highest, would contribute to cumulative impacts on this fleet (***Figure 13.48*** and ***Figure 13.49***). Impacts from wind farms which may become operational in countries where access to fishing is prohibited within operational sites would contribute considerably as well as closed areas to fishing in the Southern and Central North Sea (***Figure 13.48*** and ***Figure 13.49).***

305. Considering the increased area from where fishing may be excluded and the long term nature of the impact, particularly when taking account of the extent of the proposals for closed areas to fishing and offshore wind development in countries where fishing is not permitted during operation, the magnitude of the cumulative effect is assessed to be high.

306. In the case of beam trawlers operating from south-west ports, given the minimal activity of these vessels in the study area, the potential contribution of the operational phase of the proposed East Anglia ONE North project to any cumulative impact on this fleet would be minimal. With this in mind the magnitude of the effect is considered to be negligible for these vessels.

307. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the UK beam trawlers (both Anglo-Dutch and south-west ports vessels) to loss of fishing grounds is low. This combined with the magnitude of effect identified above results in a cumulative impact of **moderate adverse** significance (and therefore significant in EIA terms) in the case of Anglo-Dutch vessels and of **negligible** significance in the case of beam trawlers from south-west ports.

308. In the context of the assessment in respect of Anglo-Dutch vessels, it is important to note that fishing would be able to resume within the East Anglia ONE North windfarm site during operation. Considering this and the relatively low levels of activity by this fleet that the site supports, the contribution of the project to the overall cumulative impact would be very small (see ***section 13.6.2.2.3***. The conclusion of the cumulative assessment of moderate adverse significance on Anglo-Dutch beam trawlers, would therefore remain the same regardless of whether or not the proposed East Anglia ONE North project was considered in the cumulative assessment.

13.7.2.2.4 French Fishing Vessels

309. From consultation and available data (***Appendix 13.2)*** it is apparent that French fishing activity levels in the offshore development area are relatively low with the majority of activity concentrating in areas south of the proposed East Anglia ONE North project towards the English Channel. Offshore windfarms, aggregate dredging activity and MPAs in these areas, would therefore have the greatest potential to contribute to cumulative loss of fishing grounds to this fleet (***Figure 13.50*** to ***Figure 13.53***).

310. With the exception of windfarms in countries where fishing in operational sites is not permitted (i.e. Holland and Belgium) or where restrictions on towed gear fishing inside operational sites may be applied, French trawlers would be expected to have access to offshore windfarms once operational.

311. Taking the increased area potentially affected and considering the extent of fishing grounds available to this fleet and the location of other projects/activities (***Figure 13.50*** to ***Figure 13.53***) the magnitude of the cumulative effect is considered medium.

312. As discussed for the proposed East Anglia ONE North project alone (***section 13.6.1.2.4)***, the sensitivity of the French demersal and pelagic trawlers to loss of fishing grounds is low. This combined with the magnitude of effect identified above results in a cumulative impact of **minor adverse** significance

13.7.2.2.5 Danish fishing vessels

313. Activity by both Danish pelagic trawlers and sandeel trawlers is widespread throughout the North Sea with high areas of activity on the Danish coast and Central North Sea. By comparison (***Figure 13.37*** and ***Figure 13.38***), activity levels by these fleets is very low in the study area.

314. Consequently, the potential contribution of the operational phase of proposed East Anglia ONE North project to any cumulative impact on this fleet would be minimal. With this in mind the magnitude of the effect is considered to be negligible.

315. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the Danish sandeel and pelagic trawlers to loss of fishing grounds is low. This combined with the negligible magnitude of effect identified above results in a cumulative impact of **negligible** significance.

13.7.2.2.6 German fishing vessels

316. Analysis of available VMS data for German vessels (***Figure 13.39***) suggests very low levels of fishing activity occur in areas relevant to the East Anglia ONE North offshore windfarm site, with activity concentrating for the most part in the Dutch and Danish Sector of the Central North Sea. Consequently, the potential

contribution of the operational phase of the proposed East Anglia ONE North project to any cumulative impact on this fleet would be minimal.

317. As discussed for the proposed East Anglia ONE North project alone (***section 13.6)***, the sensitivity of the German vessels to loss of fishing grounds is low. This combined with the magnitude of effect identified above results in a cumulative impact of **negligible** significance

13.7.2.3 Impact 3: Displacement of Fishing Activity into Other Areas

318. During operation, the cumulative loss of fishing grounds to local inshore vessels could result in a displacement of fishing activity into other areas. This in turn, could cause an increase in competition between local inshore vessels for fishing grounds.

319. In respect of other offshore windfarms, key projects with potential to contribute cumulatively to displacement impacts on the local inshore fleet are those in the vicinity of the proposed East Anglia ONE North project, namely East Anglia ONE, East Anglia TWO and East Anglia THREE (***Figure 13.41***). It should be noted, however, that as previously mentioned, once operational, fishing by local inshore vessels would be expected to able to resume over the export cables of these windfarms. Similarly, fishing would be able to resume within the windfarm arrays, although it is recognised that some methods, such as longlining and netting may need to modify their mode of operation. The potential for displacement effects on local inshore fleet associated with offshore windfarms would therefore be very small. With regard to aggregate dredging activity, given its localised and short time nature any displacement effects on this fleet would be limited. In the particular case of displacement associated with loss of grounds as a result of restrictions on fishing implemented on MPAs, given the static nature of the gear used by the majority of the inshore fleet, it is unlikely that this would add significantly to cumulative impacts in respect of displacement, as the focus of these restrictions tends to be on vessels operating towed rather than static gear.

320. With this in mind the magnitude of the effect of displacement on the local inshore fleet is considered low.

321. As discussed for the proposed East Anglia ONE North project alone (***section 13.6),*** the sensitivity of local inshore vessels to displacement is considered to be medium. This combined with the low magnitude of the effect identified above results in a cumulative impact of **minor adverse** significance***.***

322. In respect of vessels operating towed gear, as outlined for the proposed East Anglia ONE North project alone (***section 13.6)***, it is considered that the sensitivity of the receptors, magnitude of the effect and resulting impact significance would, at worst, be as identified in relation to the loss or restricted

access to fishing grounds (***section 13.7.2.2).*** As summarised in ***Table 13.17,*** this would result in an impact of **negligible to moderate adverse** significance, depending on the fleet under consideration.

323. As previously described with regard to the assessment of loss of grounds, where impacts of moderate adverse significance (and therefore significant in EIA terms) have been identified, the contribution of the proposed East Anglia ONE North to the overall cumulative impact would be very small.

Table 13.17 Impact Significance of Cumulative Displacement of Fishing Activity into Other Areas for Towed Gear Fleets

Receptor Group		Receptor sensitivity	Magnitude of Effect	Impact Significance
Dutch Beam Trawling		Low	High	**Moderate adverse**
Dutch Seine Netting		Low	High	**Moderate adverse**
Other Dutch Methods	Demersal (otter) trawls	Low	Negligible	**Negligible**
	Nets, traps and dredges	Medium	Negligible	**Minor adverse**
Belgian Beam Trawling		Low	Medium	**Minor adverse**
Belgian Demersal Otter Trawling		Low	Negligible	**Negligible**
UK Beam Trawling (Anglo-Dutch)		Low	High	**Moderate adverse**
UK Beam Trawling (Southwest ports)		Low	Negligible	**Negligible**
French demersal and pelagic trawlers		Low	Medium	**Minor adverse**
Danish sandeel industrial trawling and pelagic trawling		Low	Negligible	**Negligible**
German fishing vessels		Low	Negligible	**Negligible**

13.7.2.4 Impact 4: Increased Steaming Times to Fishing Grounds

324. During operation, the presence of installed infrastructure associated with the proposed East Anglia ONE North project together with that of other projects included in the cumulative assessment, could potentially result in increases in steaming times for some fishing vessels.

325. As described in ***Chapter 14 Shipping and Navigation***, it is anticipated that fishing vessels will be able to steam through the operational East Anglia ONE North windfarm. Therefore, the magnitude of the effect is negligible. This would also be expected to be the case for other projects. With, this in mind, the magnitude of the effect is considered to be negligible.

326. As discussed for the proposed East Anglia ONE North project alone (***section 13.6.1.4***), for local inshore vessels, the sensitivity to increased steaming times of local inshore vessels is considered to be low and for the remaining fleets is considered to be negligible. This, in combination with the negligible magnitude of the effect identified above results in a cumulative impact of **negligible** significance for the local inshore fleet and the remaining of fleets.

13.7.2.5 Impact 5: Interference with Fishing Activities

327. The increase in vessel movements associated with the operation phase of the proposed East Anglia ONE North project together with vessels movements at other projects could result in cumulative impacts in terms of interference with fishing activities.

328. It should be noted, however, that as described above in respect of cumulative impacts for the construction phase (***section 13.7.1.5***), it would be expected that appropriate liaison enabling awareness to vessels in transit on the location of static gear and fishermen's awareness of vessel transit routes, would be undertaken at the other projects included in the assessment to minimise potential interference. In the case of towed gears, the same obligations in respect of COLREGS outlined in ***section 13.6,*** would also apply to other projects. Whilst the relative increase in the level of vessel transits resulting from the proposed East Anglia ONE North project in conjunction with other projects is recognised, with the appropriate two way liaison with fishermen and adherence to COLREGs obligations, the magnitude of the effect is considered to be low.

329. As discussed for the proposed East Anglia ONE North project alone (***section 13.6),*** the sensitivity of vessels operating static gear is considered to be medium and that of vessels operating towed gear is considered to be low. This, in combination with the magnitude of effect identified above results in a cumulative impact of **minor adverse** significance.

13.7.2.6 Impacts 6 and 7: Safety Issues and Obstacles on the Sea Bed

330. It is recognised that in addition to the proposed East Anglia ONE North project, other projects and activities included for assessment of cumulative impacts, particularly other offshore wind farms, could result in additional safety issues and sea bed obstacles for fishing vessels during the operational phase.

331. It should be noted, however, that the same factors and obligations with regard to safety and sea bed obstacles applied to the proposed East Anglia ONE North project would also apply to other projects/activities. Safety risks in a cumulative context would therefore remain as assessed for the project alone; **within acceptable limits**.

13.7.3 Cumulative Impacts during Decommissioning

332. The scope of decommissioning works for other offshore windfarm projects is likely to be similar to that described in ***section 13.6.3*** for the proposed East Anglia ONE North project.

333. It is therefore expected that cumulative impacts during decommissioning would be temporary and short term and similar to those identified in respect of the assessment of cumulative impacts during construction, namely:

- Impact 1: Potential impacts on commercially exploited fish and shellfish populations;
- Impact 2: Temporary loss or restricted access to traditional fishing grounds;
- Impact 3: Displacement of fishing activity into other areas;
- Impact 4: Increased steaming times to fishing grounds;
- Impact 5: Interference with fishing activity;
- Impact 6: Safety issues for fishing vessels; and
- Impact 7: Obstacles on the sea bed.

334. Throughout the decommissioning phase, the sensitivity of receptors is assumed to be the same as identified for assessment in respect of cumulative impacts during construction. Similarly, the magnitude of effect would be expected to be the same, and in all likelihood less, than that identified in respect of the construction phase. Consequently, cumulative impacts to fishing fleets during decommissioning are expected to be no greater, and probably less than those assessed for the construction phase.

13.8 Interactions

335. The impacts identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic impacts as a result of that interaction. The areas of interaction between impacts are presented in ***Table 13.18*** along with an indication as to whether the interaction may give rise to synergistic impacts. This provides a screening tool for which impacts have the potential to interact.

336. ***Table 13.19*** then provides an assessment for each receptor (or receptor group) related to these impacts in two ways. Firstly, the impacts are considered within a development phase (i.e. construction, operation or decommissioning) to see if, for example, multiple construction impacts could combine. Secondly, a lifetime assessment is undertaken which considers the potential for impacts to affect receptors across development phases. The significance of each individual impact is determined by the sensitivity of the receptor and the magnitude of effect; the sensitivity is constant whereas the magnitude may differ. Therefore, when

considering the potential for impacts to be additive it is the magnitude of effect which is important – the magnitudes of the different effects are combined upon the same sensitivity receptor. If minor impact and minor impact were added this would effectively double count the sensitivity.

Table 13.18 Interactions Between Impacts

Potential interaction between impacts							
Construction							
	Impact 1: Potential impacts on commercially exploited fish and shellfish populations	Impact 2: Temporary loss or restricted access to traditional grounds	Impact 3: Displacement of fishing activity into other areas	Impact 4: Increased steaming times to fishing grounds	Impact 5: Interference with fishing activities	Impact 6: Safety issues for fishing vessels	Impact 7: Obstacles on the sea bed
Impact 1: Potential impacts on commercially exploited fish and shellfish populations	-	No	No	No	No	No	No
Impact 2: Temporary loss or restricted access to traditional grounds	No	-	Yes	No	No	No	No
Impact 3: Displacement of fishing activity into other areas	No	Yes	-	No	No	No	No
Impact 4: Increased steaming times to fishing grounds	No	No	No	-	No	No	No
Impact 5: Interference with fishing activities	No	No	No	No	-	No	No
Impact 6: Safety issues for fishing vessels	No	No	No	No	No	-	Yes
Impact 7: Obstacles on the sea bed	No	No	No	No	No	Yes	-

Potential interaction between impacts							
Operation							
	Impact 1: Potential impacts on commercially exploited fish and shellfish populations	Impact 2: Complete loss or restricted access to traditional grounds	Impact 3: Displacement of fishing activity into other areas	Impact 4: Increased steaming times to fishing grounds	Impact 5: Interference with fishing activities	Impact 6: Safety issues for fishing vessels	Impact 7: Obstacles on the sea bed
Impact 1: Potential impacts on commercially exploited fish and shellfish populations	-	No	No	No	No	No	No
Impact 2: Complete loss or restricted access to traditional grounds	No	-	Yes	No	No	No	No
Impact 3: Displacement of fishing activity into other areas	No	Yes	-	No	No	No	No
Impact 4: Increased steaming times to fishing grounds	No	No	No	-	No	No	No
Impact 5: Interference with fishing activities	No	No	No	No	-	No	No
Impact 6: Safety issues for fishing vessels	No	No	No	No	No	-	Yes
Impact 7: Obstacles on the sea bed	No	No	No	No	No	Yes	-
Decommissioning							
It is anticipated that the decommissioning impacts will be similar in nature to those of construction.							

Table 13.19 Potential Interactions between Impacts on Commercial Fisheries

	Highest level significance				
Receptor	**Construction**	**Operational**	**Decommissioning**	**Phase Assessment**	**Lifetime Assessment**
Dutch beam trawlers Dutch seine netters Other Dutch methods Belgian beam trawlers Belgian otter trawlers UK local inshore fleet in general UK local inshore vessels with high dependence on the offshore development area Anglo-Dutch beam trawlers UK beam trawlers from south-west ports	Minor adverse	Minor adverse	Minor adverse	**No greater than individually assessed impact** ***Construction*** *Impact 2 Temporary loss or restricted access to traditional grounds* and *Impact 3 Displacement of fishing activity into other areas* were assessed as having a negligible to medium magnitude of impact depending on the receptor. Fishing vessels temporarily losing access to traditional fishing grounds would naturally be displaced to other areas which in turn could result in increased competition for fishing grounds in other areas. This specific pathway is already dealt with in the individual assessment of *impact 3* which concluded magnitudes of low to negligible. It is considered that there would be no further pathway for interaction of these impacts and therefore this is not considered further. ***Operation*** *Impact 2 Complete loss or restricted access to traditional grounds* and *Impact 3 Displacement of fishing activity into*	**No greater than individually assessed impact** Given that the pathways for interaction between *loss or restricted access to fishing grounds* and *displacement of fishing activity into other areas* has already been assessed throughout the lifetime of the project within the project assessment, concluding low to negligible impact magnitudes, no further discussion of this is required. Standard and best practice management measures would ensure no or very limited interaction between *safety issues for fishing vessels* and *obstacles on the seabed* such that over the project lifetime these impacts would not combine and represent an increase in the significance level.

Highest level significance					
Receptor	**Construction**	**Operational**	**Decommissioning**	**Phase Assessment**	**Lifetime Assessment**
French pelagic and demersal trawlers Danish sandeel and pelagic trawlers German beam trawlers				*other areas* again have potential to interact however in the absence of safety zones, unlike during construction fishing vessels would have full access to the windfarm site thus reducing the potential for them to be displaced to other areas. As in the construction assessment, this specific pathway is already dealt with in the individual assessment of *impact 3* which concluded magnitudes of low to negligible. It is considered that there would be no further pathway for interaction of these impacts and therefore this is not considered further. *Impact 6 Safety issues for fishing vessels* and *Impact 7 Obstacles on the sea bed* are inherently linked given that obstacles on the sea bed represent a safety issue for all fishing fleets. These impacts are deemed to be within acceptable limits when assessed individually and given that each impact will be managed with standard and best practice methodologies it is considered that there would either be no interactions or that these would not result in greater impact than assessed individually.	

13.9 Inter-relationships

337. From the assessment of impacts on commercial fisheries during the construction, operational and decommissioning phases of the proposed East Anglia ONE North project, there is the potential for impacts addressed in other ES chapters to potentially augment impacts assessed for commercial fisheries and vice versa.

338. These inter-relationships are summarised in ***Table 13.19*** below. No inter-relationships have been identified where additional mitigation is required due to an accumulation of residual impacts on commercial fisheries.

Table 13.20 Commercial Fisheries inter-relationships

Topic and description	Related Chapter	Where addressed in this Chapter
Potential Impacts on Commercially Exploited Fish and Shellfish Impacts on fish and shellfish species of commercial importance could indirectly affect the fisheries that target them.	***Chapter 10 Fish and Shellfish Ecology***	***Section 13.6.1.1*** and ***section 13.6.2.1***
Safety Issues for Fishing Vessels In addition to safety issues for fishing vessels arising from snagging risks, manoeuvrability hindrances and sea bed obstacles (addressed in this chapter), fishing vessels would also be affected by safety issues associated with potential for collision or allision with project vessels and infrastructure. These are addressed in ***Chapter 14 Shipping and Navigation.***	***Chapter 14 Shipping and Navigation***	***Section 13.6.1.6***
Increased Steaming Times Potential increases in steaming times to fishing grounds would arise depending on the potential for fishing vessels to be able to transit the offshore development area during construction and operation.	***Chapter 14 Shipping and Navigation***	***Section 13.6.1.4***and ***section 13.6.2.4***

13.10 Summary

339. A summary of the outcome of the assessment of the impacts of the proposed East Anglia ONE North project alone and cumulative with other projects on commercial fisheries receptors is given in ***Table 13.20*** and ***Table 13.21***, respectively.

340. It should be noted that the sensitivity, magnitude and resulting impact significance identified take account of the embedded mitigation measures described in ***section 13.3.3.***Where appropriate, additional mitigation measures have been proposed.

Table 13.21 Potential impacts identified for Commercial Fisheries

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Construction						
Impact 1: Potential impacts on commercially exploited fish and shellfish species	See ***Chapter 10 Fish and Shellfish Ecology***			Minor adverse	N/A	**Minor adverse**
Impact 2: Temporary loss or restricted access to fishing grounds	Dutch beam trawlers	Low	Low	Minor adverse	N/A	**Minor adverse**
	Dutch seine netters	Low	Low	Minor adverse	N/A	**Minor adverse**
	Other Dutch methods	Low / Medium	Negligible	Negligible to minor adverse	N/A	**Negligible to Minor adverse**
	Belgian beam trawlers	Low	Low	Minor adverse	N/A	**Minor adverse**
	Belgian otter trawlers	Low	Negligible	Negligible	N/A	**Negligible**
	UK local inshore fleet in general	Medium	Low	Minor adverse	N/A	**Minor adverse**
	UK local inshore vessels with high dependence on the offshore development area	Medium	Medium	Moderate adverse	Evidence-based mitigation with regard to FLOWW guidance where static gear needs to be relocated	**Minor adverse**

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
	Anglo-Dutch beam trawlers	Low	Low	Minor adverse	N/A	**Minor adverse**
	UK beam trawlers from south-west ports	Low	Low	Negligible	N/A	**Negligible**
	French pelagic and demersal trawlers	Low	Low	Minor adverse	N/A	**Minor adverse**
	Danish sandeel and pelagic trawlers	Low	Negligible	Negligible	N/A	**Negligible**
	German beam trawlers	Low	Negligible	Negligible	N/A	**Negligible**
Impact 3: Displacement of fishing activity into other areas	As above for Impact 2					
Impact 4: Increased steaming times	Local inshore fleet	Low	Low	Minor adverse	N/A	**Minor adverse**
	Other fleets	Negligible	Low	Negligible	N/A	**Negligible**
Impact 5: Interference with fishing activities (navigational conflict)	Static gear vessels	Medium	Low	Minor adverse	N/A	**Minor adverse**
	Towed gear vessels	Low	Negligible	Negligible	N/A	**Negligible**
Impact 6: Safety issues for fishing vessels	All fleets	N/A		Within acceptable limits	N/A	**Within acceptable limits**
Impact 7: Sea bed obstacles	All fleets	N/A		Within acceptable limits	N/A	**Within acceptable limits**

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Operation						
Impact 1: Potential impacts on commercially exploited fish and shellfish species	See ***Chapter 10 Fish and Shellfish Ecology***			Minor adverse	N/A	**Minor adverse**
Impact 2: Complete loss or restricted access to fishing grounds	Dutch beam trawlers	Low	Low	Minor adverse	N/A	**Minor adverse**
	Dutch seine netters	Low	Low	Minor adverse	N/A	**Minor adverse**
	Other Dutch methods	Low / Medium	Negligible	Negligible to minor adverse	N/A	**Negligible to Minor adverse**
	Belgian beam trawlers	Low	Low	Minor adverse	N/A	**Minor adverse**
	Belgian otter trawlers	Low	Negligible	Negligible		**Negligible**
	UK local inshore fleet in general	Medium	Low	Minor adverse	N/A	**Minor adverse**
	UK local inshore vessels active in the East Anglia ONE North windfarm site	Medium	Low	Minor adverse	N/A	**Minor adverse**
	Anglo-Dutch beam trawlers	Low	Low	Minor adverse	N/A	**Minor adverse**
	UK beam trawlers from south-west ports	Low	Negligible	Negligible	N/A	**Negligible**
	French pelagic and demersal trawlers	Low	Low	Minor adverse	N/A	**Minor adverse**

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
	Danish sandeel and pelagic trawlers	Low	Negligible	Negligible	N/A	**Negligible**
	German beam trawlers	Low	Negligible	Negligible	N/A	**Negligible**
Impact 3: Displacement of fishing activity into other areas	As above for Impact 2					
Impact 4: Increased steaming times	Local inshore fleet	Low	Negligible	Negligible	N/A	**Minor adverse**
	Other fleets	Negligible	Negligible	Negligible	N/A	**Negligible**
Impact 5: Interference with fishing activities (navigational conflict)	Static gear vessels	Medium	Low	Minor adverse	N/A	**Minor adverse**
	Towed gear vessels	Low	Negligible	Negligible	N/A	**Negligible**
Impact 6: Safety issues for fishing vessels	All fleets		N/A	Within acceptable limits	N/A	**Within acceptable limits**
Impact 7: Sea bed obstacles	All fleets		N/A	Within acceptable limits	N/A	**Within acceptable limits**
Decommissioning						
Impacts 1 to 7: As for the construction phase						

Table 13.22 Potential Cumulative Impacts Identified for Commercial Fisheries Receptors

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Construction						
Impact 1: Potential impacts on commercially exploited fish and shellfish species	See ***Chapter 10 Fish and Shellfish Ecology***			Minor adverse	N/A	**Minor adverse**
Impact 2: Temporary loss or restricted access to fishing grounds	Dutch beam trawlers	Low	Medium	Minor adverse	N/A	**Minor adverse**
	Dutch seine netters	Low	Medium	Minor adverse	N/A	**Minor adverse**
	Other Dutch methods	Low / Medium	Negligible	Negligible to Minor adverse	N/A	**Negligible to Minor adverse**
	Belgian beam trawlers	Low	Medium	Minor adverse	N/A	**Minor adverse**
	Belgian otter trawlers	Low	Negligible	Negligible	N/A	**Negligible**
	UK local inshore fleet	Medium	Low	Minor adverse	Assumes, evidence-based mitigation with regard to FLOWW guidance where static gear needs to be relocated will be applied at other projects, in line with the approach taken at the proposed East Anglia ONE North project	**Minor adverse**
	Anglo-Dutch beam trawlers	Low	Medium	Minor adverse	N/A	**Minor adverse**

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
	UK beam trawlers from south-west ports	Low	Negligible	Negligible	N/A	**Negligible**
	French pelagic and demersal trawlers	Low	Medium	Minor adverse	N/A	**Minor adverse**
	Danish sandeel and pelagic trawlers	Low	Negligible	Negligible	N/A	**Negligible**
	German beam trawlers	Low	Negligible	Negligible	N/A	**Negligible**
Impact 3: Displacement of fishing activity into other areas	As above for Impact 2					
Impact 4: Increased steaming times	Local inshore fleet	Low	Low	Minor adverse	N/A	**Minor adverse**
	Other fleets	Negligible	Low	Negligible	N/A	**Negligible**
Impact 5: Interference with fishing activities (navigational conflict)	Static gear vessels	Medium	Low	Minor adverse	N/A	**Minor adverse**
	Towed gear vessels	Low	Low	Minor adverse	N/A	**Minor adverse**

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Impact 6: Safety issues for fishing vessels	All fleets	N/A	N/A	Within acceptable limits	N/A	**Within acceptable limits**
Operation						
Impact 1: Potential impacts on commercially exploited fish and shellfish species	See ***Chapter 10 Fish and Shellfish Ecology***			Minor adverse	N/A	**Minor adverse**
Impact 2: Complete loss or restricted access to fishing grounds	Dutch beam trawlers	Low	High	Moderate adverse	N/A The contribution of the proposed East Anglia ONE North project to the overall cumulative impact would be minimal.	**Moderate adverse**
	Dutch seine netters	Low	High	Moderate adverse	N/A The contribution of the proposed East Anglia ONE North project to the overall cumulative impact would be minimal.	**Moderate adverse**
	Other Dutch methods	Low/Medium	Negligible	Negligible	N/A	**Negligible**
	Belgian beam trawlers	Low	Medium	Minor adverse	N/A	**Minor adverse**
	Belgian otter trawlers	Low	Negligible	Negligible	N/A	**Negligible**

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
	UK local inshore fleet in general	Medium	Low	Minor adverse	N/A	**Minor adverse**
	Anglo-Dutch beam trawlers	Low	High	Moderate adverse	N/A The contribution of the proposed East Anglia ONE North project to the overall cumulative impact would be minimal.	**Moderate adverse**
	UK beam trawlers from south-west ports	Low	Negligible	Negligible	N/A	**Negligible**
	French pelagic and demersal trawlers	Low	Medium	Minor adverse	N/A	**Minor adverse**
	Danish sandeel and pelagic trawlers	Low	Negligible	Negligible	N/A	**Negligible**
	German beam trawlers	Low	Negligible	Negligible	N/A	**Negligible**
Impact 3: Displacement of fishing activity into other areas	As above for Impact 2					
Impact 4: Increased steaming times	Local inshore fleet	Low	Negligible	Negligible	N/A	**Negligible**

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
	Other fleets	Negligible	Negligible	Negligible	N/A	**Negligible**
Impact 5: Interference with fishing activities (navigational conflict)	Static gear vessels	Medium	Low	Minor adverse	N/A	**Minor adverse**
	Towed gear vessels	Low	Low	Minor adverse	N/A	**Minor adverse**
Impact 6: Safety issues for fishing vessels	All fleets	N/A	N/A	Within acceptable limits	N/A	**Within acceptable limits**
Impact 7: Obstacles on the sea bed	All fleets	N/A	N/A	Within acceptable limits	N/A	**Within acceptable limits**
Decommissioning						
Impacts 1 to 7: As for the construction phase						

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