East Anglia
Offshore Wind

VATTENFALL

SCOTTISHPOWER RENEWABLES

East Anglia THREE

Chapter 14

Commercial Fisheries

Environmental Statement
Volume 1
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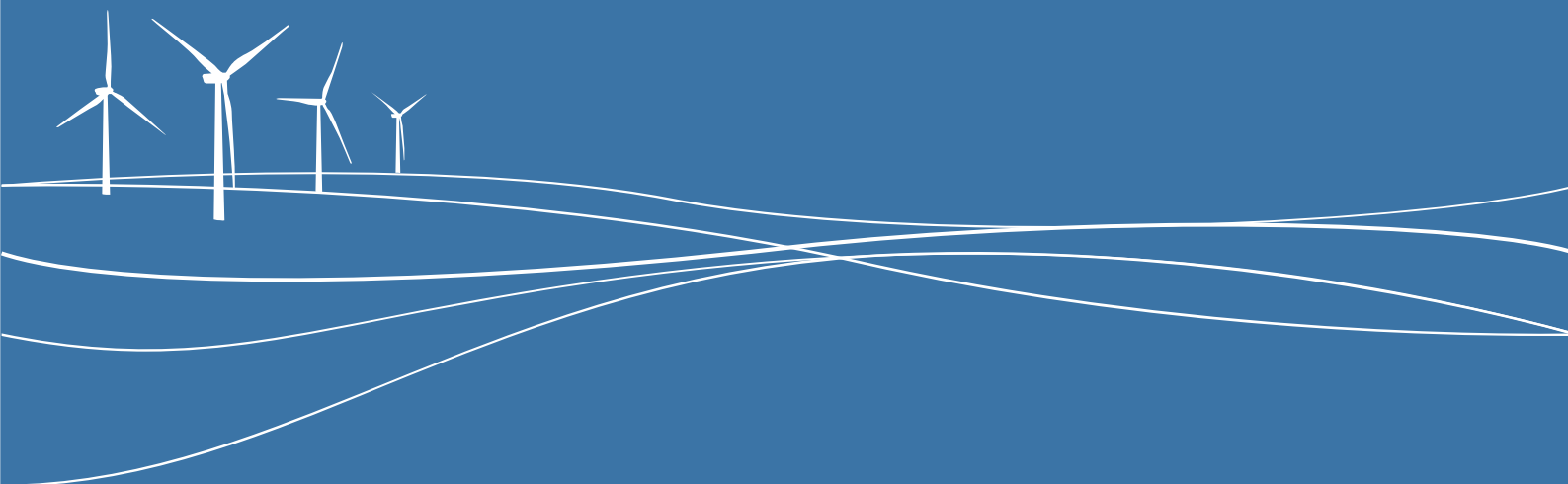

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Chapter 14 Commercial Fisheries appendices are presented in **Volume 3: Appendices** and listed in the table below.

Appendix number	Title
14.1	Commercial Fisheries Technical Report

14 COMMERCIAL FISHERIES

14.1 Introduction

1. This chapter has been prepared by Brown and May Marine Ltd (BMML) summarising the existing commercial fisheries baseline in relation to the proposed East Anglia THREE project being developed by East Anglia THREE Limited (EATL) and the potential impacts which could be sustained by commercial fisheries stakeholders.

2. For the purpose of this report only commercial fishing activity is considered, which is defined as the activity by licensed fishing vessels undertaken for the legitimate capture and sale of finfish and shellfish. The baseline evaluation and assessment focuses specifically on those fleets which are active in the vicinity of the proposed East Anglia THREE project. These include the local inshore fleet and larger vessels which operate further offshore and have home ports in the UK and elsewhere in Europe. The assessment therefore considers and evaluates impacts in local, regional and international (trans-boundary) contexts.

3. The assessment process has taken account of guidance provided in the National Policy Statement (NPS) for Renewable Energy Infrastructure (EN-3): Offshore Wind Farm Impacts – Commercial fisheries and fishing. The NPS guidance notes relevant to commercial fisheries are described in detail in *Table 14.3,* section 14.4.1.

4. There is no single data source or recognised model for establishing commercial fisheries baselines within small, discrete sea areas such as offshore windfarms. Both the description of the baseline and subsequent assessment have therefore been derived using data and information from a number of sources. In addition to analysis of fisheries statistical datasets, emphasis has been placed on undertaking direct consultation with the relevant national fishermen's federations, regional producer organisations (POs), local associations and skippers whose fishing grounds are located within the proposed East Anglia THREE project.

14.2 Consultation

5. Consultation undertaken to date is listed in *Table 14.1*.

6. Consultation relevant to commercial fisheries has been conducted through the following processes:

   - Scoping opinion - which was sought from the relevant statutory consultees (The Planning Inspectorate 2012);
   - Evidence Plan - consultation with key statutory consultees which was undertaken through the Evidence Plan process (for further details please refer

to *Appendix 11.1* and Chapter 6 Environmental Impact Assessment Methodology);

- East Anglia ONE - although not undertaken specifically for the proposed East Anglia THREE project, relevant consultation on East Anglia ONE offshore windfarm has been taken into account within this chapter;
- Comments and advice received during Commercial Fisheries Working Group (CFWG) meetings;
- Comments and advice received during the Preliminary Environmental Information Report (PEIR) consultation period (May 2014 to July 2014) were also considered and addressed where appropriate; and
- No further comments or advice were received during the Phase III consultation period (June 2015 to July 2015).

Table 14.1 Consultation Responses

Consultee	Date / Document	Comment	Response / where addressed in the PEI
Pim Visser, (VisNed) Andries de Boer, (Chairman CPO, Urk, UA) Maarten Drijver (Chairman, CPO & Beheergroep Texel UA) Jan van der Vis (Skipper of Jan Van Toon TX36)	11th May 2013. East Anglia THREE Commercial Fisheries Data Gathering (Dutch Fleet)	• Concerned that East Anglia THREE will result in interference and loss or restricted access to important grounds. • If EA THREE is to go ahead, then a corridor should left be open to ensure little increased steaming time to traditional fishing grounds. • Concerns that poor visibility and the influence of tide when hauling the gear could increase the risk of collision and deter fishing within the site. • In order for large beam trawlers to fish confidently, wind turbine spacing of 1000m would be desirable. • J-Tubes or similar should be used for EA THREE inter-array cables. • Concerns over increasing cumulative impacts from other windfarm developments in combination with planned MPZs, Marine Protected Area (MPAs) etc.	Cumulative effects are addressed in section 14.4.4 Loss or restricted access to fishing grounds is addressed in sections 14.6.1.2 and 14.6.2.2. Increased steaming times are addressed in Sections 14.6.1.4 and 16.6.2.4.
Antony Viera, AV (Comité Régional des Pêches Maritimes et des Elevages Marins (CRPMEM) NORD) Isil Karayalim, IK (OP FROM NORD) Alexiane Brefort, AB (OP CME)	21st June 2013 East Anglia THREE Commercial Fisheries Data Gathering (French Fleet): Meeting Minutes.	Key concern is potential loss of grounds both during construction and operational phases.	Loss or restricted access to fishing grounds is addressed in sections 14.6.1.2 and 14.6.2.2. At the time of writing, individual vessel charts or questionnaires have been provided and their return requested. However none of this information has yet been returned.
Steve Wightman (Lowestoft) on behalf of Wightman Fishing company.	29th July 2013. East Anglia THREE Commercial Fisheries Data Gathering (UK Fleet): Meeting Notes.	• Principal concerns relate to offshore cable corridor and wind turbine spacing. • Concerned that Offshore Export Cable installation will result in disturbance to normal activity and longlining may not be possible in operational windfarm site.	Loss or restricted access to fishing grounds is addressed in sections 14.6.1.2 and 14.6.2.2.

Consultee	Date / Document	Comment	Response / where addressed in the PEI
Felixstowe Ferry Fishermens Association (James White, Chris Hockley, Ivan Redditt, Charlie Honeywood, Roy Porter, Andrew Moore, Stephen Crawford, Allan Crawford, David Lee- Amies, Jamie Lee-Amies, Eastern Inshore Fisheries and Conservation Authority (EIFCA) representative- Alan Garnham)	30th July 2013 East Anglia THREE Commercial Fisheries Data Gathering (UK Fleet): Meeting Notes.	• Displacement has occurred as a result of the Gabbard offshore windfarm, concerned further displacement may occur due to East Anglia THREE. • Key concern is offshore cable corridor • Requested fish surveys and monitoring before and after offshore export cable installation in order to make a comparison. • Cumulative impacts of East Anglia ONE, East Anglia THREE and East Anglia FOUR	Loss or restricted access to fishing grounds is addressed in sections 14.6.1.2 and 14.6.2.2. The requirement for fish surveys would be discussed with the Marine Management Organisation (MMO). Cumulative effects are addressed in section 14.4.4.
Felixstowe Ferry Fishermens Association (Edward and Robert Butters)	30th July 2013 East Anglia THREE Commercial Fisheries Data Gathering (UK Fleet): Meeting Notes.	• Enquired about construction timescales for East Anglia ONE and East Anglia THREE, in order to make plans for the future • Key concern is offshore cable corridor • Trenching for cable burial could potentially impact the skate fishery • The cod fishery has declined since the Greater Gabbard windfarm was constructed; concerned it will decrease further once the East Anglia projects commence. • Concerns regarding cumulative impacts- other windfarms, MCZs etc. • More information should be available regarding the design envelope	Predicted construction timescales are provided in Chapter 5 Description of the Development. Impacts on demersal fish species including cod and skate are discussed in Chapter 11 Fish and Shellfish Ecology. Cumulative effects are addressed in section 14.4.4.
Southwold Fishermens Association	30th July 2013 East Anglia THREE Commercial Fisheries	• Vessels displaced from the Thames due to windfarm construction now in Southwold- increased fishing pressure • Trenching for cable burial could potentially impact the skate fishery	Impacts on demersal fish species including the cod and skate fishery are discussed in Chapter 11 Fish and

Consultee	Date / Document	Comment	Response / where addressed in the PEI
(Richard Burrell)	Data Gathering (UK Fleet): Meeting Notes.	• The cod fishery has declined since the Greater Gabbard windfarm was constructed; concerned it will decrease further once the East Anglia projects commence. • Concerns regarding cumulative impacts- other windfarms, MCZs etc. • Key concern is offshore cable corridor	Shellfish Ecology. Cumulative effects are addressed in section 14.4.4.
Orford and District Inshore Fishermen's Association (Roger Hipwell, Neil Macro, Bill Pinney, Stuart Moss, Peter Benstead, Jamie Potts)	31st July 2013 East Anglia THREE Commercial Fisheries Data Gathering (UK Fleet): Meeting Notes.	• Concerns regarding disturbance of the offshore cable corridor through Orford potting grounds. • Fishing grounds drawn for East Anglia ONE are still accurate for potting, longlining and netting. Key concern is offshore cable corridor	Loss or restricted access to fishing grounds is addressed in sections 14.6.1.2 and 14.6.2.2.
Orford and District Inshore Fishermens Association (Philip Smy)	2nd August 2013 East Anglia THREE Commercial Fisheries Data Gathering (UK Fleet): Meeting Notes.	Concerns regarding cumulative impacts- other windfarms, MCZs etc.	Cumulative effects are addressed in section 14.4.4.
Rederscentrale (Belgian Fishermens Association/Producer Organisation) (Sander Meyns, (Rederscentrale) Davy Demeester, (Skipper, MFV 'Stephanie') Guillame Lebleu, (Skipper, MFV 'Flamingo')	5th August 2013 East Anglia Commercial Fisheries Data Gathering (Belgian Fleet): Meeting Minutes.	• Encountered problems with rock dumping due to rocks entering the net and destroying them in the past. • Concern regarding the height of cable protection and stated that maximum burial represents the lowest risk of fastening/gear damage. • Key concern is offshore cable corridor • Concerned that cables may become exposed due to sand waves in the area, which may represent a fastening risk. • 750m turbine spacing is considered insufficient to safely operate beam gear • Who will be responsible in event of a fastening or collision with wind turbine?	Loss or restricted access to fishing grounds is addressed in sections 14.6.1.2 and 14.6.2.2. Obstacles on the sea bed post-construction are discussed in section 14.6.2.5 Cable protection is addressed in section 14.6.2.2 and further described in Chapter 5.

Consultee	Date / Document	Comment	Response / where addressed in the PEI
Dany Vletinck, (Skipper, MFV 'Jasmine') Rudy Neyts, (Skipper, MFV 'Marie Louise')			Wind turbine spacing is addressed in section 14.6.2.2. Procedures in the event of gear fastening and collision would form part of the Co-Existence and Fisheries Liaison Plan, required under the DML.
Southwold Fishermens Association (Simon Drake, Andrew Hale, Paul Klyne, Colin Clarke, Nigel Hayter, Paul Tyack, Chris Dyer, Jerry Hilder)	9th August 2013 East Anglia THREE Commercial Fisheries Data Gathering (UK Fleet): Meeting Notes.	• Concerns were raised about the permanent loss of fishing grounds due to cable protection where the Greater Gabbard and East Anglia offshore cable corridor will cross • Concerns regarding exclusion from the from the offshore cable corridor	EATL are working with representatives of the Greater Gabbard Offshore Wind Farm (GGOWF) and the Galloper Wind Farm (GWF) to agree appropriate methods for cable crossings to minimise impacts.
Harwich Fishermens Association (Trevor Armstrong, Ray Lovett, Arthur Bennett, Rob Osborne, Stephen Pells, Tony Marvan, V. Scott, Kevin Smith,	29th August 2013 East Anglia THREE Commercial Fisheries Data Gathering (UK Fleet): Meeting Notes.	• The most important areas for Harwich vessels is the offshore cable corridor out to 6nm • Fishermen stated vessels are sensitive to displacement due to limited operational range. • Concerns regarding cumulative impacts- other windfarms, oil and gas infrastructure and MCZs etc • Increase pressure on grounds fished by the Harwich fleet.	Displacement of fishing activity is addressed in sections 14.6.1.7 and 14.6.2.7 Cumulative effects are addressed in section 14.6.4

Consultee	Date / Document	Comment	Response / where addressed in the PEI
Gary Hambling, P. Smith, Dean Caunter, Peter Caunter)			
Lowestoft Fishermen (Richard Kean-Cockburn George Tovell Malcolm Tubby Trevor Elliott Marc Connolly Paul Mears Paul Lines Andrew Wood Melvin Robinson Ove Jenkinson)	25th September 2013 East Anglia THREE Commercial Fisheries Data Gathering (UK Fleet): Meeting Notes.	• Concerns that Spurdog was not adequately assessed in the East Anglia ONE ES chapter • Concern regarding the impact of EMFs on fish. • Concern that Cod are not coming as far north to their spawning grounds due to vibrations of piling monopiles at Greater Gabbard windfarm. • Concerns regarding cumulative impacts- other windfarms, oil and gas infrastructure and MCZs etc • Key concern is the offshore cable corridor.	The results of Shark By-watch data have been requested from Cefas but are not currently publically available. EMF related impacts including those on elasmobranch species, are assessed within Chapter 11: Fish and Shellfish Ecology. Impacts on demersal fish species including the cod and skate fishery are discussed in Chapter 11 Fish and Shellfish Ecology. Cumulative effects are addressed in section 14.4.4. A request for fishermen to provide information on their fishing grounds has been made and an admiralty chart was provided to Lowestoft stakeholders (1st October 2013). At the time of writing (27th November 2013), this has not yet been returned.
Felixstowe fisheries engagement meeting	11th December 2013 East Anglia THREE Commercial Fisheries Update (UK Fleet)	• Principle concern for local vessels is offshore cable corridor • Fishermen present disputed the accuracy of MMO data • Fishermen questioned why there had been fish monitoring surveys within the windfarm site but not within offshore cable corridor • Concerned that ground will not have much time to recover between	Timescales for submission to Planning Inspectorate and potential construction dates provided to the fishermen present. The requirement for project specific

Consultee	Date / Document	Comment	Response / where addressed in the PEI
		cable laying for East Anglia ONE and East Anglia THREE	surveys has been agreed with Cefas, depending on available information and predicted impacts. Recovery of benthic habitats is discussed in Chapter 10 Benthic Ecology.
Lowestoft fisheries engagement meeting	12th December 2013 East Anglia THREE Commercial Fisheries Update (UK Fleet)	• Fishermen present disputed the accuracy of MMO data • Concerns that the MMO landings values by port utilised are an underestimation as a significant proportion of <10m landings are not submitted to the MMO. • Concerned that ground will not have much time to recover between cable laying for East Anglia ONE and East Anglia THREE • Requested local vessels are utilised for guard and survey work • Lowestoft fishermen have decided not to draw their detailed fishing grounds on a chart as they hold a fishing licence and are therefore entitled to fish anywhere.	Timescales for submission to Planning Inspectorate and potential construction dates provided to the fishermen present. Suggested CFWG representatives present a figure of how much the port they represent earns on average per year. Explained in detail the problem with Lowestoft fishermen's broad scale approach- is that it implies a small proportional area of fishing ground lost as a result of the proposed East Anglia THREE project. A representative from the Lowestoft fleet has now been agreed and will attend future CFWG meetings
Eastern IFCA	July 2014 Consultation on PEIR	Both the construction and operational phases of the project must allow for fishing vessels of a variety of engine powers and primary gear types to continue their activity as far as is practically possible. Chapter 5 of the PEIR describes potential scour protection measures (points 54 and 80) and potential cable burial and protection methods (points 162, 168 and 181), but there is no mention in this chapter (or chapter 14) of the need to make these structures fishable, whichever methods are chosen.	This is addressed in section 14.6.2, impact 2

Consultee	Date / Document	Comment	Response / where addressed in the PEI
Eastern IFCA	July 2014 Consultation on PEIR	The process of deciding the configuration of the turbines must take account of all fishing users of the zone, including inshore fishermen, whose vessels may not have the manoeuvrability of larger, offshore vessels.	This is addressed in section 14.6.2, impact 2
Eastern IFCA	July 2014 Consultation on PEIR	In its assessment of the value of the inshore fisheries taking place in the Inshore cable corridor, chapter 14 of the PEIR utilises landings data from the Marine Management Organisation. In assisting with previous windfarm applicants' fisheries valuations, the authority has regularly advised the supplementation of these data with more precise estimates provided by our area patrol officers' monthly reports (found as agenda items within our quarterly full authority meeting papers; aggregated spreadsheets of these data are available on request).	Sea patrol officer monthly report data has been requested in aggregated spreadsheet form to utilise in this report, however to date it has not been received.
MMO	July 2014 Consultation on PEIR	Consultation with local UK fishing industry does not appear to have extended further north than Lowestoft. We advise that vessels operating from Great Yarmouth and ports in The Wash should also be considered.	Addressed in section 14.3.3
MMO	July 2014 Consultation on PEIR	The minimum cable burial depth is stated as 0.5m, with a maximum of 5m. Clarification is required on whether this minimum depth is sufficient given the predominant fishery (beam trawl), tidal regime and risk of exposure over time. We advise that the relevant DML should include on-going requirements to survey the export cable.	Addressed in section 14.6.2
Norfolk County Council (NCC)	July 2014 Consultation on PEIR	While no objection is proposed to the East Anglia Three Offshore Wind Farm, this is subject to appropriate mitigation, and where necessary compensation, being given to those commercial fishing interests in Norfolk adversely impacted by the operation of the wind farm	This has been addressed in a letter sent to Norfolk County Council in reply to the response. Summarised below: With respect to those vessels operating out of ports in Norfolk, these depend almost entirely on shellfish (crab, lobster and whelk) which are targeted on well-established grounds off the coast of North Norfolk and located

Consultee	Date / Document	Comment	Response / where addressed in the PEI
			some distance from the East Anglia THREE development. Due to the distance that the site is located offshore, and the limitations on small vessels in terms of their operational range and safety at sea, very few vessels fish inside the footprint of the windfarm itself and so this has not been assessed in this chapter

14.3 Scope

14.3.1 Study Area

7. The overall study area for the assessment of commercial fishing is shown in *Figure 14.1*. The proposed East Anglia THREE project is located within International Council for the Exploration of the Sea (ICES) Division IVc (Southern North Sea). Pressure stocks[1] are managed by ICES Division and quota is also allocated at this scale. Fisheries data are recorded, collated and analysed by ICES rectangles within each division. ICES rectangles are the smallest spatial unit available for the collation of fisheries data and have therefore been used to define the analysis areas for the proposed East Anglia THREE project.

8. For the purposes of assessment, the offshore cable corridor has been divided into the offshore and inshore areas. This is due to distinct differences in fishing patterns between offshore and inshore areas and the type and manner in which fisheries statistics are collected from vessels in the over-15m and under-15m fleets (for detail see section 14.4.2). Typically vessels over 15m have a wide operational range and can endure adverse sea conditions enabling them to undertake long trips offshore. In comparison, vessels under 15m in length (and especially those in the under 10m category) target grounds within the 12nm limit as they have a more limited operational range and a reduced capability to endure adverse weather when at sea. The offshore cable corridor includes the interconnector cable corridor and export cable corridor. The analysis areas are based on the following ICES rectangles:

- Windfarm (East Anglia THREE site) Analysis Area - ICES rectangle 34F2;
- Offshore cable corridor - ICES rectangle 33F2; and
- Inshore cable corridor - ICES rectangle 33F1.

9. A small percentage of the proposed East Anglia THREE project is located outside these analysis areas. The north-eastern corner of the East Anglia THREE site is located within ICES rectangle 34F3 and a small section of the offshore cable corridor, close to the landfall location, is located in ICES rectangle 32F1. Due to the small proportion of these rectangles occupied by the proposed East Anglia THREE project, annual and seasonal variation have not been described at the scale of individual ICES rectangles. These areas are however included in the assessment of surveillance sightings and Vessel Monitoring System (VMS) datasets which allow the levels of activity occurring in discrete areas of ICES rectangles to be assessed

[1] Stocks identified as under pressure from fishing mortality (e.g. overfishing) and therefore requiring management at the EU level through a system of Total Allowable Catches (TACs) and Quota (described further in *Appendix 14.1*)

with a higher degree of accuracy. The analysis areas are used for the existing environment description and however, for the impact assessment, the site and offshore cable corridor are used.

14.3.2 Worst Case

10. A realistic worst case scenario for the impacts of the proposed East Anglia THREE project on commercial fishing activities has been identified under the Rochdale Envelope parameters described in Chapter 6 Environmental Impact Assessment Methodology and aligned with the Cefas and Marine Consents and Environment Unit (MCEU) (2004) guidelines for offshore wind developments. The parameters which constitute the worst case scenario have been selected on the premise that they could result in the greatest potential impact upon the fishing activities.-

11. There are two main pathways by which the proposed East Anglia THREE project has the potential to adversely affect commercial fishing. Firstly, by reducing commercially important fish and shellfish populations. For example, increased sediment concentrations during the construction phase could potentially smother eggs, larvae or adults of certain species leading to reductions in recruitment into a given fishery (these are identified in Chapter 11 Fish and Shellfish Ecology). Secondly, the proposed East Anglia THREE project has the potential to constitute a physical obstruction or risk to normal fishing activities, the parameters of which are summarised in *Table 14.2*.

12. EATL is currently considering constructing the project in either a Single Phase or in a Two Phased approach. Under the Single Phase approach the project would be constructed in one single build period and under a Two Phased approach the project would be constructed in two phases each consisting of up to 600MW.

13. Under the Single Phase approach it is expected that the construction period for the proposed East Anglia THREE project (offshore and onshore) would span approximately 41 months. Under a Two Phased approach the proposed East Anglia THREE project would be built in a staggered way, with the construction of Phase 2 commencing a maximum of 18 months after the start of onshore construction of Phase 1. The total construction period would span 45 months with offshore elements over 42 Months (Chapter 5 Description of the Development, section 5.5.16).

14. For operational impacts, the worst case under either approach (Single or Two Phased) has been considered in the assessment and is presented in *Table 14.2*.

Table 14.2 Worst case assumptions

Impact	Key design parameters forming the worst case scenario	Rationale
Construction		
Impact 1: Adverse impacts on commercially exploited fish and shellfish populations	See Chapter 11 Fish and Shellfish Ecology	
Impact 2: Temporary loss or restricted access to traditional fishing grounds	Temporary transitory 500m safety zones around installed or partially installed infrastructure leading to a period of total exclusion of all fishing activities from the entire East Anglia THREE site (305km²) 500m advisory exclusion zones around cable laying vessels and along exposed sections of cables. **Single Phase approach** Complete construction including wind turbine installation and cable installation could take up to 41 months. Installation of up to 664km of export cable for 35 months **Two phased approach** Maximum duration of construction across the East Anglia THREE site of 42 months based on two phased approach with two construction periods of approximately 1 year each, with 18 months separating the start date of phase 1 and the start date of phase 2. Installation of up to 664km of export cable for 35 months	Represents the maximum duration and extent of fishing exclusion throughout construction phase and hence the greatest potential to restrict access to fishing grounds. Under the Two Phased approach to construction, the area temporarily lost to fishing would be largely the same as with the Single Phase approach with the addition of 1 electrical platform, 3 platform links and two trenches in which interconnector cables would be laid. The construction periods would also be extended by 4 months (see Chapter 5 Description of the Development section 5.5.16).
Impact 3: Safety issues for fishing vessels	**Single Phase approach** Potential for vessel allisions with structures associated with the proposed East Anglia THREE project. • Maximum of 172 wind turbines on foundations at a minimum	Based on the maximum number of wind turbines, converter and collection stations, meteorological masts, accommodation platforms, LiDAR and wave buoys (for potential collision with work vessels) and with minimum spacing.

Impact	Key design parameters forming the worst case scenario	Rationale
	separation of 675m x 900m. • Three offshore collector stations. • Two offshore converter stations. • Two meteorological masts. • Two Lidar buoys[2] • Two wave buoys[2] • Eight guard buoys[2] • One accommodation platform. **Potential for collisions between offshore windfarm construction vessels and fishing vessels.** Maximum number of 55 vessels onsite at any one time associated with construction phase. **<u>Two Phased approach</u>** Potential for vessel allisions with structures associated with the proposed East Anglia THREE project. • Maximum of 172 wind turbines on foundations at a minimum separation of 675m x 900m. • Four offshore collector stations. • Two offshore converter stations. • Two meteorological masts. • Two Lidar buoys[2]. • Two wave buoys[2] • Eight guard buoys[2] • One accommodation platform. **Potential for collisions between offshore windfarm construction vessels and fishing vessels.** Typical number of 55 vessels onsite at any one time associated with	

[2] Surface dimensions would typically be 4m wide and 4m high.

Impact	Key design parameters forming the worst case scenario	Rationale
	construction phase.	
Impact 4: Increased steaming times to fishing grounds	**Single Phased approach** Temporary transitory 500m safety zones around installed or partially installed infrastructure leading to a period of total exclusion of all fishing activities from the entire East Anglia THREE site (305km²) 500m advisory exclusion zones around cable laying vessels and along exposed sections of cables. Maximum duration of construction across the East Anglia THREE site of 41 months Installation of up to 664km of export cable over a 22 month period **Two phased approach** Temporary transitory 500m safety zones around installed or partially installed infrastructure leading to a period of total exclusion of all fishing activities from the entire East Anglia THREE site (305km²) 500m advisory exclusion zones around cable laying vessels and along exposed sections of cables. Maximum duration of offshore construction across the East Anglia THREE site of 42 months based on two phased approach with two construction periods of approximately 1 year each, with 18 months separating the start date of phase 1 and the start date of phase 2. Installation of up to 664km of export cable over a 35 month	Represents the longest distance and duration of transit diversions. The maximum number of structures will result in the greatest number of construction vessels required and therefore the greatest number of 500m safety zones from which fishing vessels will be excluded.
Impact 5: Obstacles on the sea bed post construction	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.	May result in potentially unacceptable safety risks to fishing vessels which would prevent fishing activity from occurring or resuming.
Impact 6: Interference	**Single Phased approach**	Worst case describes the maximum number of construction vessels required, resulting in greatest potential for conflict with

Impact	Key design parameters forming the worst case scenario	Rationale
with fishing activities	Construction vessels operating for a maximum of 41 months. Construction taking place all year over a maximum construction window of 41 months. **<u>Two Phased approach</u>** Construction vessels operating for a maximum of 42 months. Construction taking place all year over a maximum construction window of 42 months.	fishing vessels and gears.
Impact 7: Displacement of fishing activity into other areas	As for the impact of 'Temporary loss or restricted access to traditional fishing grounds'.	The worst case represents the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential to displace fishing activity into other areas.
Operation		
Impact 1: Adverse impacts on commercially exploited fish and shellfish populations	*See* Chapter 11 Fish and Shellfish Ecology	
Impact 2: Complete loss or restricted access to traditional fishing grounds	The maximum amount of installed infrastructure would include: 172 wind turbines on foundations at a minimum separation of 675m x 900m. Two offshore collector stations. Four offshore converter stations. Two meteorological masts. Two Lidar buoys[2] Two Wave buoys[2]; Eight guard buoys[2]; and One accommodation platform	The maximum loss of fishing ground throughout the operational phase of the proposed East Anglia THREE project would occur as a result of the maximum possible amount of installed infrastructure.

Impact	Key design parameters forming the worst case scenario	Rationale
	Cable protection applied to a maximum of 10% of inter-array cables (55,000m) Cable protection applied to a maximum of 10% of Platform link cables (24,000m) Cable protection applied to a maximum of 10% of interconnector cables (38,000m) Cable protection applied to a maximum of 10% of export cables east of export cable crossings with GGOWF Cable protection applied to a maximum of 10% of export cables west of cable crossings with GGOWF	
Impact 3: Safety issues for fishing vessels	**Fishing vessel interaction with exposed cables.** The assessment recognises the safety risks posed by inter-array and offshore export cables, based upon: Maximum inter-array cable length = 550km Maximum length of offshore export cables= 664km Maximum length of platform link cable = 240km Maximum interconnector cables 380km Up to a maximum of 10% of offshore export and inter-array cables may be protected with rock armour. Minimum array burial depth (where not protected) 0.5m. Minimum offshore export cable burial depth (where not protected) – 0.5m. **Fishing vessel collision risk with structures including:** • 172 wind turbines at a minimum separation of 675m x 900m on gravity base foundations; • Two offshore collector stations; • Four offshore converter stations;	Worst case scenario based on the maximum length of inter-array, and offshore export cables and equipment potentially exposed to interaction from fishing gears or anchor interaction or dredger interaction. Based on the greatest potential risk of allision due to maximum number of structures. Worst case scenario describes the maximum number of wind turbines and hence increases the potential extent of the zone of radar interference. Maximum number of structures at a minimum spacing creates greatest potential allision risk and therefore demand on emergency response. These parameters have the potential to result in unacceptable safety risks to fishing vessels which would prevent fishing activity from occurring or resuming within the operational site.

Impact	Key design parameters forming the worst case scenario	Rationale
	• Two meteorological masts; • Two Lidar buoys[2]; • Two wave buoys[2]; • Eight guard buoys[2]; and • One accommodation platform **Potential for marine radar interference.** Maximum of 172 wind turbines generating power with minimum wind turbine spacing of 675 x 900m. **Potential for increased emergency response including:** • 172 wind turbines on foundations at a minimum separation of 675m x 900m. • Two offshore collector stations; • Four offshore converter stations; • Two meteorological masts; • Two Lidar buoys[2]; • Two wave buoys[2]; • Eight guard buoys[2]; and • One accommodation platform	
Impact 4: Increased steaming times	Maximum amount of installed infrastructure including: • 172 wind turbines on foundations at a minimum separation of 675m x 900m. • Two offshore collector stations; • Four offshore converter stations; • Two meteorological masts; • Two Lidar buoys[2]; • Two wave buoys[2]; • Eight guard buoys[2]; and • One accommodation platform	Results in the maximum disruption to established steaming routes.

Impact	Key design parameters forming the worst case scenario	Rationale
Impact 5: Obstacles on the sea bed post construction	Any construction related obstacles and changes to sea bed conditions.	Presence of obstacles on the sea bed may represent a fastening/safety risk to fishing vessels and therefore result in unacceptable risks to fishing vessels which would prevent fishing resuming or occurring within the operational site.
Impact 6: Interference with fishing activities	Maximum number of operation and maintenance works vessels resulting in the highest number of works vessels transiting identified fishing grounds: Up to two vessels making on average 52 service trips to site per annum; and 4,000 Wind Farm Support vessel trips to site per annum. Up to 6 cable repairs per year across the entire project.	Maximum number of wind turbines would result in increased probability of conflict with fishing vessels or gears, due to associated number of operation and maintenance vessels. For details on expected cable maintenance please see section 5.5.17.3 of Chapter 5 Description of the Development
Impact 7: Displacement of fishing activity into other areas	Worst case as for Operational Impact 2: Complete loss or restricted access to traditional fishing grounds**.**	The worst case represents the greatest potential to restrict the continuation of normal (e.g. pre –construction) fishing activity and hence the greatest potential to displacement effect throughout the proposed East Anglia THREE project lifetime (25 years).
Decommissioning		
In the absence of detailed methodologies and schedules, decommissioning works and associated implications for commercial fisheries are considered analogous with those assessed fort the construction phase.		
Cumulative effects		
Impact 1: Adverse impacts on commercially exploited fish and shellfish populations	Chapter 11 Fish and Shellfish Ecology states “Outcome of the cumulative impact assessment would be greatest when the greatest number of other schemes, present or planned, are considered”	
Impact 2: Complete loss or restricted access to fishing grounds	Full development of all relevant proposed marine developments. See *Table 14.25*.	The worst case scenario has the potential to result in the maximum restriction of resumption of normal fishing.

Impact	Key design parameters forming the worst case scenario	Rationale
Impact 3: Safety issues for fishing vessels	See Chapter 15 Shipping and Navigation	Outcome of the cumulative impact assessment would be greatest when the greatest number of other schemes, present or planned, is considered.
Impact 4: Increased steaming times	Full development of relevant proposed marine developments. See *Table 14.25*.	This has the potential to result in maximum disruption to established steaming routes.
Impact 5: Interference with fishing vessels	Full development of relevant proposed marine developments. See *Table 14.25.*	Highest potential to result in conflict with fishing vessels or gears.
Impact 6: Displacement of fishing activity into other areas	Full development of relevant proposed marine developments. See *Table 14.25.*	Greatest potential to restrict the continuation of normal fishing activities within the region.

14.3.3 Embedded Mitigation Specific to Commercial Fisheries

15. Where relevant, mitigation measures are incorporated as part of the proposed East Anglia THREE project design process and are referred to as "Embedded mitigation". Those measures relevant to commercial fisheries are described within the following section and are taken into account when assessing impacts.

16. The appropriate liaison will be undertaken with all relevant fishing interests to ensure they are fully informed of all construction and maintenance activities. In order to aid and maintain regular communication between East Anglia Offshore Wind Limited and local fishermen potentially affected by the projects in the East Anglia Zone, a Commercial Fisheries Working Group (CFWG) has been established with a representative from each local port which could potentially impacted by the proposed East Anglia THREE 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 within the East Anglia THREE site or offshore cable corridor, therefore these ports are not represented on the CFWG. The CFWG aims to identify and develop co-existence strategies during a project's lifecycle. The deemed Marine Licence includes the requirement for a Co-Existence and Fisheries Liaison Plan.

17. Timely and efficient Notices to Mariners (NtMs), Kingfisher and other navigational warnings (of the position and nature of the works including offshore cable corridor crossings) will be issued to the fishing industry.

18. The UK Hydrographic Office (UKHO) will be informed of both the progress and completion of proposed East Anglia THREE project.

19. Inter-array and offshore export cables within the offshore cable corridor would be buried where possible, to the maximum required depth to prevent damage to and from fishing gear. Cable protection measures will be applied in areas where burial is not possible, e.g. where the proposed East Anglia THREE project cables are required to cross existing cables or in areas of hard ground. EATL would make every effort to reduce the amount of cable protection on the landfall side of the approximate location of the Greater Gabbard Offshore Wind Farm (GGOWF) and Galloper Offshore Wind Farm (GWF) cable crossing to 2.5%. This is a mitigation measure also proposed for coastal processes and would result in the placement of fewer obstacles on the seabed for commercial fishermen.

20. There would be a minimum separation of 675m between wind turbines within rows, and a minimum of 900m between each row, and these would be arranged in a regular pattern to assist vessel transit through the East Anglia THREE site.

21. All contractors undertaking site works would be contractually obliged and monitored by client representatives to ensure compliance with standard offshore policies. These policies prohibit the discarding of any objects or material overboard and require rapid recovery of any accidentally dropped objects.

22. Transiting East Anglia THREE works vessels will also fully comply with the international regulations (International Regulations for Preventing Collisions at Sea (COLREGS)). This should negate the requirement for fishing vessels engaged in fishing to alter course or to pose any risk to fishing gears being towed.

23. Should post installation surveys identify the presence of any construction related sea bed obstacles such as mounds, boulders or berms that could have the potential to interfere with fishing, appropriate rectification would be undertaken.

14.4 Assessment Methodology

14.4.1 Guidance

24. The assessment of potential impacts on commercial fisheries has been undertaken with specific reference to the relevant NPS. Those relevant to the proposed East Anglia THREE project are as follows:

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

25. The specific NPS assessment guidance for commercial fisheries is summarised in *Table 14.3.*

Table 14.3 NPS Assessment Guidance

NPS Requirement	NPS Reference
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
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
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
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
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
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 and studies conducted as part of the assessment.	EN-3 section 2.6.129
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
Where the precise extents of potential safety zones are unknown, a realistic worst case scenario should be assessed. Applicants should consult the Maritime and Coastguard Agency (MCA). Exclusion of certain types of fishing 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

26. 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;
- Marine Licensing requirements (replacing Section 5 Part II of the Food and Environment Protection Act (FEPA) 1985 and Section 34 of the Coast Protection Act (CPA) 1949);
- Cefas, 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 wind farms;
- 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 wind farms. 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 (Fishing Liaison with Offshore Wind and Wet Renewables Group) (2014);
- UK Oil and Gas (2008) Fisheries Liaison Guidelines - Issue 5; and
- International Cable Protection Committee (2009) Fishing and Submarine Cables - Working Together.

14.4.2 Data and Information Sources

27. There is currently no single data source or recognised model for establishing commercial fisheries baselines. It is therefore necessary to use an approach that incorporates a number of relevant data and information sources, each subject to varying sensitivities and limitations, as described below. The relevant fisheries, methods and associated effort are described in progressive detail by building upon the sources and analysis outlined below.

28. The key data sources used to characterise the baseline and assess the potential impacts of the proposed East Anglia THREE project on commercial fisheries

receptors are summarised in *Table 14.4.* A detailed description of data and information sources is provided in *Appendix 14.1*.

Table 14.1 Key Data Source Features

Data	Year	Coverage	Confidence	Notes
UK MMO Fisheries Statistics (landings values and fishing effort data)	2010 to 2013	UK vessels landing into UK and European ports. Non-UK vessels landing into UK ports.	High	Landings data provided by value (£).
UK MMO Surveillance Sightings	2010 to 2014	Sightings of vessels by gear type (all nationalities) recorded in UK waters on weekly surveillance fly overs during daylight hours.	Medium to high	May underestimate total extent of fishing activity due to flyover frequency and timing.
UK MMO Satellite Tracking (VMS) Data	20108 to 2013	Aggregated VMS pings recorded in 0.05° by 0.05° grids from UK vessels only in European waters.	High	VMS provided by value (£).
Marine Scotland VMS data	2007 to 2012	Aggregated VMS separated by gear type or fishery to show relative value.	High	VMS provided on a sliding scale of relative value. No actual financial figures are given.
Belgian Institute for Agricultural and Fisheries Research (ILVO) fisheries statistics (landings value and effort data)	2010 to 2014	All over-10m Belgian vessels recorded as actively fishing, irrespective of location.	High	Landings data provided by value (€).
Belgian ILVO VMS Data	2010 to 2014	VMS for over-15m Belgian beam trawlers, demersal trawlers, seine netters and netters) were provided for all sea areas. The data has been filtered by speed.	High	VMS provided by density.
Netherlands, Institute for Marine Resources and Ecosystem Studies (IMARES VMS and integrated Landings data. Fisheries statistics (landings value and effort data)	2010 to 2014 (VMS) 2010 to 2014 (Landings value and effort data)	VMS data combined with logbook data by Dutch vessels in the North Sea. A grid is defined based on 1/16th of an ICES rectangle. The data is filtered by speed.	High	VMS is provided by value (€), effort (days at sea) and weight. Fisheries statistics (landings values and effort) available from 2006 to 2010 for method only.
French L'Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER)	2008 to 2009	VMS charts provided by value and effort for Central (IVb) and Southern North Sea (IVc)	High	VMS provided by effort (days) and value (€).

Data	Year	Coverage	Confidence	Notes
VMS data		only.		
CRPMEM Nord-Pas-de-Calais Picardie Effort Data	2012	Nord-Pas-de-Calais Picardie fleet.	Medium to High	Based on consultation with 89% of the fleet
German Federal Office for Agriculture and Food fisheries statistics (landings value)	2009 to 2013	Landings values for German vessels in the North Sea.	High	Landings data provided by value (€).
German Federal Office for Agriculture and Food VMS data	2009 to 2013	VMS provided by density in the North Sea.	High	VMS provided by density.
Danish Ministeriet for Fødevarer, Landbrug og Fiskeri VMS data	2009 to 2013	VMS provided for all UK waters by density and can be split into gear categories.	High	VMS provided by density.
Danish, Ministeriet for Fødevarer, Landbrug og Fiskeri, fisheries statistics (landings values)	2009 to 2013	Landings values for Danish vessels operating in the North Sea.	High	Landings data provided by value (Kr).
Norway Fisheries Monitoring Centre fisheries statistics	2008 to 2012	The data is collected in a similar way to the UK data, however it is provided by Norwegian Sea Area, as opposed to ICES sea areas. However the data is compatible as these correspond with ICES rectangles.	High	Landings data provided by value (Kr).
Norway, Fisheries Monitoring Centre VMS data	2010 to 2014	VMS for over-15m Norwegian vessels in the North Sea.	High	VMS is provided by density.

14.4.3 Impact Assessment Methodology

29. The potential impacts of the proposed East Anglia THREE project on commercial fisheries receptors taken forward for assessment are as specified in the Cefas and MCEU (2004) guidelines for offshore wind developments:

- Implications for fisheries during the construction phase;
- Implications for fisheries when the proposed East Anglia THREE project is completed;
- Adverse impact on commercially targeted fish and shellfish populations;
- Adverse impact on recreational fish populations;
- Complete loss or restricted access to traditional fishing grounds;
- Safety issues for fishing vessels;
- Increased steaming times to fishing grounds;
- Obstacles on the sea bed post construction; and
- Interference with fishing activities.

30. In addition to the above, the following potential impact has also been considered for assessment:

- Displacement of fishing activity into other areas.

31. Assessment of the above impacts has been applied separately to the construction, operational and decommissioning phases.

32. Cumulative impacts relevant to commercial fishing arising from other marine developments are discussed in section 14.4.4.

14.4.3.1 Assessment Limitations

33. The limitations of an assessment of impacts on commercial fishing activities are principally associated with potential changes to the existing baseline. Target species, the location and productivity of fishing grounds and levels of fishing effort are subject to change over short timescales in response to fluctuations in landings and changes in quota allocations, legislation, technological advance, economic constraints, weather and conservation restrictions. The assessment undertaken is therefore limited to the baseline identified.

34. The following assessment has been undertaken on a fleet by fleet basis. It is however acknowledged that there may be variations between individual vessels within a specific fleet as some vessels may spend more time fishing in certain areas

compared to others. As a consequence of the limitations of the available data and information sources, described in detail in the *Appendix 14.1.*, it is not within the scope of this assessment to consider the extent of an impact on an individual vessel basis. Fishing grounds potentially impacted by the proposed East Anglia THREE project have therefore been considered in the context of their relative importance in the local and regional contexts, as well as to available fishing grounds around the UK and Europe.

35. Impacts arising from the construction, decommissioning and operational phases of the proposed East Anglia THREE project have the potential to alter the behaviour, abundance and distribution of commercially important fish species. Any such changes could in theory indirectly affect commercial fishing activities. The assessment of the potential impacts of construction, operation and decommissioning upon fish and shellfish species is provided in Chapter 11 Fish and Shellfish Ecology.

14.4.3.2 Significance Criteria

36. The significance criteria used for this assessment are as described below. It is acknowledged that the impacts of offshore windfarm developments upon commercial fishing activity are not easily categorised due to the limitations associated with fisheries data and the dynamic nature of the industry. The assigning of receptor sensitivity and impact magnitude is, therefore, to some extent qualitative and reliant on professional experience and judgement.

14.4.3.3 Sensitivity

37. Receptors have been defined by fleet and method and sensitivities assigned on this basis. It should be noted that the sensitivity of each fishery/ receptor group could vary with each potential impact, as well as between the construction, operational and decommissioning phases. As a result these are described separately, where necessary and in each instance the characteristics described in *Table 14.5* are taken into account.

Table 14.5 Definitions of Sensitivity of Commercial Fisheries Receptors

Sensitivity	Definition
High	Low spatial adaptability due to limited operational range and ability to deploy only one gear type. Limited spatial tolerance due to dependence upon a single fishing ground. Low recoverability due to inability to mitigate loss of fishing area by operating in alternative areas.
Medium	Some spatial adaptability due to extent of operational range and / or ability to deploy an alternative gear type. Moderate spatial tolerance due to dependence upon a limited number of fishing grounds. Limited recoverability with some ability to mitigate loss of fishing area by operating in alternative areas.
Low	High spatial adaptability due to extensive operational range and / or ability to deploy a number of gear types. High spatial tolerance due to ability to fish a number of fishing grounds. High recoverability due to ability to mitigate loss of fishing area by operating in range of alternative areas of the North Sea.
Negligible	Category of fishing receptor with an extensive operational range and very high method versatility. Vessels are able to exploit a large number of fisheries.

14.4.3.4 Magnitude

38. The magnitude of an effect is considered for each predicted impact on an individual fishery basis and is defined spatially, temporally and proportionally taking account of the likelihood of occurrence. The magnitude of the potential effect on a given receptor for different proposed East Anglia THREE project phases is primarily a function of dependence on the area under consideration. The criteria used to define magnitude of a potential impact on commercial fisheries are provided in *Table 14.6.*

39. With respect to duration of potential impacts, those associated with construction are considered to be short term occurring over a maximum of 2.5 years. Impacts associated with operation are long term, occurring over the 25 year operational lifetime of the proposed East Anglia THREE project. Due to the highly seasonal nature of certain fisheries, it is not possible to standardise the definition of duration of effects across the receptor groups as the timing of specific seasonal fisheries varies considerably.

Table 14.6 Definitions of Magnitude for Commercial Fisheries Receptors

Magnitude	Definition
High	A high proportion of total annual landings weights / values derived from fishing within the East Anglia THREE site or over the offshore cable corridor; and / or The change to fishing activity is permanent.
Medium	A moderate proportion of total annual landings weights / values derived from fishing within the East Anglia THREE site or over the offshore cable corridor; and / or The change is temporary but recovery within a reasonable timescale is not possible.
Low	A minor proportion of the total annual landings weights / values derived from fishing within the East Anglia THREE site or over the offshore cable corridor; and / or The change is temporary and recovery is possible within a reasonable timescale.
Negligible	Receptor has very little or no history of fishing in the areas under consideration; and / or The change is temporary and recovery is immediate.
No change	No impact, therefore no change in receptor condition.

14.4.3.5 Impact Significance

40. *Table 14.7* applies the significance criteria to the assessment of an effect, taking into account the magnitude of effect and sensitivity of the receptor. In the context of impacts on commercial fisheries, a low magnitude combined with a low sensitivity results in a minor significance. Those effects which are moderate or major are considered significant with respect to Environmental Impact Assessment (EIA) assessments.

41. The matrix is seen as a framework to aid understanding of how a judgement has been reached from the narrative of each impact assessment and it is not a prescriptive formulaic method. Defining impact significance is therefore qualitative and reliant on professional experience, interpretation and judgement.

Table 14.7 Impact Significance Matrix

Sensitivity	Magnitude				
	High	Medium	Low	Negligible	No change
High	Major	Major	Moderate	Minor	No change
Medium	Major	Moderate	Minor	Negligible	No change
Low	Moderate	Minor	Minor	Negligible	No change
Negligible	Minor	Negligible	Negligible	Negligible	No change

Table 14.8 Impact Significance Definitions

Impact Significance	Definition
Major	Very large or large change in receptor condition, both adverse or beneficial, which are likely to be important considerations at a regional or district level
Moderate	Intermediate change in receptor condition, which are likely to be important considerations at a local level.
Minor	Small change in receptor condition, which may be raised as local issues but are unlikely to be important in the decision making process.
Negligible	No discernible change in receptor condition.
No change	No impact, therefore no change in receptor condition.

42. Where the proposed East Anglia THREE project poses a potential health and safety risk to fishing vessels and crew, the significance criteria outlined previously are not applied. In these instances, risk is assessed based on the parameters used in Chapter 15 Shipping and Navigation and shown in *Table 14.8.*

43. Impacts which are within acceptable limits are considered not significant in terms of EIA regulations. Impacts deemed to be outside acceptable limits are considered to be significant in terms of the EIA regulations.

Table 14.8 Risk Matrix Description

Risk Region	Risk	Description
	Broadly Acceptable Region (Low Risk)	Generally regarded as insignificant and adequately controlled. Nonetheless the law requires further risk reductions if it is reasonably practicable. However, at these levels the opportunity for further risk reduction is much more limited.
	Tolerable Region (Intermediate Risk)	Typical of the risks from activities which people are prepared to tolerate to secure benefits. There is however an expectation that such risks are properly assessed, appropriate control measures are in place, residual risks are as low as is reasonably practicable (ALARP) and that risks are periodically reviewed to see if further controls are appropriate.
	Unacceptable Region (High Risk)	Generally regarded as unacceptable whatever the level of benefit associated with the activity.

44. It is important to note that this assessment of risks is qualitative and for the purposes of the EIA only. It is recognised that there is currently no legal mechanism to restrict access to the area occupied by the proposed East Anglia THREE project; therefore it will be the responsibility of skippers to carry out their own safety assessment based on their vessel and level of experience.

14.4.4 Cumulative Impact Assessment (CIA)

45. In addition to the methodology outlined in Chapter 6 Environmental Impact Assessment Methodology, the cumulative assessment approach adopted takes account of the following:

- For the assessment of impacts on commercially exploited fish and shellfish populations, cumulative effects can only occur if a significant impact is identified for fish and shellfish receptors (including species of commercial interest) within Chapter 11 Fish and Shellfish Ecology.
- Only those fisheries stakeholder groups with activity recorded within or close to the East Anglia THREE site and / or along the offshore cable corridor could potentially sustain a cumulative impact in relation to the proposed East Anglia THREE project.
- Only impacts assessed as significant resulting from the construction and operation of the proposed East Anglia THREE project have the potential to contribute to cumulative effects.
- It is taken that installed infrastructure and adopted regulated activities and measures form part of the existing baseline to which commercial fisheries stakeholders have already adapted. Therefore, only known planned, yet to be

constructed infrastructure, yet to commence activities or yet to be imposed measures are considered within the cumulative assessment.

- It is assumed that developers and operators of other infrastructure will adhere to the required standards so that fishing vessel safety is not compromised by a cumulative effect in respect of fishing vessel safety.
- Similarly, it is assumed that the same obligations will apply in respect of objects on the sea bed post construction and as such there is no potential for cumulative effects to occur in relation to sea bed debris.
- It is therefore considered that loss of or restricted access to traditional fishing grounds and increases in steaming times during the construction and operational phases are the only aspects for which cumulative impacts can occur.
- It should be recognised that uncertainties exist in respect of the future installations, measures and regulated activities which could contribute to the overall cumulative impact on commercial fisheries. For example, the final construction schedules of some developments considered for cumulative assessment have yet to be determined. Future changes to conservation measures and fisheries controls in ICES area IVc (and indeed other sea areas) are also difficult to predict with any degree of accuracy.

14.5 Existing Environment

14.5.1 Fisheries Control and Legislation

46. Commercial fishing in European Union (EU) waters is subject to numerous controls and regulations at European, national and local levels. The majority of such measures have a direct impact on fishing effort, landings weights and values and therefore the baseline. Furthermore, many are implemented at short notice with limited consultation, which limits confidence in predicting future trends. The main bodies regulating fisheries relevant to the proposed East Anglia THREE project through such measures are the EU through the Common Fisheries Policy (CFP), the MMO through national and regional regulations and Inshore Fisheries and Conservation Authorities (IFCAs) (out to 6nm) through local byelaws and Regulating Orders. A detailed description of relevant Fisheries Controls and legislation is provided in *Appendix 14.1*.

14.5.2 Overview of Fishing Activity (All Nationalities)

47. *Figure 14.3* shows the distribution of surveillance sightings of fishing vessels recorded in the area of the proposed East Anglia THREE project by nationality. The number and respective proportion of total observations each nationality represents

in ICES rectangles occupied by the East Anglia Zone and the proposed East Anglia THREE project is shown in *Table 14.9.*

48. Sightings within the proposed East Anglia THREE project are comprised principally of UK, Dutch and Belgian vessels. Observations of German and French vessels are also recorded but in considerably lower numbers (2010 to 2014).

49. Dutch vessels have been recorded in highest numbers within the East Anglia Zone in comparison to other nationalities, with activity concentrated within the northern half of the East Anglia Zone. The highest densities of Dutch vessel sightings are recorded outside of the proposed East Anglia THREE project, in the north-west of the East Anglia Zone. *Table 14.9* shows 83.8% of all observations within the East Anglia THREE site (34F2) are of Dutch vessels and this fleet is also the most frequently observed within the East Anglia THREE site. Sightings of Belgian vessels represent 7.7% of observations in the East Anglia THREE site (34F2), although none of these were from within the East Anglia THREE site. UK and German vessels have been recorded infrequently in the East Anglia THREE site (22 and eight observations between 2010 and 2014, respectively). In both cases only a single observation was within the East Anglia THREE site.

50. Belgian sightings represent over a third of those recorded within the offshore cable corridor (33F2) (41.2%). Significantly fewer Dutch registered vessels were observed within the offshore cable corridor (33F2) compared to the East Anglia THREE site (31.4%), although activity is still considerably higher than that recorded by both the UK (10.7%) and German (9.3%) fleets. French and Danish vessels are recorded less frequently, respectively accounting for 3.1% and 2.9% of observations in this area.

51. Vessels of UK registration represent the majority of sightings in the inshore cable corridor (33F1) (80.5%), as a considerable proportion of this ICES rectangle is inside the 6 nm limit. Sightings of non-UK vessels within the inshore cable corridor are considerably lower than in other areas. As a small area lies within the 6 to 12nm limit, however, Belgian vessels (10.1%), due to their historical rights, are more active in the inshore cable corridor (33F1) than the Dutch (1.4%).

Table 14.9 Breakdown of Vessel Sightings by Nationality in the Proposed East Anglia THREE Project (2010 to 2014) (Source: MMO 2015)

Area	Nationality	No. of sightings	% of total sightings
Proposed East Anglia THREE site (34F2)	Netherlands	459	83.8%
	Belgium	42	7.7%
	United Kingdom	22	4.0%
	Germany	8	1.5%
	Denmark	7	1.3%
	France	7	1.3%
	China	2	0.4%
	Ireland	1	0.2%
	Total	548	100.0%
Offshore cable corridor (33F2)	Belgium	173	41.2%
	Netherlands	132	31.4%
	United Kingdom	45	10.7%
	Germany	39	9.3%
	France	13	3.1%
	Denmark	12	2.9%
	China	2	0.5%
	Norway	2	0.5%
	Unknown	2	0.5%
	Total	420	100.0%
Inshore cable corridor (33F1)	United Kingdom	352	80.5%
	Belgium	44	10.1%
	France	34	7.8%
	Netherlands	6	1.4%
	Denmark	1	0.2%
	Total	437	100.0%

14.5.3 Dutch Fishing Activity – National overview

52. MMO surveillance sightings of Dutch registered vessels identified in proposed East Anglia THREE project are shown in *Figure 14.4.* The principal gear types employed by the Dutch fleet are as follows:

- Beam trawling;
- Trawling (unspecified);
- Demersal trawling; and

- Seine netting.

14.5.3.1 Beam Trawling[3]

53. *Figure 14.5* shows the distribution of Dutch beam trawl landing values (€) in the North Sea. Activity by the beam trawling fleet is widely distributed throughout the North Sea, with the highest values occurring in the Southern North Sea. Both the East Anglia THREE site and the offshore cable corridor are situated in the proximity of high value beam trawling grounds, with the highest values being recorded immediately south of the East Anglia Zone.

14.5.3.2 Demersal Otter Trawling[4]

54. The distribution of Dutch demersal otter trawling is shown in *Figure 14.6.* Similar to the beam trawl fleet, activity is widely distributed throughout the North Sea. Landings values from the proposed East Anglia THREE project are low compared to those from grounds located to the east and further north in the central North Sea.

14.5.4 Dutch Fishing Activity – Regional overview

14.5.4.1 Surveillance sightings

55. MMO surveillance data displayed in *Figure 14.4* shows that the majority of Dutch vessels within the proposed East Anglia THREE project are beam trawlers. Sightings are most dense in an area to the west of the East Anglia THREE site; those within the site itself are somewhat lower. Sightings of Dutch vessels in the offshore cable corridor (33F2) are generally low. Increased beam trawling activity is recorded immediately south of the offshore cable corridor.

14.5.4.2 Fisheries Statistics

56. The Fisheries statistics provided by IMARES and shown in *Figure 14.7* show that in the windfarm and offshore cable corridors, the majority of landings values are for sole, followed by plaice. In the East Anglia THREE site, sole represent two thirds of the total landings values.

57. *Figure 14.8* shows that in the East Anglia Zone the majority of landings values originate from the beam trawl fleet. In the East Anglia THREE site (34F2), beam

[3] Beam trawling involves the towing of steel beams held off the sea bed by shoes or rollers at each end, onto which the net is attached. This principal has been progressed further by the development of 'sum wing' and 'pulse wing' trawls where the net and chains are attached to a hydrofoil rather than a beam. On pulse wing gear the chains are replaced with electrodes. Further information on gear specification and operational practices is provided in *Appendix 14.1*.

[4] Demersal otter trawl is a towed gear comprised of a funnel shaped net held open by trawl ('otter') doors. The ground line of the net is weighted to maintain contact with the sea bed and can vary in design depending on the type of ground fished. Further information on gear specification and operational practices is provided in *Appendix 14.1*.

trawl landings represent in excess of 90% of the total. The remainder of landings originate from demersal trawlers and fly seiners[5]. The dominance of the beam trawl fleet in terms of landings values is also reflected in corresponding patterns of effort as shown in *Figure 14.10.*

58. A similar pattern is evident in the offshore cable corridor, although total annual landings are reduced by approximately 40% in comparison to the East Anglia THREE site (*Figure 14.8*). In this area, midwater pair trawlers[6] (targeting either sprat or horse mackerel) record the remainder of landings values.

59. *Figure 14.9* shows that almost all Dutch activity in the East Anglia THREE site is by the over-15m fleet. Dutch fishing effort by vessel category shown in *Figure 14.11* confirms the predominance of over-15m vessels.

60. Further information on the annual variation of the Dutch fleet in terms of effort, landings values by target species and method is provided in *Appendix 14.1.*

14.5.4.3 VMS Data

61. Dutch VMS integrated landings values and effort by method provided by IMARES are shown in *Figure 14.12* to *Figure 14.21*.

62. *Figure 14.12* shows the spatial distribution of VMS integrated landing values from the beam trawl fleet. The highest levels of landings values (over €1,500,000) by the beam trawl fleet originate from an area along the coast of the Netherlands and Belgium. Landings from the proposed East Anglia THREE site are of relatively high value but values are generally higher in the north-western section of the East Anglia Zone. Values within the offshore cable corridor are somewhat lower in the south-western and central areas increasing closer to the East Anglia THREE site.

63. VMS values from the Dutch demersal trawl fleet are shown in *Figure 14.13.* The highest landings values (over €50,000) originate from central and eastern North Sea as well as along the Dutch and Belgian coasts. With respect to vessels operating in the East Anglia Zone, the data shows that the main grounds are broadly similar to the beam trawl fleet. As far fewer vessels use demersal otter gear, however, by

[5] Fly seining (also known as Scottish seining) is an encircling gear derived from traditional anchor seining. This involves encircling a shoal of fish with the seine ropes, which are then scared into the cod end when hauling commences. In contrast to anchor seining, the vessel does not anchor during hauling of the net, instead holding position using the propeller. Further information on gear specification and operational practices is provided in *Appendix 14.1.*

[6] Midwater trawls are a towed gear comprised of a funnel shaped net held open by trawl doors which are towed up in the water column above the sea bed. The method is used to target pelagic species such as herring and mackerel and horse mackerel. Further information on gear specification and operational practices is provided in *Appendix 14.1.*

comparison landings are much lower throughout most of the area under consideration.

64. *Figure 14.14* illustrates the distribution of VMS by value from vessels operating seine nets. The data show that the highest landings values originate from the central and western English Channel as well as the central and north-east North Sea. The East Anglia THREE site is located in an area of moderate to high value whilst values are considerably lower in the offshore cable corridor.

65. The distribution of VMS by value from vessels operating static nets is shown in *Figure 14.15*. The data shows that the highest levels of landings values (over €25,000) originate from grounds off the Dutch coast. Very low values (less than €1,000) are recorded by this fleet within the East Anglia THREE site. Similarly low values are recorded immediately south in the eastern area of the offshore cable corridor.

66. *Figure 14.16* shows the distribution of VMS by values from vessels operating pelagic trawls. The highest landings values in this fishery originate from the English Channel and the northern part of the North Sea. With respect to the East Anglia Zone, high value landings are recorded to the north of the East Anglia Zone whereas low to moderate landings values originate from the rest of the East Anglia Zone. The East Anglia THREE site is located in an area recording moderate landings values. Values recorded in the area of the offshore cable corridor show more variability.

67. *Figures 14.17* to *Figure 14.21* give the patterns of effort in terms of VMS for Dutch vessels engaged in beam trawling, demersal trawling, seine netting, netting[7] and pelagic trawling, respectively. In a general sense, the areas of highest effort correspond to those observed for value. Further information relating to the distribution of landings values and fishing effort as shown by VMS data is provided in *Appendix 14.1.*

14.5.5 Dutch Fishing Activity – Project Specific

14.5.5.1 Annual Variation

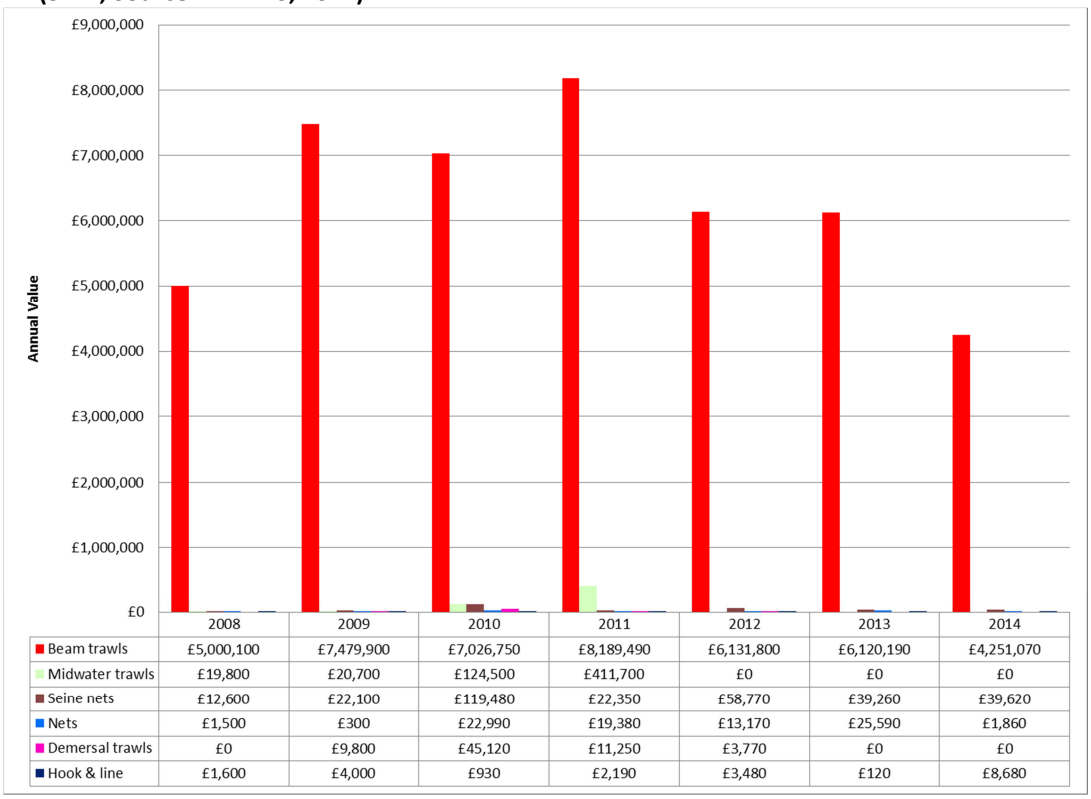
68. Annual statistics have been provided by the Dutch authorities (IMARES) up to 2013 by method and species. Beam trawl landings values recorded in the East Anglia THREE site and offshore cable corridor show limited annual variation and broadly follow landings values of sole, with peaks in 2010 (£12,649,100*; Diagram 14.1*) and 2011 (€8, 189,500; *Diagram 14.2*). Landings values by beam trawlers in the inshore

[7] Static nets, which can be either fixed (e.g. gill nets) or drifting (e.g. trammel nets), are a static gear operated in fleets which can be up to 1200m in length. Further information on gear specification and operational practices is provided in *Appendix 14.1.*

cable corridor are considerably lower and subject to increased annual variation. A detailed description of annual variations of landings values and effort for each analysis area is provided in *Appendix 14.1.*

	2008	2009	2010	2011	2012	2013	2014
Beam trawls	£7,768,800	£11,423,400	£12,649,100	£11,552,290	£9,441,940	£11,824,780	£10,036,230
Seine nets	£389,300	£137,900	£198,610	£230,870	£126,190	£47,130	£129,310
Demersal trawls	£319,800	£173,100	£80,740	£5,800	£10,070	£0	£0
Midwater trawls	£0	£85,200	£70,040	£176,800	£0	£22,420	£0
Hook & line	£0	£0	£780	£2,720	£36,180	£430	£350
Nets	£900	£1,200	£3,150	£8,550	£0	£240	£25,680

Diagram 14.1 Netherlands Annual Landings Values (€) by Method in the East Anglia THREE site (34F2; Source: IMARES, 2014)



	2008	2009	2010	2011	2012	2013	2014
Beam trawls	£5,000,100	£7,479,900	£7,026,750	£8,189,490	£6,131,800	£6,120,190	£4,251,070
Midwater trawls	£19,800	£20,700	£124,500	£411,700	£0	£0	£0
Seine nets	£12,600	£22,100	£119,480	£22,350	£58,770	£39,260	£39,620
Nets	£1,500	£300	£22,990	£19,380	£13,170	£25,590	£1,860
Demersal trawls	£0	£9,800	£45,120	£11,250	£3,770	£0	£0
Hook & line	£1,600	£4,000	£930	£2,190	£3,480	£120	£8,680

Diagram 14.2 Netherlands Annual Landings Values (€) by Method in the Offshore cable corridor (33F2; Source: IMARES 2014)

14.5.5.2 Dutch Vessels, Gears and Operating Practices

69. The analysis of data in the preceding sections and information gathered through consultation with the Dutch Fishermen's Federation (VisNed 2013) and its members indicates that Dutch fishing activity in the proposed East Anglia THREE project is predominantly by beam trawlers. During consultation it was stated that up to 57 of these vessels fish the East Anglia Zone, of which between 30 and 35 target grounds in the East Anglia THREE site and offshore cable corridor on a regular basis (VisNed 2013).

70. Most of the vessels fishing in the East Anglia THREE site are the large category of beam trawler with overall lengths of between 40 to 43m, displacements in the order of 800 tonnes and main engines recorded to be of up to 2000hp. Grounds within the general vicinity of the East Anglia THREE site are primarily fished by vessels from Texel and Den Helder. It was stated (pers. com. VisNed 2013) that effort by the Anglo-Dutch fleet[8] in this area is comparatively much less, as their main fishing grounds are located in the central North Sea. Further information on vessel specifications is provided in *Appendix 14.1.*

71. The principal target species in the area of the proposed East Anglia THREE project are sole and plaice which are fished throughout the year. It was stated during consultation that landings of plaice are highest toward the end and beginning of the year. Smaller amounts of quota are also allocated to Dutch vessels in the North Sea for turbot and brill although the quota has been fulfilled rapidly in the past couple of years (M. Driijver, pers. comm. 2013). It was also noted that whilst fishing for sole had been good, unusually low prices had been experienced due to the high volume of landings coupled with other market forces.

72. Most Dutch beam trawlers operating in the vicinity of the East Anglia THREE area use new beam trawl methods such as Sum Wing or Pulse Wing trawls. These methods provide fuel reduction costs of approximately 20% and 50% respectively. During consultation it was indicated that Pulse Wing gear targets sole more efficiently than plaice and that as a result a shift in the location of grounds fished has occurred as increasing numbers of vessels convert to Pulse Wing gear. Specifically, activity is now higher west of the Brown Ridge; an area of ground located along the eastern boundary of the East Anglia Zone. Approximately 80% of the Dutch fleet targeting grounds in the area of East Anglia THREE now use Pulse Wing gear. A number of other Dutch beam trawl vessels are awaiting responses for derogation to the EU ban on electric fishing. Should this occur, the number of vessels fishing for sole using Pulse Wing gear within the vicinity of East Anglia THREE is therefore likely to increase.

[8] 40 Dutch owned and operated vessels fishing UK quotas, including 24 beam trawlers.

73. Another response to the high fuel costs associated with beam trawling is the conversion of a number of Dutch beam trawlers to demersal single or twin rigged otter trawls or fly seining (VisNed skippers pers. comm. May 2013). It was stated during consultation that from five, to a maximum of ten, seiners may target grounds located within the offshore cable and East Anglia THREE sites during the summer months, before moving south in the winter to fish the English Channel.

74. Further information on vessel specifications and operational practices is provided in the *Appendix 14.1*.

14.5.6 Belgian Fishing Activity – Overview

75. MMO data displayed in *Figure 14.22* shows the surveillance sightings of Belgian registered vessels identified in the vicinity of the proposed East Anglia THREE project. Only beam and demersal trawling have been identified as occurring in the area. Overall, beam trawlers represent the majority of vessel sightings, with the highest concentrations recorded immediately south-west of the East Anglia Zone.

14.5.6.1 Beam Trawling

76. From a national perspective, ILVO data displayed in *Figure 14.23* shows that activity by the Belgian beam trawl fleet is widely distributed, occurring in the North Sea, English Channel, Western Approaches, Celtic Sea and Irish Sea. With respect to the proposed East Anglia THREE project, landings from the offshore cable corridor are of moderate value in the national context. Those from the windfarm and inshore cable corridors are much lower. In all areas, other than the central North Sea, landings are dominated by sole. The ICES rectangles recording the highest value landings are located in the Celtic Sea and eastern English Channel.

14.5.6.2 Demersal Trawling

77. Landings values by Belgian registered demersal otter trawlers are shown in the national context in *Figure 14.24*. The pattern of activity is broadly similar to the beam trawl fleet, although somewhat reduced in the English Channel and off the coast of East Anglia. Overall, landings from this fleet are of significantly lower value than from beam trawlers, particularly in the proposed East Anglia THREE project. With the exception of the central North Sea, where lemon sole and plaice are important, landings values from other areas are represented principally by sole.

14.5.7 Belgian Fishing Activity – Regional

14.5.7.1 Fisheries Statistics

78. *Figure 14.25* illustrates the distribution of landings values the proposed East Anglia THREE project by species. Total values are high from within the offshore cable corridor (€1,870,393) but are considerably lower from both the East Anglia THREE site (€715,539) and inshore cable corridor (€236,429). Approximately two thirds to

three quarters of total values in these areas are characterised by sole landings. The remainder are comprised of plaice, turbot, lemon sole and skates and rays. *Figure 14.26* shows that landings values in these areas originate entirely from the beam trawl fleet; demersal otter trawlers record higher proportions of landings values in those rectangles which are partially located within the 6 to 12nm limit (e.g. 33F1: inshore cable corridor). Values recorded by other methods are much lower and occur outside the study area. Patterns of effort distribution by method shown in *Figure 14.28* generally reflect this.

79. With respect to vessel size, *Figure 14.27* shows that over 90% of the beam trawl fleet targeting grounds in the offshore cable and East Anglia THREE sites are between 24 to 40m in length. In contrast, almost 75% of landings values in the inshore cable corridor originate from the 18 to 24m vessel category. Patterns of effort distribution by vessel size shown in *Figure 14.29* generally reflect landings values.

80. Further information on fisheries statistics in relation to the Belgian fleet is provided in *Appendix 14.1*.

14.5.7.2 VMS Data

81. ILVO has supplied Belgian VMS data from vessels using beam trawls, otter trawls, seine nets, and gill nets. The data has been integrated by value and effort.

82. *Figure 14.30* shows an overview of VMS by values from all gear types employed by the Belgian fleet. The highest value landings are recorded from off the Dutch and Belgian coasts, Eastern Channel and Celtic Sea. Moderate landings are recorded within the East Anglia THREE study areas.

83. *Figure 14.31* shows that the beam trawl fleet records moderate to high values from the western edge of the offshore cable corridor and the central part of the East Anglia THREE site (€100,000 – €500,000). In contrast to Dutch vessels, values from the Belgian fleet in the East Anglia THREE site itself are much lower. As the majority of the inshore cable corridor is located within the 6nm limit, landings from this area are much lower.

84. The distribution of effort by the demersal otter trawl fleet is provided in *Figure 14.31a*. In general, activity by this fleet is less widespread than beam trawlers and is concentrated in discrete areas of the Celtic Sea, Central North Sea and immediately south of the inshore cable corridor. Landings from the rectangles defining the East Anglia THREE study areas are minimal

85. *Figure 14.31b* indicates that only very low landings (in all cases less than €5,000) are recorded by the seine netting fleet in the any of the East Anglia THREE study

areas. The most important grounds for this fleet are located some distance from the East Anglia THREE project in the Western and Eastern English Channel.

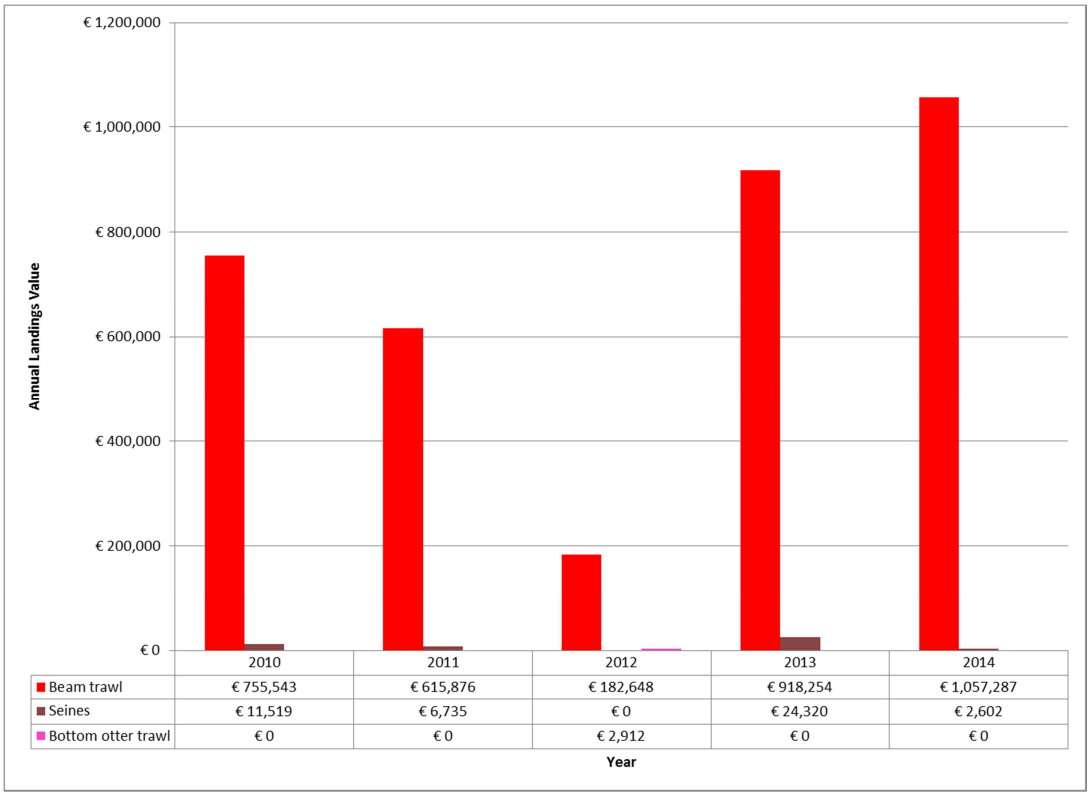
86. The distribution of value integrated VMS data from the Belgian gill netting fleet is shown in *Figure 31c*. No landings from this fleet are recorded in any of the East Anglia THREE study areas. Based on the data presented, the fishery is limited to areas off the French and Belgian coasts and in the Eastern Channel.

87. The distribution of Belgian VMS data integrated by effort is shown in *Figure 31d* to *Figure 31h*. In all cases patterns of effort correspond broadly to those shown previously for value.

14.5.8 Belgian Fishing Activity – Project Specific

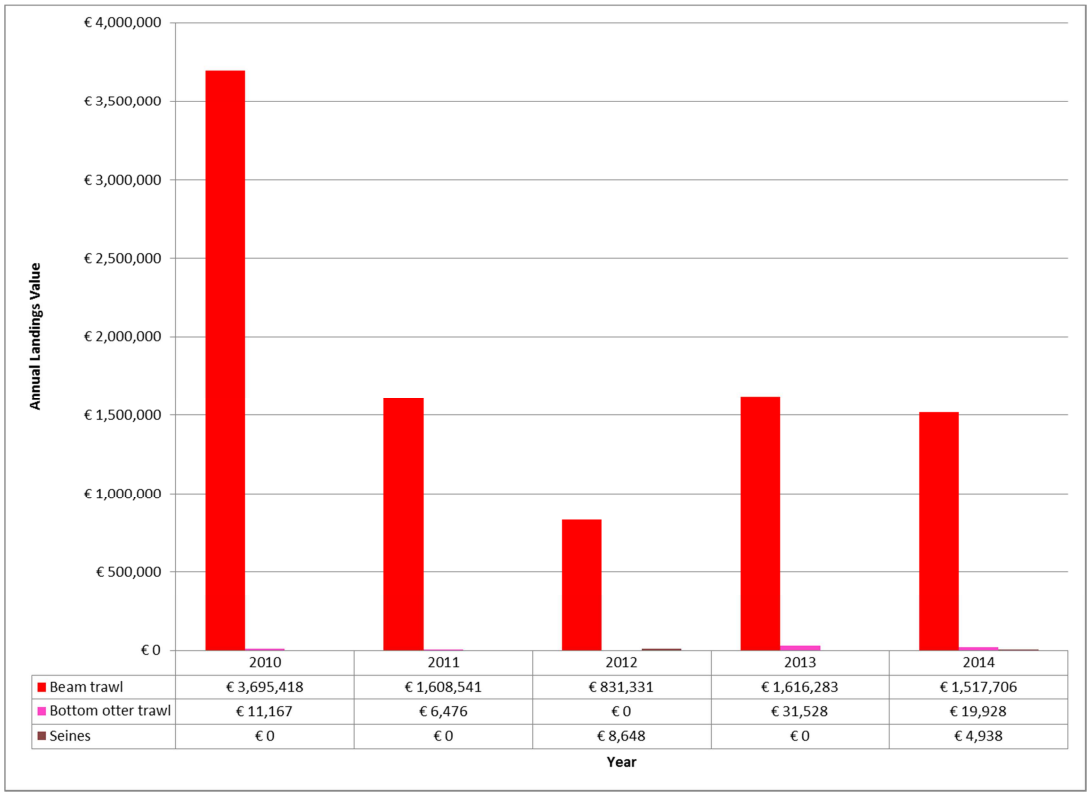
14.5.8.1 Annual Variations

88. Landings values from the Belgian fleet in the East Anglia THREE site are mainly from beam trawlers targeting sole. Beam trawler landings values recorded within the East Anglia THREE site are subject to annual variations and were highest in 2014 with €1,057,827, as indicated in Diagram 14.3. Landings values by beam trawlers have shown a general decline over the five year period (2010 - 2014) within both the offshore and inshore cable corridor, as indicated in *Diagram 14.4* and *Diagram 14.5* respectively. The values recorded by the demersal otter trawl fleet in all three areas are significantly lower than by beam trawlers. A detailed description of annual variations by method and by species for the East Anglia THREE site and the inshore and offshore cable corridor on an annual basis from 2001 to 2010 is provided in the *Appendix 14.1*.



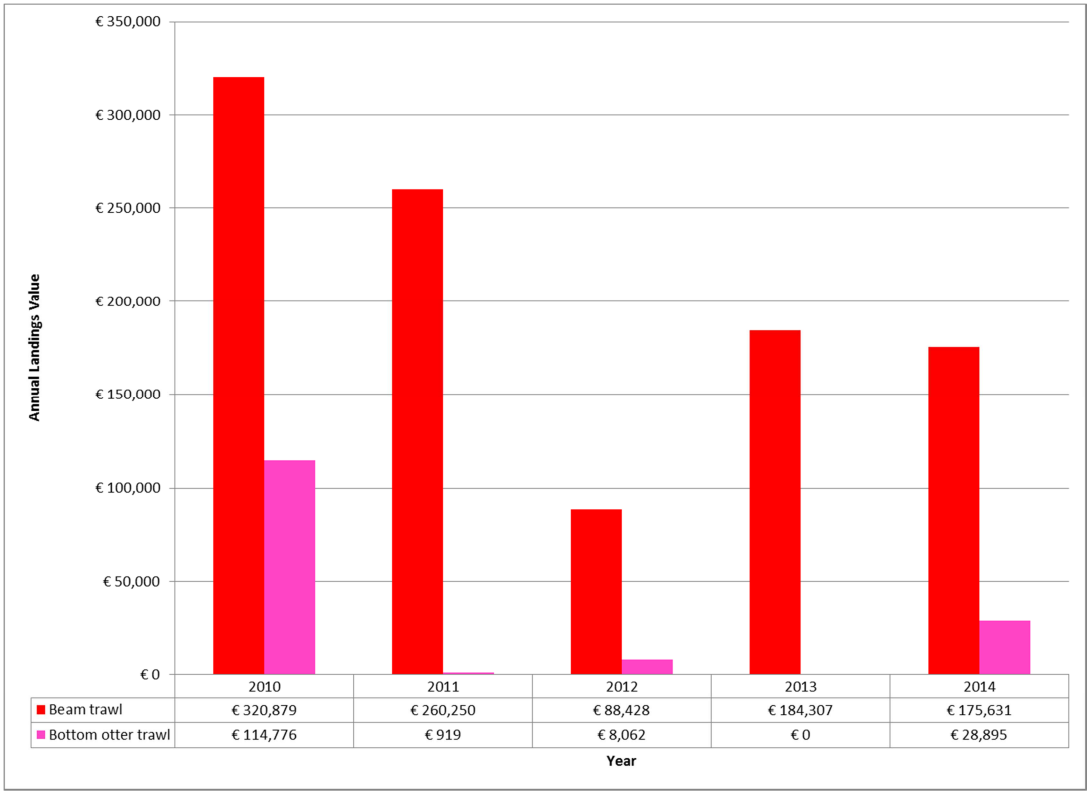
	2010	2011	2012	2013	2014
Beam trawl	€ 755,543	€ 615,876	€ 182,648	€ 918,254	€ 1,057,287
Seines	€ 11,519	€ 6,735	€ 0	€ 24,320	€ 2,602
Bottom otter trawl	€ 0	€ 0	€ 2,912	€ 0	€ 0

Diagram 14.3 Belgian Annual Landings Values (€) by Method in the Proposed East Anglia THREE site (34F2; Source: ILVO, 2015)



	2010	2011	2012	2013	2014
Beam trawl	€ 3,695,418	€ 1,608,541	€ 831,331	€ 1,616,283	€ 1,517,706
Bottom otter trawl	€ 11,167	€ 6,476	€ 0	€ 31,528	€ 19,928
Seines	€ 0	€ 0	€ 8,648	€ 0	€ 4,938

Diagram 14.4 Belgian Annual Landings Values (€) by Method in the Offshore cable corridor (33F2; Source: ILVO 2015)



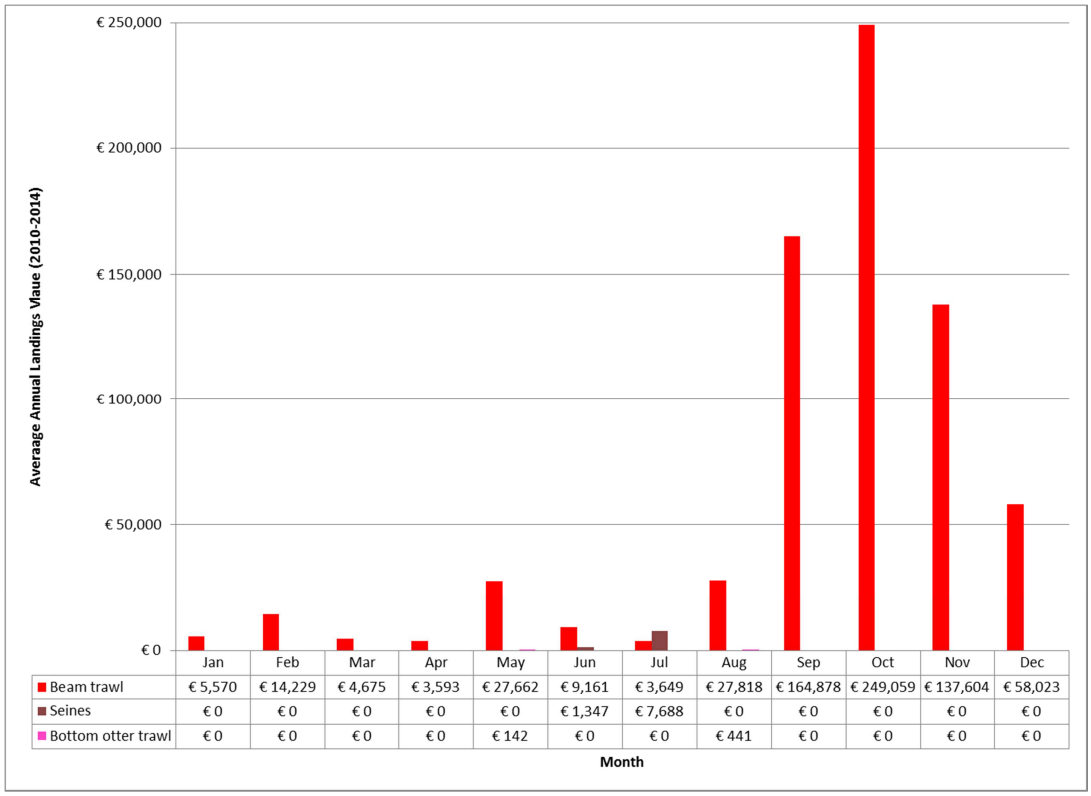
	2010	2011	2012	2013	2014
Beam trawl	€ 320,879	€ 260,250	€ 88,428	€ 184,307	€ 175,631
Bottom otter trawl	€ 114,776	€ 919	€ 8,062	€ 0	€ 28,895

Diagram 14.5 Belgian Annual Landings Values (€) by Method in the Inshore cable corridor (33F1; Source: ILVO, 2015)

14.5.8.2 Seasonal Variation

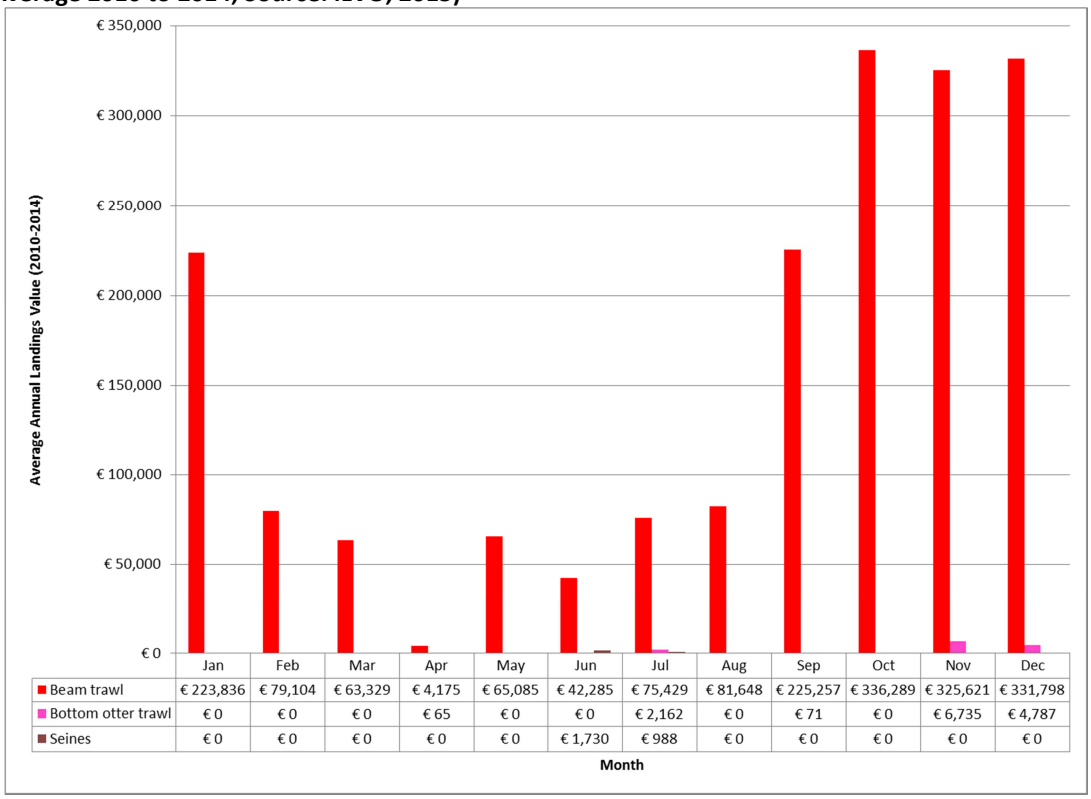
89. The seasonal distribution of landings values by beam trawlers in the East Anglia THREE site corresponds broadly to that observed in the offshore cable corridor being highest from September through to February. Values are however, generally higher in the offshore cable corridor, as indicated in *Diagram 14.6* and *Diagram 14.7*. Within the offshore cable corridor, maximum values are recorded in October (€336,289) and January (€331,798).

90. Within the Inshore cable corridor, landings values by the Belgian beam trawl fleet are highest during May (€46,592) and June (€34,410), as indicated in *Diagram 14.8*. In terms of value, monthly landings from demersal otter trawlers are typically less than a third of those from the beam trawl fishery and peak later, during June. A detailed description of seasonal variations by method and by species is provided in the *Appendix 14.1*.



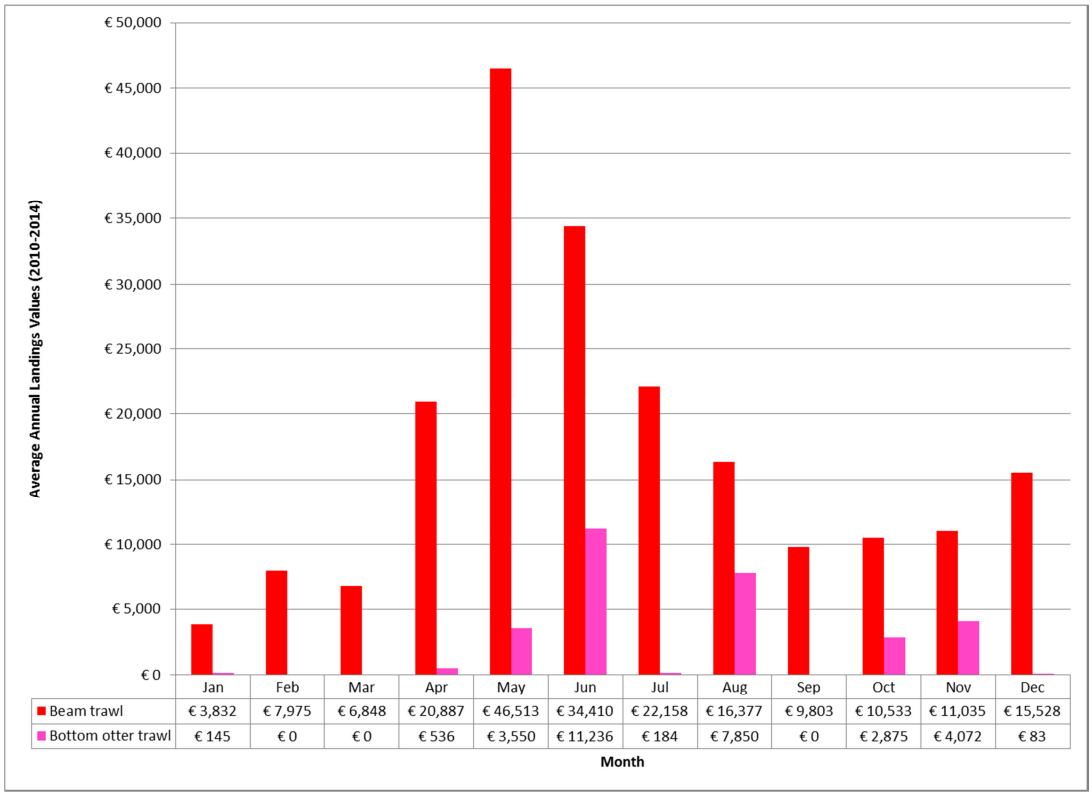
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beam trawl	€ 5,570	€ 14,229	€ 4,675	€ 3,593	€ 27,662	€ 9,161	€ 3,649	€ 27,818	€ 164,878	€ 249,059	€ 137,604	€ 58,023
Seines	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1,347	€ 7,688	€ 0	€ 0	€ 0	€ 0	€ 0
Bottom otter trawl	€ 0	€ 0	€ 0	€ 0	€ 142	€ 0	€ 0	€ 441	€ 0	€ 0	€ 0	€ 0

Diagram 14.6 Belgian Seasonal Landings Values (€) by Method in the East Anglia THREE site (34F2, Average 2010 to 2014; Source: ILVO, 2015)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beam trawl	€ 223,836	€ 79,104	€ 63,329	€ 4,175	€ 65,085	€ 42,285	€ 75,429	€ 81,648	€ 225,257	€ 336,289	€ 325,621	€ 331,798
Bottom otter trawl	€ 0	€ 0	€ 0	€ 65	€ 0	€ 0	€ 2,162	€ 0	€ 71	€ 0	€ 6,735	€ 4,787
Seines	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1,730	€ 988	€ 0	€ 0	€ 0	€ 0	€ 0

Diagram 14.7 Belgian Seasonal Landings Values (€) by Method in the offshore cable corridor (33F2, Average 2010 to 2015; Source: ILVO 2015)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beam trawl	€ 3,832	€ 7,975	€ 6,848	€ 20,887	€ 46,513	€ 34,410	€ 22,158	€ 16,377	€ 9,803	€ 10,533	€ 11,035	€ 15,528
Bottom otter trawl	€ 145	€ 0	€ 0	€ 536	€ 3,550	€ 11,236	€ 184	€ 7,850	€ 0	€ 2,875	€ 4,072	€ 83

Diagram 14.8 Belgian Seasonal Landings Values (€) by Method in the inshore cable corridor (33F1, Average 2010 to 2015; Source: ILVO, 2015)

14.5.9 Belgian Vessels, Gears and Operating Practices

91. The Belgian fishing fleet is smaller than that of the Dutch comprising of 35 vessels over 24m in length and 40 vessels under 24m, the majority of which are beam trawlers. Belgian beam trawlers are of similar design to Dutch vessels, although engine powers are usually lower. Main engine powers of the vessels targeting grounds in the vicinity of the proposed East Anglia THREE project range from 250hp to 1305hp. The majority of the fleet are registered at the main Belgian landing ports of Oostende or Zeebrugge.

92. As previously stated, Belgium holds historic fishing rights between the UK's 6 and 12nm territorial fishing limits. Under EU regulations, however, restrictions apply to use of beam trawl gears between these limits and only vessels with main engines of less than 300hp ("Eurocutters") are permitted access to these areas. It was reported during consultation that up to 30 vessels from this fleet segment may fish within the 6 to 12nm limit off the East Anglian coast (Rederscentrale, 2013). Larger vessels may operate inside 12nm only if they are using demersal otter trawls or fly seines. It was also stated that larger beam trawlers may occasionally switch over to demersal otter trawl gear allowing them access to grounds within the 6 to 12nm limit. In order to cut fuel costs, a number of Belgian beam trawlers are now using Sum Wings including a number which target grounds in the East Anglia Zone. It was reported that only five vessels use this gear on a full time basis in all sea areas

fished by the Belgian fleet (Redercentrale 2013). Further information on vessel and gear specifications are provided in *Appendix 14.1.*

93. A broad indication of the areas fished by both Eurocutters and the larger category Belgian vessels, as depicted on paper charts by skippers during consultation (Rederscentrale, August 2013) is shown in *Figure 14.32.* As would be expected these correspond broadly with VMS datasets shown previously.

94. Areas fished by both vessel categories are generally located along the western edge of the East Anglia Zone some distance from the East Anglia THREE site. Some Eurocutter grounds are located within the 6 to 12nm limit, whilst those of larger vessels are located outside of this boundary. Specific grounds fished within these areas are dictated by the distribution of target species and will vary between years.

95. Activity by the Belgian fleet is distributed throughout the central and southern North Sea, English Channel, Celtic Sea and Irish Sea and individual vessels regularly move between these areas. This is in contrast to Dutch activity which is mainly restricted to the North Sea and grounds targeted by fleets from particular ports may be relatively localised (e.g. Den Helder and Texel). It was reported during consultation that the intensity of fishing by the Belgian fleet in the vicinity of the proposed East Anglia THREE project has decreased in recent years as the quality of the fishing is perceived to have declined (Rederscentrale 2013).

96. Further information on vessel specifications and operational practices is provided in *Appendix 14.1.*

14.5.10 UK Fishing Activity – Overview

97. *Figure 14.33* shows the extent of UK fishing activity (all gear types) by vessels over-12m as recorded by VMS (value). The highest value areas are located off the West of Scotland (ICES sub-area VIa), in the Irish Sea (sub-area VIIa), Celtic Sea (sub-areas VIIf, VIIg, VIIh), English Channel (VIIe, VIId) and Central North Sea (sub-area IVb). The area of the southern North Sea (sub-area IVc) in which the proposed East Anglia THREE project is situated exhibits lower values than all other areas in UK waters. As previously highlighted, however, VMS datasets show activity for the over-15m fleet only and will therefore underrepresent total fishing activity.

98. Surveillance sightings of UK vessels identified by method are given in *Figure 14.34*. The principal gear types[9] employed by UK registered vessels within the proposed East Anglia THREE project are as follows:

- Potting;
- Gillnetting;
- Beam trawling;
- Demersal trawling;
- Longlining; and
- Driftnetting.

14.5.10.1 Potting[10]

99. Potting is undertaken by local vessels within the offshore cable corridor. *Figure 14.35* shows the distribution of landings values of shellfish pot fisheries around the UK. On a national scale, crab and lobster landings from the offshore cable corridor (33F1 and 33F2) are low. However, these landings are important to local vessels when landed in addition to fish species targeted with other methods. Similarly, it should be noted that whilst whelk landings from the proposed East Anglia THREE project are very low in a national context, they have shown an increase in recent years.

14.5.10.2 Netting

100. The distribution of landings values from UK vessels deploying driftnets, gillnets and trammel nets are shown in *Figure 14.36* to *Figure 14.38,* respectively. In all cases, landings recorded in the proposed East Anglia THREE project are dominated by sole and are of lower value than areas such as the south-east coast and English Channel. Lower values of herring and other species are recorded immediately west of the proposed East Anglia THREE project. In the south-east and English Channel, either sole or bass represent the highest value landings for all three methods in all sea areas, the majority of which will originate from small (e.g. under-10m) vessels targeting inshore grounds.

[9] Note that although scallop dredgers have been recorded during surveillance operations these are likely to be vessels steaming to and from ports outside East Anglia to grounds located in the English Channel. At the time of writing there are no known scallop grounds in the vicinity of the proposed East Anglia THREE project.

[10] Potting is a static gear comprised of a mainline holding between six to 25 pots spaced at intervals between 10 and 20m (e.g. 60 to 440m total length) depending on vessel size and the area fished. Further information on gear specification and operational practices are provided in the Technical Appendix.

14.5.10.3 Longlining [11]

101. The distribution of longlining landings values is shown in *Figure 14.39*. Landings in the proposed East Anglia THREE project are dominated by cod, with bass, skates and rays and thornback ray constituting smaller, but significant, proportions of total values.

14.5.10.4 Beam Trawling

102. The distribution of UK registered beam trawl grounds and the main species landed within the fishery are shown in *Figure 14.40*. Beam trawl landings within the East Anglia Zone are of relatively low value in the national context when compared to the Celtic sea, English Channel and central North Sea. However, landings from the offshore cable corridor are among the highest in the southern North Sea and are dominated by sole. It should be noted that the TAC for cod and plaice in the North Sea (IV) have increased in 2015, and therefore fishing activity targeting these species may increase.

14.5.10.5 Demersal Otter Trawling

103. *Figure 14.41* demonstrates that demersal trawling by UK registered vessels is widely distributed throughout all sea areas around the UK and Republic of Ireland. Landings from the proposed East Anglia THREE project are of low value compared to those from areas such as the northern North Sea, Firth of Clyde and Minches. As in other sea areas including the Thames Estuary, landings from the otter trawl fleet in the proposed East Anglia THREE project area are dominated by sole.

14.5.11 UK Fishing Activity – Regional

14.5.11.1 Surveillance Sightings

104. *Figure 14.34* shows that sightings of UK vessels are principally located within inshore areas; much lower numbers are recorded further offshore. Sightings have been particularly low in the East Anglia THREE site. Within the inshore cable corridor the highest numbers of sightings are of potting vessels, with particularly high densities recorded in the north of that ICES rectangle. Unspecified trawlers also represent a relatively high proportion of sightings within the inshore cable corridor. The highest densities of beam trawler sightings are recorded to the north-east of the inshore cable corridor. The greatest numbers of vessels working longlines also occur to the north-east of the offshore cable corridor. Demersal trawlers and gill and driftnetters are observed in lower numbers within the inshore cable corridor.

[11] Longlining is a static gear method comprised of a main line onto which a series of baited hooks are attached via snoods at regular intervals. Further information on gear specification and operational practices are provided in *Appendix 14.1.*

105. Sightings in offshore areas are characterised by low numbers of potters, beam trawlers, unspecified trawlers and longliners.

14.5.11.2 Fisheries Statistics

106. *Figure 14.42* illustrates landings values recorded within the proposed East Anglia THREE project by species. Average annual landings values from the East Anglia THREE site are comparatively low (£351,767) and dominated by sole. Plaice, cod, turbot brill and sprats represent smaller proportions of the total value.

107. A similar pattern is apparent over the offshore cable corridor, though landings of plaice are of considerably higher value than cod. On average, landings values from this area (£405,699) are greater than from the East Anglia THREE site.

108. Landings from the inshore cable corridor (£970, 093) are of considerably higher value when compared to the East Anglia THREE site and the offshore cable corridor with over half the total value represented by sole. Cod are more important than in other areas and account for approximately a quarter of total landings values. Bass and thornback rays are also of increased importance compared to rectangles located to the east and north, although respective contributions are relatively low. Landings values in 32F1, in which the south-western extremity of the offshore cable corridor is located, are the highest from any rectangle in the vicinity of the proposed East Anglia THREE project, approximately 40% of which is again comprised of sole. The large proportion of 'other species' in this rectangle will be landings of cockles from the Thames Estuary fishery. Although cod represent a smaller proportion of landings than in 33F1, the distribution of other species is similar.

109. *Figure 14.43* shows landings values recorded in the proposed East Anglia THREE project by method. Similar to adjacent areas, the majority of landings values in the East Anglia THREE site originate from vessels using beam trawls. It should be noted that vessels beam trawling within the East Anglia Three Site are likely to be Anglo-Dutch (i.e. Dutch owned and operated, but UK registered vessels) as the highest proportion of landings are recorded into Dutch ports (*Table 14.8* of *Appendix 14.1*). The proportion of landings values recorded by longlines corresponds directly with those shown previously for cod. In terms of effort (*Figure 14.45*), the use of longlines in the East Anglia THREE site is proportionally greater than corresponding landings values whilst the pattern is reversed for beam trawl effort. This suggests that beam trawlers achieve higher landings values per unit effort (e.g. more fish for fewer days at sea); a reflection of increased catching capacity and the targeting of high value species such as sole.

110. Beam trawls are also the principal method used to target plaice and sole in the offshore cable corridor. Midwater pair trawls record much lower values which correspond to those observed previously for sprat. Landings values recorded by methods such as longlines, otter trawls and gillnets are somewhat lower.

111. In the inshore cable corridor, fish species are targeted by a more diverse range of gear types. Longlines represent the greater proportion of values, followed by beam trawls, gillnets and both categories of otter trawl. Longlines are principally used to target cod and will account for a proportion of thornback ray and bass landings. In addition to sole, landings values recorded by beam trawls, gillnets and otter trawls will also be formed by varying amounts of these species.

112. *Figure 14.44* shows landings values by length category in the vicinity of the proposed East Anglia THREE project. With specific reference to the East Anglia THREE site it is interesting to note that whilst the over-15m fleet records over three quarters of the landings values (most likely Anglo-Dutch vessels), the majority of the remainder is formed by vessels in the under-10m category. This proportion is similar to that recorded for longlines (see *Figure 14.39*) indicating a number of vessels using this gear type are in the under-10m fleet. Landings values in the offshore cable corridor originate almost entirely from vessels in the over-15m category (most likely Anglo-Dutch vessels). In contrast, approximately two thirds of landings values in the inshore cable corridor are from the under-10m fleet. The distribution of effort by vessel category supports these conclusions (*Figure 14.46*).

113. Further information on fisheries statistics in relation to the UK fleet is provided in the *Appendix 14.1.*

14.5.11.3 VMS Data

114. Based on previous analysis of effort and landings data, a significant proportion of activity recorded in the proposed East Anglia THREE project is by vessels under-15m in length. This is particularly true of the inshore areas of the cable corridor. As VMS satellite data are only representative of the activity of vessels over-12 metres in length a significant proportion of activity close to shore will not be represented by MMO datasets.

14.5.11.3.1 MMO Data

115. *Figure 14.47* and *Figure 14.48* show the distribution of fishing activity by the over-15m fleet as represented by VMS value and effort, respectively.

116. The proposed East Anglia THREE project is located in an area of relatively low fishing activity by UK registered vessels, with higher value areas located to the west in the Wash and to the north around the Silver Pit. VMS densities within the East Anglia THREE site are relatively low, on average ranging from less than £1,000 to a

potential maximum of £10,000 per year. Higher values are recorded immediately south-west of the East Anglia THREE site, within the offshore cable corridor.. Although UK VMS data is not categorised by gear type, based on previous analyses of MMO statistics a considerable proportion of this offshore activity is by beam trawlers, significant numbers of which will be from the Anglo-Dutch fleet. Further areas of relatively high UK VMS densities are located closer to shore over the inshore cable corridor.

117. In the inshore cable corridor, areas of highest UK VMS effort densities mirror those observed for value. This is pattern is less evident in the offshore cable and East Anglia THREE site where effort is lower than corresponding value. This is likely a reflection of the greater fishing efficiency of larger Anglo-Dutch beam trawlers compared to those vessels which target more inshore grounds. Effort is generally low in other areas.

14.5.12 UK Fishing Activity – Project Specific

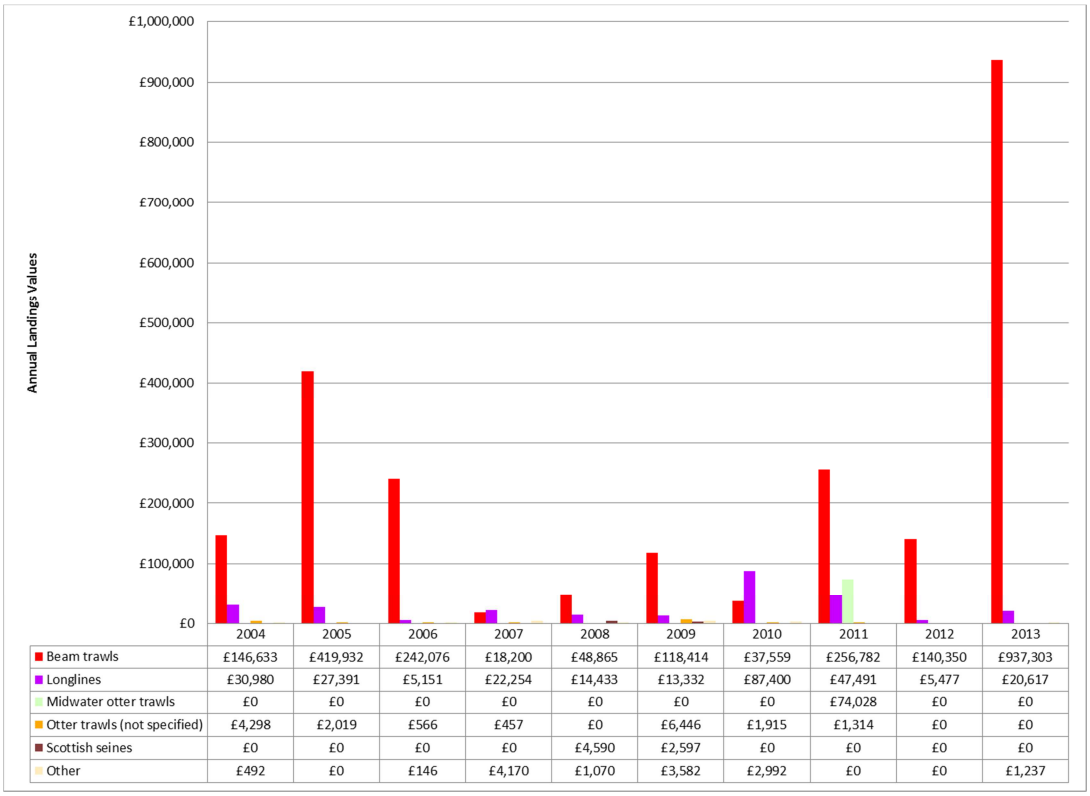
14.5.12.1 Annual Variation

118. In all years, except 2007 and 2010, beam trawler landings values have been higher than all other methods in the East Anglia THREE site, as shown in *Diagram 14.9*. It is assumed that a significant proportion of beam trawl landings values within the East Anglia THREE site are from the Anglo-Dutch fleet. Landings values from vessels engaged in longlining have been subject to high annual variability and generally follow the same distribution pattern as those recorded for cod (*Appendix 14.1*). Landings of sprat (*Appendix 14.1*) were recorded by midwater pair trawls in 2011 only.

119. With respect to the offshore cable corridor, *Diagram 14.10* shows that in most years annual average landings values from the beam trawl fishery are an order of magnitude greater than those recorded by any other method. Landings values from the fishery exceeded £1,300,000 in 2004, 2005 and 2006, but were considerably lower in subsequent years following the same pattern of decline observed in sole values (*Appendix 14.1*). A broadly similar pattern is apparent between the value of landings derived from gillnets, longlines and those of cod (both used to target the species) which show a general reduction from 2003 to 2007 (*Appendix 14.1*). Landings values originating from vessels operating midwater pair trawls only occur in 2005 (£140,013), 2008 (£21,841) and 2010 (£158,197) corresponding to landings values of horse mackerel (2005, 2008) and sprats (2010) (*Appendix 14.1*).

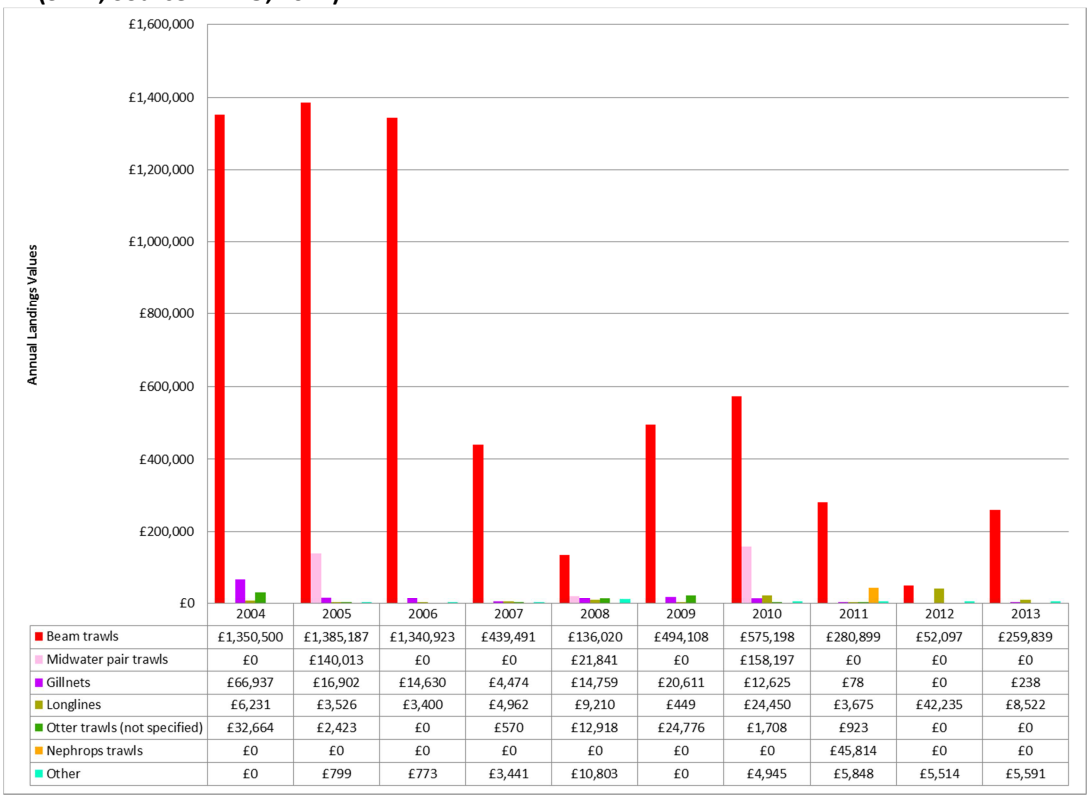
120. In the inshore cable corridor, longlines, gillnets and beam trawls record the highest values, as indicated in *Diagram 14.11*. Longline landings values broadly track those

observed for cod (which is one of the principal species targeted with this method) peaking in 2003 (£399,886) and 2010 (£489,719) (*Appendix 14.1*). Beam trawl landings show distinct peaks in 2009 (£340,719) and 2010 (£611,004) reflecting those observed for landings of sole (*Appendix 14.1*). The peak in landings for midwater pair trawls during 2005 (£247,013) matches that recorded for sprats although landings by this method were absent entirely from 2007 onwards (*Appendix 14.1*). Gillnet landings values peaked in 2011 (£315, 416). Landings values for pots remain relatively stable generally between £60,000 and £90,000 throughout the 10 year period (2003 to 2010). Further information on annual variation of landings values by method and by species are provided *Appendix 14.1*.



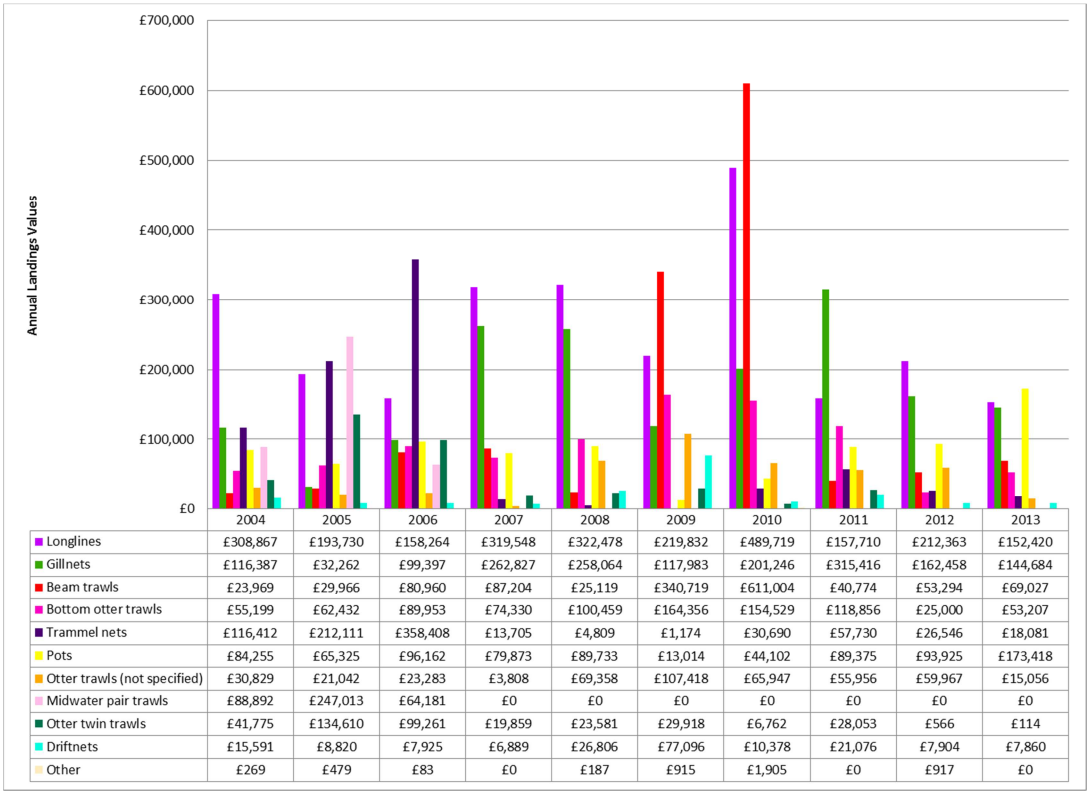
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Beam trawls	£146,633	£419,932	£242,076	£18,200	£48,865	£118,414	£37,559	£256,782	£140,350	£937,303
Longlines	£30,980	£27,391	£5,151	£22,254	£14,433	£13,332	£87,400	£47,491	£5,477	£20,617
Midwater otter trawls	£0	£0	£0	£0	£0	£0	£0	£74,028	£0	£0
Otter trawls (not specified)	£4,298	£2,019	£566	£457	£0	£6,446	£1,915	£1,314	£0	£0
Scottish seines	£0	£0	£0	£0	£4,590	£2,597	£0	£0	£0	£0
Other	£492	£0	£146	£4,170	£1,070	£3,582	£2,992	£0	£0	£1,237

Diagram 14.9 UK Annual Landings Values (£) by Method in the Proposed East Anglia THREE site (34F2; Source: MMO, 2014)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Beam trawls	£1,350,500	£1,385,187	£1,340,923	£439,491	£136,020	£494,108	£575,198	£280,899	£52,097	£259,839
Midwater pair trawls	£0	£140,013	£0	£0	£21,841	£0	£158,197	£0	£0	£0
Gillnets	£66,937	£16,902	£14,630	£4,474	£14,759	£20,611	£12,625	£78	£0	£238
Longlines	£6,231	£3,526	£3,400	£4,962	£9,210	£449	£24,450	£3,675	£42,235	£8,522
Otter trawls (not specified)	£32,664	£2,423	£0	£570	£12,918	£24,776	£1,708	£923	£0	£0
Nephrops trawls	£0	£0	£0	£0	£0	£0	£0	£45,814	£0	£0
Other	£0	£799	£773	£3,441	£10,803	£0	£4,945	£5,848	£5,514	£5,591

Diagram 14.10 UK Annual Landings Values (£) by Method in the offshore cable corridor (33F2; Source: MMO, 2014)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Longlines	£308,867	£193,730	£158,264	£319,548	£322,478	£219,832	£489,719	£157,710	£212,363	£152,420
Gillnets	£116,387	£32,262	£99,397	£262,827	£258,064	£117,983	£201,246	£315,416	£162,458	£144,684
Beam trawls	£23,969	£29,966	£80,960	£87,204	£25,119	£340,719	£611,004	£40,774	£53,294	£69,027
Bottom otter trawls	£55,199	£62,432	£89,953	£74,330	£100,459	£164,356	£154,529	£118,856	£25,000	£53,207
Trammel nets	£116,412	£212,111	£358,408	£13,705	£4,809	£1,174	£30,690	£57,730	£26,546	£18,081
Pots	£84,255	£65,325	£96,162	£79,873	£89,733	£13,014	£44,102	£89,375	£93,925	£173,418
Otter trawls (not specified)	£30,829	£21,042	£23,283	£3,808	£69,358	£107,418	£65,947	£55,956	£59,967	£15,056
Midwater pair trawls	£88,892	£247,013	£64,181	£0	£0	£0	£0	£0	£0	£0
Otter twin trawls	£41,775	£134,610	£99,261	£19,859	£23,581	£29,918	£6,762	£28,053	£566	£114
Driftnets	£15,591	£8,820	£7,925	£6,889	£26,806	£77,096	£10,378	£21,076	£7,904	£7,860
Other	£269	£479	£83	£0	£187	£915	£1,905	£0	£917	£0

Diagram 14.11 UK Annual Landings Values (£) by Method in the inshore cable corridor (33F1; Source: MMO, 2014)

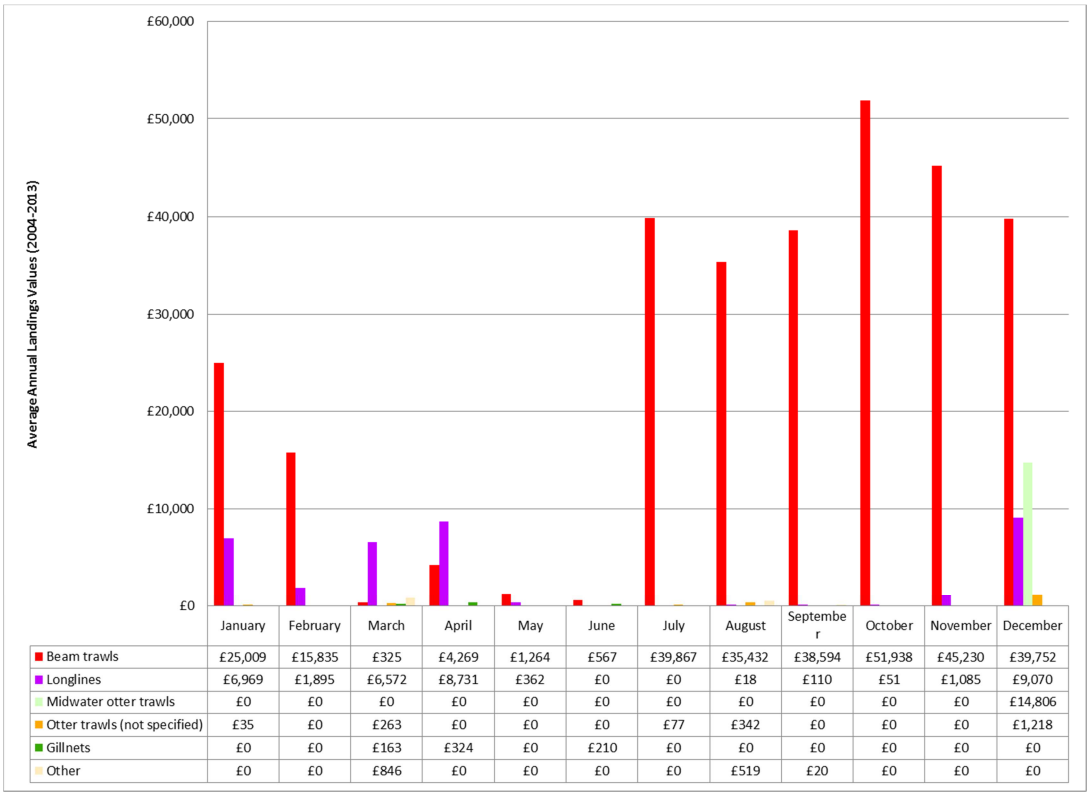
14.5.12.2 Seasonal Variations

121. In the East Anglia THREE site, landings values from the beam trawl fishery (targeting sole and plaice and to a lesser extent turbot and brill) are greatest from July to February, peaking in October, as shown in *Diagram 14.12*. Relatively high landings values recorded by midwater pair trawlers targeting sprats occur in December only (£14,806). Vessels targeting cod with longlines record their highest landings values from November through to April.

122. In the offshore cable corridor, the highest landings by beam trawls are recorded during January, as shown in *Diagram 14.13*. Landings by mid-water trawls occur in December only. Further information on seasonal variations of landings values by method and by species are provided in *Appendix 14.1*.

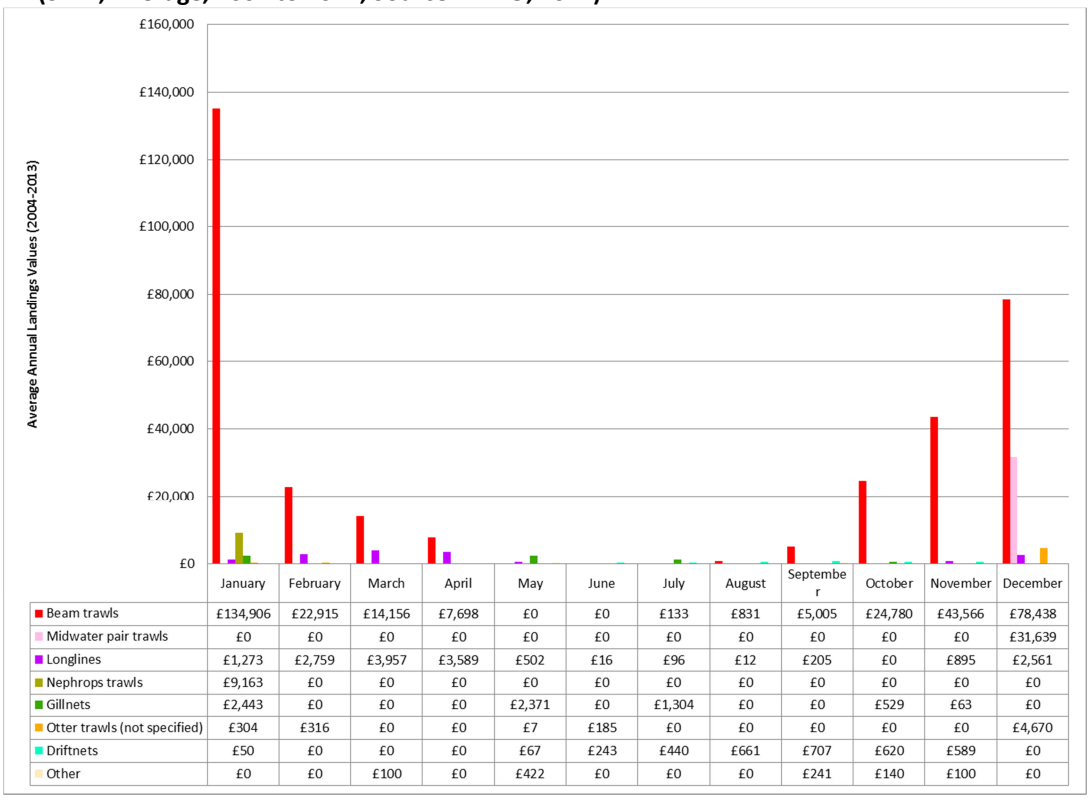
123. With respect to the inshore cable corridor, landings values from vessels operating longlines again broadly follow those recorded for cod, being highest in March (£42,854) and April (£39,629), as shown in *Diagram 14.14*. The beam trawl fleet record their highest value landings during the earlier part of the sole season (April; £34,516 and May; £47,607). Vessels setting gillnets record peak landings values during July (£35,835), August (£27,917) and September (£33,754), coinciding with the peak of the sole fishery. Demersal otter trawlers (e.g. bottom otter trawls) record the highest value landings between April (£9,993) to October (£9,066),

peaking in September (£19,906). As crab and lobster are targeted almost entirely with pots the distribution of values are broadly similar, being highest from April (£8,748) to November (£7,918).



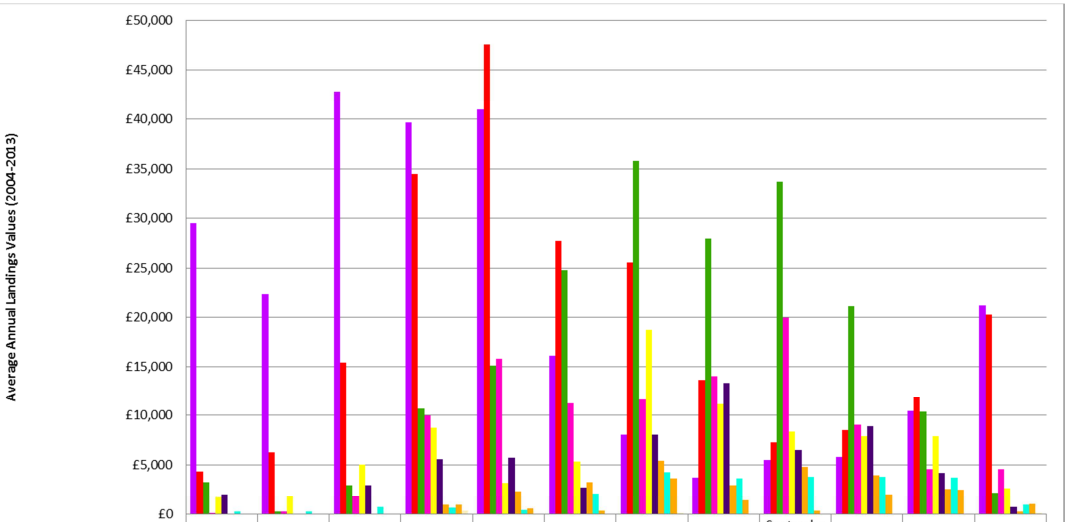
	January	February	March	April	May	June	July	August	September	October	November	December
Beam trawls	£25,009	£15,835	£325	£4,269	£1,264	£567	£39,867	£35,432	£38,594	£51,938	£45,230	£39,752
Longlines	£6,969	£1,895	£6,572	£8,731	£362	£0	£0	£18	£110	£51	£1,085	£9,070
Midwater otter trawls	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£14,806
Otter trawls (not specified)	£35	£0	£263	£0	£0	£0	£77	£342	£0	£0	£0	£1,218
Gillnets	£0	£0	£163	£324	£0	£210	£0	£0	£0	£0	£0	£0
Other	£0	£0	£846	£0	£0	£0	£0	£519	£20	£0	£0	£0

Diagram 14.12 UK Seasonal Landings Values (£) by Method in the Proposed East Anglia THREE site (34F2; Average, 2007 to 2011, Source: MMO, 2014)



	January	February	March	April	May	June	July	August	September	October	November	December
Beam trawls	£134,906	£22,915	£14,156	£7,698	£0	£0	£133	£831	£5,005	£24,780	£43,566	£78,438
Midwater pair trawls	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£31,639
Longlines	£1,273	£2,759	£3,957	£3,589	£502	£16	£96	£12	£205	£0	£895	£2,561
Nephrops trawls	£9,163	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Gillnets	£2,443	£0	£0	£0	£2,371	£0	£1,304	£0	£0	£529	£63	£0
Otter trawls (not specified)	£304	£316	£0	£0	£7	£185	£0	£0	£0	£0	£0	£4,670
Driftnets	£50	£0	£0	£0	£67	£243	£440	£661	£707	£620	£589	£0
Other	£0	£0	£100	£0	£422	£0	£0	£0	£241	£140	£100	£0

Diagram 14.13 UK Seasonal Landings Values (£) by Method in the Offshore cable corridor (33F2; Average 2007 to 2011, Source: MMO, 2014)



	January	February	March	April	May	June	July	August	September	October	November	December
Longlines	£29,526	£22,427	£42,854	£39,629	£40,983	£16,118	£8,099	£3,784	£5,549	£5,823	£10,440	£21,175
Beam trawls	£4,364	£6,302	£15,407	£34,516	£47,607	£27,725	£25,584	£13,602	£7,266	£8,511	£11,831	£20,247
Gillnets	£3,277	£275	£3,016	£10,698	£15,074	£24,819	£35,835	£27,917	£33,754	£21,066	£10,402	£2,224
Bottom otter trawls	£151	£272	£1,923	£9,993	£15,794	£11,200	£11,634	£14,035	£19,906	£9,066	£4,631	£4,583
Pots	£1,785	£1,818	£5,048	£8,748	£3,217	£5,377	£18,677	£11,184	£8,391	£7,906	£7,918	£2,697
Otter trawls (not specified)	£2,091	£43	£2,960	£5,585	£5,734	£2,767	£8,031	£13,285	£6,544	£8,884	£4,210	£732
Trammel nets	£49	£17	£0	£989	£2,346	£3,326	£5,434	£2,980	£4,828	£3,954	£2,616	£306
Driftnets	£281	£284	£753	£644	£420	£2,113	£4,306	£3,661	£3,849	£3,822	£3,758	£972
Otter twin trawls	£46	£25	£0	£979	£575	£359	£3,652	£1,464	£358	£2,080	£2,494	£1,051
Other	£0	£0	£0	£357	£0	£19	£164	£58	£33	£0	£0	£116

Diagram 14.14 UK Seasonal Landings Values (£) by Method in the Inshore cable corridor (33F1; Average 2007 to 2011, Source: MMO, 2014)

14.5.12.3 Landings Values by Port

124. In the East Anglia THREE site, the highest proportion of landings are recorded into Dutch ports; in this case Scheveningen represents 55% of the total average annual value, it is therefore assumed that these UK registered vessels landing into Dutch ports are in fact are Anglo-Dutch. Approximately 10% of landings from the East Anglia THREE site are into Lowestoft representing 4.4% of the average annual port value. Other ports record low landings from 34F2.

125. With respect to the offshore cable corridor, 89% of landings by UK registered vessels from the offshore cable corridor are into the Dutch ports of Ijmuiden (45.9%) and Scheveningen (42.5%). In both cases these landings represent a low proportion of annual landings, particularly in the case of Ijmuiden (1.0%). As described previously, landings into Dutch ports originate mainly from the Anglo-Dutch beam trawl fleet[12]. Vessels landing from the offshore cable corridor into other ports represent less than 2% of annual landings in all cases.

126. The highest proportion of landings from the inshore cable corridor (38.5%) are into Lowestoft, representing 45.3% of the port's total value between 2008 and 2012. Other important ports are Southwold and Aldeburgh and Orford (18.4% and 14.9%,

[12] Dutch owned and operated UK registered vessels, fishing UK quota.

respectively). Landings into these ports from the inshore cable corridor constitute a significant proportion of each port's total annual landings (93.9% and 72.5 %, respectively). Landings into Brixham (1.8 % of the annual value from 33F1) likely originate from UK owned beam trawlers which occasionally target grounds off the coast of East Anglia. Landings from the inshore cable corridor into Ipswich and Sizewell constitute less than 2% of the total for the rectangle in both cases but represent 33.4% and 99.6% of port totals, respectively. In the case of Sizewell, the majority of these values originate from a single vessel. In contrast, landings into Ijmuiden (Netherlands) represent 11.5% of landings values from 33F1, but this represents only 0.6% of the average annual total for the port.

127. Summary tables and further information on the distribution of landings values by port are provided in *Appendix 14.1.*

14.5.13 UK Vessels, Gears and Operating Practices

128. The current pattern of fishing by UK vessels in the area of the proposed East Anglia THREE project reflects that generally observed in UK fishing over the past two decades. This is typified by declining vessel numbers, effort, particularly in the over-15m fleet, and a shift toward smaller less powerful vessels. In grounds outside the 12nm limit, a significant proportion of UK activity has been supplanted by that of the Dutch fleet. In ports such as Lowestoft, which once supported a fleet of larger category vessels including both stern and beam trawlers, active vessels are now almost entirely in the under-10m category and tend to target more inshore grounds such as the inshore cable corridor.

129. Information gathered through consultation and analysis of the available data has shown that vessels fishing in the area of the proposed East Anglia THREE project and the offshore cable corridor deploy a range of mobile and static gear methods.

130. Within the over-15m fleet, the majority of activity has been by beam trawlers with lower levels by midwater pair trawlers and demersal otter trawlers. Previous analysis of landings values by port suggests a significant number of these vessels are from the Anglo-Dutch fleet. Activity by UK owned and registered beam trawlers based at ports such as Plymouth and Brixham is significantly lower.

131. The over-15m UK owned and registered demersal otter trawlers which occasionally operate in the area of the proposed East Anglia THREE project are understood to be vessels of between 20m to 24m in length with main engines between 350hp and 500hp. These vessels are based mainly at the east coast ports of Grimsby and Scarborough. These vessels operate either single or twin rig trawls with combined weights, including trawl doors, of approximately 2.5 to 4 tonnes.

132. Information obtained through consultation and analyses of fisheries statistics indicates that a significant amount of fishing activity in inshore waters off the Suffolk and Essex coasts is by the under-15m fleet. This is particularly true of the inshore cable corridor where over 75% of landings values originate from this fleet, a significant proportion of which are from the under-10m category. These vessels are based at the ports of Lowestoft, Southwold, Aldeburgh, Orford, Felixstowe Ferry and Harwich.

133. The majority of vessels operating from these ports are multi-purpose, utilising a number of gear types. The principal methods used in the area are longlining, static netting, driftnetting, potting and demersal trawling (single, twin rig and shrimp trawls). Skippers will also work more than one gear type in any given day. For example, fleets of pots may be shot or hauled between working nets or longlines. A small number of vessels from ports such as Harwich also undertake midwater pair trawling for sprats and herring. With the exception of four vessels from Lowestoft, all these vessels are in the under-10m category. The number of active vessels based at each port is provided in *Table 14.10*.

134. The specifications of fishing gear used by the UK fleet and detailed descriptions of operational practices are provided in *Appendix 14.1.*

Table 14.10 Numbers of Vessels by East Anglian Port and the Principal Methods Used

Numbers of Vessels by UK Port and Principal Methods			
Port	**No. of Active Vessels**	**Main Methods**	**Other Methods**
Lowestoft	14	Longlining, netting	Netting, potting, trawling, whelking
Southwold	10	Netting, longlining	Potting, trawling, whelking
Aldeburgh	6	Longlining, netting, potting	Trawling
Orford	7	Longlining, netting, potting, trawling	Whelking
Felixstowe Ferry	13	Netting, potting, longlining, trawling	Whelking
Harwich / Shotley	22	Trawling, longlining, netting	Potting, midwater pair trawling

14.5.13.1 UK Fishing Grounds

135. As under-15m vessels are not normally satellite tracked, during consultation skippers of under-15m vessels were asked to draw the extent of their fishing grounds on paper charts. These are compiled into *Figure 14.52* to *Figure 14.73*. Based on the fishing grounds drawn by fishermen, it can be seen that the only

methods which have some of their grounds located within the boundaries of the East Anglia THREE site are Lowestoft and Southwold longliners and netters.

136. During consultation with the skipper of a Lowestoft longliner it was stated that offshore areas within the East Anglia THREE site are fished only occasionally. Grounds in the vicinity of the Davy and Welland fields (located north and west of the East Anglia THREE site) and certain areas of the deep water route are targeted periodically in the spring.

137. Longliners and, to a lesser extent, netters (e.g. Southwold vessels) tend to target a wider range of grounds located further offshore than other methods and the location of productive grounds may vary from year to year. The charts produced by fishermen therefore show the extent of potential grounds targeted by longlining and netting vessels which could be targeted in any given year. It was, however, also stated in consultation with other skippers that areas within the East Anglia THREE site are targeted infrequently.

138. As shown in *Figure 14.52* to *Figure 14.73* all of the local skippers consulted produced charts showing the offshore cable corridor passing through their fishing grounds, particularly the inshore section which passes through 33F1. The spatial extent of the grounds potentially impacted varies between fleets by port and method but broadly relates to the position of the port relative to the landfall location. Based on the information provided, the vessels with the highest proportion of their grounds located within the offshore cable corridor are those from Felixstowe Ferry[13], Harwich, Orford and Aldeburgh. Vessels from Southwold (particularly netters and longliners) and Lowestoft have a smaller proportion of their grounds located in the offshore cable corridor.

139. The grounds depicted by skippers from Felixstowe are located in discrete areas such as the Sledway, Shipway and Shipwash. Therefore a high proportion are intersected by the offshore cable corridor. The same applies to Harwich netting and potting grounds that are situated in similar areas. Relatively large areas of Orford netting, potting and trawling grounds are also covered by the offshore cable corridor. The same applies to Aldeburgh netting and potting grounds. Southern, eastern and central areas of areas targeted by Southwold vessels working pots, nets and longlines are within the offshore cable corridor, although wider grounds are located further north.

[13] During consultation at Felixstowe Ferry, skippers elected to depict areas of the offshore cable corridor in terms of potential degree impact to fishing activity as opposed to indicating specific fishing areas. The location of those grounds depicting more detail was gathered during consultation for the proposed East Anglia ONE project. The use of these charts within this report has been agreed with the relevant skippers.

140. In all cases, due to the wider areas potentially available, longlining has the smallest proportion of grounds potentially intersected by the offshore cable corridor.

14.5.14 French Fishing Activity - Overview

141. Despite a number of requests to the relevant authorities, it has not been possible to obtain the detailed fisheries statistics or VMS data for French registered fishing vessels. The following description of activity by French vessels is therefore based on available published information and from consultation undertaken during 2013 with representatives of Comité National des Pêches Maritime et des Elevages Marins (CRPMEM), Nord-Pas de Calais, Fonds Régional d'Organisation du Marché Nord (OP FROM Nord) and OP CME.

14.5.15 French Fishing Activity - Regional

14.5.15.1 Surveillance Sightings

142. MMO surveillance sightings of vessels from the French fleet observed in the proposed East Anglia THREE project are shown in *Figure 14.74.* The principal gear types employed are as follows:

- Trawler (unspecified); and
- Demersal trawler.

143. *Figure 14.74* shows that overall sightings of French vessels within in the proposed East Anglia THREE project are low. The highest concentrations of French vessels are recorded some distance from the proposed East Anglia THREE project, south of the East Anglia Zone off the coasts of Essex and Kent.

144. Over the five year period for which data was provided, no French vessels have been recorded in the East Anglia THREE site. The highest number of sightings has been recorded in the inshore cable corridor, immediately north of the cable corridor. As non-UK vessels are prohibited from fishing within the UK 6nm limit, it is assumed that observations recorded within this boundary are by vessels not actively fishing. During consultation it was noted that a number of larger French vessels have the capability to switch between pelagic and demersal trawl gear during a single trip. Although not possible to quantify, the category 'unspecified trawler' is therefore likely to comprise a proportion of vessels deploying both gear types.

14.5.15.2 VMS Data

145. In response to initial consultation and the publication of the Round 3 Zone locations and boundaries, CNPMEM in association with IFREMER, produced "French Answer to the Consultation on Round 3 UK Windfarms Proposal 2009". In 2012, the CRPMEM produced a paper, also in association with IFREMER:

"Components of Activity of French Vessels in 2008 to 2009 Near the East Anglia Offshore Windfarm Project Zone".

146. The stated objective of the CNPMEM (2009) report was to assess the socio-economic impact of the Round 3 developments on French fishing activity. The CRPMEM (2012) paper provides only a series of charts showing the relative spatial distribution of effort, values and vessel numbers within the East Anglia Zone. The results and charts produced are based on speed filtered VMS data and sales registered at French fish auctions. The data used were not presented however, nor were details given of the modelling used, although reference was made to the use of algorithms.

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

148. *Table 14.11* shows the results of the assessment, which gives total annual landings for the French fleet of €79,302 in the East Anglia Zone. During consultation this data was presented to representatives of CRPMEM, Nord-Pas de Calais, OP FROM Nord and OP CME in order to check its accuracy. Representatives stated that some of this information was incorrect, specifically, that activity by netters no longer occurred in the East Anglia Zone. This information has therefore been removed which effectively reduces annual landings to €41,906.

Table 14.11 French Over-15m Effort and Value Vessel within the East Anglia Zone in 2008, Effort and Value (Source: CNPMEM, 2009)

French Over-15m (Effort and Value) Vessel Activity within the East Anglia Zone in 2008					
Vessel Type	**No. of Vessels**	**Fishing time in East Anglia Zone (hours)**	**Average dependence on the area (%)**	**Total Value (€) to the Fleet**	**Average Value (€) per Vessel**
Demersal trawlers	10	123	0.4%	€26,328	€2,633
Combined trawlers (pelagic / demersal)	7	55	0.2%	€15,984	€2,283
Purse seines	1	102	2.4%	€36,990	€36,990
Total	**18**	**208**	**3.0%**	**€79,302**	**€41,906**

149. Charts from the 2009 CNPMEM report have been reproduced to show the distribution of fishing effort by method, relative to the proposed East Anglia THREE project. *Figure 14.75* to *Figure 14.77* show that only relatively small fractions of the total effort recorded for all three methods within the East Anglia Zone have been ascribed to grounds within the proposed East Anglia THREE project.

150. *Figure 14.78* to *Figure 14.83* show charts reproduced from the later CRPMEM (2012) report. In this case data is provided in "order of magnitude" values for a grid aligning to ten minutes of latitude and ten minutes of longitude. Comparison of *Figure 14.78* and *Figure 14.79* indicates that there has been a decrease in the categorisation of landings values from the East Anglia THREE site from €75,000 to €100,000 in 2008 to €50,000 to €75,000 in 2009. Landings values from the offshore cable corridor have remained comparatively stable although they are distributed over a wider area. *Figure 14.80* and *Figure 14.81* show that vessel numbers in a small area of the north-west of the East Anglia THREE site have increased from less than five vessels in 2008 to up to ten in 2009. In addition, the area fished by up to 40 vessels in the offshore cable corridor has expanded in 2009 compared to 2008. In both 2008 and 2009 effort by French vessels remained below 100 hours per year in the East Anglia THREE site. Corresponding to vessel numbers, patterns of effort in the 100 to 250 hour category have expanded to areas east and north in 2009 compared to 2008 (*Figure 17.82* and *Figure 17.83*).

14.5.15.3 Effort Data

151. *Figure 14.84* shows effort by French vessels (all methods) by month for 2012 only and is based on a consultation with 89% of the fleet. It can be seen that the highest levels of effort by French vessels are located in the southern part of the East Anglia Zone, which supports the VMS data. The 2012 data indicate relatively low levels of activity in the west part of the East Anglia THREE site and the offshore cable corridor.

14.5.16 French Vessels, Gears and Operating Practices

152. The vessels accounting for the majority of French fishing activity in the area of the proposed East Anglia THREE project are the larger category of trawlers operating from the Nord Pas de Calais region, of which Boulogne is the principal base port. During consultation it was stated that there are up to 20 vessels which potentially target grounds in the area of the proposed East Anglia THREE project, five of which are from OP FROM Nord (four demersal otter trawlers and one pelagic freezer trawler) and 15 from CME. The majority of these vessels are between 20 and 25m in length with main engines of between 300hp and 800hp. Pelagic freezer vessels are however much larger with a registered length of 86.25m. Examples of typical French trawlers are provided in *Appendix 14.1.*

153. The majority of the French fleet operating in the East Anglia Zone are twin rigged trawlers, a high proportion of which also utilise pelagic gear. Both gear types are regularly used on the same trip, which are typically of five days duration, four times a month. The principal target species in the proposed East Anglia THREE project are whiting and mackerel, although cod and gurnard are also important. Herring are also targeted further south of the East Anglia Zone. The large pelagic freezer

trawler operating out of Boulogne targets horse mackerel. Effective gear width of the 20 to 25m class of vessels is estimated to be in the order of 90 to 100m and is towed at a maximum of five knots. It was stated that grounds in the East Anglia Zone are fished periodically and relatively infrequently, usually when fishing is poor close to the home ports.

154. With respect to the future of the fleet, it was considered by French skippers that there will be a further decrease in the number of vessels, largely due to cumulative constraints on commercial fishing activities. In addition, there is currently particular concern regarding the consequences of the CFP reform on the fleet sizes, especially trawler fleets.

14.5.17 German Fishing Activity - Overview

155. VMS densities recorded from the German fleet within the North Sea are shown in *Figure 14.85*. With respect to the proposed East Anglia THREE project, fishing activity is generally constricted to a small area of low to moderate intensity to the south of the East Anglia THREE site, within the offshore cable corridor. The areas of highest fishing intensity by this fleet are located off the German and Danish coasts, although activity is also relatively high within Dutch waters.

14.5.18 German Fishing Activity - Regional

14.5.18.1 Surveillance Sightings

156. Surveillance sightings of German registered vessels by gear type are provided in *Figure 14.86.* Activity by the fleet in the proposed East Anglia THREE project is generally low and is dominated by beam trawlers; sightings of vessels using other gears are much lower.

157. In the five years spanning 2010 to 2014 a single beam trawler was recorded by surveillance sightings within the East Anglia THREE site. Higher numbers of beam trawlers have been recorded in north-western and central areas of the offshore cable corridor. Sightings of demersal trawlers and vessels working gillnets have been recorded only occasionally within the East Anglia Zone.

14.5.18.2 Landings Values

158. Landings values by species and method are shown respectively in *Figure 14.87* and *Figure 14.88*. Landings values originating from rectangles north of the East Anglia Zone (35F2, 35F3, 36F2 and 36F3) are composed principally by sole and flatfish, with lower value landings of turbot also being recorded. As would be expected beam trawlers account for the majority of flatfish landings.

159. In those rectangles to the east and south of the East Anglia Zone, sole represent the majority of landings values with plaice of reduced importance. In these areas

gillnets replace demersal towed gears (beam and otter trawls) as the principal method used to target the sole fishery. Landings from areas south-west of the East Anglia Zone are low (32F1; €24,140, 32F1; €7,988) and comprised mainly of horse mackerel apparently caught by demersal otter trawls.

160. Landings by the German fleet in the proposed East Anglia THREE project show considerable variation between the East Anglia THREE site and cable corridor. Landings values in the offshore cable corridor (33F2; €301,969) are considerably higher, increasing by around two orders of magnitude compared to 34F2. In this area the majority of landings are of sole and horse mackerel targeted by beam trawl and demersal otter trawl, respectively.

14.5.18.3 VMS Data

161. VMS density of German registered vessels operating in the proposed East Anglia THREE project is shown in *Figure 14.89*. The data shows that less than two recorded position plots were recorded throughout almost the entire East Anglia THREE site. The intensity of activity increases (five to 20) immediately south of the East Anglia THREE site over the north-eastern area of the offshore cable corridor, corresponding to the higher landings values shown previously in 33F2.

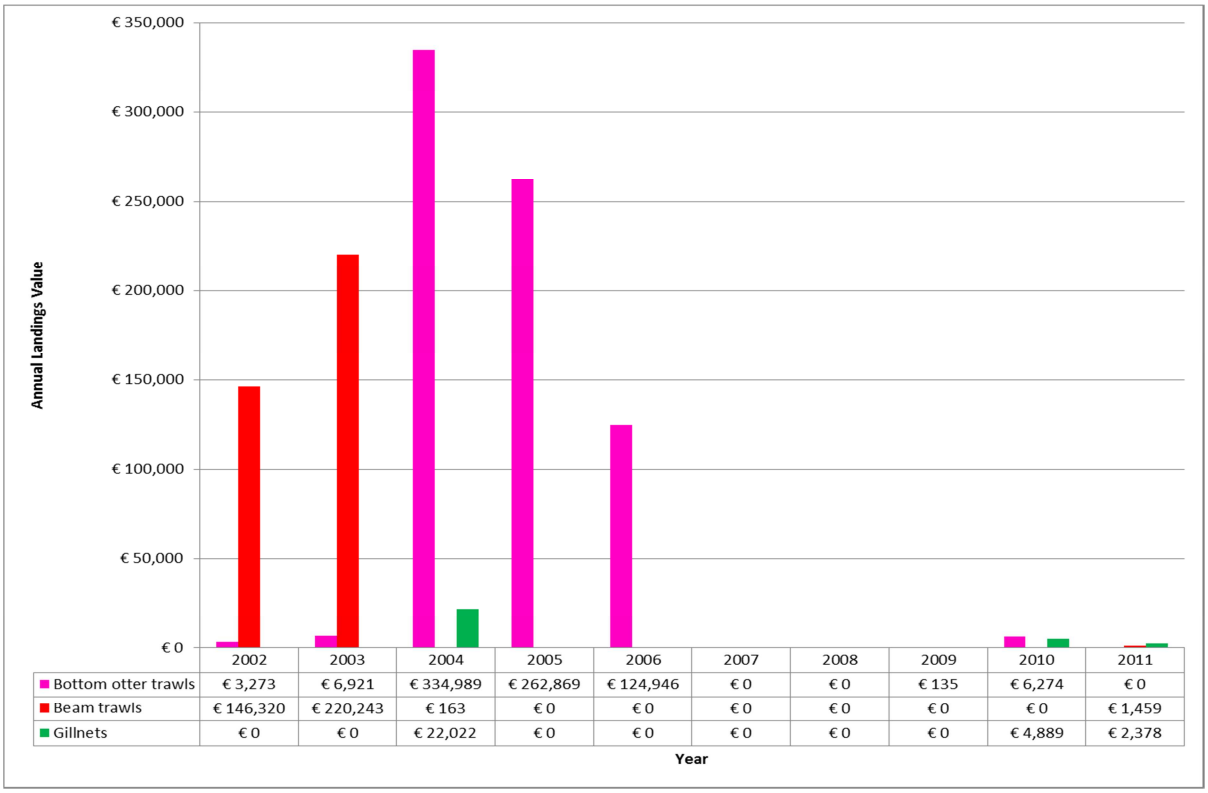
14.5.19 German Fishing Activity – Project Specific

162. No landings have been recorded by the German Fleet in the inshore cable corridor between 2010 and 2014. Annual and seasonal variations in landings values are therefore shown only for the offshore cable and East Anglia THREE site.

14.5.19.1 Annual Variation

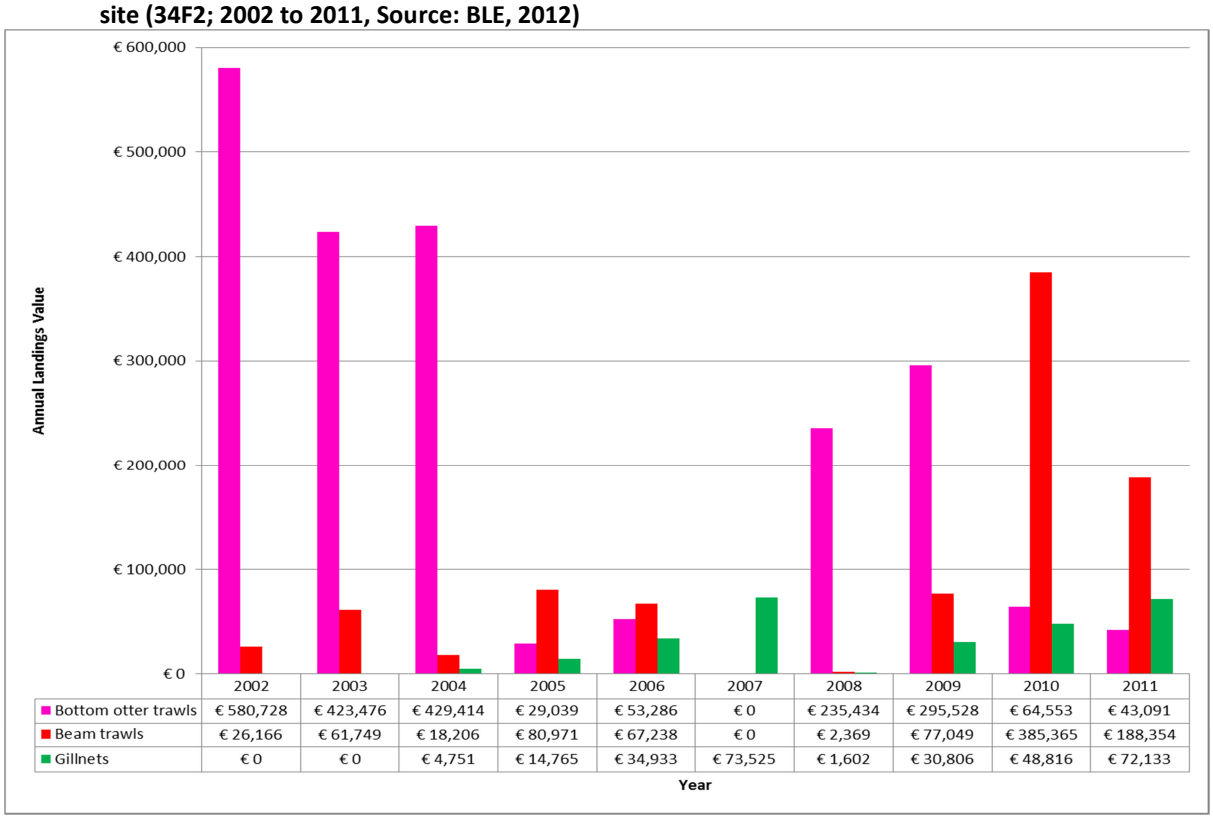
163. *Diagram 14.15* shows that in the East Anglia THREE site, landings from demersal otter trawls (horse mackerel), beam trawl and gillnets (sole, cod and whiting) were significantly higher from 2002 to 2006. Total landings values (all methods and species combined) were low in both 2010 (€11,164) and 2011 (€3,837).

164. Annual landings from the German fleet in the offshore cable corridor (*Diagram 14.16*) show that landings from demersal otter trawls (horse mackerel) peaked in 2002 (€580,728), then declined in subsequent years. With the exception of 2008, landings of beam trawlers (sole and other flatfish) have shown a pattern of increasing value, particularly in the latter part of the dataset. Gillnets follow a similar distribution, tracking fluctuations in sole landings from 2004 onwards.



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bottom otter trawls	€ 3,273	€ 6,921	€ 334,989	€ 262,869	€ 124,946	€ 0	€ 0	€ 135	€ 6,274	€ 0
Beam trawls	€ 146,320	€ 220,243	€ 163	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1,459
Gillnets	€ 0	€ 0	€ 22,022	€ 0	€ 0	€ 0	€ 0	€ 0	€ 4,889	€ 2,378

Diagram 14.15 German Annual Landings Values (€) by Method in the Proposed East Anglia THREE site (34F2; 2002 to 2011, Source: BLE, 2012)



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bottom otter trawls	€ 580,728	€ 423,476	€ 429,414	€ 29,039	€ 53,286	€ 0	€ 235,434	€ 295,528	€ 64,553	€ 43,091
Beam trawls	€ 26,166	€ 61,749	€ 18,206	€ 80,971	€ 67,238	€ 0	€ 2,369	€ 77,049	€ 385,365	€ 188,354
Gillnets	€ 0	€ 0	€ 4,751	€ 14,765	€ 34,933	€ 73,525	€ 1,602	€ 30,806	€ 48,816	€ 72,133

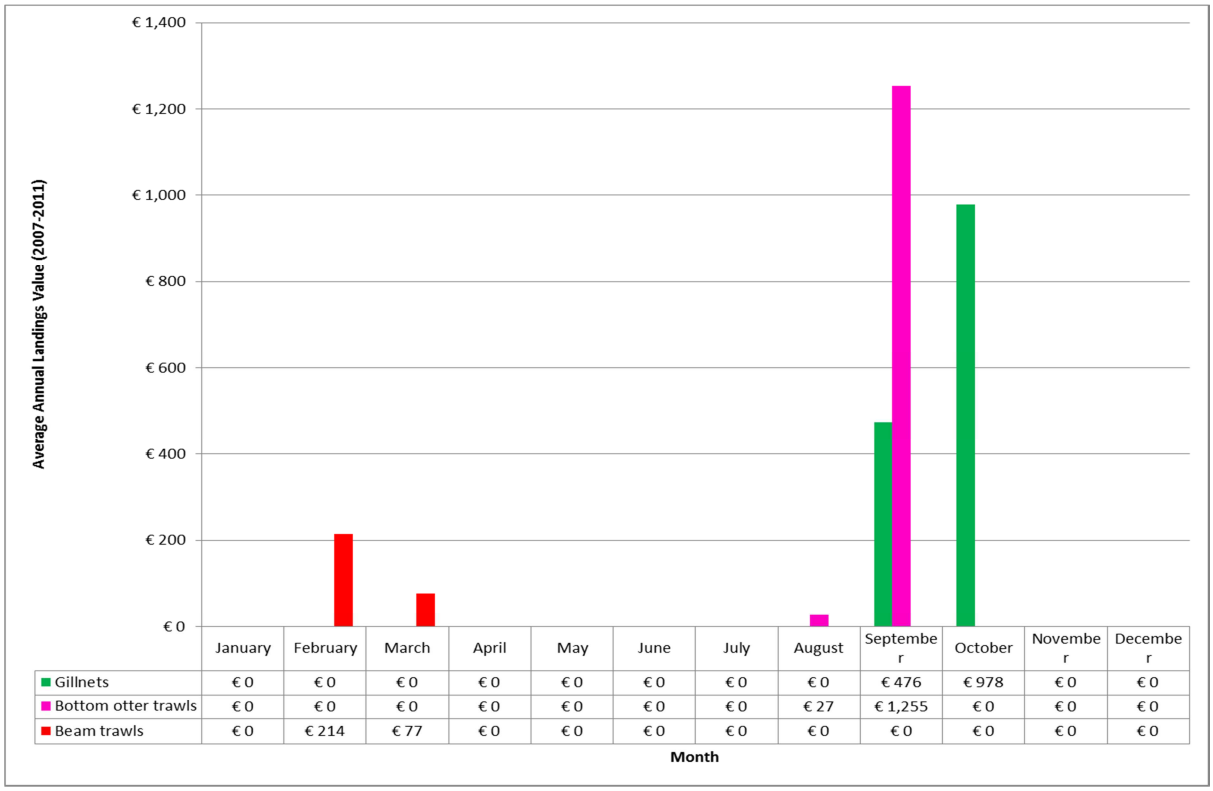
Diagram 14.16 German Annual Landings Values (€) by Method in the Offshore cable corridor (33F2; 2002 to 2011, Source: BLE, 2012)

14.5.19.2 Seasonal Variations

165. *Diagram 14.17* shows that in the East Anglia THREE site, landings are seasonally constricted, occurring mainly during September and October although lower landings are also recorded during February and March. In terms of method, beam trawls account for all landings earlier in the year, whilst gillnets and demersal otter trawls account for the higher landings in late summer / autumn.

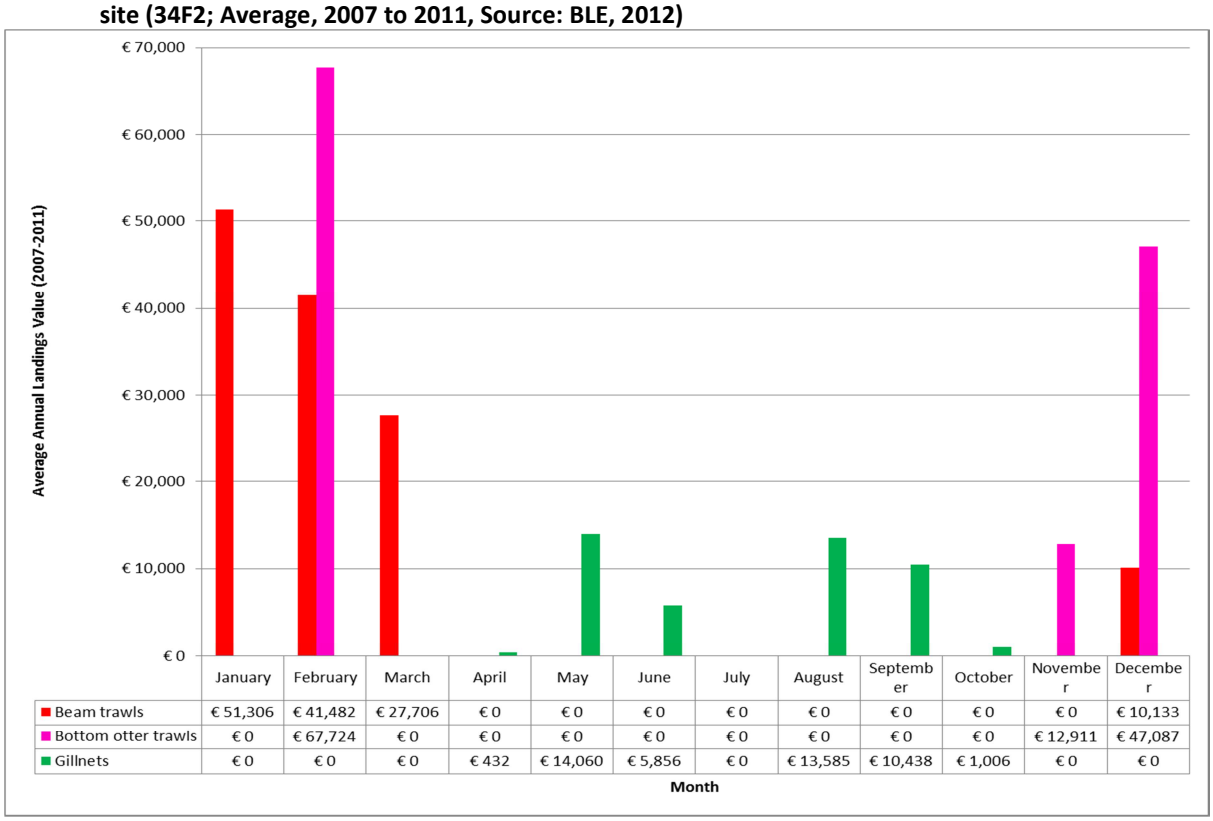
166. In respect of the offshore cable corridor, the seasonal distribution of landings values from German vessels by method is shown in *Diagram 14.18.* Landings values from beam trawls (sole and other flatfish) are seasonally constricted occurring between December and March, with a peak in January (€51,306). Landings by gillnets (sole, cod and whiting) occur between April and June and August and October whereas landings by bottom otter trawls (horse mackerel) are recorded in February, November and December.

167. Further information on annual and seasonal variation of landings values by the German fleet are provided in *Appendix 14.1.*



	January	February	March	April	May	June	July	August	September	October	November	December
Gillnets	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 476	€ 978	€ 0	€ 0
Bottom otter trawls	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 27	€ 1,255	€ 0	€ 0	€ 0
Beam trawls	€ 0	€ 214	€ 77	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0

Diagram 14.17 German Seasonal Landings Values (€) by Method in the Proposed East Anglia THREE site (34F2; Average, 2007 to 2011, Source: BLE, 2012)



	January	February	March	April	May	June	July	August	September	October	November	December
Beam trawls	€ 51,306	€ 41,482	€ 27,706	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 10,133
Bottom otter trawls	€ 0	€ 67,724	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 12,911	€ 47,087
Gillnets	€ 0	€ 0	€ 0	€ 432	€ 14,060	€ 5,856	€ 0	€ 13,585	€ 10,438	€ 1,006	€ 0	€ 0

Diagram 14.18 German Seasonal Landings Values (€) by Method in the offshore cable corridor (34F2; Average, 2007 to 2011, Source: BLE, 2012)

14.5.20 German Vessels, Gears and Operating Practices

168. Information regarding the vessels, gears and operating practices of the German fleet was not available at the time of submission of the East Anglia THREE PEIR. Further requests were made for this data for inclusion within the East Anglia THREE ES. However, despite these requests, no further information has been received to date.

14.5.21 Danish Fishing Activity - Overview

169. *Figure 14.90* shows VMS density for the Danish static netting fleet in the North Sea. Activity tends to be highest in the eastern half of the central North Sea off the coast of Denmark. Further areas of high activity are located off the Dutch and Belgian coasts, with smaller, more discrete regions located within German waters.

14.5.22 Danish Fishing Activity – Regional

170. Danish landings have been made available to BMML only by sea area (e.g. IVc) as opposed to ICES rectangles. As this provides no additional information on the nature of fishing activity in the vicinity of the proposed East Anglia THREE project, this dataset has not been included within the report.

14.5.22.1 Surveillance Sightings

171. MMO surveillance sightings of Danish vessels (all gear types) are shown in *Figure 14.91.* From 2010 to 2014, activity by the Danish fleet in the proposed East Anglia THREE project has generally been low. Of the three confirmed methods, the most frequent observations have been of Danish gillnetters. Between 2010 and 2014 a single vessel has been recorded within the East Anglia THREE site. Higher numbers have been observed to the south of the proposed East Anglia THREE project within the offshore cable corridor.

14.5.22.2 VMS data

172. *Figure 14.92* shows VMS density of static netting activity in the proposed East Anglia THREE project. Activity throughout most of the East Anglia Zone is low, including within the East Anglia THREE site and the majority of the offshore cable corridor. Higher activity is recorded immediately north and south of the north-eastern section of the offshore cable corridor. Further areas of relatively high VMS ping densities are located outside the East Anglia Zone to the east and south.

14.5.23 Danish Vessels, Gears and Operating Practices

173. The Danish fleet comprises principally of industrial sandeel trawlers, seine netters and gillnetters. Activity by the industrial sandeel fleet tends to be highest in areas such as the Dogger Bank (central North Sea) and Norwegian sector (northern North Sea) and although not limited to these areas, is considerably lower in the southern North Sea, including the proposed East Anglia THREE project. Vessels from the

sandeel fleet may periodically target sprat in the proposed East Anglia THREE project (Henrik Lund, Pers. comm.). Danish seine netters also tend to operate in northern and central North Sea areas. As demonstrated by VMS datasets, the gillnetting fleet is the most active in the proposed East Anglia THREE project.

174. Danish gillnetters target a range of demersal species in the North Sea: cod, hake, plaice, sole and turbot (Ulrich and Andersen, 2004). The fishery is relatively selective as different size meshes are employed to target different species. For example meshes of 120mm minimum size are used to target turbot and brill, which yield a smaller bycatch of plaice and cod.

14.5.24 Norwegian Fishing Activity - Overview

175. VMS data showing the distribution of Norwegian registered vessels (over-15m only) in the North Sea (UK waters only) is provided in *Figure 14.93.* The highest activity is recorded in the northern North Sea, a significant proportion of which is by pelagic vessels targeting herring and mackerel. Smaller, discrete areas of activity are located in the central North Sea along the western edge of the Dogger Bank. Activity in the southern North Sea is much lower.

14.5.25 Norwegian Fishing Activity – Regional

14.5.25.1 Surveillance Sightings

176. *Figure 14.94* shows that surveillance sightings have observed only two unspecified trawlers between 2010 and 2014, both of which have been over the north-eastern section of the offshore cable corridor.

14.5.25.2 Landings Values

177. *Figure 14.95* and *Figure 14.96* show landings values (in Norwegian Kroner (Kr)) by species and method, respectively. Landings in all rectangles in the vicinity of the proposed East Anglia THREE project, with the exception of 35F1, are mainly sprat and are targeted principally by purse seines. Vessels operating midwater otter trawls and demersal otter trawls record lower values. With respect to the proposed East Anglia THREE project, landings recorded from the East Anglia THREE site and offshore cable corridor are worth[14] of £84,858and £117,258, respectively. Norwegian vessels targeting pelagic species such as sprat catch large quantities of fish on a single voyage. It is therefore probable that these values will have been derived from very low levels of fishing effort.

14.5.25.3 VMS data

178. *Figure 14.97* suggests that activity by the Norwegian fleet in the proposed East Anglia THREE project is negligible, as in most areas (including the East Anglia THREE

[14] 1 Kr is the equivalent of 0.08 GBP

site and offshore cable corridor) an average of two to five VMS position plots are recorded per year.

14.5.26 Norwegian Vessels, Gears and Operating Practices

179. Information regarding the vessels, gears and operating practices of the Norwegian fleet was not available at the time of submission of the PEIR. Further requests were made for this data for inclusion within the final East Anglia THREE ES. However, despite these requests, no further information has been received to date.

14.5.27 Existing Environment Summary

180. The East Anglia THREE windfarm site and the offshore and inshore cable corridors are fished to varying degrees by the following fleets:

- Dutch beam trawlers, demersal otter trawlers, pelagic trawlers, fly seiners and netters
- Belgian beam trawlers and demersal otter trawlers;
- UK beam trawlers, otter trawlers, long-liners, fixed and drift netters and potters;
- French otter trawlers (demersal and pelagic);
- German beam trawlers and demersal otter trawlers;
- Danish Gillnetters; and
- Norwegian purse seiners, midwater otter trawls and demersal otter trawls.

181. The highest levels of activity and landings values within the East Anglia THREE windfarm site and in the offshore cable corridor are, by a substantial margin, from the Dutch beam trawl fleet. The vessels fishing these areas are predominantly the larger vessels from the Dutch fleet (38 to 42m), a high proportion of which are from Texel/Den Helder which operate pulse wing trawls with sole the principal target species.

182. As shown by *Figure 14.12 to Figure 14.21,* Dutch fishing activity extends over significant areas of the central and southern North Sea as well as into the Channel. Levels of activity within the East Anglia THREE windfarm site and the offshore cable corridor are of low to moderate intensity at the scale of the North Sea. The highest intensity grounds are those targeted by the beam trawl fleet and located in the north west of the East Anglia Zone and to the immediate south. Due to an absence of Dutch historic rights within the UK 6 to 12nm limit, all activity occurs outside this boundary.

183. The second highest level of activity occurring in the offshore areas of the proposed East Anglia THREE project is by Belgian vessels. This is predominantly beam trawling, although otter trawling also occurs albeit to a much lesser extent. *Figure 14.30* and *Figure 14.31 (a-h)* show that activity by the Belgian fleet occurs over wider areas than the Dutch including the central and southern North Sea, the Channel, Western Approaches and in the Celtic and Irish Seas. With reference to the proposed East Anglia THREE project, and based on the data obtained, the majority of Belgian activity is by the larger class of vessels (over 300bhp) and occurs predominantly within the offshore cable corridor outside the 12nm limit as these vessels have access to historic rights only if using demersal otter trawls (*Figure 14.30*). Activity by the Eurocutter fleet (*Figure 14.31*) is higher inside the 6-12nm limit and occurs over a smaller central area of the offshore cable corridor. Activity from both Belgian fleets within the East Anglia THREE windfarm site is very low.

184. Activity by UK registered vessels within the offshore cable corridor and East Anglia THREE site is considerably lower than that of the Dutch and Belgian fleets. Although there is activity by UK registered over 15m vessels in these areas, from the information obtained it is apparent that the majority of these are Anglo-Dutch vessels. A limited number of local vessels occasionally undertake longlining and to a lesser extent, netting within the East Anglia THREE site. The majority of the local fleet target a variety of species using longlines, drift and fixed nets, pots and trawls along the offshore cable corridor with the highest activity occurring within the 6nm limit (inshore cable corridor). These vessels are predominantly small (under 10m) and limited in their operational range and the grounds available to them.

185. Available data on French fishing activity is limited. Based on consultation and the official information available, activity by the French fleet within the East Anglia THREE site is low. Low to moderate levels of activity by trawlers operating either demersal or pelagic otter trawls (or a combination of both) are recorded over the central area of the offshore cable corridor.

186. The available data indicates that activity by the German fleet in the East Anglia THREE site is negligible, increasing around the north eastern extremity of the offshore cable corridor. Sole and horse mackerel are the principal species and are targeted with beam trawls and otter trawls (respectively).

187. Danish activity follows a similar pattern to that of the German fleet being negligible within the East Anglia THREE site increasing (albeit to relatively low levels), in the north eastern area of the offshore cable corridor. The majority of Danish activity is by the gill netting fleet which may target a range of species including cod and flatfish such as plaice, turbot and brill. Vessels from the Danish sandeel fleet, which depends heavily on central North Sea grounds such as the Dogger Bank

during the spring and summer, occasionally target sprat in the proposed East Anglia THREE project during the winter months.

188. Low numbers of Norwegian vessels may also occasionally target grounds within the proposed East Anglia THREE project. Based on VMS data, a very low level of activity occurs within the East Anglia THREE site, increasing marginally immediately east and west of the boundary. Similar levels of activity are apparent over the north eastern area of the East Anglia THREE offshore cable corridor. FMC statistics indicate that sprat accounts for the vast majority of landings values and is mainly targeted with pelagic methods (otter trawls and purse seines) although demersal otter trawls also account for some landings. Because species such as sprat are landed in high volumes on a single trip, it is expected that these values represent a low number of trips and that activity by this fleet is generally low in the proposed East Anglia THREE project area. This is supported by low VMS transmission densities in the proposed East Anglia THREE project area.

14.6 Potential Impacts

189. This section describes the assessment of the potential impacts on commercial fishing activities which might result from the construction, operation and decommissioning of the proposed East Anglia THREE project. The assessment separately evaluates the potential impacts of the proposed East Anglia THREE project and offshore cable corridor. The effects assessed are as advised in section 14.4 (Cefas Guidance Note 2004 and EN-3) and include the opinions of regulators and stakeholders identified from scoping responses and direct consultation (*Table 14.1*).

190. The project specific potential impacts (presented in *Table 14.2*) of each of the effects are assessed taking account of the fishing categories (nationality / method), as described above and in more detail in *Appendix 14.1*, and their particular sensitivities to the proposed East Anglia THREE project.

191. The assessment of cumulative impacts takes account of other relevant planned offshore windfarm developments and other infrastructure, activities and legislation; windfarms constructed and in existence form part of the existing baseline to which stakeholders have already adapted.

14.6.1 Potential Impacts during Construction

14.6.1.1 Impact 1: Impacts on Commercially Exploited Fish and Shellfish Populations

192. There is the potential for the construction phase of the proposed East Anglia THREE project to have adverse impacts on commercially harvested fish and shellfish populations resulting in behavioural changes or declines in abundance which could indirectly affect the productivity of the fishery. Adverse impacts upon

commercially exploited species during the operational phase of the proposed East Anglia THREE project are assessed fully within Chapter 11 Fish and Shellfish Ecology and are not expected to exceed **minor adverse** significance.

193. Based on the findings of Chapter 11 Fish and Shellfish Ecology, it is therefore expected that any indirect effect on catch rates in the relevant commercial fisheries for these species would also not exceed **minor adverse** significance.

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

194. From consultation, it is apparent that loss of fishing area is the principal concern of fishermen and their representatives. Restricted access or loss of traditional fishing grounds during construction and decommissioning will be a function of the short term imposition of temporary transitory safety zones around works activities. During the construction and decommissioning phases, temporary loss of fishing area could occur as a result of:

- Temporary transitory safety zones around construction / decommissioning activities;
- Temporary transitory safety zones around installed or partially installed unattended infrastructure; and
- Advisory exclusion zones along vulnerable exposed sections of offshore cables.

Single Phase

195. Under a Single Phase approach the theoretical worst case scenario for would be that commercial fishing activity would be excluded from the East Anglia THREE site and a buffer of up to 500m, in the interests of safety around the entire perimeter of the for the total duration of the single phase construction scenario of 41 months (see *Table 14.2*).

196. Under a Single Phase approach, temporary transitory safety zones would be placed around foundations and installations that are under construction, the size and location of safety zones changing as construction progresses which would last for up to 41 months (see *Table 14.2*).

197. For the offshore cable corridor, including the export cable and interconnector cables, the theoretical worst case would be the implementation of 500m advisory exclusion zones along the entire offshore cable corridor for a maximum duration of 35 months (*Table 14.2*).

198. The worst case for the offshore cable corridor would depend on the installation methods used for the interconnector and the export cables. Simultaneous lay and burial techniques, as used on many previous windfarm projects, would require

moving advisory exclusion zones; post lay techniques (i.e. jetting) would require an advisory exclusion zone along the entire length of the offshore cable corridor for the installation period A conservative realistic worst case is therefore 500m advisory exclusion zones along the length of the offshore cable corridor for an estimated duration of 35 months.

199. The scale of any impact would be directly related to the intensity and value of fishing within the area, the size of the safety / advisory exclusion zones and whether there are alternative local grounds of similar productivity which could be fished to mitigate any such loss. Due to the wide diversity of fishing areas, methods deployed, operating practices and degrees of adaptability, potential impacts have been evaluated for each of the fishing categories considered in the baseline description.

200. Due to data limitations it is beyond the scope of this assessment to assess impacts at the level of individual vessels. It is however recognised that the levels of fishing activity within the proposed East Anglia THREE project will vary between individual vessels.

14.6.1.2.1 Dutch Fishing Vessels

201. As described *Appendix 14.1*, the highest landings values are recorded by Dutch registered beam trawlers targeting sole and plaice. Dutch vessels also operate demersal otter trawls, seine nets, static nets and pelagic trawls in the proposed East Anglia THREE project. Due to the absence of any historic rights in UK territorial waters, Dutch vessels can only target grounds outside of the UK's 12nm limit (*Figure 14.2*). As a result, grounds to the west of the East Anglia Zone (i.e. the inshore cable corridor) are not targeted by Dutch owned and operated vessels (*Figure 14.4* and *Figure 17.17*). Therefore, the impact of temporary loss or restricted access to fishing grounds is considered for the East Anglia THREE site and the offshore cable corridor only.

14.6.1.2.1.1 Beam Trawling for Demersal Species

202. As previously stated, it is understood that there are between 30 and 35 vessels which target the general area of the proposed East Anglia THREE project with the greater proportion of activity being from vessels whose home ports are Texel and Den Helder. The majority of these vessels are between 40m and 42m in length, have main engines of up to 2000hp and for the most part deploy Pulse Wing gears. Due to their size and power, vessels of this class have wide potential operational ranges. The EU derogation for Pulse Wing gears however, only permits use in the Southern North Sea. Whilst Pulse Wing gear offers advantages relating to species selectivity and fuel efficiency, vessels which utilise it have more limited operational ranges than vessels using traditional beam trawl gears or Sum Wing trawls.

203. On the basis of the extent of the spatial restrictions outlined above and the versatility of the method, the sensitivity of the Dutch beam trawling fleet as a whole is considered to be low. For those vessels which operate Pulse Wing gears and have an established history of fishing within the areas of the proposed East Anglia THREE project, a medium sensitivity is ascribed to these receptors.

204. Analysis of surveillance sightings and VMS data (*Figure 14.4*, *Figure 14.12* and *Figure 14.17*) indicates low to moderate Dutch beam trawling activity within the East Anglia THREE site and offshore cable corridor, with many other areas in the North Sea being of equal or higher value. Therefore in comparison to the total grounds fished by this fleet, the area to which access could be temporarily restricted is small. In light of these considerations and taking account of the temporary, short term duration of the impact, the magnitude of the effect is assessed as low**.** Based on the low magnitude of the effect and the maximum receptor sensitivity of medium for Pulse Wing vessels, the impact of temporary loss or restricted access to fishing grounds for the Dutch beam trawl fleet during construction is assessed to be no greater than of **minor adverse** significance.

14.6.1.2.1.2 Demersal Otter Trawling

205. The levels of activity by Dutch demersal otter trawlers are substantially lower than those of the beam trawl fleet with limited activity recorded in the proposed East Anglia THREE project. This fleet also target sole and plaice as well as other demersal species. Demersal otter trawling is by over-15m vessels which have a wide range of fishing grounds (*Figure 14.6* and *Figure 14.13*).

206. Demersal otter trawlers are considered to be of low sensitivity due to their size, spatial adaptability (as shown in *Figure 14.18* and *Figure 14.13*) and target species versatility.

207. In light of the temporary nature of the impact and the relatively small area of fishing grounds that the proposed East Anglia THREE project occupies, compared to the total fishing grounds available to these vessels, the magnitude of effect is considered to be low.

208. The impact of loss or restricted access to fishing grounds for the Dutch demersal otter trawl fleet during construction is therefore assessed to be of **minor adverse** significance.

14.6.1.2.1.3 Seine Netting for Demersal and Pelagic Species

209. A small number of vessels from the Netherlands target demersal species using seine nets. These vessels are over-15m in length and target a range of clean grounds over a large area extending from the north of Denmark, south to the

English Channel and Western approaches (*Figure 14.14*). Therefore, in terms of spatial adaptability, the sensitivity of these receptors is low.

210. It is accepted that the construction phase, whilst short term, will effectively represent the beginning of a longer term phase of exclusion as, in view of the area to deploy seine net gears, it is assumed that seine netting cannot resume in the East Anglia THREE windfarm site. As such, a medium sensitivity has been assigned to Dutch seine netters.

211. As the proportion of the Dutch seine netting grounds falling within the East Anglia THREE windfarm site is small the magnitude of effect is considered to be low. As a result of the low magnitude and low sensitivity the impact of loss or restricted access to fishing grounds on Dutch seine netting fleet during construction is considered to be **minor adverse** significance.

14.6.1.2.2 Static Netting

212. Vessels setting nets are generally confined in their gear versatility by size, deck layout and main engine horsepower constraints. The highest landings values from the Dutch static netting fleet are derived from areas off the Dutch coast (*Figure 14.15*). As a consequence, due to their moderate spatial tolerance, Dutch static netters are considered to be of medium sensitivity.

213. The value of landings from the proposed East Anglia THREE project are low and encompass only a very small proportion of the grounds available to the static netting fleet, such as those off the Dutch coast (*Figure 14.15* and *Figure 14.20*). It is therefore considered that the magnitude of effect on static netting is negligible. The impact of loss or restricted access to fishing grounds for the static netting fleet during construction is therefore assessed to be of **negligible** significance**.**

14.6.1.2.2.1 Midwater Trawling for Pelagic Species

214. As discussed in *Appendix 14.1*, midwater trawlers registered at ports in the Netherlands occasionally target pelagic species such as herring, mackerel, horse mackerel and sprat in the proposed East Anglia THREE project. These vessels are over-15m in length and have extensive fishing areas (*Figure 14.16*). As a consequence of the extent of fishing grounds available to these vessels, their sensitivity is considered to be low.

215. Whilst pelagic trawling would not be able to operate within the East Anglia THREE windfarm site during the construction phase, in view of the extremely small percentage of the overall fishing grounds of which it occupies, and the fact that they are targeting highly mobile migratory species which transit the East Anglia THREE site the magnitude of effect is considered to be negligible.

216. As a consequence, the impact of loss or restricted access to fishing grounds for the midwater trawl fleet during construction would be of **negligible** significance.

217. *Table 14.12* summarises the potential impact to Dutch vessels of complete loss or restricted access to traditional fishing grounds associated with the construction phase.

Table 14.12 Impact significance of complete loss or restricted access to traditional fishing grounds for Dutch vessels during the construction phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
Dutch Beam Trawling (Traditional)	Low	Low	Minor adverse
Dutch Beam Trawling (Pulse Wing)	Medium	Low	Minor adverse
Dutch Demersal Otter Trawling	Low	Low	Minor adverse
Dutch Seine Netting	Medium	Low	Minor adverse
Dutch Static Netting	Medium	Negligible	Negligible
Dutch Midwater Trawling	Low	Negligible	Negligible

14.6.1.2.3 Belgian Fishing Vessels

218. The highest proportion of landings values recorded by Belgian registered vessels are for sole and plaice targeted by vessels operating beam and otter trawls. A category of Belgian vessels (Eurocutters) hold historic rights in UK territorial waters for demersal species and may potentially target grounds between the 6nm and 12nm limits including those within the offshore cable corridor. Vessels also fish grounds outside of the 12nm limit in the vicinity of the offshore cable corridor, however negligible activity has been recorded by Belgian vessels within the East Anglia THREE site.

14.6.1.2.3.1 Beam Trawling for Demersal Species

219. Belgian vessels which target grounds in the proposed East Anglia THREE project fall into two broad categories: 18m to 24m (Eurocutters) and larger vessels between 24m and 40m, with engine horsepower ranging between 250hp and 1305hp. The size, power and design of these vessels is such that they have a wide operational range as is demonstrated by vessels regularly moving between grounds located some distance from one another.

220. Although the beam trawl gear employed by the majority of the Belgian fleet is, in theory, no more versatile than Pulse Wing gear used by Dutch vessels, its use is not restricted to the Southern North Sea. The lack of method diversity is therefore mitigated by the ability of vessels to fish a wider array of grounds (*Figure 14.23*).

Taking these factors into consideration the sensitivity of the Belgian fleet is assessed to be low.

221. *Figure 14.23* shows that the overall areas fished by the Belgian beam trawl fleet are more extensive than those targeted by the Dutch.

222. Based on surveillance sightings (*Figure 14.22*) and VMS data (*Figure 14.30* and *Figure 14.31*), activity in the proposed East Anglia THREE project occurs in the offshore cable corridor only. *Figure 14.30* and *Figure 14.31(a-h)* show that Belgian vessels spend a maximum of 5 days a year on average in the East Anglia THREE site. Therefore, the impact of temporary loss or restricted access to fishing grounds is considered for the offshore cable corridor only. It was stated during consultation with Belgian skippers that the intensity of fishing had declined in the vicinity of the proposed East Anglia THREE project, and had increased on grounds in the Celtic Sea and English Channel (Redecentrale 2013).

223. Owing to the temporary nature of the impact and the small area occupied by the offshore cable corridor and the East Anglia THREE site compared to the extent of the total grounds available, the magnitude of the effect is assessed as low.

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

14.6.1.2.3.2 Demersal Otter Trawling

225. Landings recorded by vessels engaged in demersal otter trawling are considerably lower than those recorded by Belgian beam trawlers, particularly in the proposed East Anglia THREE project. Demersal otter trawlers operating in this area are over-15m in length, target sole and plaice and other demersal species and have a range of grounds elsewhere in the Central and Southern North Sea as well as in the Celtic Sea.

226. Demersal trawlers are considered to be of low sensitivity due to their size, operational ranges and ability to fish a number of grounds which could mitigate any potential loss of fishing area.

227. Due to the very small proportion of potential fishing grounds occupied by the offshore cable corridor (*Figure 14.24, Figure 14.30* and *Figure 14.31a*) and the short duration of exclusion during installation, the magnitude of effect is therefore considered to be negligible.

228. The impact of loss or restricted access to fishing grounds for the Belgian demersal otter trawl fleet during construction is therefore considered to be of **negligible** significance.

14.6.1.2.3.3 Seine Netting

229. Belgian vessels engaged in seine netting are over 15 m in length and have widely distributed grounds in the Western and Eastern Channel, Central North Sea and Southern North Sea. Therefore they are assigned a receptor sensitivity of low.

230. *Figure 14.31b* shows that on average this fleet derives less than €5,000 from the East Anglia THREE site and the offshore cable corridor. Similarly, effort recorded by this fleet is on average up to five days per year. For these reasons the magnitude of the effect is considered to be negligible.

231. The impact of loss or restricted access to fishing grounds for the Belgian seine netting fleet during construction is therefore considered to be of **negligible** significance.

14.6.1.2.3.4 Netting

232. Figure *14.31c* and Figure *14.31h* show that there is no recorded activity by the Belgian netting fleet in any of the East Anglia THREE site and the offshore cable corridor. Therefore there is expected to be **no change** to these vessels' fishing activity.

233. *Table 14.13* summarises the potential impact to Belgian vessels of complete loss or restricted access to traditional fishing grounds associated with the construction phase.

Table 14.13 Impact significance of complete loss or restricted access to traditional fishing grounds for Belgian vessels during the construction phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
Belgian Beam Trawling	Low	Low	Minor adverse
Belgian Demersal Otter Trawling	Low	Negligible	Negligible
Belgian Seine Netting	Low	Negligible	Negligible
Belgian Static Netting	Low	No Change	No Change

14.6.1.2.4 UK Fishing Vessels

234. The highest proportions of landings values recorded by UK registered vessels in the proposed East Anglia THREE project are of sole, plaice and cod (*Figure 14.42*). Beam trawling accounts for the highest proportion of landings values in the East Anglia THREE site and the offshore cable corridor. Beam trawling also contributes to a quarter of landings values in the inshore cable corridor. It is of importance to note that significant proportions of UK beam trawler landings in the East Anglia THREE site and offshore cable corridor are from Dutch owned, UK registered vessels (Anglo-Dutch) (see section 14.5.5.2 of *Appendix 14.1*). Longlining, netting,

bottom otter trawling and potting account for a significant proportion of landings values in the inshore cable corridor (*Figure 14.43*).

14.6.1.2.4.1 Beam Trawling

235. The patterns and practices of the UK registered beam trawl fleet including the Anglo-Dutch fleet are considered to be the same as the Dutch registered beam trawl fleet (excluding those vessels operating pulse wing gear) and therefore the sensitivity of these receptors is ascribed as low.

236. As shown by *Figure 14.40*, the operational area of UK beam trawlers covers a wide area including the Central and Southern North Sea, the English Channel and Western Approaches and parts of the Celtic Sea. Information gathered during consultation confirmed that the majority of the activity in the vicinity of the proposed East Anglia THREE project is by Anglo-Dutch vessels whose fishing effort is for the most part concentrated well to the north- northeast.

237. The UK beam trawl fleet (excluding Anglo-Dutch vessels) mainly operates out of south-west ports such as Brixham, Penzance and Newlyn with effort tending to be concentrated in the Celtic Sea and English Channel. A limited number of these vessels occasionally target sole off the coast of East Anglia. Based on AIS observations during April / May 2013 and 2014 (Marinetraffic.com), activity by these vessels is predominantly within the 6nm and 12nm limit in the inshore cable corridor. MMO landings statistics (*Table 14.13* and *Table 14.14*) indicate that a significant proportion of landings from the offshore cable corridor and windfarm site are into Dutch ports, further highlighting that the majority of recorded UK beam trawling activity in these areas is by the Anglo-Dutch fleet as opposed to UK owned vessels. Taken in combination with the temporary nature of the effect, the magnitude is therefore assessed as low.

238. Given the low receptor sensitivity and low magnitude of the effect, the impact of temporary loss or restricted access to fishing grounds for the Anglo-Dutch beam trawl fleet is assessed to be of **minor adverse** significance.

239. For the UK fleet based at south-west ports, due to the proportionally low levels of effort recorded in the proposed East Anglia THREE project compared to other areas the proportional loss of landings associated with loss of fishing areas is so small so as to render the magnitude of the effect as negligible.

240. In view of the above, the impact of temporary loss or restricted access to fishing grounds for the UK owned beam trawl fleet is therefore assessed to be of **negligible** significance.

14.6.1.2.4.2 Demersal Otter Trawling

241. UK vessels demersal otter trawling for sole and, to a lesser extent, cod, skate, rays and bass, are generally under-15m in length and fish grounds in the offshore cable corridor within the 12nm limit; based on consultation, activity in the East Anglia THREE site is lower. Therefore with respect to the under 15m fleet the assessment considers impacts associated with the offshore export cable only. Similarly, consultation and VMS data sets (*Figure 14.43, Figure 14.47* and *Figure 14.48*) indicate that the majority of activity by the UK over 15m otter trawl fleet is focussed around the offshore cable corridor. Activity recorded in the East Anglia THREE site by UK vessels over 15m is negligible. It is also considered that a significant amount of activity (as represented by VMS data -*Figure 14.47* and *Figure 14.48*) in this area will actually be from the Anglo-Dutch Beam trawl fleet, although this is not possible to quantify as data is not separated by method.

242. The under-15m vessels are considered to be of medium sensitivity, due to their limited operational range, dependence on a limited number of fishing grounds, and a reduced potential to mitigate the loss of fishing area by operating in alternative areas.

243. Over-15m vessels (between 20m and 24m) are based mainly at the east coast ports of Grimsby and Scarborough and target a range of species. These vessels have a wider operational range than under-15m vessels and a higher degree of method and target species versatility. As such they are assigned a low sensitivity. The offshore cable corridor constitutes a small proportion of the grounds available to the under-15m fleet (*Figure 14.59*, *Figure 14.63* and *Figure 14.68*), and the effect would be temporary. The magnitude of effect for under-15m vessels is therefore considered to be low.

244. In the case of the over-15m vessels, it is understood that they fish the area under consideration infrequently, with the majority of their effort being concentrated in the Central and Northern North Sea (Areas IVb and IVa). These vessels are therefore unlikely to be exposed to the impact of temporary loss or restricted access to fishing grounds, and would be able to mitigate any potential loss of small fishing area by operating in alternative areas (*Figure 14.41*). The potential effect is therefore considered to be of negligible magnitude.

245. The impact of loss or restricted access to fishing grounds for both the UK under-15m demersal otter trawl fleets during construction phases is considered to be of **minor adverse** significance and for the over 15m demersal otter trawl fleet to be of **negligible** significance**.**

14.6.1.2.4.3 Static Gears and Drift Netting

246. The local fleet is almost entirely comprised of under-10m vessels based at local ports along the Suffolk and Essex coasts which have limited operational ranges in comparison to larger vessels. Most of these vessels deploy a number of different methods depending on season and species targeted.

247. The available data suggests that potting is concentrated within the 12nm limit, in the vicinity of the offshore cable corridor and does not normally occur within the East Anglia THREE site. Netting (including gillnets, drift nets and trammel nets) and longlining also occurs mainly within inshore areas inside the 12nm limit including those through which the offshore cable corridor passes. In contrast to potting vessels, some of the longlining and netting vessels have occasionally been recorded fishing within the East Anglia THREE site. Consultation has confirmed that there is a very low amount of fishing activity within the East Anglia THREE site when compared to the activity in the offshore cable corridor.

248. Whilst the local under 15m vessels are effectively multi-purpose, due to quota restrictions and seasonal and operational range constraints the sensitivity of the UK under 15m vessels is considered to be medium.

249. From the data obtained and the charts provided by local fishermen, it is apparent that the offshore cable corridor runs though grounds fished by all of the methods deployed by local vessels (*Figure 14.52* to *Figure 14.73*). The majority of the effort by under 15m vessels is within the 6 mile limit. In the case of the offshore cable corridor the magnitude of the effect is therefore expected to be medium and for the East Anglia THREE site, low. Based on the magnitude and sensitivity described, the impact of the construction of the East Anglia THREE site on UK under 15m vessels will be of **minor adverse** significance. The impact of installation of the offshore cable corridor will be of **moderate adverse** significance.

250. A commercial Fisheries Working Group (CFWG) has been established with a representative from each local port for the East Anglia Zone. The CFWG provides a forum for open and meaningful engagement through the project's lifecycle for the mutual benefit of the fishing industry and EAOL. The CFWG will identify and develop mutually beneficial opportunities between the fishing/renewables industries in the vicinity of the East Anglia Zone.

251. The experience of agreeing mutually acceptable procedures for the relocation of static gears during survey works undertaken during the past two years implies that similar mitigation should be achievable for the installation of the offshore export cable (as discussed in the co-existence and fisheries liaison plan). On this

assumption it should be possible to reduce potential impacts to minor adverse significance.

252. *Table 14.14* summarises the potential impact to UK vessels of complete loss or restricted access to traditional fishing grounds associated with the construction phase.

Table 14.14 Impact significance of complete loss or restricted access to traditional fishing grounds for UK vessels during the construction phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
UK Beam Trawling (incl. Anglo-Dutch)	Low	Low	Minor adverse
UK Beam Trawling (south-west ports)	Low	Negligible	Negligible
UK Demersal Otter Trawling (Over-15m)	Low	Negligible	Negligible
UK Demersal Otter Trawling (Under-15m)	Medium	Low	Minor adverse
Static Gears (Offshore Cable Corridor)	Medium	Medium	Moderate adverse
Static Gears (East Anglia THREE site)	Medium	Low	Minor adverse

14.6.1.2.5 French Fishing Vessels

253. French vessels hold historic rights in UK territorial waters and may potentially target grounds between 6nm to 12nm, including those within which the East Anglia THREE site and offshore cable corridor are located. The majority of these vessels are twin rigged trawlers ranging from 20m to 25m in length which often convert to pelagic trawls. Based on surveillance (*Figure 14.74*) and VMS (*Figure 14.75* to *Figure 14.83*) data, the limited fishing activity which does occur is focussed over a short central section of the offshore cable corridor, immediately south-west of the East Anglia Zone boundary. Negligible effort is recorded within the East Anglia THREE site.

254. Based on the ability to operate multiple gear types in a wide variety of fishing grounds in the North Sea and English Channel, the sensitivity of the French fishing vessels is considered to be low.

255. As can be seen in *Figure 14.76*, *Figure 14.77* and *Figure 14.84*, French trawlers operate in wide areas over the Southern and Central North Sea. The proposed East Anglia THREE project therefore represents a small fraction of their overall fishing area resulting in a low magnitude.

256. The impact of loss or restricted access to fishing grounds for the French trawl fleet during the construction phase is therefore expected to be of negligible to **minor adverse** significance.

257. *Table 14.15* summarises the potential impact to French vessels of complete loss or restricted access to traditional fishing grounds associated with the construction phase.

Table 14.15 Impact significance of complete loss or restricted access to traditional fishing grounds for French vessels during the construction phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
French Twin Rigged & Pelagic Trawl	Low	Low	Minor adverse

14.6.1.2.6 German Fishing Vessels

258. German vessels fishing in the proposed East Anglia THREE project operate both beam trawls, otter trawls and gill nets. In the absence of any historic rights in UK territorial waters, they cannot fish within the UK's 12nm limit. The impact of temporary loss or restricted access to fishing grounds is considered for the East Anglia THREE site and the offshore cable corridor only.

259. As shown by *Figure 14.85*, the fishing areas of the German vessels are extensive and as such their sensitivity is considered to be low.

260. VMS data (*Figure 14.85*), surveillance sightings (*Figure 14.86*), and landings statistics (*Figure 14.87*) suggest activity by the German beam, otter trawl and gillnet vessels is low in the proposed East Anglia THREE project. That which does occur is centred over a small area of the offshore cable corridor and immediately south-east of the East Anglia Zone boundary. As illustrated by *Figure 14.85* the proportion of overall fishing grounds occupied by the proposed East Anglia THREE project is extremely small and therefore the magnitude of the effect is expected to be negligible.

261. Taking the above into consideration, the impact of temporary loss or restricted access to fishing grounds for the German fleet is assessed to be of **negligible significance**.

262. *Table 14.16* summarises the potential impact to German vessels of complete loss or restricted access to traditional fishing grounds associated with the construction phase.

Table 14.16 Impact significance of complete loss or restricted access to traditional fishing grounds for German vessels during the construction phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
German Beam Trawl, Otter Trawl & Gill Nets (East Anglia THREE site)	Low	Negligible	Negligible

14.6.1.2.7 Danish Fishing Vessels

263. The Danish fleet comprises principally of industrial sandeel trawlers, seine netters and gillnetters. The highest levels of activity by Danish vessels in the proposed East Anglia THREE project are recorded by the gillnetting fleet. Danish vessels do not have historic rights in UK territorial waters, and therefore cannot operate within the UK's 12nm limit. Furthermore, negligible effort has been recorded within the East Anglia THREE site. Therefore, the impact of temporary loss or restricted access to fishing grounds is considered for the offshore cable corridor only.

264. Over-15m Danish gillnetters target a range of demersal species in the North Sea including cod, hake, plaice, sole and turbot (Ulrich and Andersen, 2004). Danish vessels are able to fish a number of fishing grounds throughout the North Sea. As such, the sensitivity of Danish netters is considered to be low.

265. As the proposed East Anglia THREE project encompasses a small proportion of the grounds available to the Danish netting fleet (*Figure 14.90*), it is considered that the magnitude of effect is **negligible**.

266. The impact of loss or restricted access to fishing grounds for the Danish netting fleet during construction is therefore considered to be of **negligible** significance**.**

267. *Table 14.17* summarises the potential impact to Danish vessels of complete loss or restricted access to traditional fishing grounds associated with the construction phase.

Table 14.17 Impact significance of complete loss or restricted access to traditional fishing grounds for

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
Danish Gill Net	Low	Negligible	Negligible

14.6.1.2.8 Norwegian Fishing Vessels

268. Norwegian registered vessels in the proposed East Anglia THREE project operate purse seines, midwater and bottom trawls and are excluded from fishing within the UK's 12nm limit.

269. The Norwegian fishing vessels have a wide operational range (*Figure 14.93*) and the opportunity to target a range of grounds elsewhere; these vessels are considered to be receptors of low sensitivity.

270. By virtue of the minimal proportion of their fishing grounds occupied by the proposed East Anglia THREE project, the magnitude of effect is expected to be negligible, resulting in an impact considered to be of **negligible** significance.

271. *Table 14.18* summarises the potential impact to Danish vessels of complete loss or restricted access to traditional fishing grounds associated with the construction phase.

Table 14.18 Impact significance of complete loss or restricted access to traditional fishing grounds for Norwegian vessels during the construction phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
Norwegian Purse Seine, Midwater Trawls and Demersal Otter Trawls.	Low	Negligible	Negligible

Two Phased

272. Under the Two Phased approach to construction, the area of temporary loss to fishing would be largely the same as with the Single Phase approach with the addition of one electrical platform, three platform link cables and two trenches in which interconnector cables would be laid (*Table 14.2*). The construction period for the Two Phased approach would also be extended by four months (see Chapter 5 Description of the Development section 5.5.16).

273. However, as there will be 18 months separating the start date of phase 1 and the start date of phase 2, there is the potential for fishing activity to continue within the area of phase 2 until its construction.

274. Despite the increased area of potential impact, as the construction of phase 1 and phase 2 will be staggered (Chapter 5 Description of the development *Table 5.37*) the magnitude of impact under the Two Phased approach would remain the same as assessed for the Single Phase approach.

275. The sensitivity of the fishery receptors would remain the same as previously assessed for the Single Phase approach. As construction of the offshore elements for the Two Phased approach is slightly longer than that of the Single Phase approach (42 months compared with 41), the impact of temporary loss or restricted access to fishing grounds during construction under a Two Phased approach would be the same as assessed for the single phase approach; minor

adverse significance for all fleet segments, except for UK static gears within the offshore cable corridor which is predicted to incur an impact of **moderate adverse** significance.

14.6.1.3 Impact 3: Safety Issues for Fishing Vessels

276. With regards to safety issues for fishing vessels, it is considered that an environmental impact assessment approach is not appropriate. Safety risks are therefore discussed in terms of their being within or outside of acceptable limits (a risk is considered outside of acceptable limits if it is greater than those incurred during the course of normal fishing operations). For further detail on how safety risks to fishing vessels have been assessed please see Chapter 15 Shipping and Navigation.

277. For the Single Phase approach construction activities would be ongoing for a maximum of 41 months. For the Two Phased approach construction activities would be ongoing for a maximum of 42 months. In line with standard practice, it is expected that standard construction temporary transitory safety zones of up to 500m and advisory exclusion zones would be in place around offshore construction activities, from which all vessels, including fishing vessels, would be excluded. Infrastructure that is not fully constructed would be marked and advisory exclusion zones would be in place.

278. In order to ensure that fishermen are fully aware of the safety risks associated with the construction phase, liaison in respect of safety related consultation and notifications would form part of the pre-construction fisheries liaison program. In addition, fishermen would be kept fully informed of the construction schedule through Notices to Mariners, the Kingfisher Information Service, via the local FLOs and through any other communication channels recommended by fishermen's representatives. The Commercial Fisheries Working Group (CFWG) established for the East Anglia Zone would be maintained both as a conduit for the distribution of information to fishermen and to agree and establish co-existence strategies.

279. Risks to fishing vessels would only arise if infringements of temporary transitory safety zones/advisory exclusion zones occurred. It should also be recognised that in line with standard maritime practice, the ultimate responsibility with regards to safety lies with the master of a vessel. Compliance with the temporary transitory safety zones and advisory exclusion zones during the construction phases would put the safety risks as **broadly acceptable**. These issues are considered further within Chapter 15 Shipping and Navigation.

280. Potential allision risks between windfarm infrastructure and construction vessels and fishing vessels are discussed in Chapter 15 Shipping and Navigation.

281. Construction of the offshore elements of the Two Phased approach is slightly longer than that of the Single Phase approach (42 months compared with 41), however, this difference will not result in change in the significance of the impact from that assessed for the single phase approach.

14.6.1.4 Impact 4: Increased Steaming Times to Fishing Grounds

Single Phase

282. The implementation of temporary transitory safety zones and advisory exclusion zones during the construction phase could, in theory, result in some short term increases in steaming distances and times, and therefore higher operational costs for fishing vessels. As with safety issues for fishing vessels, the standard environmental impact assessment matrix approach presented in section 14.5.3 is not wholly appropriate for considering increased steaming times.

283. In the case of local vessels, which for the most part concentrate their activity within the 12nm limit, and therefore do not venture beyond the proposed East Anglia THREE project, there should be no material adverse impacts on increased steaming times.

284. As shown by *Figure 14.12- Figure 14.16* and *Figure 14.30- Figure 14.31*, the locations of the main fishing ports relative to the majority of fishing grounds for the Dutch and Belgian fleets are such that traditional steaming routes would not involve passages through the area to be occupied by the proposed East Anglia THREE project.

285. Similarly, the majority of the fishing grounds of the Danish, French, Norwegian and German fishing vessels, relative to the location of their base ports would generally not involve steaming routes that would pass through the proposed East Anglia THREE project.

286. Under a Single Phase approach the theoretical worst case scenario for would be that commercial fishing activity would be excluded from the East Anglia THREE site and a buffer of up to 500m, in the interests of safety around the entire perimeter of the for the total duration of the single phase construction scenario of 41 months (see *Table 14.2*).

287. In practice however, temporary transitory safety zones could be placed around foundations and installations that are under construction and construction vessels, the size and location of safety zones would change as construction progresses over a period of 41 months (see *Table 14.2*).

288. In summary, it is expected that the construction phase of the proposed East Anglia THREE project will have **no discernible impact** on fishing vessels' steaming routes. These issues are considered further within Chapter 15 Shipping and Navigation.

Two Phased

289. As the Two Phased approach will undergo staggered construction, this may lead to a reduced impact for increased steaming times to fishing grounds should the area of Phase 2 remain open to fishing until the commencement of construction. However, as the construction period for the Two Phased approach is slightly longer than that of the Single Phase approach (42 months for the offshore works), it is assumed that impact would be the same as assessed for the Single Phase approach (i.e. no discernible impact).

14.6.1.5 Impact 5: Obstacles on the Sea Bed Post-Construction

290. Obstacles remaining on the sea bed post-construction could result in damage to, or complete loss of, fishing gears.

291. 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.

292. Offshore works such as construction vessel anchoring, jack up legs or cable trenching could produce spoil or mounds onto which fishing gears could fasten.

293. As agreed for East Anglia ONE (draft DCO Schedule J, Part 2, 7 (15)), appropriate methods (e.g. trawl or drift net) would be deployed after the post-construction swath bathymetry survey to assess any sea bed obstructions resulting from the burial of the offshore cable corridor. Should the post-lay survey identify the presence of construction related sea bed obstacles such as mounds, boulders or berms that could have the potential to interfere with fishing, appropriate rectification measures would be undertaken. It is therefore considered that risk of obstacles on the sea bed will be **within acceptable limits** for commercial fishing activities.

294. Under the Two Phased approach there would be one additional electrical platform, three platform link cables and two trenches in which interconnector cables would be laid, making the likelihood of dropped objects slightly higher. In addition, the construction period for the Two Phased approach is longer than that of the Single Phase approach (42 months compares with 41). Despite the increased risk of obstacles on the sea bed it will remain within acceptable limits for commercial fishing activities (See Chapter 15 Shipping and Navigation).

14.6.1.6 Impact 6: Interference with Fishing Activities

295. The potential impacts discussed above could be considered to cause interference to fishing activities.

296. In the case of demersal static and drifting gears the propellers, rudders or towed survey equipment of construction and / or survey vessels have the potential to foul the dhan buoys and their attachment lines. A number of pre-construction surveys have been successfully completed for East Anglia ONE and East Anglia THREE. Appropriate liaison should ensure that there are no conflicts with static fishing gear.

297. It should also be recognised that in order to minimise gear losses, static gear fishermen already avoid deploying their gears in shipping routes and areas of high shipping activity. Transiting East Anglia THREE works vessels will also fully comply with the international regulations (COLREGS). This should negate the requirement for fishing vessels engaged in fishing to alter course or to pose any risk to fishing gears being towed. It is also of note that the commission Regulation (EEC) No. 365/2005 provides the surface marker buoy specifications required when outside of the 12nm limit to ensure static and passive fishing gear is visible for 2nm. The surface marker buoy specifications include a radar reflector, yellow flashing lights, luminous bands and flags. Therefore, assuming local fishermen adhere to the surface marker buoy specifications as set out in commission Regulation (EEC) No. 365/2005, interference with static or passive gear outside of the 12nm limit should be minimal. Within the 12nm limit, it is also reasonable to assume that if fishermen wish to avoid their static gears being fouled by any transiting vessels, their surface marker buoys will be clearly visible during daylight and hours of darkness.

298. As a result, a conservative assumption is that transit routes could be in the vicinity of static and towed gear grounds. Policies would be in place to avoid as far as is reasonably possible conflicts with suitably visible static gears deployed at sea. The magnitude of the effect for vessels towing gear is therefore expected to be negligible, however for static gear it is considered to be low.

299. Taking into account the mobility of towed gear vessels targeting the fisheries in the vicinity of the proposed East Anglia THREE project, their sensitivity is considered to be low. Recognising the static nature of the potting, netting (including drift netting) and longlining fisheries, which are set in the water for periods of a few hours to several days, these fisheries are considered to have less tolerance and adaptability and therefore are considered to be of medium sensitivity.

300. The impact of interference with mobile fishing activities during construction is therefore considered to be **negligible**. The impact of interference with static fishing activities during construction is therefore considered to be of **minor adverse** significance.

301. Engagement will continue through the CFWG and further evidence sought following the guidelines set out in the Co-existence Fisheries Liaison Plan to address whether specific mitigation is necessary for individual vessels when the final installation schedule is known.

302. It is considered that interference with fishing activity will be no worse for the Two Phased approach than assessed for the Single Phase approach.

14.6.1.7 Impact 7: Displacement of Fishing Activity into Other Areas

303. Concerns were raised during consultation with fishermen and their representatives that any loss or restricted access to fishing grounds as a result of the proposed East Anglia THREE project could result in increased competition for grounds outside of the East Anglia THREE site and offshore cable corridor. This may be the case during the short duration installation phase of the offshore export cable for the local static gear fisheries. Through the established CFWG however, any disruption to normal fishing practices as a consequence of the installation activities will be discussed and where necessary, the option of disruption payments will be evaluated should no other form of proactive mitigation be appropriate. It is therefore taken that the impact of displacement will not exceed that as assessed above for temporary loss or restricted access to traditional fishing grounds.

304. With regard to the other categories of fishing vessels, the East Anglia THREE site comprises only a very small proportion of the total grounds available to these vessels with the result that any displacement effects will not be greater than those assessed for temporary loss or restricted access to traditional fishing grounds (i.e. **negligible** to **minor adverse** significance).

305. As the construction phase for the offshore export cable is the same duration for both the Single Phase approach and Two Phased approach (22 months in total), it is considered that the impact of displacement to local static gear fishermen will be the same for the Two Phased approach as the Single Phase approach. Similarly, it is assumed that displacement for other categories of fishing vessel will be the same for both the Single Phase and Two Phased approach.

14.6.1.8 Summary of impacts during Construction

306. A summary of impacts during the construction phase is presented in *Table 14.19*.

Table 14.19 Impact of safety issues, increased steaming time and interference to fishing activities during the construction phase (under both Single Phase and Two Phased approaches).

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
Safety Issues For fishing vessels	N/A	N/A	Within acceptable limits
Increased Steaming Times to Fishing Grounds	N/A	N/A	No discernible impact
Obstacles on the Sea bed Post-Construction	N/A	N/A	Negligible
Interference with Fishing Activities (static Gear)	Medium	Low	Minor adverse
Interference with Fishing Activities (Mobile Gear)	Low	Negligible	Negligible

14.6.2 Potential Impacts during Operation

307. The impacts described below should be considered in the context of the operational life of the proposed East Anglia THREE project, currently estimated to be 25 years in design life. The impact assessment provided below is based on the current baseline but the potential for this to change over time should be recognised.

14.6.2.1 Impact 1: Impacts on Commercially Harvested Fish and Shellfish Populations

308. As described previously, there is potential for the operational phase of the proposed East Anglia THREE project to have adverse impacts on commercially harvested fish and shellfish populations resulting in behavioural changes or declines in abundance, which could indirectly affect the productivity of the fishery. Adverse impacts upon commercially exploited species during the operational phase of the proposed East Anglia THREE project are assessed fully within Chapter 11 Fish and Shellfish Ecology and are expected to be at worst of **minor adverse** significance.

309. Based on the findings of Chapter 11 Fish and Shellfish Ecology, it is therefore expected that any indirect effect on catch rates in the relevant commercial fisheries for these species would also not exceed **minor adverse** significance.

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

310. Under the Two Phased approach, the area completely lost to fishing would be largely the same as the Single Phase approach with an addition of one electrical platform. There will also be three additional platform link cables and two trenches in which interconnector cables would be laid. However, as stated above, it is assumed that during the operational phase the offshore export cables, inter-array

and platform link cables will be buried or protected, and therefore will not result in any material loss of fishing grounds.

311. As there is an addition of one electrical platform for the two phased approach, this is considered to be the worst case, however, the sensitivity of the fishery receptors would remain the same for both the Single Phase and Two Phased approach.

312. Existing legislation does not provide for fishing to be prevented within operational windfarm sites. It is therefore assumed that there is the potential for fishing to resume within the East Anglia THREE site once the construction phase is completed. It is however noted that the skippers may elect not to fish within the operational East Anglia THREE site if judged impractical or unsafe to do so. The impact on certain individual vessels may therefore be higher than that identified for the fleet as a whole.

313. NPS EN-3 states that "the footprint of the offshore windfarm and any associated infrastructure may be a hindrance to certain types of fishing activity such as trawling and long-lining." Although not stated within the EN3 guidance, offshore windfarms and associated infrastructure may also hinder or preclude the use of other methods such as drift netting and seine netting.

314. The worst case scenario in terms of operational infrastructure is presented in *Table 11.2*. This would include the presence of a combined total of 193 structures with a minimum spacing of 675m x 900m between wind turbines. Vessels are known to fish within operational windfarm sites which have smaller or similar spacing between wind turbines (Plate 14.1- Plate 14.2). In addition, it was stated by the skippers of Dutch beam trawlers that assuming spacing of at least 675m and a linear arrangement of turbines, it would be possible to fish within the East Anglia ONE windfarm site in safe conditions (East Anglia ONE Statement of Common Ground (SoCG) VisNed and NFFO July 2013).

315. Once operational the offshore export cables and inter-array cables would be buried to depth of between 0.5m to 5m. Depth of cable burial will depend on the substrate composition. In those substrates that are potentially mobile such as sands, deeper burial depth will be required to ensure the cable remains buried to a sufficient depth. In substrates such as clay, where re-exposure is less likely, shallower burial depths could be adequate to ensure the cable remains buried. Linnane et al., (2000), summarises research into the penetration depths of fishing gear into various seabed types. The greatest seabed penetration for beam trawls is recorded to be 300mm (0.3m) within soft mud and sand. As minimum cable burial depth is 0.5m, it is considered that there is limited opportunity for interaction between towed fishing gears and the offshore cables. Furthermore, ground

contact and penetration depths of Pulse and Sum Wing gear (the predominant gear type within the proposed East Anglia THREE project) are considerably less than for traditional beam trawl gear, further reducing the likelihood of fishing gear and cable interaction. Where sea bed conditions prevent cable burial, cables will be protected by one or a combination of the following methods: concrete mattresses, fronded concrete mattresses, rock dumping, bridging or positioning of gravel bags. The impact assessment in relation to this issue assumes a worst case of (*Table 11.2*) cable protection measures being required along

- Up to 10% of the length of the inter-array cables;
- Up to 10% of the length of the export cables at, or east of, the cable crossings with the GGOWF and GWF.
- EATL are committed to the aspiration of minimising cable protection to 2.5% of the length of the export cables to the west of these cable crossings, however, the worst case assumes 10% cable protection over the entire project.

316. As agreed within the SoCG for the East Anglia ONE development, an appropriate post-construction survey will be carried out post burial of the offshore export cables to assess sea bed status to determine whether fishing activity can resume. In the event that sea bed rectification procedures are required, the appropriate measures would be undertaken to ensure that the sea bed is returned to an acceptable condition.

317. Wind resources and geotechnical data are the main drivers for the selection of turbine location. However, it is the intention of EATL to minimise disruption to fishing activity as far as is practicable through working with the CFWG. It is recognised that the key concern for local East Anglian fishermen represented by the CFWG relates primarily to the offshore cable corridor.

318. The East Anglia ONE SoCG provides agreement that EAOL will adopt a hierarchical approach to cable protection options in the event that full burial of the entire cable length is not achievable. Under this approach, which will involve consultation with relevant fishing organisations and their representatives, protection options will be assessed using a number of criteria including the aim of selecting protection methods which would cause the least disturbance to fishing practices (East Anglia ONE SoCG VisNed and NFFO July 2013). The practice of agreeing SoCGs developed by EAOL will be consistently applied across all projects developed within the East Anglia Zone including the proposed East Anglia THREE project.

319. It is therefore assumed that during the operational phase the offshore export cables and inter-array cables will not result in any material loss of fishing ground

and that fishing activity will be able to continue normally. For this reason the impact of complete loss or restricted access to traditional fishing grounds focusses on the operational East Anglia THREE site.

320. In light of the information provided above, any restricted access to traditional fishing grounds occurring during the operational phase could only occur as a result of:

- Temporary transitory safety zones around operation and maintenance activities; and
- Safety zones around installed infrastructure.

321. Temporary transitory safety zones are expected around operation works, from which all non-works associated vessels would be excluded.

Plate 14.1 Beam Trawling for Brown shrimps in an operational windfarm in The Wash (Source: BMM, 2010)

Plate 14.2 Twinrig trawl being hauled in an operational windfarm in the Irish Sea (Source: BMM, 2103)

14.6.2.2.1 Dutch Fishing Vessels

14.6.2.2.1.1 Beam Trawling for Demersal Species

322. Dutch vessels using pulse wing trawls to target sole and plaice are considered to be of medium sensitivity as use of this gear type is only permitted within the Southern North Sea (IVC) and thus their total fishing area is more limited. Dutch vessels using Sum Wing and traditional beam trawl gears are however considered to be of low sensitivity.

323. During consultation it was stated that it would be possible for beam trawling to resume in the operational East Anglia THREE site during appropriate conditions. It is however accepted that the decision whether to undertake fishing in the operational East Anglia THREE site will be based on a skipper's own evaluation of the associated risks and benefits (See Chapter 15 Shipping and Navigation).

324. Whilst there will be some small permanent loss of fishing grounds associated with the need to avoid wind turbines, the spatial extent of this represents a minor proportion of the total grounds available to this fleet in the Southern North Sea (*Figure 14.12*). The magnitude of the effect is therefore assessed as low.

325. Based on the low magnitude of the effect and the low to medium sensitivity of the receptors, the impact of complete loss or restricted access to fishing grounds for

the Dutch beam trawl fleet during operation is assessed to be of **minor adverse** significance.

14.6.2.2.1.2 Otter Trawling for Demersal Species

326. As previously mentioned, Dutch vessels demersal otter trawling for sole and plaice are considered to be of low sensitivity due to their size, the availability of a wide range of fishing grounds in the North Sea, English Channel and Celtic Sea and relatively low levels of activity in the proposed East Anglia THREE project.

327. As with beam trawling, demersal otter trawling is expected to be able to occur within the operational East Anglia THREE site. The magnitude of the effect is therefore considered to be low**.**

328. Taking in to account the low sensitivity of the receptor and low magnitude of the effect, the impact of complete loss or restricted access to fishing grounds for the Dutch demersal otter trawl fleet during the operational phase is assessed to be of **minor adverse** significance.

14.6.2.2.1.3 Seine Netting for Demersal and Pelagic Species

329. As previously discussed for the construction phase, the sensitivity of Dutch Seine netting is medium.

330. Seine netting will effectively be excluded from the East Anglia THREE site for the duration of the operational phase. *Figure 14.14* shows, however, that the highest value grounds in the vicinity of the proposed East Anglia THREE project are located outside of the East Anglia THREE site and access will not be restricted to these areas. In addition, numerous alternative high value grounds are distributed throughout the Central and Southern North Sea and English Channel. Furthermore, the area that will be covered by the East Anglia THREE site represents a minimal proportion of the total fishing grounds available to the seine netting fleet. The magnitude of the effect is therefore assessed as low**.**

331. Taking into account the medium sensitivity of the receptor and low magnitude of effect, the impact of complete loss or restricted access to fishing grounds on the Dutch seine netting fleet during operation is assessed to be of **minor adverse** significance.

14.6.2.2.1.4 Static Netting

332. Static netting vessels have been assigned a receptor sensitivity of medium due to the relatively limited distribution of grounds when compared to other methods and limited potential to employ other gear types.

333. Based on VMS data (*Figure 14.15* and *Figure 14.20*) the proposed East Anglia THREE site is located in an area of low value and effort from the Dutch netting fleet.

Furthermore, whilst there may be a requirement for a modification in current operating practices, it is possible that static netting may be able to occur within the operational windfarm site. Should this be the case, the magnitude of the effect on the Dutch static netting fleet will be negligible. Should it not, the magnitude would be low.

334. The impact of complete loss or restricted access to fishing grounds for the static netting fleet during operation is therefore to be of **negligible** to **minor adverse** significance.

14.6.2.2.1.5 Midwater Trawling for Pelagic Species

335. As discussed above, the sensitivity of the midwater trawling fleet is low.

336. Due to the effective width of the pelagic trawl gear employed by the Dutch midwater fleet it will not be possible to for some of these vessels to fish within the operational East Anglia THREE site. Despite this, the proposed East Anglia THREE site represents a very small proportion of the grounds available to the midwater trawling fleet.

337. In addition, whilst VMS data (*Figure 14.16*) shows moderate landings from the East Anglia THREE site it should be noted that these vessels are some of the highest earning in the European fleet. Landings from the East Anglia THREE therefore represent a small fraction of the total annual gross. Furthermore, in terms of effort, *Figure 14.21* shows that these values fall into the category of less than 1 day per year on average. The loss of fishing resulting from the operational phase of the East Anglia THREE site could therefore easily be compensated by fishing in other areas. In light of these considerations the magnitude of the effect is **no change**.

338. The impact of complete loss or restricted access to fishing grounds for the midwater trawl fleet during the operational phase is therefore assessed as **no change**.

339. *Table 14.20* provides a summary of the potential impact of complete loss or restricted access to traditional fishing grounds associated with the operational phase for Dutch vessels.

Table 14.20 Impact significance to Dutch vessels of complete loss or restricted access to traditional fishing grounds during the operational phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
Dutch Beam Trawling (Traditional)	Low	Low	Minor adverse
Dutch Beam Trawling (Pulse Wing)	Medium	Low	Minor adverse
Dutch Demersal Otter Trawling	Low	Low	Minor adverse
Dutch Seine Netting	Medium	Low	Minor adverse
Dutch Static Netting	Medium	Negligible or Low	Negligible or Minor
Dutch Midwater Trawling	Low	No Change	No Change

14.6.2.2.2 Belgian Fishing Vessels

14.6.2.2.2.1 Beam Trawling for Demersal Species

340. As discussed previously the Belgian beam trawl fleet is assessed to be of low sensitivity due the availability of alternative grounds in the Central North Sea, Southern North Sea, English Channel, Celtic Sea and Irish Sea.

341. This area utilised by wind turbines represents a minimal fraction of the fishing grounds targeted by the Belgian fleet in the North Sea, English Channel, Celtic Sea and Irish Sea. In addition, *Figure 14.30* and *Figure 14.31(a-h)* show that Belgian vessels spend a maximum of 5 days a year on average in the East Anglia THREE site. Therefore these vessels derive a minimal proportion of their earnings from grounds in the proposed East Anglia THREE project. The magnitude of the effect is therefore assessed as negligible.

342. Based on the negligible magnitude of the effect and the low sensitivity of the receptor, the impact of complete loss or restricted access to fishing grounds for the Belgian beam trawl fleet during operation is assessed to be of **negligible** significance.

14.6.2.2.2.2 Otter Trawling for Demersal Species

343. Similar to the beam trawlers, the demersal otter trawl fleet is considered to be of low sensitivity.

344. The only landings from demersal otter trawlers are recorded in the inshore cable corridor which is not relevant to the impact under consideration (*Figure 14.26*). The magnitude of effect is considered to be negligible.

345. Based on the low sensitivity of the receptor, and the negligible magnitude of the effect the impact of complete loss or restricted access to fishing grounds for the

Belgian otter trawl fleet during operation is assessed to be of **negligible** significance.

14.6.2.2.2.3 Seine Netting

346. As previously stated, Belgian seine netting vessels are over 15m in length and have widely distributed grounds in the Western and Eastern Channel, Central North Sea and Southern North Sea. Therefore they are assigned a receptor sensitivity of low.

347. *Figure 14.31b* shows that on average this fleet derives less than €5,000 from the East Anglia THREE site and the cable corridor. Similarly, effort recorded by this fleet is on average up to five days per year. For these reasons the magnitude of the effect is considered to be negligible.

348. The impact of impact of complete loss or restricted access to fishing grounds for the Belgian seine netting fleet during construction is therefore considered to be of **negligible** significance.

14.6.2.2.2.4 Netting

349. Figure *14.31c* and Figure *14.31h* show that there is no recorded activity by the Belgian netting fleet in the East Anglia THREE site and the offshore cable corridor. Therefore there is expected to be **no change** to these vessels.

350. *Table 14.21* provides a summary of the potential impact of complete loss or restricted access to traditional fishing grounds associated with the operational phase for Belgian vessels.

Table 14.21 Impact significance to Belgian vessels of complete loss or restricted access to traditional fishing grounds during the operational phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
Belgian Beam Trawling	Low	Negligible	Negligible
Belgian Demersal Otter Trawling	Low	Negligible	Negligible
Belgian Seine Netting	Low	Negligible	Negligible
Belgian Static Netting	Low	No Change	No Change

14.6.2.2.3 UK Fishing Vessels

14.6.2.2.3.1 Beam Trawling

351. Anglo-Dutch and UK beam trawlers remains as assessed for the construction phase, i.e. low.

352. With respect to the UK owned and operated vessels the magnitude of the effect is considered as negligible as grounds in the proposed East Anglia THREE project are

targeted infrequently and are also understood to be located in the offshore cable corridor.

353. For the Anglo-Dutch fleet it is understood that main grounds are located north – north east of the East Anglia THREE site and are extensive compared to the small area which would be lost due to the worst case scenario of the installation of 172 wind turbines with gravity bases. The magnitude of the effect is considered to be low.

354. The impact of complete loss or restricted access to fishing grounds for the UK owned and operated beam trawl fleet is as a consequence assessed to be of **negligible** significance and for the Anglo-Dutch fleet an impact of **minor adverse** significance.

14.6.2.2.3.2 Demersal Otter Trawling

355. From consultation with local fishermen and the charts they produced, it is understood that whilst the UK under 15m demersal otter trawlers fish grounds in the offshore cable corridor, they do not fish within the East Anglia THREE site. Following completion of installation activities, fishing is expected to resume within the offshore cable corridor. It is therefore not envisaged that there will be any material effect of loss of fishing area and as such the impact would be **no change**.

356. The over 15m demersal otter trawl fleet are considered to be of low sensitivity.

357. As with the under 15m fleet, over 15m vessels will be able to continue fishing within the offshore cable corridor once cable installation is completed. As with the Dutch and Belgian beam and demersal otter trawlers it is similarly assumed that UK over 15m demersal other trawlers can resume fishing within the East Anglia THREE site. As such the magnitude of the effect is assessed to be of negligible magnitude.

358. The impact of complete loss or restricted access to fishing grounds for the over-15m demersal otter trawl fleets during operation is therefore considered to be of **negligible** significance.

14.6.2.2.3.3 Static Gears and Drift Netting

359. As for under 15m vessels operating otter trawls, the majority of activity by local vessels using a number of different methods such as pots, nets and longlines occurs within the offshore cable corridor, within the 12nm limit. The majority of these vessels will therefore not be impacted by the loss of fishing grounds within the East Anglia THREE site during the operational phase.

360. Whilst the local under 15m vessels are effectively multi-purpose, due to quota restrictions and seasonal and operational range constraints the sensitivity of the UK under 15m vessels is considered to be medium.

361. It understood from consultation that only a limited number of local vessels may occasionally target grounds in the East Anglia THREE site. Due to the infrequency with which these vessels target grounds within the proposed East Anglia THREE site and the wide area of grounds available when fishing these methods (see *Figure 14.52* to *Figure 14.55*), for the operational phase the magnitude of the effect is low**.**

362. The impact is therefore considered to be **minor adverse** significance for the longline and netting vessels, and to be of **negligible** significance for other static methods and drift netting.

363. *Table 14.22* provides a summary of the potential impact of complete loss or restricted access to traditional fishing grounds associated with the operational phase for UK vessels.

Table 14.22 Impact significance to UK vessels of complete loss or restricted access to traditional fishing grounds during the operational phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
UK Beam Trawling (incl. Anglo-Dutch)	Low	Low	Minor adverse
UK Beam Trawling (south-west ports)	Low	Negligible	Negligible
UK Demersal Otter Trawling (Over-15m)	Low	Negligible	Negligible
UK Demersal Otter Trawling (Under-15m)	Medium	No Change	No Change
UK Static Gears and drift netting (Offshore Cable Corridor)	Medium	Negligible	Negligible
UK Static Gears (East Anglia THREE site)	Medium	Low	Minor adverse

14.6.2.2.4 French, German, Danish, and Norwegian Fishing Vessels

364. As previously discussed, French, German Danish and Norwegian registered activity is recorded over the offshore cable corridor only. For all of these nationalities virtually no activity is recorded within the proposed East Anglia THREE site (*Figure 14.74* to *Figure 14.97*). As it is considered that fishing would be able to resume over the offshore cable corridor during the operational phase, it is taken that there will be **no change**. This is summarised in *Table 14.23*.

Table 14.23 Impact significance to French, German, Danish and Norwegian vessels of complete loss or restricted access to traditional fishing grounds during the operational phase

Receptor Group	Receptor sensitivity	Magnitude of Effect	Impact Significance
French, German, Danish and Norwegian	Low	No Change	No Change

14.6.2.3 Impact 3: Safety Issues for Fishing Vessels

365. During the operational phase, temporary transitory safety zones and advisory exclusion zones of 500m radius could be applied around infrastructure where certain maintenance activities are taking place involving the presence of maintenance vessels such as crane barges. Safety risks would only occur if fishing vessels infringed these zones. Compliance with the temporary transitory safety zones and advisory exclusion zones safety zones during the operational phase would put the safety risk as **broadly acceptable**. Safety issues are further considered within Chapter 15 Shipping and Navigation.

366. Offshore export cables would be buried where feasible, with sections protected by other means where necessary. Post-construction surveys would be undertaken to assess the sea bed status. In the event that sea bed rectification procedures are required, and where practicably feasible, the appropriate measure would be undertaken to ensure that the sea bed is returned to an acceptable standard for fishing practices to be safely resumed. Subject to the satisfactory outcome of post-construction surveys, the safety risks to fishing vessels from inter-array and offshore export cables are considered to be **broadly acceptable**.

367. Potential collision risks between operational windfarm infrastructure and fishing vessels are discussed in Chapter 15 Shipping and Navigation.

14.6.2.4 Impact 4: Increased Steaming Times to Fishing Grounds

368. In light of the proportionally very small amount of sea area occupied by installed infrastructure and the ability of transiting vessels to steam through the windfarm site, the magnitude of effect is considered to be negligible. The sensitivities of these vessels are as described previously in section 14.6.1.2. In each instance, the significance of the effect is considered to be **negligible**.

14.6.2.5 Impact 5: Obstacles on the Sea Bed Post-Construction

369. 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. In addition, the developer will be required to ensure any accidentally dropped objects and/or debris would be removed on completion of construction activities.

370. Furthermore, post-construction and installation sea bed surveys, and if necessary the appropriate sea bed rectification measures, would be undertaken to ensure sea bed conditions are returned to an acceptable standard. Any sea bed obstructions and spoil identified during post-installation surveying which might represent a hazard to fishing, such as trenching berms, would be rectified.

371. Provided there is compliance to obligatory standards by contractors, the impact is considered to be **within acceptable limits**.

14.6.2.6 Impact 6: Interference with Fishing Activities

372. As mentioned previously, all of the potential impacts included in this assessment could cause interference to fishing activities.

373. Activity by operation and maintenance works vessels is estimated to be less than that occurring during the construction phase. Furthermore, it is considered that codes of conduct between works vessels and fishing vessels would be well established by the completion of construction activities, irrespective of the port used.

374. Taking into account all scheduled and unscheduled maintenance, the worst case scenario is an average of approximately 4,000 two-way windfarm support vessel trips per year. In addition, it is anticipated that up to 2 service vessels would be making an average of 52 round trips per year to the East Anglia THREE site, and up to six cable repairs per year within the proposed East Anglia THREE project.

375. The magnitude of effect depends upon the location of the operation and maintenance port, which at the current time is unknown. As a result, a conservative assumption has been made that transit routes could be in the vicinity of static and towed gear grounds. Transiting East Anglia THREE works vessels will also fully comply with the international regulations (COLREGS) to negate the requirement for fishing vessels engaged in fishing to alter course or to pose any risk to fishing gears being towed. It is also of note that the commission Regulation (EEC) No. 365/2005 states the surface marker buoy specifications required when outside of the 12nm limit to ensure static and passive fishing gear is visible for 2nm. The surface marker buoy specifications include a radar reflector, yellow flashing lights, luminous bands and flags. Therefore, assuming local fishermen adhere to the surface marker buoy specifications as set out in commission Regulation (EEC) No. 365/2005, interference with static or passive gear outside of the 12nm limit should be minimal. The magnitude of the effect for vessels towing gear is therefore expected to be negligible, and for static gear and drift netting is considered to be low. Within the 12nm limit, it is also reasonable to assume that if fishermen wish to avoid their static gears or drift nets being fouled by any

transiting vessels, their surface marker buoys will be clearly visible during daylight and hours of darkness.

376. Taking into account the mobility of towed gear vessels targeting the fisheries in the vicinity of the proposed East Anglia THREE project, their sensitivity is considered to be low. Recognising the static nature of the potting, netting and longlining fisheries, set in water for periods of a few hours to several days, these fisheries are considered to have less tolerance and adaptability and therefore are considered to be of medium sensitivity.

377. The impact of interference with mobile fishing activities during operation is therefore considered to be **negligible** and the impact of interference with static fishing activities during operation is considered to be of **minor adverse** significance.

14.6.2.7 Impact 7: Displacement of Fishing Activity into Other Areas

378. As is apparent from above, it is not expected there will be any significant effects of loss of fishing area during the operational phase. It is therefore unlikely that there is any potential for displacement effects to occur with the result that the magnitude of displacement is assessed to be negligible. As none of the receptor groups have been assessed to have sensitivities above medium, the resultant displacement impacts for all categories are considered to be of **negligible** significance.

379. Safety issues, increased steaming times, interference with fishing vessels and displacement of fishing activities are summarised in *Table 14.24.*

Table 14.24 Impact of safety issues, increased steaming time and interference to fishing activities during the operational phase.

All receptor groups	Receptor sensitivity	Magnitude of Effect	Impact Significance
Safety Issues For fishing vessels	N/A	N/A	Within acceptable limits
Increased Steaming Times to Fishing Grounds	N/A	N/A	Negligible
Obstacles on the Sea bed Post-Construction	N/A	N/A	Within acceptable limits
Interference with Fishing Activities (static Gear)	Low to Medium	Low	Minor adverse
Interference with Fishing Activities (Mobile Gear)	Low	Negligible	Negligible
Displacement of Fishing Activity into Other Areas	N/A	N/A	Negligible

14.6.3 Potential Impacts during Decommissioning

380. On expiry of the lease for the proposed East Anglia THREE project, EATL would remove all structures, except cables and pin piles deeper than 1 to 2m, and return the sea bed to a usable state in accordance with the DECC decommissioning guidance (DECC 2011).

381. During the decommissioning phase, there is potential for wind turbine, foundation and cable removal activities to cause disruption to normal fishing activity.

382. The types of effect would be comparable to those identified for the construction phase, namely:

- Impact 1: Impacts on Commercially Harvested Fish and Shellfish Populations
- Impact 2: Temporary loss or restricted access to traditional fishing grounds;
- Impact 3: Safety issues for fishing vessels;
- Impact 4: Increased steaming times to fishing grounds;
- Impact 5: Obstacles on the sea bed post construction;
- Impact 6;Increased steaming times; and
- Impact 7: Displacement of fishing activity into other areas.

383. The sensitivity of receptors during decommissioning is assumed to be the same as given for the construction phase. The magnitude of effect is considered to be no greater and in all probability less than considered for the construction phase. Therefore it is anticipated that any decommissioning impacts would be no greater, and probably less than that assessed for the construction phase.

14.6.4 Cumulative Impacts

Single Phase approach

384. There is a potential for cumulative impacts to occur on the commercial fisheries receptors identified in the proposed East Anglia THREE project if all of the other potential developments, regulated activities and conservation areas listed in *Table 14.2* and shown in *Figures 14.98* to *Figure 14.111* are implemented. The likelihood of significant impacts occurring, however, depends largely on the operational practices of a given fleet, the location and the extent of fishing grounds relative to other potential windfarms, other to be installed infrastructure, regulated activities and conservation measures and the timing of their construction phases, activities and implementation.

385. With regards to cumulative effects associated with developments within the East Anglia Zone, under currently planned construction schedules it is not expected that there would be temporal overlap in the construction phases of East Anglia ONE and East Anglia THREE. Therefore it is not expected that there will be a cumulative effect associated with construction phases within the East Anglia Zone.

386. Existing windfarms, other installed infrastructure, regulated activities and marine conservation measures are considered as part of the existing environment, to which stakeholders have already adapted, and are therefore not assessed within the cumulative impact assessment. Whilst new areas are being licenced and may be developed, a significant amount of oil and gas infrastructure is entering decommissioning and removal phases which, once complete, may lead to some increase in fishable area. At this stage it is not however possible to quantify the extent of any such effects.

387. Under the Habitats directive, and the UK Marine and Coastal Access Act (2009), it is proposed that a series of conservation areas are to be implemented within the North Sea. The final boundaries of these have yet to be defined and at present some of the published boundaries are only indicative of the maximum extent of the areas under consideration. The boundaries shown in *Figures 14.98* to *Figure 14.111* therefore represent the worst case scenario in terms of the potential spatial impacts. Furthermore, the associated management policies with regards to commercial fishing have also yet to be determined.

388. Licensed and potential aggregate dredging areas are shown in *Figures 14.98* to *Figure 14.111*. In most cases, only a small percentage of these areas are or will be actively dredged at any one time, therefore these boundaries represent a worst case scenario.

389. The following evaluation of cumulative impacts focuses on the assessment of the complete loss or restricted access to traditional fishing grounds. This was the main concern raised by fishermen during consultation and it is the principal pathway from which cumulative impacts are likely to arise; it is therefore assessed separately for fleets of each nationality and gear type. The impacts of safety issues for fishing vessels, increased steaming times to fishing grounds, obstacles on the seabed, interference with fishing activities, and displacement of fishing activity into other areas are considered generically for all nationalities.

14.6.4.1 Impact 1: Complete loss or restricted Access to Traditional Fishing grounds

14.1.1.1.1 Dutch Fishing Vessels

14.6.4.1.1.1 Beam Trawling for Demersal Species

390. In comparison to other fleets, there is more potential for the Dutch beam trawl fleet to incur a cumulative loss or restricted access to fishing grounds. This is primarily expected to be a function of the construction and / or operation of windfarms located off the Dutch and Belgian coasts and, to a lesser extent, aggregate dredging areas located south of the offshore cable corridor which could constitute a relatively larger proportion of the grounds available. However, as fishing would be able to resume within the proposed East Anglia THREE project once operational, in contrast to those developments located off the Dutch and Belgian coasts[15], it is assumed that any cumulative loss or restricted access to fishing grounds would be small as a result of the proposed East Anglia THREE project and would primarily apply during the construction phase. Therefore the cumulative impact is expected to be the same as that assessed for the construction phase (i.e. medium sensitivity, low magnitude and minor adverse significance).

14.6.4.1.1.2 Otter Trawling for Demersal Species

391. It can be seen from *Figure 14.99* that there is theoretically potential for a cumulative loss of, or restricted access to, fishing grounds for the Dutch demersal otter trawlers. As shown however, the areas of highest value are outside of those areas potentially occupied by windfarms and offshore developments. The proposed East Anglia THREE project is situated in an area of low value resulting in a low magnitude of effect. The sensitivity of demersal otter trawlers is considered to be low. Therefore the proposed East Anglia THREE project would not contribute to any

[15] Commercial fishing activity is prohibited within Dutch, Belgian and Danish windfarms

significant cumulative impact of loss or restricted access to fishing grounds for the Dutch demersal otter trawl fleet (**minor adverse** significance).

14.6.4.1.1.3 Seine Netting

392. *Figure 14.100* shows that seine net vessels have a wide operational range extending as far north as the Danish coast to as far south as waters off the Cornish coast and therefore the sensitivity of these receptors is low. As is apparent, there is some potential for loss of, or restricted access to, fishing grounds particularly off the Dutch coast and the English Channel. It is also recognised that in the case of windfarm developments, there is the potential for a permanent loss of fishing area.

393. In the case of the proposed East Anglia THREE project, relatively limited levels of activity have been recorded. Furthermore, the area potentially lost as a result of the proposed East Anglia THREE project is minimal when compared to the total extent of alternative fishing grounds. However, due to the nature of the fishing method, it is accepted that seine netting will not be able to continue within the windfarm once constructed, and as a result a medium sensitivity has been assigned to Dutch seine netters. Despite this, the proposed East Anglia THREE project is situated in an area of low value and therefore would not contribute to any significant cumulative loss of, or restricted access to, fishing grounds for the Dutch seine net fleet. As a result the cumulative impact of loss or restricted access to fishing grounds on Dutch seine netting fleet is considered to be **minor adverse** significance.

14.6.4.1.1.4 Static Netting

394. As previously stated, Dutch static netters are considered to be of medium sensitivity. Levels of static netting recorded within the proposed East Anglia THREE project are negligible and therefore the magnitude of effect is negligible. The proposed windfarm developments off the Dutch coast would result in loss of, or restricted access to, fishing grounds for the static netting fleet. Due to the low level of activity within the proposed East Anglia THREE project, however, there would be no cumulative contribution from this development (i.e. negligible significance).

14.6.4.1.1.5 Pelagic trawling

395. The fishing grounds of the Dutch pelagic fleet are amongst the most extensive grounds of any European fishing vessel resulting in a low sensitivity. Due to the proposed East Anglia THREE project representing an insignificant fraction of the fishing areas depicted in *Figure 14.102* which does not include the total fishing area of these vessels as their grounds can also extend as far as the west coast of Africa and into the Eastern Atlantic, the magnitude is considered to be negligible. Furthermore, negligible levels of activity occur within the proposed East Anglia

THREE project, in conjunction with the migratory behaviour of the target species, which further confirms that the proposed East Anglia THREE project would make a negligible contribution to any cumulative effects of the loss of, or restricted access to, fishing grounds for this vessel category.

14.6.4.1.2 Belgian Fishing Vessels

396. The VMS data provided in *Figure 14.104* to *Figure 14.104c* shows that the principal vessels with any potential to sustain a cumulative impact are beam trawlers. As stated previously, the sensitivity of Belgian beam trawlers is low.

397. From *Figure 14.104* it can be seen that Belgian beam trawling activity does not occur within the East Anglia THREE site but over the offshore cable corridor only. There are number of proposed windfarms and other marine developments in all areas fished by the Belgian fleet. However, the area of ground covered by the offshore export cable is minimal in comparison and any restricted access or loss would be temporary occurring only during the construction phase giving a low magnitude. The cumulative loss of or restricted access to fishing grounds for the Belgian fleet is therefore assessed to be, at worst, **minor adverse**.

14.1.1.1.2 UK Fishing Vessels

14.6.4.1.2.1 Beam Trawling

398. The primary grounds targeted by the UK beam trawl fleet are located within the western English Channel and Celtic Sea giving a low sensitivity. It is understood that low activity by this fleet occurs in the offshore cable corridor only. *Figure 14.105* shows that, other than a single MCZ off the coast of Devon, there are no other proposed marine developments or windfarms which could impact this fleet giving a low magnitude. Therefore, the cumulative impacts on of the loss of, or restricted access to, fishing grounds for the UK beam trawl fleet is considered to be **minor adverse**.

399. There is some potential for the Anglo-Dutch beam fleet to incur loss or restricted access to fishing grounds as a result of the construction and / or operation of the Hornsea and Dogger Bank windfarms. However, activity by the Anglo-Dutch fleet within the offshore cable corridor and proposed East Anglia THREE sites is low. The proposed East Anglia THREE project is not therefore expected to contribute to the overall cumulative impact of loss of, or restricted access to, fishing grounds targeted by the Anglo-Dutch beam trawl fleet.

14.6.4.1.2.2 Demersal Otter Trawling

400. Locally based UK under-15 demersal otter trawlers have been assigned a medium sensitivity and a low magnitude. There is no potential for a cumulative impact to

loss of, or restricted access to, fishing grounds in relation to the East Anglia THREE site.

401. With respect to the offshore cable corridor, due to the presence of aggregate dredging areas and the GWF development in relatively close proximity to fishing grounds located within the offshore cable corridor, there is potential for cumulative impacts to loss of, or restricted access to fishing grounds during cable installation. If it is deemed that there would be a cumulative impact during the installation phase of the offshore export cable, the appropriate mitigation measures will be discussed through the CFWG, in line with the draft Co-existence and Fisheries Liaison Plan.

402. In the case of the over-15m vessels, they have been assigned a low sensitivity and a negligible magnitude. It is understood that they fish the East Anglia THREE windfarm site and offshore cable corridor infrequently, with the majority of their effort being concentrated in the Central and Northern North Sea (Areas IVb and IVa). The cumulative loss of or restricted access to fishing grounds for the over-15 m fleet would therefore be negligible.

14.6.4.1.2.3 Static Gears and Drift Netting

403. The UK static gear fleet (including drift netting when deployed) is almost entirely comprised of under-10m vessels based at local ports along the Suffolk and Essex coasts which have limited operational ranges giving this receptor a medium sensitivity. As with under-15m demersal trawlers, the grounds targeted by vessels deploying static gears are in close proximity to aggregate dredging areas and the GWF development. As a result the magnitude of effect is expected to be medium, giving a **moderate adverse** cumulative impact.

404. Whilst there is some potential for a temporary cumulative impact to loss of, or restricted access to fishing grounds during the installation of the offshore export cable, should this be the case, the appropriate mitigation measures would be discussed through the CFWG in line with the draft Co-existence and Fisheries Liaison Plan.

405. Due to the dynamic nature of the environment, particularly during the winter months, rapid recovery of the seabed within the offshore cable corridor is expected to occur following cable installation.

406. Where cable protection is required, it is expected that only 2.5% of the offshore export cable sections between the approximate location of the GWF and GGOWF cable crossings and landfall would be protected. As described earlier this is a measure proposed by EATL to mitigate potential impacts on coastal processes and commercial fishermen. The maximum amount of cable protection expected to be

installed as part of the installation of the East Anglia ONE export cables amounts to 0.024km^2. Although activity occurs within this area, the proportion of fishing grounds affected would be small. As a result, the contribution of cable protection (0.02km^2) for the proposed East Anglia THREE project would be minimal.

14.1.1.1.3 French Fishing Vessels

407. As previously stated, the magnitude of effect for French vessels is considered to be low. *Figures 14.106* to *Figure 14.108* show that there is a potential for cumulative impacts due to the presence of aggregate dredging areas, windfarm developments off the UK and French coasts within the English Channel and those within the Central and Southern North Sea. However, activity by the French fleet in the proposed East Anglia THREE project is negligible or low resulting in a low sensitivity. The cumulative impact of loss or restricted access to traditional fishing grounds is expected to be **minor adverse**.

14.1.1.1.4 German Fishing Vessels

408. As shown by *Figure 14.85*, the fishing areas of the German vessels are extensive and as such their sensitivity is considered to be low.

409. *Figure 14.109* shows that there is a potential for cumulative impacts due to the presence of windfarm developments off the Danish, German and Dutch coasts. However, activity by the German fleet is absent in the proposed East Anglia THREE project, and is low within the offshore cable corridor leading to a negligible magnitude. As a result, the cumulative impact of loss or restricted access to traditional fishing grounds is expected to be **negligible** for the German fleet.

14.1.1.1.5 Danish Fishing Vessels

410. As previously stated, the sensitivity of Danish netters is considered to be low. *Figure 14.110* shows that there is some limited potential for cumulative impacts principally due to the presence of windfarm developments off the Dutch coast. However, activity by the Danish fleet is negligible in the proposed East Anglia THREE project and therefore the magnitude is expected to be negligible. The cumulative loss or restricted access to traditional fishing grounds for the Danish fleet is assessed to be **negligible**.

14.1.1.1.6 Norwegian Fishing Vessels

411. As previously stated, the sensitivity of Norwegian vessels is considered to be low. As shown by *Figure 14.111*, there is little, if any, potential for cumulative impacts from proposed offshore windfarm developments or other marine regulated activities and conservation measures. In any case, activity by the Norwegian fleet is negligible in the proposed East Anglia THREE project and the offshore cable corridor giving a negligible magnitude. In light of these considerations, the

proposed East Anglia THREE project would not contribute significantly to any cumulative loss or restricted access to traditional fishing grounds for the Norwegian fleet giving a negligible significance.

14.1.1.2 Displacement of Fishing Activity into Other Areas

412. Cumulative displacement would only occur if simultaneous exclusion occurs whereby in addition to the construction phase of the proposed East Anglia THREE project, imposition of other marine regulated activities occurs at the same time. In the case of the projects within the East Anglia Zone, it is not possible to predict if there would be overlap due to the fact that the timing of any future projects has not yet been specified. It is however recognised that simultaneous exclusion may occur in the wider context whereby exclusion from other areas occurs at the same time as that occurring for the proposed East Anglia THREE project. It is however recognised that there may be exclusion from other windfarms and marine regulated activities during periods when exclusion from the proposed East Anglia THREE project occurs. At present there is insufficient certainty as to the actual construction and exclusion periods from other developments, but as previously discussed, due to the short duration of construction phase for the proposed East Anglia THREE project, it is unlikely that East Anglia THREE would contribute to cumulative displacement of fishing activity.

14.1.1.3 Impact 2: Safety Issues for Fishing Vessels

413. It is assumed that other windfarms and other offshore developments would adhere to the same safety standards in respect of fishing vessels and gears as described for the proposed East Anglia THREE project and these would therefore also be **broadly acceptable.** As such there should not be a cumulative impact**.**

14.1.1.4 Impact 3: Increased Steaming Times to Fishing Grounds

414. The implementation of temporary transitory safety zones and advisory exclusion zones around construction and maintenance works and vessels could, in theory, result in some short term increases in steaming distances and times, and therefore higher operational costs for fishing vessels.

415. In the case of local vessels which for the most part concentrate their activity within the 12nm limit, a limited number of vessels occasionally fish within the East Anglia THREE site. *Figure 14.105* shows that there is little potential for the project to contribute any significant cumulative impact to increased steaming times of those longlining and netting vessels which occasionally target the East Anglia THREE site. Similarly, there should be no material adverse impacts on increased steaming times as a result of the installation of the offshore export cable.

416. As shown by *Figure 14.98- 14.102,* due to the presence of a number of proposed windfarms off the Dutch coast and their position relative to some of the main Dutch landing ports and key fishing grounds, there is some potential for an impact on increased steaming times for Dutch fishing vessels. However, due to the position of the East Anglia THREE site, it would not contribute to the overall cumulative impacts of increased steaming times either during the construction or operational phase.

417. With respect of the Belgian fleet, *Figure 14.103- 14.104c* indicate that traditional steaming routes to fishing grounds could involve passages through aggregate dredging areas and proposed windfarm sites to the south of the offshore cable corridor. However, the installation of the offshore cable corridor would not contribute to the cumulative impact of increased steaming times for any fleet sector. The area to be occupied by the East Anglia THREE site is not actively fished by the Belgian fleet and therefore has no potential to contribute any cumulative increase to steaming times.

418. Similarly, the majority of the fishing grounds of the Danish, French, Norwegian and German fishing vessels, relative to the location of their base ports would generally not involve steaming routes that would pass through the proposed East Anglia THREE project. Therefore, the proposed East Anglia THREE project is not expected to contribute to the cumulative impact of increased steaming times.

14.1.1.5 Impact 4: Obstacles on the Seabed

419. Offshore policy (IMO, 1996) prohibits the discarding of objects or waste at sea. The reporting and recovery of any accidentally dropped object is also a legal requirement. As these regulations would also apply to other windfarms and other offshore developments the impact should remain **broadly acceptable.**

14.1.1.6 Impact 5: Interference with Fishing Activities

420. Any works vessels associated with windfarms and other offshore developments will fully comply with the international regulations (COLREGS) to negate the requirement for fishing vessels engaged in fishing to alter course or to pose any risk to fishing gears being towed. Similarly it is assumed that static gear fishermen will adhere to commission Regulation (EEC) No. 365/2005 relating to surface marker buoy specifications. The magnitude of the cumulative effect for either vessels towing gear or operating static gear would therefore remain negligible, and low respectively.

421. Sensitivity also remains the same as that assessed for the construction and operation phases being low for towed gear methods and medium for static gear methods.

422. Consequently, there is not expected to be any cumulative impact of interference for either mobile or static gear methods during the operational phase.

Two Phase approach

423. Based on the previous assessments of Single Phase and Two Phased approaches during construction and operation, there is not expected to be any material difference in terms of impacts on commercial fisheries between the two approaches. Therefore, this is also expected to be the case in terms of cumulative impacts on fisheries receptors.

Table 14.2 Results of screening for other plans and projects taken forward in the CIA (status at time of end of East Anglia THREE baseline (with current in parentheses if this has changed).

Name of Project	Country	Status
Offshore windfarms		
Humber Gateway	UK	Consented / Construction (now commissioned)
Amrumbank West	Germany	Construction (now commissioned)
Northwind	Belgium	Construction (now commissioned)
Trianel Windpark Borkum Phase 1 (Borkum West II phase 1)	Germany	Construction
Borkum Riffgrund I	Germany	Construction
Dudgeon	UK	Consented (pre-construction)
Race Bank	UK	Consented(pre-construction)
Westermost Rough	UK	Consented (now constructed)
Triton Knoll phase 1-3	UK	Consented
Narec / Blyth demonstration site	UK	Consented
Galloper	UK	Consented
WIN 2	France	Consented
European Offshore Wind Deployment Centre EOWDC	UK	Consented
2-B Energy Test Site	UK	Consented
Kentish Flats Extension	UK	Construction (now commissioned)
Kaikas	Germany	Consented
Deutsche Bucht	Germany	Consented
Veja Mate	Germany	Consented

Name of Project	Country	Status
EnBW He Dreiht	Germany	Consented
EnBW Hohe See (Hochsee Windpark 'Nordsee')	Germany	Consented
Albatros	Germany	Consented
Butendiek (Offshore- Bürger- windpark)	Germany	Consented
Sandbank	Germany	Consented
Nordlicher Grund	Germany	Consented
Borkum Riffgrund West	Germany	Consented
Borkum Riffgrund II	Germany	Consented
Gemini	Netherlands	Consented (now construction)
Trianel Windpark Borkum Phase 2 (aka Borkum West II phase 2)	Germany	Consented (now commissioned)
MEG offshore 1	Germany	Consented
Delta Nordsee 1	Germany	Consented
Delta Nordsee 2 (OWP Delta Nordsee 2)	Germany	Consented
Nordsee One (Innogy Nordsee I)	Germany	Consented
Gode Wind I	Germany	Consented
Gode Wind II	Germany	Consented
Gode Wind IV	Germany	Consented
Nordergrunde	Germany	Consented
Beaufort (formerly Katwijk)	Netherlands	Consented

Name of Project	Country	Status
Breeveertien II	Netherlands	Consented
Brown Ridge Oost	Netherlands	Consented
Clearcamp (aka EP Offshore NL1)	Netherlands	Consented
Dan Helder I	Netherlands	Consented
Eneco Luchterduinen	Netherlands	Consented
Q4	Netherlands	Consented
Q4 West	Netherlands	Consented
Tromp Binnen	Netherlands	Consented
Westermeerdijk buitendijks - Windpark Noordoostpolder	Netherlands	Consented
RENTEL	Belgium	Consented
Norther	Belgium	Consented
Belwind 2 (zone 3, Bligh Bank)	Belgium	Consented (now construction)
Kattegat	Sweden	Consented
Beatrice	UK	Consented
Telford	UK	Consented
MacColl	UK	Consented
Stevenson	UK	Consented
Hornsea Project One	UK	Consented
Dogger Bank Zone Creyke Beck A	UK	Consented
Dogger Bank Zone Creyke Beck B	UK	Consented

Name of Project	Country	Status
East Anglia One	UK	Consented
Rampion	UK	Consented
Inch Cape	UK	Consented
Neart na Gaoithe	UK	Consented
Firth of Forth Phase 1 Seagreen Alpha and Bravo	UK	Consented
Hornsea Project Two	UK	Examination/Determination
Dogger Bank Zone Teesside A	UK	Consented
Dogger Bank Zone Teesside B	UK	Consented
Saint- Brieuc	France	Full draft ES
Cherbourg	France	Scoping
Courseulles- Sur- Mer	France	Full draft ES
Ramanville	France	Scoping
Fecamp	France	Full draft ES
Fecamp II	France	Scoping
WIN2	France	Consented
3B	France	Scoping
Walney 2.5	UK	Consented
Burbo Bank 2.5	UK	Consented
Aggregates		
North West Rough (466)	UK	Application

Name of Project	Country	Status
Southernmost Rough (485)	UK	Application
Humber 4 and 7 (506)	UK	Application
Humber 5 (483)	UK	Application
Humber 3 (484)	UK	Application
Sole Pit (492)	UK	Application
New Sand Hole and Humber Extension (448/449)	UK	Application
Humber Overfalls (493)	UK	Application
North Dowsing (400)	UK	Application
Inner Dowsing (439)	UK	Application
Lowestoft Extension (495)	UK	Application
North Cross Sands (494)	UK	Application
TBC (511 - 513)	UK	Application
North Inner Gabbard (498)	UK	Pre Application
Shipwash (507)	UK	Application
Longsand (508 - 510)	UK	Application
North Falls East (501)	UK	Pre Application
Area 106/1 Humber Aggregate Region	UK	Application
Area 106/2 Humber Aggregate Region	UK	Application
Area 106/3 Humber Aggregate Region	UK	Application
Area 107 Humber Aggregate Region	UK	Application

Name of Project	Country	Status
Area 197 Humber Aggregate Region	UK	Application
Area 514/3 (was 449) Humber Aggregate Region		Application
Area 240 East Coast Region	UK	Application
Area 242 East Coast Region	UK	Application
Area 328/1 East Coast Region	UK	Application
Area 328/2 East Coast Region	UK	Application
Area 328/3 East Coast Region	UK	Application
Area 361/1 East Coast Region	UK	Application
Area 361/2 East Coast Region	UK	Application
Area 361/3 East Coast Region	UK	Application
Area 511 (was 319/251) East Coast Region	UK	Application
Area 512 (was 251/454) East Coast Region	UK	Application
Area 513/1 (was 360) East Coast Region	UK	Application
Area 513/2 (was 251/454) East Coast Region	UK	Application
Area 498 Thames Region	UK	Application
Area 507/1 (was 118/2) Thames Region	UK	Application
Area 507/2 (was 452A) Thames Region	UK	Application
Area 507/3 (was 452E) Thames Region	UK	Application
Area 507/4 (was 239/1) Thames Region	UK	Application
Area 507/5 (was 452D) Thames Region	UK	Application

Name of Project	Country	Status
Area 507/6 (was 452C) Thames Region	UK	Application
Area 508 (was 108/3) Thames Region	UK	Application
Area 509/1 (was 257) Thames Region	UK	Application
Area 509/2 (was 257) Thames Region	UK	Application
Area 509/3 (was 109/1) Thames Region	UK	Application
Area 510/1 Thames Region	UK	Application
Area 510/2 Thames Region	UK	Application
Oil and Gas		
Cygnus Alpha and Bravo	UK	In development
Tommeliten Alpha (256)	UK	Development likely but not clarified
2/7-29 (258)	UK	Development is not very likely
2/7-2 (260)	UK	Development is not very likely
2/7-22 (259)	UK	Development is not very likely
Freja (264)	UK	Existing licence with planned new developments
Dagny (272)	UK	In Planning
Alpha (273)	UK	Development likely but not clarified
E/13-1 (295)	UK	Undeveloped
E/13-2 (296)	UK	Undeveloped
Kinnoull (279)	UK	Under development
Rochelle (285)	UK	Under development

Name of Project	Country	Status
Huntington (290)	UK	Under development
Ensign (298)	UK	Under development
Clipper S (299)	UK	Under development
Katy (267)	UK	Under development
Marine conservation Zones		
NG 16, Swallow Sand	UK	Designated MCZ
NG 14, North East of Farns Deep	UK	Designated MCZ
Blackwater, Crouch, Roach and Colne	UK	Designated MCZ
Medway Estuary	UK	Designated MCZ
Thanet coast	UK	Designated MCZ
Folkestone Pomerania	UK	Designated MCZ
Beachy Head West	UK	Designated MCZ
Kingsmere	UK	Designated MCZ
Pagham Harbour	UK	Designated MCZ
Poole Rocks	UK	Designated MCZ
South Dorset	UK	Designated MCZ
Chesil Beach and Stennis Ledges	UK	Designated MCZ
Torbay	UK	Designated MCZ
Skerries Bank and Surrounds	UK	Designated MCZ
Whitesande and Looe Bay	UK	Designated MCZ

Name of Project	Country	Status
The Manacles	UK	Designated MCZ
Upper Fowey and Pont Pill	UK	Designated MCZ
Isles of Scilly Sites	UK	Designated MCZ
South West Deeps	UK	Designated MCZ
East of Haig Fras	UK	Designated MCZ
Lundy	UK	Designated MCZ
FLyde	UK	Designated MCZ
Cumbria Coast	UK	Designated MCZ
Dogger Bank cSAC	UK	Candidate SAC
North Norfolk Sandbanks and Saturn Reef cSAC	UK	Candidate SAC/ Offshore site of community importance
Bassurelle Sandbank cSAC	UK	Candidate SAC
Wight-Barfleur Reef cSAC	UK	Candidate SAC
Haig Fras cSAC	UK	Candidate SAC
Stanton Banks cSAC	UK	Candidate SAC

14.1.2 Inter-relationships

424. The assessment of the impacts arising from construction, operation and decommissioning of the proposed East Anglia THREE project given above, indicates that impacts on receptors addressed in other ES chapters may potentially further contribute to the impacts assessed on commercial fisheries.

425. The principal linkages identified are summarised in *Table 14.26* below. No inter-relationships have been identified where an accumulation of residual impacts on commercial fisheries gives rise to a need for additional mitigation.

Table 14.26 Chapter topic inter-relationships

Topic and Description	Related Chapter	Where addressed in this Chapter
Adverse Effects on Commercially Exploited Fish and Shellfish	Chapter 11 Fish and Shellfish Ecology	sections 14.6.1.1 and 14.6.2.1
Safety Issues for Fishing Vessels	Chapter 15 Shipping and Navigation	sections 14.6.1.3 and 14.6.2.3
Increased Steaming Times	Chapter 15 Shipping and Navigation	sections 14.6.1 and 14.6.2.4

14.1.3 Summary

426. *Table 14.27* summarises the impacts on commercial fisheries during the construction, operation and decommissioning phases of the proposed East Anglia THREE project. UK vessels operating static gear are the only receptors which are expected to potentially sustain a significant impact and then only during the construction phase, in relation to installation of the offshore export cable. If necessary appropriate mitigation would be decided through the CFWG. Therefore, the residual impact is reduced to minor (see *section 14.6.1.2*). In the majority of other scenarios, impacts are assessed to be at worst, minor adverse, and as such no further significant impacts are expected to result from any phase of the proposed East Anglia THREE project.

Table 14.27 Summary of Impacts on Commercial Fisheries for the Construction, Operation and Decommissioning phase of the East Anglia THREE project (under either Single Phase of Two phased Approach)

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
Construction Phase			
Impact 1: Impacts on Commercially Exploited Fish and Shellfish Populations			
Commercially exploited fish and shellfish	Variable – see Chapter 11 Fish and Shellfish Ecology	Variable – see Chapter 11 Fish and Shellfish Ecology	Minor adverse
Impact 2: Temporary Loss or Restricted Access to Traditional Fishing Grounds			
Dutch Beam Trawling (Traditional)	Low	Low	Minor adverse
Dutch Beam Trawling (Pulse Wing)	Medium	Low	Minor adverse
Dutch Demersal Otter Trawling	Low	Low	Minor adverse
Dutch Seine Netting	Medium	Low	Minor adverse
Dutch Static Netting	Medium	Negligible	Negligible
Dutch Midwater Trawling	Low	Negligible	Negligible
Belgian Beam Trawling	Low	Low	Minor adverse
Belgian Demersal Otter Trawling	Low	Negligible	Negligible
Belgian Seine Netting	Low	Negligible	Negligible

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
Belgian Static Netting	Low	No Change	No Change
UK Beam Trawling (incl. Anglo-Dutch)	Low	Low	Minor adverse
UK Beam Trawling (south-west ports)	Low	Negligible	Negligible
UK Demersal Otter Trawling (Over-15m)	Low	Negligible	Negligible
UK Demersal Otter Trawling (Under-15m)	Medium	Low	Minor adverse
UK Static Gears (Offshore Cable Corridor)	Medium	Medium	Moderate adverse (reduced to Minor adverse with effective mitigation)
Static Gears (East Anglia THREE site)	Medium	Low	Minor adverse
French Twin Rigged & Pelagic Trawl	Low	Low	Minor adverse
German Beam Trawl, Otter Trawl & Gill Nets (East Anglia THREE site)	Low	Negligible	Negligible
Danish Gill Net	Low	Negligible	Negligible
Norwegian Purse Seine, Midwater Trawls and Demersal Otter Trawls.	Low	Negligible	Negligible
Impact 3: Safety Issues for Fishing Vessels			

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	Within acceptable limits
Impact 4: Increased Steaming Times to Fishing Grounds			
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	No discernible impact
Impact 5: Obstacles on the Sea Bed Post-Construction			
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	Within acceptable limits
Impact 6: Interference with Fishing Activities			
Mobile gears – all nationalities	Not applicable to this impact	Not applicable to this impact	Negligible
Static Gears – UK	Not applicable to this impact	Not applicable to this impact	Minor adverse
Impact 7: Displacement of Fishing Activity into Other Areas			
UK Static Gears (Offshore Cable Corridor)	Medium	Medium	Negligible to Minor adverse
Operational Phase			
Impact 1: Adverse Impacts on Commercially Harvested Fish and Shellfish Populations			
Commercially exploited fish and shellfish	Variable – see Chapter 11 Fish and Shellfish Ecology	Variable – see Chapter 11 Fish and Shellfish Ecology	Minor adverse

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
Impact 2: Complete Loss or Restricted Access to Traditional Fishing Grounds			
Dutch Beam Trawling (Traditional)	Low	Low	Minor adverse
Dutch Beam Trawling (Pulse Wing)	Medium	Low	Minor adverse
Dutch Demersal Otter Trawling	Low	Low	Minor adverse
Dutch Seine Netting	Medium	Low	Minor adverse
Dutch Static Netting	Medium	Negligible or low	Negligible or minor adverse
Dutch Midwater Trawling	Low	No change	No change
Belgian Beam Trawling	Low	Negligible	Negligible
Belgian Demersal Otter Trawling	Low	Negligible	Negligible
Belgian Seine Netting	Low	Negligible	Negligible
Belgian Static Netting	Low	No Change	No Change
UK Beam Trawling (incl. Anglo-Dutch)	Low	Low	Minor adverse
UK Beam Trawling (south-west ports)	Low	Negligible	Negligible
UK Demersal Otter Trawling (Over-15m)	Low	Negligible	Negligible

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
UK Demersal Otter Trawling (Under-15m)	Medium	No Change	No Change
UK Static Gears and Drift netting (Offshore Cable Corridor)	Medium	Negligible	Negligible
UK Static Gears (East Anglia THREE site)	Medium	Low	Minor adverse
French, German, Danish and Norwegian	Low	No Change	No Change
Impact 3: Safety Issues for Fishing Vessels			
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	Within acceptable limits
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	Within acceptable limits
Impact 4: Increased Steaming Times to Fishing Grounds			
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	Negligible
Impact 5: Obstacles on the Sea Bed Post-Construction			
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	Within acceptable limits
Impact 6: Interference with Fishing Activities			
All nationalities and gear types	Low to medium	Low	Negligible to minor adverse
Impact 7: Displacement of Fishing Activity into Other Areas			

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	Negligible
Decommissioning Phase			
In the absence of detailed methodologies and schedules, the worst case scenarios for decommissioning activities and associated implications for the relevant commercial fisheries are expected to be analogous with those assessed for the construction phase.			
Cumulative impacts			
Impact 1: Complete Loss or Restricted Access to Traditional Fishing Grounds			
Dutch Beam Trawling (Traditional)	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Dutch Beam Trawling (Pulse Wing)	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Dutch Demersal Otter Trawling	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Dutch Seine Netting	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Dutch Static Netting	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Dutch Midwater Trawling	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Belgian Beam Trawling	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Belgian Demersal Otter Trawling	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Belgian Seine Netting	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
Belgian Static Netting	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
UK Beam Trawling (incl. Anglo-Dutch)	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
UK Beam Trawling (south-west ports)	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
UK Demersal Otter Trawling (Over-15m)	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
UK Demersal Otter Trawling (Under-15m)	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
UK Static Gears (Offshore Cable Corridor)	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
UK Static Gears (East Anglia THREE site)	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
French, German, Danish and Norwegian	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Impact 2: Safety Issues for Fishing Vessels			
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	Within acceptable limits
Impact 3: Increased Steaming Times to Fishing Grounds			
Dutch Vessels - all gear types	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Belgian Vessels	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
UK Vessels -all gear types	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact

Receptor Group	Receptor Sensitivity	Magnitude of Effect	Impact Significance
French, German, Danish and Norwegian	Not applicable to this impact	Not applicable to this impact	No significant cumulative impact
Impact 4: Obstacles on the Sea Bed Post-Construction			
All nationalities and gear types	Not applicable to this impact	Not applicable to this impact	Within acceptable limits
Impact 5: Interference with Fishing Activities			
All nationalities and gear types	Medium	Negligible to low	Minor adverse

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Chapter 14 Ends Here