5 Human Environment

5.1 Commercial Fisheries

5.1.1 Baseline Information

Introduction

5.1.1.1 This chapter of this Environmental Statement (ES) summarises the assessment of the potential impacts on commercial fishing from the construction, operation and decommissioning of the modified transmission infrastructure (modified TI). This includes up to two Alternating Current (AC) Offshore Substation Platforms (OSPs), inter-platform cabling and up to four export cables which will connect the OSPs to the grid connection point at New Deer. The two OSPs and associated cabling will be located within the boundary of the three consented wind farms. The modified offshore transmission infrastructure (modified OfTI) includes export cable(s) will run from the OSPs to the modified export cable route landfall site at Inverboyndie. Due to the changes in the route and the differences in the commercial fishery receptors associated with the modified route, this Environmental Impact Assessment (EIA) provides a full assessment of the modified OfTI.

5.1.1.2 The following technical reports and ES Chapters support this chapter:

- Technical Appendix 5.1 A (Commercial Fisheries) of the MORL ES (MORL, 2012);
- Technical Appendix 5.1 A (Commercial Fisheries);
- ES Chapter 8.1 (Commercial Fisheries) (MORL, 2012);
- ES Chapter 5.2 (Shipping and Navigation); and
- ES Chapter 4.2 (Fish and Shellfish Ecology).

5.1.1.3 Sections 5.1.1.9-5.1.1.14 below summarises the baseline which is described in full detail in Technical Appendix 5.1 A (Commercial Fisheries). This section includes a summary of the key fisheries identified as operating in the vicinity of the modified OfTI.

5.1.1.4 Potential effects on the salmon and sea trout fishery as a result of the modified OfTI are assessed within ES Chapter 4.2 (Fish and Shellfish Ecology). Due to the migratory behaviour of these species, it is considered appropriate to make an assessment of the fisheries in Chapter 4.2 as potential effects on the fishery will be as a result of potential effects on the species.

Consultations

5.1.1.5 EIA scoping reports for the three consented wind farms and associated OfTI were circulated to statutory and non-statutory consultees by MORL (2010, 2011). A further scoping report was issued for the modified OfTI in 2014. A number of issues and particular concerns to address in the EIA were raised in the scoping responses (Marine Scotland, 2010, 2011 and 2014). Those received from the 2014 scoping report, that are of direct relevance to the assessment of commercial fisheries are presented in Table 5.1-1. For further detail on other consultation done in relation to commercial fisheries and the modified OfTI, see section 4 of Technical Appendix 5.1 A (Commercial Fisheries).

5.1.1.6 Consultation has been undertaken with the organisations and individuals listed in Table 5.1-1. Where organisations have responded to the scoping opinion, this is highlighted. Full details of all scoping responses are provided in Chapter 1, section 1.4 of this ES.

Table 5.1-1 Responses to the 2014 Scoping Report

Organisation	Consultation response	MORL approach
Scottish Fishermen's Federation	Would expect cables to be buried as far as possible at a depth to ensure minimum risk from snagging or changes in seabed as a result of tidal movement. Where this is not possible, consultation and mitigation on alternative measures must be decided and agreed through the Moray Firth Commercial Fisheries Working Group. The SFF expect to see the cumulative and in combination impacts clearly illustrated along with any necessary mitigation. Provided information for inclusion in the baseline.	The potential effects of the cable to commercial fishing activity along with the appropriate mitigation methods (including cable burial and discussion through the Moray Firth Commercial Fisheries Working Group) are described in section 5.1.2. The cumulative and in combination effect to commercial fishing activity are described in section 5.1.3. The commercial fisheries baseline is provided in section 5.1.1 of this chapter and Technical Appendix 5.1: Commercial Fisheries.
Marine Scotland Science	ScotMap data should be used as a primary source of information. It would be worth ensuring good contact is made and consultation maintained with fisheries representatives in the area. VMS vessel fishery data indicates the key target species as nephrops, scallops and some demersal whitefish species. Squid is becoming increasingly important for vessels as there are fewer restrictions on vessels targeting this species. The fisheries baseline assessment was based on relatively old data (2000-2009), however MSS commercial fishing landings distribution maps relate to data from 2007-2011. MS could provide more up to date datasets in greater scale for a more informed baseline assessment. Baseline assessments of vessels under-15 m is very limited, thus overlapping the development with ScotMap layers is advised.	ScotMap data was included in Technical Appendix 5.1 A (Commercial Fisheries) to aid in establishing a coherent baseline upon which a robust assessment of potential effects can be made. Contact has been made and is ongoing with all relevant fisheries stakeholders. The commercial fisheries for *Nephrops,* scallops, demersal whitefish and squid have all been assessed separately for relevant effects. Maps provided by MSS have been used to prepare the commercial fisheries baseline and are presented in Technical Appendix 5.1 A: Commercial Fisheries. As above, ScotMap data has been included in preparing the baseline assessments.

5.1.1.7 Additionally, information provided through previous consultation for the three consented wind farms has been included in this assessment. This includes information provided by the following organisations:

- Caithness Static Gear Fishermen's Association;
- Fishermen's Association Limited;
- North East Inshore Fisheries Group;
- Scrabster Fishery Office;

- Buckie Fishery Office; and
- Aberdeen Fishery Office.

5.1.1.8 Further detail on the responses received from the 2010 and 2011 scoping documents are presented in the MORL ES (2012, Appendix 5.1 A: Commercial Fisheries Technical Report).

Baseline Characteristics

5.1.1.9 The commercial fisheries baseline is described in full in Technical Appendix 5.1 A (Commercial Fisheries). The principal commercial species targeted by gear type in the area of the modified OfTI are: *Nephrops* by demersal trawlers, king scallops by boat dredgers, squid by demersal trawlers, whitefish by demersal trawlers and crab and lobster by creelers. There is also some mackerel hand-lining activity in the area.

5.1.1.10 In the Moray Firth, *Nephrops* are targeted along the southern Moray Firth coast; under-15 m vessels predominantly fish in the inner Firth whereas over-15 m vessels target grounds further offshore. The modified export cable route corridor passes through areas of high intensity *Nephrops* grounds fished by the over-15 m fleet and under-15 m fleet when the weather is favourable. *Nephrops* are targeted throughout the year with a peak in activity in June and July. Activity in the vicinity of the three consented wind farms is negligible.

5.1.1.11 The majority of scallop dredging activity is recorded in central areas of the Moray Firth with discrete grounds located in the vicinity of the modified export cable route corridor and three consented wind farms. Scallops are targeted by vessels over-15 m deploying boat dredges. The majority of vessels fishing for scallops in the Moray Firth belong to the nomadic fleet and will target grounds around the UK, in addition to those in the Moray Firth. Scallops are targeted all year with the majority of activity recorded between June and September.

5.1.1.12 Squid are fished throughout the Moray Firth, however they are a sporadic species and landings have fluctuated considerably over the past ten years. As a result, it is considered that squid fishing grounds can occur anywhere within the Moray Firth. A high proportion of vessels targeting *Nephrops* will seasonally switch their gear to target squid when *Nephrops* stocks are low or quota is restricted. In addition to these vessels, there are also visiting vessels based at home ports outside the Moray Firth which will seasonally target squid in the area when they are present. The majority of squid landings are recorded between July and November.

5.1.1.13 There are a limited number of vessels which trawl for whitefish species such as cod and haddock. This activity occurs to the north of the three consented wind farms and in the eastern Moray Firth, off the coast at Fraserburgh and Peterhead. Activity within the immediate area of the modified OfTI is limited.

5.1.1.14 Creelers target crab and lobster in the coastal areas of the Moray Firth. The majority of vessels are under-10 m in length. Crab and lobster are caught throughout the year with the majority of landings occurring between June and November. Within the area of the modified export cable landfall site at Inverboyndie, six full time creelers have been identified as operating. There are also a number of part time vessels who will set a small number of creels in inshore areas during the summer months. In addition to creeling, some vessels will seasonally hand-line for mackerel in the same area.

Desktop Studies

5.1.1.15 In addition to the consultation with commercial fishermen and their representatives (see Table 5.1) to inform the baseline outlined above, a desktop review was undertaken of available data and information from the following key sources:

- Marine Scotland Science (MSS);
- International Council for the Exploration of the Seas (ICES);
- Marine Management Organisation (MMO);
- European Commission – Fisheries (Europa);
- Scientific research and other relevant publications; and
- Brown and May Marine in-house databases.

5.1.1.16 As there is currently no single data source or recognised model to establish a commercial fisheries baseline, the approach has incorporated a wide range of relevant data and information sources. Technical Appendix 5.1 A (Commercial Fisheries) outlines the relevant information and data and provides information on the varying limitations, sensitivities and uncertainties.

Legislative and Planning Framework

5.1.1.17 The assessment of potential effects from the modified OfTI on commercial fishing activities takes into account the following guidance:

- British Wind Energy Association (BWEA) (2004) Recommendations for fisheries liaison;
- 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;
- Cefas, Marine Consents and Environment Unit (MCEU), Department for Environment, Food and Rural Affairs (DEFRA) and Department of Trade and Industry (DTI) (2004) Offshore Wind Farms - Guidance note for Environmental Impact Assessment In respect of FEPA and CPA requirements, Version 2;
- Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) (2014) Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison;
- Renewable UK (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 (2010) Options and opportunities for marine fisheries mitigation associated with wind farms. Final report for Collaborative Offshore Wind Research into the Environment;
- International Cable Protection Committee (ICPC) (2009) Fishing and Submarine Cables - Working Together;
- Marine Scotland, Strategic Environmental Assessment (SEA) of Draft Plan for Offshore Wind Energy in Scottish Territorial Waters (STW): Volume 1: Environmental Report (Marine Scotland, 2010);
- The Department for Energy and Climate Change (DECC), UK Offshore Energy SEA (DECC, 2009);

- UK Oil & Gas, Fisheries Liaison Guidelines (UK Oil & Gas, 2008); and
- Section 95 of the Energy Act 2004, The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007 and DECC Guidance on 'Applying for safety zones around offshore renewable energy installations'.

5.1.2 Impact Assessment

Summary of Effects and Mitigation

5.1.2.1 This section presents an assessment of the likely significant effects of the construction, operation and decommissioning of the modified OfTI on commercial fisheries.

5.1.2.2 Potential impacts are as provided in the Cefas and MCEU guidelines which specify requirements for the assessment of impacts on commercial fisheries are listed below.

- Implications for fisheries during the construction phase:
  - Adverse effects on commercially exploited fish and shellfish populations;
  - Adverse effects on recreational fish populations;
  - Temporary loss or restricted access to traditional fishing grounds;
  - Safety issue for shipping, including fishing vessels;
  - Increased steaming times to fishing grounds; and
  - Interference with fisheries activities.
- Implications for fisheries during the operation phase:
  - Adverse effects on commercially exploited fish and shellfish populations;
  - Adverse effects on recreational fish populations;
  - Complete loss or restricted access to traditional fishing grounds;
  - Obstacles on the sea bed post-construction;
  - Safety issue for shipping, including fishing vessels;
  - Increased steaming times to fishing grounds; and
  - Interference with fisheries activities.

5.1.2.3 In addition to the potential effects above, the following effect has been identified through stakeholder consultation and is considered for both the construction and operational phases:

- Displacement of fishing activity into other areas.

5.1.2.4 As mentioned previously, adverse effects on recreational fish populations, such as salmon and sea trout, are assessed in ES Chapter 4.2 (Fish and Shellfish Ecology).

Embedded Mitigation

5.1.2.5 In line with standard industry practice, dialogue will be ongoing with fishermen prior to and during the construction and operational phases to ensure that project information is effectively disseminated to fishermen, as well as allowing for issues to be raised by the fishing community. This will be assisted by Fishing Industry Representatives (FIRs) and a Fisheries Liaison Officer (FLO). Additionally, all information regarding activities at sea will be disseminated through Notice to Mariners (NtMs) published in Kingfisher and distributed to the wider fishing community.

5.1.2.6 Cables will be buried to a target depth of 1 m, where it is technically practicable to do so, which will reduce the risk to fishing vessels from snagging. In instances where adequate burial cannot be achieved an appropriate cable protection will be used. Over-trawlability surveys will be undertaken as necessary along areas of the cable route where potential snagging risks (such as clay berms) could be located, to reduce risks to the vessels operating trawled gear. Fishing vessels have previously been used to undertake surveys in the area and it is feasible that this will continue throughout all phases of development.

5.1.2.7 Engagement with the creel fishery for offshore surveys has already been undertaken and gear removal successfully negotiated to reduce interference to those fishing activities. This engagement will continue into the construction, operation and decommissioning phases.

Summary of Effects

5.1.2.8 The main fisheries present within the area of the modified OfTI are trawling for *Nephrops*, squid and whitefish, dredging for scallops, creeling for crab and lobster and hand-lining for mackerel.

5.1.2.9 Fishing activity is expected to be restricted in discrete areas of the modified OfTI corridor during construction. It is considered however, that during operation, vessels will be able to regain access to fishing grounds located within the modified OfTI corridor.

5.1.2.10 During the construction phase, a significant moderate effect is predicted on the crab and lobster fishery due to potential temporary loss of fishing area, displacement into other grounds and interference with fishing vessels. Effects on the *Nephrops*, scallop, squid, whitefish and mackerel fisheries, during construction are considered, at worst, minor, which is not significant in Environmental Impact Assessment (EIA) terms.

5.1.2.11 Safety issues for fishing vessels will be reduced to within acceptable levels by the application of safety zones where construction activity takes place.

5.1.2.12 Cables will be buried or protected by other means where target burial depth is not possible and, although OSPs will be present, the area occupied by these will be discrete. It is considered that fishing activities would be able to resume their normal fishing patterns and practices once the modified OfTI is operational and therefore no significant effects have been identified.

5.1.2.13 During the decommissioning phase, likely significant effects are considered to be, at worst, no greater than those identified for the construction phase.

Summary of Proposed Mitigation Measures and Residual Effects

5.1.2.14 The Moray Firth Commercial Fisheries Working Group (MFCFWG) has been established and will continue to facilitate future engagement with the fishing industry. Working practices will also be agreed to achieve any possible reduction in interference. A construction management plan will be defined in consultation with fishing interests which clearly establishes protocol for engagement between Moray Offshore Renewables Limited (MORL) and fishermen throughout the construction period. Where necessary, a mitigation strategy will be devised through the means of the Moray Firth Commercial Fisheries Working Group (MFCFWG). MORL has committed to a draft Commercial Fisheries mitigation strategy as part of the applications for the Project (i.e. the three consented wind farms and export cable route to Fraserburgh). This strategy is referred to in the conditions in the Section 36

consents for the three wind farms and addresses both wind farm and transmission infrastructure.

5.1.2.15 MORL is committed to continuing the exploration and development of mitigation options in consultation with the fishing industry. At the current time, MORL is proposing to undertake fishing trials using modified scallop dredge gear with a view to identifying enhancements to traditional scallop fishing practices that may be of benefit to both the developer and the scallop fleet. At present Bangor University is preparing a feasibility report for these trials which will be consulted on with the scallop industry during the summer of 2014.

5.1.2.16 MORL will continue to facilitate ongoing dialogue throughout the pre-construction, construction and operational phases of the development, which will continue to discuss the mitigation options under investigation, as well as defining the protocol for engagement during the construction and operation phases.

5.1.2.17 A summary of the effects, receptors and the level of impact significance pre- and post-mitigation is provided in Table 5.1-2.

Table 5.1-2 Impact Assessment Summary

Effect	Receptor	Pre-mitigation Effect	Mitigation	Post-mitigation Effect
Construction & Decommissioning				
Adverse effects on commercially exploited fish and shellfish populations	Underwater disturbance to the seabed – all target species except squid	Minor significance	None	Minor significance
	Underwater disturbance to the seabed – squid	Minor significance		Minor significance
	Noise – whitefish	Minor significance	Soft start piling	Minor significance
	Noise – herring	Minor significance		Minor significance
	Noise – shellfish	Minor significance		Minor significance
Adverse effects on recreational fish populations	Underwater disturbance to the seabed – salmon and sea trout	Minor significance	None	Minor significance
	Noise – salmon and sea trout	Minor significance	Soft start piling	Minor significance
Temporary loss or restricted access to fishing grounds	Over-15 m *Nephrops* trawling	Minor significance	Ongoing discussions through the MFCFWG to include development of mitigation strategies and construction schedules	Minor significance
	Under-15 m *Nephrops* trawling	Minor significance		Minor significance
	Scallop dredging	Minor significance		Minor significance

Effect	Receptor	Pre-mitigation Effect	Mitigation	Post-mitigation Effect
	Squid trawling	Minor significance	Cable burial and protection Over-trawlability surveys Ongoing fisheries liaison	Minor significance
	Whitefish trawling	Minor significance		Minor significance
	Creeling	Moderate significance		Minor significance
	Hand-lining for mackerel	Minor significance		Minor significance
Safety issues for fishing vessels	All vessels	Within acceptable limits	Updates on the construction programme will be provided to the fishing industry through the forum of the MFCFWG, FIRs, FLO and NtMs Safety zones and adherence to standard maritime practices	Within acceptable limits
Increased steaming times to fishing grounds	Over-15 m *Nephrops* trawling	Minor significance	Ongoing discussions through the MFCFWG to include development of mitigation strategies and construction schedules Ongoing fisheries liaison	Minor significance
	Under-15 m *Nephrops* trawling	Minor significance		Minor significance
	Scallop dredging	Minor significance		Minor significance
	Squid trawling	Minor significance		Minor significance
	Whitefish trawling	Minor significance		Minor significance
	Creeling	Minor significance		Minor significance
	Hand-lining for mackerel	Minor significance		Minor significance
Displacement of fishing activity	Over-15 m *Nephrops* trawling	Minor significance	Ongoing discussions through the MFCFWG to include development of mitigation strategies and construction schedules Cable burial and protection Over-trawlability surveys Ongoing fisheries liaison	Minor significance
	Under-15 m *Nephrops* trawling	Minor significance		Minor significance
	Scallop dredging	Minor significance		Minor significance
	Squid trawling	Minor significance		Minor significance
	Whitefish trawling	Minor significance		Minor significance
	Creeling	Moderate significance		Minor significance
	Hand-lining for mackerel	Minor significance		Minor significance
Interference with	Towed gear vessels	Minor significance	Ongoing discussions	Minor significance

Effect	Receptor	Pre-mitigation Effect	Mitigation	Post-mitigation Effect
fishing vessels	Static gear vessels	Moderate significance	through the MFCFWG to include development of construction schedules Ongoing fisheries liaison Information distributed through FIRs, FLO and NtMs	Minor significance
Operation				
Adverse effects on commercially exploited fish and shellfish populations	EMFs – Shellfish	Minor significance	Cable burial/protection	Minor significance
	EMFs – Other commercial fish species	Minor significance		Minor significance
Adverse effects on recreational fish populations	EMFs – salmon and sea trout	Minor significance	Cable burial/protection	Minor significance
Complete loss or restricted access to fishing grounds	Over-15 m *Nephrops* trawling	Minor significance	Ongoing discussions through the MFCFWG Cable burial and protection Ongoing fisheries liaison	Minor significance
	Scallop dredging	Minor significance		Minor significance
	Squid trawling	Minor significance		Minor significance
	Whitefish trawling	Minor significance		Minor significance
Safety issues for fishing vessels	All vessels	Within acceptable limits	Ongoing fisheries liaison Information distributed through FIRs, FLO and NtMs	Within acceptable limits
Increased steaming times to fishing grounds	Over-15 m *Nephrops* trawling	Minor significance	Ongoing discussions through the MFCFWG Cable burial and protection Ongoing fisheries liaison	Minor significance
	Scallop dredging	Minor significance		Minor significance
	Squid trawling	Minor significance		Minor significance
	Whitefish trawling	Minor significance		Minor significance
Obstacles on the seabed post-construction	All vessels	Within acceptable limits	Seabed rectification procedures Over-trawlability surveys Compliance to obligatory standards by contractors	Within acceptable limits
Displacement of fishing activity	Over-15 m *Nephrops* trawling	Minor significance	Ongoing discussions through the	Minor significance

Effect	Receptor	Pre-mitigation Effect	Mitigation	Post-mitigation Effect
	Scallop dredging	Minor significance	MFCFWG Cable burial and protection Ongoing fisheries liaison	Minor significance
	Squid trawling	Minor significance		Minor significance
	Whitefish trawling	Minor significance		Minor significance
Interference with fishing vessels	Static gear vessels	Minor significance	Ongoing fisheries liaison Information distributed through FIRs, FLO and NtMs	Minor significance
	Towed gear vessels	Minor significance		Minor significance

Introduction to Impact Assessment

5.1.2.18 Establishing a commercial fisheries baseline upon which a robust assessment of effects can be made requires utilising a number of data and information sources. It should be noted that different data and information sources are subject to varying sensitivities and limitations which have been taken into account in the following assessment. The aim has been to provide a detailed account of commercial fishing activities using all sources currently available.

5.1.2.19 Responses arising from the scoping exercise, as well as any issues and concerns identified during the course of consultation have informed the following assessments.

Rochdale Envelope Parameters Considered in the Assessment

5.1.2.20 A worst case scenario for the effect of the installation / decommissioning and operation of the modified OfTI upon commercial fishing activities has identified the design parameters which will realistically have the greatest effect upon the fishing activities described in the baseline.

5.1.2.21 The principal factor in determining the design parameters that will constitute a worst case is the consideration of how the fishing activities described in the baseline will be most affected. This could occur in two ways: the first is the potential for the modified OfTI to cause adverse effects to fish and shellfish populations of commercial importance and hence result in reduced fishing productivity. Whilst this type of effect is briefly discussed within this section, it is more fully assessed in ES Chapter 4.2 (Fish and Shellfish Ecology). Second, there is the potential for the modified OfTI to constitute a physical obstacle or risk to the continuation of normal fishing activities as described in the baseline. Accepting that the Fish and Shellfish Ecology assessment will identify the worst case parameters for the first issue, it is the second which determines the parameters of a worst case for commercial fishing activities and which may result in the identifying of design parameters different to those identified as the worst case for incurring effects to species.

5.1.2.22 below summarises the design parameters considered to constitute a realistic worst case scenario for the continuation of normal fishing activities as described in the baseline.

Table 5.1-3 Design Envelope Parameters relevant to the Commercial Fisheries Impact Assessment

Potential Effect	Design Envelope Scenario Assessed
Construction & Decommissioning	
Adverse effects on commercially exploited fish and shellfish populations	• See ES Chapter 4.2: Fish and Shellfish Ecology
Temporary loss or restricted access to fishing grounds	• Maximum loss of fishing grounds resulting from maximum number of safety zones around construction works. The maximum number of infrastructure to be constructed will result in the highest number of safety zones: o Maximum number of OSPs in the area of the three consented wind farms with jacket substructures – two 100 x 100 m o Inter-platform cable route length plus to export cable to wind farm boundary – approximately 70 km o Offshore export cable route length from the southern boundary of the MacColl wind farm – approximately 52 km o Maximum number of export cables – 4 o Maximum width of export cable trenches – 4 x 6 m o Maximum construction period – 18 months
Safety issues for fishing vessels	• See Chapter 5.2: Shipping and Navigation o In addition, the worst case scenario should also recognise the safety risks posed from the construction of the infrastructure detailed above
Increased steaming times	• Maximum number of safety zones in the area resulting in increased steaming times
Displacement of fishing activity	• Maximum number of safety zones in the area resulting in fishing activity being displaced into other grounds and impacting fishermen in that area. An indirect effect could result in conflict between static and mobile vessels and/or increased competition for a limited resource
Interference with fishing activities	• Location of port (not currently known) for construction and maximum number of construction works vessels – 6 vessels working 255 days/year for 18 months in two phases (installation of 1 OSP and 2 cables in 2017 and potentially a further 1 OSP and 2 cables in 2020)
Operation	
Adverse effects on commercially exploited fish and shellfish populations	• See ES Chapter 4.2: Fish and Shellfish Ecology
Loss or restricted access to fishing grounds	• Maximum number of OSPs in the area of the three consented wind farms with jacket substructures – two 100 x 100 m
Safety issues for fishing vessels	• See Chapter 5.2: Shipping and Navigation o Maximum number of OSPs in the area of the three consented wind farms with jacket substructures – two 100 x 100 m
Increased steaming times	• None foreseen
Obstacles on the seabed post-construction	• Any construction related obstacles and changes to seabed conditions including cable burial and protection
Displacement of fishing activity	• Maximum number of OSPs in the area of the three consented wind farms with jacket substructures – two 100 x 100 m
Interference with fishing activities	• None foreseen in addition to potential operational effects above

5.1.2.23 The offshore export cable(s) will be buried to a target depth of 1 m based on site specific seabed conditions. Where adequate burial cannot be achieved alternative protection such as mattress or rock placement will be used. The appropriate post-construction surveys and, if necessary, seabed rectification procedures will be undertaken to ensure that fishing vessels are able to safely resume activities in the modified OfTI once operational.

EIA Methodology

5.1.2.24 The following section describes the impact assessment methodology, which has been applied to the commercial fisheries baseline. In the absence of published guidelines by Marine Scotland regarding the assessment of effects of wind farm developments (including export cables) upon commercial fishing activities, the aspects requiring assessment for the proposed development are as specified in the Cefas/MCEU *et al*. (2004) Guidelines, as follows.

- Implications for fisheries during the construction phase:
  - Adverse effects on commercially exploited fish and shellfish populations;
  - Adverse effects on recreational fish populations;
  - Temporary loss or restricted access to traditional fishing grounds;
  - Safety issue for shipping, including fishing vessels;
  - Increased steaming times to fishing grounds; and
  - Interference with fisheries activities.
- Implications for fisheries during the operation phase:
  - Adverse effects on commercially exploited fish and shellfish populations;
  - Adverse effects on recreational fish populations;
  - Complete loss or restricted access to traditional fishing grounds ;
  - Obstacles on the sea bed post-construction;
  - Safety issue for shipping, including fishing vessels;
  - Increased steaming times to fishing grounds; and
  - Interference with fisheries activities.

5.1.2.25 In addition to the potential effects above, the following effect has been identified through stakeholder consultation and is considered for both the construction and operational phases:

- Displacement of fishing activity into other areas.

5.1.2.26 Effects shall be assessed separately for the construction, operation and decommissioning phases for each identified receptor group. For the purposes of this assessment and in the absence of detailed information on decommissioning schedules and methodologies, it is assumed that any effects derived from the decommissioning phase will, at worst, be of no greater significance than those derived from the construction phase and are likely to be significantly less (e.g. there will be no piling works during decommissioning).

5.1.2.27 Displacement effects will be considered to occur if a significant loss of fishing area is identified.

5.1.2.28 Safety issues for commercial fishing and increased steaming times to fishing grounds will be assessed in full as part of Chapter 5.2: Shipping and Navigation and summarised within this chapter where relevant.

5.1.2.29 Impacts upon fish and shellfish stocks, including commercially exploited species will be assessed in full in Chapter 4.2: Fish and Shellfish Ecology assessment and summarised in the commercial fisheries chapter where relevant.

Assessment Limitations

5.1.2.30 The principal limitation of an assessment of effects upon commercial fishing activities is the potential of the established baseline to change over time. This may be for a number of reasons; fluctuations in landings, changes in legislation and management policies and economic constraints such as fuel costs and crew availability. As a result the scope of the impact assessment undertaken is limited by the baseline identified.

5.1.2.31 As discussed in Technical Appendix 5.1 A (Commercial Fisheries), the king scallop fishery is largely nomadic, with the exception of several smaller and predominantly inshore vessels, variously targeting grounds around the UK. Although it is noted that individual vessels may spend more time in certain regional areas such as the Moray Firth, it is not possible within the scope of this assessment to consider the extent of an impact on a vessel by vessel basis. Instead, scallop grounds affected by the modified OfTI have been considered within the context of their relative importance to the Moray Firth, as well as to available scallop grounds around the UK.

5.1.2.32 Changes to the behaviour of species of commercial importance in the offshore marine environment, arising from the construction/decommissioning and operation of the modified OfTI, may indirectly affect commercial fishing activities. An assessment of the potential effects upon fish and shellfish species is provided in Chapter 4.2: Fish and Shellfish Ecology and the findings summarised in the relevant sections below. It should be noted that the methodology used to assess impacts on fish and shellfish species (including significance criteria) differs from the one used to assess commercial fisheries, as the former is based on the Institute of Ecology and Environmental Management (IEEM, 2010) guidelines for ecological impact assessment (see Chapter 4.2: Fish and Shellfish Ecology).

Significance Criteria

5.1.2.33 The magnitude of an effect is considered for each type of effect on a fishery by fishery basis. In each instance, the following characteristics are taken into account.

- The extent of effects: (for development specific assessments) referring to the full area over which the effect occurs. With the exception of effects on commercially exploited species, the extent of the effect will be the extent of the area(s) from which a category of fishing is excluded during the construction/decommissioning and operational phases.
- Duration: the duration over which the effect is expected to last. With the exception of effects on commercially exploited species, the effects will either be temporary related to the duration of the construction phase or permanent relating to the operational phase.
- Reversibility: Irreversible effects are those from which recovery is not possible within a reasonable timescales. Reversible (temporary) are effects from which full spontaneous recovery is possible or for which effective mitigation is both possible and will be implemented.

5.1.2.34 The magnitude of an effect has been assessed as negligible, low, medium or high, using the following criteria.

- Negligible: there is no discernible effect upon current fishing practices.
- Low: there is no noticeable effect upon current fishing practices.
- Medium: a discernible effect upon current fishing practices.
- High: fishing activities are noticeably and permanently affected.

5.1.2.35 The definition of the magnitude of effects takes account of the principal concern expressed by fishermen during the various consultation meetings. Primarily this relates to effects associated with exclusion and/or restriction from traditional fishing grounds and displacement impacts in a wider Moray Firth context. It also recognises that the magnitude of effects will differ between receptor groups as a consequence of the proportional extent of fishing areas affected.

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

5.1.2.37 The sensitivity of a receptor will be assigned taking account of its degree for adaptability, tolerance and recoverability to the potential effect. In addition, the following parameters will be considered.

- Value: referring to the proportional value of the fishery affected by the modified OfTI.
- Tolerance: the ability of the fishery (i.e. vessels) to withstand temporary or permanent effects.
- Recoverability: referring to the degree to which a receptor group can resume baseline fishing activities.
- Adaptability: referring to the degree to which a receptor group can adapt to alternative similarly productive fishing methods, operating patterns or areas.

5.1.2.38 The sensitivity of each fishery has been assessed as low, medium or high using the following criteria.

- Low sensitivity: no significant change to current fishing practices.
- Medium sensitivity: discernible changes to current fishing practices.
- High sensitivity: fishing activities are significantly and permanently affected.

5.1.2.39 It is not within the scope of the assessment to consider the extent of an effect on a vessel by vessel basis but rather receptors have been identified based on fishing method and geographical extent of fishing grounds.

5.1.2.40 The significance criteria as defined in Table 5.1-4 have been used for this assessment. It should however be noted that the impacts of the construction/decommissioning and operation of the modified OfTI upon commercial fishing activities cannot be easily categorised and the application of the significance criteria to an assessment of effects is, as a result, subjective.

5.1.2.41 In the instances whereby the potential effect of the modified OfTI pose a risk to the health and safety of a fishing vessel and crew, the significance criteria used for this assessment cannot be applied. Instead, the risk is assessed to be within or outside acceptable limits (a risk is considered outside of acceptable limits if they are greater than those incurred during the course of normal fishing operations). For further details see Chapter 5.2: Shipping and Navigation.

5.1.2.42 It should further be noted that in instances where findings from the Fish and Shellfish Ecology Chapter have been summarised, the significance criteria used in that Chapter apply. For the purposes of this assessment any effect with a significance of moderate or above is significant for the purposes of EIA.

Table 5.1-4 Significance Criteria

		Sensitivity of Receptor		
		Low	**Moderate**	**High**
Magnitude	**Negligible**	Not significant	Minor significance	Minor significance
	Low	Minor significance	Minor significance	Moderate significance
	Moderate	Minor significance	Moderate significance	Major significance
	High	Moderate significance	Major significance	Major significance

Impact Assessment
Construction

5.1.2.43 The effects of the construction phase have been assessed on commercial fisheries occurring within the vicinity of the modified OfTI. A description of the potential changes on commercial fisheries receptors caused by each identified effect is given below. In general terms however, the potential effects arising from the construction of the modified OfTI are temporary, as they only occur during the construction phase (which is estimated to occur over an 18 month period).

Adverse Effects on Commercially Exploited Fish and Shellfish Populations

5.1.2.44 The principal commercial species targeted within the vicinity of the modified OfTI are *Nephrops*, scallops, squid, whitefish (including cod and haddock), crab species, lobster and mackerel. As previously stated, there is the potential for the construction of the modified OfTI to cause adverse effects to fish and shellfish populations of commercial importance and hence result in changes to behaviour or a decline in species abundance, which may indirectly affect the productivity of the fishery. This is an indirect effect and whilst the potential effect is briefly discussed within this section, it is fully assessed in Chapter 4.2: Fish and Shellfish Ecology.

5.1.2.45 The effects of the construction phase on these species are summarised in Table 5.1-5.

Table 5.1-5 Summary of Impact Assessment on Principal Commercial Species

Effect	Receptor	Pre-mitigation Effect	Mitigation	Post-mitigation effect
Underwater disturbance to the seabed	All target species except squid	Minor significance	None	Minor significance
	Squid	Minor significance	None	Minor significance
Noise	Whitefish	Minor significance	Soft start piling	Minor significance
	Herring	Minor significance		Minor significance
	Shellfish	Minor significance		Minor significance

5.1.2.46 Taking into account the findings of Chapter 4.2: Fish and Shellfish Ecology and accepting that there may be short-term species displacement effects which may have a limited indirect effect upon catch rates, it is reasonable to assume that the indirect effects to commercial fishing will not be greater than those identified in the table above.

5.1.2.47 The sensitivity of squid to underwater disturbance to the seabed is considered to be medium and the magnitude of effect is considered to be small. This results in a significance of effect of **minor**, which is not significant in EIA terms.

5.1.2.48 The sensitivity of all target species with the exception of squid to underwater disturbance to the seabed is considered to be low and the magnitude of effect is considered to be small. This results in a significance of effect of **minor**, which is not significant in EIA terms.

5.1.2.49 The sensitivity of whitefish and herring to noise is considered to be medium and the magnitude of effect is considered to be small. This results in a significance of effect of **minor**, which is not significant in EIA terms.

5.1.2.50 The sensitivity of shellfish to noise is considered to be low and the magnitude of effect is considered to be negligible. This results in a significance of effect of **minor**, which is not significant in EIA terms.

Adverse Effects on Recreational Fish Populations

5.1.2.51 The principal recreational species targeted within the vicinity of the modified OfTI are salmon and sea trout. There is the potential for the construction of the modified OfTI to cause adverse effects to fish populations and hence result in changes to behaviour or a decline in species abundance. This is an indirect effect and whilst the potential effect is briefly discussed within this section, it is fully assessed in Chapter 4.2: Fish and Shellfish Ecology.

5.1.2.52 The effects of the construction phase on these species are summarised in Table 5.1-6.

Table 5.1-6 Summary of Impact Assessment on Principal Recreational Species

Effect	Receptor	Pre-mitigation Effect	Mitigation	Post-mitigation effect
Underwater disturbance to the seabed	Salmon and sea trout	Minor significance	None	Minor significance
Noise	Salmon and sea trout	Minor significance	Soft start piling	Minor significance

5.1.2.53 Taking into account the findings of Chapter 4.2: Fish and Shellfish Ecology, it is reasonable to assume that the indirect impacts will not be greater than those identified in the table above.

5.1.2.54 The sensitivity of salmon and sea trout to underwater disturbance to the seabed is considered to be medium and the magnitude of effect is considered to be small. This results in a significance of effect of **minor**, which is not significant in EIA terms.

5.1.2.55 The sensitivity of salmon and sea trout to noise is considered to be medium and the magnitude of effect is considered to be negligible. This results in a significance of effect of **minor**, which is not significant in EIA terms.

Temporary Loss or Restricted Access to Fishing Grounds

5.1.2.56 The principal effects of construction considered to incur temporary loss or restricted access to these fishing grounds during the construction phase are:

- Safety zones around construction activities;
- Safety zones around installed or partial installed infrastructure; and
- Advisory safety zones along exposed sections of cable.

5.1.2.57 Temporary safety zones of 500 m are expected to be imposed around construction works, from which all non-construction associated vessels would be excluded. Safety zones around partially installed infrastructure and advisory safety zones around exposed sections of cable will further restrict access to, and result in temporary loss of, fishing area. The fishing industry will be notified of the location of all safety zones through NtMs and other communications. All vessels will be requested to respect the advisory safety zones which, as well as reducing the risk of collision damage, will provide protection to the works vessels, the export cables and other infrastructure.

5.1.2.58 It therefore follows that fishing opportunities could be progressively reduced as construction advances. As mentioned previously, it is not within the scope of this assessment to assess effects on a vessel by vessel basis. It is however recognised that

skippers may elect to avoid the area of the modified OfTI during the entire construction phase and therefore the assessed effect will be slightly higher for these vessels. The seasonality of fishing activity will also render these safety zones more sensitive depending upon the time of year, with the summer months recording the highest levels of activity overall.

5.1.2.59 During installation of the cables, simultaneous lay and burial techniques would require rolling short term safety zones around installation activities. Where separate burial methods are to be deployed or where additional protective measures are necessary, there may be longer periods when fishing vessels deploying gears will be required to avoid exposed cable sections. As has been previously stated, the export cable(s) will be buried where possible (target depth of 1 m) and where adequate burial cannot be achieved alternative protection will be used.

5.1.2.60 There is the potential for cable installation works (including export cables and inter-platform cabling) to preclude fishing activities safely resuming as a result of the associated risks with snagging fishing gear, particularly in the case of towed gear fishing activities such as bottom otter trawling for *Nephrops* and boat dredging for scallops. It is considered that normal fishing practices cannot safely resume in the immediate vicinity of the cable(s) until all the necessary cable protection measures, including rock placement and/or mattressing, have been completed and the area is considered at an acceptable standard for all fishing activities to safely resume. It is considered that access to fishing grounds will not resume until these measures are satisfactorily complete and their 'over-trawlable' status confirmed by post-installation surveys.

5.1.2.61 The construction of the OSPs will progressively result in permanent loss of fishing grounds within the footprint of those areas, which will potentially be up to 0.02 km^2. In addition, vessels will not be able to resume fishing activities in the immediate vicinity of the export cables during installation and until the appropriate post-installation surveys confirm the 'over-trawlable' status of the seabed.

5.1.2.62 Given the availability of fishing grounds within the Moray Firth and the ability of large, over-15 m vessels to exploit these grounds, the sensitivity of the over-15 m vessels targeting the *Nephrops*, squid, scallops and whitefish fisheries is considered to be low.

5.1.2.63 Smaller vessels targeting inshore fisheries including the under-15 m *Nephrops* fleet, creel vessels and vessels hand-lining for mackerel are limited by their operational ranges. Additionally, these fisheries are often seasonal, with the majority of activity occurring over a limited period of time. The sensitivity of these fisheries is therefore considered to be medium.

5.1.2.64 As shown in Figures 5.21, 5.27 and 5.32 of Technical Appendix 5.1 A (Commercial Fisheries), activity by the under-15 m *Nephrops* fleet, vessels hand-lining for mackerel and vessels trawling for whitefish generally occurs in areas outwith of the modified OfTI. As a result, the magnitude of effect for these vessels is considered to be low. It is noted, however, that under-15 m *Nephrops* vessels will occasionally target the same grounds as the over-15 m fleet in the vicinity of the modified export cable route during favourable weather.

5.1.2.65 Figures 5.13, 5.14, 5.31 and 5.33 of Technical Appendix 5.1 A (Commercial Fisheries) show fishing activity for the over-15 m *Nephrops* fleet, scallop dredgers, squid trawlers and creelers, respectively. High levels of activity for each fishery are located in the vicinity of the modified OfTI and grounds are considered to be of high value to each fishery. As the cable route and footprint of the OSPs constitute a relatively very

small proportion of total grounds available and the effect will be temporary, the magnitude of effect is considered to be medium.

5.1.2.66 The significance of effect for all fisheries is considered to be, at worst, **minor adverse**, with the exception of the creel fishery which has a significance of effect of **moderate adverse**. All effects are direct and of a temporary nature.

5.1.2.67 Mitigation will be implemented which will reduce impacts on the commercial fishing industry. The Section 36 consent conditions for the three consented wind farms refer to the draft Commercial Fisheries Mitigation Strategy proposed by MORL in respect of the three consented wind farms and the then proposed OfTI. The commitments given there are also given by MORL in respect of the modified OfTI. Ongoing discussions through the MFCFWG will include the development of mitigation strategies and construction schedules. Cables will be buried or protected by other means where target burial depth is not possible and over-trawlability surveys will be undertaken as necessary. Liaison with the fishing industry will be ongoing via FIRs and the FLO, this will include gear removal negotiations where required. This mitigation would result in a **minor adverse** residual effect on the creel fishery.

5.1.2.68 The under-15 m *Nephrops* fishery and the mackerel hand-lining fishery are considered to be of medium sensitivity, low magnitude and the significance of effect is therefore considered to be **minor**, which is not significant in EIA terms.

5.1.2.69 The over-15 m *Nephrops* fishery, squid fishery and scallops fishery are considered to be of low sensitivity and medium magnitude, resulting in a significance of effect of **minor**, which is not significant in EIA terms.

5.1.2.70 The whitefish fishery is considered to be of low sensitivity and magnitude, resulting in a **minor** effect, which is not significant in EIA terms.

5.1.2.71 The creel fishery is considered to be of medium sensitivity and magnitude and the significance of effect is therefore considered to be **moderate**, which is significant in EIA terms. It is considered however, that the mitigation suggested above will result in a residual effect of **minor**, which is not significant in EIA terms.

Safety Issues for Fishing Vessels

5.1.2.72 In line with standard practices, safety zones of 500 m may be in place around all offshore construction works from which all vessels, including fishing vessels, will be excluded. Risk to fishing vessels would only occur if infringement of these safety zones occurred. It should also be recognised that in line with standard maritime practices the ultimate responsibility with regards to safety lies with the master of a vessel. These issues are considered further in Chapter 5.2: Shipping and Navigation.

5.1.2.73 In addition, there is the potential for infrastructure outside of the designated safety zones to pose a risk to fishing vessels as a result of potentially hazardous interaction with fishing gear. This includes export cable(s), OSPs and inter-platform cabling. Infrastructure that is not fully installed will be appropriately marked and lit and safety zones will be in force. Areas of exposed offshore export cable that constitute a potential snagging risk will be marked by the presence of guard vessels. There will also be advisory safety zones communicated for exposed cables. Furthermore, updates on the construction programme will be provided to the fishing industry through the forum of the MFCFWG, FIRs, FLO and NtMs.

5.1.2.74 Compliance with the safety zones during the construction phase and adherence to standard maritime practices would put safety risks **within acceptable limits**, which is not significant in EIA terms.

Increased Steaming Times

5.1.2.75 The implementation of safety zones during the construction phase could result in some increases in steaming distances and times and therefore higher operational costs for fishing vessels. Safety zones will however be very discrete (500 m around construction vessels) and relatively short term. The sensitivity of vessels is as defined above in "Temporary loss or restricted access to fishing grounds" and the magnitude of effect is considered to be low. The significance of the effect is therefore, at worst, **minor adverse** for all vessels. All effects are direct and of a temporary nature.

5.1.2.76 The MFCFWG will include the development of construction schedules which will potentially reduce impacts of construction on the commercial fishing industry. In addition, ongoing fisheries liaison, including the dissemination of information through Fishery Industry Representatives (FIRs), Fisheries Liaison Officer (FLO) and Notice to Mariners (NtMs), will ensure that all potentially impacted stakeholders will be aware of ongoing construction works.

5.1.2.77 Vessels participating in the under-15 m *Nephrops* fishery, the creel fishery and the mackerel hand-lining fishery are considered to be of medium sensitivity, low magnitude and therefore the effect will be of **minor** significance, which is not significant in EIA terms.

5.1.2.78 Vessels scallop dredging, trawling for squid, trawling for whitefish and the over-15 m vessels trawling for *Nephrops* are considered to be of low sensitivity, low magnitude and therefore the effect will be of **minor** significance, which is not significant in EIA terms.

Displacement of Fishing Activity

5.1.2.79 Concerns were raised during consultation with fishermen that wind farm related activities, including the installation of export offshore cable(s) and OSPs which may limit access to fishing grounds, could displace vessels into grounds outside the area, potentially resulting in increased competition for grounds elsewhere. This may result in either conflict between vessels competing for the same resource or between different fishing methods (i.e. between static and towed gear).

5.1.2.80 Displacement of fishing vessels into other areas will be a function of the loss or restricted access to traditional fishing grounds as fishing areas are restricted by substrate type, operational ranges of vessels targeting the fishery and, in some cases, seasonality. As discussed previously, the creel fleet has been assessed as potentially being significantly affected by the construction of the modified OfTI. It is therefore possible that creel vessels will be displaced and impact upon other creelers targeting grounds outside of the modified OfTI. The significance of effect is as assessed for the loss or restricted access to traditional fishing grounds and is therefore considered to be **moderate adverse** for creel vessels and, at worst, **minor adverse** for all other fishing types. All effects are direct and of a temporary nature.

5.1.2.81 As mentioned above (Sections 5.1.2.5-5.1.2.7), embedded mitigation will be implemented which will reduce impacts on the commercial fishing industry. Ongoing discussions through the MFCFWG will include the development of mitigation strategies and construction schedules. Cables will be buried or protected by other means where target burial depth is not possible and over-trawlability surveys will be undertaken as necessary. Liaison with the fishing industry will be ongoing via FIRs and the FLO, this will include gear removal negotiations where required. This mitigation would result in a minor adverse residual impact on the creel fishery.

5.1.2.82 The under-15 m *Nephrops* fishery and the mackerel hand-lining fishery are considered to be of medium sensitivity, low magnitude and the significance of effect is therefore considered to be **minor**, which is not significant in EIA terms.

5.1.2.83 The over-15 m *Nephrops* fishery, squid fishery and scallops fishery are considered to be of low sensitivity and medium magnitude, resulting in a significance of effect of **minor**, which is not significant in EIA terms.

5.1.2.84 The whitefish fishery is considered to be of low sensitivity and magnitude, resulting in a **minor** effect, which is not significant in EIA terms.

5.1.2.85 The creel fishery is considered to be of medium sensitivity and magnitude and the significance of effect is therefore considered to be **moderate**, which is significant in EIA terms. It is considered however, that the mitigation suggested above will result in a residual effect of **minor**, which is not significant in EIA terms.

Interference with Fishing Vessels

5.1.2.86 All of the potential effects included in this assessment could cause interference to fishing activities. An additional effect to be considered is the potential for navigational conflict arising between fishing vessels and construction vessels transiting to and from the modified OfTI. This could include the fouling of static gear marker buoys and dhans, or towed gear vessels being required to alter towing direction.

5.1.2.87 The potential for interference will be, in part, determined by the seasonality of construction works and the location of the construction port. At this current time, the construction port is unknown, however a conservative assumption has been made that transit routes will be in the vicinity of static and towed gear grounds. The limited duration of the construction schedule and the relatively low level of works vessel transits for the modified OfTI construction activities are recognised.

5.1.2.88 Transiting works vessels will fully comply with the international regulations for preventing collisions at sea (COLREGS) to negate the requirements for fishing vessels engaged in fishing to alter course. Transit routes will also be established prior to construction commencing to aid with maritime safety. Due to the high mobility of towed gear vessels, the sensitivity is considered to be low. As works vessels will comply with COLREGs to minimise interference with towed gear vessels, the magnitude is considered to be low. The significance of effect is therefore considered to be **minor adverse**, which will be a direct effect of a temporary nature.

5.1.2.89 It should also be recognised that in order to minimise gear loss, static gear fishermen avoid deploying their gear in shipping routes and areas of high shipping activity. Works vessels will also comply with COLREGS which reduces risk to fishing gears being towed. Static gear vessels are considered to be of medium sensitivity as these vessels are restricted in the mobility and operational range. The magnitude of effect is considered to be medium as the potential for static gear to be towed away or fouled by works vessels is considered to be greater than works vessels colliding with mobile vessels towing gear. Due to the nature of the static gear fishery, gear is left unattended for extended periods of time and, although gear is marked and works vessels will comply with COLREGS, there is still a risk of static fishing gear being damaged or lost. As a result, the significance of effect is therefore considered to be **moderate adverse**. It should be noted however that ongoing discussions through the MFCFWG will include the development of construction schedules. Additionally, information regarding construction activity will be distributed to the fishing industry through the means of the FIRs, FLO and through NtMs published in Kingfisher.

Consultation with the fishing industry will be ongoing to minimise potential impacts on fishing activities. This will result in a residual effect of **minor adverse**.

5.1.2.90 The sensitivity of towed gear vessels is considered to be low and the magnitude of effect is also low. The significance of effect is therefore considered to be **minor,** which is not significant in EIA terms.

5.1.2.91 The static gear fleet is considered to be of medium sensitivity and there is expected to be a medium magnitude of effect. The significance of effect is therefore considered to be **moderate**, which is significant in EIA terms. It is considered however, that the mitigation suggested above will result in a residual effect of **minor**, which is not significant in EIA terms.

Operation

5.1.2.92 The assessment below is based on the current baseline and the potential of this to change should be recognised. It should be noted that once operational it is assumed that the export cable(s) will no longer have the potential to adversely affect commercial fishing activities as cables will be buried or protected where burial is not possible.

Adverse Effects on Commercially Exploited Fish and Shellfish Populations

5.1.2.93 The principal commercial species targeted within the vicinity of the modified OfTI are *Nephrops*, scallops, squid, whitefish (including cod and haddock), crab species, lobster and mackerel. There is the potential for the operational modified OfTI to cause adverse effects to fish and shellfish populations of commercial importance, and hence result in changes to behaviour or a decline in species abundance, which may indirectly affect the productivity of the fishery. This is an indirect effect and whilst the potential effect is briefly discussed within this section, it is fully assessed in Chapter 4.2: Fish and Shellfish Ecology, and summarised below.

5.1.2.94 The impacts of the operational phase on these species are summarised in Table 5.1-7.

Table 5.1-7 Summary of Impact Assessment on Principal Commercial Species

Effect	Receptor	Pre-mitigation Effect	Mitigation	Post-mitigation effect
EMFs	Shellfish	Minor Significance	Cable burial/protection	Minor Significance
	Other commercial fish species	Minor Significance		Minor Significance

5.1.2.95 Taking into account the findings of Chapter 4.2: Fish and Shellfish Ecology, and accepting that there may be short-term species displacement effects which may have a limited indirect effect upon catch rates, it is assumed that the indirect effects upon commercial fishing will not be greater than those identified in the table above.

5.1.2.96 The sensitivity of shellfish and other commercial fish species to EMFs is considered to be low and the magnitude of effect is considered to be small. This results in a significance of effect of **minor**, which is not significant in EIA terms.

Adverse Effects on Recreational Fish Populations

5.1.2.97 The principal recreational species targeted within the vicinity of the modified OfTI are salmon and sea trout. There is the potential for the operational modified OfTI to cause adverse effects to fish populations and hence result in changes to behaviour or a decline in species abundance. This is an indirect effect and whilst the potential effect is briefly discussed within this section, it is fully assessed in Chapter 4.2: Fish and Shellfish Ecology, and summarised below.

5.1.2.98 The impacts of the operational phase on these species are summarised in Table 5.1-8.

Table 5.1-8 Summary of Impact Assessment on Principal Recreational Species

Effect	Receptor	Pre-mitigation Effect	Mitigation	Post-mitigation effect
EMFs	Salmon and sea trout	Minor Significance	Cable burial/protection	Minor Significance

5.1.2.99 Taking into account the findings of Chapter 4.2: Fish and Shellfish Ecology, it is assumed that the indirect impacts upon recreational fishing will not be greater than those identified in the table above.

5.1.2.100 The sensitivity of salmon and sea trout to EMFs is considered to be medium and the magnitude of effect is considered to be small. This results in a significance of effect of **minor**, which is not significant in EIA terms.

Complete Loss or Restricted Access to Fishing Grounds

5.1.2.101 Subject to successful burial of the cable(s) or if necessary, protection, and the appropriate post-construction surveys being undertaken, it is considered that fishing will be able to recommence in the modified OfTI. It is therefore considered that no impacts on the commercial fishing activities identified previously will occur as a result of the operational cable(s). Furthermore, it is considered that impacts of temporary loss or restricted access to fishing grounds during the operational phase will only arise as a result of the presence of the OSPs. It should be noted that the OSPs will be located further offshore than grounds targeted by the inshore fleet and therefore only the over-15 m *Nephrops*, scallop, squid and whitefish fisheries have been assessed.

5.1.2.102 Once operational, the two OSPs will result in a total loss of seabed of 0.02 km^2 within the modified OfTI. This is considered to be a very discrete area when compared to fishing grounds and therefore the magnitude of effect is considered to be low. The sensitivity of each receptor is as assessed previously in "Temporary loss or restricted access to fishing grounds during construction" and therefore the significance of effect for each receptor will be, at worst, **minor adverse**. All effects are direct and permanent.

5.1.2.103 The appropriate liaison and information distribution will be undertaken to make fishermen fully aware of the locations and designs of all infrastructure in the modified OfTI.

5.1.2.104 The under-15 m *Nephrops* fishery, creel fishery and the mackerel hand-lining fishery are considered to be of medium sensitivity, low magnitude and the significance of effect is therefore considered to be **minor**, which is not significant in EIA terms.

5.1.2.105 The over-15 m *Nephrops* fishery, squid fishery, scallops fishery and whitefish fishery are considered to be of low sensitivity and low magnitude, resulting in a significance of effect of **minor**, which is not significant in EIA terms.

Safety Issues for Fishing Vessels

5.1.2.106 Safety issues for fishing vessels during the operational phase of the modified OfTI are discussed in Chapter 5.2: Shipping and Navigation and are summarised below.

5.1.2.107 Provided cable protection measures (for both export cables and inter-platform cables) and over-trawl surveys are satisfactorily completed and, if necessary, seabed rectification procedures are undertaken, it is considered that fishing vessels will be able to continue with normal fishing practices once the cable(s) are operational. It is therefore considered that safety risks to fishing vessels as a result of the operational cable(s) will be within acceptable limits.

5.1.2.108 There is the potential for fishing gears to fasten on the foundations of the OSPs. In order to minimise this risk the appropriate liaison and information distribution will be undertaken to make fishermen fully aware of the locations and designs of all underwater infrastructure which might represent a fastening risk to fishing gears. Furthermore, in line with standard offshore practices, fishermen will be made fully aware of the procedures to be adopted in the event of a fastening incident. Compliance with the implemented safety measures and policies means that the safety risks to fishing vessels and their gears should be **within acceptable limits,** which is not significant in EIA terms.

Increased Steaming Times

5.1.2.109 As mentioned previously, it is considered that the cable(s) will not affect fishing activities once operational and therefore there will be no increase in steaming times for fishing vessels. As before, only the fisheries potentially impacted by the presence of the OSPs will therefore be assessed.

5.1.2.110 Chapter 5.2: Shipping and Navigation considers that there is good prospect for fishing vessels to navigate within the three consented operational wind farm sites where the OSPs will be located. The magnitude of effect associated with increases in steaming times as a result of the operational OSPs is considered to be low. The sensitivities of the receptors are as defined previously and therefore the significance of effect is considered to be, at worst, **minor adverse**. All effects are direct and permanent.

5.1.2.111 The appropriate liaison and information distribution will be undertaken to make fishermen fully aware of the locations and designs of all infrastructure in the modified OfTI.

5.1.2.112 Vessels participating in the under-15 m *Nephrops* fishery, the creel fishery and the mackerel hand-lining fishery are considered to be of medium sensitivity, low magnitude and therefore **minor** significance, which is not significant in EIA terms.

5.1.2.113 Vessels scallop dredging, trawling for squid, trawling for whitefish and the over-15 m vessels trawling for *Nephrops* are considered to be of low sensitivity, low magnitude and therefore **minor** significance, which is not significant in EIA terms.

Obstacles on the Seabed Post-construction

5.1.2.114 There is the potential for obstacles to be left on the seabed during the construction or decommissioning phases of the modified OfTI which could result in damage to or loss of fishing gears, as well as representing a safety hazard. Additionally, offshore works such as cable trenching can produce seabed obstructions that can cause fastenings for fishing nets and damage to fishing gears.

5.1.2.115 Contractors (those engaged to undertake development works offshore) will be obliged and monitored to ensure compliance with standard offshore policies prohibiting the discarding of objects or waste at sea (International Maritime Organisation (IMO), 1996). The reporting and recovery of any accidentally dropped objects is also required.

5.1.2.116 Any seabed obstructions and spoil identified during post-installation surveying and which might represent a hazard to fishing, such as trenching berms, will be rectified.

5.1.2.117 Provided there is compliance to obligatory standards by contractors and, if necessary, the implementation of seabed rectification measures, the effect is considered to be **within acceptable limits**, which is not significant in EIA terms.

Displacement of Fishing Activity

5.1.2.118 As discussed previously, displacement of fishing activity is a function of the complete loss or restricted access to traditional fishing grounds. It is therefore considered that the significance of effect on fishing vessels will be, at worst, **minor adverse**. All effects are direct and permanent.

5.1.2.119 The under-15 m *Nephrops* fishery, creel fishery and the mackerel hand-lining fishery are considered to be of medium sensitivity, low magnitude and the significance of effect is therefore considered to be **minor**, which is not significant in EIA terms.

5.1.2.120 The over-15 m *Nephrops* fishery, squid fishery, scallops fishery and whitefish fishery are considered to be of low sensitivity and low magnitude, resulting in a significance of effect of **minor**, which is not significant in EIA terms.

Interference with Fishing Vessels

5.1.2.121 All of the impacts included in this assessment have the potential to cause interference to fishing activities. An additional effect to be considered is the potential for navigational conflicts arising between fishing vessels and operations and maintenance vessels transiting to and from site. This could include the fouling of static gear marker buoys and dhans, or towed gear vessels being required to alter towing direction.

5.1.2.122 This interference has the potential to impact more fishing vessels than those operating in the immediate vicinity of the modified OfTI, depending upon the location of the operations and maintenance port. At the current time, the operations and maintenance port is unknown, however a conservative assumption has been made that operation and maintenance transit routes will be in the vicinity of static and towed gear grounds.

5.1.2.123 Activity by operations and maintenance vessels will be less frequent than that occurring during the construction phase and furthermore it is considered that codes of conduct between works vessels and fishing vessels will be well established by the completion of construction activities, irrespective of port used. Transit routes will also be well established prior to operation.

5.1.2.124 Transiting works vessels will fully comply with COLREGS to negate the requirements for fishing vessels engaged in fishing to alter course. It therefore follows that the significance of impact on these vessels will be of low sensitivity and low magnitude, which results in a **minor adverse** effect, which will be a direct, permanent impact.

5.1.2.125 Works vessels will also comply with COLREGS which reduces risk to fishing gears being towed. Static gear vessels are considered to be of medium sensitivity and the magnitude of effect will be low, which results in a **minor adverse** effect on these vessels, which will be a direct, permanent effect.

5.1.2.126 The sensitivity of towed gear vessels is considered to be low and the magnitude of effect is also low. The significance of effect is therefore considered to be **minor,** which is not significant in EIA terms.

5.1.2.127 The static gear fleet is considered to be of medium sensitivity and there is expected to be a low magnitude of effect. The significance of effect is therefore considered to be **minor**, which is not significant in EIA terms.

Decommissioning

5.1.2.128 As mentioned previously, for the purposes of this assessment and in the absence of detailed information on decommissioning schedules and methodologies, it is assumed that any effects derived from the decommissioning phase will, at worst, be of no greater significance than those derived from the construction phase and are likely to be significantly less (e.g. there will be no piling works during decommissioning).

5.1.3 Cumulative Impact Assessment

Summary

5.1.3.1 This section presents the results of the assessment of the potential cumulative effects upon commercial fisheries arising from the modified OfTI in conjunction with reasonably foreseeable marine coastal developments and activities. MORL's approach to the assessment of cumulative effects is described in Chapter 1.3: Environmental Impact Assessment.

5.1.3.2 A whole project assessment has been undertaken for the likely significant cumulative effects of the modified OfTI in conjunction with the three consented wind farms.

5.1.3.3 An assessment then follows of the likely significant cumulative effects of the whole project with the Beatrice Offshore Windfarm Limited (BOWL) (including the offshore generation station and associated TI) and the Western Development Area (WDA).

5.1.3.4 An assessment of the likely significant effects of the whole project in conjunction with the following unconsented but reasonably foreseeable projects has also been undertaken:

- Firth of Forth Phase 1 (including the associated TI);
- Inch Cape Offshore Wind Farm (including the associated TI); and
- Neart Na Gaoithe Offshore Wind Farm (including the associated TI).

5.1.3.5 Due to lack of detail about schedules and design parameters, it has not been possible to carry out an assessment of the likely cumulative effects of some anticipated future developments located in the Moray Firth and elsewhere. Instead a general commentary on the following developments has been provided, however these have not been assessed:

- Other renewable energy developments;
- The Scottish Hydro Electric Transmission Limited (SHE-T) cable;
- Shipping and navigation;
- Relevant oil and gas activities; and
- Marine Protected Areas (MPAs) and other closed or restricted areas.

5.1.3.6 The following likely significant effects are considered.

- Implications for fisheries during the construction phase:
  - Adverse effects on commercially exploited fish and shellfish populations;
  - Adverse effects on recreational fish populations;
  - Temporary loss or restricted access to traditional fishing grounds;
  - Safety issue for shipping, including fishing vessels;
  - Increased steaming times to fishing grounds;
  - Interference with fisheries activities; and
  - Displacement of fishing activity into other areas.
- Implications for fisheries during the operation phase:
  - Adverse effects on commercially exploited fish and shellfish populations;
  - Adverse effects on recreational fish populations;
  - Complete loss or restricted access to traditional fishing grounds;
  - Obstacles on the sea bed post-construction;
  - Safety issue for shipping, including fishing vessels;
  - Increased steaming times to fishing grounds;
  - Interference with fisheries activities; and
  - Displacement of fishing activity into other areas.

5.1.3.7 The MORL ES (MORL, 2012) provided a detailed assessment of potential effects from all relevant developments, both individually and cumulatively. The preceding impact assessment demonstrates that the nature, magnitude, extent, duration and significance of the potential effects from the modified OfTI are the same or less than previously assessed in the MORL ES (MORL, 2012). Comparable aspects of the other, now consented, developments considered for cumulative effects have either stayed the same, or have been refined (reduced) since the previous assessments were made. Therefore, the nature, magnitude, extent, duration and significance of cumulative effects also remain the same or are reduced.

5.1.3.8 A summary of cumulative effects is listed in Table 5.1-9 below.

Table 5.1-9 Cumulative Impact Summary

Effect/Receptor	Residual significance level for modified TI	Whole project assessment: Modified TI + Stevenson, Telford and MacColl	Whole project with consented projects + WDA	Whole project with unconsented but reasonably foreseeable projects	Mitigation Method
Construction					
Adverse effects on commercially exploited fish and shellfish populations	Underwater disturbance to the seabed – general: Minor significance Noise – general: Minor significance	Underwater disturbance to the seabed – general: Minor significance Noise – general: Minor significance	Underwater disturbance to the seabed – general: Minor significance Noise – general: Minor significance	Underwater disturbance to the seabed – general: Minor significance Noise – general: Minor significance	Soft-start piling
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	Underwater disturbance to the seabed: Cumulative effects associated with increased suspended sediment concentrations and sediment re-deposition are expected to be of minor significance. Noise: Cumulative effects associated with underwater noise are expected to be minor following mitigation (see Chapter 2.1: Fish and Shellfish Ecology, section 2.1.3 for further details).				
Adverse effects on recreational fish populations	Underwater disturbance to the seabed – salmon and sea trout: Minor significance Noise – salmon and sea trout: Minor significance	Underwater disturbance to the seabed – salmon and sea trout: Minor significance Noise – salmon and sea trout: Minor significance	Underwater disturbance to the seabed – salmon and sea trout: Negligible - Minor significance Noise – salmon and sea trout: Minor significance	Underwater disturbance to the seabed – salmon and sea trout: Negligible - Minor significance Noise – salmon and sea trout: Minor significance	Soft-start piling
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	Underwater disturbance to the seabed: Cumulative effects associated with increased suspended sediment concentrations and sediment re-deposition are expected to be of minor significance. Noise: Cumulative effects associated with underwater noise are expected to be minor following mitigation (see Chapter 2.1: Fish and Shellfish Ecology, section 2.1.3 for further details).				

Effect/Receptor	Residual significance level for modified TI	Whole project assessment: Modified TI + Stevenson, Telford and MacColl	Whole project with consented projects + WDA	Whole project with unconsented but reasonably foreseeable projects	Mitigation Method
Temporary loss or restricted access to fishing grounds	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	Scallop dredge vessels: Moderate significance All other vessels: Minor significance	Ongoing discussions through the MFCFWG to include development of mitigation strategies and construction schedules Cable burial and protection Over-trawlability surveys Ongoing fisheries liaison Scallop gear trials
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	Scallop dredge vessels: Moderate significance All other vessels: Minor significance				
Safety issues for fishing vessels	All vessels: Within acceptable limits	All vessels: Within acceptable limits	All vessels: Within acceptable limits	All vessels: Within acceptable limits	Updates on the construction programme will be provided to the fishing industry through the forum of the MFCFWG, FIRs, FLO and NtMs Safety zones and adherence to standard maritime practices
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	All vessels: Within acceptable limits				

Effect/Receptor	Residual significance level for modified TI	Whole project assessment: Modified TI + Stevenson, Telford and MacColl	Whole project with consented projects + WDA	Whole project with unconsented but reasonably foreseeable projects	Mitigation Method
Increased steaming times to fishing grounds	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	Ongoing discussions through the MFCFWG to include development of mitigation strategies and construction schedules Ongoing fisheries liaison
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	All vessels: Minor significance				
Displacement of fishing activity	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	Scallop dredge vessels: Moderate significance All other vessels: Minor significance	Ongoing discussions through the MFCFWG to include development of mitigation strategies and construction schedules Cable burial and protection Over-trawlability surveys Ongoing fisheries liaison Scallop gear trials
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	Scallop dredge vessels: Moderate significance All other vessels: Minor significance				

Effect/Receptor	Residual significance level for modified TI	Whole project assessment: Modified TI + Stevenson, Telford and MacColl	Whole project with consented projects + WDA	Whole project with unconsented but reasonably foreseeable projects	Mitigation Method
Interference with fishing vessels	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	Ongoing discussions through the MFCFWG to include development of construction schedules Ongoing fisheries liaison Information distributed through FIRs, FLO and NtMs
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	All vessels: Minor significance				
Operation					
Adverse effects on commercially exploited fish and shellfish populations	EMFs – general: Minor significance	EMFs – general: Minor significance	EMFs – general: Minor significance	EMFs – general: Minor significance	Cable burial / protection
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	EMFs: As it is expected that the cables within the modified OfTI will be buried to a sufficient depth that EMFs will be minor (EN-3), the contribution of the modified OfTI to the cumulative impact of EMFs will be of minor significance.				
Adverse effects on recreational fish populations	EMFs – salmon and sea trout: Minor significance	EMFs – salmon and sea trout: Minor significance	EMFs – salmon and sea trout: Minor significance	EMFs – salmon and sea trout: Minor significance	Cable burial / protection
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	EMFs: As it is expected that the cables within the modified OfTI will be buried to a sufficient depth that EMFs will be minor (EN-3), the contribution of the modified OfTI to the cumulative effect of EMFs will be of minor significance.				

Effect/Receptor	Residual significance level for modified TI	Whole project assessment: Modified TI + Stevenson, Telford and MacColl	Whole project with consented projects + WDA	Whole project with unconsented but reasonably foreseeable projects	Mitigation Method
Complete loss or restricted access to fishing grounds	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	Scallop dredge vessels: Moderate significance All other vessels: Minor significance	Ongoing discussions through the MFCFWG Cable burial and protection Ongoing fisheries liaison Scallop gear trials
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	Scallop dredge vessels: Moderate significance All other vessels: Minor significance				
Safety issues for fishing vessels	All vessels: Within acceptable limits	All vessels: Within acceptable limits	All vessels: Within acceptable limits	All vessels: Within acceptable limits	Ongoing fisheries liaison Information distributed through FIRs, FLO and NtMs
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4t	All vessels: Within acceptable limits				
Increased steaming times to fishing grounds	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	Ongoing discussions through the MFCFWG Cable burial and protection Ongoing fisheries liaison
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	All vessels: Minor significance				

Effect/Receptor	Residual significance level for modified TI	Whole project assessment: Modified TI + Stevenson, Telford and MacColl	Whole project with consented projects + WDA	Whole project with unconsented but reasonably foreseeable projects	Mitigation Method
Obstacles on the seabed post-construction	Within acceptable limits	Within acceptable limits	Within acceptable limits	Within acceptable limits	Seabed rectification procedures Over-trawlability surveys Compliance to obligatory standards by contractors
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	Within acceptable limits				
Displacement of fishing activity	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	Scallop dredge vessels: Moderate significance All other vessels: Minor significance	Ongoing discussions through the MFCFWG Cable burial and protection Ongoing fisheries liaison Scallop gear trials
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	Scallop dredge vessels: Moderate significance All other vessels: Minor significance				
Interference with fishing vessels	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	All vessels: Minor significance	Ongoing fisheries liaison Information distributed through FIRs, FLO and NtMs
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	All vessels: Minor significance				

Assessment of Cumulative Effects

5.1.3.9 The developments and activities considered in detail within this assessment are listed below and are shown in Figure 5.1-1.

- MORL three consented wind farms (Telford, Stevenson and MacColl);
- MORL WDA;
- BOWL site and export cable route;
- Firth of Forth Phase 1 and export cable route;
- Inch Cape Offshore Wind Farm and export cable route; and
- Neart Na Gaoithe Offshore Wind Farm and export cable route.

5.1.3.10 The connection between the WDA and the three consented wind farms necessitates a slightly different approach to assessment, as the effects arising from the "worst case" for the three consented sites cannot simply be added to the "worst case" scenario for the WDA. The potential capacity of the WDA (500 MW) when added to the consented capacity of the EDA (1,166 MW) exceeds the overall target capacity of the MORL zone (1,500 MW). It is not proposed that the target capacity for the MORL zone will be exceeded. 500 MW represents the maximum development on the WDA, but in the event that MORL successfully constructs in excess of 1,000 MW in the three consented wind farm sites then the development in the WDA will be restricted accordingly to ensure the MORL zone capacity is not exceeded.

5.1.3.11 This restriction of the total capacity of the MORL zone means that the effects from development in the EDA and WDA combined will be restricted also. In the MORL ES, effects were assessed on the basis of a potential capacity of 1,500 MW (3x500 MW) from the EDA alone. So the predicted effects of a 1,500 MW offshore wind farm within the MORL zone have been assessed and reported in the MORL ES. Where it is considered relevant and can be justified on the basis that conditions across the zone are consistent, the conclusions from that assessment have been assumed in this ES to be representative of the effects of the three consented wind farms and the WDA combined.

5.1.3.12 As mentioned previously, a general commentary on the following developments has been provided, however no significance ratings have been assessed:

- Other renewable energy developments;
- The SHE-T cable;
- Shipping and navigation;
- Relevant oil and gas activities; and
- MPAs and other closed or restricted areas.

5.1.3.13 Although sufficient information has been provided on the MeyGen tidal project in the Pentland Firth to assess potential cumulative effects, it is considered that the fishing activity that occurs in the Moray Firth will not be synonymous with that occurring in the area of the tidal project. As such, a full cumulative assessment has been scoped out and a brief commentary on tidal projects in the Pentland Firth, including the MeyGen project, has been provided.

5.1.3.14 There is currently one MPA which is proposed for the Moray Firth area (Southern Trench). As no information on the management procedures for the area is available (i.e. whether or not fishing will be able to resume within the operational MPA) it is not possible to full assess potential cumulative effects arising from this proposal. As such,

a brief commentary on MPAs and their potential to contribute towards a cumulative effect has been provided.

5.1.3.15 Although there will be some development at the ports of Invergordon, Nigg and Ardeseir, these development works are not expected to have any impact on fisheries.

5.1.3.16 Currently, there are no licensed aggregate dredging areas in the Moray Firth, the closest being located in the Firth of Forth. Although it is recognised that loss of fishing area as a result of aggregate dredging may apply to certain vessels, it is not considered within the scope of this assessment to identify impacts on a vessel by vessel basis.

5.1.3.17 The study area of the assessment is the same as that described in Technical Appendix 5.1 A (Commercial Fisheries) and focuses principally on cumulative effects in the Moray Firth.

5.1.3.18 Cumulative effects on commercially exploited fish and shellfish populations are addressed in full in Chapter 4.2: Fish and Shellfish Ecology and summarised below.

5.1.3.19 It is recognised that fishing vessels may not spend all, or indeed a significant proportion, of their time in the Moray Firth and hence certain other offshore renewable developments may also affect them. This is most obviously the case for the scallop fishery, which is targeted by vessels that are largely nomadic, variously targeting grounds around the UK. As stated previously, although individual vessels may spend more time in certain regional areas such as the Moray Firth, it is not possible within the scope of this assessment to consider the extent of an effect on a vessel by vessel basis. Instead, scallop grounds affected by the proposed projects in the Moray Firth have been considered within the context of available scallop grounds around the UK relevant to other offshore renewable developments.

Methodology

5.1.3.20 The assessment methodology has followed that outlined in the Moray Firth Offshore Wind Developers Group Discussion Document (MORL, 2012, Technical Appendix 1.3 D: MFOWDG Cumulative Assessment Document).

Worst Case Scenarios

5.1.3.21 The detailed assessment of the likely significant cumulative effects focuses on the modified OfTI in conjunction with the three consented wind farms, WDA, the BOWL site and export cable route, the Firth of Forth Phase 1 and export cable route, Inch Cape Offshore Wind Farm and export cable route and Neart na Gaoithe Offshore Wind Farm and export cable route, as a result of their proximity and the level of project information that has been made available.

Telford, Stevenson and MacColl

5.1.3.22 The worst case scenario for the three consented wind farms is summarised in Table 5.110 below. It should be noted that this varies from the original worst case scenario for the three consented wind farms as provided in ES Chapter 11.1 (Commercial Fisheries) (MORL, 2012).

Table 5.1-10 Summary of the MORL Three consented wind farms Worst Case Parameters

Worst case parameters	**Scenario assessed**
Wind farm site	186 x 6 MW turbines
Turbine Layout	
Minimum spacing (crosswind)	1,080 m
Minimum spacing (downwind)	1,350 m
Foundations and Substructure	
Foundation type	Gravity Base
Footprint of individual turbine	65m diameter
Met Mast	
Maximum number of met masts	2
Inter Array Cables	
Estimated total length	572 km

Western Development Area

5.1.3.23 The worst case parameters of wind farm design for the WDA in terms of commercial fisheries are provided in Table 5.1-11.

Table 5.1-11 Summary of the MORL WDA Worst Case Parameters

Worst case parameters	**Scenario assessed**
Wind farm site	100 x 5 MW turbines
Turbine Layout	
Minimum spacing (crosswind)	1,080 m
Minimum spacing (downwind)	1,350 m
Foundations and Substructure	
Foundation type	Gravity Base
Footprint of individual turbine	3,318 m^2
Met Mast	
Maximum number of met masts	1 x 4.5 m diameter

BOWL Site and Export Cable Route

5.1.3.24 The worst case parameters of wind farm design for the BOWL site and export cable route in terms of commercial fisheries are provided in Table 5.1-12.

Table 5.1-12 Summary of the BOWL Worst Case Parameters as consented and restricted by condition

Worst case parameters	**Scenario assessed**
Wind farm site	125 turbines but with the potential to install140 turbines if consent conditions are met.
Turbine Layout	
Minimum spacing (crosswind)	924 m
Minimum spacing (downwind)	924 m
Foundations and Substructure	
Foundation type	Tubular Jacket and Gravity Base
Footprint of individual turbine	1,963m^2
Met Mast	
Maximum number of met masts	3
Inter Array Cables	
Estimated total length	325 km
Additional Offshore Infrastructure	
Maximum number of OSPs	3
Export Cable	
Maximum length of offshore export cable corridor	65 km
Maximum number of cables	4
Export cable route	South of the development to landfall in the Spey Bay area

Other Developments

5.1.3.25 Developments that are at an earlier stage and for which there are limited development details at this stage, are also considered. The worst case scenarios for these projects are limited in detail and are as follows:

- Firth of Forth Phase 1 – 2 x 75 turbine wind farms;
- Inch Cape Offshore Wind Farm – 213 turbines, three met masts, five offshore substations and 6 offshore export cables; and
- Neart na Gaoithe Offshore Wind Farm – 125 turbines and 2 offshore substations.

Cumulative Assessment

5.1.3.26 The types of effects considered in this assessment are listed below.

- Implications for fisheries during the construction phase:
  - Adverse effects on commercially exploited fish and shellfish populations;
  - Adverse effects on recreational fish populations;
  - Temporary loss or restricted access to traditional fishing grounds;
  - Safety issue for shipping, including fishing vessels;
  - Increased steaming times to fishing grounds;
  - Interference with fisheries activities; and
  - Displacement of fishing activity into other areas.
- Implications for fisheries during the operation phase:
  - Adverse effects on commercially exploited fish and shellfish populations;
  - Adverse effects on recreational fish populations;
  - Complete loss or restricted access to traditional fishing grounds;
  - Obstacles on the sea bed post-construction;
  - Safety issue for shipping, including fishing vessels;
  - Increased steaming times to fishing grounds;
  - Interference with fisheries activities; and
  - Displacement of fishing activity into other areas.

5.1.3.27 The receptors identified for consideration in this assessment are:

- Demersal trawling for *Nephrops* (over and under-15 m vessels);
- Dredging for scallops;
- Demersal trawling for squid;
- Demersal trawling for whitefish;
- Creeling for crab and lobster; and
- Hand-lining for mackerel.

5.1.3.28 A summary of the overall significance for each effect described below is given in Table 5.1-9 above.

Adverse Effects on Commercially Exploited Fish and Shellfish Populations

5.1.3.29 The principal commercial species targeted within the vicinity of the modified OfTI are *Nephrops*, scallops, squid, whitefish (including cod and haddock), crab species, lobster and mackerel.

5.1.3.30 Predicted cumulative adverse effects on commercially exploited fish and shellfish populations arising from the construction and operation of the proposed developments are described in Chapter 4.2: Fish and Shellfish Ecology and summarised in Table 5.1-13 below.

Table 5.1-13 Summary of Impact Assessment on Principal Commercial Species

Effect/Receptor	Residual significance level for modified OfTI	Whole project assessment: Modified OfTI + Stevenson, Telford and MacColl	Whole project with consented projects + WDA	Whole project with unconsented but reasonably foreseeable projects	Mitigation Method
Adverse effects on commercially exploited fish and shellfish populations	Underwater disturbance to the seabed – general: Minor significance Noise – general: Minor significance EMFs – general: Minor significance	Underwater disturbance to the seabed – general: Minor significance Noise – general: Minor significance EMFs – general: Minor significance	Underwater disturbance to the seabed – general: Minor significance Noise – general: Minor significance EMFs – general: Minor significance	Underwater disturbance to the seabed – general: Minor significance Noise – general: Minor significance EMFs – general: Minor significance	Soft-start piling Cable burial / protection
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	Underwater disturbance to the seabed: Cumulative effects associated with increased suspended sediment concentrations and sediment re-deposition are expected to be of minor significance. Noise: Cumulative effects associated with underwater noise are expected to be minor following mitigation (see Chapter 2.1: Fish and Shellfish Ecology, section 2.1.3 for further details). EMFs: It is expected that the cables within the modified OfTI will be buried to a sufficient depth that EMFs will be significantly attenuated (EN-3). Furthermore, as EMFs diminish rapidly both horizontally and vertically from source, the overall footprint over which EMFs could be detected by sensitive species will be small. Therefore, the contribution of the modified OfTI to the overall cumulative impact of EMFs will be of minor significance.				

Adverse Effects on Recreational Fish Populations

5.1.3.31 The principal recreational species targeted within the vicinity of the modified OfTI are salmon and sea trout.

5.1.3.32 Predicted cumulative adverse effects on recreational fish populations arising from the construction and operation of the proposed developments are described in Chapter 4.2: Fish and Shellfish Ecology and summarised in Table 5.1-14 below.

Table 5.1-14 Summary of Impact Assessment on Principal Recreational Species

Effect/Receptor	Residual significance level for modified OfTI	Whole project assessment: Modified OfTI + Stevenson, Telford and MacColl	Whole project with consented projects + WDA	Whole project with unconsented but reasonably foreseeable projects	Mitigation Method
Adverse effects on recreational fish populations	Underwater disturbance to the seabed – salmon and sea trout: Minor significance Noise – salmon and sea trout: Minor significance EMFs – salmon and sea trout: Minor significance	Underwater disturbance to the seabed – salmon and sea trout: Minor significance Noise – salmon and sea trout: Minor significance EMFs – salmon and sea trout: Minor significance	Underwater disturbance to the seabed – salmon and sea trout: Negligible - Minor significance Noise – salmon and sea trout: Minor significance EMFs – salmon and sea trout: Minor significance	Underwater disturbance to the seabed – salmon and sea trout: Negligible - Minor significance Noise – salmon and sea trout: Minor significance EMFs – salmon and sea trout: Minor significance	Soft-start piling Cable burial / protection
Total Cumulative Impact Assessment (Whole project plus those developments listed in sections 5.1.3.3 and 5.1.3.4)	Underwater disturbance to the seabed: Cumulative effects associated with increased suspended sediment concentrations and sediment re-deposition are expected to be of minor significance. Noise: Cumulative effects associated with underwater noise are expected to be minor following mitigation (see Chapter 2.1: Fish and Shellfish Ecology, section 2.1.3 for further details). EMFs: As it is expected that the cables within the modified OfTI will be buried to a sufficient depth that EMFs will be minor (EN-3), the contribution of the modified OfTI to the cumulative effect of EMFs will be of minor significance.				

Temporary and Complete Loss or Restricted Access to Fishing Grounds

5.1.3.33 It should be noted that the worst case scenario for the three consented wind farms differs from that previously identified in ES Chapter11.1 (Commercial Fisheries) (MORL, 2012). Additionally, the availability of different data sets has resulted in changes to the assessment. It therefore follows that the potential effects arising from the three consented wind farms in MORL ES (2012) Chapter 11.1 may vary to those identified below.

5.1.3.34 The *Nephrops* fishery is the most important fishery in the Moray Firth and is targeted by a range of vessels, both over and under-15 m. Fishing grounds for the over-15 m fleet are principally concentrated in the southern half of the Moray Firth (Figure 5.1-2), whereas fishing grounds for the under-15 m fleet are located in the inner Firth (Figure 5.1-3). It should be noted however, that these vessels will occasionally target the same grounds as the over-15 m fleet in favourable weather. All *Nephrops* fishing grounds are located out with the consented wind farm sites but in the vicinity of the modified export cable route. Activity is generally constant on an annual basis. Larger category vessels have the operational range to target grounds in the wider North Sea, however smaller category vessels are limited in their operational range and tend to spend the majority of their time fishing grounds in the Moray Firth.

5.1.3.35 Analysis of statistical datasets and information gathered through consultation with fishermen demonstrates that dredging for scallops occurs in areas throughout the Moray Firth and in the vicinity of the MORL Zone, BOWL site and associated export cable routes (Figure 5.1-4). The majority of vessels are nomadic and will potentially target grounds around the UK. The amount of time spent in the Moray Firth varies annually and depends upon the productivity and availability of grounds here and elsewhere.

5.1.3.36 The squid fishery in the Moray Firth is important on a national scale. There is also a squid fishery in the Firth of Forth, although this is less productive and landings vary significantly on an annual basis. In light of this, the cumulative effect upon the fishery will therefore predominantly arise from the BOWL site in conjunction with the MORL Zone and associated export cables (Figure 5.1-5).

5.1.3.37 Although some whitefish activity (principally for haddock) is recorded in the in the north of the BOWL site, the majority of grounds are located away from the developments and associated export cable routes (Figure 5.1-6) and as a result there is not considered to be a significant cumulative effect upon the fishery.

5.1.3.38 Although crab and lobster activity is located throughout coastal areas of the Moray Firth, it is considered that the fishery under consideration for the cumulative effects arising as a result of the modified OfTI and other developments in the Moray Firth is only comprised of those vessels fishing the immediate area of the modified OfTI. This is due to the small operational ranges of vessels within the creel fishery which limits the vessels to discrete areas. The vessels targeting the crab and lobster fishery in the vicinity of the modified OfTI landfall at Inverboyndie will only be affected by the installation of the export cables (Figure 5.1-7). As a result, it is not considered that there will be a cumulative effect upon the fishery from infrastructure in addition to this.

5.1.3.39 As with the creel fishery, the mackerel hand-lining fishery is targeted by small, local vessels which will have limited operational ranges (Figure 5.1-8). It is therefore considered that there will be no cumulative effect on the fishery from infrastructure in addition to the modified OfTI.

Modified OfTI and Three Consented Wind Farms

5.1.3.40 There is the potential for all fishing activity to be temporarily displaced from localised areas in the MORL three consented wind farm sites during construction as a result of the temporary 500 m safety zones around all major construction activities. Cumulatively, there will be six major construction events in the MORL three consented wind farm sites in addition to 500 m safety zones during the construction of the MORL modified OfTI.

5.1.3.41 Additionally, during the construction phase, the safety risks associated with the installation of inter array cables and export cables for the MORL consented wind farms would result in the progressive loss of access to these areas as the construction schedule advances. Access to these areas will not resume until the appropriate over-trawl surveys and if necessary seabed rectification measures have been completed, confirming that normal fishing activities can safely resume.

5.1.3.42 The sensitivities of the fisheries are as defined for the site specific impact assessment previously (i.e. over-15 m *Nephrops* fleet is low, under-15 m *Nephrops* fleet is medium, scallop fleet is low and the squid fleet is low).

5.1.3.43 As shown in Figure 5.1-3, activity by the under-15 m *Nephrops* fleet generally occurs in areas to the south-west of the developments, with discrete areas transected by the MORL modified OfTI. As a result, the magnitude of effect for these vessels is considered to be low. The cumulative significance of effect of the MORL modified OfTI and three consented wind farms for these vessels is considered to be **minor adverse**.

5.1.3.44 Figure 5.1-2 shows the fishing activity by the over-15 m *Nephrops* fleet. All activity occurs outside of the three consented wind farm sites, to the south in the areas of the modified OfTI. It is therefore considered that there is no additional cumulative effect arising from the MORL modified OfTI in conjunction with the three consented wind farms and the effect is as assessed previously (i.e. **minor adverse**).

5.1.3.45 Figure 5.1-4 shows scallop dredging activity in the Moray Firth (see inset). Moderate to high levels of activity are located throughout the Moray Firth, including in the vicinity of the MORL three consented wind farms and modified OfTI. The magnitude of effect is considered to be high. The cumulative significance of effect of the MORL modified OfTI and three consented wind farms for scallop dredging vessels is considered to be **moderate adverse**.

5.1.3.46 It can be seen from Figure 5.1-5, that squid trawling occurs throughout the Moray Firth. As mentioned previously, the fishery varies year on year and it is not possible to predict future fishing grounds. As such, the assumption has been made that squid trawling can occur throughout the Moray Firth, including within the vicinity of the MORL three consented wind farms and the modified OfTI. Due to the availability of grounds, the magnitude of effect is therefore considered to be medium. The cumulative significance of effect of the MORL modified OfTI and three consented wind farms for vessels trawling for squid is considered to be **minor adverse**.

5.1.3.47 Subsequent to any necessary seabed rectification measures being satisfactorily completed, it is considered that fishing vessels will regain some degree of access to fishing grounds within the operational wind farm sites, although it is recognised that individual skippers, particularly those operating bottom towed gear, may consider it unsafe to continue fishing. It is also considered that vessels fishing grounds over the export cables will regain full access to their traditional fishing grounds during operation. It is therefore considered that the magnitude of effect will remain as identified for the construction phase. The significance of the cumulative effect of complete loss of fishing grounds during the operational phase is therefore expected to be **moderate adverse** for scallop and **minor adverse** for *Nephrops* (both over and under-15 m) and squid.

5.1.3.48 As mentioned above (Sections 5.1.2.5-5.1.2.7), embedded mitigation will be implemented which will reduce impacts on the commercial fishing industry. Ongoing discussions through the MFCFWG will include the development of mitigation strategies and construction schedules. Cables will be buried or protected by other

means where target burial depth is not possible and over-trawlability surveys will be undertaken as necessary. Liaison with the fishing industry will be ongoing via FIRs and the FLO. In addition, scallop gear trails will be undertaken. This mitigation would result in a **minor adverse** residual cumulative effect on the scallop fishery during both construction and operation.

5.1.3.49 The under-15 m *Nephrops* fishery is considered to be of medium sensitivity, low magnitude and the cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms is considered to be **minor**, which is not significant in EIA terms.

5.1.3.50 The over-15 m *Nephrops* fishery and squid fishery are considered to be of low sensitivity and medium magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms of **minor**, which is not significant in EIA terms.

5.1.3.51 The scallop dredge fishery is considered to be of low sensitivity and high magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms of **moderate**, which is significant in EIA terms. It is considered however, that the mitigation suggested above will result in a residual effect of **minor**, which is not significant in EIA terms.

5.1.3.52 No cumulative effects arising from the construction and operation of the modified OfTI in conjunction with the three consented wind farms on the whitefish, creel and mackerel hand-lining fisheries have been identified.

Modified OfTI, Three Consented Wind Farms, WDA and BOWL

5.1.3.53 In addition to the MORL three consented wind farms and modified OfTI, there is the potential for fishing activity to be temporarily displaced from localised areas in the BOWL site and export cable route and the WDA.

5.1.3.54 The sensitivities of the fisheries are as defined for the site specific impact assessment previously (i.e. over-15 m *Nephrops* fleet is low, under-15 m *Nephrops* fleet is medium, scallop fleet is low and the squid fleet is low).

5.1.3.55 As mentioned previously, the under-15 m *Nephrops* fleet targets grounds in the inner Firth with low levels of activity located in the south of the Moray Firth. This includes grounds transected by the modified OfTI and BOWL export cable route. Low monetary value grounds are also located in the WDA. It is considered however, due to the very low levels of activity recorded in these areas, the magnitude of effect is low. The cumulative significance of effect of the MORL modified OfTI, three consented wind farms, BOWL project and WDA for these vessels is considered to be **minor adverse**.

5.1.3.56 The over-15 m *Nephrops* fleet targets grounds in the south of the Moray Firth, including grounds through which the modified OfTI and BOWL export cable route pass. Due to the temporary nature of the construction events for the offshore export cable installation and the discrete areas covered by the cable routes, the magnitude of effect is considered to be no greater than that assessed for the modified OfTI (i.e. low), resulting in a significance of effect of **minor adverse**.

5.1.3.57 Scallop grounds are located throughout the Moray Firth, including in the areas of the MORL three consented wind farms, WDA, BOWL site and associated export cable routes. The magnitude of effect is considered to be high. The cumulative

significance of effect of the MORL modified OfTI, three consented wind farms, WDA and BOWL project for scallop dredging vessels is considered to be **moderate adverse**.

5.1.3.58 Squid grounds are located throughout the Moray Firth, however, as mentioned previously, fishing activity can vary year on year. Due to the availability of grounds, the magnitude of effect is therefore considered to be medium. The cumulative significance of effect of the MORL modified OfTI , three consented wind farms, WDA and BOWL project for vessels trawling for squid is considered to be **minor adverse**.

5.1.3.59 As mentioned above, during operation vessels will be able to regain access to the BOWL site, WDA and three consented wind farms. Vessels towing trawl gear may decide it is unsafe to continue working within the operational wind farm site and as such the magnitude of effect is considered the same as for construction. The significance of the cumulative effect of complete loss of fishing grounds during the operational phase of the MORL three consented wind farms, WDA, modified OfTI and BOWL project is therefore expected to be **moderate adverse** for scallop and **minor adverse** for *Nephrops* (both over and under-15 m) and squid.

5.1.3.60 As mentioned previously, mitigation has been suggested which will reduce the effect on scallop dredging activity to **minor adverse**. Potential mitigation for the BOWL project is unknown, however it is considered that as the majority of scallop dredging activity is located in the three consented wind farms and as BOWL are included in the MFCFWG, the mitigation suggested above would still reduce the effect to **minor adverse** for both the construction and operational phases.

5.1.3.61 The under-15 m *Nephrops* fishery is considered to be of medium sensitivity, low magnitude and the cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA is considered to be **minor**, which is not significant in EIA terms.

5.1.3.62 The over-15 m *Nephrops* fishery and squid fishery are considered to be of low sensitivity and medium magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA of **minor**, which is not significant in EIA terms.

5.1.3.63 The scallop dredge fishery is considered to be of low sensitivity and high magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA of **moderate**, which is significant in EIA terms. It is considered however, that the mitigation suggested above will result in a residual effect of **minor**, which is not significant in EIA terms.

5.1.3.64 No cumulative effects arising from the construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA on the whitefish, creel and mackerel hand-lining fisheries have been identified.

Modified OfTI, Three Consented Wind Farms and Unconsented but Reasonably Foreseeable Projects

5.1.3.65 In addition to the MORL three consented wind farms and modified OfTI, there is the potential for fishing activity to be temporarily displaced from localised areas in other unconsented but reasonably foreseeable projects. Principally, these include the three developments in the Forth and Tay area:

- Firth of Forth Phase 1 and export cable route;
- Inch Cape Offshore Wind Farm and export cable route; and
- Neart Na Gaoithe Offshore Wind Farm and export cable route.

5.1.3.66 The sensitivities of the fisheries are as defined for the site specific impact assessment previously (i.e. over-15 m *Nephrops* fleet is low, under-15 m *Nephrops* fleet is medium, scallop fleet is low and the squid fleet is low).

5.1.3.67 Under-15 m vessels targeting *Nephrops* in the Moray Firth will target fish grounds outside of the areas identified in Figure 5.1-3. It is therefore considered that the Forth and Tay projects will not add to any cumulative effect on these vessels.

5.1.3.68 Over-15 m *Nephrops* trawlers have the potential to target grounds in the Forth and Tay. Only export cable routes are located over high activity areas in the Forth and Tay area (Figure 5.1-2) and therefore, due to the temporary nature of construction works and the discrete areas covered by cables, the magnitude of effect is considered to be no greater than that identified previously (i.e. low). The cumulative significance of effect of the MORL modified OfTI, three consented wind farms, and other unconsented projects for these vessels is therefore considered to be **minor adverse**.

5.1.3.69 High levels of scallop dredging activity are located in the Forth and Tay area, including grounds on which offshore developments are being considered. As a result, the magnitude of effect is considered to be high. The cumulative significance of effect of the MORL modified OfTI, three consented wind farms and other unconsented projects for scallop dredging vessels is considered to be **moderate adverse**.

5.1.3.70 Although squid activity has been recorded in the Forth and Tay area, activity is limited and vessels will often choose to fish more productive grounds in the Moray Firth. It is therefore considered that the Forth and Tay projects will not add to any cumulative effect on these vessels.

5.1.3.71 During operation, the magnitude of effect for all vessels towing gear is considered the same as for construction. The significance of the cumulative complete loss of fishing grounds during the operational phase of the MORL three consented wind farms, modified OfTI and other unconsented projects is therefore expected to be **moderate adverse** for scallop and **minor adverse** for over-15 m *Nephrops* vessels.

5.1.3.72 Although mitigation has been suggested by MORL which reduce the residual effects of the three consented wind farms and modified OfTI to minor, mitigation has not yet been suggested for the unconsented wind farms in the Forth and Tay area. Due to the high levels of scallop dredging activity occurring in the area, it is considered that the cumulative residual effect will not be lowered by MORLs mitigation alone and as such the residual effect is considered to be **moderate adverse**.

5.1.3.73 The over-15 m *Nephrops* fishery are considered to be of low sensitivity and medium magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms and other unconsented projects of **minor**, which is not significant in EIA terms.

5.1.3.74 The scallop dredge fishery is considered to be of low sensitivity and high magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms and other unconsented projects of **moderate**, which is significant in EIA terms.

5.1.3.75 No cumulative effects arising from the construction and operation of the modified OfTI in conjunction with the three consented wind farms and other unconsented projects on the under-15 m *Nephrops* fleet, squid trawlers, whitefish trawlers, creelers and mackerel hand-lining fishery have been identified.

Total Cumulative Effect

5.1.3.76 The total cumulative effect of all developments which have the potential to result in loss or restricted access for commercial fishing activities during the construction and operational phases is considered to be of **moderate** significance for scallop dredge vessels, which is significant in EIA terms. The total cumulative effect on all other vessels is considered to be of **minor** significance, which is not significant in EIA terms.

Safety Issues to Fishing Vessels
Modified OfTI and Three Consented Wind Farms

5.1.3.77 Vessels travelling greater distances to fishing grounds may be affected by multiple developments. The proximity of the MORL three consented wind farms and modified OfTI pose a cumulative risk to the safety of fishing vessels in the area.

5.1.3.78 There will be overlap in the construction schedules of the MORL three consented wind farms and the modified OfTI. In line with standard practice, construction safety zones of 500 m will be in place around all offshore construction activities and partially construction infrastructure, from which all vessels, including fishing vessels, will be excluded. There will also be communications of advisory safety zones around areas of exposed cables.

5.1.3.79 Risks to fishing vessels would only occur if there were infringements of these safety zones. 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 safety zones would put the safety risk within acceptable limits. These issues are considered further in Chapter 5.2: Shipping and Navigation.

5.1.3.80 There is the potential for infrastructure outside of the designated safety zones to pose an additional risk to fishing vessels as a result of potentially hazardous interactions with fishing gear. These include turbines, inter array cables, OSPs and offshore export cables.

5.1.3.81 Infrastructure that is not fully installed will be appropriately marked and lit and safety zones put in place. Areas of exposed cable that constitute a potential snagging risk will be marked by the presence of guard vessels and advisory safety zones communicated. Furthermore, updates on the construction programme and vessel management plan will be provided to the fishing industry through the forum of the MFCFWG, FIRs, FLO and NtMs.

5.1.3.82 It is expected that, subsequent to the appropriate overtrawl surveys and installation burial and protection measures being completed, normal fishing activities will be able to safely resume in the immediate vicinity of Moray Firth developments during the operational phases. The safety risks would therefore be **within acceptable limits** for all commercial fisheries operating in the area, which is not significant in EIA terms.

Modified OfTI, Three Consented Wind Farms, WDA and BOWL

5.1.3.83 Vessels travelling greater distances to fishing grounds may be affected by multiple developments. The proximity of the MORL three consented wind farms and modified OfTI to the WDA and BOWL project poses the greatest cumulative risk to the safety of fishing vessels in the area.

5.1.3.84 As per consent conditions for the wind farm, BOWL is expected to follow the same standard guidelines as outlined above and as such the safety risks would be **within acceptable limits** for all commercial fisheries operating in the area, which is not significant in EIA terms.

Modified OfTI, Three Consented Wind Farms and Unconsented but Reasonably Foreseeable Projects

5.1.3.85 There is the potential for some vessels travelling to other areas, such as the Forth and Tay, to be affected by other, unconsented developments.

5.1.3.86 It is assumed, because of ES commitments and conditions on currently consented wind farms, that the unconsented developments will follow the same standard guidelines as outlined above and as such the safety risks would be **within acceptable limits** for all commercial fisheries operating in the area, which is not significant in EIA terms.

Total Cumulative Effect

5.1.3.87 The total cumulative effect of all developments which have the potential to result in safety issues for fishing vessels during the construction and operational phases is considered to be of **within acceptable limits**, which is not significant in EIA terms.

Increased Steaming Time to Fishing Grounds
Modified OfTI and Three Consented Wind Farms

5.1.3.88 The sensitivities of the fisheries are as defined for the site specific impact assessment previously (i.e. over-15 m *Nephrops* fleet is low, under-15 m *Nephrops* fleet is medium, scallop fleet is low and the squid fleet is low).

5.1.3.89 Cumulatively, there will be six major construction events in the MORL three consented wind farm sites in addition to 500 m safety zones during the construction of the MORL consented wind farms and modified OfTI. Due to the discrete nature of these safety zones however, the magnitude of effect is considered to be low. The significance of the effect is therefore **minor adverse** for all vessels.

5.1.3.90 The Shipping and Navigation assessment (Chapter 5.2 of this ES) considers that there is a good prospect for fishing vessels to navigate within the consented operational wind farm sites and modified OfTI. The magnitude of effect is considered to be low during the operational phase. The significance of the effect is therefore, at worst, **minor adverse** for all vessels.

5.1.3.91 The MFCFWG will include the development of construction schedules which will potentially reduce impacts of construction on the commercial fishing industry. In addition, ongoing fisheries liaison, including the dissemination of information through FIRs, FLO and NtMs, will ensure that all potentially impacted stakeholders will be aware of ongoing construction works.

5.1.3.92 Vessels participating in the under-15 m *Nephrops* fishery, the creel fishery and the mackerel hand-lining fishery are considered to be of medium sensitivity and low magnitude. The cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms is considered to be **minor**, which is not significant in EIA terms.

5.1.3.93 Vessels scallop dredging, trawling for squid, trawling for whitefish and the over-15 m vessels trawling for *Nephrops* are considered to be of low sensitivity and low magnitude. The cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms is considered to be **minor**, which is not significant in EIA terms.

Modified OfTI, Three Consented Wind Farms, WDA and BOWL

5.1.3.94 The sensitivities of the fisheries are as defined for the site specific impact assessment previously (i.e. over-15 m *Nephrops* fleet is low, under-15 m *Nephrops* fleet is medium, scallop fleet is low and the squid fleet is low).

5.1.3.95 There is the potential for the maximum of eight 500 m safety zones (six simultaneous construction events within the three MORL consented wind farms and modified OfTI and two in the BOWL site and associated export cable route) plus additional safety zones in the MORL modified OfTI and WDA to result in minor increases to steaming times during the construction phase. Due to the discrete nature of these safety zones however, the magnitude of effect is considered to be low. The significance of the effect is therefore **minor adverse** for all vessels.

5.1.3.96 The Shipping and Navigation assessment (Chapter 5.2 of this ES) considers that there is a good prospect for fishing vessels to navigate within the consented operational wind farm sites, modified OfTI, WDA and BOWL project. The magnitude of effect is considered to be low during the operational phase. The significance of the effect is therefore, at worst, **minor adverse** for all vessels.

5.1.3.97 Vessels participating in the under-15 m *Nephrops* fishery, the creel fishery and the mackerel hand-lining fishery are considered to be of medium sensitivity and low magnitude. The cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA is considered to be **minor**, which is not significant in EIA terms.

5.1.3.98 Vessels scallop dredging, trawling for squid, trawling for whitefish and the over-15 m vessels trawling for *Nephrops* are considered to be of low sensitivity and low magnitude. The cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA is considered to be **minor**, which is not significant in EIA terms.

Modified OfTI, Three Consented Wind Farms and Unconsented but Reasonably Foreseeable Projects

5.1.3.99 Due to the high number of construction events which could occur simultaneously within the Forth and Tay area, it is considered that there may be some increases to steaming times during construction. This will, however, only apply to those vessels that target grounds in the area, namely the over-15 m *Nephrops* fleet and the scallop dredge fleet. The magnitude of effect for these vessels is therefore considered to be medium. The sensitivity of vessels is as defined above (i.e. low for both) and therefore the cumulative significance of effect is considered to be minor adverse. There is considered to be no additional cumulative effect for all other fisheries as a result of unconsented developments in the Forth and Tay.

5.1.3.100 It is generally considered that there is a good prospect for fishing vessels to navigate within the operational wind farm sites in the Moray Firth and Forth and Tay. The sensitivity of vessels is as defined above and the magnitude of effect is considered to be low during the operational phase. The significance of the effect is therefore, at

worst, **minor adverse** for vessels that fish grounds in the Forth and Tay area (i.e. over-15 m *Nephrops* fleet and scallop dredge vessels). There is considered to be no additional cumulative effect for all other fisheries as a result of unconsented developments in the Forth and Tay.

5.1.3.101 Vessels scallop dredging, and the over-15 m vessels trawling for *Nephrops* are considered to be of low sensitivity and low magnitude. The cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms and unconsented projects is considered to be **minor**, which is not significant in EIA terms.

5.1.3.102 No cumulative effects arising from the construction and operation of the modified OfTI in conjunction with the three consented wind farms and other unconsented projects on the under-15 m *Nephrops* fleet, squid trawlers, whitefish trawlers, creelers and mackerel hand-lining fishery have been identified.

Total Cumulative Effect

5.1.3.103 The total cumulative effect of all developments which have the potential to result in increased steaming times during the construction and operational phases is considered to be of **minor** significance, which is not significant in EIA terms.

Obstacles on the Seabed Post-construction
Modified OfTI and Three Consented Wind Farms

5.1.3.104 There is the potential for obstacles to be left on the seabed during- and post-construction which could result in damage to, or loss of, fishing gears, as well as representing a safety hazard. Offshore works such as construction vessel anchoring, jack-up legs or cable trenching can produce seabed obstructions which could cause fastenings and damage to fishing gears. The cumulative effect of the MORL three consented wind farms and the modified OfTI will be an increase in the scale of potential effect.

5.1.3.105 Offshore policy prohibits the discarding of objects or waste at sea (IMO Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter). The reporting and recovery of any accidentally dropped objects is also required. In addition, overtrawl surveys and seabed rectification measures will be undertaken in areas of all the consented developments and the modified OfTI in the Moray Firth.

5.1.3.106 Provided there is compliance to obligatory standards by all contractors and, if necessary, the implementation of seabed rectification measures, the cumulative effect is considered to be **within acceptable limits**, which is not significant in EIA terms.

Modified OfTI, Three Consented Wind Farms, WDA and BOWL

5.1.3.107 Due to commitments in the ES and consent conditions, it is assumed that BOWL will follow the same standard guidelines as outlined above and as such the cumulative effect would be **within acceptable limits**, which is not significant in EIA terms.

Modified OfTI, Three Consented Wind Farms and Unconsented but Reasonably Foreseeable Projects

5.1.3.108 Due to ES commitments and conditional consents awarded for other wind farm projects, it is assumed that the three unconsented developments will follow the same standard guidelines as outlined above and as such the cumulative effect would be **within acceptable limits**, which is not significant in EIA terms.

Total Cumulative Effect

5.1.3.109 The total cumulative effect of all developments which have the potential to result in obstacles on the seabed post-construction is considered to be **within acceptable limits**, which is not significant in EIA terms.

Displacement of Fishing Activity
Modified OfTI and Three Consented Wind Farms

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

5.1.3.111 Displacement of fishing vessels into other areas will be a function of the loss or restricted access to traditional fishing grounds as fishing areas are restricted by substrate type, operational ranges of vessels targeting the fishery and, in some cases, seasonality. As mentioned previously, the whitefish, creel and mackerel hand-lining fisheries will not experience cumulative effects due to the location of fishing grounds.

5.1.3.112 In the Moray Firth, there is the potential for fishing activity to be displaced from MORL's three consented wind farms during construction as a result of the safety risks associated with the installation of inter array cables. In addition, fishing vessels will be temporarily excluded from the area of the modified OfTI, until overtrawl surveys confirm the 'over-trawlable' status of the seabed.

5.1.3.113 Overtrawl surveys, and, if necessary, seabed rectification procedures, within the wind farm sites will also confirm the 'over-trawlable' status of the seabed. Fishing vessels will subsequently regain some degree of access to grounds within the operational wind farms. It is however recognised that individual skippers will ultimately decide whether they wish to resume fishing within the operational sites.

5.1.3.114 Subsequent to the above measures being satisfactorily completed, it is considered that fishing vessels will regain some degree of access to fishing grounds within the consented operational wind farm sites, although it is recognised that individual skippers, particularly those operating bottom towed gear, may consider it unsafe to continue fishing within the consented operational wind farm sites because of the presence of infrastructure.

5.1.3.115 The significance of the cumulative displacement of fishing vessels during the construction and operational phases of the three consented wind farms and modified OfTI is as identified previously for the complete loss or restricted access to traditional fishing grounds (i.e. **moderate adverse** for scallop dredge vessels and **minor adverse** for over and under-15 m *Nephrops* trawlers and squid trawlers).

5.1.3.116 As mentioned above (Sections 5.1.2.5-5.1.2.7), embedded mitigation will be implemented which will reduce impacts on the commercial fishing industry. Ongoing discussions through the MFCFWG will include the development of mitigation strategies and construction schedules. Cables will be buried or protected by other means where target burial depth is not possible and over-trawlability surveys will be undertaken as necessary. Liaison with the fishing industry will be ongoing via FIRs and the FLO. In addition, MORL will undertake scallop gear trials. This mitigation would result in a **minor adverse** residual effect on the scallop fishery.

5.1.3.117 The under-15 m *Nephrops* fishery is considered to be of medium sensitivity, low magnitude and the cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms is considered to be **minor**, which is not significant in EIA terms.

5.1.3.118 The over-15 m *Nephrops* fishery and squid fishery are considered to be of low sensitivity and medium magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms of **minor**, which is not significant in EIA terms.

5.1.3.119 The scallop dredge fishery is considered to be of low sensitivity and high magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms of **moderate**, which is significant in EIA terms. It is considered however, that the mitigation suggested above will result in a residual effect of **minor**, which is not significant in EIA terms.

5.1.3.120 No cumulative effects arising from the construction and operation of the modified OfTI in conjunction with the three consented wind farms on the whitefish, creel and mackerel hand-lining fisheries have been identified.

Modified OfTI, Three Consented Wind Farms, WDA and BOWL

5.1.3.121 The significance of the cumulative displacement of fishing vessels during the construction and operational phases of the three consented wind farms, modified OfTI, WDA and BOWL project is as identified previously for the complete loss or restricted access to traditional fishing grounds (i.e. **moderate adverse** for scallop dredge vessels and **minor adverse** for over and under-15 m *Nephrops* trawlers and squid trawlers).

5.1.3.122 As mentioned previously, mitigation has been suggested which will reduce the effect on scallop dredging activity to **minor adverse**. Potential mitigation for the BOWL project is unknown, however it is considered that as the majority of scallop dredging activity is located in the three consented wind farms and as BOWL are included in the MFCFWG, the mitigation suggested above would still reduce the effect to **minor adverse** for both the construction and operational phases.

5.1.3.123 The under-15 m *Nephrops* fishery is considered to be of medium sensitivity, low magnitude and the cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA is considered to be **minor**, which is not significant in EIA terms.

5.1.3.124 The over-15 m *Nephrops* fishery and squid fishery are considered to be of low sensitivity and medium magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA of **minor**, which is not significant in EIA terms.

5.1.3.125 The scallop dredge fishery is considered to be of low sensitivity and high magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA of **moderate**, which is significant in EIA terms. It is considered however, that the mitigation suggested above will result in a residual effect of **minor**, which is not significant in EIA terms.

5.1.3.126 No cumulative effects arising from the construction and operation of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA on the whitefish, creel and mackerel hand-lining fisheries have been identified.

Modified OfTI, Three Consented Wind Farms and Unconsented but Reasonably Foreseeable Projects

5.1.3.127 The significance of the cumulative displacement of fishing vessels during the construction and operational phases of the three consented wind farms, modified OfTI and other unconsented developments in the Forth and Tay area is as identified previously for the complete loss or restricted access to traditional fishing grounds (i.e. **moderate adverse** for scallop dredge vessels and **minor adverse** for over-15 m *Nephrops* trawlers).

5.1.3.128 Although mitigation has been suggested by MORL which reduce the residual effects of the three consented wind farms and modified OfTI to minor, mitigation has not yet been suggested for the unconsented wind farms in the Forth and Tay area. Due to the high levels of scallop dredging activity occurring in the area, it is considered that the cumulative residual effect will not be lowered by MORLs mitigation alone and as such the residual effect is considered to be **moderate adverse**.

5.1.3.129 The over-15 m *Nephrops* fishery are considered to be of low sensitivity and medium magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms and other unconsented projects of **minor**, which is not significant in EIA terms.

5.1.3.130 The scallop dredge fishery is considered to be of low sensitivity and high magnitude, resulting in a cumulative significance of effect during both construction and operation of the modified OfTI in conjunction with the three consented wind farms and other unconsented projects of **moderate**, which is significant in EIA terms.

5.1.3.131 No cumulative effects arising from the construction and operation of the modified OfTI in conjunction with the three consented wind farms and other unconsented projects on the under-15 m *Nephrops* fleet, squid trawlers, whitefish trawlers, creelers and mackerel hand-lining fishery have been identified.

Total Cumulative Effect

5.1.3.132 The total cumulative effect of all developments which have the potential to result in displacement of fishing activity during the construction and operational phases is considered to be of **moderate** significance for scallop dredge vessels, which is significant in EIA terms. The total cumulative effect on all other vessels is considered to be of **minor** significance, which is not significant in EIA terms.

Interference to Fishing Activities
Modified OfTI and Three Consented Wind Farms

5.1.3.133 All of the potential cumulative effects included in this assessment would cause interference to fishing activities. An additional effect to be considered is the potential for navigational conflicts arising between fishing vessels and construction, operation and maintenance vessels transiting to and from the sites. This could include the fouling of static gear marker buoys and dhans, or towed gear vessels being required to alter towing direction.

5.1.3.134 The potential for interference will be, in part, determined by the seasonality of construction, operation and maintenance works and the location of the works ports. At this current time, the ports are unknown, however a conservative approach has been taken that works vessels will have the potential to interfere with all fishing activities in the area.

5.1.3.135 Transiting works vessels will fully comply with COLREGS to negate the requirements for fishing vessels engaged in fishing to alter course. Transit routes will also be established prior to construction commencing to aid with maritime safety. Due to the high mobility of towed gear vessels, the sensitivity is considered to be low. As works vessels will comply with COLREGs to minimise interference with towed gear vessels, the magnitude is considered to be low. It therefore follows that the cumulative effect during construction on towed gear vessels will be **minor adverse**.

5.1.3.136 It should also be recognised that in order to minimise gear loss, static gear fishermen avoid deploying their gear in shipping routes and areas of high shipping activity. Works vessels will also comply with COLREGS which reduces risk to fishing gears being towed. Static gear vessels are considered to be of medium sensitivity as these vessels are restricted in the mobility and operational range. The magnitude of effect is considered to be medium as, although works vessels will comply with COLREGS to reduce risk to fishing gears being towed, there is still higher risk of this occurring when compared to interference with towed gear vessels. The cumulative significance of effect is therefore considered to be **moderate adverse** during construction.

5.1.3.137 During operation, it is considered that the number of works vessels required will be reduced; as such the magnitude of effect for both mobile and static gear vessels will be low, resulting in a **minor adverse** cumulative effect for both.

5.1.3.138 It should be noted that ongoing discussions through the MFCFWG will include the development of construction schedules. Additionally, information regarding construction activity and the vessel management plan will be distributed to the fishing industry through the means of the FIRs, FLO and through NtMs published in Kingfisher. Consultation with the fishing industry will be ongoing to minimise potential impacts on fishing activities. This will result in a residual effect of **minor adverse** on the static gear fleet during construction.

5.1.3.139 The sensitivity of towed gear vessels is considered to be low and the magnitude of effect is also low. The significance of effect during both the construction and operational phases of the modified OfTI in conjunction with the three consented wind farms is therefore considered to be **minor,** which is not significant in EIA terms.

5.1.3.140 During operation, the static gear fleet is considered to be of medium sensitivity and low magnitude. The significance of effect of the modified OfTI in conjunction with the three consented wind farms is therefore considered to be **minor,** which is not significant in EIA terms.

5.1.3.141 The static gear fleet is considered to be of medium sensitivity and there is expected to be a medium magnitude of effect during construction. The significance of effect of the modified OfTI in conjunction with the three consented wind farms during construction is therefore considered to be **moderate**, which is significant in EIA terms. It is considered however, that the mitigation suggested above will result in a residual effect of **minor**, which is not significant in EIA terms.

Modified OfTI, Three Consented Wind Farms, WDA and BOWL

5.1.3.142 There is the potential for interference to fishing vessels to increase due to the presence of works vessels for the BOWL project and WDA in conjunction with those present for the three consented wind farms and modified OfTI. Assuming BOWL follow the standard guidelines highlighted above, it is considered that there will be no increase in the cumulative effect on the towed gear vessels (i.e. **minor adverse** during the construction and operational phases) and static gear vessels (**moderate adverse** during construction and **minor adverse** during operation).

5.1.3.143 It is assumed that BOWL will have the same standard mitigation as discussed above and, as they are also a member of the MFCFWG, the residual effect on the static gear fleet will be **minor adverse**.

5.1.3.144 The sensitivity of towed gear vessels is considered to be low and the magnitude of effect is also low. The significance of effect during both the construction and operational phases of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA is therefore considered to be **minor,** which is not significant in EIA terms.

5.1.3.145 During operation, the static gear fleet is considered to be of medium sensitivity and low magnitude. The significance of effect of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA is therefore considered to be **minor,** which is not significant in EIA terms.

5.1.3.146 The static gear fleet is considered to be of medium sensitivity and there is expected to be a medium magnitude of effect during construction. The significance of effect of the modified OfTI in conjunction with the three consented wind farms, BOWL project and WDA during construction is therefore considered to be **moderate**, which is significant in EIA terms. It is considered however, that the mitigation suggested above will result in a residual effect of **minor**, which is not significant in EIA terms.

Modified OfTI, Three Consented Wind Farms and Unconsented but Reasonably Foreseeable Projects

5.1.3.147 There is the potential for interference to fishing vessels to increase due to the presence of works vessels for the unconsented developments in the Forth and Tay in conjunction with those present for the three consented wind farms and modified OfTI. It should be noted however that interference with these works vessels will only occur with fishing vessels operating in the Forth and Tay (i.e. over-15 m *Nephrops* vessels and scallop dredgers).

5.1.3.148 It is assumed that the unconsented project developers will follow the standard guidelines highlighted above and as such it is considered that there will be no increase in the cumulative effect on the towed gear vessels (i.e. **minor adverse** during the construction and operational phases).

5.1.3.149 The sensitivity of towed gear vessels is considered to be low and the magnitude of effect is also low. The significance of effect during both the construction and operational phases of the modified OfTI in conjunction with the three consented wind farms and the unconsented projects is therefore considered to be **minor,** which is not significant in EIA terms.

5.1.3.150 No cumulative effects arising from the construction and operation of the modified OfTI in conjunction with the three consented wind farms and unconsented projects on the static gear fleet have been identified.

Total Cumulative Effect

5.1.3.151 The total cumulative effect of all developments which have the potential to result in interference with fishing vessels during the construction phase is considered to be of **moderate** significance for static gear vessels, which is significant in EIA terms. It should be noted however that the mitigation discussed above will result in a residual effect of **minor** significance on the static gear fleet during construction, which is not significant in EIA terms.

5.1.3.152 The total cumulative effect on mobile gear vessels during both construction and operation is considered to be of **minor** significance, which is not significant in EIA terms.

Commentary on Developments
Other Offshore Wind Farms

5.1.3.153 The wide operational range of certain fishing vessels (in some instances all around the UK), may potentially result in some fisheries being affected by the development of other offshore wind farms around the UK. This is particularly the case for the nomadic scallop fishery, where there is the potential for temporary and/or complete loss of fishing grounds and the resulting displacement of fishing activity into other areas, to be a result of multiple offshore wind farm developments. The scale of displacement will depend upon the importance of scallop grounds in the vicinity of other developments, as well as the construction and operational programmes.

5.1.3.154 Additional consideration has been given to the nomadic scallop fishery. In the case of the nomadic scallop fleet, there are a number of proposed offshore wind farm developments around the UK which could affect the fishery in addition to the modified OfTI, MORL three consented wind farms, WDA, BOWL project and unconsented projects in the Forth and Tay. Proposed developments located in the vicinity of scallop fishing grounds are listed below and can be seen in **Error! Reference source not found.**:

- Rampion Round 3 Zone;
- Irish Sea Round 3 Zone; and
- First Flight Offshore Wind Farm Zone.

5.1.3.155 Although project details are available for the Rampion Round 3 Zone development, it has not been considered feasible to undertake a robust assessment on the nomadic scallop fleet on a national scale using the limited information currently available for the other projects. As such, a commentary has been provided to discuss the potential cumulative effects on the nomadic scallop fleet.

5.1.3.156 The cumulative effect upon the nomadic scallop fishery is dependent upon the productivity of grounds affected and the scale of effect identified for each development. Information available for the projects listed above is not currently detailed enough to quantify the scale of effect upon the nomadic scallop fishery. It is, however, considered that in each instance the scale of effect will be largely defined by the engineering design and construction schedules of individual developments and the ability of vessels to regain access to grounds once the sites are operational.

Marine Energy Developments in the Pentland Firth and Orkney Waters

5.1.3.157 The receptors affected by the modified OfTI have not for the most part been identified as operating within the Pentland Firth and Orkney waters, although it is recognised that in certain years the squid fishery may attract vessels from around the Scottish coast, including the Orkney Islands, depending upon the productivity of the fishery. As a result, the marine developments in the Pentland Firth, including the MeyGen tidal project, will not have a cumulative effect.

SHE-T Cable

5.1.3.158 The construction activities during the installation of the proposed SHE-T cable and the modified OfTI have the potential to cumulatively affect fishing activities. The scale of effect will depend upon the construction schedule and the status of the infrastructure in the operational phase.

Shipping and Navigation

5.1.3.159 The principal cumulative effect of shipping and navigation upon commercial fishing activities is discussed in Chapter 5.2: Shipping and Navigation.

Offshore Oil and Gas Development

5.1.3.160 There is currently oil and gas development in the Greater Beatrice Area of the Moray Firth. This includes Beatrice Field infrastructure and the Jacky platform and corresponding subsea flow lines. All vessels are prohibited from within 500 m of any such infrastructure. Included within the oil and gas infrastructure are two operational demonstrator wind turbines. The existing Beatrice and Jacky infrastructure currently limits fishing activity in the Moray Firth as a result of these safety zones and the modified OfTI, MORL consented wind farms, BOWL project and WDA will cumulatively add to this. It is also noted that the offshore demonstrator turbines currently operational in the Moray Firth are located within the footprint of the safety zone currently encompassing the Greater Beatrice Field infrastructure. Site investigation surveys for currently licensed and unlicensed blocks may also temporarily displace fishing activity but the extent of such an effect is currently unknown.

MPAs and other Closed/Restricted Areas

5.1.3.161 MPAs currently in place have had the effect of restricting fishing activities in certain areas, particularly those activities affecting the seabed (i.e. bottom towed gear). For example, in Cardigan Bay (a designated Special Area of Conservation (SAC)), all scallop dredging is prohibited. It is considered that the Marine Conservation Zone (MCZ) announcements in England and Wales and the Nature Conservation MPAs in Scotland will enforce additional limitations upon certain, if not all, fishing activities in the future.

5.1.3.162 The potential for cumulative effects of the modified OfTI, MORL consented wind farms, WDA, BOWL project and unconsented developments in the Forth and Tay in

conjunction with existing and proposed MPAs in the Moray Firth (for example the proposed Southern Trench MPA) and wider area (with particular reference to the nomadic scallop fleet) is noted, although it is not possible to quantify the cumulative significance of the effect.

5.1.3.163 There are additional fisheries management policies in place which also restrict or prohibit certain or all type of fishing activities. Such restrictions may be seasonal or annual and are subject to review. There are not currently any restricted or closed areas in the Moray Firth.

5.1.3.164 Management policies around the UK which result in restricted access to grounds have the potential to affect the nomadic scallop fleet (for example, the closure in Isle of Man waters). It is possible that additional closed areas may apply in the future.

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