

# European Offshore Wind Deployment Centre Environmental Statement

## Appendix 21.2: Commercial Fisheries EIA Technical Report





# European Offshore Wind Deployment Centre (EOWDC)

## Commercial Fishing Impact Assessment

Undertaken by  
Brown & May Marine Ltd

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## Commercial Fisheries

### Information for the Non-Technical Summary

Commercial fishing activities in the region within which the proposed EOWDC site is situated are considered to be at relatively low levels. Potting for crab and lobsters; demersal otter trawling for whitefish and nephrops; and dredging for scallops, account for the majority of the activity within the regional area.

With regards to the local area, from consultation with the Scottish Fishermen's Federation (SFF), local fishermen and the District Fishery Officer, it is understood that only four, 11-metre and under demersal trawlers actively fish in the area of the site, targeting mainly flatfish. Two of the vessels operate out of Aberdeen and two from Peterhead (Section 10.3 Baseline Assessment).

Whilst larger trawlers operating out of Aberdeen may transit through the site, in view of the operating costs of these larger vessels, the area of the site is not sufficiently productive to justify such vessels actually fishing within it.

The principal fishing grounds for potting are located further south and to the north of the site (Section 10.2 Baseline Assessment). During consultation with local potting skippers, it was stated that the proposed EOWDC site is not recognised as a productive potting ground.

In view of the limited number of turbines proposed, the small area of the site and the low level of fishing activity within it, the overall impacts on commercial fishing are expected to be negligible, although for a small number of local vessels, the potential impacts may be of minor significance.

### Introduction

In the absence of published guidelines from Marine Scotland regarding the impacts that could potentially be sustained by commercial fishing via the introduction of offshore renewable developments in Scottish waters, the impacts requiring assessment for the proposed EOWDC development are as specified in the Cefas/MCEU (2004) Guidelines, which are as follows;

- Adverse impacts on commercially exploited species
- Complete loss of or restricted access to traditional fishing grounds
- Safety issues for fishing vessels
- Interference with fisheries activities
- Increased steaming times to fishing grounds
- Presence of seabed obstacles and obstruction
- Any other concerns raised by local fishermen and fishing organisations

The assessments of the above impacts are addressed separately for the construction/decommissioning phases and operational phase in terms of site specific and cumulative effects.

It is considered that the potential impacts associated with the decommissioning phase will be of no greater significance than those of the construction phase, and in view of the absence of piling will, in reality, be less.

### Methodology Consultation

Consultation with local fishermen and other stakeholders was principally undertaken by the Scottish Fishermen's Federation (SFF) between 2008 and 2010. The SFF represent approximately 90% of Scottish fishermen.

In addition, direct consultation was undertaken with the skippers and owners of the vessels who were identified as fishing in the area of the development, and the District Fisheries Officer, between October 2010 and January 2011.

The individuals and organisations consulted were:

- Aberdeen District Fisheries Office (281010);
- Fisheries Research Services (211107);
- Scottish Fishermen's Federation (211107);
- Sydney McLean – Boy Paul – Peterhead (170111);
- Ricky Greenhowe – Skua II- Aberdeen (170111);
- John Anderson – Tern – Aberdeen (170111);
- Stuart Willox – Maddie Marie – Peterhead (170111); and
- Scottish Inshore Fish Producers Association (December 2007 & 150211).

### Key Guidance Documents

For both the baseline and impact assessments account has been taken of the following;

- Offshore Wind Farms, Guidance Note for Environmental Impact Assessment in Respect of FEPA and CPA Requirements - Version 2; Cefas, MCUE, Defra, DTI, June 2004
- Strategic Environmental Assessment (SEA) of Draft Plan for Offshore Wind Energy in Scottish Territorial Waters: Volume 1: Environmental Report; Marine Scotland 2010
- UK Offshore Energy – Strategic Environmental Assessment; DECC, January 2009
- Recommendations for Fisheries Liaison; FLOW, May 2008
- Fisheries Liaison Guidelines – Issue 5; UK Oil & Gas, 2008
- Guidelines to Improve Relations between Oil & Gas Industries and Near-shore Fishermen, UKOOA (renamed UK Oil & Gas), August 2006
- Fishing & Submarine Cables – Working Together, International Cable Protection Committee (CPC), February 2009
- Options and Opportunities for Marine Fisheries Mitigation Associated with Wind Farms, COWRIE 2010.
- Scoping Response -Marine Scotland (15.12.10)

## Data Information and Sources

The principal data and information sources used were:

- International Council for the Exploration of the Sea (ICES)
- Marine Management Organisation (MMO)
- Marine Scotland, Marine Science (MS)
- Scottish Fisheries Protection Agency (SFPA)
- European Fisheries Commission (Europa)
- Brown & May Marine in-house databases

## Impact Assessment Methodology

The assessment aims to describe the magnitude of effect for each potential impact (i.e. the change created by an activity in terms of its spatial extent, duration and scale) and the sensitivity of each receptor (i.e. the environmental resources that would be affected) based on its importance and recoverability. The effect and sensitivity of the receptor are then used to derive the significance of each potential impact. The criteria used in the assessment are given below:

### **Spatial Extent of Effect**

- A national/international effect
- A regional effect
- A local, site specific effect including within 5km of the site

### **Duration of Effect**

- A long term/permanent effect (more than 10 years)
- A medium effect (existing for 5 to 10 years)
- A short term effect (existing for 1 to 5 years)
- A temporary effect (existing for less than 1 year)

### **Scale of Effect**

- Above accepted standards/guidelines
- Within accepted standards/guidelines
- Where there are no standards/guidelines available, the impact relative to background conditions

### **Recoverability of the Receptor**

- High
- Medium
- Low or None

### **Importance of the receptor (taking into account international, national and regional legislation, and function within the ecosystem)**

- High

- Medium
- Low or None

The impact significance is then given as **MAJOR**, **MODERATE**, **MINOR** or **NEGLIGIBLE** guided by the matrix given in Table 1.



Table 1 Matrix Used to Guide Significance Ratings of Impacts

		Sensitivity of Receptor			
		VERY HIGH	HIGH	MEDIUM	LOW
Magnitude of Effect (based on spatial, duration and scale)	VERY HIGH	Major	Major	Major	Moderate
	HIGH	Major	Major	Moderate	Minor
	MEDIUM	Major	Moderate	Moderate	Minor
	LOW	Moderate	Minor	Minor	Negligible
	NEGLIGIBLE	Minor	Negligible	Negligible	Negligible

Certain elements of the following assessments are based upon incomplete knowledge and data gaps. In such instances, the assessment may be based upon a number of assumptions and, therefore, a degree of uncertainty will exist.

### Implications of Significance

Where the significance for a potential impact is classified as **MODERATE to MAJOR** or **MAJOR**, it is considered to be a potentially significant effect. It should be noted however that significant effects may not be unacceptable as their effect may be reversible. A **NEGLIGIBLE** significance is assigned to a potential impact if it produces no discernible effect on the environment resource in question.

### Cumulative and In-combination Impact Assessment Methodology

The cumulative impact assessments have applied the same methodology and potential impacts outlined above.

In view of the limited number of vessels and their operational ranges in relation to the locations of designated Special Areas of Conservation (SAC) and Special Protected Areas (SPA) it is considered that there will be no in-combinations effects as defined under the Habitats Regulations Appraisal (HRA). Any impacts relating to salmon are dealt with in the EOWDC Salmon and Seat Trout Impact Assessment.

Cumulative impact assessments have been undertaken on all existing and any reasonably foreseeable project/development activities. The following elements that are considered to have the potential to contribute to cumulative impacts are;

- **Other Offshore Wind Farms**

The closest wind farm developments to the EOWDC site are the proposed Firth of Forth developments 58 km to the south and the Moray Firth developments 117 km to the north.

- **Shipping and Navigation**

The potential cumulative impacts associated with commercial shipping and navigation are discussed in Section 15 (Shipping and Navigation).

- **Offshore Oil Developments**

Currently available information suggests that within the foreseeable future, there will be no oil and gas exploration or production activities within the general area of the proposed EOWDC site which would contribute to cumulative effects. This activity has therefore been scoped out of the cumulative assessment process.

- **Introduction of Marine Protected Areas (MPAs)**

The Marine (Scotland) Act has established powers for the development of Marine Protected Areas (MPAs) in the seas around Scotland. These areas have yet to be defined so at present it is unclear as to the potential location of any future MPAs. It is however likely, given the nature of the seabed in the general area of EOWDC site, that no MPAs will be designated and as such will not contribute to a cumulative effect.

In terms of other spatial restrictions, as mentioned in the Baseline Assessment, there are no local fishing restrictions within 3 nm limit specific to the Aberdeen Bay area; however the use of mobile or active gear is prohibited during certain times of the year in four areas to the south of the site. These have therefore been scoped out of the cumulative assessment process.

- **Aggregate Dredging**

The Middle Bank licensed dredging area in the Firth of Forth, approximately 150 km from the EOWDC site is the closest licensed dredging area. It should also be noted however that at present it is not active. This activity has therefore been scoped out of the cumulative assessment process.

- **Other Offshore Works**

Due to erosion in Aberdeen Bay, the foreshore required beach replenishment works, with 70,000 cubic tonnes of material dredged from local offshore areas between July and August 2006. It is expected that such works will be required every five to seven years (pers. comm. FRS, 2007). It is therefore possible that beach replenishment works may occur within the general area of the EOWDC site during its lifespan.

- **Ocean Laboratory**

It is proposed that an Ocean Laboratory may be installed within the site and will be subject to separate application and EIA. As such, at this stage it will only be assessed in terms of its cumulative effect.

### Assessment of Impacts against a Changing Baseline

A number of factors unrelated to the proposed EOWDC development may cause changes to the commercial fishing baseline over the life of the project. For instance, the trend in UK commercial fishing over the last 30 years has been one of decline. This trend, with specific reference to Aberdeen, is detailed further in the Baseline Assessment (Section 6.0).

## Worst Realistic Case

As mentioned above, current trends in fishing indicate that levels of activity are unlikely to increase over the lifetime of the project. The impact assessment therefore assumes the current baseline as the worst realistic case in terms of the levels and types of fishing activity.

For the majority of impacts, the realistic worst case site layout is assumed to be the highest density of wind turbines within the site, i.e. 11 wind turbines, giving a minimum distance between turbine towers of 790 m. In terms of the smallest navigable distance between structures, the worst case would be jacket foundations which, with the implementation of 100 m safety zones, would leave spacing between turbines of 550 m. At present 50m safety zones around turbines are planned, which is in-line with other UK offshore wind farm sites. It is possible, however, that this zone could be up to 100 m and therefore 100 m should be assumed as worst case. A 200 m anchor exclusion is also planned around cables.

## Impact Assessment

### Adverse Impacts on Commercially Exploited Species

#### Construction & Decommissioning Phase

#### Potential Impacts

As discussed in Section 9 (Marine Ecology), the principal impacts which could adversely affect commercially exploited species, which are confined to the construction and decommissioning phases, are noise and vibration and habitat loss. Potting for crabs and lobsters, demersal otter trawling for whitefish and nephrops, and dredging for scallops accounted for the majority of the commercial fishing activity in the regional study area by recorded landings values.

Available research into the effects of noise and vibration suggests that the impacts on the main target species in the area of the development are not considered to be on the same scale as for hearing specialists such as clupeids (Nedwell & Howell, 2004). It is however accepted that fish and mobile shellfish species, such as crabs and lobsters, may temporarily vacate the site or a part of it as a result of noise or vibration disturbance.

The potential impacts on salmonids are discussed separately within the salmon and sea trout assessment for the proposed EOWDC.

As only 11 turbines are to be installed, the number of piling events will be small. Under normal conditions, based on data from wind farms constructed to date, the duration of piling individual foundations typically varies between 20 minutes and thirteen hours. For the purposes of assuming a worst case scenario, five days is taken as the theoretical maximum duration for the installation of a single foundation, with the worst case actual piling time being 24 hours continuous (further details in Chapter 3, Description of the Proposed Development).

Research at the Horns Rev Offshore Wind Farm also suggests that it is unlikely that there would be any significant long-term detrimental effect on the relevant commercial fish and shellfish stocks (Hydit *et al.*, 2006). To date, within UK waters, there is no available research data regarding the recovery time of localised shellfish stocks following piling. Observations of potters in, for example, the operational Barrow Offshore Wind Farm, however, suggest that within a matter of months, crabs and lobsters return to an operational site in sufficient quantities to support resumption of commercial potting activities, indicating no longer term adverse impacts. Figure 1 shows a 10 metre potter which recommenced working in the operational Barrow wind farm site within a matter of months following completion of construction works.



Figure 1 10 metre Fishing in the Barrow Wind Farm

The installation of turbines and the laying and burial of the intra-field and export cables, is, as stated in Section 9, not expected to increase suspended sediment concentrations to levels which would have any significant adverse impact on commercially exploited species.

It is predicted that potential impact of the proposed EOWDC on commercially exploited species will be of *MEDIUM* sensitivity, *LOW* magnitude and therefore of *MINOR* significance.

### Mitigation

In order to minimise, as far as is practically possible, any potential impacts from piling noise, in line with standard practice, soft start piling will be employed.

## Residual Impacts

In view of the above, it is predicted that the potential site specific impact will be localised, temporary and at worst of *MINOR* significance and confined to the local area.

It is likely that the decommissioning phase would be over a shorter time frame than construction and would not involve piling. The impacts are therefore expected to be of lower significance than during the construction phase.

## Cumulative Impacts

### Other Offshore Wind Farms

The potential cumulative impact of noise and vibration and increased sediment concentrations, as a result of piling and cable burial activities from other offshore wind farm developments, is discussed in Section 9 (Marine Ecology). The closest wind farm developments to the EOWDC site are the proposed Firth of Forth developments 58 km to the south and the Moray Firth developments 117 km to the north. It is unlikely all three developments would be under construction or decommissioning at the same time. The potential cumulative impact has therefore been assessed to be of *NEGLIGIBLE* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### Shipping & Navigation

The principal impact which could adversely affect commercially exploited species during the construction or decommissioning phase is noise. This is discussed in Section 9 (Marine Ecology), which predicts the contribution to cumulative effects to be of *LOW* sensitivity, *LOW* magnitude and, as such, of *NEGLIGIBLE* significance.

### Other Offshore Works

It is unlikely that beach replenishment works in Aberdeen Bay would coincide with the construction or decommissioning phase of the EOWDC. Should this occur however, the comparative sediment levels from the foundation piling and cable installations would be low, localised and over a short duration so that the contribution to cumulative effects would be of *LOW* magnitude with *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### Ocean Laboratory

In view of the limited number of wind turbines, the contribution of an additional piling event for the construction of the offshore Ocean Laboratory to cumulative effects is expected to be of *LOW* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### Operational Phase

#### Potential Impacts

As discussed in Section 9 (Marine Ecology), there is little evidence to suggest that the principal commercially targeted species, i.e. flatfish, in the proposed EOWDC site would be adversely affected by the electro-magnetic effects of inter-array and export cables.

It is therefore predicted that the potential impact will be of *LOW* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### Mitigation

The presence of foundation structures will provide refuge for mobile species and increase the surface area for colonisation of prey species and/or for the settlement of juvenile shellfish. The addition of scour protection, if used, would provide additional habitat and shelter for commercially important fish and shellfish species, thus resulting in a *BENEFICIAL* impact.

A study (Linley *et al.*, 2007) undertaken on behalf of BERR on the reef effects of offshore wind farms supported this and provided the following findings:

- The structures may result in new habitat opportunities, extending the distributions of some mobile species such as crabs, lobsters and finfish, thereby enhancing the productivity of these populations and subsequently commercial fishing in the area;
- There is evidence to indicate that juveniles of some species such as whiting, crabs and lobsters preferentially use rocky reefs as a habitat which suggests that the scour protection on turbines may offer direct benefits to these species;
- The high niche diversity (including interstitial spaces between rocks) is likely to promote recovery from storm events, reduce predation and support a more bio-diverse community than could be expected from unprotected turbines.

Sampling programmes undertaken at the Horns Rev and Nysted Offshore Wind Farms concluded that the hard substrate around turbine bases was beneficial to the reproduction and growth of native mobile species such as crabs, providing shelter and nursery grounds (presented by S. Leonhardt at the Danish Monitoring Programme Conference, November 2006).

### Residual Impacts

The residual impact of the proposed EOWDC on commercially exploited species during its operational phase is likely to be *NEGLIGIBLE* significance and in some cases potentially *BENEFICIAL* which in turn could have a *BENEFICIAL* effect for certain fishing methods such as potting.

### Cumulative Impacts

As the operational EOWDC is expected to have no significant adverse impacts on commercially exploited species, it will therefore not make any contribution to cumulative effects.

## Complete Loss of or Restricted Access to Traditional Fishing Grounds

### Construction & Decommissioning Phase

#### Potential Impacts

The complete loss of, or restricted access to, traditional fishing grounds was the primary concern raised by local fishermen actively fishing in the area of the proposed EOWDC site. A significant adverse impact would only occur if there were no alternative local fishing areas of similar productivity. As shown by the Baseline Assessment, the levels of activity within the site are low and confined to very few local vessels. In addition, the overall area of the site is small and the construction phase over a relatively short period. As such, the potential impact has been assessed to be of *LOW* magnitude, *MEDIUM* sensitivity and therefore of *MINOR* significance for those local vessels known to fish the area.

#### Mitigation

Whilst construction safety procedures and schedules have yet to be finalised, it is envisaged that an exclusion zone will be in operation during the construction of the EOWDC. As a worst case approach, this would include a 500 m zone around all inter array cable, foundation and turbine installation works. In practice, it may be that smaller sections of the site would be subject to the exclusion zone at any one time. Similarly, during the export cable burial works, vessels not associated with the EOWDC would be expected to keep 500 m away from all cable installation works. Export cable burial is expected to take approximately 52 hours in total at 500 m/hour for a maximum length of 26 km.

On-going liaison will be maintained to ensure fishermen are informed of construction/decommissioning vessels schedules and routes.

#### Residual Impacts

In the national and regional contexts, the impact of loss of fishing area will be of *NEGLIGIBLE* significance. In the case of the four local vessels identified as fishing the area of the EOWDC site and export cable route the temporary residual impact is expected to be of *MINOR* significance.

#### Cumulative Impacts

##### Other Offshore Wind Farms

In view of the limited number of vessels actively fishing in the area, their operational ranges, and that the closest wind farm developments are 58 km and 117 km from the proposed EOWDC site, it is considered that the potential cumulative impact will be of *NEGLIGIBLE* magnitude, *LOW* sensitivity and subsequently of *NEGLIGIBLE* significance.

#### Shipping & Navigation

The potential cumulative effect with shipping and navigation is discussed in Section 15 (Shipping and Navigation) however, overall, it is considered to be *NEGLIGIBLE* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### Other Offshore Works

If beach replenishment works in Aberdeen Bay were to occur during the construction or decommissioning phase of the project, in view of the number of vessels involved, the potential impact would be of short duration and localised and as such considered to be of *NEGLIGIBLE* significance.

### Ocean Laboratory

The cumulative effect of an additional piling event for the construction of the offshore Ocean Laboratory is expected to be of *LOW* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### Operational Phase

#### Potential Impacts

An adverse impact will only occur if fishing vessels which previously fished the site could not return to it once construction activities had been completed. As previously stated, only four demersal trawlers, who fish the area for only part of the year, have the potential to be impacted. The evidence given in the Baseline Assessment also suggests that the majority of these vessels fishing areas are inshore of the site.

As such in the national and regional contexts, the potential impact for larger vessels has been assessed to be of *LOW* magnitude, *LOW* sensitivity and subsequently of *NEGLIGIBLE* significance. In the case however, of the four local vessels identified as fishing the area of the EOWDC site, the impact is expected to be of *MEDIUM* magnitude, *MEDIUM* sensitivity and consequently of *MODERATE* significance.

### Mitigation

Evidence from UK wind farms has shown that demersal trawling and certain other fishing methods can resume within operational wind farms. A minimum blade clearance height of 22 m is in excess of the air height of the largest UK fishing vessels. Figure 2 shows a 10 metre demersal trawler fishing inside the Kentish Flats Offshore Wind Farm and Figure 3 is a photograph taken onboard a 24 metre demersal trawler hauling its net inside the Barrow Offshore Wind Farm.





Figure 2 10 metre Vessel Fishing in the Kentish Flats Offshore Wind Farm



Figure 3 24 metre Vessel Fishing in Barrow Offshore Wind Farm

## Residual Impacts

Whilst fishing may resume within the operational site once the construction exclusion zones have been removed, with some modifications to towing patterns and gears, there will be a small loss of fishing area resulting from the safety zones around the turbines which could result in an adverse impact of *MINOR* significance on the four local vessels known to fish the area.

This may however be compensated by increased concentrations of fish attracted into the site as a consequence of the addition of underwater structures, which has been shown to be the case in the Kentish Flats Offshore Wind Farm (pers. comm. Whitstable skippers 2011). The residual loss of fishing area is therefore considered to be of *NEGLIGIBLE* significance and there may in fact be potentially *BENEFICIAL* effect for certain methods.

## Cumulative Impacts

### Other Offshore Wind Farms

In view of the limited number of vessels actively fishing in the area, their operational ranges, and that the closest wind farm developments are 58 km and 117 km from the proposed EOWDC site, it is considered that potential cumulative impacts will be of *NEGLIGIBLE* magnitude, *LOW* sensitivity and subsequently of *NEGLIGIBLE* significance.

### Shipping & Navigation

The potential cumulative impacts with commercial shipping and navigation are discussed in Section 15 (Shipping and Navigation) and are assessed to be of *NEGLIGIBLE* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### Other Offshore Works

If beach replenishment works in Aberdeen Bay were to occur, it could result in some temporary loss of close inshore fishing areas. As such the cumulative impact has been assessed to be of *LOW* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### Ocean Laboratory

The cumulative effect of an offshore Ocean Laboratory is expected to be of *NEGLIGIBLE* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

## Safety Issues for Fishing Vessels

### Construction & Decommissioning Phase

#### Potential Impacts

In line with standard practice, construction exclusion zones will be in place around all offshore construction activities from which all vessels other than construction vessels will be excluded. Risks to fishing vessels safety would therefore only occur if infringements of these safety zones occurred. It should also be recognised that in line with standard maritime practice, the ultimate responsibility in regards to safety lies with the master of a vessel. With compliance with the imposed safety zones, the safety risks to fishing vessels should be within acceptable limits. This issue is considered further within the Navigational Risk Assessment (appendix 15.1).

#### Mitigation

Obligatory formal notices (Notice to Mariners), fisheries liaison and distribution channels will be established to ensure that construction and safety information is efficiently and effectively disseminated to the relevant skippers and vessel owners.

It is also envisaged that the Scottish Fishermen's Federation (SFF), who have over 30 years experience in dealing directly with oil interests in the North Sea, will play an important role in fisheries liaison and information distribution.

The Navigation Risk Assessment (Section 15) considers that, providing skippers of fishing vessels are aware of, and respect, safety exclusion zones, the safety risks during construction would be within acceptable limits.

#### Operational Phase

The safety issues associated with the operational phase are discussed in Section 15 which considers that with appropriate mitigation in place any potential impacts are deemed to be of low significance.

Providing standard offshore safety procedures are implemented and skippers of fishing vessels adhere to them, the safety risks would be considered to be within acceptable limits.

## Interference to Fishing Activities

### Construction & Decommissioning Phase

#### Potential Impacts

All of the potential impacts included in this assessment could be considered to cause interference to fishing activities. The only other impact yet to be considered is the potential navigational conflicts which may arise between construction/decommissioning/survey vessels and fishing vessels such as the fouling of static gear marker buoys and dhans or causing trawlers to change their towing directions. Due to the low number of fishing vessels in the proposed EOWDC area the potential impact has been assessed to be of *LOW* magnitude, *MEDIUM* sensitivity and therefore of *MINOR* significance.

## Mitigation

Where possible, construction and decommissioning vessels will adhere to established transit routes. On-going liaison will also be maintained to ensure fishermen are informed of construction vessels schedules and routes.

Contractors laying and trenching the export cable will also be obliged to adhere to standard fisheries notification and liaison procedures as specified by the International Cable Protection Committee (ICPC).

Liaison will also be undertaken to identify the locations of static gears to provide contractors with the required information in order to enable them to avoid conflicts with static gears.

## Residual Impacts

With the procedures described above, residual impact is expected to be of *NEGLIGIBLE* significance.

## Cumulative Impacts

Taking into consideration the limited number of vessels actively fishing in the area, the distance from other developments and activities, and with adherence to standard procedures and on-going liaison, the potential of cumulative interference effects are predicted to be of *NEGLIGIBLE* significance.

### Operational Phase

## Residual Impacts

It is predicted that, with adherence by maintenance vessels to the same procedures as described above for construction vessels, the impact will be of *NEGLIGIBLE* significance.

## Cumulative Impacts

Similarly, as with the construction and decommissioning phases, there is not expected to be any significant cumulative effects.

## Increased Steaming Times to Fishing Grounds

### Construction & Decommissioning Phase

## Potential Impacts

The implementation of safety exclusion zones, described above, could in theory, result in short-term increases in steaming distances and times, and therefore higher operational costs. In the worst case, the entire site would be closed to all vessels, including fishing vessels for the duration of construction and decommissioning activities. The experience of the construction of wind farms in the UK to-date however indicates that this is unlikely to be the case with exclusion zones being temporary and transitory around specific construction activities.

Figures 8.1 to Figures 8.8 in the Baseline Assessment give examples of 15 metre and over UK fishing vessels entering and exiting Aberdeen harbour through the area of the proposed EOWDC site in transit to fishing grounds further afield. It can be seen that these vessels steam to fishing grounds often in excess of 200 nm from Aberdeen Harbour and any increase in overall steaming distances and times due to deviations around the site would be considered to be minimal. As such the potential impact has been assessed to be of *LOW* magnitude, *LOW* sensitivity and subsequently of *NEGLIGIBLE* significance.

In the case of the smaller local vessels, a significant proportion of their traditional fishing grounds are located inshore of the EOWDC site, as indicated by the example of plotter tracks shown in the Baseline Assessment (Figure 10.11). It is however accepted that during the construction and decommissioning phases, there may be occasions when the presence of safety exclusion zones may temporarily increase the steaming times of local vessels with a history of fishing in and around the EOWDC site area. As a result, the potential impact is considered to be of *LOW* magnitude, *MEDIUM* sensitivity and subsequently of *MINOR* significance.

### **Mitigation**

During the construction and decommissioning phases, the appropriate notifications will be provided, and on-going liaison will be maintained, to keep skippers of fishing vessels informed of the schedule of the imposition of exclusion zones around construction and decommissioning activities.

### **Residual Impacts**

In the case of the larger class of vessels, whose fishing grounds are considerable distances from the site, it is predicted that the impact on steaming times will be of *NEGLIGIBLE* significance. For the smaller local vessels the temporary impact will be of *MINOR* significance.

### **Cumulative Impacts**

#### **Other Offshore Wind Farms**

The potential cumulative impacts are considered to be of *NEGLIGIBLE* significance, with a *NEGLIGIBLE* magnitude and *LOW* sensitivity, as the closest wind farm developments are 58 km and 117 km from the proposed EOWDC site.

#### **Shipping & Navigation**

The potential cumulative impacts with commercial shipping and navigation are discussed in Section 15 (Shipping and Navigation) and expected to be of *NEGLIGIBLE* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

#### **Other Offshore Works**

If beach replenishment works in Aberdeen Bay were to occur at the same times as construction and decommissioning activities, it could result in some temporary increases to

steaming times. As such the potential cumulative impacts has been assessed to be of *LOW* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### **Ocean Laboratory**

The cumulative effect of an offshore Ocean Laboratory is expected to be of *NEGLIGIBLE* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

### **Operational Phase**

#### **Potential Impacts**

An adverse impact on steaming times would only occur if fishing vessels were prohibited or were unable to safely steam through the operational EOWDC site. Consultation undertaken by the SFF with fishermen and their representatives has identified concerns regarding the safety of steaming through operational wind farms.

The worst case scenario of 11 turbines with jacket foundations would result in a minimum navigable distance between turbine centres of 550 m, this allows for a 100 m exclusion zone and turbine base. This distance is substantially greater than many commercial harbour approach channels and entrances, including Aberdeen Harbour.

As a result the potential impact is predicted to be of *LOW* magnitude, *LOW* sensitivity and therefore of *NEGLIGIBLE* significance.

#### **Mitigation**

As stated above, there is evidence to show that fishing vessels fish within operational wind farms where the distance between turbine rows range from 500 m to 700 m, e.g. Kentish Flats Offshore Wind Farm and Barrow Offshore Wind Farm. It is therefore reasonable to assume that in the appropriate conditions it should be possible for fishing vessels to steam through the EOWDC site.

#### **Residual Impacts**

As fishing and other vessels should be able to steam through the operational site, the impact on steaming times and distances during the operational phase is predicted to be of *NEGLIGIBLE* significance.

#### **Cumulative Impacts**

As the potential impact of the operational site on steaming times and distances has been assessed to be of *NEGLIGIBLE* significance, there is no potential for cumulative impacts.

## Presence of Seabed Obstacles and Obstructions

### Construction & Decommissioning Phase

#### Potential Impacts

Waste or debris left on the seabed by construction or decommissioning vessels could result in damage or loss of fishing gears, as well as representing a safety hazard. Offshore works such as cable trenching, construction vessel anchoring or jack up legs can produce seabed obstructions which have caused fastenings and damage to fishing gears.

As such, the potential impact is considered to be of *HIGH* sensitivity, *LOW* to *HIGH* magnitude and therefore of *MINOR* to *MAJOR* significance.

#### Mitigation

Contractors engaged will be contractually obliged and monitored to ensure compliance and adherence to company and standard offshore policies prohibiting the discarding of objects or waste at sea. They will also be required to report and recover any accidentally dropped objects. Furthermore seabed obstructions and spoils identified during post-construction monitoring, which might represent a hazard to fishing, will be rectified.

#### Residual Impacts

With compliance to obligatory standards by contractors and, if necessary, the implementation of rectification measures, the residual impacts are expected to be within acceptable limits and as such to be of *NEGLIGIBLE* significance.

#### Cumulative Impacts

As the impacts associated with construction and decommissioning phases of the EOWDC site are considered to be of *NEGLIGIBLE* significance, there is no potential for cumulative effects.

#### Operational Phase

As maintenance contractors will be under the same contractual obligations as construction and decommissioning contractors, the cumulative impacts of seabed obstacles will be the same as for the construction and decommissioning phases, i.e. of *NEGLIGIBLE* significance.

#### EOWDC Future Research and Monitoring Opportunities

The proposed EOWDC is designated as a development site in close proximity to a major fishing port; as such Marine Scotland's research facility offers opportunities for projects to be undertaken to research practical measures for enhancing the co-existence between operational wind farms and commercial fishing. Such projects could include:

- Trials using local fishing vessels to demonstrate the most appropriate and effective operating practices within operational wind farms for a variety of fishing methods.
- Sampling surveys using local fishing vessels to monitor potential reef effects during the operational phase.

- Trials into the practical and commercial viability of other fishing methods not currently used in the area by local vessels but which could be feasibly and productively deployed within operational wind farms.



### Summary of Impact Assessment

A summary of the various impacts assessed above is given in Table 2. As is apparent, the overall impact of the proposed EOWDC on commercial fishing is expected to be very small, being for the most part *NEGLIGIBLE* and in the few cases where discernable impacts might occur, they will be of no more than of *MINOR* significance.

In the national and regional contexts, in view of the limited number of turbines and the comparatively small area of the site, and relatively low levels of fishing activity, it is to be expected that the overall impact on commercial fishing will be so low as to be of *NEGLIGIBLE* significance.

With regards to the local context, the Baseline Assessment has determined that only four local vessels fish the site area and export cable route to any significant extent, and the fishing effort that does occur is at relatively low levels and seasonal. Whilst there could be some temporary impacts of *MINOR* significance associated with loss of fishing area during the construction and decommissioning phases, every endeavour will be made to liaise with skippers to mitigate these as far as is practically possible.

Once operational, it is expected that fishing will be able to resume within the site, however, changes in operating patterns maybe required, such as changing established towing patterns and some gear modifications e.g. shortening the fleet lengths of potting gear and fixed nets. It is possible, that as found in the operational Kentish Flats and Barrow Offshore Wind Farms, there may be a beneficial reef effect whereby fishermen can exploit concentrations of fish and shellfish attracted into the site.

As stated above, the EOWDC is to be an experimental site and should practical trials into the coexistence between commercial fishing and the operational site be undertaken, local vessels, provided they are suitably certified, could be used for the undertaking of such trials.

As discussed in chapter 9 (marine ecology) the principal impacts which could adversely affect commercially exploited species during the construction and decommissioning phases are noise, vibration and habitat loss and suspended sediment. After mitigation these impacts are deemed, at worst, to be of *MINOR* significance and confined to the local area. There is little evidence to suggest that the principal commercially targeted species, i.e. flatfish, in the proposed EOWDC site would be adversely affected by the electro-magnetic effects of inter-array and export cables during the operational phase, the potential impact is therefore deemed to be of *NEGLIGIBLE* significance.

Cumulative impacts are, for the most part, expected to be of *NEGLIGIBLE* significance. This is a consequence of the little offshore development, either existing or planned, in the vicinity of the site. Furthermore, as the EOWDC development is expected to result in very few impacts above *MINOR* significance, and those which do occur would be temporary and localised, the contribution of the development to cumulative impacts is expected to be minimal.

Table 2 Environmental Impact Assessment Summary Matrix

Potential Impact/ Activity	Receptor	Spatial extent	Duration	Magnitude	Probability of effect occurring	Sensitivity	Significance level	Mitigation measures and rationale	Significance level after mitigation
<b>CONSTRUCTION AND DECOMMISSIONING</b>									
<b>Adverse impacts on commercially exploited species</b>	All vessels	Local	Temporary	Low	Uncertain	Medium	Minor	Use of appropriate engineering techniques, e.g. soft start piling. Low sensitivity of principal target species.	Minor
<b>Complete loss of, or restricted access to traditional fishing grounds</b>	Larger vessels Local vessels	Local	Temporary	Low	Certain	Low Medium	Negligible Minor	Effective, on-going liaison	Negligible for larger vessels Possibly minor for local vessels
<b>Safety issues for fishing vessels</b>	All vessels	Local	Temporary	Low to High	Unlikely	High	Minor to major if collision occurred	Implementation and adherence to standard offshore safety procedures. Involvement of the SFF for liaison and information distribution.	Within acceptable limits
<b>Interference to fishing activities</b>	All vessels	Local	Temporary	Low	Unlikely	Medium	Minor	Construction vessels using existing shipping routes. On-going liaison informing skippers of construction vessels schedules and routes.	Negligible
<b>Increased steaming times to fishing grounds</b>	Larger vessels Local vessels	Local	Temporary	Low	Unlikely Likely	Low Medium	Negligible Minor	Transitory, short term exclusion areas around construction activities within the site. Limited numbers of potentially impacted vessels. Low probability of a significant number of steaming routes likely to be affected.	Negligible for larger vessels Possibly minor for local vessels

Potential Impact/ Activity	Receptor	Spatial extent	Duration	Magnitude	Probability of effect occurring	Sensitivity	Significance level	Mitigation measures and rationale	Significance level after mitigation
<b>Presence of seabed obstacles and obstructions</b>	All vessels	Site- specific	Temporary	Low to High	Uncertain	High	Minor to major if fastening occurred	Contractors are required to report and recover any accidentally dropped objects. Seabed obstructions and spoils identified during post-construction monitoring, which might represent a hazard to fishing, will be rectified.	Within acceptable limits
<b>Restriction of access during laying of export cables</b>	All vessels	Local	Temporary	Low	Certain	Low to medium	Negligible, possible minor for some local vessels	Short duration and small transitory area of exclusion. Limited numbers of potentially affected vessels.	Negligible, possibly minor for some local vessels
<b>OPERATIONAL</b>									
<b>Adverse impacts on commercially exploited species</b>	All vessels	Local	Temporary	Low	Unlikely	Low	Negligible	The presence of underwater structures will provide refuge for mobile species and increased surface area for colonisation of prey species and/or the settlement of juvenile shellfish. Scour protection, if used, will likely offer additional habitat for species by providing shelter and nursery grounds.	Negligible to beneficial
<b>Complete loss of, or restricted access to traditional fishing grounds</b>	Larger vessels  Local vessels	Local	Permanent	Low  Medium	Unlikely  Likely	Low  Medium	Negligible  Moderate	Certain fishing practices may resume within the operational site with some modification to operating practices.	Negligible to beneficial  Minor

Potential Impact/ Activity	Receptor	Spatial extent	Duration	Magnitude	Probability of effect occurring	Sensitivity	Significance level	Mitigation measures and rationale	Significance level after mitigation
<b>Safety issues for fishing vessels</b>	All vessels	Site-specific	Permanent	Low to High	Unlikely	High	Minor to Major if collision occurred	Implementation and adherence to standard offshore safety procedures.	Within acceptable limits
<b>Interference to fishing activities</b>	All vessels	Local	Permanent	Low	Unlikely	Medium	Minor	Maintenance vessels using existing shipping routes. On-going liaison informing skippers of maintenance vessels schedules and routes.	Negligible
<b>Increased steaming times to fishing grounds</b>	All vessels	Local	Permanent	Low	Unlikely	Low	Negligible	Potential for fishing vessels to steam through the site in favourable conditions. Limited numbers of potentially impacted vessels. Low probability of a significant number of steaming routes likely to be affected.	Negligible
<b>Presence of seabed obstacles and obstructions</b>	All vessels	Site-specific	Temporary	Low to High	Uncertain	High	Minor to Major if fastening occurred	Contractor obligations and standard offshore practices should have removed obstructions and obstacles. Any scour protection rock placement would be adjacent to wind turbine bases.	Within acceptable limits
<b>Damage to fishing gear/vessels from exposed cables</b>	All vessels	Site-specific	Temporary	Low to High	Unlikely	High	Minor to Major	Cable burial to at least 0.6 m depth. Implementation and adherence to standard offshore safety procedures. Cable route surveys. Temporary exclusion zones until issues are rectified.	Negligible to Minor

## References

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