

5 Human Environment

5.1 Commercial Fisheries

5.1.1 Introduction

5.1.1.1 This chapter summarises the baseline study of commercial fishing activities, including salmon and sea trout fisheries, in the vicinity of the three proposed development sites (Telford, Stevenson and MacColl) and the offshore transmission infrastructure (OfTI). For the purpose of this study, commercial fishing is defined as any legal fishing activity undertaken for declared taxable profit.

5.1.1.2 The following technical appendices support this chapter and can be found as:

- Technical Appendix 4.3 B (Salmon and Sea Trout Ecology Technical Report).
- Technical Appendix 5.1 A (Commercial Fisheries Technical Report).

5.1.1.3 For the purposes of this assessment, salmon and sea trout fisheries in the Moray Firth are separately addressed to other commercial fisheries, as a result of their being located largely in-river (with the exception of some coastal netting) and being different in nature to the majority of marine commercial fishing activities. In addition, due to the migratory behaviour of salmon and sea trout, fisheries have been assessed for all rivers flowing into the Moray Firth. It is also recognised that salmon is a qualifying feature or primary reason for Special Area of Conservation (SAC) site selection of the following rivers in the Moray Firth:

- Berriedale and Langwell Waters SAC (primary reason);
- River Moriston SAC (qualifying feature);
- River Oykel SAC (qualifying feature); and
- River Spey SAC (primary reason).

5.1.1.4 This chapter sets out the following:

- The responses from key statutory and non-statutory stakeholders to MORLs scoping requests for the offshore generation station and the TI and the draft Environmental Statement (ES);
- Baseline methodology for commercial fisheries and salmon and sea trout;
- The baseline characteristics of the area of the three proposed wind farm sites and the OfTI in terms of (1) commercial fisheries and (2) salmon and sea trout;
- Individual baseline characteristics for the three proposed wind farm sites; and
- The relevant legislative and planning context.

5.1.1.5 This baseline is used to inform the commercial fisheries impact assessment described in:

- Chapters 8.1, 11.1 and 15.1 (Commercial Fisheries); and
- Chapter 12.1 (Whole Project Assessment).

5.1.2 Consultations

5.1.2.1 The Moray Firth Offshore Wind Farm Developers Group (MFOWDG) has collaborated to hold joint discussions with commercial fisheries interests. The MFOWDG is committed to ensuring that a collaborative approach is continued, where feasible, in future stages of development.

Commercial Fisheries

5.1.2.2 MORL has engaged the local and wider fishing industry from the beginning of project development. Fishing Industry Representatives (FIRs) with an understanding of the fisheries undertaken in the areas of the developments, were recruited at an early stage to facilitate effective and ongoing development with the fishing community. In addition, regular updates have been held with the fishing community to discuss the Project and ascertain concerns. Consultation was undertaken and is ongoing with the organisations and individuals listed below. This consultation helped inform the baseline and impact assessments. The same commitment to engagement will be followed throughout the lifetime of the projects.

- Marine Scotland;
- Scottish Fishermen's Federation;
- Scallop Association;
- Caithness Static Gear Fishermen's Association;
- Fishermen's Association Limited;
- North East Inshore Fisheries Group; and
- A sample of regional fishermen.

5.1.2.3 In addition, Table 5.1-1, Table 5.1-2 and Table 5.1-3 below summarise the relevant scoping responses received for the proposals, and results of the draft ES consultation process.

Table 5.1-1 Summary of the Three Proposed Wind Farm Sites Scoping Responses

Organisation	Scoping Comments	MORL Response
Marine Scotland	The site is beyond the geographic remit of the local inshore fisheries groups, however they should be kept informed / consulted. Fishing statistics may not show activity from < 10 m vessels, however we would agree that these vessels, and indeed vessels < 15 m are unlikely to frequently operate this far offshore.	MFIFG consulted on proposals.
Moray Firth Inshore Fisheries Group	Commercial shellfish stocks are very important in the area. The juvenile scallops are not very mobile and can be susceptible to smothering by highly mobile sediments. Sediment loadings will need to be considered in the assessment, during construction and operation.	Sedimentary processes assessed in Chapters 3.5, 6.2, 9.2 and 13.2. Also covered in Chapters 7.1 and 10.1.
	The EIA process should consider how interactions with the fishing industry could be minimised and maximum access maintained both on a temporal and spatial basis.	Assessed in Chapters 8.1, 11.1 and 15.1.
	Operation exclusion zones should be evaluated within the EIA in order to accurately indicate the restrictions on the fishing industry.	Assessed in Chapters 8.1, 11.1 and 15.

Table 5.1-2 Summary of Transmission Infrastructure Scoping Responses

Organisation	Scoping Comments	MORL Response
Marine Scotland	There are no aquaculture sites within the proposed boundaries of the MORL wind farms. There is, however, an active mussel site close to where one of the initial options for the cable route corridor joins the land between Lossiemouth Forest and Portgordon.	Landfall point excluded from Rochdale Envelope.
Inshore Fisheries Group	There is a need to ensure that for fisheries with naturally highly variable landings, such as the scallop and squid fisheries within the Moray Firth, that any data analysis and the use of long term data averages does not mask the importance of such fisheries to the fishing community.	Each fishery is assessed in Chapters 8.1 and 11.1.
	In addition to historic landing patterns and values, it is also important to recognise the value of near shore fishing grounds and species in relation to national management measures of days at sea and quota restrictions placed on various fish stocks. The squid fishery has no such restrictions and is extremely economically important.	Each fishery is assessed in Chapters 8.1 and 11.1.

Table 5.1-3 Summary of Draft ES Consultation

Organisation	Consultation Response	MORL Response
Marine Scotland	When describing commercial species / fisheries it would be worth including figures with average value landed in £, as this will give a better indication of the commercial importance of the species to the fishing industry.	Included in Technical Appendix 5.1 A.
	When considering changes to fishing activity, the inter-array cabling and cable route should also be considered as this is what may affect types of fishing that can occur.	Assessed in Chapters 8.1 and 11.1.
	Complete exclusion of fishing by the scallop fleet from the MORL site would pose a significant impact to the fleet.	Assessed in Chapters 8.1 and 11.1.

Salmon and Sea Trout

5.1.2.4 Consultation was undertaken and is ongoing with the organisations and individuals listed below. Further information is included in Chapter 4.3 (Fish and Shellfish Ecology).

- Marine Scotland Science (MSS);
- Association of Salmon Fishery Boards (ASFB);
- Salmon Net Fishing Association of Scotland (SNFAS);
- District Salmon Fishery Boards (DSFBs) in the regional study area;
- Salmon Fishery Trusts and netsmen;
- Moray and Pentland Firths Salmon Protection Group (MPFSPG); and
- Moray Firth Sea Trout Project (MFSTP).

5.1.3 Baseline methodology for Commercial Fisheries and Salmon and Sea Trout Commercial Fisheries

Data and Information Sources

5.1.3.1 The principal sources of data and information used for the collation of the commercial fisheries baseline were:

- International Council for the Exploration of the Sea (ICES);
- Marine Management Organisation (MMO);
- Marine Scotland;
- Marine Scotland Science (MSS);
- District Fishery Officers (DFOs);
- The Scottish Fishermen's Federation (SFF); and
- Fishermen and their representatives.

5.1.3.2 Further details on the baseline methodology, including the sensitivities and qualifications of these data sources, are described in Technical Appendix 5.1 A (Technical Report).

Literature Review

5.1.3.3 The following reports were reviewed and relevant information included in the baseline (for a full reference list, see 5.1.9 below):

- ICES Stock Assessment Reports and other ICES publications of relevance;
- EC / National and Local Fisheries Legislation;
- Marine Scotland and Marine Scotland Science publications;
- Oil and Gas UK publications;
- CEFAS publications; and
- Any other relevant publications.

Statistical Datasets

5.1.3.4 The following statistical datasets were analysed for inclusion in the baseline:

- MMO Fisheries Statistics;
- MMO Surveillance Sightings;
- MMO UK Satellite Tracking (VMS) Data;
- Marine Scotland Satellite Tracking (VMS) Data; and
- Marine Scotland Data Analysis.

5.1.3.5 The data analysis methodology for commercial (offshore) fisheries is described in Technical Appendix 5.1 A (Commercial Fisheries Technical Report).

Salmon and Sea Trout

5.1.3.6 The principal sources of data and information used for the collation of the salmon and sea trout fisheries baseline were:

- MSS; and
- Consultation with regional DSFBs, salmon netmen and the Moray Firth Sea Trout Project.

5.1.3.7 The principal datasets used to inform the salmon and sea trout fisheries baseline were:

- MSS Salmon and Sea Trout Catch Data by Fishery Region (1952 to 2009);

- MSS Salmon and Sea Trout Catch Data by Salmon Fishery District (2000 to 2009); and
 - MSS Salmon and Sea Trout Netting Effort Data (2001 to 2010).
- 5.1.3.8 Each fishery in Scotland is required to provide the number and total weight of salmon, grilse and sea trout caught and retained during each month of the fishing season. In this context, the term salmon refers to multi-sea-winter salmon (MSW), whilst grilse refers to one-sea-winter salmon (1SW).
- 5.1.3.9 The catch data used for the purposes of this assessment are as reported. Where there are no records of reported catches, it has been assumed that no fish have been caught. It is recognised, however, that there may be a degree of error as a result of misreporting of catches. In addition, further errors may also exist within the catch dataset due to misclassification of fish between the grilse and salmon categories. The catch data used are as provided by MSS in October 2010. The effort data used are as provided by MSS in September 2011.
- 5.1.3.10 Rod-and-line fisheries are also required to provide the monthly numbers and total weight of those salmon, grilse and sea trout which were caught and released back into the river, a practice which is known as "catch and release". As a result, MSS catch data for the rod-and-line fishery is broken down into two categories, "rod-and-line" and "catch and release". Note that the total catch by the rod-and-line fishery is in effect the sum of the catches recorded in both categories. Where appropriate, data from both categories have been combined to give an indication of the total rod-and-line catch. Similarly, the catch by net-and-coble and fixed engines (bag and stake nets) (fishing methods which use nets to catch multiple fish) has been combined in some instances to provide an indication of the total catch by the net fishery.
- 5.1.3.11 The catch data used in this report are Crown copyright, used with the permission of Marine Scotland Science. Marine Scotland is not responsible for interpretation of these data by third parties. Further detail on the baseline methodology is given in Technical Appendix 4.3 B.

5.1.4 Study Area

Commercial Fisheries

- 5.1.4.1 The study areas for the assessment of commercial fishing intensity is in Figure 5.1-1, Volume 6 b. The approach has been to use a brief national overview (national study area), to provide context for the fishing grounds in the general area of the proposed development. The regional study area has been defined to ensure sufficient coverage of those areas surrounding the proposed development. The local area is the smallest available spatial unit used for the collation of fisheries statistics. When possible, fishing activities in the specific area of the proposed development and along the OfTI route have been further described.

Salmon and Sea Trout

- 5.1.4.2 The study areas used for the assessment of salmon and sea trout fisheries was defined at the local, regional and national level. The local study area focuses on the salmon fishery district (SFD) where the OfTI landfall is located; the Deveron district. The regional study area includes all salmon fishery districts with rivers flowing into the Moray Firth and the Ugie district. Given the migratory behaviour of salmon and sea trout and the importance of their fisheries across the country, a national scale has also been briefly described. The study areas defined for the salmon and sea trout fisheries assessment are given in Figure 5.1-2, Volume 6 b.

5.1.5 Baseline Characteristics of the Area of the Three Proposed Wind Farm Sites and the OSP (Part of the OffI) Locations for Commercial Fisheries (Excluding Salmon and Sea Trout)

Commercial Fisheries Overview

- 5.1.5.1 ICES rectangle 45E7, within which the three proposed wind farm sites are located, records landings values (average 2001 to 2010) that are of moderate importance on a national and regional scale (Figure 5.1-3 and Figure 5.1-4, Volume 6 b). The principal species targeted are:
- King scallops (55.4 %);
 - Nephrops (14.1 %);
 - Whitefish, including haddock, monks and cod (19.7 %); and
 - Squid (7.6 %).
- 5.1.5.2 The following methods are principally used: boat dredges to target scallops, otter trawls to target *Nephrops*, seine nets and otter trawls to target whitefish, and demersal trawls to target squid (Figure 5.1-5, Volume 6 b).
- 5.1.5.3 The majority of vessels operating in rectangle 45E7 are over-15 m in length (90.7 %) and therefore the activity of these vessels will be included within the satellite tracking (VMS) datasets. Vessels between 10 to 15 m in length account for a lower percentage of the vessels operating in 45E7 (8.0 %), with under-10 m vessels and non-UK vessels recording negligible values (1.0 % and 0.3 %, respectively) (Figure 5.1-6, Volume 6 b).
- 5.1.5.4 Landings values for all species from rectangle 45E7 are broadly highest between May and September, although there are also moderate landings recorded in April and October (see Commercial Fisheries Technical Report: Technical Appendix 5.1 A).
- 5.1.5.5 The majority of landings from rectangle 45E7 are into ports in the Moray Firth area (Table 5.1-4 below). Fraserburgh is the principal port, with 44.8 % of landings (values) from 45E7, although it should be noted that this only contributes 1.8 % of the port's total annual value. In contrast, ports such as Buckie (23.1 %), Wick (12.6 %) and Whitehills (0.6 %) record relatively smaller proportions of the landings values from 45E7, but these represent a larger proportion of each port's total value (12.6 %, 16.2 % and 15.4 %, respectively).

Table 5.1-4 Top Ten Ports by Landings Value from ICES Rectangle 45E7 (Source: MMO)

Port	Annual Landings Values (£) in the Local Study Area	% of Annual Value in the Local Study Area	Total Annual Port Value	% of Total Annual Port Value that the Local Study Area Represents
Fraserburgh	£756,592	44.8 %	£42,443,828	1.8 %
Buckie	£389,720	23.1 %	£3,101,428	12.6 %
Wick	£213,408	12.6 %	£1,316,196	16.2 %
Peterhead	£134,887	8.0 %	£92,541,652	0.1 %
Macduff	£91,077	5.4 %	£1,383,240	6.6 %

Port	Annual Landings Values (£) in the Local Study Area	% of Annual Value in the Local Study Area	Total Annual Port Value	% of Total Annual Port Value that the Local Study Area Represents
Scrabster	£34,683	2.1 %	£27,763,471	0.1 %
Aberdeen	£14,333	0.8 %	£10,608,148	0.1 %
Lochinver	£12,711	0.8 %	£32,813,888	0.0 %
Ullapool	£11,439	0.7 %	£13,565,030	0.1 %
Whitehills	£9,482	0.6 %	£61,577	15.4 %

Offshore Export Cable Route and DC OSP Location

5.1.5.6 The offshore export cable route and DC OSP location, part of the OfTI, pass through ICES rectangles 45E7, 44E7 and 44E8 (see Figure 5.1-1, Volume 6 b), which record landings of regional importance for:

- Nephrops;
- Scallops;
- Haddock;
- Squid; and.
- Crustaceans.

5.1.5.7 ICES rectangle 45E7, in which the northern section of the export cable route is located, and including the potential DC OSP locations, has been described in relation to the three proposed wind farm sites. The mid-section of the cable route passes through rectangle 44E7 which records high landings values of *Nephrops*, and to a lesser extent squid. The southern section of the offshore export cable route and the export cable landfall are located in rectangle 44E8, which records moderate landings values of haddock, *Nephrops* and crustaceans (crab and lobster).

5.1.5.8 The majority of vessels operating in rectangles 45E7, 44E7 and 44E8 are over 15 m in length (90.7 %, 75.7 % and 64.2 %, respectively) and therefore the activity of these vessels will be included within the satellite tracking (VMS) datasets. Vessels under 10 m in length record 23.2 % of the landings values of rectangle 44E8 (Figure 5.1-6, Volume 6 b).

5.1.5.9 Table 5.1-5 below shows that the majority of landings from rectangle 44E7 are into Fraserburgh (65.1 %), however this only represents 4.8 % of the port's total average annual value. Ports such as Whitehills (0.9) records relatively smaller proportions of the landings values from rectangle 44E7, but this represents a larger proportion of the port's total average annual value (45.3 %).

Table 5.1-5 Top 21 Ports by Landings Value from ICES Rectangle 44E7 (Source: MMO)

Port	Annual Landings Values (£) in the Local Study Area	% of Annual Value in the Local Study Area	Total Annual Port Value	% of Total Annual Port Value that the Local Study Area represents
Fraserburgh	£2,054,230	65.1 %	£42,443,828	4.8 %
Buckie	£652,547	20.7 %	£3,101,428	21.0 %
Macduff	£266,248	8.4 %	£1,383,240	19.2 %
Peterhead	£92,125	2.9 %	£92,541,652	0.1 %
Whitehills	£27,903	0.9 %	£61,577	45.3 %
Aberdeen	£8,003	0.3 %	£10,608,148	0.1 %
Scrabster	£7,711	0.2 %	£27,763,471	0.0 %
Burghead	£6,331	0.2 %	£553,123	1.1 %
Ullapool	£5,791	0.2 %	£13,565,030	0.0 %
Lossiemouth	£5,693	0.2 %	£155,708	3.7 %

5.1.5.10 Table 5.1-6 below shows that vessels operating in 44E8 mainly land their catch into Fraserburgh (58.2 %), although again this only represents 3.4 % of the port's total average annual value. Ports such as Gardenstown (0.3 %) records relatively smaller proportions of the landings values from rectangle 44E8, but this represents a larger proportion of the port's total average annual value (69.3 %).

Table 5.1-6 Top Ten Ports by Landings Value from ICES Rectangle 44E8 (Source: MMO)

Port	Annual Landings Values (£) in the Local Study Area	% of Annual Value in the Local Study Area	Total Annual Port Value	% of Total Annual Port Value that the Local Study Area represents
Fraserburgh	£1,460,681	58.2 %	£42,443,828	3.4 %
Peterhead	£756,338	30.1 %	£92,541,652	0.8 %
Aberdeen	£74,849	3.0 %	£10,608,148	0.7 %
Macduff	£57,511	2.3 %	£1,383,240	4.2 %
Scrabster	£55,490	2.2 %	£19,552,069	0.3 %
Buckie	£34,018	1.4 %	£3,101,428	1.1 %
Whitehills	£14,430	0.6 %	£61,577	23.4 %
Burghead	£10,688	0.4 %	£553,123	1.9 %
Gardenstown	£6,297	0.3 %	£9,091	69.3 %
Lochinver	£5,576	0.2 %	£32,813,888	0.0 %

Scallop Fishery

- 5.1.5.11 The principal species targeted in the immediate area of the proposed development is (king) scallops. Rectangle 45E7 records the highest scallop landings in the regional study area, £936,375 (averaged 2001 to 2010), and 55.4 % of the total value of landings of that rectangle.
- 5.1.5.12 King scallops are principally targeted by boat dredges. Scallop vessels generally tow either one or two beams, onto which a number of dredges are attached, depending upon vessel size, engine power and winch capacity. In Scottish waters, scallop vessels are restricted by the number of dredges that can be operated: within 6 nm no more than eight dredges per side are permitted, within 6 to 12 nm up to ten dredges aside are permitted and outside 12 nm vessels are allowed to operate up to 14 dredges per side. However, it is likely that a revision to scallop gear allowances in Scottish waters may be made in the near future, to align with those enforced in English waters: a limit of eight dredges aside inside 12 nm and no limit on the number outside of 12 nm (pers. comm., Scallop industry representative, 2012).
- 5.1.5.13 The principal type of dredge used is the English 'Springer' type, whereby the scallops are raked from the seabed by steel teeth that are attached along the leading edge of the dredges and which can penetrate the seabed to a depth of approximately 20 cm. Scallop dredging is not currently restricted by quota or effort and activity occurs year round, although it peaks in the summer months. Regional restrictions or closures may apply elsewhere, although there are none in place in the area of the three proposed wind farm sites at the present time.
- 5.1.5.14 The majority of vessels targeting scallops in the Moray Firth are over 15 m in length and as a result, analysis of VMS data is accurate in further describing their activities. Plate 5.1-1 below, Figure 5.1-7 and Figure 5.1-8 in Volume 6 b indicate that scallop dredging activity occurs in areas on and around the Smith Bank, including the three proposed wind farm sites, and in inshore areas along the Caithness and Moray coasts. In the case of Figure 5.1-7, Volume 6 b, 2008 data was selected as it showed the highest densities of activity over the three year period of available data. Annual fluctuations in activity should therefore be noted.

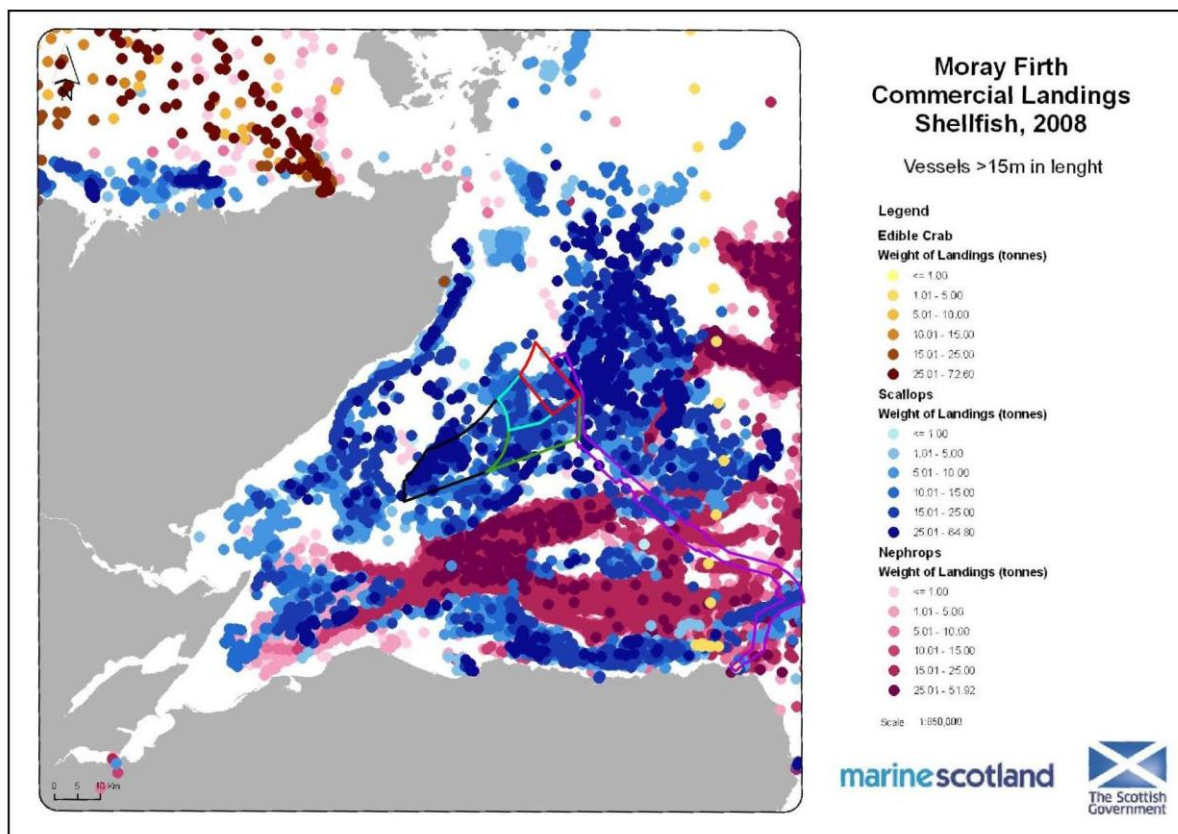


Plate 5.1-1 Moray Firth Commercial Landings Shellfish, 2008

- 5.1.5.15 Larger category scallop vessels are capable of fishing in difficult weather conditions and continuously for several days. These vessels are described as nomadic due to their geographical range; variously targeting grounds around the UK. Scallop fishing for the nomadic fleet is generally cyclical; grounds are intensively targeted for a period and then left to recover. Scallop grounds around the UK are on the Scottish east and west coasts, in the Irish Sea and the English Channel (Figure 5.1-9, Volume 6 b). The number of vessels in the Moray Firth will therefore vary annually, depending upon productivity and access to grounds.
- 5.1.5.16 In addition to the over 15 m fleet, several small category vessels with home ports in the Moray Firth operate full time in the area. Due to the limited operational range of these vessels, it is considered that their activity is restricted to grounds within the Moray Firth.
- 5.1.5.17 Scallop stock levels in the Moray Firth are considered to be stable, however other grounds around the UK, such as those located in Cardigan Bay and waters off the Isle of Man, have been subject to restrictions and closures as a result of concerns over scallop populations. Whilst this is currently not the case in the Moray Firth, it is nevertheless a possibility that future restrictions upon activity may apply.
- 5.1.5.18 The proposed development is located on scallop fishing grounds in the Moray Firth which are of moderate importance on a regional scale. Taking into account the nomadic nature of the fleet and access to grounds around the UK, however, the grounds are of low importance on a national scale.

OfTI: Offshore Export Cable Route and DC OSPs

- 5.1.5.19 The offshore export cable route and DC OSP location passes through rectangles which record scallop landings of moderate importance in the regional study area (Figure 5.1-4, Volume 6 b). Scallop activity is located along the northern portion of the cable route, and to a lesser extent in an inshore strip across the southern portion of the cable route (Plate 5.1-1 above).

Nephrops Fishery

- 5.1.5.20 *Nephrops* are the highest value shellfish species in the Moray Firth, with the highest recorded landings in southern and eastern rectangles of the regional study area (Figure 5.1-4, Volume 6 b). They constitute 14.1 % (£238,755) of the total value in 45E7 (averaged 2001 to 2010), which is of relatively low importance on a regional scale.
- 5.1.5.21 *Nephrops* are substrate specific, inhabiting burrows in muddy substrates. They are principally targeted by demersal otter trawlers in the Moray Firth. Vessels can employ either single or twin rig demersal gear with a 70 mm mesh cod end to target the species. Vessels target *Nephrops* year round although there are seasonal fluctuations in landings, with a peak recorded during the summer months (June to August) (Technical Appendix 5.1 A: Commercial Fisheries Technical Report). Weather conditions are a factor in determining levels of activity in the winter months, particularly for local vessels of limited size.
- 5.1.5.22 The majority of landings of *Nephrops* in 45E7 are recorded by vessels over 15 m in length (77.7 %), whose activities can be identified using VMS data (Figure 5.1-10, Volume 6 b), although smaller, inshore *Nephrops* vessels will also target the fishery. The VMS data and Marine Scotland analysis (Plate 5.1-1 above) indicate that there is negligible activity carried out by the over 15 m *Nephrops* fleet in 2008 and 2009 within the three proposed wind farm sites, with principal areas of activity located in the north east and south of the regional study area. Fishing grounds are consistent throughout the period of analysed data. Consultation with local *Nephrops* fishermen (Figure 5.1-11, Volume 6 b), the majority of whom operate vessels under 15 m, confirmed this.
- 5.1.5.23 The Moray Firth *Nephrops* fishery is currently considered to be harvested sustainably. However, in line with national commitments to reduce the overall fishing pressure, it is possible that further restrictions may affect the current baseline in the future.
- 5.1.5.24 Due to the fishery operating in other areas of the regional study area, *Nephrops* fishing grounds are of very low importance within the boundary of the proposed development.

Offshore Export Cable Route and DC OSPs

- 5.1.5.25 Plate 5.1-1 above identifies moderate densities of over 15 m vessels targeting *Nephrops* grounds along the mid and southern section of the offshore export cable route (Figure 5.1-10, Volume 6 b). As previously stated, consultation with fishermen (the majority of whom operate vessels under 15 m in length) identified *Nephrops* grounds in the south of the Moray Firth, in the vicinity of the southern section of the cable route (Figure 5.1-11, Volume 6 b). It was confirmed that the majority of grounds are located in the west of the Moray Firth.
- 5.1.5.26 The offshore export cable route and DC OSP location passes through *Nephrops* grounds of moderate importance in the regional study area.

Whitefish Fishery

- 5.1.5.27 The principal commercial whitefish species in the Moray Firth is haddock. Monkfish / anglerfish are also recorded at low levels. There are very low recorded levels of cod in the Moray Firth.
- 5.1.5.28 Whitefish in the Moray Firth are principally targeted by the over 15 m fleet. VMS data indicates that landings are relatively low, with a slight increase to the north of the proposed development (Figure 5.1-12, Volume 6 b). Haddock is the principal species targeted. Marine Scotland data analysis (Plate 5.1-2 below) shows low landings of cod in the same area, likely as a result of the mixed fishery.

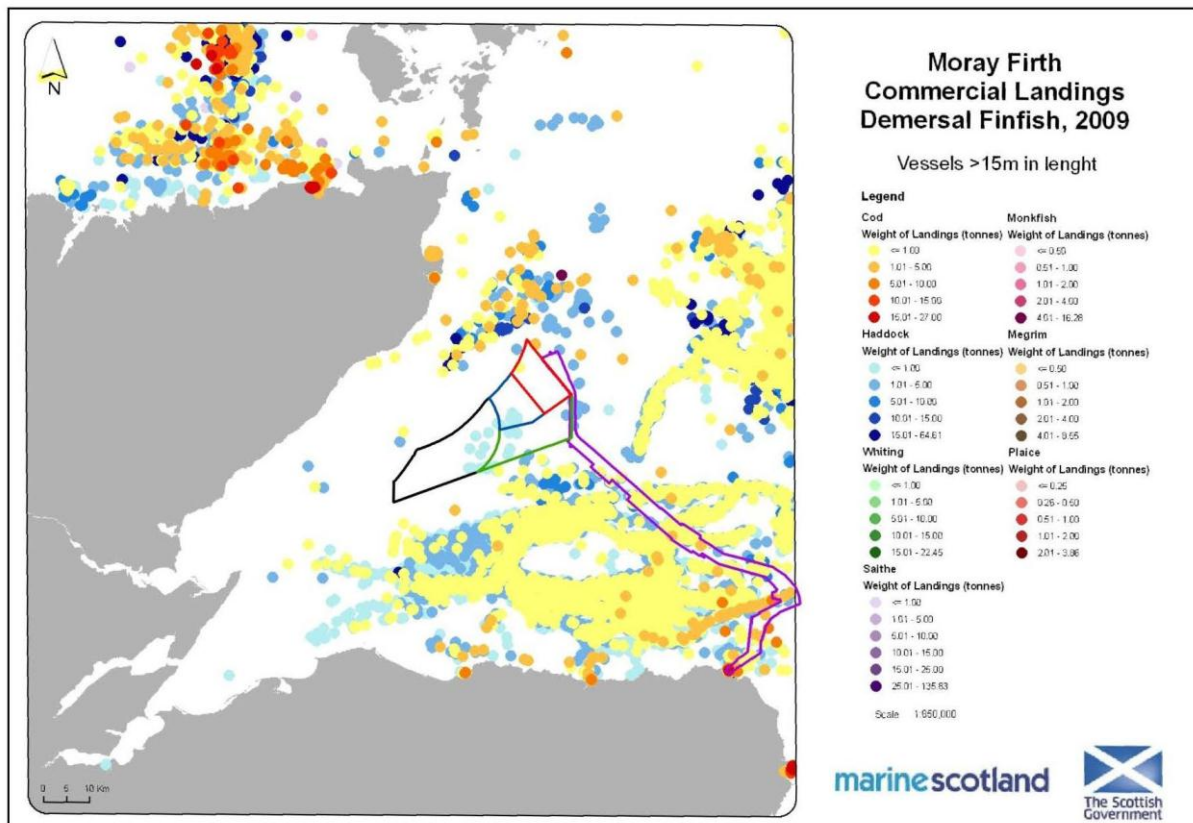


Plate 5.1-2 Moray Firth Commercial Landings Demersal Finfish, 2009

- 5.1.5.29 Haddock is targeted throughout the year by Scottish seine nets (on clean ground to the immediate north west of the proposed development) and demersal trawlers (offshore of Fraserburgh in the south east) (Figure 5.1-13, Volume 6 b). There is a decline in landings during the summer months (Technical Appendix 5.1 A: Commercial Fisheries Technical Report).
- 5.1.5.30 UK whitefish landings have declined significantly in recent years, as a result of concerns about sustainability and subsequent reductions in fishing capacity. Fisheries management policies have had the effect of reducing both fleet numbers and time spent at sea by those remaining vessels. A number of whitefish vessels have since diversified into targeting *Nephrops* and scallops. The majority of vessels who currently target whitefish will spend a large proportion of time fishing in productive grounds outside of the Moray Firth.

- 5.1.5.31 It is possible that stocks may recover to a sufficient extent to see increased effort in the fishery, and fisheries management policies may be amended to reflect this, although this is not considered likely.
- 5.1.5.32 Due to the fishery operating in other areas of the regional study area, whitefish fishing grounds are of very low importance within the boundary of the proposed development.

Offshore Export Cable Route and DC OSP Location

- 5.1.5.33 Figure 5.1-12, Volume 6 b, and Plate 5.1-2 above show that a low level of demersal finfish landings are located along the mid and southern sections of the cable route, with haddock and cod constituting the majority of the landings. A patch of activity is recorded in the vicinity of the export cable landfall. This area was also identified by one of the vessels sampled (Figure 5.1-13, Volume 6 b).
- 5.1.5.34 Due to the fishery operating in other areas of the regional study area and taking into account the relatively small area of whitefish grounds the offshore export cable route and DC OSP location passes through, whitefish grounds are of low importance.

Squid Fishery

- 5.1.5.35 Squid is an increasingly important fishery in the Moray Firth. The squid fishery is currently unregulated (subject to holding a fishing license), and vessels which are constrained by restrictions on pressure stocks (such as whitefish and *Nephrops*) target the species. Annual landings values vary significantly, as the fishery is dependent upon the arrival of the species in the area to spawn. Peak landings for squid occur in August and September, although fishermen have reported the fishery to be lengthening, with vessels beginning to target the species in June and continuing into February (Technical Appendix 5.1 A: Commercial Fisheries Technical Report).
- 5.1.5.36 Bottom otter trawlers targeting *Nephrops* or whitefish reconfigure gear to target squid, operating nets with a smaller mesh size and higher headline. As mentioned previously, the majority of *Nephrops* and whitefish vessels in 45E7 are over-15 m and are therefore satellite tracked, although smaller vessels will also target the fishery. The VMS dataset (over 15 m vessels only) for 2009 shows localised areas of high density activity, principally in the southern Moray Firth, and in the vicinity of the western section of the three proposed wind farm sites (Figure 5.1-14, Volume 6 b). Consultation with fishermen targeting squid, identified grounds throughout the Moray Firth (Figure 5.1-15, Volume 6 b), as well as that of the fishery, as important to the under 15 m fleet. Additional spatial data by Marine Scotland for 2009 and 2010 (Plate 5.1-3 below, over 15 m only) shows a broader distribution of fishing grounds throughout the Moray Firth, including in the vicinity of the three proposed wind farm sites.

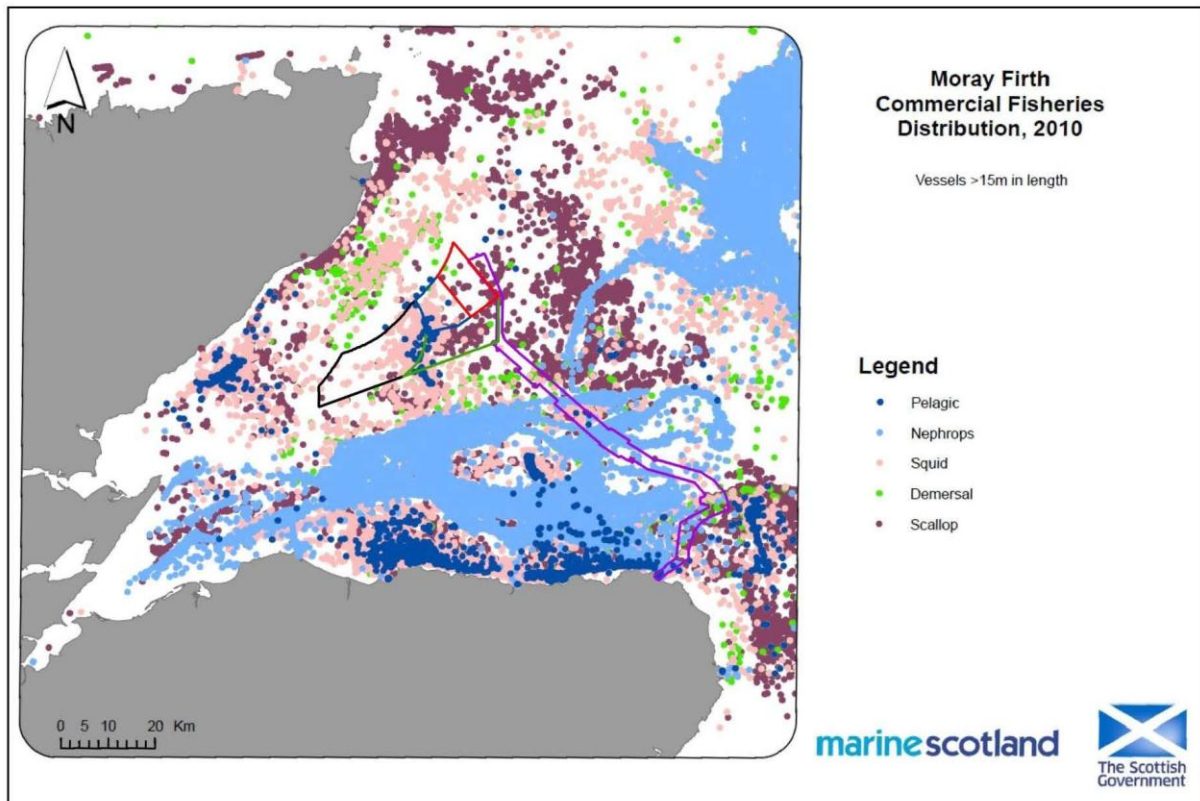


Plate 5.1-3 Moray Firth Commercial Fisheries Distribution, 2010

- 5.1.5.37 Squid have a short lifespan and stock levels depend on the survival success rates of individual breeding seasons. Landings of squid in rectangle 45E7 record high values in 2009 (£566,765) and 2010 (£419,844), although the preceding years recorded much lower levels, with only £8,380 recorded in 2008 (see Technical Appendix 5.1 A: Commercial Fisheries Technical Report).
- 5.1.5.38 In addition to vessels with home ports in the regional study area, and dependent upon the productivity of the fishery and constraints on other activities, vessels from around Scotland may also arrive in the Moray Firth to target squid.
- 5.1.5.39 At present, squid is considered to be resistant to fishing pressure. It is, however, thought in some quarters that squid spawning grounds need to be identified and effectively managed in order to protect future stocks. Squid stocks are erratic and highly sensitive to environmental change and as such it is not currently possible to predict future stocks.
- 5.1.5.40 Taking into account the importance of the squid fishery in the Moray Firth and the annual variation in distribution of activity, the proposed development is located on squid grounds that are of moderate importance on a regional scale.

Offshore Export Cable Route and DC OSP Location

- 5.1.5.41 Figure 5.1-14, Volume 6 b, and Plate 5.1-3 above (MS 2010) show that the majority of squid activity in the Moray Firth by the over 15 m fleet, is located to the west of the OfTI location. However, as stated above, activity in 2010 appears to be more widely dispersed in the Moray Firth than the year previously. Further consultation with squid fishermen who principally operate vessels under 15 m in length

identified squid grounds targeted by one of the vessels sampled, along the southern section of the cable route (Figure 5.1-15, Volume 6 b).

- 5.1.5.42 The offshore export cable route and DSP location passes through squid fishing grounds that are of low importance on a regional scale.

Crab and Lobster Fishery

- 5.1.5.43 The crab and lobster fishery in the Moray Firth is principally located in inshore waters inside of 6 nm. There is negligible activity recorded within the three proposed wind farm sites. Crustaceans such as crab and lobster are the main species targeted, although whelk landings are also recorded along the Caithness coast. Vessels are under 15 m in length and hence not monitored by VMS.
- 5.1.5.44 Crab and lobster are principally targeted by full time static gear vessels setting pots / creels, although there are also a number of part time vessels who will set a small number of creels in inshore areas during the summer months. Lobsters are targeted on rocky, uneven ground and around wreck sites. Fishing is year round, although peak activity occurs between June and September. As a result of the limited size of vessels in the area, weather conditions are a significant factor in determining levels of activity in the winter months (Technical Appendix 5.1 A: Commercial Fisheries Technical Report).
- 5.1.5.45 Lobster and crab fishing grounds in the Moray Firth are located along the Caithness coast and, to a lesser extent, in areas along the Moray coast. There are no identified static gear grounds within the proposed development area (Figure 5.1-16, Volume 6 b).
- 5.1.5.46 Crab and lobster fishing grounds are of very low importance within the boundary of the proposed development.

Offshore Export Cable Route and DC OSP Location

- 5.1.5.47 Crab and lobster grounds have been identified in areas around the southern section of the cable route, adjacent to the export cable landfall (Figure 5.1-16 Volume 6 b), which are important to the local area. Nine full time creel vessels operate out of Fraserburgh, all of which are under 12 m in length. In addition, there are also a number of part time vessels who will set creels in inshore areas, predominantly during the summer months.
- 5.1.5.48 Crab and lobster grounds along the offshore export cable route and DC OSP location are of low importance on a regional level, however, taking into account the level of activity identified and the limited operational range of the inshore crab and lobster vessels operating in the vicinity of the export cable landfall, crab and lobster grounds are of moderate importance on a local scale.

Other Fisheries

Mackerel Fishery

- 5.1.5.49 It is of note that 2010 data from Marine Scotland (Plate 5.1-3 above) identified pelagic activity by the over-15 m fleet in areas of the Moray Firth: inshore areas along the Moray coast, north-east of Fraserburgh, in a small area off the Caithness coast and along the western edge of the three proposed wind farm sites. It was stated that vessels targeting squid were landing boxes of mackerel during this period (pers, comm. Fishing Industry Representative, 2011), which may

account for the activity. There are, however, negligible recorded landings of pelagic species, including mackerel, in rectangle 45E7 during the same period (2010) (see Technical Appendix 5.1 A: Commercial Fisheries Technical Report).

Offshore Export Cable Route and DC OSP Location

- 5.1.5.50 The mackerel handline fishery is principally targeted by small, inshore vessels operating handlines in inshore areas along the Moray coast during the summer months. There may be up to 110 vessels in the Moray Firth targeting the seasonal fishery, principally between June and August. Time spent at the fishery is dependent upon access to quota and the vast majority of vessels will be limited to a maximum of a couple of days a week at the fishery. A number of creel vessels may target the fishery in conjunction with operating creel gear. The seasonal fishery is locally important.
- 5.1.5.51 There are approximately 15 under 10 m artisanal vessels between Burghead and Buckie which may seasonally target the fishery. There are approximately 80 small, inshore vessels in the Fraserburgh District (Rattray Head to Cullen) which will seasonally target the fishery to varying degrees. This may range from full time creel vessels and those with access to quota from a Producer Organisation (estimated to be seven vessels) to part-time and seasonal vessels.
- 5.1.5.52 The mackerel handline fishery is located in inshore areas along the Moray coast and in the vicinity of the export cable landfall (pers. comm., Buckie and Fraserburgh District Fishery Offices, Jan 2012).

Aquaculture and Other Shellfish

- 5.1.5.53 There are no aquaculture sites within the boundaries of the three proposed wind farm sites or in the vicinity of the OfTI, the closest being located in the Spey Bay area. There are active shellfish sites in inshore areas of the Moray Firth, predominantly in inner Firths, such as the Cromarty and Dornoch, and a mussel site in the west of the Spey Bay area (see Technical Appendix 5.1 A: Commercial Fisheries Technical Report).

5.1.6 Baseline Characteristics of the Area of the Three Proposed Wind Farm Sites and the OfTI for Salmon and Sea Trout

- 5.1.6.1 The right to fish for salmon in Scotland, whether inland or at sea, is a heritable right (a right relating to land). The taking of salmon without the right or written permission to do so is prohibited under *the Salmon and Freshwater Fisheries (protection) (Scotland) Act, 1951*.
- 5.1.6.2 The only lawful fishing methods to catch salmon and sea trout in inland waters are rod-and-line and net-and-coble. At sea it is prohibited to catch fish by enmeshment. Effectively, the only lawful methods to catch salmon and sea trout at sea are net-and-coble, fixed engines and rod-and-line.
- 5.1.6.3 All Scottish salmon fisheries are closed for a minimum of 168 days a year. Actual closure dates may vary but are mostly from late August to mid February, depending upon individual DSFB policy. Angling may continue for a few weeks either side of this. Weekly closed times are also nationally enforced, being 24 hours (Sunday) in the case of angling and 60 hours for all other methods.

- 5.1.6.4 Salmon fisheries are saleable and netmen or companies may acquire fishing rights over relatively large areas. Coastal heritable rights extend out to 12 nm, although coastal salmon fishing is limited by virtue of gear restrictions. Other interested parties may also purchase rights. For example: the Atlantic Salmon Conservation Trust has historically bought coastal sites to close them down as a conservation measure in order to halt coastal netting activities. Similarly, rod-and-line interests may buy up river or coastal netting rights to close them down, often through the DSFBs.
- 5.1.6.5 An indication of the contribution of each fishing method to the total reported catch by salmon fishery region in Scotland is given in Figure 5.1-17, Volume 6 b, expressed as annual (average 2000 to 2009) fish caught by method. In general terms, rod-and-line (rod-and-line and catch and release combined) accounts for the majority of the reported catch in most salmon fishery regions, although in some areas, particularly in salmon fishery regions along the north and east coasts of Scotland, netting (fixed engines and net-and-coble) accounts for a relatively high percentage of the total catch. It should be noted that the national trend is a decrease in netting effort and therefore the contribution of netting to the annual catch (shown in Figure 5.1-17, Volume 6 b) may, depending on the fishery region and district under consideration, overestimate the current levels of exploitation.
- 5.1.6.6 The decrease in catches by the net fishery from historic levels is illustrated in Plate 5.1-4 below. This shows the number of fish caught by net-and-coble and fixed engines from 1952 to 2009 in Scotland.

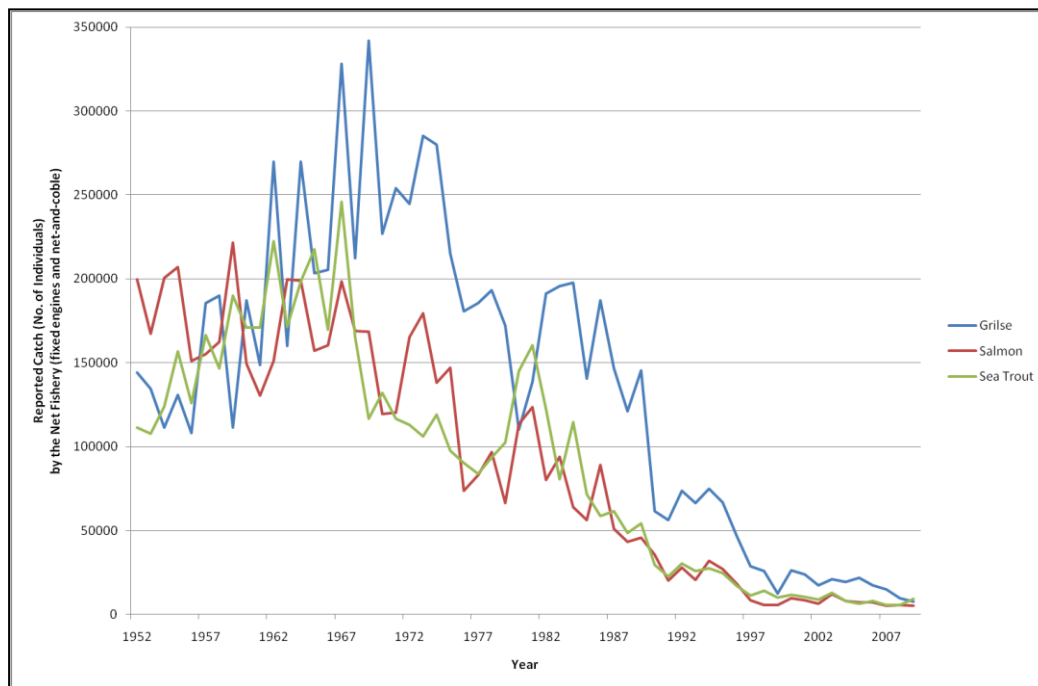


Plate 5.1-4 Annual Catch in Scotland by Net Fisheries (Fixed Engines and Net and Coble) for the Period 1952 to 2009 (Source: MSS 2010)

Salmon and Sea Trout Fisheries in the Regional Study Area

- 5.1.6.7 An indication of the annual reported catch by species and method in the regional study area is given in Figure 5.1-18 and Figure 5.1-19, Volume 6 b respectively, expressed as the number of individuals caught by district (average 2000 to 2009).

5.1.6.8 Salmon and grilse account for the majority of the catch in all the districts within the regional study area, with the exception of the Lossie and Ugie, where sea trout is the principal species caught.

5.1.6.9 The principal fishing method in the regional study area is rod-and-line, being the only method used in a number of districts (e.g. Spey, Deveron). Netting by both fixed engines and net-and-coble, however, occurs at varying degrees in a number of districts.

5.1.6.10 An indication of the annual variation in fishing effort by net fisheries in the regional study area, broken down by fixed engines and net-and-coble in districts where these methods are used, is given below in Plate 5.1-5 and Plate 5.1-6 respectively (2001 to 2010).

5.1.6.11 An overview of the salmon and sea trout fishery by district within the regional study area is given below.

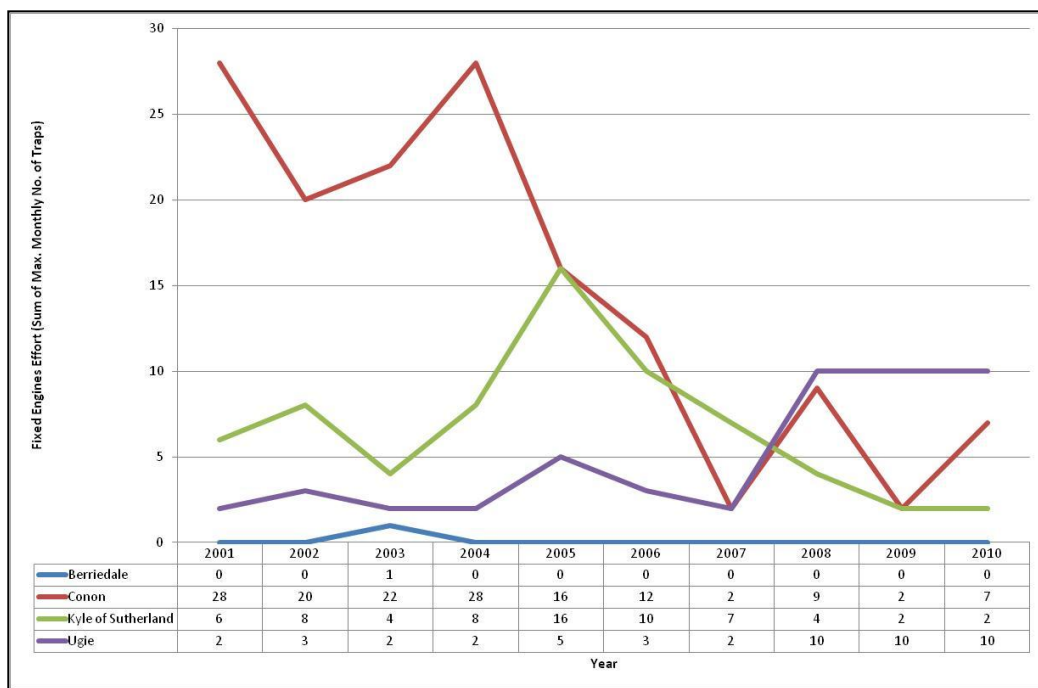


Plate 5.1-5 Annual Fixed Engines Effort (Max. No. of Traps) by SFD (2001 to 2010) (Source: MSS 2011)

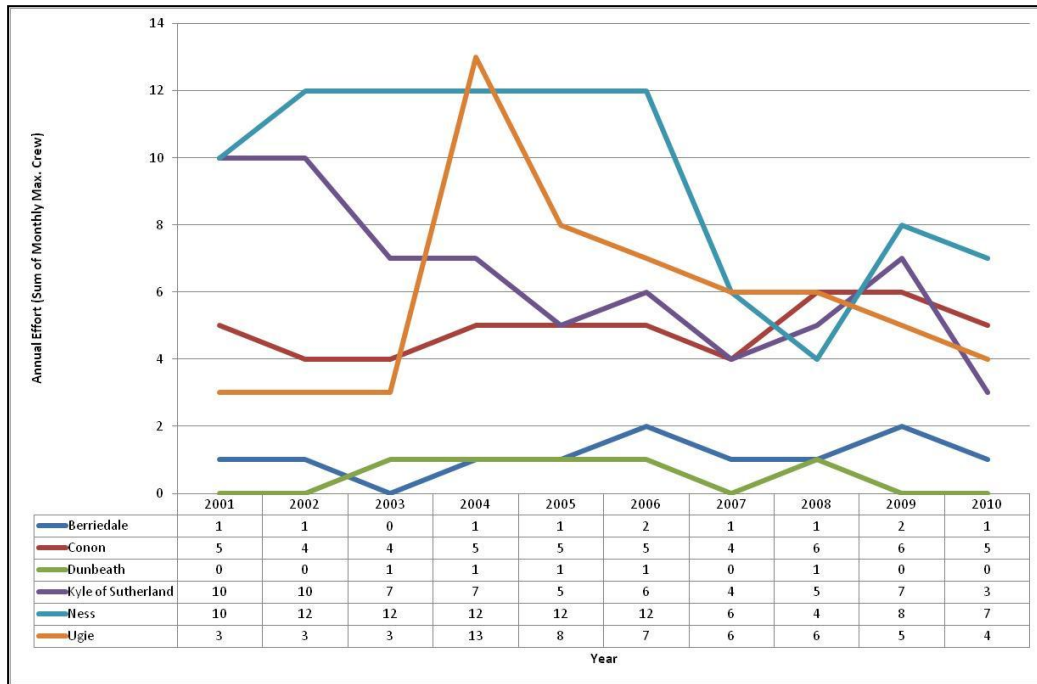


Plate 5.1-6 Annual Net and Coble Effort (Max. Crew) by SFD (2001 to 2010) (Source: MSS 2011)

The Spey

- 5.1.6.12 The Spey district records the largest salmon and sea trout catches in the regional study area, and is the most commercially important in the Moray Firth. Salmon has been a primary reason for the selection of the River Spey SAC, where the salmon population is considered to be of high quality.
- 5.1.6.13 Rod-and-line is currently the only fishing method used in the Spey. Overall, the highest catches in the district (all species) are recorded from June to August with May and September also recording relatively high catches.
- 5.1.6.14 The seasonality of the catch by species is given in Plate 5.1-7 below (average reported catch 2000 to 2009). Salmon are principally caught from May to September, although March and April also record relatively high salmon catches reflecting the variety of salmon runs in the district. Grilse catches are highest in July and August. The sea trout season starts on 30th April and runs until the end of September. Within this period the highest sea trout catches are recorded in June and July.

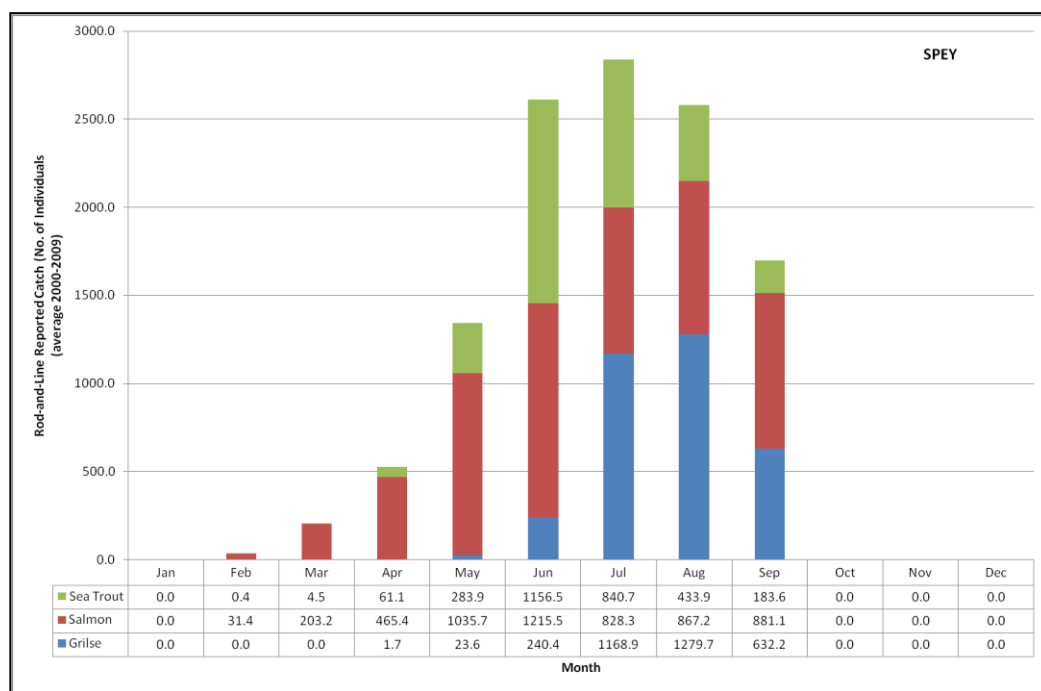


Plate 5.1-7 Seasonality of the Rod-and-Line Reported Catch by Species in the Spey District (Average 2000 to 2009) (Source: MSS 2010)

The Deveron

- 5.1.6.15 The Deveron is mainly a salmon river although sea trout is of importance during the summer months. Rod-and-line is the only method currently used in this district.
- 5.1.6.16 The seasonality of the catch by species is given in Plate 5.1-8 below (average reported catch 2000 to 2009). Overall (all species combined), the highest catches are recorded from August to October. Sea trout are caught in highest numbers in June and July. Grilse catches peak in August, although July, September and October also record relatively high catches. Salmon are caught throughout the season, however comparatively higher catches are recorded in September and October.
- 5.1.6.17 As a result of the proximity of the export cable landfall to the river Deveron, the river's fishery is further discussed in Paragraphs 5.1.6.59 to 5.1.6.61 below.

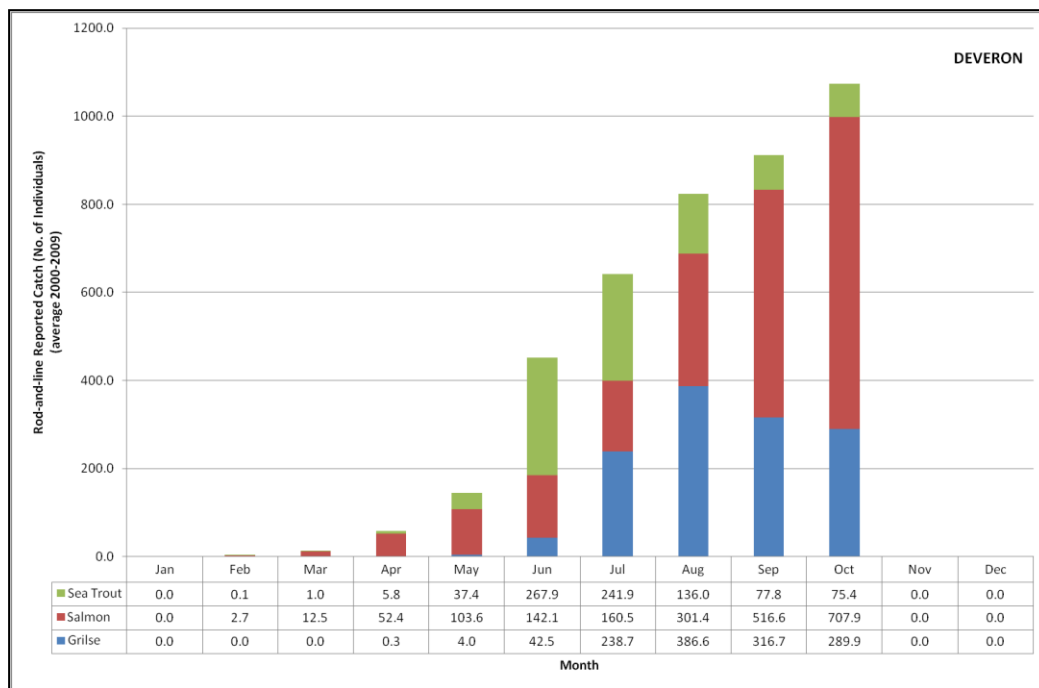


Plate 5.1-8 Seasonality of the Rod-and-Line Reported Catch by Species in the Deveron District (Average 2000 to 2009) (Source: MSS 2010)

The Ugie

- 5.1.6.18 The Ugie is mainly a sea trout river although salmon are of importance during the spring and autumn months. Net-and-coble is the principal method used mainly in the estuary. Rod-and-line is also an important method utilised in the district and fixed engines are used in coastal areas, although to a limited extent.
- 5.1.6.19 The seasonality of the catch by species is given in Plate 5.1-9 below (average reported catch 2000 to 2009). Overall (all species combined) the highest catches are recorded from June to October. Sea trout are caught in highest numbers in June, July and August, with moderate catches recorded in May, September and October. Grilse and salmon catches peak in October and September.
- 5.1.6.20 The seasonality of the net fishery in the Ugie district is given in Table 5.4-7 below based on monthly catches by net-and-coble and fixed engines. Fixed engines record the highest catches in August and net-and-coble record the highest catches in June, although July also records relatively high catches. The netting season runs from 21st February to 9th September.
- 5.1.6.21 The exact boundaries between coastal heritable titles in the Ugie district are unclear. Stations are currently operational in the Ugie Salmon Fishing district and the proprietors' fish grounds which extend north to the oil and gas pipelines (north of Peterhead).

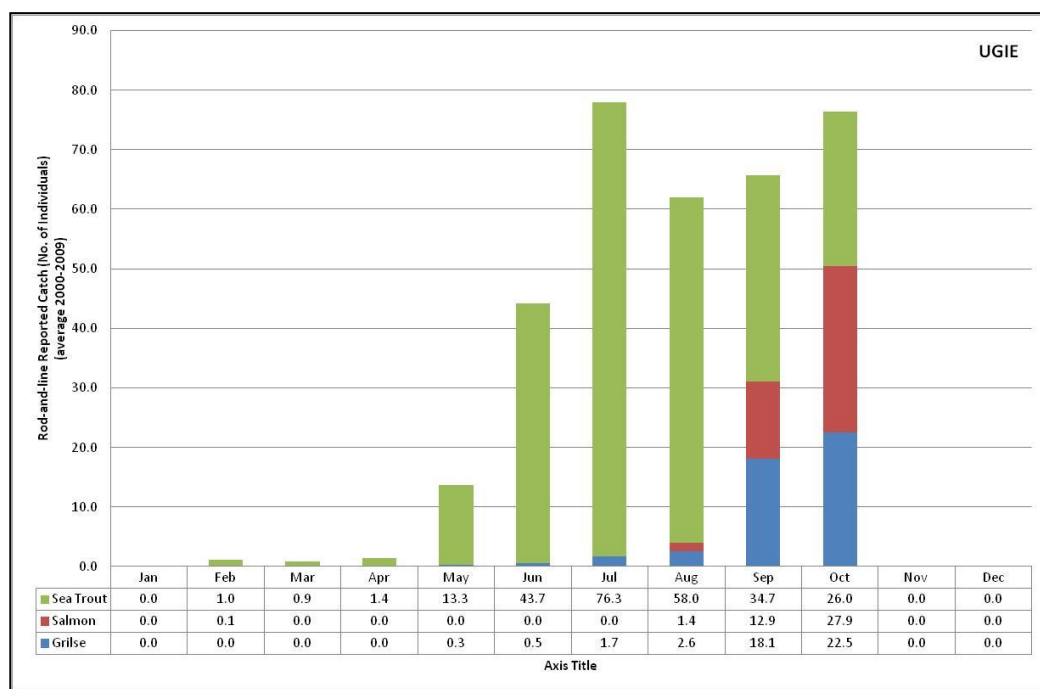


Plate 5.1-9 Seasonality of the Rod-and-Line Reported Catch by Species in the Ugie District (Average 2000 to 2009) (Source: MSS 2010)

Table 5.1-7 Seasonality of Catch (No. of Individuals Caught) of the Net Fisheries in the Ugie District (Average 2000 to 2009) (Source: MSS 2010)

Ugie	Month				
	May	June	July	August	September
Fixed Engine	1.1	2.6	11.1	17.7	1.5
Net-and-Coble	63.8	236.5	159.1	17.3	0.0

The Nairn, Lossie and Findhorn

- 5.1.6.22 Rod-and-line is currently the only fishing method used in the three districts. An indication of the seasonality of the fishery in the Nairn, Lossie and Findhorn districts is given below in Table 5.1-10, Table 5.1-11 and Table 5.1-12 below respectively, based on monthly reported catches by species (average 2000 to 2009).
- 5.1.6.23 In the Nairn, the highest salmon and grilse catches are recorded from July to September. Sea trout are caught in greatest numbers from June to August.
- 5.1.6.24 In the Lossie, sea trout catches are highest from May to October peaking in July and August. Salmon and grilse are principally caught from August to October.
- 5.1.6.25 In the Findhorn, salmon catches are highest from May to September. Grilse are principally caught from July to September whilst sea trout are caught from June to September.

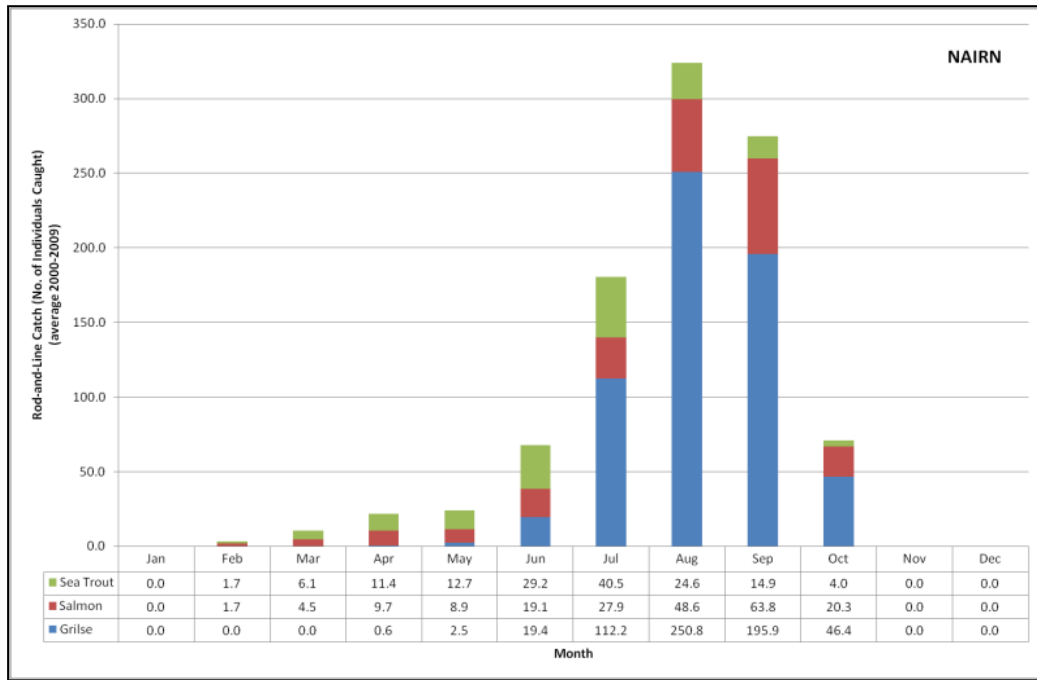


Plate 5.1-10 Seasonality of the Rod-and-Line Reported Catch by Species in the Nairn District (Average 2000 to 2009) (Source: MSS 2010)

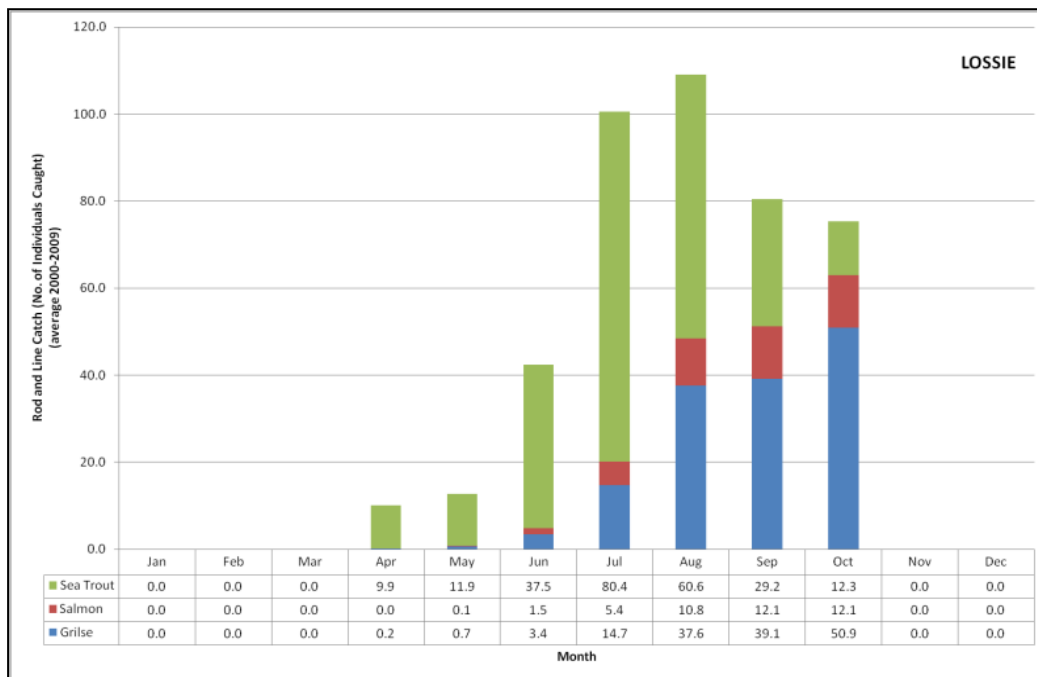


Plate 5.1-11 Seasonality of the Rod-and-Line Reported Catch by Species in the Lossie District (Average 2000 to 2009) (Source: MSS 2010)

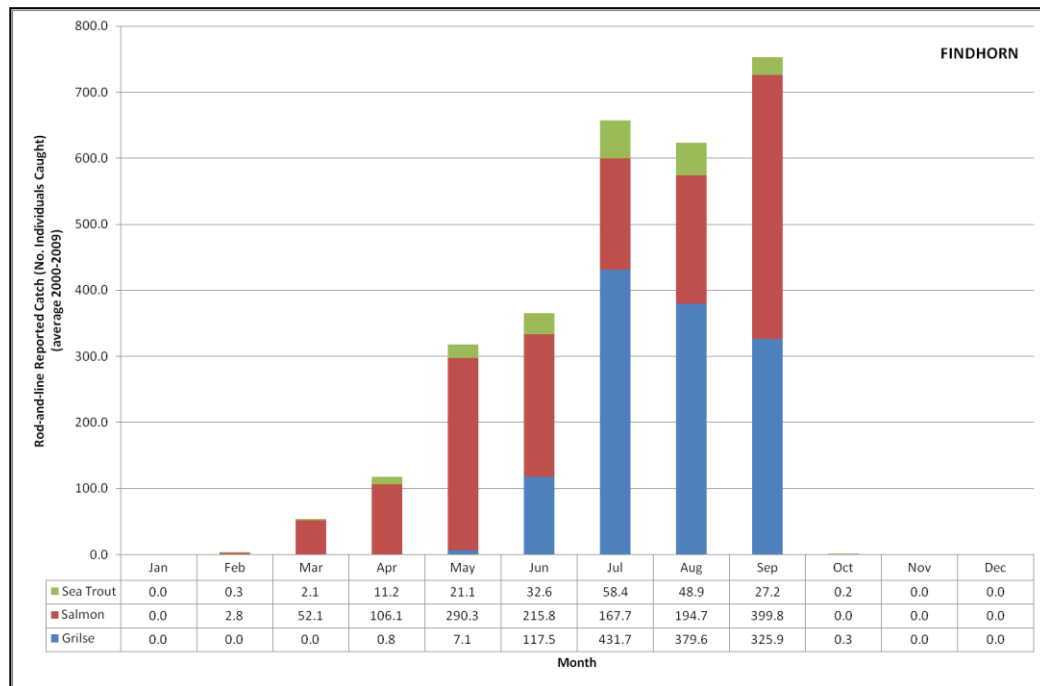


Plate 5.1-12 Seasonality of the Rod-and-Line Reported Catch by Species in the Findhorn District (Average 2000 to 2009) (Source: MSS 2010)

The Ness and Beaully

- 5.1.6.26 The Ness and Beaully districts have both important salmon and sea trout fisheries, although there has been a marked decline in sea trout catches over the past two decades. The river Moriston, which flows into the northern side of Loch Ness, has been designated as a SAC and lists salmon as a qualifying feature (as described in Chapter 4.1: Designated Sites).
- 5.1.6.27 Rod-and-line is the principal method used in both districts and is undertaken in coastal areas and in freshwater. Net-and-coble fishing takes place to a limited extent in coastal areas in the Ness district whilst rod-and-line is the only fishery currently active in the Beaully.
- 5.1.6.28 The seasonality of the rod-and-line catch by species in the Ness and Beaully is shown below in Plate 5.1-13 and Plate 5.1-14 respectively.
- 5.1.6.29 Salmon and grilse are principally caught from July to October in both districts. Salmon are however also caught in relatively high numbers earlier in the season (from April to June in the Beaully and from March to June in the Ness).
- 5.1.6.30 Sea trout are principally caught from July to September, but are also caught in some numbers earlier in the season, generally from March onwards.
- 5.1.6.31 In the Ness, the net fishery (net-and-coble) is open from 28th February to 26th August. An indication of the seasonality of the fishery is given in Table 5.1-8 below. The majority of reported catches are recorded from June to August, peaking in July.

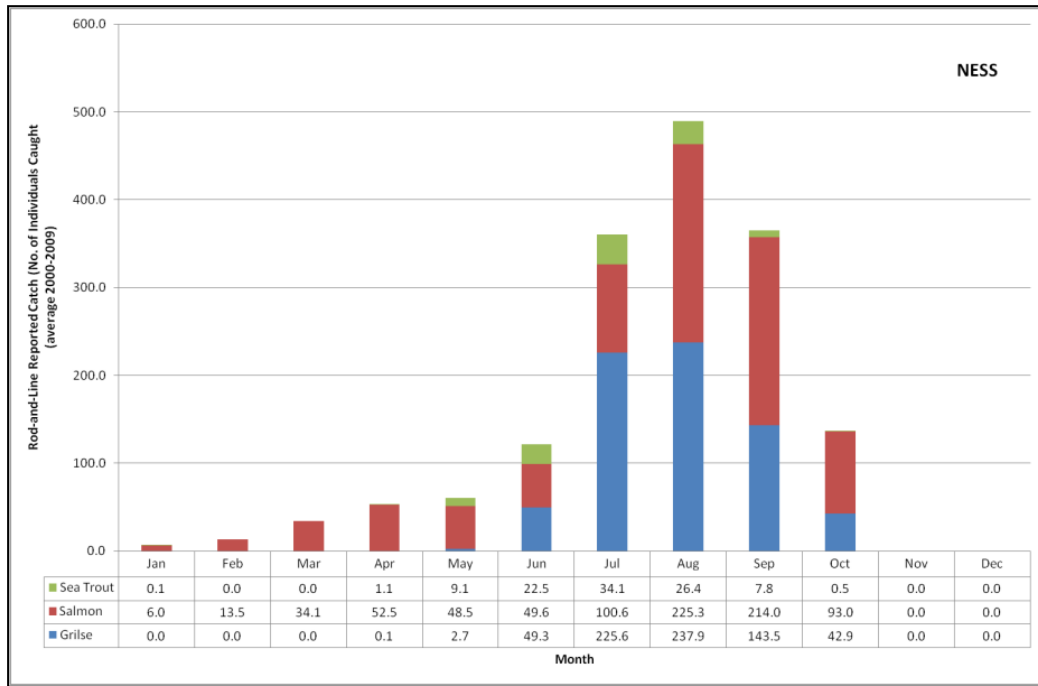


Plate 5.1-13 Seasonality of the Rod-and-Line Reported Catch by Species in the Ness District (Average 2000 to 2009) (Source: MSS 2010)

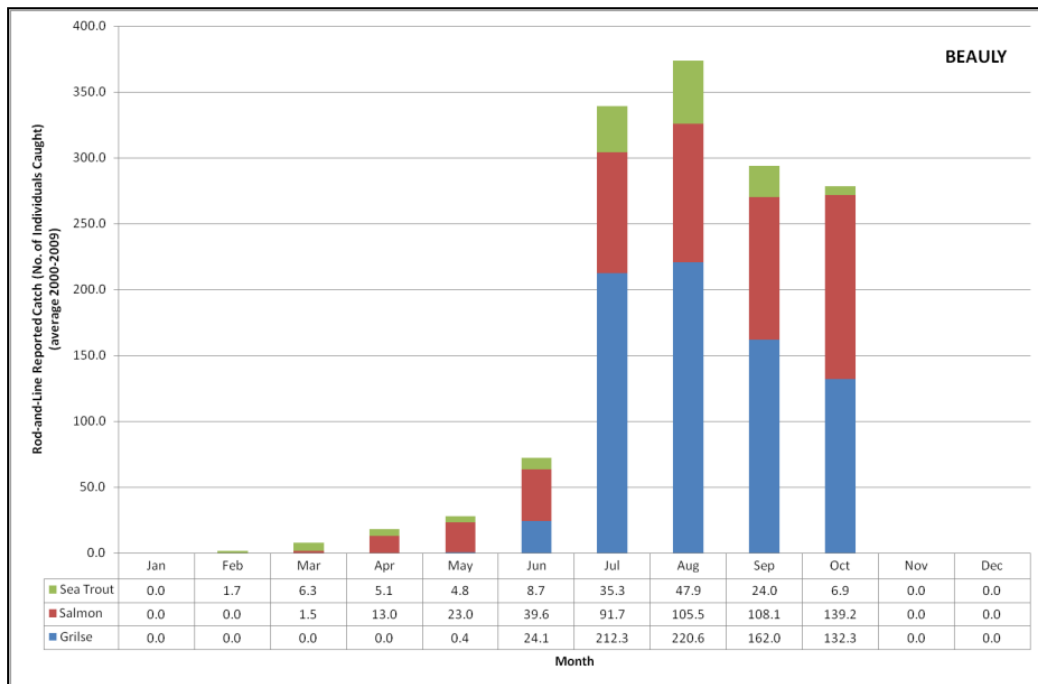


Plate 5.1-14 Seasonality of the Rod-and-Line Reported Catch by Species in the Beaully District (Average 2000 to 2009) (Source: MSS 2010)

Table 5.1-8 Seasonality of Catch (No. of Individuals Caught) by the Net-and-Coble Fisheries in the Ness District (average 2000 to 2009) (Source: MSS 2010)

Ness	Month				
	April	May	June	July	August
Net-and-Coble	0.5	0.9	64.5	189.7	84.5

The Conon and Alness

- 5.1.6.32 Most rivers in the Conon and Alness districts have a combination of both salmon and sea trout.
- 5.1.6.33 Rod-and-line is the main fishery in the two districts. Rod-and-line is used in the river, but also in the estuary for sea trout. In the Conon district, fixed engines are used in coastal areas and net-and-coble in the estuary, although to a limited extent.
- 5.1.6.34 The seasonality of the rod-and-line fishery (including catch and release) is given below in Plate 5.1-15 and Plate 5.1-16 for the Conon and Alness districts respectively.
- 5.1.6.35 In the Conon, salmon are caught from May to September peaking around June. Grilse are principally caught from July to September whilst sea trout are caught from June to September, peaking in July.
- 5.1.6.36 In the Alness, salmon are principally caught from July to October. Grilse are caught in highest numbers from August to October whilst sea trout are principally caught from June to August, peaking in July.
- 5.1.6.37 The seasonality of the net fishery in the Conon district is given in Table 5.1-9 below, based on monthly catches (averaged 2000 to 2009) by net-and-coble and fixed engines. Both fixed engines and net-and-coble record highest catches in July. The netting season runs from 11th February to 26th August.
- 5.1.6.38 Active coastal netting stations in the Conon are located from Tarbat Ness inwards toward the firth. Stations are currently operational off Balintore and Hilton and from Tarbat Ness Lighthouse south to Ballone Castle.

Table 5.1-9 Seasonality of Catch (No. of Individuals Caught) by the Net Fisheries in the Conon District (Average 2000 to 2009) (Source: MSS 2010)

Conon	Month				
	April	May	June	July	August
Fixed Engines	1.4	17.3	55.9	106.9	9.5
Net-and-coble	0.0	0.0	5.5	110.3	11.9

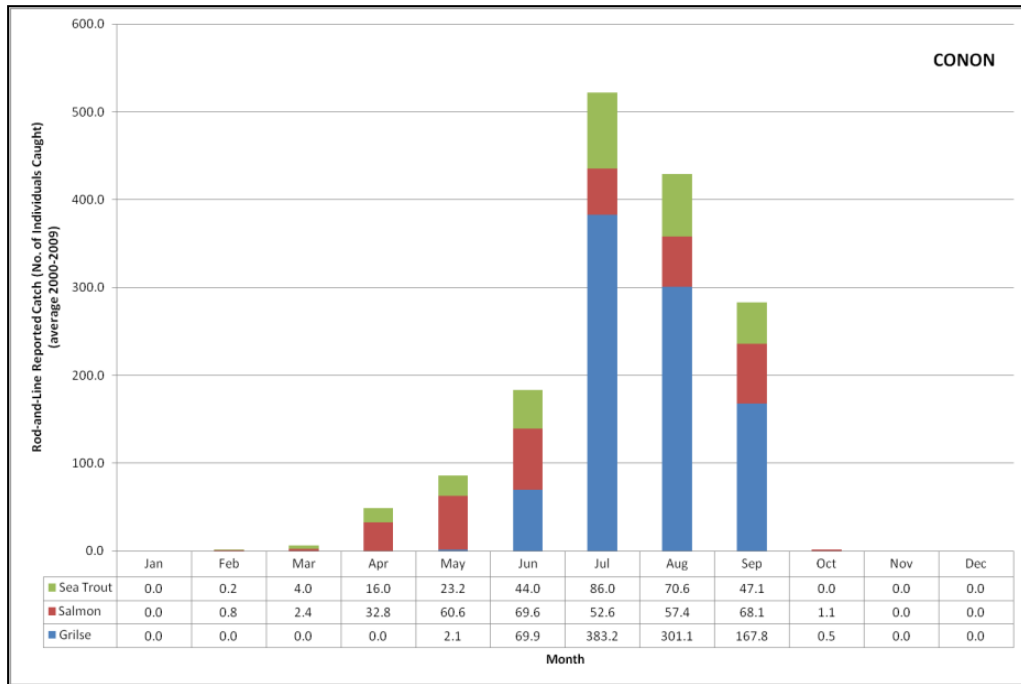


Plate 5.1-15 Seasonality of the Rod-and-Line Reported Catch by Species in the Conon District (Average 2000 to 2009) (Source: MSS 2010)

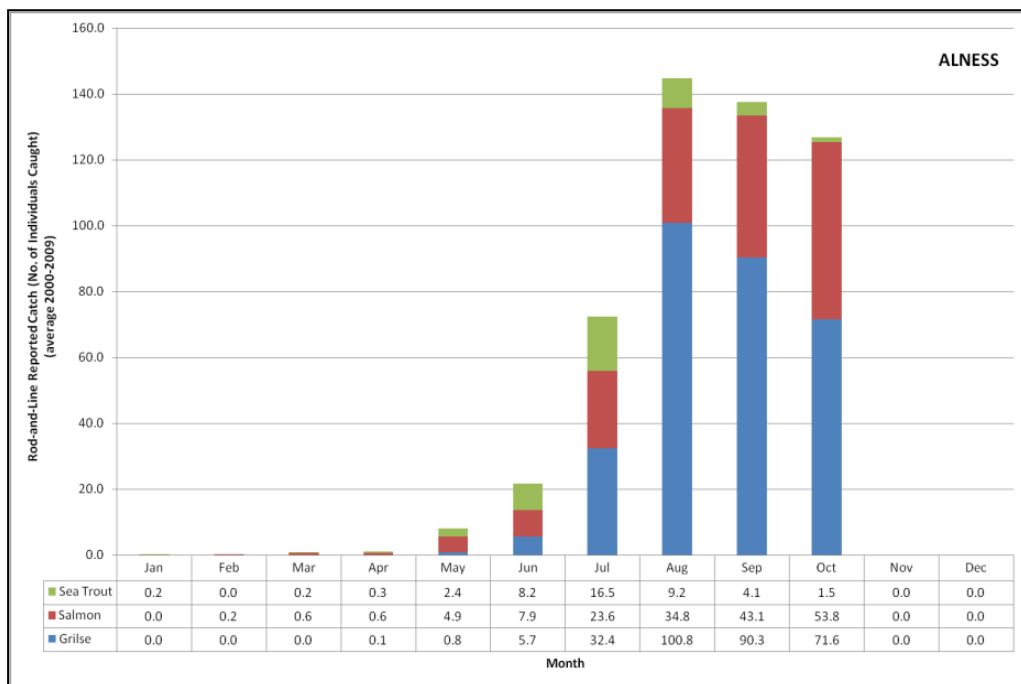


Plate 5.1-16 Seasonality of the Rod-and-Line Reported Catch by Species in the Alness District (Average 2000 to 2009) (Source: MSS 2010)

The Kyle of Sutherland

5.1.6.39 The river Oykel, which flows into the Kyle of Sutherland, has been designated as a SAC and lists salmon as a qualifying feature (as described in Chapter 4.1: Designated Sites).

- 5.1.6.40 The majority of the catch in the Kyle of Sutherland district comes from the rod-and-line fishery although there are a limited number of active net fisheries (both net-and-coble and fixed engines) which account for comparatively low catches.
- 5.1.6.41 The seasonality of the rod-and-line fishery (including catch and release) based on reported catches by species (averaged 2000 to 2009) is shown in Plate 5.1-17 below. Overall (all species combined), the highest reported catches are recorded from July to September.
- 5.1.6.42 Salmon are caught in relatively high numbers from April to September and grilse from July to September. Sea trout are predominantly caught from June to August, peaking in July.
- 5.1.6.43 As previously mentioned, the net fishery accounts for a comparatively small proportion of the total catch in the district. During the 2000 to 2009 period catches by fixed engines and net-and-coble were only recorded from April to August, with the highest catches by both methods corresponding to the month of July (see Table 5.1-10 below).

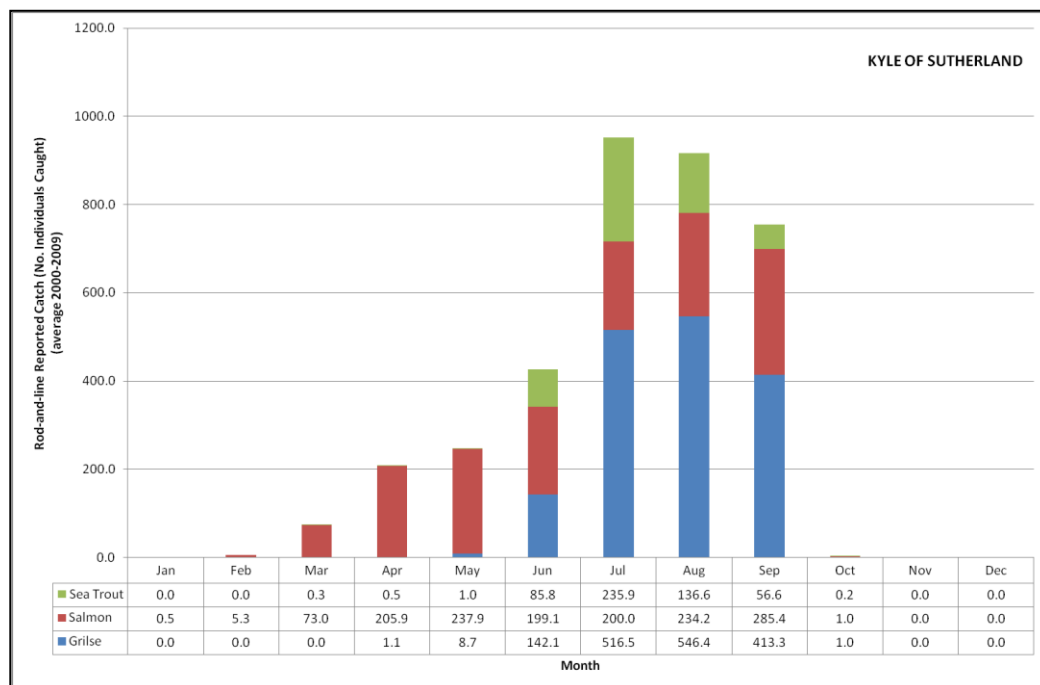


Plate 5.1-17 Seasonality of the Rod-and-Line Reported Catch by Species in the Kyle of Sutherland District (Average 2000 to 2009) (Source: MSS 2010)

Table 5.1-10 Seasonality of Catch (No. of Individuals Caught) by the Net Fisheries in the Kyle of Sutherland District (Average 2000 to 2009) (Source: MSS 2010)

Kyle of Sutherland	Month				
	April	May	June	July	August
Fixed Engines	0.6	0.0	19.2	115.4	37.2
Net-and-Coble	1.2	4.7	63.5	107.3	12.5

The Brora

- 5.1.6.44 Rod-and-line is the only method used in the Brora district. Netting rights are held by Sutherland Estates at the mouth of the River Brora, however, these are no longer exploited. Netting activity stopped in the late 1970s.
- 5.1.6.45 An indication of the seasonality of the fishery in the district is given in Plate 5.1-18 below, expressed as monthly catches by species (average 2000 to 2009).
- 5.1.6.46 Salmon are caught throughout the season principally from March to October. Catches are relatively consistent throughout this period with July recording peak catches. Sea trout are principally caught from June to August peaking in July. Similarly, grilse are caught in greatest numbers from June to August, also peaking in July. Overall, the greatest catches (all species combined) are recorded in July and August.

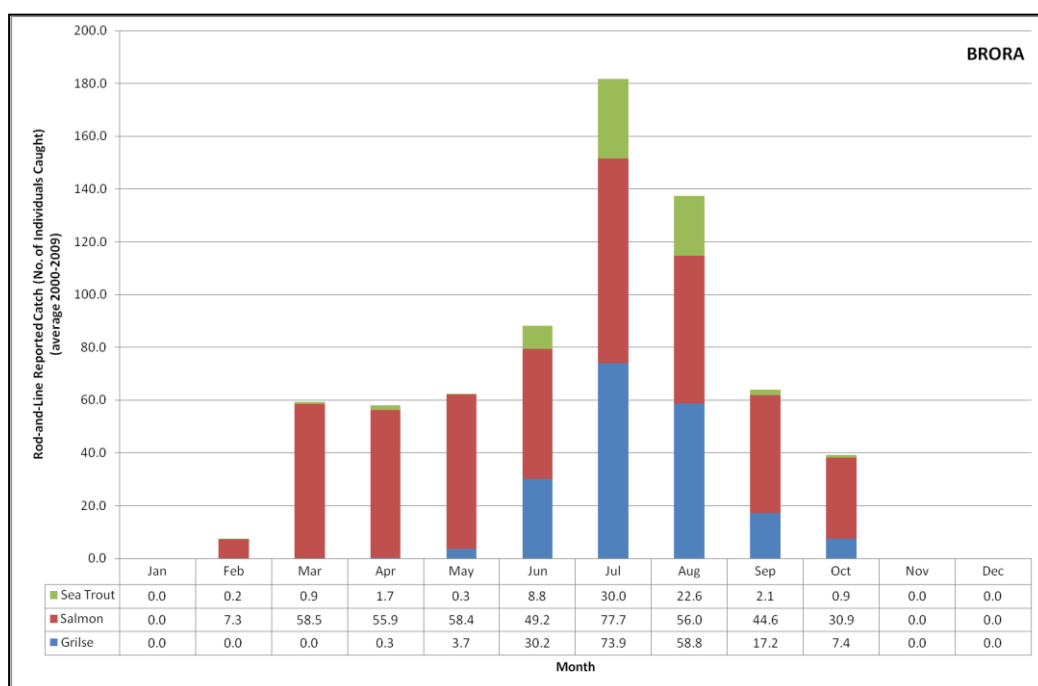


Plate 5.1-18 Seasonality of the Rod-and-Line Reported Catch by Species in the Brora District (Average 2000 to 2009) (Source: MSS 2010)

The Helmsdale

- 5.1.6.47 In the Helmsdale district, rod-and-line is currently the only method used. Netting activity ceased approximately 20 years ago.
- 5.1.6.48 The fishing season runs from 11th January until the end of September. An indication of the seasonality of the fishery is shown in Plate 5.1-19 below, based on monthly catches by species (average 2000 to 2009). Overall (all species combined), the highest catches in the district are recorded in July and August.
- 5.1.6.49 Salmon catches are relatively consistent throughout the season with high catches being recorded during the periods April to May, June to August and August to September. Grilse are principally caught from June to September with catches peaking in July. Similarly, sea trout are principally caught from June to August also peaking in July.

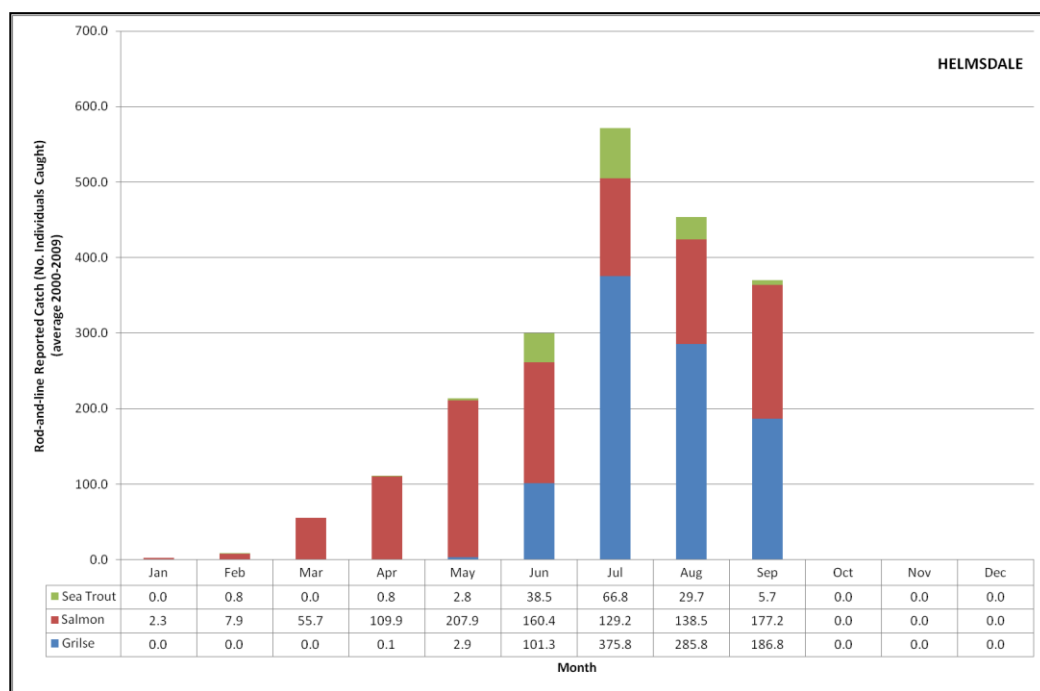


Plate 5.1-19 Seasonality of the Rod-and-Line Reported Catch by Species in the Helmsdale District (Average 2000 to 2009) (Source: MSS 2010)

The Wick, Dunbeath and Berriedale

- 5.1.6.50 Salmon is a primary reason for the SAC site selection of the Berriedale and Langwell waters (see also Chapter 4.1: Designated Sites).
- 5.1.6.51 An indication of the seasonality of the rod-and-line fishery (including catch and release) in the Wick, Dunbeath and Berriedale districts is given below in Plate 5.1-20, Plate 5.1-21 and Plate 5.1-22 respectively.
- 5.1.6.52 Overall (all species combined), the highest catches are recorded in July and August. Sea trout catches are comparatively low. The highest catches are recorded from July to September.
- 5.1.6.53 Salmon catches are highest from June to September in Wick, July to October in Dunbeath and June to September in Berriedale.
- 5.1.6.54 Grilse are principally caught from July to September in Wick, July to August in Dunbeath and in July in Berriedale.
- 5.1.6.55 An indication of the seasonality of the net fishery (net-and-coble and fixed engines) in the Berriedale and Dunbeath districts is given in Table 5.1-11 below.
- 5.1.6.56 In the Berriedale district, the month of July records the highest catches both by fixed engines and net-and-coble.
- 5.1.6.57 Similarly, in Dunbeath the highest catches by net-and-coble are recorded in July and August.

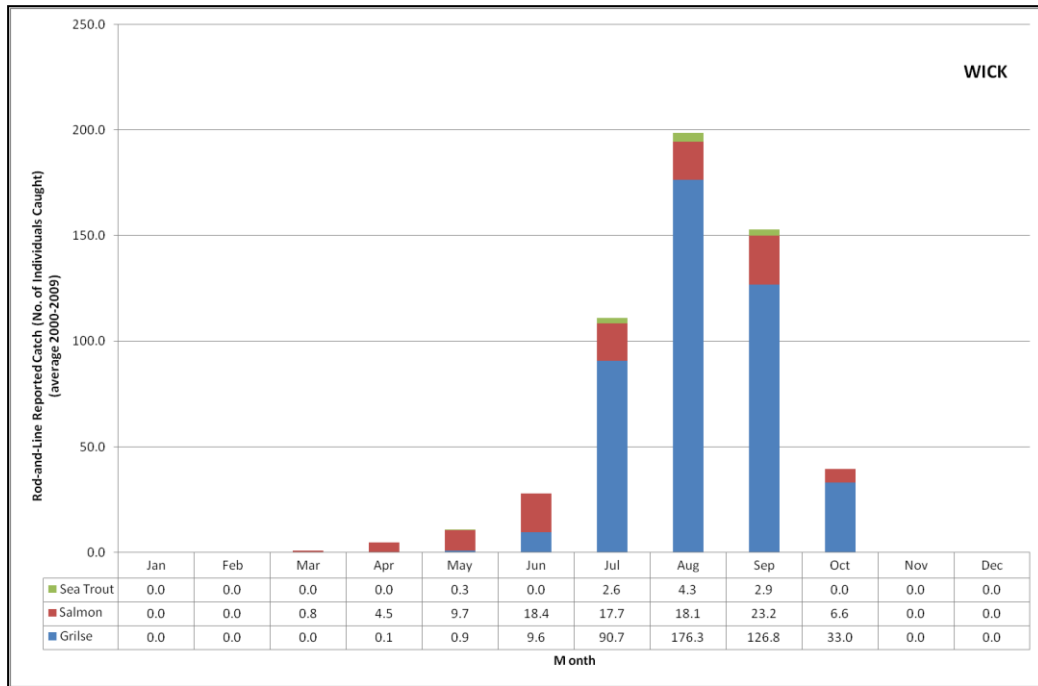


Plate 5.1-20 Seasonality of the Rod-and-Line Reported Catch by Species in the Wick District (Average 2000 to 2009) (Source: MSS 2010)

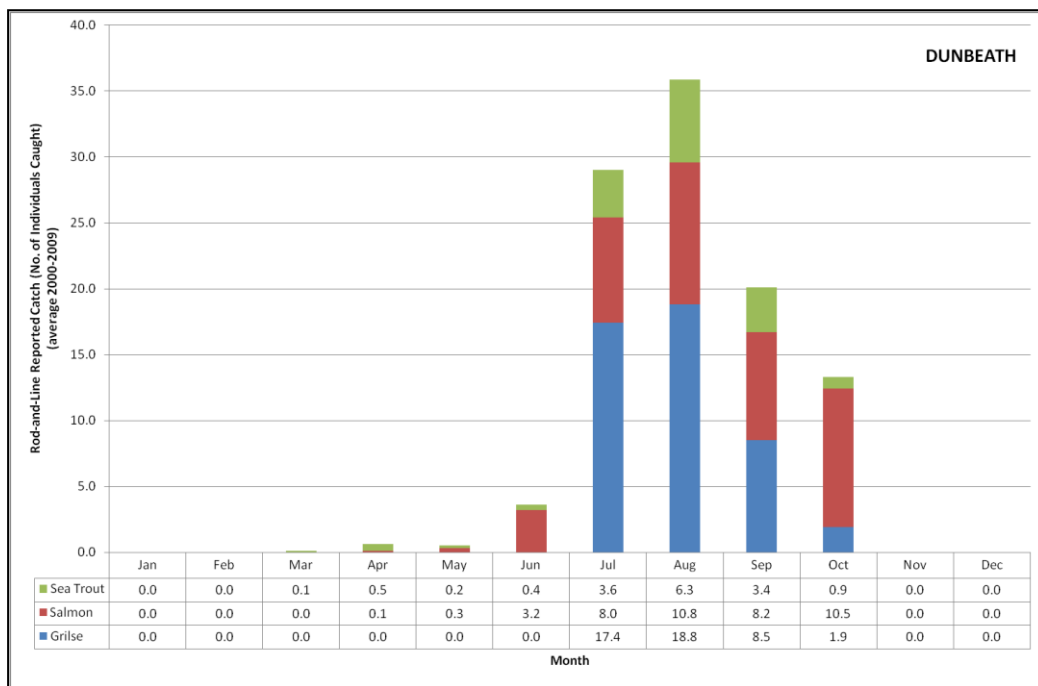


Plate 5.1-21 Seasonality of the Rod-and-Line Reported Catch by Species in the Dunbeath District (Average 2000 to 2009) (Source: MSS 2010)

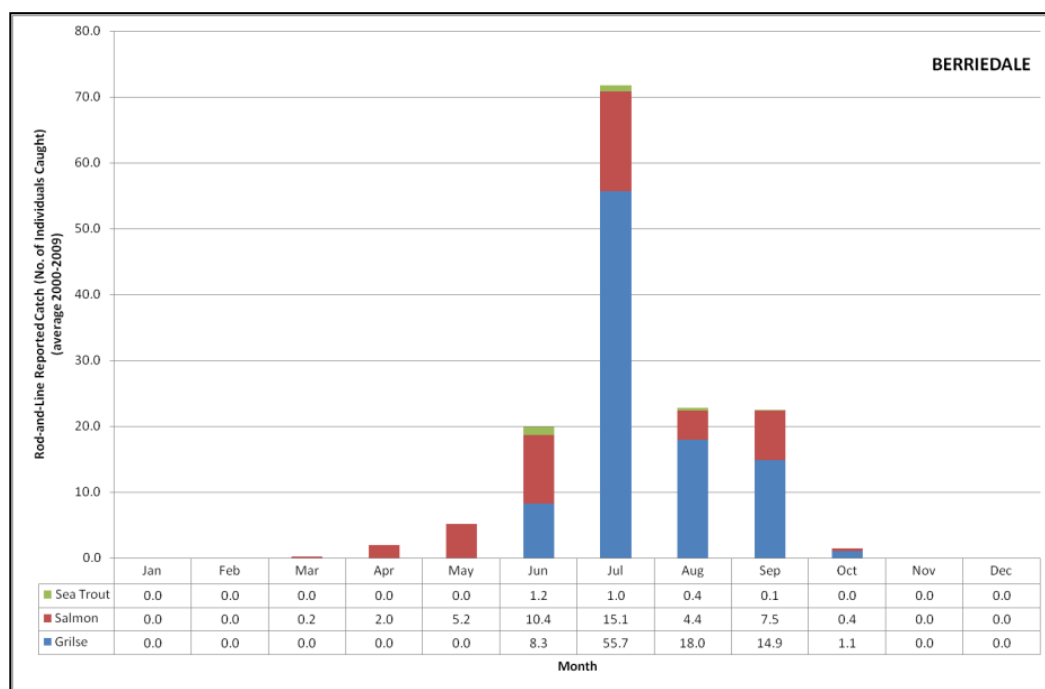


Plate 5.1-22 Seasonality of the Rod-and-Line Reported Catch by Species in the Berriedale District (Average 2000 to 2009) (Source: MSS 2010)

Table 5.1-11 Seasonality of Catch (No. of Individuals Caught) by the Net Fisheries in the Berriedale and Dunbeath Districts (Average 2000 to 2009) (Source: MSS 2010)

District	Method	Month		
		June	July	August
Berriedale	Fixed Engine	0.0	9.2	0.0
	Net-and-coble	0.8	27.9	1.0
Dunbeath	Net-and-coble	0.0	18.3	13.6

Salmon and Sea Trout Fisheries in the Local Study Area

5.1.6.58 The location of the export cable landfall, relative to the boundaries of the Deveron DSFB, is given in Figure 5.1-20, Volume 6 b.

The Deveron

5.1.6.59 As previously mentioned the Deveron is mainly a salmon river although sea trout is of importance during the summer months. The only fishing method currently used in the Deveron district is rod-and-line and there are no operational coastal netting stations. Nets were once operational within the district; however these were bought by the Board in 1991 and are no longer fished.

5.1.6.60 The export cable landfall is in close proximity to the Water of Philorth, located in the Deveron DSFB. Fishing activity in the Water of Philorth is relatively low, compared to other rivers in the district, and the catch consists primarily of sea trout.

- 5.1.6.61 The majority of sea trout are believed to be in the sea from April to the end of August. Smolts migrate out of the river at the end of March / April (this is an important period in their migration) and adults feed in grounds off the coast from March until September. Sea trout return to the rivers throughout this period, although most individuals return later in the year, around August, close to the spawning season.

5.1.7 Individual Site Baseline Characteristics

Commercial Fisheries

- 5.1.7.1 The identification of fishing activities within each of the three proposed wind farm sites is limited in the following ways:

- Due to the large spatial area of ICES rectangles, it is not possible to use fisheries statistical data to assess the three proposed wind farm sites on a site specific basis: the three sites all fall within ICES rectangle 45E7 and the analysis for this rectangle applies to all of the three sites.;
- Fishing patterns and practices will vary year on year, particularly in the case of the two principal fisheries occurring in the immediate area of the three proposed wind farm sites.:
 - Scallop activity is limited by the substrate requirements of scallops, which are generally located in areas of sand, fine gravel or sandy gravel. This substrate is however prevalent in the Moray Firth, particularly in the vicinity of the three proposed wind farm sites and the Western Development Area, and the four years of spatial data shows variations in the densities and locations of scallop activity within these areas. In addition, the fishery is cyclical and grounds may be left for a period to recover. As a result, it is not currently possible to definitively identify differences in the level and distribution of activity between the three sites.; and
 - Squid activity in the Moray Firth varies significantly on an annual basis. Although fishing activity has predominantly been recorded in coastal areas and in the general vicinity of nephrops grounds, 2009 and 2010 additionally recorded activity in the area of the three proposed wind farm sites. It is likely that variation in the pattern of activity will occur in the future.

Telford

- 5.1.7.2 Scallop fishing has been recorded within the Telford site, although consistently to a slightly lesser degree than in either the Stevenson or MacColl sites for the four year period of spatial data.

- 5.1.7.3 Squid activity in the central Moray Firth in 2009 and 2010 (when high landings were recorded in 45E7 and for which spatial distribution is available) was not recorded in the Telford site.

Stevenson

- 5.1.7.4 Scallop fishing has been consistently recorded within the Stevenson site during the four year period, although annual fluctuations should be noted. Squid activity has been recorded in 2009 and 2010 (when high landings were recorded in 45E7 and for which spatial distribution is available), primarily concentrated in the west of the site.

MacColl

5.1.7.5 Scallop fishing has been consistently recorded at the highest level within the MacColl site during the four year period, compared to the Telford and Stevenson sites for the four year period of spatial data. Squid activity has been recorded in 2009 and 2010 (when high landings were recorded in 45E7 and for which spatial distribution is available), primarily concentrated in the west of the site.

5.1.7.6 Table 5.1-12 below summarises the baseline characteristics of the individual wind farm sites.

Table 5.1-12 Summary of Baseline Characteristics in the Individual Wind Farm Sites

Individual Wind Farm Sites	Summary of Baseline Characteristics
Telford	Scallop activity, but relatively lower than in Stevenson and MacColl. No over 15 m vessel squid activity recorded in the site during the period of analysed data
Stevenson	Scallop activity. Level of activity fluctuates over the period of analysed data. Over 15 m vessel squid activity predominantly in the west of the site, although annual variations in activity should be noted.
MacColl	Scallop activity. Level of activity is most consistent relative to Telford and Stevenson sites over the period of analysed data. Over 15 m vessel squid activity predominantly in the west of the site, although annual variations in activity should be noted.

Salmon and Sea Trout

5.1.7.7 Site specific characteristics for salmon and sea trout fisheries do not apply, because all salmon fisheries are in-river, or to a lesser extent, coastal. The ecology of the species in the marine environment and the potential use they make of the three proposed wind farm sites is described in Chapter 4.3 (Fish and Shellfish Ecology).

5.1.8 Legislative and Planning Framework

5.1.8.1 The commercial fishing baseline for the three proposed wind farm sites takes into account the following guidelines and legislations:

- Marine and Coastal Access Act 2009;
- Marine (Scotland) Act 2010;
- DEFRA and CEFAS requirements as specified in the 2004 Guidelines (CEFAS, 2004); and
- British Wind Energy Association 2004 Recommendations.

5.1.8.2 The key guidance documents used for both the baseline and impact assessment are as follows:

- Offshore Wind Farms, Guidance Note for Environmental Impact Assessment in Respect of FEPA and CPA Requirements – Version 2; CEFAS, MCEU, 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; and
- MORL Scoping Responses.

5.1.9 References

Beukers-Stewart, B. D. and Beukers-Stewart, J. S. (2008) Principles for the Management of Inshore Scallop Fisheries around the United Kingdom. Environmental Department, University of York report to CCW / SNH / NE

Campbell, R. and McKay, A. (2007) The Moray Firth Squid Fishery 2006. Fisheries Research Services Internal Report No. 15 / 07

Daunt, F., Wanless, S., Greenstreet, S.P.R., Jensen, H., Hamer, K.C. and Harris, M.P. (2008) The impact of the sandeel fishery closure on seabird food consumption, distribution, and productivity in the northwestern North Sea. *Can. J. Fish. Aquat. Sci.* 65: 362-381

Hastie, L., Pierce, G., Pita, C., Viana, M., Smith, J. and Wangvoralak, S. (2009) Squid Fishing in UK Waters. Report to SEAFISH Industry Authority

Keitz, S. and Bailey, N. (2010) Fish and Shellfish Stocks 2010. Marine Scotland Report

Linnane, A., Ball, B., Munday, B., van Marlen, B., Bergman, M. and Fonteyne, R. (2000) A review of potential techniques to reduce the environmental impact of demersal trawls. *Irish Fisheries Investigations (New Series)*. No. 7

Moray Firth IFG Committee (2009 and 2010) Meeting Minutes

Moray Firth Partnership: www.morayfirth-partnership.org

Natural Scotland (2010) Scottish Sea Fisheries Statistics 2009. Scottish Government

Pers. comm. Buckie and Fraserburgh District Fishery Offices (2012)

Pers. comm. Fishing industry representative (2011)

Pers. comm. Scallop industry representative (2012)

Ross, D. (2010) Scallop-dredging row leaves Scots boats nowhere to fish. *The Herald Scotland*, 18 / 11 / 10

Smith, J.M., Pierce, G.J., and Theodossiou, I. (2006) The importance of fishers' knowledge as a management tool: a case of the 2006 decline of the Moray Firth Loligo fishery in North East Scotland and the implications for future management strategies. *ICES CM 2007 / O:06*

Synthesis of the Consultation on the Reform of the Common Fisheries Policy (2010) European Commission

The Scottish Government, Fisheries Section: <http://www.scotland.gov.uk/fisheries>.

Young, I.A.G., Pierce, G.J., Stowasser, G., Santos, M.B., Wang, J., Boyle, P.R., Shaw, P.W., Bailey, N., Tuck, I. and Collins, M.A. (2006) The Moray Firth directed squid fishery. *Fisheries Research*, 78: 39-43

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5.2 Shipping and Navigation

5.2.1 Introduction

- 5.2.1.1 This chapter summarises baseline vessel activity and navigational features in the vicinity of the Project study area.
- 5.2.1.2 In carrying out the assessment, recreational sailing data, maritime incidents, fishing sightings / surveillance data and shipping survey data recorded in the area was used to identify the baseline navigational activity. Furthermore, consultation with relevant statutory and non-statutory bodies was undertaken.

5.2.2 Consultations

- 5.2.2.1 Consultation on navigational issues has been carried out with stakeholders during the Project. Paragraphs 5.2.2.1 to 5.2.2.4 summarise the key consultation meetings. Given the proximity of the Beatrice Offshore Wind Farm Ltd (BOWL) development to the MORL Project a number of joint consultation meetings were carried out.
- 5.2.2.2 During an Offshore Operators meeting and Hazard Review Workshop, carried out in July 2011, a number of navigational and non-navigational concerns (i.e. engineering and emergency response issues) were raised. At the time of preparing the Environmental Statement, there is ongoing consultation through MORL and BOWL to ensure comments are addressed with stakeholders and considered within the final NRA(s).
- 5.2.2.3 A summary of the main shipping and navigation scoping and consultation meeting comments identified during the Project are provided below in Table 5.2-1 to Table 5.2-3. It is noted that full scoping consultations are provided in Chapter 1.4 (Stakeholder Consultation).

Table 5.2-1 Summary of the Three Proposed Wind Farm Sites Scoping Responses

Organisation	Scoping Comments	MORL Response
Marine Scotland	The ES should supply detail on the possible impact on navigational issues for both commercial and recreational craft.	Impacts assessed in Chapters 8.2 and 11.2.
MCA	A Navigation Risk Assessment will need to be submitted in accordance with MGN 371 (and 372) and the DfT / MCA Methodology for Assessing Wind Farms.	Navigation Risk Assessment included in Technical Appendix 5.2 D.
	Particular consideration should be given to the implications of the size and location on SAR resources and Emergency Response & Co-operation Plans (ERCOP) and Guard Vessel provisions.	Assessed in Chapters 8.2 and 11.2.
	The effects on ship's radar will need to be assessed on a site specific basis taking into account previous studies.	Assessed in Chapters 8.2 and 11.2.
Northern Lighthouse Board (NLB)	NLB agrees that Notice to Mariners, Radio Navigation Warning and publications in appropriate bulletins will be required stating the nature and timescales of works carried out in the marine environment. All navigational marking and lighting of the site or its associated marine infrastructure will require the Statutory Sanction or the NLB prior to deployment.	This will be undertaken prior to and during construction, operation and decommissioning.
	The NLB also encourages engagement with the Moray Firth Offshore Wind Developers Group (MFOWFDG) to work together to minimise the cumulative impact of site development.	Cumulative impacts assessed in Chapter 15.2.

Organisation	Scoping Comments	MORL Response
Royal Yacht Association (RYA) Scotland	The RYA welcomes the commitment to undertake the Marine Navigational Risk Assessment following DfT / MCA Methodology.	Included in Technical Appendix 5.2 D.
	The RYA would expect to see that recreational craft are to be included in the Navigational Risk Assessment and that RYA will be part of the consultees for this assessment.	Included in Technical Appendix 5.2 D.
	The RYA considers that the creation of safety zones around individual operational turbines that exclude small craft are unlikely to increase their navigational safety and would therefore be unnecessary, impracticable and disproportionate.	
	The RYA recognises that increased navigational risk occurs during construction, major maintenance and decommissioning and therefore temporary safety zones are required. These activities should be supported by regular Notices to Mariners.	
Scottish Canoe Association (SCA)	The SCA do not have any concerns with this proposal. Given the distance out to sea, this is not an area where sea Kayakers would venture and the development should not have any significant impact on tidal flows and sediment deposition close to shore where small recreational boats (e.g. kayaks) could be affected by any potential changes to tidal flows and sandbanks.	Noted

Table 5.2-2 Summary of Transmission Infrastructure Scoping Responses

Organisation	Scoping Comments	MORL Response
MCA	Particular attention should be paid to cabling routes and where appropriate burial depth for which a Burial Protection Index (BPI) study should be completed and, subject to the traffic volumes, an anchor penetration study may be necessary. The developer must ensure that 'the works' do not encroach on any recognised anchorage, either charted or noted in nautical publications, within the proposed consent area.	Cabling routes assessed in Chapters 8.2 and 11.2. BPI an anchor penetration study has not been fed into the ES, but will be considered in the development process
	The cumulative and in combination effects require serious consideration, particularly the adjacent Scottish Territorial Waters wind farm projects, the positive interaction with MFOWFDG is noted.	Cumulative effects assessed in Chapter 15.2
Chamber of Shipping	The Chamber is pleased to note that the anchoring of large vessels in the general area around the proposed cable route has been recognised by the developers.	Assessed in Chapters 8.2 and 11.2
	The Navigational Risk Assessment should clearly identify those areas where anchoring takes place and the cable route should be planned in such a way that it avoids important anchoring locations, which may not necessarily be marked on charts. Alternatively, cables should be buried to depths where impairment is less likely.	Noted
NLB	NLB would require that Notice(s) to Mariners, Radio Navigation Warning and publication in appropriate bulletins will be required stating the nature of the works.	Included in assessment

Organisation	Scoping Comments	MORL Response
RYA	<p>Cable laying operations are normal activities covered by the International Regulations for Preventing Collisions at Sea, to which recreational sailors must conform. RYA know that modern installation techniques, such as trenching and directional drilling, can return the landfall site to its original condition so that beaches and adjacent shallow waters can still be used for landing and for temporary anchoring of small recreational craft.</p> <p>RYA Scotland will be pleased to provide any additional information that may be required.</p>	Noted

Table 5.2-3 Summary of Main Consultation Meetings

Organisation	Consultation Response	MORL Response
MCA 23rd September 2010, 6th September 2011 and 8th March 2012	The main issue was to address possible cumulative issues for the two projects (MORL and BOWL), combined with the oil and gas developments in the area.	Addressed in Chapter 15.2
	MCA stated their preference for phased construction safety zones and operational safety zones to be based on experience gained during the construction phase. Justification would be required for operational safety zones. The Cable route(s) require being included within the NRA.	Included in assessment and Technical Appendices 5.2 D and 5.2 E
	Floating structure (turbines or OSPs) was raised as a concern.	Floating structures now removed from the Rochdale Envelope
	In terms of layouts, simple patterns are preferred, such as grid or diamond layouts, avoiding isolated turbines.	Wind farm layouts restricted to grid or diamond.
DfT 23rd September 2010 and 6th September 2011	The main issue was to address possible cumulative issues for the two projects (MORL and BOWL), combined with the oil and gas developments in the area.	Addressed in Chapter 15.2
	DfT also stated their preference for phased construction safety zones and operational safety zones to be based on experience gained during the construction phase. Justification would be required for operational safety zones.	Considered in ES but not assumed to be granted
Chamber of Shipping 24th September 2010, 5th September 2011 and 8th March 2012	The Chamber of Shipping noted that one of the key issues would be the oil and gas operational vessels passing through the site and that there should be ongoing consultation / dialogue with vessels (the Chamber should be kept informed).	Consultations undertaken and potential effects assessed in Chapters 8.2 and 11.2
	The Chamber and mariners would be concerned regarding any proposals to install floating turbines, especially as they would be an unproven technology within UK waters. Chamber of Shipping stated that developers may have to approach the MCA to ask if they would be revising MGN 371 and 372 (should such turbines be proposed).	Floating structures removed from Rochdale Envelope.
	It was stated that given the distance between the proposed sites and the coastline they would not be concerned regarding the amount of sea room between the wind farms and the coast.	
	They would be concerned regarding the deviation of oil and gas service vessels from any developments within the Western Development Area.	

Organisation	Consultation Response	MORL Response
Chamber of Shipping 24th September 2010, 5th September 2011 and 8th March 2012	Depth of cable burial is key in charted anchorage areas (2 m plus). Relocation of anchorage areas is also possible.	Floating structures removed from Rochdale Envelope.
	Commercial vessels wouldn't be expected to pass through the site, but may use it as a waypoint.	
NLB 17th September 2010 and 5th March 2012	The Moray Firth Round 3 Zone was considered not to be in an area of high shipping levels.	Considered in ES but not assumed to be granted
	NLB noted strong tides run south into the Zone, these can create difficult conditions when there are strong south easterly winds against the tides, with very large waves in flood tide.	
	Overall, it was felt by the NLB that the proposals avoid major navigational routes and therefore there are no serious concerns.	
	NLBs preference is that operational safety zones (OSZs) cannot be effectively policed (which would be very difficult throughout the entire Eastern Development Area) and it is not worth having them in place. No preference was expressed for the grid or diamond layouts, but these regular patterns are preferable to other options. NLB noted that it is preferable for there to be no navigational channels and instead to keep the wind farm more compact and therefore easier to navigate around rather than through.	
RYA/CA 24th September 2010, 6th September 2011 and 5th March 2012	RYA / CA stated that yachts can get pushed into the area by the tide when sailing up towards the Pentland Firth. However, it was acknowledged that the area wasn't particularly busy from a recreational sailing perspective with medium use cruising routes through the general area.	Noted
	RYA / CA noted that the activity is very weather dependent and the busiest routes are mainly coastal - along the Moray and Caithness coastlines. In addition, very few vessels go north to the Pentland Firth having come through the Caledonian Canal.	
	RYA / CA would like to see a VHF repeater installed at the site as MCA coverage tends to be patchy further offshore. Additionally, they would like a weather station to transmit data on VHF to assist vessels in the area.	
	RYA / CA were concerned that different types of turbines could be used in adjacent sites and that the sites may not be aligned and the fact they may not be regular grid patterns. However, the consultees understood the reasons why the developers could not guarantee that this would be the case.	
	In the event of floating turbines being used, they would be concerned that the area could become a no go area for recreational vessels.	
	RYA Scotland felt OSZs are not effective and they are not recommended by the RYA. Excluding boats from these areas is not effective mitigation as not all vessels are necessarily aware of the OSZs in place, and it is impractical to police these across a site as large as this (and could potentially harm relations with other sea users). For the floating OSPs, this may be different as the structure extends further under sea than above and is therefore not visible.	Assessed in Chapters 8.2 and 11.2

Organisation	Consultation Response	MORL Response
	It wasn't felt there was any anchoring risk to recreational vessels as their anchors only run to about 20 cm depth. If rock placement is utilised in areas where cables can't be buried, these areas need to be clearly identified.	Assessed in Chapters 8.2 and 11.2
Ithaca Energy 7th July 2011	It was pointed out that the Jacky platform could be decommissioned in 2014 / 15, but this is largely dependent on other operations in the area, possible future tie-ins and the Polly field development. The Polly location is approximately 2 nm to the southeast of the Beatrice field.	Noted
Talisman Energy 7th July 2011	Access will be required for bringing heavy lift vessels to decommission offshore installations at the Beatrice Field.	Noted

5.2.2.4 In addition to the Hazard Identification Workshops, two meetings were held with most consultees: one during the scoping phase of the wind farm and one as part of the draft ES consultation process.

5.2.3 Baseline Characteristics

5.2.3.1 The main data sources used for the desktop study are listed below:

- AIS and radar (non-AIS) survey data for Moray Firth Round 3 Zone from survey vessels operating during spring / summer (April to July 2010) and winter (November 2010 to January 2011);
- Fishing surveillance satellite data (2009) and over flight data (2005 to 2009);
- Maritime incident data from the Maritime Accident Investigation Branch (MAIB) (2001 to 2010) and Royal National Lifeboat Institute (RNLI) 2001 to 2010;
- UK Admiralty Charts; and
- Admiralty Sailing Directions, North Coast of Scotland Pilot (NP 52).

5.2.3.2 The shipping and navigation baseline presents an assessment of the existing navigational features and shipping activity recorded within and adjacent to the Project sites. The baseline data for each of the main navigational users is presented in the remainder of this chapter.

5.2.3.3 During spring/summer 2012, a continuous AIS data collection survey will commence at Helmsdale in Caithness. This will enable the baseline to be validated against the marine traffic survey data and increasing seasonal knowledge of traffic movements within the area prior to construction.

5.2.4 Offshore Generating Station

Navigational Features

5.2.4.1 Figure 5.2-1, Volume 6 b presents the relevant navigational features, which are described below.

5.2.4.2 Offshore infrastructure is present in the Jacky Field and Beatrice Development Area boundary. The closest platform is located at the Jacky Field, approximately 3.7 nm west of the Stevenson site. The study area boundary (Figure 5.2-1, Volume 6 b) is also approximately 5.4 nm east of the Beatrice demonstrator offshore wind turbines. The study area boundary has been selected on the basis that it captures navigational features and traffic which could be affected by a nearby development.

5.2.4.3 Firing Practice Areas D807 (now withdrawn) and D808 intersects the study area. No restrictions are placed on the right to transit the firing practice area at any time. Firing practice areas are operated using a clear range procedure: exercises and firing only take place when the areas are considered to be clear of all shipping.

Overview of Melocean Data

5.2.4.4 The tidal streams in the Moray Firth area are provided below:

- The tide on the north coast of Scotland is predominantly semi-diurnal and progresses east along the north coast and through the Orkney and Shetland Islands thence south down the east coast. Ranges are about 3 m in the Orkney Islands, 2 m in the Shetlands Islands and 4 m at the head of the Moray Firth;
- Tidal streams are very strong off Duncansby Head and fairly strong off Rattray Head and in the inner part of the Moray Firth, they are generally weak elsewhere, both in the eastern approaches to and within, Moray Firth; and
- Currents in the North Sea are generally very variable and much affected by existing, and recent, local weather. There is a very weak clockwise circulation around the shore of the Moray Firth. When there is a large amount of snow melt in spring and during and after heavy rain or western gales, temporary but quite appreciable local currents emerge from the Dornoch, Cromarty and Inverness Firths areas.

5.2.4.5 During consultation with NLB it was noted that strong tides can run south into the study area and, combined with a strong south easterly wind against the tide, can result in large waves during the flood tide. RYA / CA consultation also highlighted that sailing yachts can be pushed into the study area by the tide when sailing north towards Pentland Firth.

5.2.4.6 Historically, visibility has been shown to have a major influence on the risk of ship collision. The annual probability of visibility less than 1 km for the UK North Sea is approximately 0.03 (i.e. approximately 3 % of the year).

5.2.4.7 The frequency of severe sea state for the Moray Firth area (significant wave height exceeding 5 m) is approximately 0.1 % per year, with the predominant wind direction from south through to westerly direction.

Shipping Surveys

5.2.4.8 Vessel-based Automatic Identification System (AIS) and radar track data on vessel movements were gathered to identify the vessel activity both within and adjacent to the study area.

5.2.4.9 This data was supplemented with shore and offshore based AIS survey trial coverage to overcome any data shortfalls, i.e. periods when the survey vessels were outside the tracking range and when travelling between ports.

5.2.4.10 Details on non-AIS vessels were obtained by tracking targets on the survey ships' radar or from manually recording vessels within visual range.

- 5.2.4.11 Two vessel based surveys were carried out:
- Chartwell geophysical vessel recorded data from 1st April to 31st July 2010; and
 - Gargano geotechnical vessel recorded two periods 2nd November to 13th December 2010 and 31st December 2010 to 9th January 2011.
- 5.2.4.12 Plots of the winter and summer survey data are presented in Figure 5.2-3 and Figure 5.2-4, Volume 6 b.
- 5.2.4.13 In total, there was an average of 14 vessels per day passing within 10 nm of the MORL Zone during the winter survey and 18 vessels per day recorded during July 2010.
- 5.2.4.14 It is noted that the increased traffic recorded in the summer survey can be partly attributed to fishing and recreational vessels passing through the area in more favourable weather and sea conditions. This data will also be validated as part of the surveys as described in paragraph 5.2.3.3 above.

Fishing Activity

- 5.2.4.15 The busiest month of fishing tracks intersecting the study area was recorded during July 2010 and is presented in Figure 5.2-5, Volume 6 b. The fishing vessel tracks were mainly recorded on AIS (70 %), with 30 % on radar (non-AIS).
- 5.2.4.16 Fishing vessels were the second most common ship type within the area, after cargo vessels, with 15 % of vessels recorded during July 2010 associated with the Pentland Firth route steaming either NNW or SSE.
- 5.2.4.17 There was an average of just under one fishing vessel every two days recorded passing through the study area during the survey.

Recreation Activity

- 5.2.4.18 The recreational vessel tracks recorded during the shipping surveys is presented in Figure 5.2-6, Volume 6 b. It is noted that no recreational vessels were recorded during the winter months.
- 5.2.4.19 Fourteen recreation vessels were recorded passing through the study area during the survey, headed north west / south east (generally to and from Wick). Recreational vessels were mostly using cruising routes from Banff and Peterhead to Wick and Northern Isle marinas (i.e. Scrabster and Kirkwall).
- 5.2.4.20 It is noted that 55 % of vessel tracks were recorded on radar with 45 % broadcasting on AIS.
- 5.2.4.21 A plot of the recreational activity and cruising routes based on the latest RYA data (2010) is presented in Figure 5.2-7, Volume 6. The study area is intersected by a 'medium use' cruising route passing from Wick to north eastern Scottish marinas including Whitehills and Peterhead.

Maritime Incidents

- 5.2.4.22 The locations of accidents, injuries and hazardous incidents reported to Marine Accident Investigation Branch (MAIB) within 10 nm of the MORL Zone for the last ten years (January 2001 to December 2010) are presented in Figure 5.2-8, Volume 6 b, colour-coded by type.
- 5.2.4.23 A total of 12 unique incidents involving 12 vessels were reported in the area, corresponding to an average of just over one per year.

- 5.2.4.24 Three incidents were reported within the study area. One incident was reported as a hazardous incident in May 2005 involving a 21 m fishing vessel which had a near miss with another vessel which was not identified. The other two incidents were reported as accidents to people. One incident occurred in September 2003 on board a UK registered 15 m (in length) scallop dredger involving an injury to a crew member. The other incident also involved an injury to a crew member whilst the unspecified 24 m UK registered vessel was on passage.
- 5.2.4.25 It is noted that a machinery failure was recorded within the study area.
- 5.2.4.26 Data on RNLI lifeboat responses within 10 nm of the MORL Zone in the ten year period between 2001 and 2010 have been analysed. A total of 21 launches to 21 unique incidents were recorded by the RNLI (excluding hoaxes and false alarms) and are presented in Figure 5.2-9, Volume 6 b, colour-coded by casualty type.
- 5.2.4.27 There was an average of two RNLI incidents per year recorded within 10 nm of the Moray Forth Zone from 2001 to 2010.
- 5.2.4.28 There were no incidents recorded within the study area over the 10 year period analysed. The closest incident was recorded approximately 300 m west of the MORL Zone and involved a large fishing vessel in April 2003. A machinery failure occurred on the fishing vessel and Wick all-weather lifeboat (ALB) assisted the vessel.
- 5.2.4.29 The second closest incident occurred 1 nm north west of the proposed sites and involved a leak / swamping on board a sailing yacht in wind force 6 in September 2010. Royal Air Force (RAF) and Wick ALB SAR units were involved in assisting the vessel to safety.

Search and Rescue (SAR)

- 5.2.4.30 The closest SAR helicopter base is located at Lossiemouth, operated by the RAF, approximately 25.5 nm to the south-south-west of the proposed sites. A chart of the SAR helicopter bases is presented in Figure 5.2-10, Volume 6.
- 5.2.4.31 The RNLI stations in the vicinity of the proposed sites are presented in Figure 5.2-11, Volume 6 b. At each of these stations, crew and lifeboats are available on a 24 hour basis throughout the year.

5.2.5 Transmission Infrastructure

- 5.2.5.1 The study area for the transmission infrastructure includes the area of the three proposed wind farms as well as a 10 nm buffer around the proposed cable route to shore to ensure that any shipping activities which could be affected by the transmission infrastructure are included.

Navigational Features

- 5.2.5.2 Figure 5.2-2, Volume 6 b presents the relevant navigational features, which are outlined below.
- 5.2.5.3 Firing Practice Area D808 intersects part of the offshore export cable route. D808 is now withdrawn.
- 5.2.5.4 The main navigational features relate to the two main ports in the area, at Fraserburgh and Peterhead. There are a number of gas pipelines in Rattray Bay that run from various North Sea offshore platforms to the onshore St Fergus Gas Terminal.

- 5.2.5.5 Admiralty Sailing Directions (2009), North Coast of Scotland Pilot, recommended Fraserburgh Beach and Peterhead Bay as the two main anchorages in the area. Aberdour Bay is also known to be used as an anchorage, approximately 7 nm west of the offshore export cable route.
- 5.2.5.6 In addition, there are two Marine Environmental High Risk Areas (MEHRAs) located within 5 nm of the export cable landfall.
- 5.2.5.7 MEHRAs have been identified by the UK Government as an area of environmental sensitivity and at high risk of pollution from ships. The Government expects mariners to take note of MEHRAs and either keep well clear of or, where this is not practicable; exercise an even higher degree of care than usual when passing nearby.

Shipping Survey

- 5.2.5.8 AIS based shipping data was recorded from the Ivero survey vessel from July to October 2011 for the offshore export cable route.
- 5.2.5.9 Data gathered from 26th August to 22nd September 2011 is presented in Figure 5.2-12, Volume 6 b.
- 5.2.5.10 From a commercial vessel perspective the Moray Firth is generally not a busy area. The main shipping routes in the area are either headed into the Moray Firth and Inverness (e.g. shuttle tankers to the Nigg terminal or coastal shipping to Inverness) or using routes off Rattray Head bound for Pentland Firth and the Northern Isles (e.g. Northlink ferries to both Shetland and Orkney from Aberdeen).
- 5.2.5.11 Other routes in the vicinity consist of fishing vessels and tankers passing parallel to the Moray / Buchan coastline to local fishing ports and Inverness / Cromarty Firth, with a further route identified as being associated with offshore vessels supporting the Beatrice and Jacky Oil Fields or headed to other North Sea platforms passing off Rattray Head from Peterhead and Aberdeen.
- 5.2.5.12 In addition, large tankers anchor in the Moray Firth whilst awaiting orders. Figure 5.2-13, Volume 6 b presents the anchored vessels recorded from the complete Ivero survey (6th July to 2nd October 2011 – 84 days).
- 5.2.5.13 Five vessels were recorded at anchor within Aberdour Bay. These vessels were composed of four offshore supply vessels and one general cargo vessel.
- 5.2.5.14 Further offshore, larger vessels (e.g. shuttle tankers) anchor in an area of shallower water (39 to 50 m), north of the Southern Trench approximately 7 nm south west of the offshore export cable route. From the combined survey period, a shuttle tanker, Aberdeen (221 m in length broadcasting a draught of 8.5 m), was recorded for 16 days during July, August and September 2011.
- 5.2.5.15 Within the export cable landfall area, two cargo vessels were recorded at anchor during three days.

Fishing Activity

- 5.2.5.16 Fishing vessel activity recorded during 28 days of the shipping survey (July and September 2011) is presented in Figure 5.2-14, Volume 6 b.

- 5.2.5.17 It can be observed that fishing vessel tracks are mostly recorded heading in / out of the fishing port of Fraserburgh, where fish are landed for markets. Fish are also landed for onward sale at a number of ports within the Moray Firth such as Buckie, Lossiemouth, Banff and Macduff. Most fishing vessels within the study area were steaming as opposed to engaged in fishing. Fishing activity was mainly in the west and south of the three proposed wind farm sites during the maritime survey, predominantly by scallop dredges and small trawlers.
- 5.2.5.18 Fishing activity recorded from satellite surveillance data (2009) is presented in Figure 5.2-15, Volume 6 b.
- 5.2.5.19 From the satellite positions, there are relatively higher density areas of fishing vessels recorded within 4 nm of the Fraserburgh port approaches. It is noted the vast majority of vessel sighting speeds were over 6 knots (90 %), and hence were likely to be transiting to / from port.

Recreation Activity

- 5.2.5.20 Recreation vessel activity recorded during July and September 2011 is presented in Figure 5.2-16, Volume 6 b.
- 5.2.5.21 On average, there was just under one recreational vessel recorded per day during the survey. The majority of vessels were recorded transiting along the Aberdeenshire and Banff / Buchan coastlines (within 2 nm of land) off Rattray Head, Fraserburgh and Rosehearty.

Maritime Incidents

- 5.2.5.22 The locations of accidents, injuries and hazardous incidents reported to MAIB within 10 nm of the offshore export cable route for the last ten years (January 2001 to December 2010) are presented in Figure 5.2-17, Volume 6 b, colour-coded by type. A total of 86 incidents were reported, corresponding to an average of nine per year. There was one incident reported within the offshore export cable route area. An incident occurred when a small hand-line fishing vessel (8 m in length) became grounded in July 2006 during poor visibility and dense fog. The vessel beached at slow speed (with no damage sustained) and was re-floated at high tide with assistance from the RNLI.
- 5.2.5.23 It should also be noted that a large number of incidents were recorded within the Fraserburgh harbour limits, with the majority involving fishing vessels (i.e. machinery failures, fire / explosion, person overboard and contacts).
- 5.2.5.24 Data on RNLI lifeboat responses within 10 nm of the study area in the ten year period between 2001 and 2010 have been analysed. A total of 120 launches to 108 unique incidents were recorded by the RNLI (excluding hoaxes and false alarms) and are presented in Figure 5.2-18, Volume 6 b, colour-coded by casualty type.
- 5.2.5.25 No incidents were recorded within the offshore export cable route over the 10 year period analysed. However, it should be noted that a relatively high number of incidents (16), generally involving fishing vessels and people, occurred in Fraserburgh harbour limits and Fraserburgh Bay.

5.2.6 Summary of Individual Site Baseline Characteristics

5.2.6.1 A summary of the baseline conditions in each wind farm site is presented in Table 5.2-4 below.

Table 5.2-4 Summary of Baseline Conditions Within each Wind Farm Site

Individual Wind Farm Sites	Summary of Baseline Characteristics
Telford	<p>There is a low level of commercial and non-commercial shipping passing through the site. The majority of shipping uses the Pentland Firth route approximately 4 nm to the north east. In terms of intersecting tracks, there was approximately one vessel every ten days headed to / from Wick (mainly coastal tankers and recreation vessels).</p> <p>Fishing activity recorded within the site during the maritime surveys was low.</p> <p>Firing practice area D808 intersects the eastern section of the Telford site.</p> <p>There was a low level of maritime incidents (MAIB and RNLI) recorded in the site and wider area. The large proportion of RNLI incidents were recorded off the coastline (i.e. Wick Bay and the Caithness coastline).</p>
Stevenson	<p>There is a low level of commercial and non-commercial shipping passing through the site. The majority of shipping uses the Pentland Firth route (8 nm north east). A small number of recreation vessels were recorded intersecting the site during the summer survey (headed towards Wick). The Stevenson site is also intersected by a 'medium use' cruising route passing from Wick to north eastern Scottish marinas including Whitehills and Peterhead.</p> <p>Fishing activity was recorded within the centre and south / west of the site during the maritime surveys, predominantly by scallop dredgers and small trawlers.</p> <p>The site is located approximately 3.6 nm north east of the Jacky Platform.</p> <p>There was a low level of maritime incidents (MAIB and RNLI) recorded in the site and wider area. The large proportion of RNLI incidents were recorded off the coastline, i.e. Wick Bay and the Caithness coastline.</p>
MacColl	<p>There is a low level of commercial and non-commercial shipping passing through the site. The majority of shipping uses the Pentland Firth route (4 nm north east). In terms of routes passing through the site, there was approximately one vessel every ten days headed to / from Wick (coastal tankers and recreation vessels). The MacColl site is also intersected by a 'medium use' cruising route passing from Wick to north eastern Scottish marinas including Whitehills and Peterhead.</p> <p>Offshore support vessels headed to Beatrice / Jacky Fields intersect the southern corner of the site when routing from the nearby offshore support bases of Peterhead and Aberdeen.</p> <p>Fishing activity was recorded within the centre and south of the site during the maritime surveys, predominantly by scallop dredgers and small trawlers.</p> <p>Firing Practice Area D807 (now withdrawn) intersects the southern part of the MacColl, and D808 intersects the eastern area of the site.</p> <p>There was a low level of maritime incidents recorded in the site and wider area (as noted for the Telford and Stevenson sites).</p>

5.2.7 Legislative and Planning Framework

Primary Guidance

5.2.7.1 The primary guidance used during this assessment was the Maritime and Coastguard Agency (MCA) Marine Guidance Notice 371 (MGN 371) Offshore Renewable Energy Installations (OREIs) Guidance on UK Navigational Practice, Safety and Emergency Response Issues (2008).

5.2.7.2 Marine Guidance Notice 371 highlights issues that need to be taken into consideration when assessing the impact on navigational safety from offshore renewable energy developments, proposed for United Kingdom (UK) internal waters, territorial sea or Renewable Energy Zones.

5.2.7.3 There are five annexes containing recommendations (1 to 4) and regulatory extract (5) as follows:

- Annex 1: Considerations on site position, structures and safety zones;
- Annex 2: Navigation, collision avoidance and communications;
- Annex 3: MCA shipping template, assessing wind farm boundary distances from shipping routes;
- Annex 4: Safety and mitigation measures recommended for OREI during construction, operation and decommissioning; and
- Annex 5: Standards and procedures for generator shutdown and other operational requirements in the event of a search and rescue, counter pollution or salvage incident in or around an OREI.

Other Guidance

5.2.7.4 Other forms of marine and navigation based guidance used in this assessment are listed as follows:

- Department of Environment and Climate Change (DECC) Guidance Notes on Safety Zones, DECC (2007);
- IALA Recommendation O-139 (2008), The Marking of Man-Made Offshore Structures;
- MCA Marine Guidance Notice 372 (MGN 372) Offshore Renewable Energy Installations (OREIs) Guidance to Mariners Operating in the Vicinity of UK OREIs (2008) – Section 2.7 effects of wind farms and wind turbines on routing and Section 4 safety zone and exclusion zones;
- International Maritime Organisation (IMO), Guidelines for Formal Safety Assessment (FSA) (2007); and
- Search and Rescue (SAR) Framework, MCA (2002) – Chapter 1 (MCA) and Chapter 4 (Royal National Lifeboat Institution (RNLI)).

Review Process

5.2.7.5 DECC, in association with the MCA and the Department for Transport (DfT), produced the "Methodology for Assessing the Marine Navigational Safety Risks of Offshore Wind Farms" (2005) to provide a template for developers in preparing their navigation risk assessments.

5.2.7.6 The methodology is centred on risk controls and the feedback from risk controls into risk assessment. It requires a submission that shows sufficient risk controls / mitigation measures are, or will be, in place for the assessed risk to be judged as broadly acceptable or tolerable with further controls or actions.

5.2.8 References

Admiralty Sailing Directions (2009). North Coast of Scotland Pilot, NP 52, 7th Edition.

DECC (2007), Applying for Safety Zones around Offshore Renewable Energy Installations, Guidance notes.

DECC U.K. Government (2005). Methodology for Assessing the Marine Navigational Safety Risks of Offshore Wind farms.

IALA Recommendation O-139 (2008). The Marking of Man-Made Offshore Structures.

IMO (2007). Consolidated text of the Guidelines for Formal Safety Assessment (FSA) for use in the IMO rule-making process. (MSC / Circ.1023-MEPC / Circ.392) (14th May 2007).

MCA (2002). Search and Rescue Framework for the United Kingdom of Great Britain and Northern Ireland.

MCA (2008). Marine Guidance Note 371 (M+F), Offshore Renewable Energy Installations (OREI): Guidance on Navigational Practice, Safety Issues and Emergency Response Issues.

MCA (2008). Marine Guidance Note 372 (M+F), Offshore Renewable Energy Installations (OREI): Guidance to Mariners operating in the vicinity of UK OREIs.

The Royal Yachting Association (2008). UK Coastal Atlas of Recreational Boating; Recreational Cruising Routes, Sailing and Racing Areas around the UK Coast. Second Edition by RYA; Supported by Trinity House.

The Royal Yachting Association and the Cruising Association (2004). Sharing the Wind.

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5.3 Military and Civil Aviation

5.3.1 Introduction

5.3.1.1 This chapter describes the baseline characteristics of the three proposed wind farm sites (Telford, Stevenson and MacColl) and associated transmission infrastructure in respect of aviation receptors and activities. The information presented has been drawn from:

- Desktop studies;
- Consideration of the key legislative and planning information; and
- Consultation with relevant stakeholders.

5.3.1.2 This chapter is supported by the following documents:

- Technical Appendix 5.3 A (Moray Firth Offshore wind farm: Initial Aviation Assessment Report; November 2010, Spaven Consulting Report No. 10/283/MOR/4);
- Technical Appendix 5.3 B (Beatrice and Moray Offshore Wind Farms Helicopter Impact Assessment: Document Reference; Spaven Consulting Report No. P1492D003); and
- Technical Appendix 5.3 C (Radar Propagation Modelling).

5.3.1.3 This baseline is used to inform assessment of the likely significant effects of the three proposed wind farms and the transmission infrastructure on aviation and radar, which is presented in:

- Chapter 8.3, 11.3 and 15.3 (Military and Civil Aviation); and
- Chapter 12.1 (Whole Project Assessment).

5.3.1.4 The chapter includes the following components:

- Legislative and Planning Framework;
- Consultations;
- Baseline Conditions;
- Individual Site Baseline Summary Characteristics.

5.3.2 Consultations

5.3.2.1 MORL has consulted a number of aviation stakeholders throughout the scoping and EIA phase of the developments and the comments are summarised in Table 5.3-1 below.

5.3.2.2 A further meeting with the MoD is planned for 27th June 2012 to discuss the perceived effects on MoD radar and operations, and to consider the applicability of mitigation solution options.

Table 5.3-1 Summary of Consultation Undertaken

Organisation	Consultation Response	MORL Approach
Civil Aviation Authority (CAA)	CAA recommends discussion with Wick airport and with the helicopter operators based at Aberdeen airport.	Consultation with relevant stakeholders undertaken.
	With respect to the onshore cable route, MORL may need to address aviation effects between the landfall and the onshore substation if power lines are a significant height above ground.	No above-ground power lines proposed between landfall and substation.
NATS En-Route Limited (NERL)	The proposal has the potential to affect NERLs Communications, Navigation and Surveillance (CNS) infrastructure.	Potential effects assessed. Ongoing consultation with NATS.
Ministry of Defence (MoD) through Defence Infrastructure Organisation (DIO)	The turbines will be 33 km and 76 km from the ATC radar and Lossiemouth PSR and may cause unacceptable interference.	Effects upon radar assessed.
	MoD is willing to enter discussions with the developer with the aim of finding suitable mitigation; however, research and financial responsibility rests with the developer.	Meeting sought with MoD and arranged for summer 2012.
	The applicant should take account of MoD aviation and radar operations in the EIA.	Effects assessed.
	The turbines will be within EGD (UK Danger Area) 807 and will unacceptably affect military activities.	D807 now withdrawn by the MoD.
Offshore Helicopter Operators and Platform Operators	Consultation undertaken with CHC Scotia, Bond Offshore, Bristow, Ithaca, Wood Group, Talisman.	Hazard Identification workshop undertaken (August 2011).
	Information on use of Helicopter Main Route (HMR), flight schedules and approach procedures discussed.	Helicopter Impact Assessment produced (Technical Appendix 5.3 B) and approved by helicopter operators. Potential mitigation discussed.

5.3.3 Baseline Conditions

Identified Receptors

5.3.3.1 The development of turbines within the three proposed wind farm areas has the potential to affect a number of aviation stakeholders:

- Potential concerns may be raised with regard to the effect of wind farms within the three development areas upon NERL radar and operations and other users of radar data supplied by NERL;
- The MoD has raised potential concerns about the impact of wind farms within the three development areas upon the radar and operations provided by the MoDs Air Surveillance And Control System (ASACS) Force in support of the defence of the UK;
- The MoD has raised potential concerns about the impact of wind farms within the three development areas upon the radar and operations provided by the MoDs ATC service providers;

- Potential concerns have been raised by Offshore Helicopter Stakeholders regarding the effects of turbines within the three development areas upon the operations in support of the Oil and Gas Industries in the region; and
- The potential exists that the wind farms within the three development areas will present a physical obstruction to aviation operations in the area, with regard to the minimum safe altitude which is set in areas to ensure separation between aircraft and known obstacles.

5.3.3.2 The following specific receptors have been identified:

- NERL - Allanshill Primary Surveillance Radar (PSR) supporting Civil Air Traffic Control (ATC) and En-route operations;
- MoD Airspace Surveillance and Control Systems (ASACS) – Buchan PSR supporting UK Air Defence operations and training;
- MoD ATC – Lossiemouth PSR used to provide navigational services to aircraft inbound to and outbound from the airfield, to military aircraft operating over the Moray Firth;
- Highlands and Islands Airports Ltd (HIAL) Wick Airport regarding potential effects on aircraft flight patterns and procedures;
- Helicopter Main Routes – HMR X-Ray a specific routing used by helicopters transiting between Aberdeen, via Wick to the Atlantic Rim offshore installations west of the Shetland Islands;
- Helicopter Approach Procedures to offshore platforms; and
- Minimum Safe Altitude, which is the lowest altitude set in areas to ensure adequate vertical separation between aircraft and known obstacles.

Airspace Classification

5.3.3.3 The three proposed wind farm sites and transmission infrastructure are situated in an area of Class G uncontrolled airspace which is established from the surface up to Flight level (FL) 195 (approximately 19,500ft). Class C controlled airspace is established above FL195. Under this classification of airspace the following applies:

- Class G uncontrolled airspace: any aircraft can operate in this area of uncontrolled airspace without any mandatory requirement to be in communication with or receive a radar service from any Air Traffic Control (ATC) Unit. Pilots of aircraft operating under Visual Flight Rules (VFR) in Class G airspace are ultimately responsible for seeing and avoiding other aircraft and obstructions.

5.3.3.4 In the area of the three proposed wind farm sites and transmission infrastructure, the Class G uncontrolled airspace is sub-divided into areas with the following aviation stakeholder responsibility:

- RAF Lossiemouth Air Traffic Control (ATC) uses their PSR to provide services to aircraft inbound to and outbound from the airfield, to military aircraft operating over the Moray Firth, including the location of the three proposed wind farm sites and transmission infrastructure. In addition, RAF Lossiemouth is responsible for navigational services to transitory civil and military aircraft operating within a 40 nautical mile (nm) radius of the airfield, up to 9,500 ft, from Monday to Friday between 0900 and 1700 hrs;

Note: Danger Area (D) 807 has been removed from operation. D807 was established from sea level up to 1,500 ft, in a 10 nm radius of the point N57°58'00'' W002°50'00''. Promulgated activity in D807 included predominantly low level anti-submarine warfare training but can include live firing and bombing. RAF Lossiemouth provided a monitoring service for aircraft operating in D807.

- HMR X-Ray is used by helicopters transiting between Aberdeen, via Wick to the Atlantic Rim offshore installations west of the Shetland Islands. HMR X-Ray is established between 1,500 ft and FL 55 (approximately 5,500 ft). Navigational services for aircraft operating on this route are provided by Aberdeen Airport, using a radar feed of the NERL Allanshill PSR, and RAF Lossiemouth when aircraft are operating at low altitudes due to better Lossiemouth coverage;
- Advisory Route W4D follows the same route as HMR X-Ray between Aberdeen and Wick but extends from FL 55 up to FL 185. Advisory Routes provide a degree of protection to aircraft using them, but unlike fully controlled airspace, do not provide separation against all other aircraft. W4D is predominantly used by scheduled passenger services between Wick and Aberdeen Airports and by aircraft on transatlantic flights between the UK / Europe and North America; and
- Above 9,500 ft, the responsibility for the provision of navigation services lies with NERL and the military service providers based at the NERL Centre at Prestwick, Ayrshire.

5.3.3.5 Class C controlled airspace: all aircraft operating in this airspace must be in receipt of an air traffic service from NERL or a separate authorised military service provider.

5.3.3.6 Temporary Reserved Area (TRA) 008B is established above the three development sites from FL 195 up to FL 245. Promulgated activity within the TRA 008B includes Air Combat and training exercises and supersonic flight. ASACS Units using radar data supplied from the Buchan PSR are responsible for navigation services and support to aircraft activity within TRA 008B during promulgated activity times.

5.3.3.7 D712D within the Northern Managed Danger Area (MDA) complex is established from FL 245 up to FL 660. Distinct areas within the Northern MDA are activated when required. Promulgated activity within the Northern MDA includes Air Combat and training exercises and supersonic flight. ASACS Units using radar data supplied from the Buchan Air Defence radar are responsible for navigation services and support to aircraft activity within the Northern MDA when active.

5.3.3.8 Outside the times that TRA 008B and the Northern MDA are active, NERL is responsible for the provision of navigation services to aircraft in transit above FL 195 above the three development sites.

5.3.4 Individual Site Baseline Summary Characteristics

5.3.4.1 Table 5.3-2 below shows the individual wind farm baseline conditions.

Table 5.3-2 Individual Wind farm Baseline Summary

Individual Wind Farm Sites	Summary of Baseline Characteristics
Telford	<p>An area of Class G uncontrolled airspace which is established from the surface up to Flight level (FL) 195 (approximately 19,500ft). Class C controlled airspace is established above FL 195.</p> <p>Class G uncontrolled airspace:</p> <ul style="list-style-type: none"> • RAF Lossiemouth ATC uses their PSR to provide services to aircraft inbound to and outbound from the airfield, to military aircraft operating over the Moray Firth. In addition, RAF Lossiemouth is responsible for navigational services to transitory civil and military aircraft operating within a 40 nm radius of the airfield; • Advisory Route W4D follows the same route as HMR X-Ray between Aberdeen and Wick but extends from FL 55 up to FL 185; and • Above 9,500 ft, the responsibility for the provision of navigation services lies with NERL and the military service providers based at the NERL Centre at Prestwick. <p>Class C controlled airspace:</p> <ul style="list-style-type: none"> • Temporary Reserved Area (TRA) 008B is established above the three development sites from FL 195 up to FL 245. D712D within the Northern Managed Danger Area (MDA) complex is established from FL 245 up to FL 660; • ASACS Units using radar data supplied from the Buchan PSR are responsible for navigation services and support to aircraft activity in these areas; and • Outside the times that TRA 008B and the Northern MDA are active, NERL is responsible for the provision of navigation services to aircraft in transit above FL 195.
Stevenson	<p>An area of Class G uncontrolled airspace which is established from the surface up to Flight level (FL) 195 (approximately 19,500ft). Class C controlled airspace is established above FL 195.</p> <p>Class G uncontrolled airspace:</p> <ul style="list-style-type: none"> • RAF Lossiemouth ATC uses their PSR to provide services to aircraft inbound to and outbound from the airfield, to military aircraft operating over the Moray Firth. In addition, RAF Lossiemouth is responsible for navigational services to transitory civil and military aircraft operating within a 40 nm radius of the airfield; • Advisory Route W4D follows the same route as HMR X-Ray between Aberdeen and Wick but extends from FL 55 up to FL 185; and • Above 9,500 ft, the responsibility for the provision of navigation services lies with NERL and the military service providers based at the NERL Centre at Prestwick. <p>Class C controlled airspace:</p> <ul style="list-style-type: none"> • Temporary Reserved Area (TRA) 008B is established above the three development sites from FL 195 up to FL 245. D712D within the Northern Managed Danger Area (MDA) complex is established from FL 245 up to FL 660; • ASACS Units using radar data supplied from the Buchan PSR are responsible for navigation services and support to aircraft activity in these areas; and • Outside the times that TRA 008B and the Northern MDA are active, NERL is responsible for the provision of navigation services to aircraft in transit above FL 195.

Individual Wind Farm Sites	Summary of Baseline Characteristics
MacColl	<p>An area of Class G uncontrolled airspace which is established from the surface up to Flight level (FL) 195 (approximately 19,500ft). Class C controlled airspace is established above FL 195.</p> <p>Class G uncontrolled airspace:</p> <ul style="list-style-type: none"> • RAF Lossiemouth ATC uses their PSR to provide services to aircraft inbound to and outbound from the airfield, to military aircraft operating over the Moray Firth. In addition, RAF Lossiemouth is responsible for navigational services to transitory civil and military aircraft operating within a 40 nm radius of the airfield; • Advisory Route W4D follows the same route as HMR X-Ray between Aberdeen and Wick but extends from FL 55 up to FL 185; and • Above 9,500 ft, the responsibility for the provision of navigation services lies with NERL and the military service providers based at the NERL Centre at Prestwick. <p>Class C controlled airspace:</p> <ul style="list-style-type: none"> • Temporary Reserved Area (TRA) 008B is established above the three development sites from FL195 up to FL245. D712D within the Northern Managed Danger Area (MDA) complex is established from FL 245 up to FL 660; • ASACS Units using radar data supplied from the Buchan PSR are responsible for navigation services and support to aircraft activity in these areas; and • Outside the times that TRA 008B and the Northern MDA are active, NERL is responsible for the provision of navigation services to aircraft in transit above FL 195. <p>In addition:</p> <p>HMR X-Ray is used by helicopters transiting between Aberdeen, via Wick to the Atlantic Rim offshore installations. HMR X-Ray is established between 1500 ft and FL55. Navigational services for aircraft operating on this route are provided by Aberdeen Airport, using a radar feed of the NERL Allanshill PSR, and RAF Lossiemouth when aircraft are operating at low altitudes.</p>

5.3.5 Legislative and Planning Framework.

5.3.5.1 A variety of aviation publications contain information and guidance relating to the potential effects of an offshore wind development on aviation stakeholders. The following documents were consulted to inform the study:

- Civil Aviation Policy (CAP) 393 Air Navigation: The Order and the Regulations;.
- CAP 670 ATS Safety Requirements;
- CAP 764 CAA Policy and Guidelines on Wind Turbines;
- UK Aeronautical Information Publications (Civil and Military); and
- MCA: Offshore Renewable Energy Installations, Emergency Response Co-operation Plans (ERCoP) for Construction and Operations Phase, and Requirements for Emergency Response and SAR Helicopter Operations.

5.3.6 References

Civil Aviation Policy (CAP) 393 Air Navigation: The Order and the Regulations.

Civil Aviation Policy (CAP) 670 ATS Safety Requirements.

Civil Aviation Policy (CAP) 764 CAA Policy and Guidelines on Wind Turbines.

UK Aeronautical Information Publications (Civil and Military).

5.4 Seascape, Landscape and Visual Receptors

5.4.1 Introduction

5.4.1.1 The term Seascape, Landscape and Visual Receptors refers to the landscape and seascape character of the Moray Firth, and the communities of people who experience this environment, the relationships that they have with each other and the physical environment. This chapter describes the existing seascape, landscape and visual environment within a 50 km radius study area around the proposed Telford, Stevenson and MacColl wind farm sites and the associated Transmission Infrastructure (TI). Specifically, it describes the baseline seascape, landscape and visual environment of the coastal parts of Caithness, Moray and Aberdeenshire within the study area. Seascape character is an extension of landscape character, but emphasises other elements that are slightly different or more important at the coast, when defining the character of seascape compared to landscape. Seascape is defined by SNH (2005) as:

“An area of any extent or scale which includes the sea as a key feature. Seascape has physical and experiential attributes, and encompasses the interrelationship between the sea and the sky, and may include land”.

5.4.1.2 The study consisted of the following aspects:

- Consultation with relevant statutory and non-statutory bodies;
- Detailed desk studies and assessments to establish the baseline conditions within the study area; and
- Field studies to inform the baseline.

5.4.1.3 In addition, consideration of the relevant key legislative and planning information is provided throughout this chapter.

5.4.1.4 This baseline is used to inform the impact assessment described in:

- Chapters 8.4, 11.4 and 15.4 (Seascape, Landscape and Visual Receptors); and
- Chapter 12.1 (Whole Project Assessment).

5.4.1.5 The outputs of the SLVIA are used to inform the assessment of likely significant effects on:

- Chapters 8.5 and 11.5 (Archaeology and Visual Receptors); and
- Chapters 8.6 and 11.6 (Socio-Economics, Recreation and Tourism).

5.4.2 Consultations

5.4.2.1 The Seascape, Landscape and Visual Impact Assessment (SLVIA) has been carried out in consultation with Marine Scotland (MS), Scottish Natural Heritage (SNH), Joint Nature Conservation Committee (JNCC), and the relevant local authorities: The Highland Council; Moray Council; and Aberdeenshire Council. In particular, this consultation has helped to define the:

- SLVIA study area;
- Seascape / landscape character baseline;

- Viewpoint selection;
- Rochdale Envelope presentation;
- Presentation of the visualisations; and
- Other wind farms to be included in cumulative assessment.

5.4.2.2 A summary of the main aspects of the consultation is provided in Table 5.4-1 below.

Table 5.4-1 SLVIA Consultations

Organisation	Consultation Response	MORL Approach
SNH / JNCC / Marine Scotland (Responses relating to the scoping opinions for both the wind farm sites and transmission infrastructure).	<p>Scoping response:</p> <p>Marine Scotland's scoping response incorporated SNH response on SLVIA, which provided advice on the method of assessment, seascape baseline, visibility and Zone of Theoretical Visibility (ZTV), viewpoint selection and assessment, cumulative impacts and potential mitigation. A copy of this scoping response is included in Technical Appendix 1.3 B.</p> <p>A consultation meeting was held with SNH and Marine Scotland on 4th July 2011 to discuss the SLVIA.</p> <p>SNH provided an Offshore Wind SLVIA Advice Note subsequent to this meeting, and comments on the Beatrice Offshore Wind Farm Ltd (BOWL) approach to the BOWL SLVIA.</p> <p>As agreed at initial meeting with MORL over their transmission works, held on 28th February 2011, SNH and JNCC TI Scoping Opinion advised that landscape and visual interests can be scoped out of the EIA for the offshore cable works.</p> <p>The TI scoping response requested flexibility in the number of viewpoint locations and photomontages of the offshore (and onshore) substations produced, in relation to predicted patterns of development visibility (ZTVs) and in consultation with statutory and community organisations.</p>	Noted
	<p>Comments on Draft Environmental Statement (ES):</p> <p>A consultation meeting was held with SNH on 20th March 2012 to discuss the content of the Draft ES. A written advice note from SNH is included in Technical Appendix 5 C, with the key points summarised as follows:</p> <ul style="list-style-type: none"> • Written feedback provided following the meeting confirmed that relevant information is presented clearly and concisely;. • The assessment covers all major requirements and there are no substantive comments or major additional requirements; • Outstanding aspects that should be included in the final ES are atmospheric visibility, night-time effects etc.; and • Potential grouping of cumulative ZTVs should be considered. 	<p>Night time photomontages produced (Figures 8.4-16 c and 8.4-21 c, Volume 7).</p> <p>Met Office visibility data considered in assessment.</p>

Organisation	Consultation Response	MORL Approach
<p>The Highland Council (Responses relating to the scoping opinions for both the wind farm sites and transmission infrastructure).</p>	<p>Scoping response: The Highland Council advised that:</p> <ul style="list-style-type: none"> • Visibility and visual impacts of the development from the coast are of high importance; and • Guidance in the Highland Council's standards for visualisation of wind energy developments should be followed. <p>A consultation meeting was held with The Highland Council on 4th July 2011 to discuss the SLVIA.</p>	<p>These are followed in the assessment.</p>
	<p>Comments on Draft ES: A consultation meeting was held with The Highland Council on 7th March 2012 to discuss the content of the Draft ES. The key points summarised as follows:</p> <ul style="list-style-type: none"> • Relatively few substantive comments about information provided or the draft assessment; 	<p>Noted</p>
	<ul style="list-style-type: none"> • Requested that MORL supply photographic information for THC's 'cumulative viewer' when it is available. Not required for ES submission, but may be useful if provided during the determination period; 	<p>Can be supplied during determination period.</p>
	<ul style="list-style-type: none"> • Additional scoping stage wind farm, Earl's Cairn, located near Strouper to be included in cumulative assessment; and 	<p>Included.</p>
	<ul style="list-style-type: none"> • Agreed that brief written comments would be provided by THC following meeting (not received to date). 	
	<p>Moray Council (Responses relating to the scoping opinions for both the wind farm sites and transmission infrastructure).</p>	<p>Scoping response: Moray Council advised that:</p> <ul style="list-style-type: none"> • Photomontages should consider the impact from key points along the Moray coastline; • Cumulative impact assessment should consider BOWL and future western development area; and • Requested consultation on the OFTO scoping report given potential implications for the Moray coastline, harbours, fisheries and roads.
<p>A consultation meeting was held with Moray Council on 4th July 2011 to discuss the SLVIA. Moray Council subsequently provided suggested viewpoints from the Moray Coast for inclusion in the SLVIA as follows:</p> <ul style="list-style-type: none"> • Burghead Promontory, Headland & Visitor Centre; • Lossiemouth Prospect Terrace, Interpretation Point; • Buckie Cliff Terrace; • Portknockie Bow Fiddle Rock, Cliff Top Viewpoint; • Cullen, Viaduct; and • Bin Hill; High Level View. 		<p>Noted</p>

Organisation	Consultation Response	MORL Approach
	<p>Comments on Draft ES:</p> <p>A consultation meeting was held with Moray Council on 7th March 2012 to discuss the content of the Draft ES. The key points are summarised as follows:</p> <ul style="list-style-type: none"> • Move Lossiemouth Prospect Terrace viewpoint to Harbour or car park at Lossiemouth Golf Course. OPEN proposed to move viewpoint to Harbour; and • Consider moving wireline view to underneath photomontage in visualisation page layout. • Consider including cumulative photomontage of Moray and BOWL from viewpoint(s) in Moray. 	<p>Noted</p> <p>Viewpoint 16 moved to Lossiemouth Harbour.</p> <p>The existing photomontage page layout has been retained with existing view, wireline and photomontage consecutively to follow guidance.</p>
<p>Aberdeenshire Council</p> <p>(Responses relating to the scoping opinions for both the wind farm sites and transmission infrastructure).</p>	<p>Scoping response:</p> <p>Aberdeenshire Council advised that:</p> <ul style="list-style-type: none"> • Offshore wind farm will not have any direct or indirect effects on the interests of the Council; and • 'On land' development will have an impact on Council's interests and should be scoped with Aberdeenshire Council. <p>Aberdeenshire Council provided detailed comments on the construction of the onshore infrastructure associated with the development, which was considered to be the main issue for the Aberdeenshire Council administrative area.</p>	<p>Noted</p>
	<p>Recommended to carry out a LVIA produced in accordance with the Guidelines for Landscape and Visual Impact Assessment.</p>	<p>To accompany Town & Country Planning application for onshore works.</p>
	<p>Recommended that a landscape masterplan should be produced for the onshore substation in line with Peterhead Southern Gateway Environmental Improvement Masterplan, adapted in detail for the onshore substation site.</p>	<p>In discussion with landowners.</p>
	<p>Comments on Draft ES:</p> <p>A consultation meeting was held with Aberdeenshire Council on 22nd March 2012 to discuss the content of the Draft ES. The key points summarised as follows:</p> <ul style="list-style-type: none"> • Aberdeenshire Council have limited interest in the offshore works; • Onshore works are of material interest, but Aberdeenshire Council had difficulty locating onshore information in the Draft ES; • Would ideally prefer a separate assessment of the onshore OFTO in an onshore ES document rather than it being combined with the offshore aspects. 	<p>Noted</p> <p>Layout of ES amended to aid clarity.</p>

Organisation	Consultation Response	MORL Approach
	<ul style="list-style-type: none"> Final ES should just describe the baseline situation, or provide a preliminary / overview assessment, if the cable route and onshore substation are not finalised, rather than assess a "worst case scenario" that would have to be re-assessed once the substation location is defined. 	This approach has been followed.
	<ul style="list-style-type: none"> Considered that MORL should only produce substation photomontages when confident about the effects of the development (i.e. its location, design and form). Presenting development 'envelope' photomontages e.g. just showing the preferred search area, could lead to misinterpretation of proposals for substation. Suggested an additional viewpoint from Knock Hill in Aberdeenshire, to show the cumulative effect of onshore wind farms in Aberdeenshire. 	This approach has been followed.
	<ul style="list-style-type: none"> Confirmed that full LVIA of cable landfall not needed due to it having a short term, temporary visual effect. Final ES to consider providing construction methods, drawings and photographic examples of cable laying for cable landfall to allow the Council to form a view on the likely effects. 	Considered this was not required and that the effect would be not significant, as Knock Hill is over 55 km away from the offshore wind farm and there is a similar viewpoint nearby at Bin Hill.
	<ul style="list-style-type: none"> Substation proposals should aim to deliver some of the landscape objectives of the Peterhead Gateway Masterplan. Confirmed that viewpoints proposed in the Draft ES for substation assessment are appropriate. A90 is the most significant receptor - approach to Peterhead. 	Developers are in discussion.
	Recommended that proposals for onshore substation are co-ordinated with other developers (e.g. carbon capture, owner / operator substation etc.).	Noted

5.4.3 Baseline Assessment Methodology

5.4.3.1 The baseline study describes the existing seascape, landscape and visual environment of the study area. Establishing a baseline helps to gain an understanding of what makes the seascape distinctive, its important components or characteristics, and how it is changing prior to the introduction of the Project. The baseline is instrumental in the identification of the seascape and landscape character receptors and visual receptors / views to be included in the assessment. The baseline seascape, landscape and visual conditions are described for the three proposed wind farm sites and associated offshore and onshore elements of the export cable route.

5.4.3.2 Defining the baseline character of the study area requires a specific focus on both the 'seaward' and the 'landward' elements. Landscape character contributes to seascape character and vice versa. The coastal character assessment:

- Analyses the coastal landscape; and
- Identifies its elements and experiential qualities that are distinctive and typify the place.

- 5.4.3.3 However, the emphasis placed on individual aspects of assessment varies. These include landform, openness, climate, scale, seascape, coastal and landscape character and features, marine features, aspect, visibility, designations and cumulative impacts.
- 5.4.3.4 A coastal character methodology, informed by those used for SNH's aquaculture studies (SNH, 2008) has been applied to identify Coastal Character Areas (CCAs) informed by, and at a scale comparable to, the existing SNH Landscape Character Assessments (LCAs) (SNH, 1997 and 1998). Although developed for aquaculture capacity studies, the methodology identifies areas of consistent coastal character with strong integrity, such as a specific bay or stretch of coast. Other desk sources, such as the Beaches of Scotland series (Countryside Commission for Scotland, 1970 and 1977) have been used to inform the basis of Coastal Character Areas, together with site specific field surveys.
- 5.4.3.5 The baseline seascape characterisation has been informed by SNH's Seascapes Report (SNH, 2005) which identifies national seascape types / units, although this is a strategic assessment with general descriptions and has limitations for use with specific development proposals.
- 5.4.3.6 Other guidance on seascape assessment in Wales and England is relevant, particularly the Guide to Best Practice in Seascape Assessment (CCW, 2001) and Seascape and Visual Impact Report (DTI, 2005). These recommend definition of seascape units based on land / sea / headland intervisibility at local, regional and national scales, together with seascape and visual characteristics, activities, visibility and views.
- 5.4.3.7 Draft Seascape Character Assessment Guidance for England, Scotland and Wales is currently under preparation and due for publication in 2012, but was not published at the time of preparation of this assessment. There is not a full understanding or familiarisation of the new methodology amongst consultees or practitioners and as it stands this new seascape character assessment guidance could not be adopted to define the seascape baseline for the three proposed wind farm sites.
- 5.4.3.8 The approach to seascape assessment responds to the advice on characterisation provided by SNH in their scoping opinion and consultations to date, focusing on both the 'seaward' and the 'landward' elements of the study area. The baseline study comprehensively reviews the coastal and seascape / landscape character using:
- Landscape character information taken from the relevant terrestrial Landscape Character Assessment (SNH national series of LCAs);
 - Coastal character information based on national coastal character descriptions and relevant coastal references in the terrestrial LCA; and
 - More detailed characterisation and / or subdivision of the coast into Coastal Character Areas.
- 5.4.3.9 The key characteristics and sensitivity of these seascape character types / units are identified, as appropriate, with respect to the three proposed wind farm sites and the TI.

Coastal and Seascape / Landscape Characterisation Methodology

5.4.3.10 SNH's 'Guidance on Landscape / Seascape Capacity for Aquaculture' provides a methodology for assessing the seascape capacity for aquaculture development. The methodology described has been adapted for the purpose of the SLVIA to define the baseline character and visual qualities of the coastal landscape / seascape. The methodology is divided into a series of broad stages, summarised in the table below.

Table 5.4-2 Summary of Coastal Character Approach

<p>Preliminary Stage: Prepare a Brief.</p> <ul style="list-style-type: none"> Define / agree the study area, development scenarios and mapping scale. <p>Stage One: Identify National Seascape Character Types</p> <ul style="list-style-type: none"> Identify national level seascape character types from SNH Seascape Study (2005); and National seascape types will form a framework within which these coastal character areas will 'nest'. <p>Stage Two: Identify Terrestrial Landscape Character Types</p> <ul style="list-style-type: none"> Identify terrestrial landscape character types to understand coastal character and landscape types where the sea or coast provides the defining characteristics or for use in the OnTI assessment. <p>Stage Three: Identify Coastal Character Areas</p> <ul style="list-style-type: none"> Undertake initial site visit and desk study to identify Coastal Character Areas; Undertake detailed survey and analysis of relevant seascape / coastal character within each Coastal Character Area; Identify key characteristics, experiences, features and visual qualities; Identify key viewpoints and photography; Identify boundaries and names of Coastal Character Areas with geographical integrity; and Output: a map showing the Coastal Character Areas. <p>Stage Four: Undertake Sensitivity Analysis</p> <ul style="list-style-type: none"> Assess the sensitivity of individual Coastal Character Areas to the Development; and Prepare explanation and justifications. <p>Stage Five: Undertake Impact Assessment</p> <ul style="list-style-type: none"> Assess the magnitude of change of the Development on Coastal Character Areas; and Assess the effect of the Development on Coastal Character Areas by making judgements on their sensitivity and magnitude of change to the Development.
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Preliminary Stage: Prepare a Brief

Development Scenario

5.4.3.11 The SLVIA is based on the Rochdale Envelope described in Chapter 2.2 (Project Description) and the parameters relevant to the SLVIA described in Chapter 8.4. The 'worst realistic case' scenario is assessed and illustrated in the SLVIA.

Search Area

5.4.3.12 A search area has been identified to establish the study area for the SLVIA. The search area, shown as the whole of the mapped area in Figure 5.4-1, Volume 7, encompasses:

- The Telford, Stevenson and MacColl offshore wind farms, offshore substation platforms and the offshore export cable route in the Moray Firth;

- The adjacent Caithness, Moray and Aberdeenshire coastlines;
- The southern edge of the Orkney Isles; and
- Inland parts of Aberdeenshire covering the onshore cable landfall and the onshore export cable route to the onshore substation(s) study area at the proposed national grid connection point near Peterhead Power Station.

5.4.3.13 Within this search area, a SLVIA study area is defined for the offshore generating stations (OGS) and offshore transmission infrastructure (OfTI). A separate LVIA study area is defined for the onshore transmission infrastructure (i.e. onshore cable landfall, the onshore export cable route and onshore substation(s)) (OnTI). The study area does not encompass all of the offshore export route because stakeholder consultations confirmed that the offshore cable route could be excluded from the SLVIA. The study area for the SLVIA is described as follows.

Study Area – OGS and OfTI

- 5.4.3.14 The SLVIA for the three proposed wind farm sites has been undertaken within a 50 km radius study area of the Telford, Stevenson and MacColl offshore wind farms as shown in Figure 5.4-1, Volume 7. The definition of the study area for this assessment has been chosen based on best practice guidance (SNH, 2006), Project specific desk study and fieldwork. A preliminary Zone of Theoretical Visibility (ZTV) and wireline views of the three proposed wind farm sites were used to review the potential visibility of the three proposed wind farm sites and inform the study area boundary. The area defined equates to a minimum distance between the Telford, Stevenson and MacColl sites and the edge of the study area of 50 km. The study area boundary does not define the area beyond which there will be no effect, but defines the area within which significant effects may be identified.
- 5.4.3.15 The Telford and Stevenson sites are located approximately 22 km from Caithness, at their closest points. The study area includes the Caithness coast between Duncansby Head and Brora, and extends up to approximately 30 km inland. The choice of study area has been influenced by the landscape character types identified in the Caithness LCA, shown in Figure 5.4-2, Volume 7. It encompasses the Flat Peatlands and the Moorland Slopes and Hills types, which define the inland extent of visibility of the sea. The Caithness part of the study area is also influenced by the National Coastal Character types, shown in Figure 5.4-3, Volume 7, the limits of which help establish the study area. The Caithness coastline is within National Seascape Unit 7 – East Caithness and Sutherland, and is defined mainly by Seascape Character Type 2: Rocky Coastline with Open Sea Views, with smaller sections of Type 1: Remote High Cliffs and Type 3: Deposition Coastline with Open Sea Views.
- 5.4.3.16 The 50 km study area includes the North Aberdeenshire / Morayshire coast between Lossiemouth and Banff and is within the North Aberdeenshire / Morayshire Coast National Seascape Unit 5. This coastline is defined mainly by National Seascape Character Type 2: Rocky Coastline with Open Sea Views and Type 3: Deposition Coastline with Open Sea Views. The Moray coast is located approximately 40 km from the MacColl site, at its closest point. The southern edge of South Ronaldsay in the Orkney Isles is within the study area, but lies beyond 47 km from the three proposed wind farm sites. Wirelines produced from Brough on South Ronaldsay indicated that there would be extremely limited visibility with the majority of the turbines below the horizon and not visible, therefore further assessment from the Orkney Isles was scoped out at this stage.

Study Area – OnTI

5.4.3.17 The LVIA for the OnTI has been undertaken within a study area as shown in Figure 5.4-1, Volume 7. The definition of the study area for this assessment has been chosen based on Project specific desk study and fieldwork. The factors which influenced the choice of OnTI study area included the location of the cable landfall, onshore export corridor route and onshore substation(s); their potential zone of visual influence; the temporary nature of effects and feedback from stakeholder consultations. The area defined encompasses the proposed onshore export cable route (including the export cable landfall at Fraserburgh Beach) and the proposed substation(s) near Peterhead. A 5 km radius study area is defined for the LVIA of the substation(s), as shown in Figure 5.4-8, Volume 7.

Map Scale

5.4.3.18 Several map scales have been used for the presentation of both contextual information and illustration of more detailed assessments. A scale of 1:475,000 has been used to present a strategic overview of the whole study area and 1:280,000 scale has been used to present a strategic overview of the Caithness and Moray / Aberdeenshire sections of the study area.

Stage One: Identify National Seascape Character Types

5.4.3.19 The baseline seascape characterisation has been informed by SNH's Seascapes Report (SNH, 2005) which identifies national seascape types / units, although this is a strategic assessment with general descriptions and has limitations for use with specific development proposals. The study provides a 'nationwide' look at the coast. Scotland's coastline is classified into 33 'seascape units', comprising 13 'coastal character types', as shown in the study area in Figure 5.4-3, Volume 7.

5.4.3.20 These coastal character types and seascape units establish coastal character at the national scale, valid only at the broad, strategic level. When assessing specific development proposals, a more detailed character assessment is needed. Strategically, these 'national level' coastal character types and seascape units will form a framework within which coastal character areas will 'nest'. This hierarchy of seascape character areas is illustrated in Table 5.4-3 below.

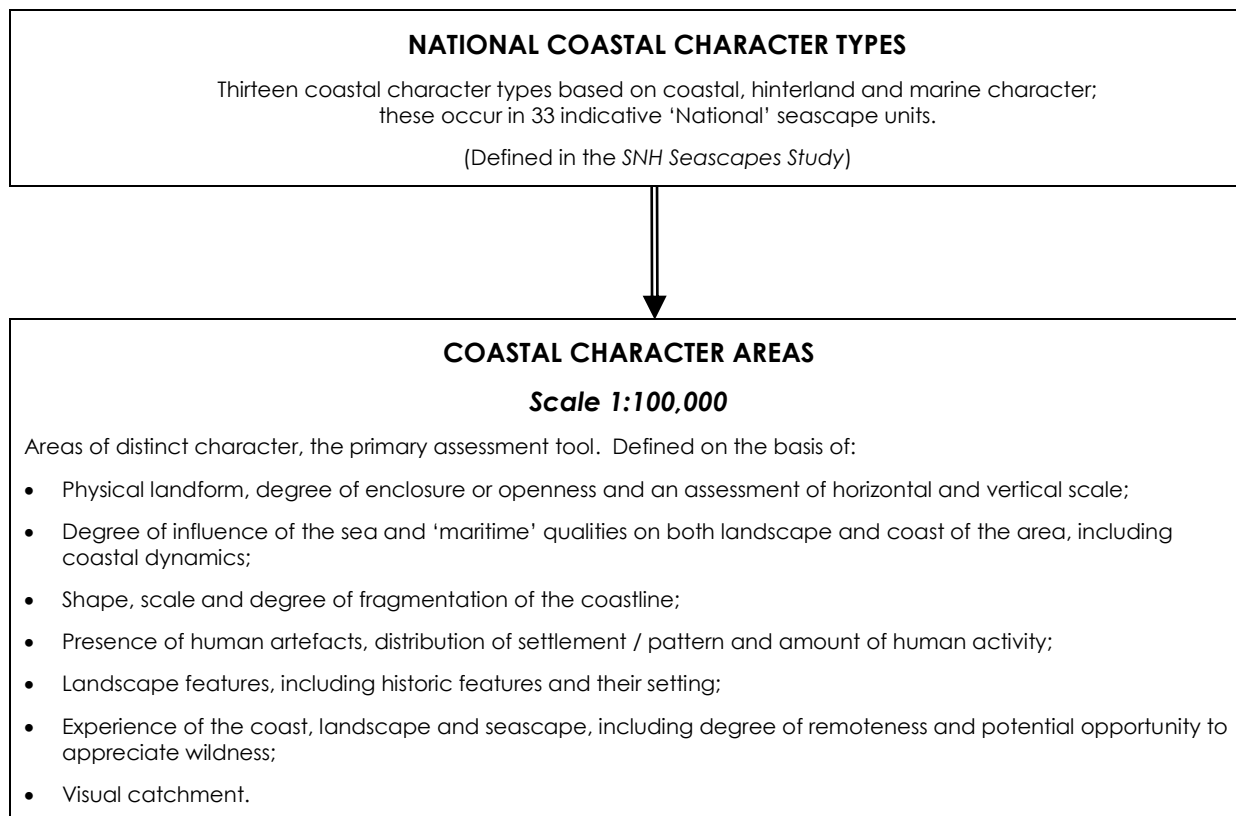
Stage Two: Identify Terrestrial Landscape Character Types

5.4.3.21 A review of the relevant terrestrial Landscape Character Assessments (SNH national series of LCAs) has been undertaken to help understand the physical coastal character. The coastal character assessment is best done at a scale comparable to the existing Landscape Character Assessments, and is informed by them. In order to review the coastal character, the existing SNH terrestrial LCAs covering the coastal parts of the study area are examined in conjunction with field survey and assessment. The existing terrestrial SNH character assessment for Caithness, Moray and Nairn, and Banff and Buchan cover the coastal parts of the study area (SNH, 1997 and 1998).

5.4.3.22 These LCAs provide detailed descriptions of coastal characteristics for some of the landscape types in the study area. The landscape types identified along the coast have directly informed the definition of Coastal Character Areas, where the sea or coast provide the defining characteristics (for example: the 'High Cliffs and Sheltered Bays' landscape type of Caithness). Other landscape types in the

study area about the coast and are influenced by the sea, but the sea and coast do not provide the defining characteristic (for example: the 'Small Farms and Crofts' landscape type of Caithness). These landscape types have been subject to further coastal characterisation to define Coastal Character Areas within the coastal part of these landscape types. Other landscape types, located further inland, have little or no relationship with the coast, where the sea is not a characteristic element. These landscape types have not influenced the coastal characterisation and are considered separately as distinct landscape types. Terrestrial landscape character types are used to inform the assessment of the export cable routes.

Table 5.4-3 Hierarchy of Coastal Character Assessment



Stage Three: Identify Coastal Character Areas

5.4.3.23 Coastal Character Areas further subdivide the National Seascape Types into areas of consistent coastal character with a strong identity, such as a specific bay or a section of coast or loch with a similar character.

5.4.3.24 The following characteristics are used to help identify Coastal Character Areas:

- Physical landform, the degree of enclosure or openness and an assessment of horizontal and vertical scale;
- The degree of influence of the sea and qualities which may be described as 'maritime' on the landscape and coast of the area, including coastal dynamics;
- The shape, scale and degree of fragmentation of the coastline and visual catchment;

- The presence of human artefacts, distribution of settlement pattern and amount of human activity;
- Landscape features, including historic features and their setting; and
- Experience of the coast, landscape and seascape, including the degree of remoteness and potential opportunities to appreciate wildness.

5.4.3.25 A detailed survey has been carried out to identify, analyse and present the elements of the coastal landscape which are most likely to be affected by the three proposed wind farm sites. Coastal Character Areas are identified as areas of distinct character at the local / regional level and are mapped at 1:100,000 scale in Figure 5.4-4 A to Figure 5.4-4 E, Volume 7. This scale was considered most appropriate for the assessment given the location of the three proposed wind farm sites over 20 km from the coast, the area covered by development and the large size of the study area. When assessing the specific development proposals, consisting of three offshore wind farms located at long distances offshore, a coastal character at the scale comparable to the existing terrestrial LCAs was considered most suitable.

5.4.3.26 Coastal Character Areas vary in size, according to the determining characteristics of the coast. Uniform, linear coastlines tend to define larger Coastal Character Areas, while definitive enclosed bays or headland features tend to define smaller Coastal Character Areas. Coastal Character Areas embrace consistent areas of seascape, usually with a common geographic or place name, which forms the basis of the character area. They are usually a stretch of coastline with a relatively consistent overall character, or a whole island or sea loch. The key characteristics and features of the Coastal Character Areas are described based on relevant desk studies, such as the SNH's terrestrial LCAs and field survey assessment. A checklist of issues explored to consider the key characteristics of Coastal Character Areas is outlined in Table 5.4-4 below.

Table 5.4-4 Coastal Character – Key Characteristics

Topic	Analysis of physical characteristics	Analysis of experiential characteristics	Judgements	Recognised values
Maritime Influences	<p>Aspect and orientation of existing marine based activities.</p> <p>Maritime processes and dynamics.</p> <p>Scale, distance and expansiveness of open sea.</p>	<p>Sense of space and light.</p> <p>Sense of exposure.</p> <p>Sense of containment or openness.</p> <p>Sounds associated with the sea, smell of the sea.</p>	<p>Unity of landscape character.</p> <p>Aesthetic qualities, including characteristics, experiences, and perceptions which create exceptional aesthetic quality.</p> <p>Assessing significance of</p>	<p>Landscapes and seascapes designated because of their scenic, landscape or recreational value</p> <p>landmarks designated because of their cultural or</p>

Topic	Analysis of physical characteristics	Analysis of experiential characteristics	Judgements	Recognised values
Character of Coastal Edge	Shape and scale of coastline. Degree of indentation and enclosure. Presence of offshore islands. Fragmentation of edge. Deposition features, tidal variations, landmarks and shoreline development.	Sense of exposure. Sense of containment or openness.	physical characteristics. Assessing intensity and significance of experiential characteristics. Identification of dominant physical or experiential characteristics. Identification of aesthetic attributes. Determining the extent of the relevant setting for significant features and landmarks	historic significance. Longer distance routes. Roads designated as scenic or tourist routes.
Character of Immediate Hinterland	Key elements of landscape character topography and relief vegetation pattern. Existing settlement pattern landmarks.	Sense of containment or openness. Presence of maritime influence.	Identifying relevant cultural associations with place.	
Wildness / Isolated Coast	Presence of natural processes. Presence of development / human activity. Actual accessibility ruggedness of terrain.	Sense of naturalness perceived remoteness sense of isolation.	Intensity of sense of wildness degree of ruggedness and perceived accessibility. Degree to which natural processes dominate the experience of place.	Wild land search areas.

Stage Four: Undertake Sensitivity Analysis

5.4.3.27 The sensitivity of a Coastal Character Area is an expression of its ability to accommodate the three proposed wind farm sites as part of its own character or as part of the visual setting or context of the coastal character. This is dependent on the value, quality, existing character and position of the Coastal Character Area in relation to the three proposed wind farm sites as explained below:

- The value of the Coastal Character Area is a reflection of its importance in terms of any designations that may apply, or as a landscape / seascape resource;
- The quality of the Coastal Character Area is a reflection of its attributes, such as sense of place and scenic quality, and the extent to which attributes have remained intact;
- The existing coastal character determines the degree to which the receptor may accommodate the influence of the development; and
- The position of the Coastal Character Area in relation to the three proposed wind farm sites will influence its sensitivity to the change proposed and will vary according to whether they have a close / direct or distant / indirect relationship.

5.4.3.28 Levels of sensitivity (high, medium-high, medium, medium-low and low) are applied to each Landscape Type and Coastal Character Area. The sensitivity of

each receptor is a product of the specific combination of value, quality and existing landscape character as evaluated for that receptor. It is not possible to provide definitions for each of the levels of sensitivity (low, medium–low, medium, medium–high and high) as the level of sensitivity of each receptor is a product of consideration of the factors specific to each receptor and the application of professional judgement. In the SLVIA, there may also be intermediate levels of magnitude of change where the change falls between two of the definitions e.g. medium–high or medium–low. The combination of criteria and the resulting level of sensitivity are described in the evaluation of sensitivity for each receptor, as presented in Chapters 8.4, 11.4 and 15.4 (Seascape, Landscape and Visual Receptors).

Stage Five: Undertake Impact Assessment

5.4.3.29 The significance of the effect on Coastal Character is dependent on the multiple factors considered in determining the sensitivity and the magnitude of change and by applying professional judgement to assess whether the three proposed wind farm sites will have an effect that is significant or not significant. A significant effect will occur where the combination of the variables results in the three proposed wind farm sites having a definitive effect on the receptor, so that its landscape character is redefined by the presence of the three proposed wind farm sites. A not significant effect will occur where the effect of the three proposed wind farm sites is not definitive, and the landscape character of the receptor continues to be defined principally by its baseline characteristics. The methodology for the impact assessment for the SLVIA is described fully in Chapter 8.4 and Technical Appendix 5.4 A.

Visual Baseline

5.4.3.30 The baseline study includes the identification of specific viewpoints based on desk and field survey and subsequently agreed with statutory consultees. An outline of the relevant issues considered when defining the baseline visual character is shown in Table 5.4-5 below.

Table 5.4-5 Methodology for Coastal / Seascape Assessment: Visual Assessment

Topic	Analysis of Physical Elements	Analysis of Type of Views	Judgements	Recognised Values
Visual Assessment	<ul style="list-style-type: none"> Presence of the coastal edge. Presence of the open sea. Focal points or features within the views. Aspect and orientation of viewpoint, character of seascape. 	<ul style="list-style-type: none"> Overlook from settled areas. Views experienced as part of a sequence. Elevated viewpoints panoramas. Sudden revelations. Glimpse views. 	<ul style="list-style-type: none"> Significance of views and viewpoints. Significance and dominance of compositional elements. Quality of visual composition from viewpoints. Aspect and transient qualities such as quality of light and reflectivity. 	<ul style="list-style-type: none"> Views which contribute to the experience of a landscape or seascape designated for its scenic quality. Views to and from features designated because of their historic significance. Views from longer distance routes. Views from popular recreational areas or specific facilities.

- 5.4.3.31 A proposed viewpoint list, map and initial ZTV were provided to SNH, Marine Scotland and local authorities during the consultation. Feedback on the viewpoints and format of the visualisations was provided during the consultation stages by SNH, the Highland Council and Moray Council. Viewpoints in Caithness were selected in collaboration with BOWL, to ensure a consistent viewpoint list for assessment of both projects. Based on the desk study, field survey, collaboration with BOWL and consultations with stakeholders, the viewpoints listed in Table 5.4-11 below are described and assessed in the SLVIA.

Meteorological Context

- 5.4.3.32 The judgements made in the SLVIA are based on optimum viewing conditions with clear visibility of the turbines. This assumption constitutes the worst case scenario and in reality the degree and extent of visual effects arising from the three proposed wind farm sites is a combination of several different factors, including the prevailing weather conditions. The prevailing visibility weather can determine changes in character and visibility, with varied wind, light and tidal movements and the clarity or otherwise of the atmosphere. Collectively, these will combine to reduce the number of days upon which views of the three proposed offshore wind farm sites will be available from the coastline and hinterland, or to inhibit views of the sites, rendering them more visually recessive within the wider seascape.
- 5.4.3.33 Although the SLVIA is based on clear visibility of the turbines, a baseline description of the visibility frequency is provided using METAR visibility data from Wick Airport, to highlight trends in the visibility conditions of the study area. Most synoptic observing stations have sensors which provide a measurement of visibility. Visibility sensors measure the meteorological optical range which is defined as the length of atmosphere over which a beam of light travels before its luminous flux is reduced to 5 % of its original value. The use of light within the visible spectrum allows the sensor to most accurately simulate human perception of visibility. Reasonably accurate measurements are possible over a range of visibility extending from a few tens of metres to a few tens of kilometres.
- 5.4.3.34 Visibility is categorised into distance ranges, such as < 1 km, 1 to 2 km, 2 to 3 km etc. and a frequency table compiled revealing the total number of observations within each distance category at hourly intervals for each month. The data, summarised in Technical Appendix 5.4 A, highlights trends in the visibility conditions of the study area, such as the distance category which has the most visibility observations recorded, and approximate number of viewing days lost to low visibility weather conditions. At its closest point, the proposed Telford Wind Farm lies approximately 26 km from Wick; the visibility frequency is based on this distance as this is the nearest point of the three proposed wind farm sites to the meteorological station.

5.4.4 Baseline Conditions – Landscape and Seascape Character

Offshore Generating Stations

National Seascape Units

- 5.4.4.1 Indicative National Seascape Units are defined in accordance with the SNH Seascape Study (2005). A range of existing spatially defined areas and information were considered and used as a basis for these areas, dividing the

Scottish coastline into indicative national seascape units. Four of these seascape units are partially located within the study area, as shown in Figure 5.4-3, Volume 7:

- North Caithness / Pentland Firth;
- East Orkney;
- East Caithness / Sutherland; and
- North Aberdeenshire / Moray Coast.

5.4.4.2 Two of these seascape units cover the majority of the study area and are most relevant in describing the baseline seascape character at the national level: the North Aberdeenshire / Moray Coast seascape unit and the East Caithness / Sutherland seascape unit, which are described as follows.

Seascape Unit 5: North Aberdeenshire / Moray Coast

5.4.4.3 Key Characteristics:

- North-facing generally 'straight' coastline with small indentations, few significant headlands and with open views to North Sea;
- Low cliffs / rocky coastline predominates;
- Farmland backs coast and this generally comprises a low lying gently rolling open plain with some Remnant heathland present in places; and
- Small and widely spaced settlements clustered in the main at base of cliffs or inlets, many of these are of historic interest and all have a strong relationship to the coast.

5.4.4.4 *Scale and Openness:* The openness of the sea in views gives an expansive scale.

5.4.4.5 *Form:* Generally low, although rugged cliffs interspersed with a few small sandy or stony bays / inlets. Rolling farmland abuts coast. The landform is not generally distinctive.

5.4.4.6 *Settlement:* Small, often tightly clustered villages and towns located along the coast. Many of these settlements are traditional in character with strong links to the sea. There are few industrial features. Buildings tend to be small.

5.4.4.7 *Pattern / Foci:* Small indentations of cliffs, wooded inlets and minor headlands form a distinct rhythmic pattern along the coast echoed by the foci of small villages and town in coves and inlets. The partial enclosure provided by rolling farmland at the coast focuses views to sea.

5.4.4.8 *Lighting:* Lights from coastal towns, lights of oil platforms, the two Beatrice demonstrator turbines and boats at sea are part of the baseline environment. The flare stack of Beatrice platform is visible on many nights.

5.4.4.9 *Movement:* Limited movement of shipping – some towing of oil platforms from Cromarty Firth.

5.4.4.10 *Aspect:* Northerly / southerly to land on either side of the Firth.

5.4.4.11 *How seascape is experienced:* Base of cliffs often inaccessible and not visible from coastal roads. Villages and towns (and access roads down to them) offer

key views. The coast is a key area for viewing wildlife (e.g. dolphins) and from small boats. Spey Bay marks the end of the Spey Way Long Distance Route Coastal paths and beaches are well used in the western part of this area.

- 5.4.4.12 *Modification / Remoteness / Sense of Naturalness*: This seascape unit has a feeling of being 'out of the way' because of its relatively sparse population and presence of small traditional settlements with close ties to the sea. The presence of many roads, steadings, farmlands, villages and castles prevent remoteness being a key characteristic. Intensive farmland backs coast and this reduces the sense of naturalness.
- 5.4.4.13 *Degree of Exposure*: A fairly exposed seascape.
- 5.4.4.14 *Sensitivity*: Low – Medium Sensitivity. The simple landform, general absence of focal features and expansive scale of the sea are key factors in limiting sensitivity of this seascape to development.
- 5.4.4.15 *Forces for Change*: No significant forces for change have been identified in this unit apart from development of possible Nortrail coastal trail.

Seascape Unit 7: East Caithness and Sutherland

- 5.4.4.16 Key characteristics are as follows:
- Predominantly low rocky coastline with few significant indentations or headlands, low cliffs are present in some areas;
 - Narrow coastal shelf is a feature and this is tightly constrained by inland hills which have direct views over the sea and along strongly linear edge, usually farmed in strips;
 - Communications located within coastal shelf;
 - Dense villages and some crofting on coastal edge or located at base of cliffs – many of these have a strong traditional character; and
 - Occasional sandy bays further north in Caithness backed by low lying and more extensive farmland.
- 5.4.4.17 *Scale and Openness*: Close to the coast the landscape component is small scale with a backdrop of large scale moorland and hills and strongly contained by steep sided hills, directing views out to sea. The sea in contrast is very open and expansive.
- 5.4.4.18 *Form*: Little variation in coastal edge, some high cliffs north of Helmsdale although generally low cliffs / rocky edge. A narrow linear coastal shelf is present. Views are directed along the coast and out to sea. Hill tops are generally not visible from coast.
- 5.4.4.19 *Settlement*: Sparsely settled with small settlements and isolated houses widely spaced and located within narrow inlets or on coastal shelf. No industry or large scale built features with exception of roads, railways and overhead power lines located along the coastal fringe. Settlements often have a strong historic / traditional character and crofting pattern.
- 5.4.4.20 *Pattern / Foci*: Strong linear rhythm of containing hill slopes, narrow shelf, rocky coastal edge and sea. A pattern of strip farming is evident on the coastal shelf. The sea and the distant horizon of sea / sky comprise the key focus.

- 5.4.4.21 *Lighting*: Generally relatively little illumination, but Beatrice platform flare stack is visible at night. Many light houses and distant views of lights on the Moray coast.
- 5.4.4.22 *Movement*: Generally limited movement on land with road / rail traffic sparse. Movement of sea can be a strong feature due to openness. Occasional shipping is visible.
- 5.4.4.23 *Aspect*: Easterly aspect.
- 5.4.4.24 *How seascape is experienced*: Road / railway aligned along coastal edge and from settlements.
- 5.4.4.25 *Modification / Remoteness / Sense of Naturalness*: Sense of remoteness increases with travel northwards. There is a sense of this area being relatively undeveloped, due to knowledge of hinterland being vast, remote and with little habitation. The small scale and traditional character of settlements also emphasises the sense of remoteness, although communications / power lines are evident along coast. Feels 'on the edge' due to sparse settlement, remoteness and closeness to sea.
- 5.4.4.26 *Degree of Exposure*: Exposed coast with little shelter.
- 5.4.4.27 *Sensitivity*: Low – Medium Sensitivity. The expansiveness and exposure of the open sea and the simplicity of form are key factors in limiting the sensitivity of this seascape to development. Other factors such as the existing industrial features, including oil rigs and offshore wind turbines on the skyline influence the perception of this seascape.
- 5.4.4.28 *Forces for Change*: Pressure for onshore wind energy developments on hills adjacent to the coast may raise sensitivity due to cumulative impacts, although restricted inland views (apart from those from the sea itself) would be likely to limit significance.

National Seascape Character Types

- 5.4.4.29 National Seascape Character Types establish coastal character at the national scale, valid at the broad, strategic level and provide a framework for coastal character areas at the regional and local scale. Six of these National Seascape Types are located within the study area, as shown in Figure 5.4-3, Volume 7. Deposition Coast with Islands (Type 12) covers the Orkney Isles, which have been scoped out of the assessment. National Seascape Types 1, 2, 3, 4 and 6 are most relevant in describing the baseline seascape character of the study area, as follows.

Type 1: Remote High Cliffs

- 5.4.4.30 *Location*: North Caithness.
- 5.4.4.31 *Physical characteristics*: High cliffs, often over 200 m tall, with occasional small sandy or stony bays at their base, contained by rocky headlands. Stacks, caves and collapsed cliffs are often features of this coastline. There is a strong contrast of line and form arising between the sheer verticality of cliffs and wide horizontal expanse of the sea.
- 5.4.4.32 This type usually has a high moorland, or occasionally, mountainous, hinterland where semi-natural heathland is the dominant land cover. Settlement is

generally absent although occasional small villages can be found tucked in bays and inlets or extensive crofting on tops within Highland areas. Light houses can be prominent features on headlands. This type has a remote, wild character due to the absence of roads and settlement. Where roads exist they are aligned parallel to the coast.

- 5.4.4.33 Access and views to the coast from the hinterland are restricted due to the cliffs. Wide elevated views are directed along the coast and out to open sea, although views of other islands are possible, such as Orkney. Views of rigs or boats can be a focus within the maritime component of this type. The Northern quality of light often gives intense clarity in views.
- 5.4.4.34 *Experiential qualities:* Coastline has a particularly exposed character and is physically remote from settlement. The coast is difficult to access and the water's edge is often blocked by impassable steep cliffs. These are exhilarating and awe-inspiring coastlines due to the great height of cliffs giving elevated and distant views and being particularly dramatic when the sea is turbulent. The noise of sea birds nesting on cliffs and waves add to the attraction and excitement of this seascape type.

Type 2: Mainland Rocky Coastline with Open Sea Views

- 5.4.4.35 *Location:* East Caithness and North Aberdeenshire coasts.
- 5.4.4.36 *Physical characteristics:* Long straight stretches of coastline with cliffs rising to some 30 m height and often with a raised beach edge. There are few significant headlands although geological differences create variety with softer sandstone forming an indented coast with bays and inlets, arches and caves; harder volcanic rocks producing a more resistant coastline of promontories, low cliffs and rocky shoreline. Notable blow holes on the north east coast. Productive arable farming occurs up to the cliff edge and tree cover is minimal. Compact fishing villages are located at the base of cliffs in small bays while castles and cliff top forts occur on dramatic headland locations, and are highlighted against the simple sea backdrop. These settlements and built features appear to be spaced at even intervals and thus provide a visual rhythm of foci along the coast. Views over the North Sea are generally wide and open, although parts of the Caithness coast have views of Hoy over the Pentland Firth. Shipping is a common feature seen out to sea. Some isolated industry occurs along this coast (for example: the pipeline fabrication facility in Sinclair Bay).
- 5.4.4.37 *Experiential qualities:* Exposed coastline with open views and strong historical associations of castles and cliff top forts and cultural interest of fishing villages. These coastlines are of geological and ecological interest and support nesting birds. While these are exposed seascapes, their agricultural hinterland, the presence of settlement and nearby roads and also views of shipping and occasional industry, limits the sense of wildness likely to be experienced.

Type 3: Mainland Deposition Coastline with Open Views

- 5.4.4.38 *Location:* East Caithness and Morayshire coasts.
- 5.4.4.39 *Physical characteristics:* Low sections of coast comprising long, sweeping curved sandy beaches, often backed by dunes and forming a soft linear edge to the sea. This type tends to have a simple horizontal visual composition of sky, sea and land. Grassland and gorse occurs behind dunes and this is backed in turn by flat,

mixed or arable farmland. Some areas of dunes are reserved for military live firing. Golf courses occur within this type and settlements are located within farmland. Larger settlements are popular holiday and golf resorts. Views are long and expansive along beaches and uninterrupted, although low level, views occur over the North Sea. Ships are commonly seen at sea.

- 5.4.4.40 *Experiential qualities:* This type is often located within relatively well-populated areas and beaches are an important recreational resource. The straightness of the coast and open views of the sea give a degree of exposure. The northern coastal light can often accentuate particular textures, shapes and colours. This type has a dynamic character – both physically and experientially – visible in the migration of sand and the constantly changing character of the sea and passing weather systems.

Type 4: Outer Firths

- 5.4.4.41 *Location:* Outer Moray Firth, Morayshire coast.
- 5.4.4.42 *Physical characteristics:* Sandy beaches interspersed with low rocky headlands. Backed by broader agricultural plains, views are often restricted by coastal forestry located on dune systems. Relatively well populated with small towns and villages along coast, some of these comprising small holiday resorts. Golf courses are located on links and dunes backing coast. Occasional industry and roads and railways are aligned parallel to the coast. Islands are occasional features in views over the Moray Firth. Land on either side of the Firth is a focus common to this type, with settlements, and often masts and other infrastructure located on ridges, forming significant features in views. The profile of land on the opposite side of the Firth tends to flatten due to both the distance and often subtle topography. The Outer Firth contains major shipping routes.
- 5.4.4.43 *Experiential qualities:* The containment of the Firth, where land is visible and provides shelter, generally gives a less exposed and dramatic seascape. However this sense of enclosure is weakened further to the east of the Moray Firth where the Firth suddenly broadens and land flattens creating a more open seascape. The presence of ships, rigs, settlements (particularly visible at night) and other built features and well farmed hinterland gives this type a developed character away from the open sea.

Type 6: Narrow Coastal Shelf

- 5.4.4.44 *Location:* East Sutherland Coast between Golspie and north of Helmsdale.
- 5.4.4.45 *Physical characteristics:* Predominantly rocky but 'straight' coastline, backed by a narrow corridor of level land tightly constricted by inland hills and the open sea, creating a distinctly linear space. The coastal shelf forms an important corridor for communications including major roads, railway lines and power lines. Steep sided narrow glens intersect the coastal shelf and these are often wooded. The coastal shelf is largely utilised for agriculture due to favourable drainage and soils. In Sutherland, crofts are often located in a linear fashion parallel to the coast. This type is generally sparsely settled with small harbour settlements situated on inlets; and with historic churches, harbours and houses within these settlements forming foci. Views focus on open sea.
- 5.4.4.46 *Experiential qualities:* The Coastal Shelf can feel remote due to the containment of inland hills / coastal scarp, although communications often are aligned close

to or within this type. Views directed over sea rather than hinterland due to the presence of steep hills inland.

Terrestrial Landscape Character Types

5.4.4.47 The study area covers a sizeable area covering the Moray Firth, its adjacent coastline in Caithness, Morayshire and Aberdeenshire, and the southern edge of South Ronaldsay in the Orkney Islands. The existing terrestrial SNH character assessment for Caithness, Moray and Nairn, and Banff and Buchan cover the coastal parts of the study area (Caithness and Sutherland LCA (SNH, 1998); Moray and Nairn LCA (SNH, 1998); and Banff and Buchan LCA (1997)). These reviews divide the landscape into tracts that are referred to as landscape character types. For the purposes of this assessment, Landscape Types provide an overview of the landscape of the study area and describe where the sea or coast influence or define the characteristics of the landscape. Figure 5.4-2, Volume 7 identifies all of the Landscape Types within the study area. Landscape types situated along the coast directly inform the definition of Coastal Character Areas, where the sea or coast provide the defining characteristics. Other landscape types near the coast are influenced by the sea, but the sea and coast do not provide the defining characteristic. These landscape character types are listed, along with a summary of their key characteristics in Table 5.4-6 below. All other landscape types in the study area shown in Figure 5.4-2, Volume 7, but not listed in Table 5.4-6 below have limited influence on the coastal characterisation. Located further inland, they have little or no relationship with the coast and the sea is not a characteristic element. These landscape types are considered separately as distinct Landscape Types.

5.4.4.48 The principal defining characteristics of every Landscape Type in the study area are not described in the SLVIA, as these can be referred to in the SNH landscape character assessments, but a summary of the key characteristics of the Landscape Types defined or influenced by the sea, are described Table 5.4-6 below. This information is then used in the definition of Coastal Character Areas.

Table 5.4-6 Landscape Types Defined or Influenced by the Sea

Landscape Character Assessment	Landscape Type Defined or Influenced by the Sea	Location	Summary of Key Characteristics
Banff and Buchan (SNH Review No. 37)	26. The Coast: Cliffs of the North and South-East Coasts	Banff and Buchan Coast	Cliffs, headland, inlets occasional sandy bays and notable blow holes.
	4. Coastal Farmland: Western Coastal Farmland	Hinterland of Banff and Buchan coast	Large-scale landscape of coastal farmland. Glimpses of the sea, which never seems too distant.
Moray and Nairn (SNH Review No. 101)	2. Coastal: Soft Coastal Shore	Spey Bay	Broad intertidal flats, dunes, marsh and spits and sandy beaches. Settlement including RAF Base.
	2. Coastal: Hard Coastal Shore	Between Burghead Bay and Lossiemouth Between Buckie and Cullen	Small coves, cliffs, pebble beaches. Farmland up to cliff edge. Views over Moray Firth to distant land. Settlements on headlands and in coves.

Landscape Character Assessment	Landscape Type Defined or Influenced by the Sea	Location	Summary of Key Characteristics
Moray and Nairn (SNH Review No. 101) (continued)	2. Coastal: Coastal Forest	Hinterland to Soft Coastal Shore	Distinctive backdrop planted on dunes and gravel. Provides a feeling of remoteness and containment of views. Little settlement although quarrying.
	7. Coastal Lowlands	Hinterland of Morayshire coast	Gently undulating coastal plain. Occasional views to the sea from higher ground. Views often precluded by coastal forests or by ridges and folds in the landform.
Caithness and Sutherland (SNH Review No. 103)	12. High Cliffs and Sheltered Bays	North and north-east coast of Caithness	Long narrow exposed stretches of very high cliffs interrupted by bays at glen intersections. Stacks, caves, pebbles and collapsed cliffs views directed along coast and out to sea focusing on islands, rigs and boats. Backed by moorland or small farms / crofts. Road aligned parallel to coast. Access and views to coast restricted due to cliffs.
	16. Long Beaches Dunes and Links	North East Caithness (Sinclair's Bay)	Soft linear edge to sea. Wide open space, extensive visibility. Recreation / golf links / caravan parks. May be backed by farmland or settlements.
	8. Coastal Shelf	East Caithness Coast (near Helmsdale)	Elevated platform, linear semi-enclosed by inland hills thus directing views out to sea. Transport corridor / small settlements and often farmed.
	20. Open Intensive Farmland	North East Caithness (near Wick)	Characteristics of clear light quality, exposure to extreme weather conditions and extensive views are augmented in areas located near the coast.
	18. Mixed Agriculture and Settlement	North Caithness coast	Edged in some places by high cliffs and bays or long beaches, dunes and links. Open vistas generally edged by the distant horizon of the sea or distinctive profiles of far-away hills. Clear skies and light allow some sense of direction to be gained from the distinct character of the sea.
	23. Small Farms and Crofts	North and East Caithness	Nature of the sea and the coastline strongly influences the areas that lie adjacent to the coast. The land division tends to relate directly to the coastal edge. Influenced by the sea, clarity of coastal light, the activity and sound of the waves, strong wind and sea birds.

Landscape Character Assessment	Landscape Type Defined or Influenced by the Sea	Location	Summary of Key Characteristics
Caithness and Sutherland (SNH Review No. 103) (continued)	11. Harbour	Wick, Dunbeath, Latheronwheel, Helmsdale	Harbours create a focus in the landscape – where the sea abuts the land against high harbour walls. Mainly located where a glen intersects the coastline or at the edge of a bay. Most activity within this character type is sea based – the level of this varying. Rich assortment of experiential characteristics associated with the combination of sea, land and human activity.
	6. Coastal Island	Stroma, Pentland Skerries	Uninhabited coastal islands of the Pentland Firth. Wavecut rock platforms, low cliffs and tilted strata have caused the formation of cliffs.
	19. Moorland Slopes and Hills	East Caithness and Sutherland	The coastline is generally not visible because of the convex slope of the landform. Variable landform allows distant views of the sea and its bays further along the coast.
Orkney (SNH Review No. 100)	1. Cliff Landscapes	South Ronaldsay	Eastern side of South Ronaldsay, with cliff tops over 200 m in places. Main features formed by marine erosion – eroding coastal features such as cliffs, stacks and caves. Influence of sea gives rise to wildlife interest.
	3. Coastal Basins	South Ronaldsay	Wide basin landform open to the sea. Smooth relief dropping to sea levels from surrounding hills. 'Ouse' waterbodies behind coastline. Views out to sea and access to beaches.
	5. Coastal Hills and Heath	South Ronaldsay	Small area on western coast of South Ronaldsay. Coastal hills with strong relief at coast of up to 150 m, which typically meet the sea at dramatic cliffs landscapes.
	13. Holms	Swona	Small uninhabited oval shaped islands with domed landform. Wavecut rock platforms and occasional low cliffs. Tilted strata have caused the formation of cliffs on one side.
	17. Low Island Pastures	South Ronaldsay	Open, extensive views from one side of the island to another or across headlands. Experience of exposure and large skies. Visual relationship with the sea.

Coastal Character Areas

5.4.4.49 Using the layers of desk information available on national seascape character and terrestrial landscape character, together with detailed site survey information (methodology described in 5.4.3 of this chapter) Coastal Character Areas within the study area are defined in Table 5.4-7 below and mapped in Figures 5.4-4 a to 5.4-4 e, Volume 7. The coastline has been divided into 23 Coastal Character Areas. The key characteristics and features of these Coastal Character Areas,

which may be influenced by the Developments, are described in 5.4.3 of this chapter alongside the sensitivity analysis (Stage 5) and impact assessment (Stage 6) for each Coastal Character Area.

Table 5.4-7 Coastal Character Areas

Region	Coastal Character Area	Location
Orkney Islands	1. South Ronaldsay	Island of South Ronaldsay
	2. Swona	Island of Swona
	3. Pentland Skerries	Islands lying in the Pentland Firth
Caithness	4. Stroma	Island of Stroma
	5. Scarfskerry	Coast between Dunnet Head and St John's Point
	6. Gills Bay and John O' Groats	Gills Bay and adjacent coast between St John's Point and Duncansby Head
	7. Duncansby Head	Eastern coast of Duncansby Head
	8. Freswick Bay and Nybster Coast	Freswick Bay between Skirza Head and Ness Head
	9. Sinclair's Bay	Sinclair's Bay between Keiss and Noss Head
	10. Noss Head	Coastline around Noss Head between Castle Sinclair and Wick Bay
	11. Wick Bay	Wick Bay between Staxigoe and Castle of Old Wick
	12. Sarclet Head	Coastline round Sarclet Head between Wick Bay and Lybster Bay
	13. Lybster Bay	Lybster Bay and adjacent coast
	14. Dunbeath Bay	Coastline between Berriedale and Latheronwheel, encompassing Dunbeath Bay
	15. Helmsdale to Berriedale Coastal Shelf	Coastal shelf between Berriedale and Helmsdale
	16. Brora to Helmsdale Deposition Coast	Coastal shelf between Brora and Helmsdale
Moray & Nairn	17. Lossiemouth to Burghead Coast	Hard coastal shore between Lossiemouth and Burghead
	18. Spey Bay	Soft coastal shore within Spey Bay between Lossiemouth and Portgordon
	19. Portgordon to Portknockie Coast	Settled coastline between Portgordon and Portknockie
	20. Cullen Bay	Cullen Bay between Bow Fiddle Rock and Logie Head
Aberdeenshire	21. Sandend Bay	Sandend Bay and its adjacent coastline between Logie Head and East Head, Portsoy
	22. Boyne Bay	Boyne Bay and its adjacent coastline between East Head and Knock Head, Whitehills.
	23. Boyndie Bay	Banff and Boyndie Bays between Knock Head and Macduff

5.4.5 Baseline Conditions – Landscape Designations

5.4.5.1 The sites of the Telford, Stevenson and MacColl wind farms are not covered by any known national or local landscape related planning designations. The cable landfall and a short section of the onshore export cable are located partly within a Special Landscape Area. Various nationally and regionally designated areas and features are found in the wider study area and have been considered in the assessment. The designated areas that are relevant to the assessment are shown in Figure 5.4-5, Volume 7.

5.4.5.2 There are three ways in which such designations are relevant to the assessment.

- The presence of a designation can give an indication of a recognised value that may increase the sensitivity of a landscape character receptor or viewpoint, and may therefore affect the significance of the effect on that receptor or viewpoint;
- The presence of a relevant designation can lead to the selection of a viewpoint within the designated area, as the viewpoint will provide a representative outlook from that area; and
- Designated areas may be included as landscape receptors so that the effects of the three proposed wind farmsites on these features of the landscape that have been accorded particular value can be specifically assessed.

National Scenic Areas (NSAs)

5.4.5.3 National Scenic Areas (NSAs) are areas considered to be of outstanding scenic quality on a national level, and are protected by a legal duty to safeguard and enhance their character or appearance (Section 263A of the Town and Country Planning (Scotland) Act 2007). There are no NSAs within the study area. The Dornoch Firth NSA is situated 60 km to the south-east of the three proposed wind farm sites at its closest point, outside the study area.

Gardens and Designed Landscapes (GDLs)

5.4.5.4 Sites designated in the 'Inventory of Gardens and Designed Landscapes in Scotland' (Historic Scotland, 1998) are protected in planning policy from development that may affect the landscape itself or its setting. GDLs have been included in the assessment both as specific receptors and as factors to be considered in the sensitivity of landscape character receptors and visual receptors / viewpoints. There are eight inventory listed landscapes in the study area, shown on Figure 5.4-5, Volume 7, all located at long distance from the three proposed wind farm sites. The GDLs within the study area are listed in Table 5.4-8 below.

Table 5.4-8 Gardens and Designed Landscapes in the Study Area

Region	Garden and Designed Landscape	Distance from EDA
Caithness	Castle of Mey	47 km
	Dunbeath Castle	34 km
	Langwell Lodge	38 km

Region	Garden and Designed Landscape	Distance from EDA
Morayshire	Cullen House	42 km
	Gordon Castle	48 km
	Gordonstoun	48 km
	Innes House	47 km
Aberdeenshire	Duff House	50 km

5.4.5.5 Scottish Historic Environments Policy (SHEP) (Historic Scotland, 2010) sets out Scottish Ministers vision and strategic policies for the historic environment, including inventory gardens and designed landscapes. The GDLs within the study area are covered by the relevant local development plans for each Local Authority Area. The closest of the GDLs to the Development is Dunbeath Castle, located approximately 34 km to the west of the three proposed wind farm sites.

5.4.5.6 An assessment of the effects on the setting of registered Historic Parks and Gardens has been carried out in Chapter 8.5 and Chapter 11.5 (Archaeology and Visual Receptors).

Special Landscape Area (SLA) (Highland)

5.4.5.7 The inclusion of a number of different planning authorities within the study area gives rise to variations in the regional designations that are used. While these regional designations are consistent in their broad aims and objectives, local plan descriptions and policies help to highlight any variations.

5.4.5.8 In September 2010, The Highland Council proposed that areas previously known as Areas of Great Landscape Value (AGLV) be renamed as Special Landscape Areas. The Highland Council produced citations for each of these Special Landscape Areas (SLAs), generally following the boundaries shown in the Highland Structure Plan (2001). The policy context for SLAs is within Policy 61 (Landscape) of the Highland Wide Local Development Plan 2012, which also has an appendix item for SLAs.

5.4.5.9 There are four SLAs in the study area, as shown in Figure 5.4-5, Volume 7:

- Duncansby Head (38 km from the Telford site at its closest point);
- Dunnet Head (47 km from Telford site at its closest point);
- Flow Country and Berriedale Coast (35 km from Stevenson site at its closest point); and
- Loch Fleet, Loch Brora and Glen Loth (46 km from MacColl site at its closest point) (partially within study area).

5.4.5.10 The closest SLA to the site – Flow Country and Berriedale Coast – lies around 35 km (at its closest point) to the west of the Telford site. The citation for this SLA provides the following references to the coastal landscape:

"This area extends from the coastal shelf and cliffs near Berriedale in the south, including Badbea, to Loch More in the north. It includes the wide expanse of interior peatland known as The Flow Country and extends westwards to include Knockfin Heights and the highly distinctive range of hills in the south that includes

the peaks of Morven, Maiden Pap and Scaraben. This extensive area comprises a contrasting range of landscapes, from interior peatland to isolated mountains and a raised coastal shelf. The Berriedale and Langwell glens are steeply incised in their middle and lower reaches, and where they approach the sea they converge and cleave through the coastal cliffs".

- 5.4.5.11 The Duncansby Head SLA is situated approximately 38 km (at its closest point) to the north west of the Telford site. The citation for this SLA provides the following references to the coastal landscape:

"This area is located at the extreme north east of the British mainland and lies to the east of John o'Groats. It includes both Duncansby Head and the Stacks of Duncansby. Forming the most north–easterly point on mainland Britain, the headland is notable for its spectacular cliff scenery and its commanding views. Huge populations of seabirds use the cliffs as a breeding ground in spring providing a distinctive experience of bird noise and activity".

- 5.4.5.12 Dunnet Head SLA and Loch Fleet, Loch Brora and Glen Loth SLA are located over 46 km from the three proposed wind farm sites Dunnet Head SLA is mainly outwith the study area and includes the most northerly point on mainland Britain. The peninsula is characterised by its prominent headland, striking vertical cliffs and expanse of isolated moorland jutting out into the Pentland Firth, so that experience at its northern tip is one of being more at sea than on land. Loch Fleet, Loch Brora and Glen Loth SLA are an area of rolling moorland hills, punctuated by a series of southeast orientated glens, straths and lochs, and edged to a narrow strip of farmed coastal shelf running along the shoreline. The character of this area is distinguished by its composition of contrasting landscape features – the contrasting landform, landcover and landscape pattern that empathise the distinction of each other. All of the SLAs are considered in the assessment in Chapter 8.4 (Seascape, Landscape and Visual Receptors), and where there is potential for significant effects to occur on their special qualities, the effects are assessed in full.

Areas of Landscape Significance (ALS)

- 5.4.5.13 Areas of Landscape Significance (ALS) designations are regionally important areas designated for their landscape value in the Aberdeenshire Local Plan (2006). There is one ALS within the study area covering the Banff and Buchan Coast. The location of this ALS is illustrated in Figure 5.4-5, Volume 7, as covering the coast between Cullen Bay and Banff. The primary purpose of the ALS designation is to conserve and protect the natural beauty of these landscapes, including their flora and fauna, physical landforms and the environmental assets that they represent. Local Plan policy ENV5b refers specifically to development "within or adjacent to Areas of Landscape Significance". The Development is not located within or adjacent to any ALS, being a minimum distance of 41 km (at its closest point) from the Banff and Buchan Coast ALS.
- 5.4.5.14 ALS may influence the location of a representative viewpoint or may be a factor that influences the consideration of the value of the landscape character receptor or view and, thus, increase its sensitivity. They are not, however, included as specific landscape receptors in the assessment. This is because the planning policies that cover this designation are relevant to development within or adjacent to the designated area and it is therefore only when the site itself is covered by such a designation, or immediately next to the designation, that the policy is applicable.

Wild Land Search Area

- 5.4.5.15 Search Areas for Wild Land (SAWL) as defined in SNH's 'Wildness in Scotland's Countryside Policy Statement No. 02 / 03' lie to the west of the study area at a minimum distance of 36 km at its closest point from the proposed sites (as shown on Figure 5.4-5, Volume 7). The distance of the developments from the SAWL and the limited visibility of the three proposed wind farm sites from these areas (shown on Figure 8.4-11, Volume 7) are considered to be sufficient that a specific detailed assessment of effects on wild land is not required. Likely significant effects on the wildness characteristics of the landscape have however been taken into consideration in the assessment of effects on landscape character.
- 5.4.5.16 The presence or otherwise of wild land characteristics on other parts of the study area and the effects on these characteristics, where they may arise, is addressed in the assessment of effects on Coastal Character Areas.

5.4.6 Baseline Character Associated with OnTI

- 5.4.6.1 The landscape effects of the OnTI will be included in material accompanying the Town & Country Planning application to Aberdeenshire Council for the OnTI. The baseline landscape environment of the onshore export cable and onshore converter station are described as follows.

National Seascape Character Types

- 5.4.6.2 The onshore cable landfall lies within the National Seascape Character Type 3: Mainland Deposition Coastline with Open Views as described previously and shown in Figure 5.4-10, Volume 7.

Terrestrial Landscape Character

- 5.4.6.3 The existing terrestrial SNH character assessment for Banff and Buchan (SNH, 1997) covers the OnTI study area. The assessment divides the landscape into tracts that are mapped and referred to as landscape character areas. These have been subsequently subdivided into geographically specific areas and it is these areas that provide a useful starting point for the baseline characterisation of the onshore export cable route.
- 5.4.6.4 Figure 5.4-9, Volume 7, identifies these landscape character areas within the OnTI study area. Landscape character areas situated along the coast directly inform the definition of Coastal Character Areas, where the sea or coast provide the defining characteristics. Other landscape areas near the coast are influenced by the sea, but the sea and coast do not provide the defining characteristic. These landscape character areas are listed, along with a summary of their key characteristics in Table 5.4-9 below.

Table 5.4-9 Terrestrial Landscape Character

Landscape Character Area	Landscape Character Sub-Area	Summary of Key Characteristics
The Coast	Cliffs of the North and South-East Coasts	Cliff edged headland, inlets occasional sandy bays and notable blow holes. Overall impression of open, large scale landscape, wide expanses of merging sea and sky. Vegetated slopes and frequent habitation, including ruined castles and mansion houses.

Landscape Character Area	Landscape Character Sub-Area	Summary of Key Characteristics
	Dunes and Beaches from Fraserburgh to Peterhead	Long stretches of beaches backed by rolling dunes. Uninterrupted views over the open sea. Limited vegetation associated with the dune grasses. Little settlement although Ron Lighthouse and St Fergus Gas Terminal are prominent man-made features.
Coastal Farmland	North-Eastern Coastal Farmland	Uniform, gently undulating terrain. Transitional area between ridged landscape to west and coastal plain to east. Large open fields on low ground with more diverse moss, moorland, woodland and crops / rough pasture on slightly higher ground inland. Widely scattered farms along network of roads. Some settlement and road corridors of A98 and A981.
	Eastern Coastal Agricultural Plain	Low coastal plain composed of very gently undulating land bordering the eastern coast. Open, large scale and windswept with views of the sea a dominant feature. Agriculture predominant with some local mosses and medium sized coniferous blocks. Woodland sparse – restricted to occasional shelterbelts and around farmsteads. Large open fields with fenced boundaries. Stone walls more typical of northern area. Random network of roads and farmsteads. Some small villages.
Agricultural Heartland	Agricultural Heartland	Agricultural land use over gently rolling landform. Open views over the surrounding, large scale landscape. Trees in shelterbelts, along ridges, around farms and in small coniferous blocks combine to provide some contrast and prevent a sense of bleakness. Field boundary types varied between fences and hedges to the south and east with some stone walls and consumption dykes to the north near Strichen.

5.4.6.5 Scottish Natural Heritage Review No. 37 (Banff and Buchan) identifies the landfall point as being located in The Coast landscape character area, within the Dunes and Beaches from Fraserburgh to Peterhead landscape unit. This landscape unit is a coastal landscape with wide expanses of sand and dunes, which form a contrast to the high headlands and cliffs of the coastline elsewhere. The remainder of the onshore export cable route and the onshore substation(s) are located in The Coastal Farmland landscape character area, within the Eastern Coastal Agricultural Plain landscape unit. This landscape unit sweeps around the eastern coast of Banff and Buchan is formed from a variety of landscapes, with the proximity and influence of the sea and the extent agricultural cultivation being common elements in determining its landscape character. A local landscape character assessment has been carried out within the locality of the onshore substation(s), as shown in Figure 5.4-14, Volume 7. An indicative location for the onshore substation(s) is shown near the existing Peterhead Power Station and substation, together with local landscape units in the locality around Peterhead. These local landscape units are listed, along with a summary of their key characteristics in Table 5.4-10 below.

Table 5.4-10 Onshore Substation(s) – Local Landscape Character

Local Landscape Unit	Summary of Key Characteristics
Boddam	<p>Settlement is the prevailing influence.</p> <p>Coastal setting, with rugged, granite cliffs around Buchan Ness.</p> <p>Visual amenity and character are strongly influenced by the scale of the adjacent Peterhead Power Station.</p> <p>Sheltered harbour and fishing boats provide maritime influence.</p>
Eastern Coastal Agricultural Plain	<p>As described in Table 5.4-9 above.</p>
Coastal Farmland with electrical infrastructure	<p>Electrical infrastructure is the prevailing influence within the coastal farmland.</p> <p>Scottish and Southern electrical substation and three overhead power lines.</p> <p>Limited landscape structure, screening and aesthetic merit.</p> <p>Remains of a derelict railway line.</p> <p>Electrical infrastructure influences the perception of the southern gateway into Peterhead.</p>
Cliffs to the South of Boddam	<p>Rugged, granite cliffs to the south of Buchan Ness.</p> <p>Highly sculptured and fractured cliffs, broken and treacherous reefs.</p> <p>Dramatic features such as caves, stacks and blow holes.</p> <p>Occasional sheltered sandy bays.</p> <p>Physically restricted, yet open, large scale landscape with wide expanses of sea.</p>
Dunes and Beaches north of Peterhead	<p>As described in Table 5.4-9 above.</p>
Invernettie	<p>Southern gateway to Peterhead.</p> <p>Settled area on the southern edge of Peterhead, to which it is connected, but with some physical separation and aspect towards Sandford Bay.</p> <p>Character and amenity negatively influenced by sewage works and HM Prison, contrasting with coastal influence of Sandford Bay.</p>
Peterhead	<p>Large settled area forming Aberdeenshire's largest settlement.</p> <p>Developed as a planned settlement, which grew as a fishing port and a base for this industry.</p> <p>Later growth established Peterhead as a major oil industry service centre.</p> <p>Considerable land holdings allocated for industrial development.</p>
Peterhead Bay	<p>Prevailing character influenced by maritime influences around Peterhead Bay and harbour.</p> <p>Sheltered deep-water port, serving oil / gas and fishing industries.</p> <p>Fabrication, decommissioning and bulk handling facilities.</p> <p>Leisure craft marina, with cruise ships visits and quays.</p>

Local Landscape Unit	Summary of Key Characteristics
Peterhead Power Station	<p>Large scale and massing of Peterhead Power Station is prevailing influence.</p> <p>Dominates the southern gateway into Peterhead.</p> <p>Aesthetically arresting scale and form in the landscape, increased by location close to settlement and coast.</p> <p>Areas of undeveloped land and screening landforms.</p>
Peterhead Urban Fringe	<p>Urban fringe landscape between Peterhead and the A90.</p> <p>Profusion of scales of commercial and industrial premises set amongst urban fringe farmland.</p> <p>Areas of under-used undeveloped land, some with little maintenance, storages yards and dereliction.</p>
Sandford Bay	<p>Deeply recessed bay which is sheltered from northerly winds.</p> <p>Setting influenced by sewage treatment plant and Peterhead Power Station, which pumps its cooling water directly into the bay.</p> <p>Sandford Bay catches easterly swells and is a surfing location, despite the nearby industry.</p>
Stirling Hill	<p>Localised area of higher ground with physical relief rising gradually above the surrounding coastal plan and cliffs. Affords elevated views over Peterhead.</p> <p>Hilltops of Stirling Hill and Hillhead of Cowells have several communications masts.</p> <p>Red Peterhead granite has been quarried in large quantities from Stirling Hill.</p> <p>Tramways linked the quarries with Boddam Harbour and the railway, which is now disused.</p>

5.4.6.6 The Invernettie to Boddam area of south Peterhead has been identified through various consultations as being generally unsatisfactory in terms of amenity value and appearance. Issues relate to a profusion of designs and scales of industrial and commercial premises, many of which feature little or no landscaping, screening or aesthetic merit. The area also features expanses of undeveloped land, some with little maintenance, extensive and underused storage yards etc, as well as the remains of a derelict railway. All these factors contribute to an image of south Peterhead that local people and businesses have expressed concerns about, and the desire to see future development in the area contributing to a more positive image for this part of the settlement and the town as a whole. This issue was identified as a priority by Scottish Enterprise and Aberdeenshire Council and resulted in the formulation of the Peterhead Southern Gateway Environmental Improvement Masterplan (Aberdeenshire Council, 2011).

5.4.6.7 The Peterhead Southern Gateway Environmental Improvement Masterplan is a component of the Energetica project. The objective of this project is to create diversity in the region's future economy by creating, over 15 years, a location of excellence for attracting low carbon and renewable research, development and manufacturing enterprises along the Energetica corridor that extends from north Peterhead to Aberdeen. The masterplan outlines several design principles which aim to improve the amenity value of the area as well as contributing generally to improving the image of south Peterhead as a whole. It is envisioned that a quality environment is an essential aspect of this objective and to this end there is an emphasis on all proposed development in the Energetica corridor area featuring quality environmental and architectural design.

- 5.4.6.8 Scottish Hydro–Electric Transmission Ltd (SHETL) and National Grid Electricity Transmission plc (NGET) are proposing the development of an Eastern High Voltage Direct Current (HVDC) Link between Scotland and England. In Scotland this project initially requires the construction of a HVDC Converter station, a 400 kV Substation; and cable corridor for two HVDC cables. The onshore options for the construction and operation of the Eastern HVDC in the Peterhead area are currently under consideration and consultation. Four potential site options have been identified for construction of the 400 kV Substation and Converter Station in the Peterhead area, near the existing Peterhead Power Station.

Coastal Character Areas

- 5.4.6.9 Using the layers of desk information available on national seascape character and terrestrial landscape character, together with detailed site survey, a Coastal Character Area has been defined at Fraserburgh Bay and mapped in Figure 5.4-11, Volume 7. This Coastal Character Area forms part of the wider Landscape Character Area of the Coast, however, its distinctiveness will be useful to inform the assessment of the effects of the cable landfall development that may occur within these areas.
- 5.4.6.10 The characteristics and features of the Fraserburgh Bay Coastal Character Area, which may be influenced by the Development, are described as follows.

Fraserburgh Bay Coastal Character Area

- 5.4.6.11 Maritime influences
- Ships are commonly seen at sea.
- 5.4.6.12 Character of coastal edge
- Low sections of coast comprising long, sweeping curved sandy beaches, often backed by dunes and forming a soft linear edge to the sea;
 - Settlement of Fraserburgh and industrial development are prevalent at the western end of the bay;
 - Eastern end of the bay is has less development influence and there are footpaths to Cairnbulg Point;
 - Views are long and expansive along the beach and uninterrupted, although low level, views occur over the North Sea; and
 - Simple horizontal visual composition of sky, sea and land, although settlement of Fraserburgh adds visual complexity.
- 5.4.6.13 Character of immediate hinterland
- Grassland and gorse occurs behind dunes and this is backed in turn by flat, mixed or arable farmland;
 - Fraserburgh Golf Courses occurs within the hinterland of this CCA;
 - Cairnbulg Castle and Formartine and Buchan Way;
 - Wildness / isolated coast;
 - Relatively well–populated areas and beaches are an important recreational resource;

- The straightness of the coast and open views of the sea give a degree of exposure;
- This type has a dynamic character – both physically and experientially – visible in the migration of sand.

Landscape Designations

- 5.4.6.14 The coastal sections and landfall of the cable route is located within an Area of Landscape Significance (ALS) that covers a section of the coastline between Fraserburgh and Peterhead. The primary purpose of the ALS designation is to conserve and protect the natural beauty of these landscapes, including their flora and fauna, physical landforms and the environmental assets that they represent. Local Plan policy ENV5b refers specifically to development “*within or adjacent to Areas of Landscape Significance*”.
- 5.4.6.15 ALS may influence the location of a representative viewpoint or may be a factor that influences the consideration of the value of the landscape character receptor or view and thus, increase its sensitivity. The ALS will be included as a specific landscape receptor in the assessment of the onshore export cable route in Chapter 11.4 (SLVIA).

Landscape Elements and Features

- 5.4.6.16 The land use of the onshore export cable route is predominantly agricultural with some hedgerows, trees, woodlands, coniferous plantations, roads and watercourses creating some subdivision. There are also some areas described in the character assessments as mosses.
- 5.4.6.17 Prominent woodland forms part of the policies at Philorth to the south of Fraserburgh. A further woodland area is to be found further south at Concraigs and there are marked shelterbelts at Lonmay. Cairnchina is the focus of a further area of mixed plantation. There are woodland blocks near to the River Ugie and its tributaries and further areas to the south east near to the A950 and A90 road corridors.
- 5.4.6.18 Viewpoints are used to illustrate landscape elements where they will be affected by the construction of the underground cable route, landfalls or the converter station.

5.4.7 Baseline Conditions – Views

- 5.4.7.1 There are a number of visual receptors, consisting of settlements, routes and features / attractions in the Study Area that require consideration in the assessment, as views from them may be affected by the three proposed wind farm sites. These are described briefly below and shown in Figure 5.4-6, Volume 7.

Visual Receptors

Settlements

- 5.4.7.2 The Study Area covers a large part of North East Caithness and the Morayshire and Aberdeenshire Coasts. Settlement along the Caithness coasts consists predominantly of scattered farms and crofts, with occasional villages such as Helmsdale, Dunbeath, Lybster and Keiss. Wick is the largest settlement in the Caithness part of the study area; the town straddles the River Wick and extends along both sides of Wick Bay. Wick is the closest large settlement to the three

proposed wind farm sites, located at a minimum distance of 25 km from the Telford site (at its closest point). The closest settlement to the three proposed wind farm sites is Sarclet, located approximately 23 km from the Telford site (at its closest point). The areas to the south of the study area covering the Morayshire and Aberdeenshire coasts contain a substantial amount of development, the main settlements include Lossiemouth, Buckie, Cullen and Banff, with smaller settlements at Portgordon, Findochty, Portknockie, Portsoy and Whitehills located within the sheltered bays along this coast. Portknockie is the closest settlement on the Morayshire coast, located at a distance of approximately 40 km from the MacColl site (at its closest point).

Roads

5.4.7.3 There are numerous road corridors traversing the Study Area, many of which are associated with urban development, while others provide access to the wider countryside. The main road corridors within the Caithness part of the study area are the A9(T), A99, A882, A836 and A897, with minor roads connecting the more remote parts of the study area including the B870, B874 and B876. The main road corridors within the Morayshire / Aberdeenshire part of the study area are the A99, A941 and A942. It is not possible, or necessary, to assess the likely effects of the three proposed wind farm sites on every route, however some of the key routes require consideration in the assessment. Three principal criteria have been considered in determining the inclusion of routes in the assessment:

- The extent to which the route traverses the Study Area or extends across a notable part of it, rather than passing through as just a short stretch;
- The importance of the route in terms of recognition, signage, traffic volume and usage; and
- The extent of visibility of the three proposed wind farm sites from the route.

5.4.7.4 The closest main road to the three proposed wind farm sites is the A99, Helmsdale to John O' Groats, which is located approximately 23 km west of the three proposed wind farm sites at its closest point. The A9(T) is located approximately 31 km from the three proposed wind farm sites at its closest point and the A882 is located 26 km from the three proposed wind farm sites. The effect of the three proposed wind farm sites on these key routes in Caithness is assessed in detail in 8.4.5 of Chapter 8.4 (Seascape, Landscape and Visual Receptors). The A98 road corridor in Morayshire is located at a minimum distance of 42 km from the three proposed wind farm sites, with other road corridors in Morayshire located at greater distances.

Railways

5.4.7.5 The Study Area includes one main railway line, running from Inverness to Wick and Thurso. The line follows the coast between Brora and Helmsdale before turning inland to a route along Strath of Kildonan outside the study area. The line re-enters the study area near Halkirk, where it branches north to Thurso and south east to Wick. The line is located approximately 26 km from the three proposed wind farm sites at its closest point, but is generally at longer distances from the three proposed wind farm sites.

Long Distance Routes

5.4.7.6 National Cycle Route 1 (NCR1) traverses the northern part of the study area, shown in Figure 5.4-6, Volume 7, running along the north Caithness coast between

John O' Groats and Thurso. The coastline and settlements of Morayshire are linked by a waymarked coastal walking trail, the Moray Coast trail, of approximately 50 miles between Findhorn and Cullen. The Moray Trail takes in landscapes from rugged cliffs, caves and sheltered coves to fishertown harbours and sweeping stretches of sandy beaches. The Moray Firth is one of 12 national tourist routes, designed to provide the travelling holidaymaker with an alternative to the main trunk roads and motorways. The route has been selected because it is attractive in its own right but also to offer a variety of things to see and do on the way to a main destination.

Attractions and Visitor Facilities

5.4.7.7 Tourism and recreation in the area are addressed in Chapters 5.6, 8.6 and 11.6 (Socio-Economics, Recreation and Tourism). There are features and resources of interest to visitors in the study area; John o' Groats is popular with tourists because it is usually regarded as the most northerly settlement of mainland Great Britain, although it is actually one end of the longest distance between two inhabited points on the British mainland, Land's End being the other. The actual most northerly point is the nearby Dunnet Head. Some of the coastal villages and harbours provide attractive locations to stay for tourist visitors, including Keiss, Dunbeath and Helmsdale. The natural and historic environment of the Caithness coast provides extensive interest to visitors. The Caithness landscape, and particularly the coastline, is rich with the remains of human occupation from the pre-historic era to the present day, and there are numerous sites where this history is interpreted for visitors. The underlying geology, harsh climate and long history of human occupation have shaped the distinctive natural heritage. The landscape incorporates both common and rare habitats and species, and Caithness provides a stronghold for many once common breeding species of interest. The Moray coastline has a string of sandy beaches and accessible coastal settlements such as Buckie, Lossiemouth, Findochty, Portknockie and Cullen, have long been popular for family holidays. For the walker there are extensive coastal walks in the study area, taking in cliffs, arches and stacks as well as sand and dunes.

Viewpoints

5.4.7.8 The assessment of landscape and visual effects is informed by a series of 24 viewpoints, which were selected to cover locations with specific receptors of importance within the ZTV (Figure 8.4-5, Volume 7) for the three proposed wind farm sites and OfTI, such as recognised viewpoints, designated landscapes, important routes and attractions. A variety of landscape and coastal character areas and locations from different directions and at varied distances have also been represented in the selected views. A range of viewpoints were selected through desk study, field work and consultation. Viewpoints for the SLVIA have been considered and agreed in consultation with Highland Council, Moray Council, Aberdeenshire Council and SNH. Viewpoints have also been selected in collaboration with BOWL.

5.4.7.9 In order to reach a final list of viewpoints chosen, a wide range of viewpoints have been considered at key visual receptors in the Study Area. Viewpoints have been selected only from locations from where clear views of the three proposed wind farm sites may be obtained; the set of viewpoints may therefore be considered to represent the maximum likely significant effects of the three proposed wind farm sites, rather than typical predicted effects. In addition, it

should be noted that there are proportionally more viewpoints close to the three proposed wind farm sites than further away; this is deliberate, in order to show views from places where the three proposed wind farm sites are more likely to have a larger visual effect.

5.4.7.10 The viewpoint assessment is used to inform and illustrate the assessment of effects on landscape / coastal character and the assessment of effects on views. Table 5.4-11 below lists the viewpoints and provides information on their location, the type of receptor that experiences the view and their distance from the nearest turbine. A description of the baseline conditions in these views is described in Table 8.4-4 of Chapter 8.4 (Seascape, Landscape and Visual Receptors) so that they may be read together with the impact assessment. The locations of these viewpoints are shown in Figure 5.4-7, Volume 7, and the existing views towards the three proposed wind farm sites from each viewpoint are shown in Figures 8.4-13 to 8.4-36, Volume 7.

Table 5.4-11 Viewpoints

ID	Name	Easting	Northing	Distance (km) from the Three Proposed Wind Farm Sites	Receptors
1	DUNCANSBY HEAD	340528	973247	41.95 (Telford)	Walkers / birdwatchers
2	KEISS PIER	335055	960934	34.54 (Telford)	Residents / tourist visitors
3	SORTAT	328903	963016	40.22 (Telford)	Residents
4	WICK BAY	336985	951027	26.15 (Telford)	Residents
5	SARCLET (Sarclat Haven Info Board)	334989	943334	22.96 (Stevenson)	Residents / visitors
6	HILL O' MANY STANES	329516	938430	24.20 (Stevenson)	Walkers / tourist visitors
7	LYBSTER (end of Main Street)	324843	935082	26.67 (Stevenson)	Residents
8	LATHERON (A9)	319803	933152	30.73 (Stevenson)	Residents / road users
9	DUNBEATH (nr Heritage Centre)	315957	929567	33.68 (Stevenson)	Residents
10	BERRIEDALE (A9)	313153	924611	36.07 (Stevenson)	Residents / road users
11	MORVEN	300482	928539	48.92 (Stevenson)	Walkers
12	NAVIDALE	303766	916161	44.61 (MacColl)	Residents
13	CATCHORY	325836	957348	38.84 (Telford)	Residents
14	MINOR RD, south side of Stemster Hill	319802	940395	33.55 (Stevenson)	Road users
15	WHALIGOE STEPS	332051	940296	23.11 (Stevenson)	Tourist visitors
16	LOSSIEMOUTH, PROSPECT TERRACE (Info Point)	323397	870574	46.26 (MacColl)	Residents
17	BUCKIE, CLIFF TERRACE	343091	865825	44.23 (MacColl)	Residents
18	PORTNOCKIE – Bow Fiddle Rock Info Point	349411	868741	41.08 (MacColl)	Walkers
19	CULLEN, Viaduct & cycle path	350995	867102	42.80 (MacColl)	Residents / cyclists / walkers

ID	Name	Easting	Northing	Distance (km) from the Three Proposed Wind Farm Sites	Receptors
20	BIN HILL	347989	864267	45.53 (MacColl)	Walkers
21	FINDLATER CASTLE	354169	867086	43.16 (MacColl)	Tourist visitors / walkers
22	PORTSOY	359071	866382	44.82 (MacColl)	Residents
23	FERRY ROUTE (Kirkwall to Aberdeen) north	388911	931385	24.66 (Telford)	Ferry passengers
24	FERRY ROUTE (Kirkwall to Aberdeen) south	382009	950868	28.46 (Telford)	Ferry passengers

5.4.8 Baseline Visibility Frequency

- 5.4.8.1 A ten year period of meteorological data from Wick Airport was made available to inform the average visibility for the Study Area. The data has recorded visibility up to 30 km on an hourly basis over ten years, between 2002 and 2011. The monthly averages are presented in Technical Appendix 5.4 B.
- 5.4.8.2 There are no clear trends in visibility range across different seasons over the period, with the percentage of visibility being broadly similar in the summer months as in the winter months. The main trends in visibility can be interpreted from the average of all observations over the period for different distances.
- 5.4.8.3 Analysing the data sets shows the following for the ten year period:
- Very poor¹ visibility at distances less than 1 km occurs 1.7 % of the time;
 - Poor visibility, at distances between 1 & 4 km, occurs 3.6 % of the time;
 - Moderate visibility, at distances between 4 & 10 km, occurs 12.9 % of the time;
 - Good visibility, at distances between 10 & 20 km, occurs 48.9 % of the time;
 - Very good visibility, at distances between 20 & 40 km, occurs 34.2 % of the time; and
 - Excellent visibility, at distances over 40 km, occurs 0.3 % of the time (over the ten year period).
- 5.4.8.4 'Good' visibility (between 10 km to 20 km) is most frequent over the period. 'Very poor' and 'excellent' visibility are, at either end of the spectrum, least frequent over the period. It is reasonable to conclude that the area benefits from good and very good visibility conditions over the majority of the period. The data does, however, show that visibility frequency drops sharply with distances over 25 km, such that visibility over 25 km occurs for only 12 % of the time.
- 5.4.8.5 The proposed Telford Wind Farm lies approximately 26 km from Wick; the visibility frequency is based on this distance as this is the nearest point of the three proposed wind farm sites to the meteorological station. The effect of the development in relation to the baseline visibility frequency is assessed in Chapter 8.4 (Seascape, Landscape and Visual Receptors).

¹ Visibility definitions provided by the Met Office <http://www.metoffice.gov.uk/weather/uk/guide/key.html#vis>

Night-time Visual Baseline

- 5.4.8.6 Night time photographs (Figures 8.4-16 c and 8.4-21 c, Volume 7) have been taken from Wick Bay and Dunbeath to illustrate the night-time visual baseline and consider the visual effects of turbine lighting. The photograph from Wick Bay illustrates a brightly lit harbour and residential area to the west, with a very dark centre of view over the open water.
- 5.4.8.7 The night time photograph taken at Dunbeath shows a mostly dark scene with brightly lit areas around housing to the north of the viewpoint and with some individual road lighting in the centre of the view. The oil / gas platforms along the darkened horizon are seen as spots of lights, with one particularly bright platform to the south.

5.4.9 Baseline Views Associated with OnTI.

- 5.4.9.1 There are a number of visual receptors, consisting of settlements, routes and features / attractions in the OnTI study area that require consideration in the assessment, as views from them may be affected by the onshore export cable and substation(s). These visual receptors are described briefly below and shown in Figure 5.4-13, Volume 7.
- 5.4.9.2 The majority of the study area for the OnTI will be affected only temporarily by the changes arising during construction of the onshore export cable, however, there may also be limited long term effects that arise as a result of the operation of the landfall, the substation(s) and where losses of vegetation such as trees and hedgerows cannot be mitigated. The visual effects will be included in material accompanying the Town & Country Planning application to Aberdeenshire Council for the OnTI. The baseline visual environment of the OnTI is described as follows.
- 5.4.9.3 The settlement of Fraserburgh lies partially within and near to the northern-most extents of the onshore export cable route and the location of the landfall at Fraserburgh Bay. The beach at Fraserburgh Bay is also a popular visitor attraction for leisure pursuits including general beach recreation, surfing and walking. There is also a nearby golf course and the Formartine and Buchan Way long distance footpath begins in Fraserburgh and passes close to the coast and through the northern and southern parts of the study area. The Formartine and Buchan way follows the route of a disused railway line to the south of Fraserburgh, stretches south through the Fraserburgh route to Strichen and crosses it again between Longside and Peterhead. Emanating from Fraserburgh is also the A90 road to Peterhead and this along with a section of the A981 and the A950 are the main roads that cross through the Fraserburgh Cable Route Study Area. There are a number of small settlements and many scattered properties and farms within OnTI study area.

Viewpoints

- 5.4.9.4 The assessment of the effects of the OnTI is informed by a number of viewpoints. These viewpoints are listed in Table 5.4-12 below, with information on their location and type of receptor that will experience the view. The location of these viewpoints is shown in Figure 5.4-7, Volume 7.

Table 5.4-12 OnTI Viewpoints

ID	Name	Easting	Northing	Receptors
Cable landfall				
1	FRASERBURGH, BEACH ESPLANADE	400036	866212	Residents (Fraserburgh), beach recreation, walkers.
Onshore cable route				
Viewpoints to be confirmed in separate additional information provided with Town and Country Planning Application for onshore OFTO when cable route and substation location is known.				
Onshore converter station				
1	BODDAM, STATION ROAD	413001	842425	Residents (Boddam)
2	A90, PARKING BAY, PETERHEAD POWER STATION	412277	842822	Road users (A90)
3	NEWTON	411502	843029	Residents
4	WHINBUSH	412001	841861	Residents / landscape character context
5	INVERNETTIE ROUNDABOUT, PETERHEAD	411901	84405	Residents / road users (Peterhead)
6	SANDFORD BAY	412701	844225	Residents / road users (Peterhead)

5.4.9.5 Viewpoints for the onshore export cable route will be included in material accompanying the Town & Country Planning application to Aberdeenshire Council for the OnTI, when the onshore export cable has been located within the onshore cable route. A description of the baseline conditions in these views is described in Chapter 11.4 (Seascape, Landscape and Visual Receptors) so that they may be read together with the impact assessment. The existing view towards the onshore cable landfall is shown in Figure 11.3-1, Volume 7. The existing views towards the substation(s) from six viewpoints identified in Table 5.4-12 above are shown in Figures 11.4-3 to 11.4-8, Volume 7.

5.4.10 References

Aberdeenshire Local Plan (Aberdeenshire Council, 2006).

An Assessment of the Sensitivity and Capacity of the Scottish Seascape in Relation to Wind Farms (SNH, 2005).

Banff and Buchan LCA (SNH, 1997).

Beaches of Caithness and Beaches of Northeast Scotland (Countryside Commission for Scotland, 1970 and 1977).

Caithness and Sutherland LCA (SNH, 1998).

Guidance on Landscape / Seascape Capacity for Aquaculture (SNH, 2008).

Guidance on the Assessment of the Impact of Offshore Windfarms: Seascape and Visual Impact Report (DTI, 2005).

Guide to Best Practice in Seascape Assessment (CCW, 2001).

Highland Structure Plan (Highland Council, 2001).

Highland Wide Local Development Plan (Highland Council, 2012).

Moray and Nairn LCA (SNH, 1998).

Peterhead Southern Gateway Environmental Improvement Masterplan (Aberdeenshire Council, April 2011).

Visualisation of Windfarms, Good Practice Guidance (SNH, 2006).

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5.5 Archaeology and Visual Receptors

5.5.1 Introduction

5.5.1.1 This chapter presents the results of the baseline studies undertaken in order to identify the cultural heritage assets that may be subject to effects resulting from the construction, operation and decommissioning of the three proposed wind farms and associated Transmission Infrastructure. Detailed information regarding the methodologies employed is presented in Technical Appendix 5.5 A (Archaeology and Visual Receptor Technical Report).

5.5.1.2 The studies consisted of the following:

- Consultation with relevant statutory and non-statutory bodies, including SNH, SEPA, SWT and the Ugie Angling Association (see 5.5.2 of this chapter);
- Detailed desk studies and assessments to establish the baseline conditions within the study areas (see 5.5.3 of this chapter);
- Geotechnical and geophysical studies to inform the baseline assessment for the offshore components (see 5.5.4 and 5.5.5 of this chapter);
- Site walkover to inform the baseline assessment for the onshore components (see 5.5.4 of this chapter); and
- Consideration of the relevant key legislative and planning information (paragraph 5.5.8.1).

5.5.1.3 The baseline studies have sought to identify and characterise:

- Assets that may be physically affected by the wind farms and associated Transmission Infrastructure, throughout all phases of their lifespan; and
- Onshore assets that may be subject to setting impacts, primarily during the operational phase of the Project.

5.5.1.4 Assets identified in the course of the baseline studies are detailed in Technical Appendix 5.5 A. In the interests of clarity, offshore cultural heritage assets associated with the three proposed wind farm sites are referred to by HW numbers while offshore cultural heritage assets within the offshore transmission infrastructure (OfTI) are referred to by HA numbers issued in the course of the assessment. Previously recorded onshore assets are referred to according to their designation index number (SM: Scheduled Monument; HB: Listed Building) or Aberdeenshire Historic Environment Record (HER) number.

5.5.1.5 This baseline is used to inform the archaeological impact assessment described in the following chapters:

- Chapters 8.5, 11.5 and 15.5 (Archaeology and Visual Receptors); and
- Chapter 12.1 (Whole Project Assessment).

5.5.2 Consultations

5.5.2.1 In order to produce an informed assessment, contact was initiated with statutory authorities including Marine Scotland (The Scottish Government), Historic Scotland, and the Highland Council Historic Environment Team (HCHET). Their responses in relation to the marine and onshore cultural heritage assets within their statutory remit are outlined in Table 5.5–1 below.

Table 5.5–1 Consultation Responses

Organisation	Consultation Response	MORL Approach
Marine Scotland (The Scottish Government)	<p>Scoping response:</p> <p>General Principles</p> <p>* The ES should address the predicted impacts on the historic environment and describe the mitigation proposed to avoid or reduce impacts to a level where they are not significant.</p>	These have been addressed in the EIA
	<p>* Direct impacts on the resource itself and indirect impacts on its setting must be addressed in the EIA.</p>	These have been addressed in the EIA
	<p>Baseline Information</p> <p>* Information on the location of all archaeological / historical sites held in the National Monuments Record of Scotland (NMRS) can be obtained from www.PASTMAP.org.uk</p> <p>* Data on scheduled monuments, listed buildings and properties in care can also be downloaded from Historic Scotland's Spatial Data Warehouse.</p>	All available information for cultural heritage has been accessed
Historic Scotland (HS)	<p>Scoping response:</p> <p>Principle of Proposal</p> <p>* HS are content with the principle of the proposal. HS considers it unlikely that there shall be significant adverse impacts on marine assets and on the setting of terrestrial assets within HS statutory remit.</p> <p>* In HS's view, the proposed methodology for baseline surveys, assessment of impacts and mitigation is considered acceptable.</p>	Noted
	<p>* The relevant Council archaeological and conservation service will be able to provide information and advice on unscheduled archaeology and category B and C (S) listed buildings.</p>	Advice was sought from HCHET
	<p>Marine Assets</p> <p>* HS confirmed that there are no designations within their statutory remit located within the proposed development area.</p>	Noted
	<p>* HS recommended that the potential impact on undesignated wrecks is assessed as these could be subject to potential direct impacts, depending on the location of the sub-sea works. HS recommended that indirect impacts on historic assets on the seabed within the proposed development area and possibly beyond which may be caused by alteration to tidal currents and sedimentary regimes, and by changes to the chemical balance of the water and seabed sediments, should be assessed.</p>	Indirect effects were considered within the assessment

Organisation	Consultation Response	MORL Approach
	HS encouraged that archaeological analysis of grab and core samples to be undertaken, and that results of all archaeological assessments should be archived through the Royal Commission on the Ancient and Historical Monuments of Scotland.	All geotechnical data was assessed
	<p>Cumulative Impact</p> <p>* HS welcomes that potential cumulative impacts shall be assessed in relation to the wind farms; and that the cumulative assessment for the transmission infrastructure will be scoped out of the assessment.</p> <p>Additional feedback:</p> <p>* HS were content with the progress during the compilation of the baseline and the impact assessment, opinion and feedback for which were established during meetings in October 2010 and May 2011.</p> <p>Comments on Draft ES:</p> <p>* Further feedback was provided in relation to the draft ES submissions in a letter date 26th March 2012 which broadly concurred with the results of the assessment and the mitigation measures proposed.</p>	Noted
Highland Council Historic Environment Team (HCHET)	<p>Highland Council agreed with the proposed approach, which would involve the assessment concentrating on an agreed selection of cultural heritage assets in Caithness with settings related to the sea. It was agreed that the same assets that had been considered by the Beatrice Offshore Wind Farm Ltd (BOWL) should be considered in this instance.</p> <p>The potential for impacts upon assets in Easter Ross to be affected by the western development was raised. Potential impacts related to the western development area lie outside the scope of the current assessment.</p>	Agree with comment

5.5.3 Offshore Generating Station and Transmission Infrastructure Baseline Characteristics

Desktop Studies

- 5.5.3.1 This cultural heritage baseline assessment comprises:
- The results of an onshore and offshore desk-based assessment;
 - The results of the archaeological assessment of marine geophysical and geotechnical survey data; and
 - The assessment of onshore cultural heritage assets in connection with the export cable and transmission infrastructure (see Technical Appendix 5.5 A).
- 5.5.3.2 Baseline data gathering was undertaken in order to identify all cultural heritage assets within the established study areas.
- 5.5.3.3 The established study areas examined individually are the three proposed wind farm sites and the OfTI, referred to as the Inner Study Area. A 1 km buffer zone around the three proposed wind farm sites and the OfTI is referred to as the Outer Study Area (Figures 5.5-1 and Figure 5.5-2, Volume 6 b).

5.5.3.4 The Onshore Transmission Infrastructure (OnTI) study area has also been assessed for cultural heritage assets (Figure 5.5-3 and Figure 5.5-4, Volume 6 b) including those where setting may be affected by the offshore generating station (Figure 5.5-5, Volume 6 b).

Desk-Based Assessment

5.5.3.5 The desk-based assessment comprised a documentary and cartographic search utilising available sources in order to locate all known cultural heritage assets, and to identify the archaeological potential of a wider study area; in this case encompassing the North Sea, Moray Firth and Aberdeenshire coast and terrestrial hinterland in the vicinity of the OfTI export cable landfall. A full list of sources used for this assessment is included in Technical Appendix 5.5 A.

Telford, Stevenson and MacColl Wind Farms

5.5.3.6 The desk based assessment established that there are no designated wrecks or other cultural heritage assets with legal designations within either the Inner Study Area or the Outer Study Area. The report identified six recorded wreck sites, four of which are located inside the Inner Study Area (HW1001 to HW1004) and two wrecks within the Outer Study Area (HW1005 & HW1006). Of these sites four are considered to be 'Live' with known locations, while two are considered to be 'Dead' as they have not been detected by repeated surveys. A further two UK Hydrographic Office (UKHO) obstructions have been identified, one within the Inner Study Area (HW1014) and one (HW1015) in the Outer Study Area (see Table 5.5-2 below and Figure 5.5-1, Volume 6 b).

5.5.3.7 There is one reported loss within the Inner Study Area recorded in the National Monuments Record of Scotland. This corresponds to a UKHO SeaZone entry (HA1001) and is therefore assigned the same HA number in this assessment.

Table 5.5-2 Offshore Cultural Heritage Assets with Known Locations Including UKHO 'Dead' Entries (those in bold are live)

HW No.	UKHO No.	Name	Type	Designations	WGS84, UTM 30N Coordinates	Study Area	Status
HW1001	1328	Carisbrook (possibly)	Steamer	None	515045 6461955	Inner	Live
HW1002	1306	Llanishen (probably)	Steamer	None	514733 6458851	Inner	Live
HW1003	1184	Active	Fishing Trawler	None	516145 6455801	Inner	Dead
HW1004	1182	Unknown	Unclassified	None	516574 6453645	Inner	Live
HW1005	1171	Minsk	Cargo Steamer	None	520562 6441757	Outer	Live

HW No.	UKHO No.	Name	Type	Designations	WGS84, UTM 30N Coordinates	Study Area	Status
HW1006	1169	HMS Lynx	Destroyer	None	521994 6441416	Outer	Dead
HW1014	4280	None	Obstruction Foul Ground	None	516351 6453014	Inner	Dead
HW1015	1181	None	Obstruction	None	524948 6453838	Outer	Dead

Offshore Transmission Infrastructure

5.5.3.8 The assessment has established that there are no designated wrecks or other cultural heritage assets with legal designations within the OfTI cable route. The study has identified 14 recorded wreck sites in the SeaZone dataset, of which 11 were located in the OfTI cable route Inner Study Area and 3 in the OfTI cable route Outer Study Area. Of these recorded wrecks four are considered to be 'LIVE' (HA 1004, 1005, 1009 and 1014), eight 'DEAD' wrecks and two wrecks have been lifted (LIFT). Further to this, four UKHO obstructions have been recorded in the OfTI cable route; two of these in the Inner Study Area (HA 1098, and 1101) and two (HA1099 and 1100) in the Outer Study Area (see Table 5.5–3 below & Figure 5.5-2, Volume 6 b).

Table 5.5–3 Offshore Cultural Heritage Assets in the OfTI Cable Route with Known Locations Including UKHO 'Dead' Entries (those in bold are live)

HA No.	Name	Type	Designations	UTM30N metres	Study Area	Status
HA1001	Unknown	Unclassified	None	544989.012, 6425679.569	Inner	DEAD
HA1002	Unknown	Unclassified	None	562171.057, 6415801.273	Outer	DEAD
HA1003	PRINCESS CAROLINE	Passenger Ship	None	558659.068, 6419365.863	Outer	DEAD
HA1004	HILLFERN (POSSIBLY)	Cargo ship	None	549508.9, 6424832.913	Inner	LIVE
HA1005	REMUERA	Passenger ship	None	566601.366, 6405076.739	Outer	LIVE
HA1009	SVARTON (PROBABLY)	Cargo ship	None	567783.375, 6414501.145	Inner	LIVE
HA1010	TRSAT	Cargo ship	None	568285.149, 6405135.192	Outer	DEAD
HA1011	Northern Light	Small fishing boat	None	559764.876, 6394734.604	Outer	DEAD

HA No.	Name	Type	Designations	UTM30N metres	Study Area	Status
HA1014	TRSAT (PROBABLY)	Cargo ship	None	566218.334, 6403214.235	Outer	LIVE
HA1032	WATCHFUL	Small fishing boat	None	560202.584, 6395390.282	Outer	LIFT
HA1035	Unknown	Small fishing boat	None	559617.765, 6394609.062	Outer	LIFT
HA1036	Unknown	Aircraft	None	544891.116, 6429013.326	Outer	DEAD
HA1037	Unknown	Unclassified	None	565439.941 6404747.357	Inner	DEAD
HA1038	Challenger	Fishing Trawler	None	571130.613 6409375.456	Inner	DEAD
HA1098	None	Obstruction	None	524,988.318 6,453,803.73	Inner	-
HA1099	None	Obstruction	None	567,136.745, 6,414,396.319	Outer	-
HA1100	None	Obstruction	None	567656.837 6402547.67	Outer	-
HA1101	None	Obstruction	None	560,557.775, 6,394,870.679	Inner	-

5.5.3.9 A large number of wrecks from the National Monuments Record (NMRs) dataset were identified in the OfTI cable route but the location of the majority of these records is described as arbitrary or tentative and an extensive geophysical survey failed to locate any wreck remains in their recorded locations. Four NMRS records appear to correspond with the SeaZone wrecks (HA1005, 1009, 1014, 1101).

5.5.4 Archaeological Assessment of Marine Geophysical Data

Telford, Stevenson and MacColl Wind Farms

5.5.4.1 A geophysical survey of the three proposed wind farms was undertaken by Osiris Projects on behalf of Moray Offshore Renewables Ltd (MORL) (Walters, 2011). The marine data and survey reports were subsequently made available for archaeological analysis and assessment (see Technical Appendix 5.5 A). The aim of this marine geophysical archaeological assessment was to identify any cultural heritage assets recorded in the Inner and Outer Study Areas and to inform the baseline study and Environmental Impact Assessment (EIA) for the three proposed wind farm sites. Marine geophysical survey data was collected using sidescan sonar, magnetometer, sub-bottom profiler and multi-beam bathymetry. Geophysical targets were identified and given a high, medium or low archaeological potential rating (see Technical Appendix 5.5 A).

5.5.4.2 The archaeological geophysical assessment undertaken for MORL identified three anomalies of high archaeological potential that have been positively identified as wrecks (HA157, 158 and 159) and 17 anomalies of medium potential (HW36, 44, 52, 61, 71, 72, 73, 74, 75, 76, 77, 78, 80, 100, 102, 108, and 117), all of which are located within the Inner Study Area and associated 1 km buffer Outer Study Area (see Table 5.5–4 below and Figure 5.5-1, Volume 6 b).

Table 5.5–4 Targets of High and Medium Archaeological Potential Identified in the geophysical Survey

HW ID	Site Name	Site Type	Sidescan Potential	Mag Potential	UTM30N metresE	UTM30N metresN
157	<i>Carisbrook (possibly)</i>	Wreck	High	High	515050.8	6461978.66
158	<i>Unknown</i>	Wreck	High	High	516485.9	6453673.1
159	<i>Llanishen (probably)</i>	Wreck	High	High	514759.9	6458893.73
36	–	–	Medium	–	525711.5	6447161
44	–	–	Medium	–	521132.4	6446479
52	–	–	Medium	–	520384.8	6447576
61	–	–	Medium	–	523746.1	6454553
71	–	–	Medium	–	520779.5	6448862
72	–	–	Medium	–	516404.7	6447812
73	–	–	Medium	–	509171.3	6446862
74	–	–	Medium	–	508985.4	6447061
75	–	–	Medium	–	515055.2	6461947
76	–	–	Medium	–	515642.5	6462110
77	–	–	Medium	–	511513.2	6456395
78	–	–	Medium	–	513932.1	6454259
80	–	–	Medium	–	517192.39	6450733.81
100	–	–	Medium	–	513356.5	6458593
102	–	–	Medium	–	516052.1	6463919
108	–	–	Medium	–	517946	6450716
117	–	–	Medium	–	509730.2	6439767

Transmission Infrastructure

5.5.4.3 A geophysical survey of the OfTI cable route Inner and Outer Study Areas was undertaken by Gardline Geosurvey on behalf of MORL (Gardener, 2011). The marine data and survey reports were subsequently made available for archaeological analysis and assessment by Headland Archaeology (see Technical Appendix 5.5 A). The chief aim of the marine geophysical assessment was to identify any known or unknown cultural heritage assets recorded in OfTI cable route Inner and Outer Study Areas and to inform the baseline study and EIA for the proposed OfTI export cable. Marine geophysical survey data was collected using sidescan sonar, sub-bottom profiler, magnetometer and multi-beam bathymetry. All geophysical targets were identified and allocated a high, medium or low archaeological potential rating (see Technical Appendix 5.5 A).

5.5.4.4 The archaeological geophysical assessment has identified 15 targets of high archaeological potential positively identified as wrecks (HA52, 55, 65, 66, 87, 116, 129, 137, 141, 168, 179, 302, 352, 357 and 362) and 42 anomalies of medium archaeological potential (Sites HA5, 9, 21, 26, 28, 29, 53, 60, 63, 69, 72, 84, 85, 92, 95, 114, 122, 125, 136, 142, 150, 158, 160, 164, 169, 173, 174, 179, 180, 181, 182, 185, 188, 198, 200, 202, 211, 212, 296, 317, 366 and 386) all of which are located within the OfTI cable route Inner and Outer Study Area (see Table 5.5–5 and Figure 5.5-2, Volume 6 b).

Table 5.5–5 Targets of High and Medium Archaeological Potential Identified in the OfTI Cable Route Geophysical Survey

HA	Site Name	Site Type	Sidescan Potential	Mag Potential	UTM30NmE	UTM30NmN
5	–	Debris	Medium	–	520204.28	6460925.28
9	–	Debris	Medium	–	520680.1	6460835.52
21	–	Debris	Medium	–	524596.08	6453925.37
26	–	Debris	Medium	–	524250.76	6454980.82
28	–	Debris	Medium	–	522427.98	6459665.05
29	–	Debris	Medium	–	525408.5	6454631.95
52	Unknown	Wreck SeaZone entry 20226	High	–	549507.45	6424777.67
53	–	Wreck debris	Medium	High	549485.11	6424821.26
55	Unknown	HA52 debris	High	–	549509.59	6424797.79
60	–	Chain	Medium	–	550331.72	6422362.07
63	–	Debris	Medium	–	549598.7	6423337.09
65	Unknown	Wreck same as HA52?	High	–	549485.85	6424785.76
66	Hillfern (Possibly)	Wreck	High	High	549509.25	6424838.2

HA	Site Name	Site Type	Sidescan Potential	Mag Potential	UTM30NmE	UTM30NmN
69	-	Debris	Medium	-	553189.35	6419773.53
72	-	Debris	Medium	-	572036.12	6409225.78
84	-	Debris	Medium	-	549209.29	6423551.71
85	-	Debris	Medium	-	567096.67	6415732.69
87	-	Debris	High	-	562914.76	6417183.16
92	-	Debris	Medium	-	562500.94	6417272.75
95	-	Debris same as 92?	Medium	-	562505.92	6417287.08
114	-	Debris	Medium	-	527681.22	6441736.24
116	-	Wreck	High	-	527301.22	6442005.93
122	-	Debris	Medium	-	571716.06	6413088.65
125	-	Debris with scour	Medium	-	569569.61	6415493.47
129	-	Buried wreck	High	-	570669.48	6414087.14
136	-	Debris/chain/scour	Medium	-	568530.38	6413905.88
137	Svarton (Probably)	Wreck	High	High	567751.03	6414518.83
141	Svarton (Probably)	Same as 137?	High	-	567766.3	6414546.9
142	-	Wreck debris	Medium	-	567823.54	6414607.63
150	-	Debris	Medium	-	568135.88	6415298.18
158	-	Debris	Medium	-	533677.7	6434712.67
160	-	Buried debris?	Medium	-	527645.11	6441737.04
164	-	Debris	Medium	-	542705.36	6428552.86
168	-	Wreck	High	High	529157.23	6439611.87
169	-	Debris	Medium	High	529158.31	6439601
173	-	Debris	Medium	-	560572.61	6394565.45
174	-	Debris	Medium	-	560606.3	6394582.45
179	-	Wreck	High	-	560649.28	6394483.69
180	-	Debris	Medium	-	560518.47	6394350.29

HA	Site Name	Site Type	Sidescan Potential	Mag Potential	UTM30NmE	UTM30NmN
181	–	Debris	Medium	–	560659.02	6394487.44
182	–	Chain	Medium	–	560248.21	6394176.6
185	–	Debris	Medium	–	560748.64	6394451.05
188	–	Debris	Medium	–	560575.92	6394204.38
198	–	Chain	Medium	–	559903.91	6394827.38
200	–	Chain	Medium	High	560262.29	6394776.3
202	–	Debris	Medium	–	560480.92	6394709.55
211	–	Wreck debris	Medium	–	560642.97	6395082.23
212	–	Wreck debris	Medium	–	560639.29	6395080.56
296	–	Debris	Medium	–	562131.18	6395132.74
302	–	Wreck	High	–	571143.86	6415234.08
317	–	Debris	Medium	–	573666.88	6411290.4
352	Remuera	Wreck	High	High	566636.97	6405082.18
356	–	Debris	Medium	High	566183.17	6403215.91
357	Trsat (Probably)	Wreck	High	High	566202.38	6403193.8
362	Trsat (Probably)	Buried wreck same as 357?/352?	High	–	566191.42	6403202.87
366	–	Debris	Medium	–	567013.52	6402338.48
386	–	Debris	Medium	–	564846.02	6398078.35

5.5.5 Archaeological Assessment of Marine Geotechnical Data

Telford, Stevenson and MacColl Wind Farms

5.5.5.1 A geotechnical survey of the three proposed wind farm sites was undertaken and an archaeological assessment of the palaeoenvironmental potential was carried out (see Technical Appendix 5.5 A). A total of 25 boreholes were assessed from 18 locations across the three proposed wind farm development areas chosen to gain an overall representation of the underlying geology of the site. The logs of the boreholes were assessed in order to gauge whether the deposits contained any sediments of palaeoenvironmental potential; in particular peats or sediments with high organic contents such as organic silts. The information for the borehole and grab sample logs was supplied by Fugro Geo-consultancy.

- 5.5.5.2 The geotechnical assessment established that the presence of organic bands in the stratigraphic record from a single borehole, BH12, is potentially significant in terms of palaeoenvironmental potential (see Figure 11, Technical Appendix 5.5 A). These organic deposits if found to contain microfossils (e.g. pollen, ostracods) and / or macrofossils (e.g. plant macrofossils, shell fragments), would be of great significance in obtaining palaeoenvironmental and palaeoclimate data for possible Quaternary inter-stadial events. This single evidence from BH12 and the absence of organic sediments such as peats within the Holocene sediments within the remaining data indicates that there is very limited potential for palaeoenvironmental data from proxies such as pollen from these sediments. The presence of residual scattered flints and lithic artefacts within the marine sediments remains a possibility.

Offshore Transmission Infrastructure

- 5.5.5.3 A geotechnical survey for the OfTI was undertaken and an assessment of the palaeoenvironmental potential of the sediments established (Technical Appendix 5.5 A). A total of 53 CPTs (cone penetration tests) and 28 vibrocores were taken from across the cable route at regular intervals to gain a representation of the underlying geology of the OfTI cable route. The logs of the boreholes were assessed in order to gauge whether the deposits contained any sediments of palaeoenvironmental potential; in particular peats or sediments with high organic contents such as organic silts. The information for the boreholes was provided by Gardline Geosciences Limited (Scott, 2011).
- 5.5.5.4 The geotechnical assessment has identified six potentially interesting and palaeoenvironmentally important areas in the OfTI cable route, namely vibrocores VC43, VC45, VC46, VC47, VC49 and VC53. These all contained organic staining and deposits generally in the top 1 m of the vibrocore recovery. These organic deposits have the potential to contain environmental indicators such as pollen and macrofossils that may aid in palaeoenvironmental and past climate change studies. These vibrocores were all identified in the nearshore element of the offshore export cable where it is also noted that a number of cores failed to recover sufficient information during sampling due to poor ground conditions (see Figure 16, Technical Appendix 5.5 A). No organic peat deposits were identified in any of the boreholes, although there is the possibility that artefactual material could be present.

5.5.6 Potential for Submerged Archaeology and Palaeolandscapes

- 5.5.6.1 The desk-based assessment established that the area of the three proposed wind farm sites and OfTI cable corridor within the outer Moray Firth has been either under ice or submerged by the North Sea throughout the late Glacial/early Holocene. This has meant that extensive organic sediments of palaeoenvironmental interest from this period such as peats are unlikely to have formed. The potential for the discovery of relict land surface deposits and features of archaeological interest therefore is regarded as low. Despite this, there is the potential for the discovery of residual artefacts from secondary contexts in the marine sediments, such as lithics.

5.5.7 Potential for Unrecorded Maritime Cultural Heritage Assets

- 5.5.7.1 The assessment identified a number of recorded maritime losses within the three proposed wind farm sites and OfTI cable corridor, a number of which have known

positions and which have been confirmed in the archaeological assessment of geophysical data (see Technical Appendix 5.5 A). The assessment also identified a significant number of maritime loss events, both vessels and aircraft, within the wider Moray Firth and North Sea in proximity to the main development. Further, there are a large number of maritime losses listed in the NMRS dataset with arbitrary or tentative locations recorded within the study area. As such, the potential for the discovery of unrecorded cultural heritage assets within the proposed three wind farms and OfTI cable corridor therefore is regarded as moderate.

5.5.8 Onshore Transmission Infrastructure Baseline Characteristics.

5.5.8.1 A desk-based assessment and walkover survey of the onshore transmission cable route from Fraserburgh to Boddam and the potential site(s) of the substation were undertaken. The methods used and results are detailed in Technical Appendix 5.5 A. Locations of assets are shown on Figures 5.5-3 & 5.5-4, Volume 6 b.

Designated Assets

5.5.8.2 There are three scheduled monuments within the OnTI study area, which is comprised of a corridor along the onshore cable route between the Fraserburgh landfall and Boddam, and the substation site(s):

- Fraserburgh cemetery pill box (SM 8220);
- Knockmonean cairn (SM 1138); and
- Trefor Hill motte (SM 11141).

5.5.8.3 There are 73 listed buildings in the OnTI study area, 17 of which are Category B. The remainder are Category C(S). Most (53) are within the Boddam conservation area.

Mesolithic

5.5.8.4 Very little evidence of Mesolithic activity has been recorded in the general area, but Mesolithic sites are generally under-recorded; they are rarely identified through means other than excavation or field-walking as the features typically present are very slight. However, one site that is likely to be of Mesolithic date, is recorded south of Fraserburgh. In the 19th century, during the excavation of grave plots in Kirktown Cemetery, several shell middens were noted, consisting of ash, stone and shell fragments (NK06NW0002). It is likely that further Mesolithic assets are nearby but are as yet unrecorded.

Neolithic and Bronze Age

5.5.8.5 The firmest evidence of activity relating to this period is provided by a scattering of findspots, where flint and stone tools and other artefacts have been found by chance. In one instance, a cinerary urn (NK06SW0003) was found north of Rathen in close proximity to two other find spots of flint arrowheads (NK06SW0004 & 9), and two cropmark enclosures, the morphology of which suggests a prehistoric date. It is likely that further remains of prehistoric date survive in the Rathen area.

5.5.8.6 Monuments that can be firmly assigned to this period are scarce and are restricted to a burial cairn (SM 11138), two burial cairns (HER NK06SW0005 & 6) that have been removed and a possible stone circle (NK05SW0002), which has also

been removed. There is an appreciable correlation between the distribution of findspots, the location of the cairns and the superficial geology; the cairns and findspots are all concentrated on areas of sand and gravel and alluvium along the Water of Philorth. Whilst it is possible that this reflects archaeological visibility, it appears more likely that it is a true reflection of the patterns of prehistoric activity as it seems reasonable to assume that farming and hence settlement would have been focussed on the lighter easily worked soils of this area.

Late Prehistoric and Early Historic

5.5.8.7 The more substantial settlements of the later prehistoric and early historic period are more readily identifiable as cropmarks than those that preceded them and ten probable sites of this date have been identified as cropmarks (NJ96SE0074 & 75, NK04NE0042, NK04NW0008 & 31 and NK06SW0025, 41, 42, 44, 45 & 47). As with the earlier prehistoric assets, these are concentrated on the sand and gravel and alluvium around the Water of Philorth.

Medieval and Post-Medieval

5.5.8.8 In contrast to records relating to earlier periods, records held by the NMRS and the HER for this period are dominated by documentary records. This is likely to have resulted from the current pattern of scattered farms having largely developed from the pattern established during the medieval period, resulting in medieval farmsteads frequently underlying existing farmsteads. This is demonstrated by early cartographic sources (Blaeu, Moll). An exception to this rule of sites being overlain by later buildings is the scheduled motte at Trefor Hill (SM 11141), which survives as an upstanding mound, overlooking the surrounding farmland.

5.5.8.9 Areas of rig and furrow are also recorded along the route as cropmarks. These are straight and broad and hence post-medieval at the earliest.

5.5.8.10 Analysis of vertical aerial photographs identified elements of an early enclosure, which partially survives today within the parkland associated with Philorth House. Documentary records show that Philorth House is of 17th century date, suggesting that if this is an earlier enclosure, that it could be post-medieval in date.

5.5.8.11 Aside from these largely agricultural assets, the HER holds a record for a causeway (NK05SW0007) that was supposedly built prior to the Battle of Inverurie in 1308. The exact location of the causeway is unknown.

18th and 19th Century

5.5.8.12 The 18th and 19th century saw increasingly intensive farming of this area resulting in the improvement and enclosure of land and the construction of new more 'industrial' farm-buildings. This period also saw the growth of Fraserburgh. Most of the buildings constructed at this time are still occupied and hence not relevant to the current study. Most farmsteads of this period have survived, but some have been demolished (e.g. NK14SW0079). The ridge and furrow associated with the farmsteads has largely been ploughed away, but in one instance north of Longside, has survived as upstanding earthworks (NK04NW0033). Here the ridge and furrow is very well-preserved.

5.5.8.13 Two railways are also recorded within the study area – a small trackway west of Boddam built to carry convicts from their prison to quarries (NK14SW0061) and a

branch line associated with the Great North of Scotland Railway. Both no longer operate as railways, however the North of Scotland line has been converted into a cycle path.

20th Century

- 5.5.8.14 This area of Aberdeenshire has a rich and well-preserved range of World War Two (WW2) defence sites, ranging from RAF airbases and stop lines. The largest of these sites is the short-lived RAF Longside (NK04NE0027), operational between 1941 and 1945. The No 598 Squadron was formed at this site, but the squadron later moved to RAF Bircham Newton in 1945. Although short-lived, the base did become fully operational and hence a variety of built structures (such as blister hangers, control tower, pill-boxes and air raid shelters) were constructed within the confines of the airbase. Only some of these features survive today. The site today is used as a training area for Bond helicopters.
- 5.5.8.15 RAF Buchan (NK14SW0088) is also within the OnTI study area, sited south of Boddam. The site was opened in 1952 as an Air Defence Radar Unit, and eventually became one of two 'Control and Reporting Centres' responsible for co-ordinating aspects of air defence during the Cold War period. Decommissioned in 2005, many of the original buildings, fixtures and fittings still survive; although part of the domestic quarters have been converted into a hotel.
- 5.5.8.16 Further sites are recorded within and near Fraserburgh, relating to WW2 home front defence features, such as tank defence blocks and pill-boxes. The beaches from Fraserburgh to Peterhead were considered extremely vulnerable to an invasion launched from Norway (Barclay 2005) and as such many of these locations were heavily fortified with stop lines comprising pillboxes, anti-tank blocks and ditches and barbed wire entanglements. While the anti-tank blocks were recorded in 1998 as no longer surviving, the pillboxes still survive, one of which is scheduled (SM 8220).

Palaeoenvironmental

- 5.5.8.17 The OnTI cable route passes through an area of peat east of New Leeds. The peat may have potential as a palaeoenvironmental resource; it does not appear to have been disturbed by recent agricultural activity. Recent work at St Fergus Moss to the east has provided an early Mesolithic inception date for the peat, there is potential for the peat therefore to provide a full palaeoenvironmental sequence from the Mesolithic onwards. This would provide valuable evidence regarding human interaction with the environment.

5.5.9 Key Onshore Assets Considered in Relation to Setting

- 5.5.9.1 The onshore Setting Study Area for the initial consideration of effects upon the setting of onshore assets resulting from the offshore generating station extended 25 km from the boundaries of the Stevenson, Telford and MacColl Wind Farms. Assets beyond this distance were considered where raised by Historic Scotland and / or HCHET.
- 5.5.9.2 The pattern of designated onshore assets reflects the history of Caithness, which has seen settlement and agriculture concentrate on the more readily cultivable land along the coast. Two aspects of this are particularly important to the area's cultural heritage. In the more marginal, inland areas less intensive land use has

allowed multi period or palimpsest landscapes of great time depth to survive whilst the coast is dotted with traces of the herring boom of the early 18th century, at which time the traditional small scale fishing infrastructure was greatly extended and processes industrialised. As a result of these factors there are a large number of designated assets present within 25 km of the three proposed wind farms. These comprise:

- 32 scheduled monuments;
- 164 listed buildings (comprising two Category A, 99 Category B and 63 Category C(S)); and
- One conservation area (Wick).

5.5.9.3 The scheduled monuments are largely prehistoric, with a notable concentration in the vicinity of Loch of Yarrows and Loch Watenan. Three are Properties in Care: Cairn of Get, Hill o'Many Stanes and Castle of Old Wick. Most of the listed buildings are within the Wick conservation area and have no visual relationship with the sea or landscape beyond the town.

5.5.9.4 All assets considered are listed in Technical Appendix 5.5 A. Their locations are shown on Figure 5.5-5, Volume 6 b. Only assets that might potentially be subject to setting impacts have been carried through to assessment. These have been selected using the following criteria:

- Theoretical intervisibility: Only assets within the Zone of Theoretical Visibility (ZTV) have been considered further;
- Proximity to the coast: Assets immediately adjacent to the coast are likely to have a relationship with the sea that contributes to their cultural significance. Consequently, all designated assets within the ZTV and on the coastline have been considered further;
- Designed visual relationships or historical relationships with the sea: Assets with confirmed or probable designed visual relationships or historical relationships that are within the ZTV have been considered further; and
- Extensive views of the sea: The sense of place of assets with only glimpsed views of the sea, is unlikely to be affected by developments out at sea, hence only those with clear visual relationships with the sea were considered further.

5.5.9.5 An initial list of assets considered to be potentially subject to setting impacts was presented to consultees. Additional assets have been considered where raised by consultees. Those considered by the impact assessment are summarised in Table 5.5–6 below.

Table 5.5–6 Onshore Assets Considered in Relation to Setting Impacts (those beyond 25 km are in bold)

Official Reference Number	Site Name and Type	Designation
SM 527	Borrowston Broch	Scheduled
SM 548	Garrywhin Fort	Scheduled
SM 599	Tulloch (Usshilly) Broch and field system	Scheduled

Official Reference Number	Site Name and Type	Designation
SM 2301	Wag of Forse settlement	Scheduled
SM 7242	Forse House settlement, field system and burnt mound	Scheduled
SM 696	Watenan Broch	Scheduled
SM 4289	Watenan Fort	Scheduled
SM 5073	Dunbeath Inver Fort	Scheduled
SM 5182	Latheronwheel promontory fort	Scheduled
SM 90048	Cairn of Get	Scheduled
SM 90065	Castle of Old Wick	Scheduled
SM 90162	The Hill o' Many Stanes	Scheduled
HB 7935	The Corr croft	Category A-listed
HB 7936	Dunbeath Castle	Category A-listed
HB 7946	Forse House Hotel	Category B-listed
HB 7945	Dunbeath Portomin Harbour	Category B-listed
HB 14070	The Whaligoe Steps	Category B-listed
-	Lybster	Conservation area
HB7954	Lybster Harbour	Category B-listed

5.5.10 Individual Site Baseline Characteristics

5.5.10.1 Table 5.5–7 below, provides a summary of the baseline characteristics of the three proposed offshore wind farm sites.

Table 5.5–7 Summary of Baseline Characteristics

Individual Wind Farm Sites	Summary of Baseline Characteristics
Telford	<p>Inner Study Area</p> <p>Sites HW1001, 1002 and 1004 (identified 'Live' wrecks).</p> <p>Sites HW 157, 158 & 159 (sidescan sonar targets of high potential)</p> <p>Sites HW61, 75, 76, 100, 102 and 108 (sidescan sonar targets of medium potential)</p> <p>Site HW1014 (unknown obstruction)</p> <p>Outer Study Area</p> <p>Site HW1015 (unknown obstruction)</p>

Individual Wind Farm Sites	Summary of Baseline Characteristics
Stevenson	<p>Inner Study Area Sites HW72, 77, 78 and 80 (sidescan sonar targets of medium potential)</p> <p>Outer Study Area Sites HW73 & 74</p>
MacColl	<p>Inner Study Area Sites HW44, 52, 71 and 117 (sidescan sonar targets of medium potential)</p> <p>Outer Study Area Site HW1005 ('Live' Wreck) Site HW1006 ('Dead' Wreck) Site HW36 (sidescan sonar target of medium potential)</p>

Table 5.5–8 Summary of Offshore Infrastructure (OfTI) Baseline Characteristics

Sites	Summary of Baseline Characteristics
Inner Study Area	<p>Sites HA 1004 and 1009 (identified 'Live' wrecks)</p> <p>Sites Sites HA 1001, 1037 and 1038 (identified 'Dead' wrecks)</p> <p>Sites HA 52, 55, 65, 66, 87, 116, 129, 137, 141, 168, 179, 246, 247, 249 and 302 (sidescan sonar targets of high potential)</p> <p>Sites HA 5, 9, 21, 26, 28, 29, 53, 60, 63, 69, 72, 84, 85, 92, 95, 114, 122, 125, 136, 142, 150, 158, 160, 164, 169, 173, 174, 179, 180, 181, 182, 185, 188, 198, 200, 202, 211, 212, 296, 317, 356, 366 & 386 (sidescan sonar targets of medium potential)</p> <p>Sites HA1098 and 1101 (unknown obstructions)</p>

5.5.11 Legislative and Planning Framework

5.5.11.1 This assessment is conducted in line with industry best practice following all relevant policy and guidance, International and European charters and conventions, UK & Scottish legislation, Scottish national planning policy and all relevant regional and local planning guidance. Full details of these legislative and guidance procedures are given in Technical Appendix 5.5 A).

5.5.11.2 The following legislation has been taken into account as part of the archaeology and cultural heritage assessment process:

- The Marine (Scotland) Act 2010;
- Protection of Wrecks Act 1973;
- The Protection of Military remains Act 1986;
- Merchant Shipping Act 1995;
- Ancient Monuments and Archaeological Areas Act 1979;
- Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997;
- Valetta Convention;
- The ICOMOS Charter (1996); and
- UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001) (UNESCO).

- 5.5.11.3 The baseline study has been carried out in accordance with the following guidance and best practices:
- Institute for Archaeologists 2011 Standard and Guidance for Desk-Based Assessment;
 - Joint Nautical Archaeology Policy Committee (JNAPC) Code of Practice for Seabed Development (2008);
 - COWRIE Historic Environment Guidance for the Offshore Renewable Energy Sector (2007);
 - COWRIE Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore renewable Energy (2008);
 - COWRIE Guidance for Offshore Geotechnical Investigations and Historic Environment Analysis: guidance for the renewable energy sector (forthcoming);
 - The Crown Estate (2010). Offshore Renewables Protocol for Archaeological Discoveries;
 - The Crown Estate (2010). Round 3 Offshore Renewables Projects Model Clauses for Archaeological Written Schemes of Investigation; and
 - Towards a Strategy for Scotland's Marine Historic Environment (Historic Scotland 2009).

5.5.12 References

Astill M., Firth A. and Gribble J. 2008 UKCS Offshore Oil and Gas and Wind Energy Strategic Environmental Assessment: Archaeological Baseline. Wessex Archaeology, Unpublished Client Report.

Baird, B. 2009 Shipwrecks of the Forth and Tay Dunbeath.

Ferguson, D. M. 1991 Shipwrecks of North–East Scotland 1444–1990 Aberdeen.

Holmes, R., Bulat, J., Henni, P., Holt, J., James, C., Kenyon, N., Leslie, A., Long, D., Morri, C., Musson, R., Pearson, S., and Stewart, H. (2004) DTI Strategic Environmental Assessment Area 5 (SEA5): Seabed and Superficial Geology and Processes. Commercial Report CR/04/064N

ICOMOS 1996. Charter on the Protection and management of Underwater Cultural Heritage.

Larne, R. and Larne, B. 1998 Shipwreck Index of the British Isles – Volume IV – Scotland London.

Lynch, F., Aldhouse– Green, S., and Davies, J, L., Prehistoric Wales. Sutton Publishing.

Manley, J., 1989. Atlas of Prehistoric Britain. Phaidon. Oxford.

McGee, B 2003 <http://casualtylist.tripod.com/> Accessed 06/12/2010

NSA 1837 New Statistical Account of Scotland Edinburgh

Osiris Projects 2011. Morl Offshore Wind Farm Geophysical Survey Report, Volume 2A.

Shennan, I., Lambeck, K., Horton, B., Innes, J.B., Lloyd, J., McArthur, J.J., Purcell, T. and Rutherford, M.M. 2000 'Late Devensian and Holocene records of relative sea-level changes in northwest Scotland and implications for glacio–hydro–isostatic modelling'. Quaternary Science Reviews 19 1103–1135.

The War Graves Photographic Project <http://twgpp.org/information.php?id=767103> Accessed 06/12/2010

Unesco, 2001. The UNESCO Convention on the Protection of Underwater Cultural Heritage. UNESCO General Conference 31.C.

Wessex Archaeology Ltd. 2007 Historical Environment Guidance for the Offshore Renewable Energy Sector. Commissioned by Cowrie Ltd.

Wessex Archaeology Ltd. 2009. UKCS Offshore Oil and Gas and Wind Energy Strategic Environmental Assessment: Archaeological Baseline. Prepared by the Department of Energy and Climate Change.

Unpublished Sources

Gardener, D. 2011. 'MORL Offshore Wind Farm Geophysical Survey. Volume 1: Operations Report'.

Moray Offshore Wind Farm Archaeology and Cultural Heritage Baseline Technical Report, Headland Archaeology UK Ltd., October 2011.

Scott, D. 2011. Moray Offshore Renewables Ltd UKCS Quadrants 12, 18 & 19 Moray Offshore Wind Farm Development – Export Cable Route Surveys July–2011 To October–2011 Geotechnical Report. Gardline Geosciences Limited.

Walters, J. 2011. 'MORL Offshore Wind Farm Geophysical Survey. Report Volume 2a'.

Databases of Cultural Heritage Asset Consulted.

Designated wreck data was downloaded from Historic Scotland's website © Historic Scotland
Offshore Sites and Monuments Record information derived from NMRS data © Crown Copyright RCAHMS

Wrecks and Obstructions information derived from SeaZone data © Copyright UKHO

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5.6 Socio-Economics, Recreation and Tourism

5.6.1 Introduction

- 5.6.1.1 This chapter describes the existing socio-economic environment and sets out a baseline of socio-economic indicators. These relate to:
- Economic indicators including employment, Gross Value Added (GVA)¹;
 - Social indicators such as population, house prices, education and deprivation; and
 - Tourism indicators including levels of activity and profile of visitors.
- 5.6.1.2 The analysis uses several geographic areas. The main study area is defined as covering the Moray, Highlands, Aberdeenshire and Aberdeen City Local Authority areas (Figure 5.6-1, Volume 6 b). While Highland, Moray and Aberdeenshire are the closest authorities to the Project, Aberdeen City was also included given its number of energy-related businesses and proximity to the site. Local authority areas are used because they provide the most common basis for providing data. For some data, where it is available, more detail has been provided for smaller geographical areas. Impact beyond the Study area is likely to be weaker, although given the scale of investment, the likely economic impact on Scotland as a whole is also considered. For the tourism analysis, and parts of the baseline, it has been possible to present information at a more local level, using a zone of 50 km from the site.

5.6.2 Consultations

- 5.6.2.1 A summary of consultation responses relevant for the socio-economic assessment are shown in Table 5.6-1 below.

Table 5.6-1 Consultation Responses

Organisation	Comment	MORL Approach
Marine Scotland (The Scottish Government)	<p>Scoping response:</p> <p>The application should include relevant economic information connected with the Project, including the potential number of jobs, and economic activity associated with the procurement, construction operation and decommissioning of the development.</p>	<p>Estimates of the potential number of jobs, and economic activity associated with the procurement, construction operation and decommissioning are set out in Chapter 8.6 and 11.6.</p>
	<p>Cumulative Effects</p> <p>Cumulative impacts could be considerable on natural fish and commercial fisheries and the possible effects on coastal fishing communities should be addressed in the socio-economic chapter.</p>	<p>Cumulative impacts are reported in Chapter 15.6.</p> <p>The assessment of the impact on commercial fishing is in Chapter 15.1.</p> <p>This indicates no significant impact on fishing catches and therefore there are no related significant effects on coastal fishing communities.</p>

¹ Gross Value Added is defined by the Office for National Statistics "the difference between output and intermediate consumption for any given sector/industry. That is the difference between the value of goods and services produced and the cost of raw materials and other inputs which are used up in production."

Organisation	Comment	MORL Approach
Scottish Canoe Association (SCA)	<p>Scoping response:</p> <p>Given the distance out to sea this is not an area where sea Kayakers would venture into and the development should not have any significant impact on tidal flows and sediment deposition close to shore where small recreational boats such as kayaks could be affected by any potential changes to tidal flows and sandbanks.</p>	Assessment of effects on sea-kayaking are reported in Chapter 8.6 and 11.6.
Surfers Against Sewage	<p>Scoping response:</p> <p>SAS also believe that offshore renewable energy has the potential to help combat climate change, but are concerned that future development has the potential to cause negative impacts on surfing resources and recreation, and negative impacts on the social and economic benefits that surfing contributes to wider communities.</p>	Assessment of effects on surfing are reported in Chapter 8.6 and 11.6.
Scottish Enterprise (SE)	<p>Comments on draft ES:</p> <ul style="list-style-type: none"> The method and approach to economic impact modelling seems sound and reasonable. Useful to show the differences between High and Base cases. More detail on job estimates and comparison with local markets would help SE and HIE. 	At this stage, there is no more information on suppliers and it is not possible to provide more detail of likely significant effects on job markets and skills requirements.
	<ul style="list-style-type: none"> SE anticipate tourism impact to be positive overall as a result of contractor nights and tourism sea trips. 	Tourism impacts assessed in Chapter 8.6 and 11.6.
	<ul style="list-style-type: none"> Reasonable to exclude macro deadweight and displacement factors e.g. net impacts on energy markets, subsidies, oil and gas activity. More could be done on skills supply Multipliers seem appropriate and should be set out in a table (in Annex) 	Multipliers used are set out in Technical Appendix 5.6 A.
Highlands and Islands Enterprise (HIE)	<p>Comments on draft ES:</p> <ul style="list-style-type: none"> The overall approach seems reasonable as there are still many uncertainties. More detail on supply chain potential would be useful for the region and inform development agencies. 	Supply chain information is being developed by SE and HIE (in 5.6.4 below).
	<ul style="list-style-type: none"> Some data on earnings and the Index of Multiple Deprivation is considered a less accurate measure in rural areas than urban ones. More evidence would be useful in the Base and High case scenarios. 	Caveats on earnings and Index of Multiple Deprivation data are noted in the assessment.
	<ul style="list-style-type: none"> Add timespan for phases and sub-phases. 	The timespan for the Project phases and sub-phases has been added.
	<ul style="list-style-type: none"> Overall employment figures seem low – can this be compared with company's projections. 	The figures presented are based on expenditure scenarios provided by the developer (based on financial models available at the time of this assessment).

Organisation	Comment	MORL Approach
	<ul style="list-style-type: none"> • More clarity on overall impacts – show by phases 	Commentary on some wider socio-economic impacts are included, but relate to future supply decisions.
	<ul style="list-style-type: none"> • Wider socio-economic impacts should be discussed, but may be covered in landscape and fishing assessments. 	Addressed in Chapter 8.6 and 11.6

5.6.2.2 Additional consultations have also been undertaken with several organisations as follows:

- Aberdeenshire Council, The Highland Council, Moray Council, Moray Firth Partnership, Highlands and Islands Enterprise and Scottish Enterprise have provided understanding of the strength of the supply chain;
- Skills Development Scotland has provided overview of activities being supported to develop skills in the study area;
- Caithness and Sutherland Enterprise, and VisitScotland have provided understanding of tourism; and
- Royal Yacht Association has provided understanding of the level of yachting activity in the study area.

5.6.3 Offshore Generating Station and Transmission Infrastructure Baseline Characteristics

5.6.3.1 The study area includes the cities of Aberdeen and Inverness with a series of smaller towns along the Aberdeenshire and Moray coast (Figure 5.6-1, Volume 6 b). The conurbations closest to the wind farm sites are all more than 25 km from the proposed sites. They are on the east Caithness coast and include the towns and villages of Brora (a population of 1,160), Golspie (1,650), Helmsdale (800), Lybster (850) and Wick (7,300). Towns and villages on the north Moray coast are further from the proposed wind farm sites, Lossiemouth (population of 6,800) is 46 km away, Buckie (8,000) is 45 km, Portknockie (1,200) is 42 km and Portsoy (1,700) is 45 km.

5.6.3.2 The two authorities to the southeast of the three proposed wind farms, Aberdeenshire Council and Aberdeen City Council are characterised by income above the Scottish average, higher house prices and higher proportions of the population working in oil and gas-related jobs. Aberdeenshire in particular has a growing population. Incomes are lower in Highland and Moray although unemployment rates in all four authorities have tended to be below the Scottish average since 1992. In Aberdeen City, Aberdeenshire and Moray unemployment has historically been well below the national average. The figures fell steadily between 1993 and 2008, but have increased slightly since then to around 3 %.

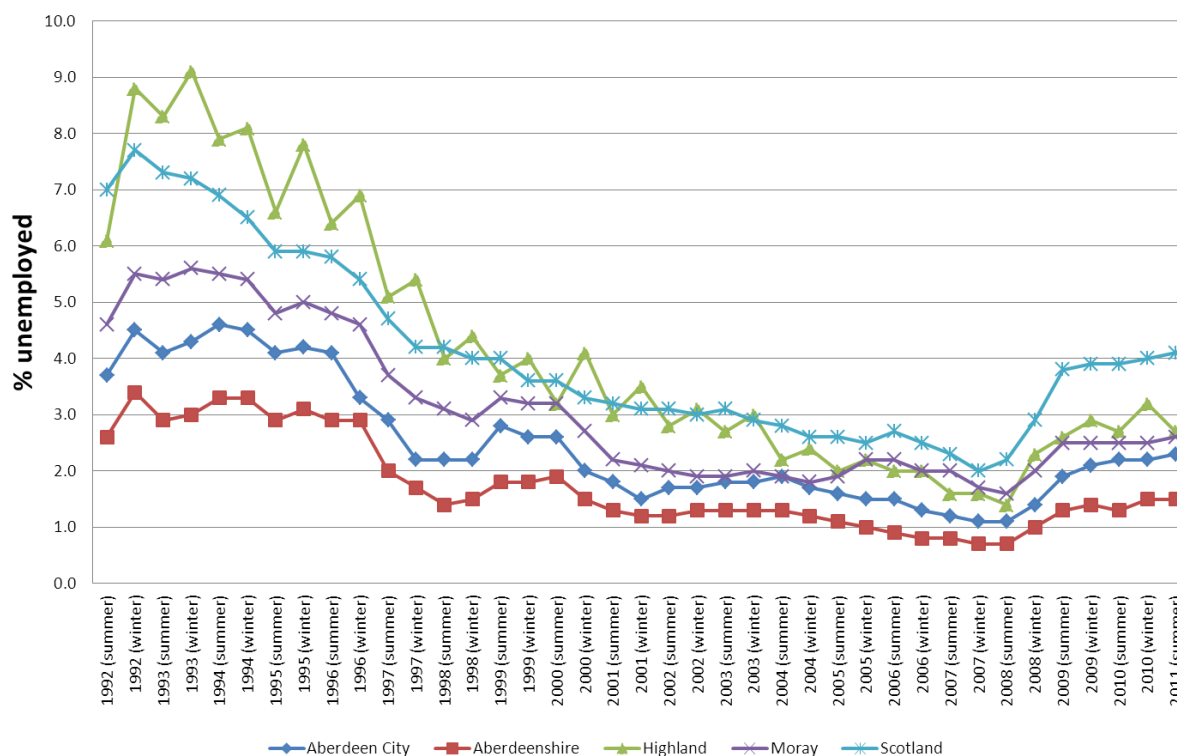
Population

5.6.3.3 Across the study area the total population in 2010 was 772,000. In 2010 the number of working age people (aged 16 to 64) was 507,000 which equates to 66 % of the population and the same proportion as in Scotland as a whole. Aberdeen City has a higher proportion of working age residents (70 %) than nationally while in Highland, Moray and Aberdeenshire the proportions are slightly

lower (64 %, 64 % and 65 % respectively). In these three authorities the proportion of the population over 65 is slightly above the national average (Office for National Statistics, 2011a).

Unemployment

5.6.3.4 Unemployment rates in the study area have tended to be below the Scottish average since 1992 as depicted in Plate 5.6-1 below (Office of National Statistics, 2011b). The exception is Highland, where unemployment was higher in the first half of the 1990s. In Aberdeen City, Aberdeenshire and Moray unemployment has historically been well below the national average. The figures fell steadily between 1993 and 2008, the start of the recession. From then unemployment rose slightly but remains below 3 %, which is low by most standards. With reductions in public sector budgets and slow economic growth, unemployment has risen over the past three years.

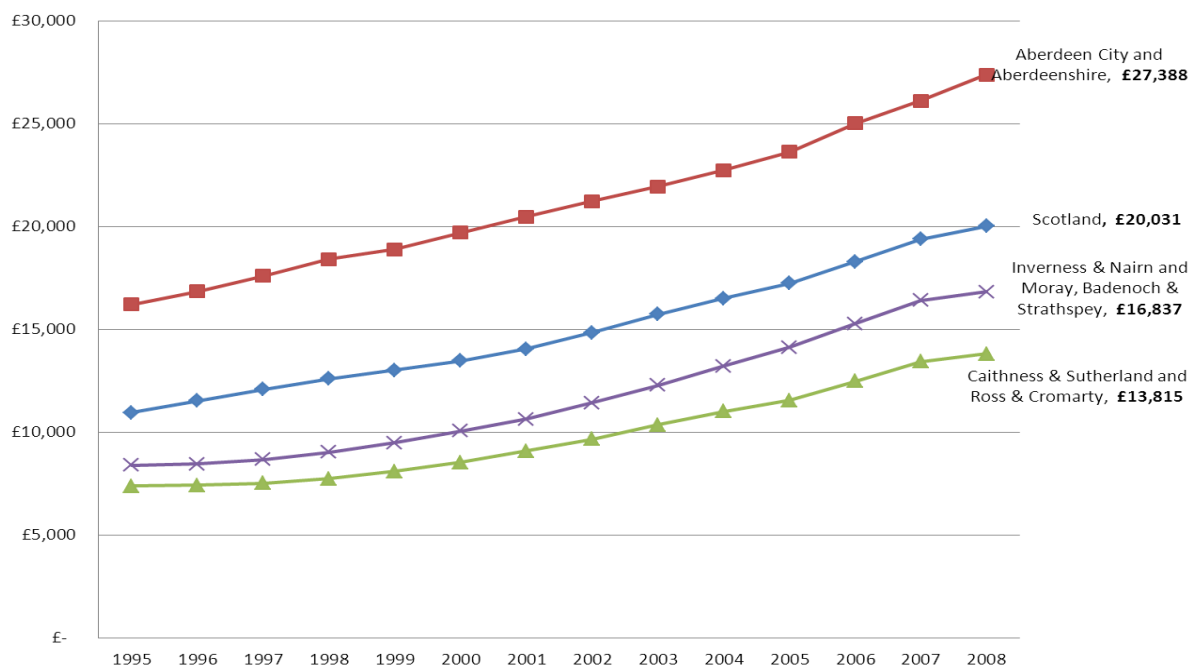


Source: (Office of National Statistics, 2011b)

Plate 5.6-1 Unemployment Rates Within the Study Area

Gross Value Added (GVA)

5.6.3.5 There is a significant difference in the GVA generated in Aberdeen and Aberdeenshire and in the more rural Moray and Highland areas. This mostly reflects the very high value added of the oil and gas sector. GVA per head in Caithness and Sutherland and Ross and Cromarty is around half the Aberdeen and Aberdeenshire as shown in Plate 5.6-2 below (Office of National Statistics, 2010a).



Source: ONS (2010a) Regional Accounts 2010

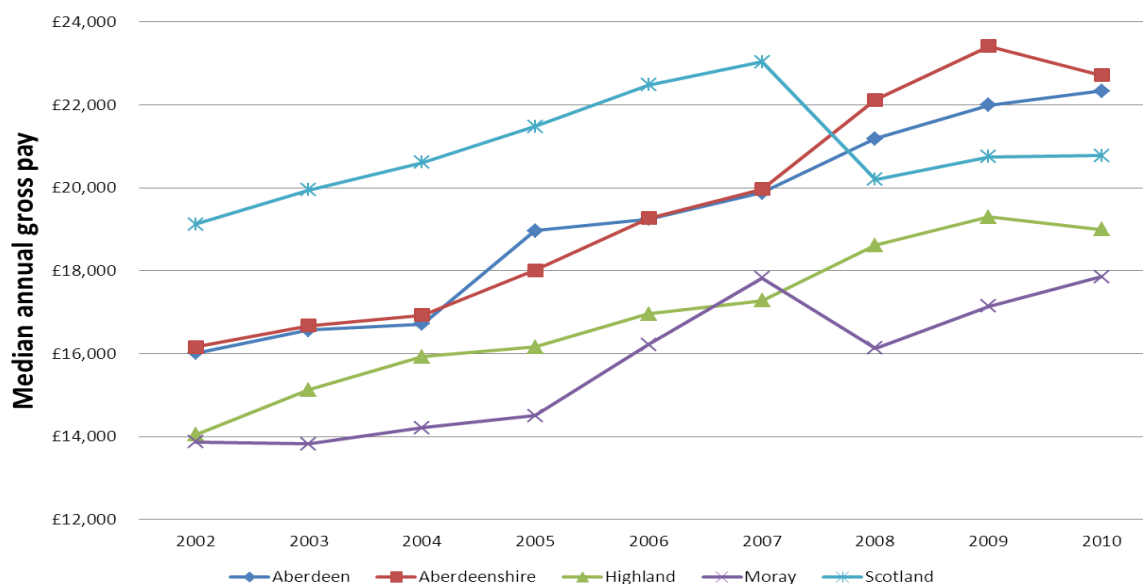
Plate 5.6-2 GVA Per Head (NUTS² for the three geographies Within the Study Area)

Individual Median Earnings

5.6.3.6 Nationally, earnings increased steadily from 2002 to 07, followed by a major fall in 2008, reflecting the financial crisis, before flattening out in 2009 and 2010 as shown in Plate 5.6-3 below (Office of National Statistics, 2010b). Aberdeen, Aberdeenshire and Highland did not suffer the same decline in 2008, but earnings flattened out in 2009 and 2010, and in Aberdeen fell slightly in 2010. In Moray, earnings dipped in 2008, but continued to grow in 2009 and 2010. The strength of the oil and gas sector has been important in maintaining both employment and earnings in the north east.

5.6.3.7 In absolute terms, median earnings in Aberdeen and Aberdeenshire are well above the Scottish median, while Highland and particularly Moray are significantly below. Median earnings in Aberdeen are around 25 % higher than in Moray.

² Nomenclature of Territorial Units for Statistics – this is the system of geo-coding adopted for EU countries



Source: ONS (2010b) Annual Survey of Hours and Earnings - resident analysis

Plate 5.6-3 Individual Median Annual Gross Pay 2002 to 2010

House Prices

5.6.3.8 The pattern of house prices in the study area has closely followed the national picture (Registers of Scotland, 2011). There were sharp increases in house prices between 2003, peaking in 2008 just before the financial crisis and subsequent recession. Even so, house prices have remained at around 2007 prices. The highest median prices are in Aberdeenshire, from where high earners commute to oil and gas related jobs in and around Aberdeen. The median of £185,000 is well above the Scottish national median of £135,000. Prices in Aberdeen City (£150,000) and in Highland (£145,000) are also well above the national figure. Moray, with lower levels of GVA and earnings also has a lower median house price (£128,500).

Education

5.6.3.9 Table 5.6-2 below sets out the highest level qualifications among the working age population, for each of the Local Authorities in the study area (Office for National Statistics, 2011a). Qualifications in Aberdeen City and Aberdeenshire are above the national average, while Highland and Moray are slightly below. All the areas are above the national average for qualifications equivalent to NVQs levels two and three, and all have a lower proportion of people with no qualifications than the national average.

Table 5.6-2 Qualifications Jan 2010 to Dec 2010 by Local Authority Area (% of pop aged 16 to 64)

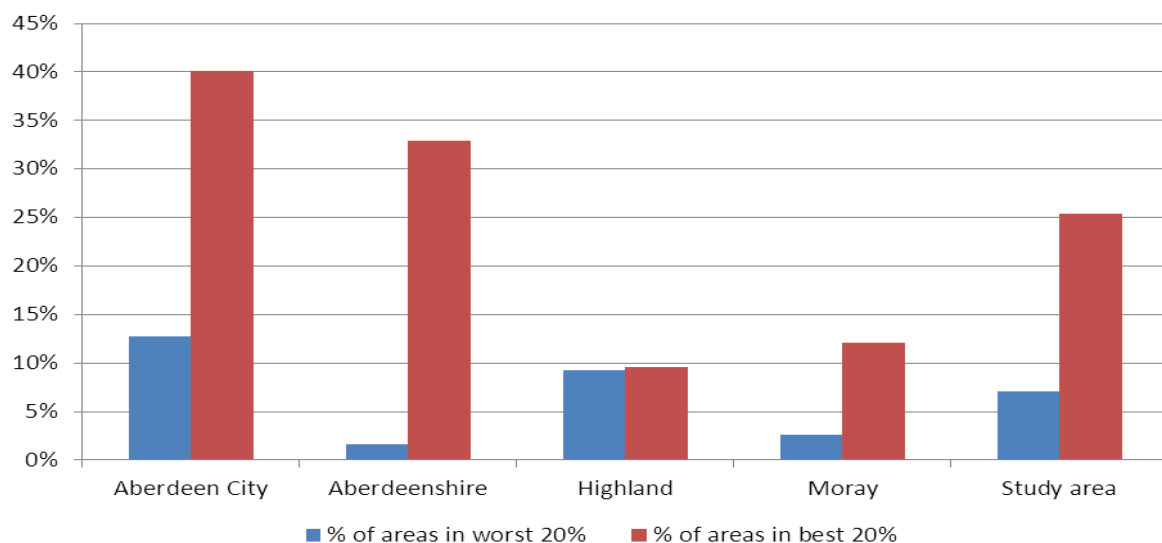
	Scotland	Moray	Highlands	Aberdeenshire	Aberdeen City
NVQ 4+	35.0	29.5	33.6	37.4	43.5
NVQ 3+	55.9	55.8	57.2	59.9	60.6

	Scotland	Moray	Highlands	Aberdeenshire	Aberdeen City
NVQ 2+	70.2	71.1	77.0	73.4	74.3
NVQ 1+	80.1	83.6	86.8	84.8	83.5
None	12.3	9.5	6.6	8.1	9.1

Source: ONS (2011) Annual Population Survey

Deprivation

5.6.3.10 One of the key measures of quality of life is captured by the indices of deprivation. Though not directly comparable, each index is based on the concept that dimensions of deprivation such as income, employment, education and health can be identified and measured separately. These dimensions, sometimes referred to as 'domains' are then aggregated to provide an overall measure of multiple deprivation and each individual area is allocated a deprivation rank and score. It should be noted that in more rural areas such as the Highlands, these scores are often not considered to be as accurate or reflective measures of deprivation as they are for urban areas. Plate 5.6-4 below, shows how quality of life in all four areas compares positively with the Scottish benchmark (Scottish Neighbourhood Statistics, 2009). Forty per cent of the neighbourhoods in Aberdeen are in the best 20 % in Scotland and 12 % in the worst 20 %, while Highland and Moray both have fewer in the top and a bottom end of the rankings. There are a small number of neighbourhoods (6 % in the study area) that are in the lowest 20 % in Scotland.



Source: Scottish Neighbourhood Statistics (2009 rankings)

Plate 5.6-4 Proportion of Neighbourhoods in the Best and Worst 20 % in Scottish SIMD Rankings by Local Authority

5.6.3.11 Separately, the Scottish Household Survey collects residents' views of their neighbourhood and reports the percentage of residents that rate their neighbourhood as a "very good" place to live. In common with many of the indicators, Aberdeenshire scores well above the Scottish average (70 % compared with 55 % nationally), as do Highland (70 %) and Moray (69 %). Aberdeen City scores below the national average (51 %) (Scottish Household Survey, 2008 to 2010).

5.6.4 Business and Employment Baseline

Employment

5.6.4.1 Oil and gas-related employment is important in Aberdeen and to a lesser extent Aberdeenshire (Office for National Statistics, 2009). This is shown in Table 5.6-3 below. Food and drink production is a major employer in both Moray and Aberdeenshire, while tourism is more important in the Highlands. In Highland and Moray, the proportion of employment in health and education (mostly public sector) employment is above the Scottish average. Although the number of jobs in some sectors, such as fishing and tourism is relatively low, these are important jobs within some of the local towns and villages. Equally several large employers (Dounreay in Highland and the RAF airbases in Moray) have been large employers, crucial in maintaining levels of employment / economic activity in this last decade. However, employment supported by both of these is declining as a result of the decommissioning of Dounreay and the changing status of RAF Kinloss.

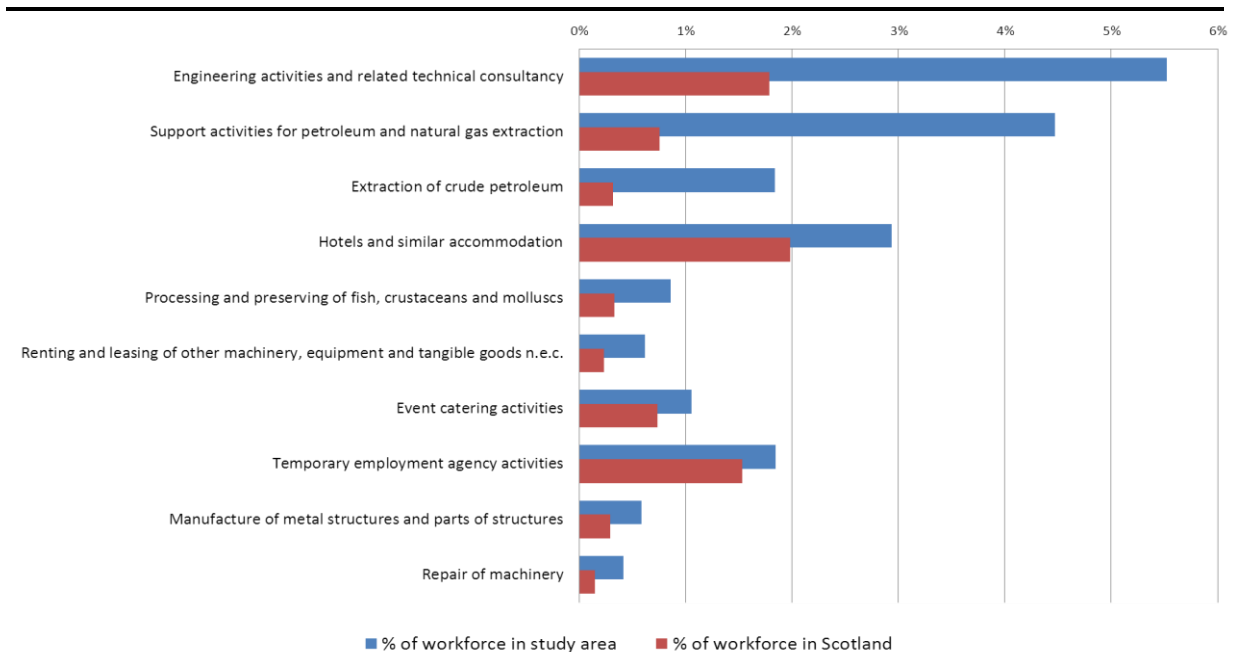
Table 5.6-3 Employment by Sector for the Study Area and for Scotland (BRES data 2009)

Industry	Aberdeen City	Aberdeenshire	Highland	Moray	Scotland
Agriculture, Forestry & Fishing	100	1,100	1,000	300	33,800
Mining, Quarrying & Utilities (oil and gas production)	22,400	4,400	2,400	400	61,700
Manufacturing	12,000	10,900	6,600	5,700	187,800
Construction	6,700	7,100	6,200	2,200	132,200
Motor trades	2,400	1,600	2,300	700	40,400
Wholesale	4,900	3,200	2,600	800	73,600
Retail	12,900	9,700	10,900	4,200	237,500
Transport & Storage (inc. postal)	7,700	3,900	5,200	1,200	102,500
Accommodation & Food Services	12,200	5,800	11,600	2,500	173,400
Information & Communication	3,600	1,000	2,100	300	57,000
Financial & insurance	2,200	800	1,200	500	93,500
Property	1,700	600	1,000	300	27,300
Professional, Scientific & Technical	23,600	7,900	4,700	900	149,000
Business Administration & Support Services	13,200	3,600	5,800	900	177,800
Public Administration & Defence	7,900	4,200	6,200	2,400	153,000
Education	10,200	7,500	9,000	3,500	195,900

Industry	Aberdeen City	Aberdeenshire	Highland	Moray	Scotland
Health	26,700	9,900	18,100	5,500	383,400
Arts, entertainment, recreation & other services	5,500	3,900	4,300	1,500	102,900
Column Total	175,900	87,100	101,400	33,700	2,382,500

Source: ONS Business Register and Employment Survey (2009) Note: data rounded to 100

- 5.6.4.2 Plate 5.6-5 below uses four digit Standard Industrial Classification (SIC) data to show the key sectors and their importance to the study area relative to Scotland. It shows the importance of the oil and gas sectors and engineering, driven by Aberdeen, the food and drink manufacture in Moray and the significance of tourism, which is largely in the Highlands.
- 5.6.4.3 The study area is home to 72 % of Scotland's businesses in the mining and quarrying and oil and gas extraction. The other areas of strength, relative to Scotland, are agriculture, forestry and fishing (34 % of Scottish businesses) and electricity, water and gas sector (32 %).
- 5.6.4.4 In Moray, manufacturing, which includes food processing, is a major employer and in Highland accommodation and food services, which includes most tourism activity employs 11,600 people. Employment categorised as "professional, scientific and technical services" is also important in Aberdeen, much of this relates to the oil and gas sector. It includes, for example, engineers, chemists, technicians, designers and architects. Health and education are other important industries in all four authorities, as it is across Scotland.
- 5.6.4.5 The analysis further highlights the relative strengths in engineering, oil and gas extraction and support activities for the oil and gas industry. This is largely based in and around Aberdeen. Using the 4 digit SIC codes, employment in Aberdeen City in support activities for petroleum and natural gas extraction, engineering activities and related technical consultancy and extraction of crude petroleum comes to 37,000, around a fifth of the workforce. There is a similar pattern in Aberdeenshire with a high proportion of employment in engineering and oil and gas support.
- 5.6.4.6 Note that the employment structure in Highland and Moray is quite different to Aberdeen. In Highland there is a high proportion of hotel employment, health and hospital activity and the hazardous waste treatment at Dounreay. In Moray the dominant activities are in food manufacture, distilling, primary education and defence employment.



Source: ONS Business Register and Employment Survey (2009)

Plate 5.6-5 Key sectors in the Study Area Relative to Scotland

Supply Chain

- 5.6.4.7 A study carried out by Scottish Renewables (Scottish Renewables, 2012) estimates that there were a total of 11,136 full time equivalent posts in project design, development, operation and supply in renewable energy in Scotland in 2011. Of these, 943 work on offshore wind projects. This section considers some of the recent activity in the supply chain in Scotland.
- 5.6.4.8 In the development phase Scottish firms are generally well positioned in relation to securing work from potential wind farm projects, and "have been successful in providing support services, especially in the area of environmental assessment and planning advice" (AEA, 2010).
- 5.6.4.9 There are more significant gaps in some areas of manufacturing. Consultations with Scottish Enterprise suggested that the most significant gaps are in turbine and cable manufacture. However, unlike onshore where turbines are 70 % of the cost, this is closer to 40 % for offshore (Renewable UK, 2011). The market is currently dominated by the large German, Danish, Spanish and US manufacturers. There may also be opportunities to manufacture some components of small parts, although overseas manufacturers will often work with regular suppliers to provide sub-assemblies or groups of components.
- 5.6.4.10 Scottish Development International is working to try and secure inward investment in turbine manufacturing in Scotland. This will take time to establish the production facilities and then to demonstrate to the market that the turbines are reliable. The Scottish Enterprise report, Energy Industry Market Forecast, Renewable Energy 2009 to 2014 (Scottish Enterprise, 2009) notes that "Scottish suppliers provide some electrical and electronic equipment, towers and monopiles but the vast majority of high value components are still imported". However, there are other significant manufacturing elements that Scottish firms can deliver.

- 5.6.4.11 For the construction phase, Scottish-based firms appear well placed given the strong engineering base and oil and gas experience in the North Sea, however, the availability of suitable vessels and logistics could be a constraint. One of the largest interventions to support the supply chain has been the projects identified in the National Renewables Infrastructure Plan (Scottish Enterprise and Highlands & Islands Enterprise, 2010). This is supported by a £70M National Renewable Infrastructure Fund (N-RIF) within the Scottish Enterprise area and with a commitment of support for specific investments in the Highlands and Islands by HIE. For the Moray Firth, the potential development of port facilities at Nigg and Ardersier would benefit from these funds. Decisions on the use of specific ports are yet to be made by developers but will have a significant impact on the economic and employment benefits for Scotland and the study area. The situation at both Nigg and Ardersier is dynamic. Significant developments have taken place at both sites since this study commenced, and are continuing with regards to their development towards the offshore wind market.
- 5.6.4.12 The operations and maintenance phase lasts over the lifetime of the Project and consequently the investment and employment supported is longer term than just development and construction. Cumulatively, this can represent a third, to a half of the full investment. Part of this may be subcontracted through the turbine manufacturer who would be responsible for maintenance over a warranty period. Whatever arrangement is adopted it is likely to require local employment and provide opportunities for Scottish companies. Experience of managing offshore operations in the North Sea will also be an advantage.

Supply Developments

- 5.6.4.13 The 2020 Route Map for Renewable Energy in Scotland (Scottish Government, 2011) describes some of the developments in the past year including Mitsubishi Power Systems Europe Ltd, and Wind Towers (Scotland) Ltd – a joint venture between the owner / operator and Marsh Wind Technology to take over the tower manufacturing facility at Machrihanish. Other recent announcements include Gamesa investing in the Port of Leith, Samsung investment in Fife Energy Park and the Global Energy Group's purchase of the Nigg Yard. Other major projects announced are the choice of Glasgow as the location for the Offshore Renewable Energy (ORE) Catapult centre and the Green Investment Bank locating in Edinburgh.
- 5.6.4.14 There is also diversification, with the most notable examples being BiFab, based at Methil, Burntisland and Arnish, producing jacket foundations; Isleburn Ltd, part of the Global Energy Group, part of the team which assembled and installed the Beatrice Demonstrator offshore wind prototypes and which has manufacturing facilities for a range of full scale wave and tidal technology prototypes, while offshore engineering firms Technip and Subsea 7 have established renewable divisions in Aberdeen.
- 5.6.4.15 Scottish Enterprise and Highlands and Islands Enterprise have undertaken a number of other initiatives to support the supply chain. In addition to the work of Scottish Development International in seeking inward investment in turbine and cable manufacturer, and the support made available through the National Renewables Investment Fund, both agencies are developing supply chain databases to better understand where the gaps are and to promote the opportunities from offshore wind and other renewables. SE has launched the Offshore Wind Expert Help programme and Offshore Wind Manufacturing Audits as well as awareness raising events.

Skills Development

- 5.6.4.16 A related part of the effectiveness of the supply chain in Scotland will be the availability of people with the right skills. The jobs created will require a range of skills across the different phases of development, from environmental consultants, engineers, planners, welders, divers, technicians and vessel crew. There are major overlaps with the oil and gas industry.
- 5.6.4.17 An action plan for energy has been developed by Skills Development Scotland (Skills Development Scotland, 2011). This describes the main requirements for the sector. It reports that the main skills gaps are in engineering (marine, structural, civil, structural and mechanical) leadership and management, project management, welders, turbine technicians and divers. The majority of these jobs require the equivalent of NVQ level 3 qualifications. It estimates that there are around 8,000 undergraduates in related subject areas along with 3,000 postgraduates, while Scotland's Colleges support around 25,000 to 30,000 learners in relevant subjects, there are about 3,000 new apprenticeship starts each year in engineering and energy related jobs. Other activities to support skills includes the Low Carbon Skills Fund, the Whitlock Energy Collaboration Centre at Carnegie College, which has produced 15 to 20 trained people a year, and the launch of the Modern Apprenticeship Wind Turbine Technician framework. In addition, 12 universities are working together under the Energy technology Partnership, which supports research and development. In spring 2011 the developer undertook direct intervention in this field when, working with HIE, MORL organised an Offshore Wind Skills Conference for HE, SE and local authorities in Inverness.

5.6.5 Tourism Baseline

- 5.6.5.1 Tourism is an important part of the Scottish economy. The tourism sector contributes in the region of £4.4 billion GVA and employs over 200,000 people in around 20,000 tourism-related businesses across the country (VisitScotland, 2010a). Despite difficult economic conditions and significant international competition, the industry has proved resilient and is playing an important role in supporting the economic recovery.
- 5.6.5.2 Using a different methodology, a recent Deloitte & Oxford economic report (Deloitte and Oxford Economics, 2010) on the 'visitor economy' estimates that, in Scotland, the sector's total wider contribution accounts for around £11 billion GDP (10.4 % of the country's economy and 10 % of the workforce).
- 5.6.5.3 There are several factors that differentiate tourism from other industries, which make it particularly important in relation to wind farm developments. The first is that it is often disproportionately important in rural and more remote parts of the country. It is one of a few industries that help retain population and income in these areas. The second, is that many of the jobs it supports require fewer technical skills and qualifications.
- 5.6.5.4 Its importance to Scotland means that the tourism sector is one of a number of priority industries identified by the Scottish Government, Scottish Enterprise and Highlands and Islands Enterprise (HIE). The national tourism aims are set out in "A Framework for Change" (VisitScotland, 2006) which targets real expenditure growth of 50 % between 2005 and 2015.

- 5.6.5.5 In the study area, the baseline employment data indicates that tourism is of greater importance in Moray and Highland, where the hotel and restaurant sectors comprise a higher proportion of the businesses and employment. Each of the areas has its own characteristics, but the coast is a major part of the tourism offer.
- 5.6.5.6 In 2009, Scotland attracted just over 15 million visitors a year of which 12.5 million were from within the UK (5.9 million were from within Scotland). These visitors spent 68 million nights in Scotland and spent £4.1 billion (VisitScotland, 2011).
- 5.6.5.7 Tourism is one of the most important industries in the Highlands, particularly on the west coast. Although it may be less significant in Aberdeen and Aberdeenshire, in particular areas, and for specific communities, it can be a major source of income and employment. The most recent tourism figures from VisitScotland for the relevant areas are shown in Table 5.6-4 below. (VisitScotland, 2011).

Table 5.6-4 Highland, Aberdeen and Grampian Tourism Data (2009)

Region	Category	Number	Nights	Expenditure
Highland	Overseas visitors	0.46 M	2.2 M	£129 M
	Domestic (UK) visitors	1.87 M	8.35 M	£436 M
	Total	2.33 M	10.55 M	£565 M
Aberdeen & Grampian	Overseas visitors	0.24 M	1.67 M	£98 M
	Domestic (UK) visitors	1.25 M	4.38 M	£246 M
	Total	1.49 M	6.05 M	£344 M
Scotland	Overseas visitors	2.56 M	21.91 M	£1,359 M
	Domestic (UK) visitors	12.47 M	46.08 M	£2,736 M
	Total	15.03 M	67.99 M	£4,095 M

Source: UKTS and IPS data 2009 sourced from VisitScotland 2011

- 5.6.5.8 Domestic tourists are evenly divided between English and Scottish visitors in the Highlands, but almost two thirds of domestic visitors are from Scotland. The strongest markets for overseas visitors for Highland are the USA (15 %) and Germany (14 %). In Aberdeen and Grampian, Germany is the single largest overseas market (15 %) with the USA second (10 %). Overseas visitors to the Highlands stay an average of 4.7 nights compared with the total average duration of an overseas visit to Scotland which is 8.6. In Aberdeen and Grampian this is 6.9. Visitors from within the UK stay an average of 4.2 days in the Highlands and 3.7 in Aberdeen and Grampian compared with a total of 3.7 for Scotland.

Tourism Characteristics of the Immediate Study Area

- 5.6.5.9 The following descriptions are adapted from VisitScotland descriptions. East of Inverness and Nairn, Moray includes the coastline east toward Buckie. The significant settlements include Lossiemouth on the coast, and towns such as Forres, Elgin and Keith inland. Although not a strong tourist destination the area is home to wildlife, such as ospreys, otters, crested tits, red squirrels, pine martens and bottlenose dolphins. Culbin Forest stands on one of the largest sand dune

systems in Britain, and Culbin Bar is a good example of a shingle spit. The area is best known for the whisky distilleries that form part of the Speyside Whisky Trail, such as Dallas Dhu at Forres, Glen Moray at Elgin and Strathisla at Keith.

- 5.6.5.10 The east Caithness coast is the closest land to the proposed wind farm sites. This stretches from Dornoch, north to Wick with coastal towns and villages linked by the A9. Brora is a small town on the coast, a base for a number of golf courses in the area and for touring Caithness and Sutherland. Three miles south is a preserved Iron Age broch (a drystone building unique to Scotland), Carn Liath. The Clynelish Distillery is a mile further north. Golspie is ten miles north of Dornoch, the village has a long sandy beach and there are a number of scenic walks. There are a number of historic buildings, including St Andrews church and Dunrobin Castle and gardens, one of the grandest houses in the north of Scotland. Above the village is a 100 foot tall statue of the first Duke of Sutherland. The village has a golf course, bowling club, tennis courts and a swimming pool with fitness facilities. There are facilities for loch and sea angling. The village also has the Highland Wildcat mountain bike trails and a good range of local services including accommodation. Easter Ross is also developing its potential as a stopping-point for cruise ships. Helmsdale is another fishing village and the Timespan Heritage Centre uses a combination of life-size displays and hi-tech exhibits to tell the story of the area. Nearby are Baille an Or and Suisgill - sites of the 'great Sutherland gold rush' of 1869.
- 5.6.5.11 The village of Dunbeath is on the A9 coast road, between Helmsdale and Lybster. Although not open to the public, Dunbeath Castle is on the cliff top on the opposite side of the bay and there is also a Dunbeath Heritage Centre. Lybster was established at the height of the 19th century herring boom. There is a Water Lines Heritage Centre at the harbour. The Grey Cairns of Camster are seven miles north of Lybster. There are more ancient remains at East Clyth, two miles north of Lybster.
- 5.6.5.12 John O'Groats, the most northerly place on mainland Britain is undergoing a substantial redevelopment. Wick is the principal town in the far north of the mainland and once a major herring port and its story is told in the Wick Heritage Centre. There are the 15th to 17th century ruins of Sinclair and Girnigoe castles on a thin promontory three miles north of the town and cliff top walks to the castles via Noss Head lighthouse from the village of Staxigoe.
- 5.6.5.13 Thurso on the north coast is the most northerly town on the British mainland. Its visitor attractions include the Swanson Gallery and the glass blowing studio, Glass Creations. It is also popular with surfers. West of Thurso is Dounreay nuclear power station with a visitor centre.

Visitor Profile

- 5.6.5.14 The closest point to the proposed wind farm sites, and the points at which the turbines will be most visible, is the east Caithness coast from Helmsdale, north to John O'Groats. A detailed review of tourism in Caithness and Sutherland has been prepared by Tourism Resource Consultants (TRC) (2010). The report provides information on the profile of tourists staying in the area. Around a third are Scottish residents, just over 40 % are from the rest of the UK with 26 % from overseas, as detailed in Table 5.6-5 below. While business tourism in relation to the decommissioning of Dounreay is an important part of the market around Thurso, it is less so, on the east coast. The east coast tends to be a route for visitors travelling north rather than a destination in itself (VisitScotland consultation).

5.6.5.15 Room occupancy data can be used to estimate the number of staying visitors and the value of tourism within the local economy. The TRC report provides room occupancy averages from 2009 compared to the national average values. The results indicate room occupancy of 58 %, which allows an estimation of the value of tourism within the areas closest to the wind farms.

Table 5.6-5 Origin of Visitors to Caithness and Sutherland

Category	Scottish	Rest of UK	Europe	American	Other	Total
Hotel	36 %	45 %	14 %	3 %	2 %	100 %
B&B / Guest House	26 %	32 %	32 %	6 %	4 %	100 %
Total Serviced Accommodation	33 %	41 %	19 %	4 %	3 %	100 %

Source: TRC (2011) Ambitious for Tourism Caithness and North Sutherland, Highlands and Islands Enterprise

Tourism in the Immediate Area

5.6.5.16 GIS analysis has been used to estimate the number of establishments, rooms and sleeping spaces within 50 km of the proposed wind farms, using data on the location of accommodation providers in Moray provided by TRC. Not all of these establishments will be within view of the wind farms (see Chapter 8.4: Seascape, Landscape and Visual Receptors). However, the analysis suggests that there are 107 establishments, 511 rooms and 1,057 sleeping spaces within 50 km.

5.6.5.17 Bed occupancy (as opposed to room occupancy) is typically around 40 % (Tourism Resource Consultants, 2010) and the average tourist expenditure in the Highlands is £53.50 (VisitScotland, 2011) per night. On this basis, the expenditure of visitors that stay within 50 km is £8.3 million a year.

5.6.5.18 In addition, there will be some recreational day trips to the area to visit the coast and others driving through the immediate area from where the sites will be visible. There are no estimates of day visits although distances from major centres of population will limit the number.

Main Tourist Attractions in the Wider Area

5.6.5.19 The Scottish Visitor Attraction National Monitor (VisitScotland, 2010b) provides estimates of the number of annual visits to main attractions. Table 5.6-6 below sets out the attractions that are closest to the wind farm sites, including Inverness. The most popular attractions are James Pringle Weavers (195,000 visitors) and Culloden visitor centre (121,000 visitors) just outside Inverness. North of Inverness, most attractions are visited by fewer people. Dunrobin Castle, a mile north of Golspie, is the largest attraction on that part of the inner Moray Firth coast with 62,000 visitors. The Timespan Heritage Centre at Helmsdale is within 50 km of the site, attracting 12,600 visitors.

Table 5.6-6 Visitor Attractions, Location and Visitor Numbers

Attraction	Ownership	Place	Visitors in 2009
James Pringle Weavers of Inverness	Private	Inverness	195,100
Culloden Visitor Centre	National Trust Scotland	Inverness	121,178
Dunrobin Castle	Charity/Trust	Golspie	62,689
Fort George	HS	Inverness	61,460

Attraction	Ownership	Place	Visitors in 2009
Highlanders Regimental Museum	Charity/Trust	by Inverness	54,060
Inverness Museum and Art Gallery	Local Authority	Inverness	44,379
Highland Wineries	Private	Inverness	20,000
Inverness Floral Hall & Coffee Shop	Local Authority	Inverness	16,424
Timespan Heritage Centre	Private	Helmsdale	12,617
Cromarty Courthouse Museum	Charity/Trust	Cromarty	8,337
Loch Fleet NNR	Government Agency	Golspie	7,500
Groam House Museum	Charity/Trust	Rosemarkie	7,078
Historylinks Museum	Charity/Trust	Dornoch	6,371
Pulteney Distillery Visitor Centre	Private	Wick	4,500
Clynelish Visitor Centre	Private	Brora	3,182
Laidhay Croft Museum	Charity/Trust	Dunbeath	2,530
Lyth Arts Centre	Private	Wick	1,368
Lybster Harbour Visitor Centre	Charity/Trust	Lybster	707
Orcadian Stone Company Ltd	Private	Golspie	395

Source: VisitScotland (2010b) Visitor Attraction National Monitor 2009

Dolphin Tourism

5.6.5.20 The Moray Firth Partnership commissioned Aberdeen Centre for Environmental Sustainability (ACES) to undertake a study to value the tourism expenditure related to the east of Scotland bottlenose dolphin population (ACES, 2010). The study estimated that the total direct expenditures related to the bottlenose dolphin population was at least £10.4 million, but around a third would potentially be spent elsewhere in Scotland even in the absence of opportunities to see these dolphins. It estimates that the additional tourism expenditure that depends on the presence of the east of Scotland bottlenose dolphin population was at least £4 million, supporting approximately 202 Full Time Equivalent (FTE) jobs. The study found 33 % considered seeing dolphins as the main reason for their visit. Estimates were based on a 526 person survey of visitors to recognised dolphin viewing locations and centres around principally the Moray Firth. The bulk of dolphin tourist expenditure is received by general tourist providers around the Moray Firth region, particularly Highland (61 %) and Moray (14 %).

Sailing

5.6.5.21 Data on recreational craft use was collected as part of the Shipping and Navigation Assessment and the types of risks that relate to recreational use are considered in more detail in Chapter 5.2. The interest here is on the potential impacts on tourism (and the expenditure that is brought to the economy) and any potential loss of amenity for local recreational users.

5.6.5.22 Data from the Royal Yachting Association and the UK Atlas of Recreational Boating (Royal Yachting Association, 2009) indicates cruising and popular sailing routes around the Moray Firth. There is one cruising route that passes through the wind farm sites (see Chapter 5.2: Shipping and Navigation). The general sailing areas are shown to be in the inner Moray Firth and more than 50 km from the three proposed wind farm sites. There is no racing area identified on the Moray Firth map.

- 5.6.5.23 An assessment of the value of sailing in Scotland was carried out by Scottish Enterprise (Tourism Resources Company, 2010). This estimated that there was berthing / mooring capacity in Scotland for 12,500 vessels. The study defines the north zone as extending from Gairloch on the west coast to Peterhead in Aberdeenshire and estimates just over 2,000 berths / moorings. The expenditure associated with sailing was estimated to be approximately £100 million in 2010 in Scotland, and expected to rise to £145 million in ten years. The value in the north area was reported as £10.1 million. The report suggests that "The north area of the Scottish sailing product is seen by many as being at the 'fringe' of activity". The study notes that the main areas considering new berths (approximately 750) were in two locations: Buckie and Whiteness on the Moray Firth. The report also concluded that, in the North, the emphasis in future needs to be on the creation of a "string of pearls" and visitor nodes to encourage sailing itineraries in the area and attract more foreign boats and others. However, it rated the relative strength of future market / economic opportunity in the north to be "low to medium".
- 5.6.5.24 The Shipping and Navigation Assessment concludes that there is limited recreational fishing and recreational vessel activity within the three proposed wind farm sites. Fourteen sailing yachts were recorded passing through the proposed sites during the survey periods and were generally headed to and from Wick using coastal and cross-Moray Firth cruising routes. Consultations with the RYA suggest that the area was not particularly busy from a recreational sailing perspective.

Other Recreation

Surfing

- 5.6.5.25 There are three surfing sites on the east Caithness coast, north of Wick at Keiss, Ackergill and Sinclair's Bay. There are also a number of sites on the Moray coast, although these are beyond 50 km from the wind farm sites. Marine Scotland (Marine Scotland, 2011) reports a quote from Surfers Against Sewage that: "*surfing is popular on the south side of the Moray Firth but rarely undertaken on beaches along the northern Moray Firth*". There is little information on the extent of sea-kayaking, but the Caithness Kayak Club organises sea kayaking from a number of places including Ackergill during the summer.

Walking

- 5.6.5.26 There are no data on the number of walkers visiting the coast closest to the proposed wind farm sites, although the main paths are identified in Chapter 8.4 (Seascape, Landscape and Visual Receptors). There is no continuous coastal path in the study area due to the coastline topography but short lengths of accessible coastal routes can be found at Duncansby Head and Lybster. There are also several short heritage paths along the coast focused on historic industry and fishing stations.
- 5.6.5.27 However, the onshore cable route includes approximately 8.4 km of the Formartine and Buchan Way which is classified by the Aberdeenshire Council as Core Path (Figure 5.6-2, Volume 6 b). This 85 km long-distance footpath extends from Dyce, north to Peterhead and Fraserburgh following the track of a former railway line, the Formartine and Buchan Railway. The route opened in the early 1990s. There is no data on the number of people walking this route, although a report for Scottish Natural Heritage (Peter Scott Planning Services, 2010) provides figures for several other long distance walking routes cases. The Southern Upland Way has 1,000 users that complete the route annually and the Speyside Way which estimates 2,500 users completing and 40,000 part users.

Other Attractions

5.6.5.28 There are a number of other features / attractions that provide recreation facilities within the 50 km zone of the proposed site. The majority of recreation facilities and attractions on the east Caithness coast are found around Wick, with fewer along the coast down to Helmsdale north.

5.6.6 Individual Site Baseline Characteristics

5.6.6.1 Consideration of individual site characteristics and impacts is required because MORL is seeking consent for each of the three wind farm sites. However, this baseline relates to onshore conditions and remains the same for all three sites.

5.6.7 Legislation and Planning Framework

5.6.7.1 There are no specific statutory guidelines or requirements for the assessment of socio-economic impacts set out by the relevant EIA Regulations, or in any other statutory or advisory guidance on the preparation of EIAs. The economic strategy for Scotland and Scottish Planning Policy 6 (SPP6) provided a much stronger emphasis on economic activity and encouraged due impact assessment alongside the environmental assessments. For example: the Scottish Government in SPP6 stated that:

“Applications should include details of the environmental, social and economic benefits that will arise from the project, both locally and nationally, including the overall number of jobs and economic activity associated with the procurement, construction and operation of the development. Planning authorities should consider whether any such benefits could or should be secured by way of a planning condition or planning agreement”.

5.6.7.2 This is in agreement with the priority of the Scottish Government to grow the Scottish economy and, more particularly, with the published policy statement “Securing a Renewable Future: Scotland's Renewable Energy”, and subsequent reports from The Forum for Renewables Development Scotland (FREDS) (2003) all of which highlight the manufacturing potential of the renewables sector. However, there remains a lack of firm guidance. For example: SPP6 is superseded by the Scottish Planning Policy (SPP) 2010 and the same requirements are not detailed within SPP as it is intentionally a short, overarching document. SPP also relates to land use planning and as such does not fully cover offshore developments. Recent work by Marine Scotland is looking to develop a baseline and gap analysis for socio-economic data for offshore renewables. This should help to inform the socio-economic impact assessments at a Project level in due course.

5.6.7.3 The scope of the economic element of the assessment is to estimate the significance of the employment and GVA that would be associated with the expenditure made in relation to the construction, operation and decommissioning of the Wind Farms. This is subsequently referred to as the economic impact.

5.6.8 References

- Aberdeen Centre for Environmental Sustainability (ACES). (2010). Value the Tourism Expenditure related to the East of Scotland Bottlenose Dolphin Population. University of Aberdeen Business School.
- AEA. (2010). Energy Industry market forecasts 2009-2014,. Scottish Enterprise.
- Deloitte and Oxford Economics. (2010). The Economic Contribution of the Visitor Economy.
- Marine Scotland. (2011). Economic Assessment of the Short Term Options for Offshore Wind Energy in Scottish territorial Waters: Costs and Benefits to Other Marine Users and Interests.
- Office for National Statistics. (2009). Business Register and Employment Survey.
- Office of National Statistics. (2010a). Regional Accounts.
- Office of National Statistics. (2010b). Annual Survey of Hours and Earnings.
- Office for National Statistics. (2011a). Annual Population Survey.
- Office of National Statistics. (2011b). Claimant count.
- Peter Scott Planning Services. (2010). Developing the Network of Longer Distance Routes. Scottish Natural Heritage Commissioned Report No. 380
- Registers of Scotland. (2011). Official House Prices data.
- Renewable UK. (2011). Offshore Wind Forecasts of future costs and benefits.
- Royal Yachting Association. (2009). The UK Atlas of Recreational Boating.
- Scottish Enterprise. (2009). Energy Industry Market Forecast, Renewable Energy 2009-2014 .
- Scottish Enterprise and Highlands & Islands Enterprise. (2010). National Renewables Infrastructure Plan Stage 2.
- Scottish Government. (2011). 2020 Route Map for Renewable Energy in Scotland.
- Scottish Household Survey. (2008 to 2010). Neighbourhoods as a place to live.
- Scottish Neighbourhood Statistics. (2009). Scottish Index of Multiple Deprivation.
- Scottish Renewables. (2012). Delivering the Ambition: Employment in Renewable Energy in Scotland.
- Skills Development Scotland. (2011). Skills Investment Plan for the Energy Sector.
- SQW. (2011). Maximising employment and skills in the offshore wind supply chain,. UK Commission for Employment and Skills.
- The Forum for Renewables Development Scotland (FREDS). (2003). Securing a Renewable Future: Scotland's Renewable Energy.
- Tourism Resources Company. (2010). Value of Sailing Tourism in Scotland. Scottish Enterprise.
- Tourism Resource Consultants. (2010). Caithness and Sutherland Serviced Accommodation Needs of Business Tourism.
- VisitScotland. (2006). A Framework for Change.
- VisitScotland. (2010a). Tourism Statistics.
- VisitScotland. (2010b). Visitor Attraction Monitor 2009.
- VisitScotland. (2011). VisitScotland factsheet 2009 for North of Scotland.

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5.7 Traffic and Transport

5.7.1 Introduction

- 5.7.1.1 This chapter contains relevant information on the OnTI to allow Scottish Ministers and Marine Scotland to make decisions on the applications for Section 36 consents and Marine Licences for the three proposed wind farm sites and the OfTI. Discussions are ongoing with landowners to determine the exact location and layout of the substation(s) on their land within the preferred onshore substation area. This will be finalised following production of a masterplan by the owner / operator of the Peterhead Power Station compound which forms part of the preferred area. Once the precise location and layout for the onshore substation(s) and export cable location has been confirmed, an application for planning permission for the OnTI will be submitted to Aberdeenshire Council and will be supported by this ES and such further information as is required to support the planning application.
- 5.7.1.2 This chapter provides the baseline information for the traffic and transportation assessment associated with the onshore transmission infrastructure (OnTI). The traffic and transportation associated with the construction of the offshore wind farms and offshore transmission infrastructure (OfTI) has not been considered within this chapter due to the uncertainty of which port will be utilised during construction and the method of transportation for the offshore elements. The chapter describes and characterises the public road system that may be used during construction, operation and decommissioning of the Project, and establishes the traffic flow on these roads. Such effects are most pronounced in close proximity to the OnTI and the study area, as shown in Figure 5.7-1, Volume 6 b, and the assessment is therefore restricted to the following major and minor roads:
- A90 trunk;
 - A950 non-trunk;
 - A952 non-trunk; and
 - Several B and C roads.
- 5.7.1.3 This study area was established based on the location of the development and the main roads servicing the locality. The A roads will be the main road network servicing the construction of OnTI. In consultation with Aberdeenshire Council, the B and C roads were identified for inclusion within the study area for assessment.
- 5.7.1.4 This chapter comprises the following:
- Consultation with relevant statutory bodies;
 - Detailed desk study and accompanying field survey to establish baseline conditions; and
 - Consideration of the relevant key legislative and planning information.
- 5.7.1.5 The desk study and accompanying field survey considered a number of aspects including:
- Existing road and access arrangements;
 - Trunk road baseline traffic;

- Road capacities;
- Accident records; and
- General traffic growth.

5.7.1.6 A detailed account of this information is provided in:

- Technical Appendix 5.7 A (Consultee Response);
- Technical Appendix 5.7 B (Traffic Flow Data Conversion); and
- Technical Appendix 5.7 C (Future Traffic Baseline).

5.7.1.7 This baseline is used to inform the traffic and transport impact assessment described in:

- Chapters 11.7 and 15.7 (Traffic and Transport); and
- Chapter 12.1 (Whole Project Assessment).

5.7.1.8 The onshore export cable route is being developed, with engineering studies continuing to establish the preferred location within this route. Several access points to the OnTI, via new, temporary and existing entrances, are being considered. The onshore export cable route is described, shown on Figure 5.7-1, Volume 6 b. No permanent access junctions or tracks are to be constructed for the cabling. However, a permanent access will be constructed for the proposed substation(s).

5.7.2 Consultations

5.7.2.1 Consultation letters were sent out in October 2011 as a supplementary consultation to the MORL Offshore Transmission Infrastructure Scoping Report that was issued to the various stakeholders by MORL in September 2011. The report invited the stakeholders to comment on the approach to the environmental impact assessment, specify issues to be addressed and recommend assessment methodologies.

5.7.2.2 Where necessary, subsequent discussions have taken place, and the following organisations were consulted during the course of the traffic assessment:

- Aberdeenshire Council (Traffic, Development Control and Network Management);
- Transport Scotland (Network Management); and
- Grampian Police – Aberdeenshire Division (Traffic).

5.7.2.3 The consultation responses are provided in Table 5.7-1 below.

Table 5.7-1 Consultation Responses

Organisation	Issues Raised	MORL Approach
Aberdeenshire Council	<p>Aberdeenshire Council (AC) has responsibility for the non-trunk road network including the A950 and the A952, the B-class roads (the B9033) and the C-class roads within the study area.</p> <p>Refer to Technical Appendix 5.7 A for copies of the responses received.</p> <p>AC was happy with the proposed methodology.</p> <p>AC requested the exact route of the cable be provided to determine more accurately which roads will be impacted.</p> <p>AC agreed that the level of additional traffic on the local road network with regards to the substation is minor and will not require further detailed evaluations.</p> <p>AC noted that MORL are to ensure that construction vehicles involved with the cable installation and substation construction are to not exceed the size of vehicles common to rural Aberdeenshire. Any vehicles that do exceed this size are to be regarded as abnormal vehicles. Traffic Management Plans will be required to be discussed and agreed with AC and relevant police authorities.</p> <p>AC also noted that suitable traffic diversions are to be proposed as a result of the development.</p>	<p>Since the exact route of the cable is undecided, MORL have surveyed all the C roads that could potentially be affected by the works. The C roads to be assessed were identified by AC.</p> <p>Otherwise, ACs concerns have been addressed in Chapter 11.7 and Chapter 15.7.</p>
Transport Scotland	<p>Transport Scotland has responsibility for the trunk road network of Aberdeenshire which for this study area is the A90.</p> <p>No concerns were raised. Refer to Technical Appendix 5.7 A for copies of the responses received.</p>	Noted
Grampian Police	<p>No concerns were raised. Refer to Technical Appendix 5.7 A for copies of the responses received.</p>	Noted
Marine Scotland Scoping Opinion	<p>MORL issued a Scoping Report to the various stakeholders inviting them to comment on the approach to the EIA.</p> <p>Marine Scotland requested that the traffic impact assessment should 'provide information relating to the preferred route options for delivering equipment via the trunk road network. The EIA should also address access issues, particularly those impacting upon the trunk road network; in particular, potential stress points at junctions, approach roads, borrow pits, bridges, site compound and batching areas'.</p>	Noted

5.7.3 Baseline

Desktop Study

- 5.7.3.1 The onshore export cable route is located within the Banff and Buchan area of Aberdeenshire.
- 5.7.3.2 The landfall is located in Fraserburgh Bay and the cable route travels south to the substation(s) site near Boddam, south of Peterhead. The cable route could potentially cross the A90, A950, A952, the River Ugie and the Formartine and Buchan Way and several other B, C and unclassified roads.
- 5.7.3.3 Figure 5.7-1, Volume 6 b, illustrates the onshore export cable route.
- 5.7.3.4 The access to the cable route would be from several different locations along the road network including trunk, non-trunk and local roads. This is due to the nature of the onshore export cable route as it crosses a large number of different properties, which would also provide access points to the development sites.
- 5.7.3.5 The extent of the road network that has been considered within the traffic study area is as follows:
- A90 from Ellon to Fraserburgh;
 - A950 from Peterhead to Mintlaw;
 - A952; and
 - Several B, C and Unclassified Roads.
- 5.7.3.6 The study area has been determined on the basis of the potential effect of increased traffic during the construction, operation and decommissioning.

Description of Existing Conditions

- 5.7.3.7 The existing road and transportation conditions for the onshore export cable route are described throughout this chapter. The roads assessed below were identified as being the key roads within the study area and were agreed upon with Aberdeenshire Council. It has been assumed that these roads only will be utilised for the transportation of construction materials (in LGVs and HGVs) and heavy plant and by the construction staff.

Existing Road and Access Arrangements

A90

- 5.7.3.8 The A90 is a trunk road and regional traffic route linking Fraserburgh to Peterhead and Aberdeen. From Peterhead the A90 continues south along the east coast of Scotland to Edinburgh via Dundee and Perth. It is the main highway between Fraserburgh and Peterhead. Between Fraserburgh and Peterhead the road is predominantly a full width (7.3 m) single carriageway. The road alignment generally follows the undulating topography of the surrounding countryside with several sections affording overtaking opportunities. The road surface is generally in a good condition. Typically, the speed limit on the A90 is 60 mph with the exception of 40 mph limits when the road travels through Crimond and St Fergus. The A90 currently conveys HGVs, relating to traffic from local agricultural and other small industry activities and traffic to and from the St Fergus Gas Terminal. There are no footways along the majority of this road with little or no pedestrian traffic known of or anticipated.

5.7.3.9 Construction traffic associated with the laying of cable through the onshore cable route would utilise access from the A90 and the following roads directly via the A90:

- B9033;
- C17B;
- C27B;
- C5B;
- C43B;
- C38B;
- C60B; and
- C64B.

5.7.3.10 While some of these B and C class roads are considered to be key routes in the road network, they were observed during the site survey to be lightly trafficked.

A950

5.7.3.11 The A950 is a non-trunk road and a regional traffic route linking Peterhead to Mintlaw. From Mintlaw traffic can either continue west along the A950 towards New Pitsligo or turn north towards Fraserburgh along the A952. Between Peterhead and Mintlaw the road is predominantly a full width (7.3 m) single carriageway. Similar to the A90, the road alignment follows the undulating topography of the surrounding countryside with several sections affording overtaking opportunities. The road surface is generally in a good condition. The national speed limit applies to the A950 with the exception of 30 mph limits through residential towns of Longside and Mintlaw and a 20 mph speed limit zone as the A950 passes Mintlaw Primary School. As with the A90, the A950 conveys mostly local traffic between Mintlaw and Peterhead including HGVs and agricultural vehicles. Between the A90 and Mintlaw footways are only present in Longside and Mintlaw.

5.7.3.12 Construction traffic associated with the laying of cable along the onshore cable route would utilise access from the A950 and the following roads directly via the A950:

- C39B; and
- C43B.

A952

5.7.3.13 The A952 is a non-trunk regional traffic route providing a direct route to Fraserburgh by avoiding the section of the A90 via Peterhead. The A952 bisects the A950 at Mintlaw and is bounded by the A90 at Toll of Birness to the south and to the north at Cortes, 6.5 km south of Fraserburgh. The road is predominantly a full width (7.3 m) single carriageway. Similar to the A90 and A950, the road alignment follows the undulating topography of the surrounding countryside with several sections affording overtaking opportunities. The road surface is generally in a good condition. The national speed limit applies to the A950 with the exception of 30 mph limits through Mintlaw. The A952 is seen as the more direct route from the Toll of Birness to Fraserburgh. Traffic on this road consists mainly of HGVs, agricultural vehicles and also local traffic. Between the A90 and Mintlaw footways are only present in Mintlaw.

5.7.3.14 Construction traffic associated with the laying of the cable through the onshore cable route would utilise access from the A952 and the following roads directly via the A952:

- C27B;
- C28B; and
- C5B.

Trunk Road Baseline Traffic

5.7.3.15 Traffic flow data on the trunk road network surrounding the site has been obtained from Transport Scotland's Automatic Traffic Counter (ATC) database for the locations listed in Table 5.7-2 below. These locations are highlighted on Figure 5.7-2, Volume 6 b.

Table 5.7-2 Transport Scotland ATC Sites

Ref.	Site	Traffic Counter Site Reference	Eastings	Northing
1	A90 (T) Ellon Bypass	ATC02024	397050	829460
2	A90 (T) Cruden Bay	124054	410000	839210
3	A90 Peterhead Peripheral South	ATCNE002	410510	846300
4	A90 (T) Inverugie	JTC08327	409680	851080
5	A90 (T) South of Fraserburgh	ATCNE001	399800	863700

5.7.3.16 The Annual Average Daily Traffic (AADT) information for several years at each site has been examined to identify and exclude any data that may be spurious or unrepresentative. For each site, the data has been processed to provide both five day and seven day AADT flows in each direction, as well as combined flows.

5.7.3.17 The relevant traffic flow characteristics for each counter site are summarised below in Table 5.7-3 through to Table 5.7-7 for the respective locations. The most recent data for a complete year has been utilised and the survey year is noted for each site in the table.

Table 5.7-3 Traffic Volumes on A90 (T) at Ellon Bypass

Site 1. (2009)	Northbound No.	Southbound No.	Combined		
			No.	No. of HGVs	% HGVs
Seven Day AADT	6,247	6,356	12,603	987	8 %
Five Day AADT	6,804	6,891	13,694	1,228	9 %

5.7.3.18 No HGV numbers were given for counter site 1. Therefore, numbers have been interpreted from the data provided for site 2 and site 8 (see Table 5.7-12 below). It has been assumed that all traffic recorded at site 1 will split at the Toll of Birness and either take the A952 to Fraserburgh or the A90 to Peterhead. Therefore the total number of HGVs recorded at site 1 is a combination of the HGV numbers recorded at site 2 and site 8.

Table 5.7-4 Traffic Volumes on A90 (T) near Cruden Bay

Site 2 (2009)	Northbound No.	Southbound No.	Combined		
			No.	No. of HGVs	% HGVs
Seven Day AADT	3,464	3,504	6,968	748	11 %
Five Day AADT	3,841	3,869	7,710	935	12 %

Table 5.7-5 Traffic Volumes on A90 (T) along Peterhead Peripheral South

Site 3 (2009)	Northbound No.	Southbound No.	Combined		
			No.	No. of HGVs	% HGVs
Seven Day AADT	2,895	3,017	5,912	1,018	17 %
Five Day AADT	3,173	3,304	6,477	1,272	20 %

5.7.3.19 No HGV numbers were given for counter site 3. Therefore, numbers have been interpreted from the data provided for site 2, 4 and 6 (see Table 5.7-9 below). It has been assumed that all HGV numbers recorded at site 6 will be included in the site 3 total. Since this traffic counter has been positioned on the Peterhead peripheral road it has been assumed that 50 % of the traffic recorded at site 2 will utilise this section of road with the other 50 % travelling to / from Peterhead via the A982 (South Rd). Similarly 50 % of traffic recorded at site 4 have been assumed to travel to / from Peterhead via the A982 (North Road) with the other 50 % utilising the Peterhead peripheral road. Therefore HGVs predicted at site 3 have been generated from a combination of the total HGV numbers from site 6 and 50 % of the HGV numbers from sites 2 and 4.

Table 5.7-6 Traffic Volumes on A90 (T) near Invergie

Site 4 (2010)	Northbound No.	Southbound No.	Combined		
			No.	No. of HGVs	% HGVs
Seven Day AADT	2,975	2,968	5,943	550	9 %
Five Day AADT	3,266	3,247	6,513	688	11 %

Table 5.7-7 Traffic Volumes on A90 (T) South of Fraserburgh

Site 5 (2009)	Northbound No.	Southbound No.	Combined		
			No.	No. of HGVs	% HGVs
Seven Day AADT	3,575	3,595	7,170	519	7 %
Five Day AADT	3,867	3,884	7,751	643	8 %

5.7.3.20 No HGV numbers were given for counter site 5. Therefore, numbers have been interpreted from the data provided for site 4 and 7 (see Table 5.7-10 below). It has been conservatively assumed that all HGVs recorded at site 7 will continue to travel to / from site 5. Furthermore it has also been assumed that 50 % of the

traffic recorded at site 4 is associated with the St Fergus Gas Terminal with the other 50 % travelling between Peterhead and Fraserburgh. Therefore the predicted HGV numbers at site 5 will be a combination of the total recorded at site 7 and 50 % of the total at site 4.

5.7.3.21 Through the recorded traffic flow data from the ATCs and extrapolation of the HGV numbers, a complete set of data for both directions and also for the classification of vehicles is available for sites 1 to 5. There appeared to be a consistency in the data with a small growth in the traffic volumes evident when data from previous years was examined.

Local Road Network Baseline Traffic

5.7.3.22 Consultation with Aberdeenshire Council at an early stage indicated that there was limited data available for the non-trunk roads within the study area. Listed in Table 5.7-8 below is the location on the A950 of the only permanent counter the Council maintain within this study area.

Table 5.7-8 Aberdeenshire Council ATC Site

Ref.	Site	Easting	Northing
6	A950 West of Peterhead	408840	846440

5.7.3.23 The data available from this ATC was for a period covering 30th May to 9th August 2011. It provided traffic flows for each hour along the A950, including a.m. and p.m. peaks, and five day and seven day average flows. A breakdown of the vehicle classification was also provided.

5.7.3.24 From this dataset, a representative week from a neutral month was taken for further interrogation and utilisation in calculating the AADT. A neutral month is a month that is unaffected by seasonality effects, such as holidays creating unrepresentative traffic. This was for the week 6th to 12th June 2011. The Design Manual for Roads and Bridges (DMRB) provides a formula for converting data into AADT (Volume 13, Section 1, Part 4: Traffic Input to COBA). This formula utilises the classification of the road and seasonality factors to convert the 16 hour traffic flow into AADT. Refer to Technical Appendix 5.7 B for further details.

5.7.3.25 The relevant traffic flow characteristics for this counter site are summarised in Table 5.7-9 below:

Table 5.7-9 Traffic Volumes on A950 West of Peterhead

Site 6 (2011)	Northbound No.	Southbound No.	Combined		
			No.	No. of HGVs	% HGVs
Seven Day AADT	3,149	3,164	6314	369	6 %
Five Day AADT	3,387	3,406	6,792	460	7 %

5.7.3.26 The data available from both Transport Scotland and Aberdeenshire Council did not provide adequate coverage of all the roads within the study area to be considered in the assessment. Due to this shortfall in existing data, new surveys were commissioned. Two sites were selected and their locations are indicated in Figure 5.7-2, Volume 6 b and Table 5.7-10 below:

Table 5.7-10 Local Traffic Count Sites

Ref.	Site	Easting	Northing
7	A952 North of Mintlaw	399856	849271
8	A952 South of Mintlaw	400317	846567

5.7.3.27 These surveys were undertaken using automatic traffic counters that were installed on 3rd October 2011 and were left in-situ for seven days. The information collected provides details of total flows in each direction and the proportions of HGVs on these roads.

5.7.3.28 The traffic flows recorded at Sites 7 and 8 provided details of a week within a neutral month and the average flows were utilised to calculate the AADT. This interpretation of the data again utilised the methods outlined in the DMRB, taking account of the seasonality of the data. Refer to Technical Appendix 5.7 B for further details. The AADT data is summarised below in Table 5.7-11 and Table 5.7-12 for both locations.

Table 5.7-11 Traffic Volumes on A952 North of Mintlaw

Site 7 (2011)	Northbound No.	Southbound No.	Combined		
			No.	No. of HGVs	% HGVs
Seven Day AADT	3,080	3,123	6,202	245	4 %
Five Day AADT	3,341	3,357	6,698	299	4 %

Table 5.7-12 Traffic Volumes on A952 South of Mintlaw

Site 8 (2011)	Northbound No.	Southbound No.	Combined		
			No.	No. of HGVs	% HGVs
Seven Day AADT	2,693	2,727	5,420	240	4 %
Five Day AADT	2,910	2,913	5,823	293	5 %

5.7.3.29 A sense check was applied to the traffic flow data. Site 1, located on the Ellon Bypass, was compared with the flows at site 2, at Cruden Bay. This check confirmed the expected split in traffic at the intersection of the A90 and A952 with vehicles travelling to both Peterhead and Fraserburgh, respectively. When flows from the A952 are taken into consideration, the sum of site 2 and site 7 flows compare favourably with those at site 1.

5.7.3.30 Comparing the flows at sites 2 and 3, there is an indication that some of the traffic on the A90 is absorbed locally and also enters Peterhead on one of the southern approach roads, given the decrease in traffic volumes at site 3.

5.7.3.31 With the traffic that continues along the A90 around Peterhead at site 3, it is assumed that while a proportion of the traffic is associated with the Port at Peterhead, a percentage continues north to other local areas around Rattray Head and also the gasworks at St. Fergus. It can also be assumed that some of this traffic has been generated locally. This is confirmed by the flows recorded at site 4 at Inverugie which are higher than those at site 3.

5.7.3.32 No traffic flows were available or recorded north of St. Fergus until the A952 has re-merged with the A90. Site 5 is located to the south of Fraserburgh and accounts for traffic from the A952 and from the A90 north of Peterhead. Given that the sum of traffic flows from sites 4 and 8 is greater than that recorded at site 5, it can be assumed that a large proportion of traffic on the A952 is travelling to Fraserburgh and that a considerable proportion of the flow from site 4 is absorbed both locally and at the gasworks at St. Fergus.

5.7.3.33 The baseline data for the traffic impact assessment will be taken from all eight sites to determine the percentage increases in general traffic and HGV volumes as this represents a complete set of data on the affected road network.

Road Capacities

5.7.3.34 Typical capacities for a variety of road types are provided within DMRB (Volume 15, Table 5 / 3 / 1). These capacities, which are quoted as two-way flows in vehicles per hour, have been extracted for the road classes surrounding the site and are summarised in Table 5.7-13 below.

Table 5.7-13 Road Capacities and Typical Peak Flows

Road Category	Description	Width (m)	Speed Limit (mph)	Capacity vph (two way flow per hour)	Typical Recorded Peak Flows vph (two way flows per hour)
A90	Rural - Typical Single	7.3	60	2,400	668
A950	Rural - Typical Single	7.3	60	2,400	769
A952	Rural - Typical Single	7.3	60	2,400	665
B9033	Rural – Poor Single	5.5	60	1,600	–
C-Road	Rural – Poor Single	5.5	60	1,600	–

5.7.3.35 Comparing the recorded hourly flows on all the roads examined with the capacity limits indicated above, it is apparent that all roads within the vicinity of the site are operating well below their respective capacity limits. This would indicate that there is a low degree of sensitivity of the local road network in terms of traffic volume to any changes in these flows. The nature of the routes, change in character at particular locations. However this is unlikely to have an appreciable effect on capacity.

Accident Records

5.7.3.36 Through the consultation process neither Grampian Police nor Aberdeenshire Council have raised concerns regarding road safety or accident black spots on the road network in the study area.

5.7.4 Change within the Environment

5.7.4.1 The above discussions and data illustrate the baseline conditions at this point in time and include all existing influences. The predicted changes in the baseline conditions over the lifetime of the development are examined below in order to ensure that the effects are properly considered against any changing environmental baseline.

- 5.7.4.2 Within the context of traffic and transportation, the following possible changes will be examined:
- General traffic growth / decline on the road network;
 - Effects of other known developments that are sufficiently progressed in the planning system on the existing traffic patterns (not included under general changes); and
 - Possible upgrades by roads authorities to the road infrastructure.

General Traffic Growth

5.7.4.3 The traffic flow data available for the roads within the study area are from surveys in different years (2009 to 2011). The effects of traffic growth can be calculated using the National Road Traffic Forecasts (1997). These forecasts provide growth projections for both the trunk and local roads. The appropriate growth factors from the base traffic year to the predicted construction period are indicated in Table 5.7-14 below. Central growth factors, which represent the most likely outcome, were applied to the total AADT. However, low growth factors were applied to the HGV figures. Using low growth projections for the traffic data maximises the likely effects due to development traffic. These factors have been applied to the raw traffic flow data in the previous tables. The factored traffic flow data can be found in Technical Appendix 5.7 C for the future year base flows.

Table 5.7-14 Growth Factors for Traffic Flow Data

Road	Year	G.F. All Vehicles	G.F. HGV
Site 1 - A90 Ellon Bypass (Trunk)	2009	1.0847	1.1359
Site 2 - A90 Cruden Bay (Trunk)	2009	1.0847	1.1359
Site 3 - A90 Peterhead (Trunk)	2009	1.0847	1.1359
Site 4 - A90 Inverugie (Trunk)	2010	1.0589	1.1142
Site 5 - A90 Fraserburgh (Trunk)	2009	1.0847	1.1359
Site 6 - A950 Peterhead (Other)	2011	1.0459	1.0932
Site 7 - A952 North Mintlaw (Other)	2011	1.0459	1.0932
Site 8 - A952 South Mintlaw (Other)	2011	1.0459	1.0932

Effects of Other Developments

5.7.4.4 Various known developments have been identified at the scoping stage that are expected to be under construction at the same time as this development. The developments to be considered for the cumulative effects are listed in Chapter 1.3 (Environmental Impact Assessment) and will be assessed in Chapter 15.7 (Traffic and Transport).

Planned Changes to the Road Network

5.7.4.5 Based on the consultations carried out with the road authorities, there are no planned changes to either the local or trunk road network in the vicinity and construction time scale of the development.

5.7.5 Legislative and Planning Framework

- 5.7.5.1 Policy and guidance relevant to transportation are provided at a national level through the Scottish Planning Policy (SPP) and Planning Advice Note 75 – Planning for Transport (PAN 75).
- 5.7.5.2 Regional and local policy is contained in the Aberdeen City and Shire Structure Plan and the Aberdeenshire Local Plan (including the current draft update).
- 5.7.5.3 The methodology employed in this assessment and preparation of the baseline data has been developed from specific guidance for Traffic Impact Assessment set out in guidance published by IEMA in Guidelines for the Environmental Assessment of Road Traffic and IHT in Guidelines for Traffic Impact Assessment.

5.7.6 References

Design Manual for Roads and Bridges (2005), Volume 13 Economic Assessment of Road Schemes.

Design Manual for Roads and Bridges (2005), Volume 15 Economic Assessment of Road Schemes in Scotland.

Institute of Environmental Management and Assessment. "Guidelines for the Environmental Assessment of Road Traffic – Guidance Notes No. 1". Institute of Environmental Management and Assessment.

Institution of Highways and Transportation (1994). Guidelines for Traffic Impact Assessment. Institution of Highways and Transportation.

National Road Traffic Forecasts (1997), Department of the Environment, Transport and the Regions.

5.8 Other Human Activities

5.8.1 Introduction

- 5.8.1.1 This chapter describes the other human activities (with marine components) occurring within or in the vicinity of the proposed Telford, Stevenson and MacColl offshore wind farm sites and the associated offshore transmission infrastructure (OfTI). Activities include other offshore wind farm projects, military practice and exercise areas, oil and gas activity, marine dredging and disposal, telecommunications, and subsea cables and pipelines. The potential for unexploded ordnance within the offshore wind farm sites is also described.
- 5.8.1.2 The description of baseline conditions that follows is based upon desktop reviews of existing information, but primarily results from consultation with other operators with assets or interests in the Project area.
- 5.8.1.3 Note that the following chapters describe the following activities:
- Chapter 5.1 (Commercial Fisheries);
 - Chapter 5.2 (Shipping and Navigation);
 - Chapter 5.4 (Military and Civil Aviation); and
 - Chapter 5.6 (Socio-Economics, Tourism and Recreation).

5.8.2 Consultations

- 5.8.2.1 Consultation has been undertaken with key stakeholders to gather information on the offshore human activities that occur within the vicinity of the three proposed wind farms and transmission infrastructure and which may subsequently be impacted upon by the Project. Table 5.8-1 below summarises the issues that have been highlighted during consultation.
- 5.8.2.2 As a member of RenewableUK, MORL is involved in ongoing discussion with Oil and Gas UK, the Department of Energy and Climate Change (DECC) and The Crown Estate regarding the management of potential conflicts of interest between the offshore renewables and oil and gas industries.

Table 5.8-1 Consultation Summary

Organisation	Consultation Response	MORL Response
Marine Scotland	Marine Scotland noted that the Moray Firth Round 3 zone lies close to the Beatrice Offshore Wind Farm proposal within Scottish territorial waters of the Moray Firth, and that they welcome and encourage collaborative working between the developers in the area.	MORL is committed to ongoing collaboration as a member of the Moray Firth Offshore Wind Developers Group (MFOWDG) and adherence to the MFOWDG Cumulative Impact Assessment Discussion Document, which has involved joint gathering / sharing of baseline data and adherence to standardised impact assessment approaches.

Organisation	Consultation Response	MORL Response
Ministry of Defence	In response to the proforma submitted by MORL to the MoD at the Project scoping stage, the MoD stated that it would object to the Project unless mitigation measures are agreed that would minimise impacts upon danger area D807, which overlapped with parts of the proposed wind farm sites and transmission infrastructure. In March 2012, the D807 ceased to exist and subsequently the MoD has confirmed that they will not object to the Project on these grounds.	No action required.
Joint Radio Company (JRC) Limited	JRC stated that they do not foresee the proposed developments resulting in any interference to scanning telemetry systems. MORL confirmed this position in April 2012.	No action required.
Atkins Limited	Atkins stated that they do not foresee the proposed developments resulting in any interference to scanning telemetry systems. MORL confirmed this position in April 2012.	No action required.
Office of Communications (OFCOM)	OFCOM do not foresee the proposed developments resulting in any interference to civil microwave fixed links. MORL confirmed this position in April 2012.	No action required.
British Broadcasting Corporation (BBC)	Self assessment tool – details submitted March 2012 and again May 2012 (awaiting response).	Awaiting response.
Health and Safety Executive (HSE)	HSE confirmed that no safety zones are present around the four abandoned well heads within the Telford and MacColl sites.	No action required.
Scottish Hydro Electric Transmission Limited (SHEL) (ongoing)	Several meetings held with SHEL to discuss planned MORL, BOWL and SHEL cable routes. SHEL has agreed to re-route their consented cable around the boundaries of the MORL wind farm sites.	Ongoing consultation with SHEL required to keep up-to-date with plans for the development of the SHEL hub and cable routes.
Faroese Telecom (ongoing)	Faroese Telecom is aware of the proposed MORL development. Further consultation is planned to determine cable crossing agreements, if required.	Ongoing consultation with Faroese Telecom to determine cable crossing agreements.
Caithness Petroleum Ltd (ongoing)	Caithness Petroleum Ltd has previously met with MORL and is aware of the proposed development. Further consultation is planned to understand whether Caithness Petroleum Ltd intends to further explore and develop any assets within their licensed areas. MORL attempted to contact Caithness Petroleum Ltd in late 2011 / early 2012 and continue to seek to establish contact.	Ongoing consultation to understand intentions for exploration within their licence areas.

Organisation	Consultation Response	MORL Response
Ithaca Energy (ongoing)	Ithaca Energy is aware of the proposed MORL development. Consultation is ongoing with opportunities for collaboration being exploited (e.g. MORL LIDAR system installed on Jacky platform, with metocean data shared by MORL and Ithaca Energy). Ithaca Energy has requested that they be kept up to date by MORL on the outputs of consultation and studies relating to potential impacts of development on shipping and navigation, helicopter access to offshore platforms, and the effects of underwater construction noise upon marine mammals.	Ongoing consultation and sharing of information with Ithaca Energy.
Royal Society for the Protection of Birds (RSPB)	Requested that information is provided on the Project's carbon balance (for further detail see Chapter 1.4).	MORL has provided calculations relating to the potential energy generated and CO ₂ emissions savings produced from the proposed Telford, Stevenson and MacColl offshore wind farms. Calculations are presented in Chapter 8.7.

5.8.3 Offshore Generating Station and Transmission Infrastructure Baseline

Desktop Studies and Consultation

5.8.3.1 Other human activities have been described through desk-based study of available data and information gathered during the consultation process. Available data sources used to inform this chapter include:

- United Kingdom Offshore Operators Association (UKOOA)(location of submarine cables and pipelines);
- United Kingdom Cable Protection Committee (UKCPC)(location of submarine cables);
- The Crown Estate (offshore wind farm lease sites);
- UK DEAL (oil and gas infrastructure);
- Department of Energy and Climate Change (DECC) (oil and gas licensing);
- SeaZone (licensed areas, safety zones and seabed infrastructure);
- DECC Strategic Environmental Assessments (other marine users); and
- Marine Scotland (dredging and marine disposal sites).

5.8.3.2 A detailed desktop study was commissioned by MORL to identify the potential for unexploded ordnance (UXO) to occur within the proposed wind farm sites, and the threats and risks associated with it (Technical Appendix 5.8 A).

5.8.4 Offshore Wind Farm Projects

- 5.8.4.1 The Beatrice Wind Farm Demonstrator Project is located adjacent to the Beatrice oil field, immediately to the west of the Moray Firth Round 3 Zone. It is comprised of two 5 MW wind turbines and was developed in 2007 by Scottish and Southern Energy (SSE) and Talisman Energy. The Project has a proposed lifespan of five years and all electricity generated is fed to a nearby oil platform.
- 5.8.4.2 In 2009, the joint venture Beatrice Offshore Wind Farm Limited (BOWL) (a partnership of SSE Renewables and Repsol Nuevas Energias, formerly SeaEnergy Renewables) was awarded an exclusivity agreement by The Crown Estate to develop the Beatrice Offshore Wind Farm in Scottish Territorial Waters. The lease area lies adjacent to the north eastern boundary of the Moray Firth Round 3 Zone, and MORL proposes a buffer equivalent to 5 WTG rotor diameters along the MORL / BOWL boundary. The wind farm is expected to have a capacity of up to 1,000 MW, with construction commencing in 2014 and the Project being operational by 2017. It is expected that there will be some overlap in the BOWL and MORL construction schedules.
- 5.8.4.3 In order to minimise conflict and encourage collaboration, and in light of the potential for cumulative impacts to arise, MORL and BOWL have formed the Moray Firth Offshore Wind Developers Group (MFOWDG) in association with The Crown Estate (TCE). Via MFOWDG, MORL and BOWL have undertaken joint consultation and agreed upon standardised approaches to the Environmental Impact Assessment (EIA). It is envisaged that collaboration will continue through construction and into wind farm operation and potentially decommissioning.

5.8.5 Military Practice and Exercise Areas

- 5.8.5.1 Practice and Exercise Areas (PEXA) are used for various military practice activities by the Royal Navy, the Army, the Royal Air Force (RAF) and the Ministry of Defence (MoD). Figure 5.8-1, Volume 6 b shows those PEXA that are proximate to the three proposed wind farms and the offshore transmission infrastructure. Portions of the proposed Telford and MacColl wind farm sites and lengths of the proposed export cable route to Fraserburgh lie within danger area D809(South), which is used by the RAF for a variety of practice flying and firing exercises. Portions of the proposed MacColl Wind Farm site and export cable overlap with danger area D807, which is used by the RAF for live firing, bombing and sonobuoy training. However, since 1st March 2012, D807 has been permanently and completely withdrawn (Notice to Airmen No. B0238 / 12) and an initial objection from the MoD to the proposed wind farm development was withdrawn by the MoD in February 2012 (Technical Appendix 1.4 C).

5.8.6 Oil and Gas Operations and Infrastructure

- 5.8.6.1 There are two operational oil fields to the southwest of the proposed Telford, Stevenson and MacColl wind farm sites, adjacent to the westernmost boundary of the Western Development Area (WDA). The Beatrice oil field (Block 11 / 30a) commenced production in 1981 and the Jacky oil field (Block 12 / 21c) commenced production in 2009. Infrastructure within the fields comprises the Beatrice Alpha, Bravo and Charlie platforms, the Jacky platform, and seabed cables and pipelines linking the platforms (see Figure 5.8-2, Volume 6 b). Beatrice Alpha, Bravo and Charlie are owned by Talisman Energy and operated by Ithaca Energy. The Jacky platform is owned and operated by Ithaca Energy.

- 5.8.6.2 These fields and their associated infrastructure do not overlap with the proposed boundaries of the three wind farms or associated offshore transmission infrastructure.
- 5.8.6.3 There are four existing but abandoned wellheads within the Project boundaries: two within the proposed Telford site; and two within the proposed MacColl site. Correspondence with the HSE has confirmed that there are no mandatory safety zones associated with the wellheads.
- 5.8.6.4 In terms of the potential for future exploration and production within the Project boundaries, the three proposed wind farm projects overlap with currently active, but as yet un-exploited, licence blocks.
- 5.8.6.5 Blocks 12 / 22b and 12 / 23b are held by Caithness Petroleum Ltd, having been awarded during the 25th oil and gas licensing round in 2010. Consultation with Caithness Petroleum Ltd highlighted that the prospects that are under current investigation lie to the east of the proposed wind farm sites. MORL is in discussion with Caithness Petroleum Ltd, who are yet to confirm whether they consider the prospects viable or not and whether they will progress the development of any potential assets.
- 5.8.6.6 During the 26th oil and gas licensing round in 2010 / 2011, potential licence awards were made to Sendero (block 12 / 21b, which overlaps with the proposed Stevenson offshore wind farm site), and to Suncor (blocks 12 / 26b and 12 / 27, which overlaps with the proposed Stevenson and MacColl wind farm sites). The overlapping boundaries are shown in Figure 5.8-2, Volume 6 b. MORL is seeking to establish contact with Sendero and Suncor in order to understand their intentions in terms of block investigation.
- 5.8.6.7 The 27th oil and gas licensing round is ongoing. One of the blocks on offer (12 / 22 A) overlaps with the northernmost portion of the Telford site. Potential awards are not expected to be made prior to MORL consent application.
- 5.8.6.8 MORL is also aware of the potential development of the Polly prospect by Ithaca Energy, which lies 2.5 km to the east of the existing Beatrice field within the blocks 11 / 30 A and 12 / 26 C. This is within the WDA of the Moray Firth Round 3 Zone and adjacent to the three proposed wind farms. Ithaca Energy currently state that development of Polly is not commercially viable (Ithaca Energy, 2011).

5.8.7 Marine Dredging and Disposal

- 5.8.7.1 Dredging and disposal activity within the Moray Firth is sporadic and associated with ports, harbours and coastal marine disposal sites (see Figure 5.8-1, Volume 6 b). Activities are therefore located some distance from the proposed offshore wind farms and much of the OfTI. Where the proposed export cable nears the coastline at Fraserburgh, it will travel within several kilometres of the existing 'Fraserburgh' marine disposal site, though at no point will overlap with it. It is considered unlikely that the MORL Project will result in any impacts upon dredging and disposal activity or marine disposal sites and as such these activities are not considered within the EIA.

5.8.8 Subsea Cables and Pipelines

- 5.8.8.1 There are no existing sub-sea cables within the proposed offshore wind farm boundaries.
- 5.8.8.2 There is one consented but not constructed cable route which crosses all three proposed wind farm sites. The route was consented by Scottish Hydro Electric Transmission Limited (SHETL) and runs between a converter station at Upper Kergord (Shetland) and Blackhillock (mainland Scotland). SHETL is obliged to develop a transmission connection for those renewable energy projects that have been consented on the Shetland Isles (e.g. Viking Wind Farm). In accordance with the conditions of the offshore cable consent, SHETL are obliged to consult and agree cable routing and installation timing with MORL prior to the commencement of any work. As a result of these discussions, SHETL has agreed to re-route their cable around the boundaries of the three proposed wind farms.
- 5.8.8.3 There is an existing telecommunications cable (SHEFA-2 Seg.9) to the east of the three proposed wind farm sites (owned by Faroese Telecom). The cable runs from the Orkney Islands to the Scottish coast west of Fraserburgh and passes approximately 0.5 to 1 km east of the Telford and MacColl site boundaries. Within 12 nm of the coast, SHEFA has specific seabed rights granted to them as part of their seabed lease with The Crown Estate. In particular, permission must be granted by the cable owner for any works planned to be undertaken within 250 m either side of the cable. Where works are within 1 km of the cable, the operator must be notified prior to any works being undertaken.
- 5.8.8.4 The proposed MORL offshore DC export cable will need to cross both the consented SHETL and existing SHEFA cables in order to make landfall at Fraserburgh and therefore cable crossing and notification of works agreements will need to be established with both operators.
- 5.8.8.5 There are no pipelines within or adjacent to the three proposed wind farms or offshore transmission infrastructure.

5.8.9 Telecommunications

- 5.8.9.1 An initial screening exercise of the potential impacts of the development of the Moray Firth Round 3 Zone on telecommunications was undertaken in 2009 (Pager Power, 2009). The study stated that development in the Eastern Development Area (EDA) would not interfere with existing microwave links, scanning telemetry or non-aviation radar and would not cause TV or radio interference. Stakeholders requested that MORL sought re-confirmation of this position prior to consent application being made because the use of the spectrum is dynamic and the use of the band changes on an ongoing basis. Further consultation in April 2012 confirmed the development of the Telford, Stevenson and MacColl wind farms is not expected to result in any interference to existing telecommunications systems.
- 5.8.9.2 Telecommunications used by the Beatrice and Jacky oil platforms are set up via satellite and will therefore not be affected by wind farm development.
- 5.8.9.3 It is considered unlikely that the MORL Project will result in any adverse impacts upon telecommunications systems and as such, these systems are not considered any further within the EIA.

5.8.10 Unexploded Ordnance

5.8.10.1 MORL commissioned a desk-based study (6 Alpha Associated Ltd, 2011) to identify the risk posed to the MORL Project by unexploded ordnance (UXO), and to identify potential measures by which any risks may be reduced to an acceptable level. The study identified potential UXO sources based on analysis of a variety of data and presents the results of a UXO risk assessment which considered the hazards associated with the potential UXO sources. The study also recommends measures to be taken to minimise the risk posed by potential sources of UXO. The results of the study are provided in full in Technical Appendix 5.8 A.

5.8.10.2 UXO threat within the Moray Firth offshore area is primarily the result of munitions and weaponry employed during World War I and World War II: sea-dumped munitions / explosives, shipwrecks carrying munitions / explosives, and sea mines represent the main sources of UXO within the region. Table 5.8-2 below summarises information on potential UXO sources within the region.

Table 5.8-2 Potential UXO Sources

UXO Sources	Regional Summary
Bombed Areas	Present. Allied aircraft attacked at least one U-Boat in the region (though outside of Project boundaries) in 1944. It is known that Axis aircraft bombed allied shipping in this region in 1939 / 1940.
Axis Minefields	Present. Mine lying in the region during WWI. <i>HMS Lynx</i> was sunk by an Axis mine in 1915. Axis mine laying in WWII not recorded; sporadic mine laying by U-Boat and air likely.
Allied Sea Minefields	Present. 463 mines laid in WWI within 20 nm of the Round 3 Zone to counter U-Boats. Approximately 5,600 mines laid in WWII within 30 to 40 nm of the site to 46 nm of the Round 3 Zone to counter U-Boats and general invasion.
Military Training Ranges	Present. Historical and current Royal Navy, Army and Royal Air Force training ranges overlap with the proposed wind farm sites and transmission infrastructure. Ranges have supported torpedo, anti-aircraft and bombing practice historically, and more recently missile, torpedo, air-to-air firing and small arms ammunition practice.
Munitions-related Shipwrecks	Present. Four of the wrecks present within the proposed wind farm sites were sunk by either mines, torpedoes, gunfire or bombing. The wreck of the <i>HMS Lynx</i> , which lies immediately to the south of the proposed MacColl site southernmost boundary, holds some UXO.
Munitions Disposal	Present. Sea mines were cleared post-WWII. It is suspected that some sea mines may remain in place in the region as a result of ineffectual clearance techniques.

5.8.10.3 The probability of UXO encounter within the Moray Firth Round 3 Zone has been mapped on the basis of desk study findings (see Technical Appendix 5.8 A). The majority of the EDA is considered to have a background residual UXO threat resulting from general wartime and subsequent military training activities in the region. Within the easternmost extents of the proposed Telford and MacColl wind farm sites, the probability of encountering UXO is slightly higher as a result of present military practice activity in danger area D809 South. In the southwest portion of the proposed MacColl Wind Farm site, UXO encounter probability is defined as 'highly likely'. This is driven by the presence of historical 'live' bombing ranges (i.e. the current military range D807 and WWII Armament Ranger 127A). UXO encounter is 'almost certain' on the wreck of the HMS Lynx, though this lies outside of and to the south of the MacColl Wind Farm boundary.

5.8.11 Individual Site Baseline Characteristics

5.8.11.1 There is little to distinguish the three proposed wind farm sites. The key features of each site are summarised in Table 5.8-3 below.

Table 5.8-3 Wind Farm Site Characteristics

Proposed Wind Farm	Summary of Baseline Characteristics
Telford	Existing oil and gas licence block award (Caithness Petroleum Ltd) Two abandoned well heads Partial overlap with danger area D809 UXO encounter probability varies between 'possible' and 'likely'
Stevenson	Existing oil and gas licence block award (Caithness Petroleum Ltd) Potential oil and gas licence block award (Sendero and Suncor) UXO encounter probability varies between 'possible' and 'highly likely'
MacColl	Existing oil and gas licence block award (Caithness Petroleum Ltd) Potential oil and gas licence block award (Sendero) Two abandoned well heads Partial overlap with danger area D809 UXO encounter probability varies between 'possible' and 'highly likely'

5.8.12 Legislative and Planning Framework

5.8.12.1 During Project development and in consulting with other operators, MORL has adhered to standard industry guidelines and procedures.

5.8.12.2 With reference to the potential for MORL wind farm and transmission infrastructure to interact with existing and planned subsea cables, MORL has adhered to recommendations provided by the International Cable Protection Committee (ICPC) and the UK Cable Protection Committee (UKCPC) regarding potential interactions with subsea cables. MORL is aware that the UKCPC is currently producing a new guideline in collaboration with the offshore wind industry and TCE, which is expected to be available later in 2012 (currently available in draft).

5.8.12.3 In order to ensure the safety of other sea users throughout the life time of the three proposed wind farms, MORL will also seek to establish safety zones around wind farm infrastructure during its installation and operation in line with the requirements of the Energy Act 2004 and the Electricity (Offshore Generating Stations) (Safety Zones) (Applications Procedures and Control of Access) Regulations 2007. It is expected that a 500 m rolling safety zone will be established around works during installation and 50 m operational safety zones will be established around wind turbine generators (WTGs) and offshore substation platforms (OSPs).

5.8.13 References

6 Alpha Associates. Unexploded Ordnance Threat and Risk Assessment with Risk Mitigation Strategy. Round 3 – Zone 1, Moray Firth Offshore Wind Farm. February 2011.

DECC. 26th Round webpage. Accessed January 2012 at: http://og.decc.gov.uk/en/olgs/cms/licences/lic_rounds/26th_round/26th_round.aspx

ICPC Recommendations. Available via: <http://www.iscpc.org/>

Ithaca Energy. Operations / Assets webpage. Accessed January 2012 at: <http://www.ithacaenergy.com/polly.aspx>

Notice to Airmen No. B0238/12 – Danger Area D807 Moray Firth Completely Withdrawn.

Pager Power. High Level Screening Assessment. February 2009.

Subsea Cables UK. The Proximity of Offshore Renewable Energy Installations and Submarine Cable Infrastructure. Provisional draft.11.2. May 31st 2012.

UKCPC. Guideline No. 6 – Guidelines for Proximity of Wind Farm Developments and Submarine Cables. Issue 3, September 2010.

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