

9. TERRESTRIAL ECOLOGY

Additional information relevant to Section 9 is presented in Appendix F in Volume 2 of 3 of the EIS.

9.1 RECEIVING ENVIRONMENT

Emphasis is placed on identification of natural and / or semi-natural habitats and assessment of their quality.

9.1.1 Statutory Context

The ecological assessment has been undertaken with due consideration to the following legislation:

- The European Communities (Birds and Natural Habitats) Regulations 2011
- Wildlife Acts 1976-2012;
- The Habitats Directive 92/43/EEC;
- The Birds Directive 2009/147/EC;
- European Communities (Environmental Impact Assessment) (Agriculture) Regulations 2011.
- European Union (Environmental Impact Assessment and Habitats) Regulations 2011.
- European Union (Environmental Impact Assessment and Habitats) Regulations.
- Flora (Protection) Order, 1999.

In addition, in considering the ecological impacts of the proposed development, regard was made to the following guidance and information documents:

- CIEEM (2006). Guidelines for Ecological Impact Assessment (Chartered Institute of Ecology and Environmental Management).
- DAHG (2011). Irelands National Biodiversity Plan: Actions for Biodiversity 2011 – 2016.
- Fossitt (2000). A Guide to Habitats in Ireland.
- NRA (2005). Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes.
- NRA (2006a). Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes.
- NRA (2006b). Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes.
- NRA (2006c). Guidelines for the Treatment of Otters prior to the Construction of National Roads Schemes.
- NRA (2006d). Guidelines for the Treatment of Bats during the Construction of National Roads Schemes.
- NRA (2009). Ecological Surveying Techniques for Protected Flora and Fauna

during the Planning of National Road Schemes.

- NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes.
- Smith et al. (2011). Best Practice Guidance for Habitat Survey and Mapping in Ireland.

9.1.2 Wind Farm Site

The wind farm site is located in the upper reaches of the Roughty River valley within the Derrynasaggart Mountains. The general topography of the wind farm site is upland mountain, both gently sloping hillsides and areas of more rocky hill slope with a topography of undulating rocky ridges and inter-ridge depressions which radiate from the sides of the hills to lowland river valleys sculptured by riverine erosion and glacial processes. The site is underlain by folded Old Red Sandstone, the bedding of which is much in evidence at the site. Altitudes vary from less than 200 m OD along the Roughty River valley in the northern sector to 530 m OD at the summit of Coomataggart in the south-east and up to 550 m OD in the south-western sector.

The site is drained by the Roughty River and its tributaries. The Roughty rises in the immediate vicinity and flows in a westerly direction through the village of Kilgarvan. It continues westwards to the sea at Kenmare.

The main landuse within the site is grazing by sheep. Grazing appears to occur throughout and is locally intensive. Parts of the lower lying ground along the river valleys comprise semi-improved and improved grassland fields. A small forest plantation, which is recently clear felled, occurs in the northernmost part of the site, with extensive established forestry to the north-east. A series of wind farm developments occur in the wider area.

9.1.3 Underground Cable

The cable route is almost entirely confined to the existing road network, diverging slightly from it at watercourse crossings and at some joint bay locations.

The vast majority of the cable route and associated joint bay construction (an intrinsic element of underground cable circuits where separate lengths of cable are joined together in an underground chamber) is along or adjacent to public roads. The main exception occurs in six instances along the route where river crossings will be by means of horizontal directional drilling (HDD) requiring a localised route, off the public road. For minor watercourse and drainage ditch crossings some off-road works will also be required.

For approximately 10 km from Ballyvouskill Substation the route is within or alongside the Mullaghanish to Musheramore SPA and is upland in character, comprising mostly afforestation (Conifer plantation ED4) and upland grazing pastures (latter varying from Wet grassland GS4 to Improved grassland GA1). These habitats are interspersed with areas of heath (both Wet heath HH1 and Dry heath HH3) and Exposed rock ER1. The road crosses various upland streams (Eroding/upland rivers FW1).

Approaching Ballyvourney, the route skirts the Bohill River for a stretch. A tributary and the main channel of the Bohill River are crossed. The route then proceeds through and alongside the Cascade Woods section of the St. Gobnet's Wood cSAC, which comprises various natural woodland (WN) and modified (WD) woodland types.

At Ballyvourney the route crosses the N22 and is directed beneath the main channel of the Sullane River. The main part of St. Gobnet's Wood is on high ground to the southeast of

the crossing point. The direction is now generally south-westwards. From Ballyvourney to Coolea, the route is alongside the Sullane River. The river channel has well developed riparian vegetation along the margins which broadens to Riparian woodland (WN5) in places. Much of the land, however, is pasture grassland of varying quality though there are patches of Heath (HH) and Scrub (WS1) in places.

The route continues within the Sullane valley to the west of Coolea. A remnant area of low-lying bog (Blanket bog PB) occurs between the road and the river channel, with areas of heath (mainly Dry heath HH1) on rocky ground to the south of the road.

At Lumnagh More heath and conifer plantations becoming a feature. An upper tributary of the Sullane River is crossed at Lumnagh Beg and west of this there is extensive afforestation extending to west of Derrylahan. The route continues to rise towards The Coom on the Cork/Kerry border.

The Sillahertane Stream flows to the south of the road, with the landscape here more open with heath and small grassland fields. There is a crossing of the Sillahertane Stream just south of the road junction and conifer plantations (WD4) appear again along with some mixed broadleaved woodland (WD1). Rhododendron is frequent within the woods and along the road sides. This section skirts the valley of the Roughty River, with small pasture fields characteristic of the area. The final section is along a track which passes the entrance to Sillahertane Wind Farm, with Sillahertane Bog NHA to the east. Access to the Coomataggart 110 kV substation is via approximately 1.3 km of track internal to Grousemount Wind Farm.

Apart from commercial forestry, the principal landuse along the route is grazing by sheep. There are a number of constructed and permitted wind farm developments within the wider area.

9.1.4 Evaluation of Ecological Significance

The impact significance is a combined function of the value of the affected feature (its ecological importance), the type of impact and the magnitude of the impact. It is necessary to identify the value of ecological features within the study area in order to evaluate the significance and magnitude of possible impacts.

The method of evaluating ecological significance used herein is broadly based on guidelines issued by Chartered Institute of Ecology and Environmental Management (CIEEM) 2006 and the National Roads Authority (NRA) 2009. The results of the habitat and fauna surveys were evaluated to determine the significance of identified ecological features located in the study area on an importance scale ranging from international → national → county → local. The local scale is approximately equivalent to one 10 km square but can be operationally defined to reflect the character of the area of interest. Because most sites will fall within the local importance scale, this is sub-divided into local importance (high value) and local importance (low value) (see NRA 2009).

9.1.5 Methodology - Desk Review

A comprehensive desktop review was carried out to identify features of ecological importance within the study area and surrounding region. A review of designated sites was carried out as part of the desktop study (see www.NPWS.ie).

Consultation with the Department of Arts, Heritage and the Gaeltacht took place through the Development Applications Unit. Whereas a response issued in relation to the cable, a response relating to the wind farm remains outstanding.

9.1.6 Methodology – Field Surveys – Wind Farm

Field Surveys - Habitats and Vegetation

The Grousemount sector of the site was surveyed initially in August 2003 as part of an earlier assessment for a wind farm on this site. Further surveys were carried out in September 2008 (specifically the Knockanruddig sector) and in November 2010 (entire site). (The above surveys were carried out by John Conaghan, Brian Madden & Mary O'Connor, BioSphere Environmental Services.)

The Barnastooka sector of the site was surveyed initially between September 2008 and January 2009. (The survey carried out by Carl Dixon & Mark Donnelly of Dixon Brosnan Consultant).

An updated habitat/vegetation survey was carried out in early November 2014 (John Conaghan, BES). This focused on the Barnastooka sector of the site. A further site visit was made in July 2015 to check for the presence of the rare hawkweed species at the main river and stream crossings within the wind farm site.

In the surveys, much of the site area was walked, the habitats present were noted and a list of vascular plant, moss and liverwort species present compiled. During the surveys, emphasis was placed on the locations for turbines and the connecting roads. In addition to recording the presence of habitats and species, further important parameters such as the relative abundance of plant species, condition of the vegetation and degree of disturbance were noted. The field survey and habitat mapping was aided by use of colour aerial photographs of the site.

Main habitats noted within the site are classified in accordance with the scheme of Fossitt (2000). Where relevant, linkages with the EU Habitats Directive classification system are given. Plant nomenclature in this report follows Stace (1995) for vascular plants, Smith (1978) for mosses, Smith (1991) for liverworts.

At all times, particular attention was given to the possible presence of habitats and/or plant species that are legally protected under Irish or European legislation (especially the Flora Protection Order 1999 and EU Habitats Directive).

Field Surveys - Mammals (Including Bats)

Terrestrial mammal species were detected either by direct observations or by search for signs, such as dwellings, e.g. setts, tracks or feeding signs. Observations for mammals were made during the various bird and habitat surveys. In addition, sections of the main river channel through the site were walked for signs of otter.

As bats can be affected by wind farms and the site is within the range of the lesser horseshoe bat (Annex II listed species), a specific bat assessment was carried out by Mr Conor Kelleher. The assessment was based on personal experience by Mr Kelleher of bat distribution in the immediate area.

Field Surveys - Birds

The Grousemount sector of the site was surveyed initially for birds in July 2003 as part of an earlier assessment for a wind farm on this site. Further bird surveys with particular focus on the Knockanruddig sector were carried out in September 2008 and in November 2010 (entire site). All above surveys were carried out by Dr Brian Madden (BES).

The Barnastooka sector of the site was surveyed initially in July 2008, December 2008 and November 2009 (surveys carried out by Colin Barton of Cork Ecology).

The above surveys involved traversing the site area and observing sections of the site and environs for periods of between 30 minutes and 120 minutes from suitable vantage points. Emphasis was placed on the early morning and late-afternoon to evening periods when birds are most active.

It is noted that at the time of the surveys, contact had been made with National Parks & Wildlife Service (NPWS) (specifically David Norriss, Research Branch & Paddy O'Sullivan, Regional Manager) regarding the breeding status of Hen Harrier in the local area. As it was indicated that the Grousemount wind farm site was not within a known breeding area for hen harriers, it was considered that a specific survey for this species (following the methodology of Scottish Natural Heritage) was not merited.

A full winter bird survey of the entire site was carried out in 2014/15, with monthly site surveys (each extending over three days) between October and March. The main focus of this survey was for the possible presence of White-tailed Eagle, which could pass through the area since they are now established in the southwest as a result of the re-introduction programme. During the survey, all wintering bird species were recorded. This survey was carried out by Brian Madden & Joe Adamson (BES). As the final survey was in late-March 2015, some birds were already establishing breeding territories at this stage.

Kerry Slug

Full details of the methods used to assess the status and distribution of this legally protected and Annex II listed species are presented in Appendix F.5.

A desktop assessment including a review of previous records of Kerry Slug within and surrounding the study area was undertaken.

There are three main survey approaches that are used to survey for Kerry Slug. These include hand searching techniques (diurnal or nocturnal) and live refuge trapping (metric traps). The method used during the current survey is live refuge trapping as recommended for use by McDonnell et al. (2013). This method is favoured over other techniques because it enables quantitative sampling (McDonnell and Gormley 2011a,b). In addition, it removes the requirement of undertaking searches during wet weather (in the case of diurnal searches), and the health and safety risks associated with nocturnal searches in remote locations. The metric trap method involves the following:

- Metric traps. This is a refuge trap technique. The metric traps (0.25 m²), manufactured by De Sangosse (Pont du Casse, France), are made up of absorbent material covered with a reflective upper surface and a black perforated plastic on the underside. They are wetted in advance of being laid out and are baited with Carrot. Traps are secured to rock outcrops (outcrop metric traps) or on surface vegetation (in the case of heath) using stones, tent pegs, or nails as appropriate. They can also be wrapped around tree trunks (banded metric traps) when undertaking surveys at wooded sites (not relevant to current survey). Traps are checked weekly for a period of up to six weeks. If required, traps are re-wetted during site visits using a watering can.

In all, 31 metric traps were set out amongst potentially suitable habitat within the wind farm site during early August 2015. In addition to checking the metric traps, incidental observations of Kerry Slug were recorded during each site visit.

9.1.7 Methodology - Field Surveys - Cable

A multidisciplinary drive-over and walk-over survey of the entire underground cable route was undertaken between August and November 2014. Additional site visits were made in

December 2014 and January 2015 to review aspects of final design. Surveys were mostly conducted from public roads as the project is almost entirely in or adjacent to roads. Emphasis was placed on assessing semi-natural habitats, e.g. bog, heath, woodland and scrub, which occurred within the route corridor. A corridor width of 200 m centered on the underground cable route was considered during the survey though in places this varied due to local topography.

Field Surveys - Habitats

Target notes were made on habitats of ecological interest encountered during the survey including notes on dominant vegetation, plant species diversity, vegetation structure, drainage, disturbance and management. The habitats encountered on site were classified in accordance with Fossitt (2000), with linkages to the EU Habitats Directive Annex I habitats where relevant. Principal habitats were plotted onto a series of field maps at a scale of 1:5,000.

Field Surveys - Fauna

During the site visits, the route was assessed for evidence of mammal activity. The presence of mammals is indicated principally by their signs, such as dwellings, feeding signs or droppings, though direct observations are also occasionally made. Survey also included search for habitats suitable for amphibians and reptiles. The nature and type of habitats present are also indicative of the species likely to be present (Smal 1995).

Particular attention was given to the possible presence of otters owing to their high conservation status. At the indicated river and stream crossings, stretches of approximately 50 m either side of the road bridge were assessed for otter presence, notably spraints, slides and holes that could be used as holts.

Owing to the nature of the project, i.e. cable located almost entirely within roads and tracks, a specialised survey for bats was not considered necessary and the project does not require the removal of any mature trees or buildings, which are potential bat roosts.

Bird species were recorded along the route corridor. As the survey was carried out largely in autumn and early winter, the type of habitats present were evaluated for their potential to support species of conservation value that might only be present in summer.

While Kerry Slug (Annex II listed species) is known to be resident in the general area, including St. Gobnet's Wood cSAC, a specialised survey for this important species was not considered necessary due to the fact that its usual habitats, namely deciduous woodland, blanket bog or unimproved oligotrophic open moor and lake shores (McDonnell & Gormley 2011), will not be affected by the works.

Based on the characteristics of the habitats present it was considered unnecessary to carry out assessments of other specialised species (such as marsh fritillary)

Survey Limitations and Constraints

The field surveys were undertaken principally from August - November 2014, which is still largely within the recommended period for botanical and habitat assessment. While access to private lands was generally not feasible (unless with permission from landowner), sufficient information could be obtained from public roads to make an evaluation of the habitat without the need for return visits.

While it was not possible to record mammal activity or tracks in areas of suitable habitat removed from the roadside, this is not considered a constraint as most construction works are in hardcore surfaces and adjoining habitats will be largely unaffected.

While preliminary survey for otter was carried out at proposed watercourse crossings, pre-construction otter survey be undertaken at river and stream crossings as a precautionary measure.

Overall, based on the characteristics of the proposed development, i.e. mostly confined to road corridor, and the nature of the habitats in proximity to the route, the survey methodology is considered adequate to determine the baseline ecology of the area.

9.1.8 Sites of Nature Conservation Importance

The Grousemount Wind Farm site adjoins the Sillahertane Bog Natural Heritage Area (NHA) along its eastern boundary and overlaps slightly with the Ballagh Bog proposed NHA (pNHA) along the southern boundary. An outline description of these sites along with all designated sites within a radius of 10 km of the wind farm and the cable route is presented below. In addition, the Kenmare River SAC is considered as the Roughty River flows into Kenmare Bay, while the Killarney National Park SPA is considered as it supports a population of the rare Greenland White-fronted Goose. The sites are shown in Figure 9.1 with site synopses (as prepared by NPWS) for each is presented in Appendix F.1.

Natural Heritage Areas (NHAs)

- Slaheny River Bog NHA (site code 00383): Situated approximately 3.5 km southwest of the wind farm site and at just over 7 km southwest of the permitted Coomataggart Substation. It comprises a mosaic of upland habitats, with wet heath, blanket bog and broad-leaved mixed woodland.
- Sillahertane Bog NHA (site code 01882): Situated immediately east of the wind farm site (adjoins site boundary) and north-east of the permitted Coomataggart Substation site, with the cable route passing close to the its south-western extremity. It is a fairly intact blanket bog and wet heath system, with some well-developed flushes.
- Doughill Bog NHA (site code 01948): Situated approximately 7.5 km west of the wind farm site. It is a fairly intact blanket bog system.
- Conigar Bog NHA (site code 02386): Situated approximately 3.5 km south of the wind farm site and at approximately 6 km south-west of the permitted Coomataggart Substation. It is a fairly intact upland blanket bog and wet heath system.
- Boggeragh Mountains NHA (site code 02447): Situated approximately 9 km north-east of the eastern end of the cable route. It includes good examples of blanket bog.

Proposed Natural Heritage Areas (pNHAs)

- Gouganebarra Lake pNHA (site code 01057): Situated in Co. Cork at approximately 2 km from the southern boundary of the wind farm site and at approximately 4 km south of the cable route extremity at the permitted Coomataggart Substation. It is a glacial lake which lies in the lower part of a corrie cut into the eastern flanks of the Shehy Mountains. Peregrine breeds on cliffs.
- Lough Allua pNHA (site code 01065): Situated approximately 5 km from the wind farm and at approximately 6 km south-east west of the western end of the cable route. It comprises a large lake complex.
- Roughty River pNHA (site code 01376): Situated approximately 3 km northwest of

the wind farm site and at approximately 4 km northwest of the cable route. It comprises a section of the Roughty River where an endemic species of Hawkweed (*Hieracium scullyi*) grows.

- Kilgarvan Woods pNHA (site code 01787): Situated approximately 5 km from the wind farm site and at approximately 7 km west of the southern end of the cable route. It comprises a broadleaved woodland just south of Kilgarvan.
- Ballagh Bog pNHA (site code 01886): Situated immediately south of the wind farm and overlaps slightly with its site boundary, and at approximately 2 km southwest of the cable route extremity at the permitted Coomataggart Substation. It comprises a high-level river plain and surrounding mountain slopes. There is a series of small valley bogs that are reasonably wet.

Candidate Special Areas of Conservation (cSACs)

- St. Gobnet's Wood cSAC (code 0106): Situated at approximately 11 km from the wind farm site and the Cascade Wood part of the SAC is in close proximity to the cable route. The underground cable route runs within the third class road that splits Cascade Wood into east and west sections. While the route crosses the Sullane River, the crossing here will be by directional drilling and the river and associated habitats (notably alluvial woodland) and species will not be affected.
- Kilgarvan Ice House cSAC (site code 0364): Situated approximately 7 km west of the wind farm site and at approximately 9 km west of the western end of the cable route. It comprises a complex of buildings and is a cSAC because it contains an important summer and hibernation roost of the Lesser Horseshoe Bat.
- Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment cSAC (code 0365): Situated approximately 7 km from the wind farm site and within 4 km of the cable route (at eastern end), with the Clydagh River corridor the closest point. It is a very large site extending from southwest of Millstreet to west of Killarney and supports a high diversity of Annex I habitats and Annex II species.
- Derryclogher (Knockboy) Bog cSAC and pNHA (site code 01873): Situated in Co. Cork just less than 5 km southwest of the wind farm site and at a distance of approximately 8 km southwest of the south-western end of the cable route. It is a blanket bog complex situated under the summit of Knockboy Mountain.
- Mullaghanish Bog cSAC (code 01890): Situated at approximately 17 km from the wind farm site and at approximately 1 km north of the eastern section of the cable route. It is centred around the summit of Mullaghanish Mountain on the Cork/Kerry border, and is a good quality mountain blanket bog, a habitat type which is listed with priority status on Annex I of the E.U. Habitats Directive.
- Old Domestic Building, Curraglass Wood cSAC (site code 02041): Situated approximately 6 km northwest of the wind farm site and at approximately 6 km northwest of the western end of the cable route. It comprises a stone dwelling and is a cSAC because it contains an important summer roost of the Lesser Horseshoe Bat.
- Kenmare River cSAC (code 02158): Situated approximately 15 km from the wind farm site and at approximately 17 km from the cable route. It is a long, narrow, south-west facing bay. It is a deep, drowned glacial valley and the bedrock is mainly Old Red Sandstone which forms reefs along the middle of the bay

throughout its length. Numerous islands and inlets along the length of the bay provide further areas of additional shelter in which a variety of habitats and unusual communities occur.

- Blackwater River (Cork/Waterford) cSAC (code 02170): Situated at approximately 15 km from the wind farm site and at approximately 4 km north of the westerly most section of the cable route. It is a very large site draining a major part of Co. Cork and five mountain ranges, and supports a high diversity of Annex I habitats and Annex II species, including Atlantic salmon and freshwater pearl mussel.
- Glanlough Woods cSAC (site code 02315): Situated just over 5 km west of the western boundary of the wind farm site and at approximately 8 km west of the south-western end of the cable route. It comprises a complex of buildings and is a cSAC because it contains an important maternity roost of the Lesser Horseshoe Bat.

Special Protection Areas (SPAs)

- Killarney National Park SPA (code 04038): Situated approximately 11 km from the wind farm site. It is a large site encompasses the lakes and part of the Macgillycuddy's Reeks in the vicinity of Killarney. The site is of ornithological importance as it supports a good diversity of upland and woodland birds, as well as wintering waterfowl. It is a traditional site for a population of Greenland White-fronted Geese and supports breeding Merlin.
- Mullaghanish to Musheramore Mountains SPA (code 04162): It comprises a substantial part of the Boggeragh/Derrynasaggart Mountains and supports an important Hen Harrier population. The eastern 10 km of the cable route passes through or alongside the SPA.

9.1.9 Habitats, Vegetation & Flora – Wind Farm

The dominant habitat within the wind farm site is wet heath (HH3) which has developed on sloping terrain with a relatively shallow peat cover. Other habitats that occur include upland blanket bog (PB2), dry heath (HH1), dry-humid acid grassland (GS3), improved agricultural grassland (GA1), wet grassland (GS4), poor fen and flush (PF2), exposed siliceous rock (ER1) and eroding/upland river (FW1). The dominant wet heath habitat generally forms an intricate mosaic with dry heath and exposed siliceous rock while upland blanket bog occurs on the deeper peat deposits in areas of relatively flat topography.

In the following sections the vegetation composition of these habitats is described. A table listing the plant species occurring on site is presented in Appendix F.2. Principal habitats are mapped in Figure 9.2.

Wet Heath (HH3)

Wet heath vegetation characterised by purple moor-grass (*Molinia caerulea*) dominates the site, developing in sloping areas where the peat depth is generally between 30 and 80 cm. The heath vegetation is relatively species-poor with ling heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), heath rush (*Juncus squarrosus*), carnation sedge (*Carex panicea*), bog asphodel (*Narthecium ossifragum*) and tormentil (*Potentilla erecta*) among the more common associates. Throughout the site the cover of the ericoid species is typically less than 25%. The moss cover in wet heath areas is generally low in comparison to other peatland habitats, with *Sphagnum capillifolium* and *Hypnum jutlandicum* the main species encountered. In the Barnastooka section of the site wet

heath dominated by very tall and luxuriant purple moor-grass dominates the high ridge.

The condition of the habitat is generally good as a result of the relatively low levels of livestock grazing evident at present. Wet heath vegetation dominated by purple moor-grass is a common and widespread habitat in the uplands of counties Cork and Kerry.

Equivalent EU Annex 1 Habitat – Northern Atlantic wet heaths with *Erica tetralix* (4010)

Dry Heath (HH1)

Dry heath is a widespread habitat throughout the site though it rarely covers large areas. Typically the habitat is most commonly associated with areas of rock outcrop where the peat depth is less than 300 mm. Ling heather is the dominant species with western gorse (*Ulex gallii*), bell heather (*Erica cinerea*) and green ribbed sedge (*Carex binervis*) also frequent. The main mosses occurring in the vegetation are *Hypnum jutlandicum*, *Hylocomium splendens* and *Sphagnum capillifolium*. Often the habitat grades into adjoining areas of wet heath which occupies the slightly deeper peats and exposed siliceous bedrock is generally close by.

In common with wet heaths the condition of the habitat is generally good as a result of the relatively low levels of livestock grazing evident at present.

Equivalent EU Annex 1 Habitat – European dry heaths (4030)

Upland Blanket Bog (PB2)

Blanket bog vegetation within the site is largely confined to a number of small, relatively flat plateau areas where the peat depth exceeds 1 m. Deer grass (*Trichophorum cespitosum*) is the dominant vascular plant species with purple moor-grass generally sub-dominant. Other frequent vascular plant species include cross-leaved heath, bog asphodel (*Narthecium ossifragum*), ling heather, common bog-cotton (*Eriophorum angustifolium*) and hare's tail bog-cotton (*Eriophorum vaginatum*). The moss layer is typically well-developed with *Sphagnum capillifolium*, *Sphagnum papillosum*, *Sphagnum cuspidatum*, *Racomitrium lanuginosum* and the liverwort *Pleurozia purpurea* among the most conspicuous species.

Three distinct areas of blanket bog occur within the Grousemount section of the site. While the hydrology of these areas has been damaged somewhat by drainage, peat-cutting and erosion in the past, recent levels of disturbance appear to be of a low intensity.

Equivalent EU Annex 1 Habitat – Blanket bog (7130) including active blanket bog

Poor Fen and Flush (PF2)

Poor fen and flush is a relatively infrequent habitat within the site. The habitat occurs in sloping wet areas where there is some degree of flushing by base-poor surface waters. Two main types of poor flush vegetation occur. The most frequently encountered type is dominated by the tall rush species soft rush (*Juncus effusus*) and/or sharp flowered rush (*Juncus acutiflorus*) with *Sphagnum fallax* and *Polytrichum commune* dominating the moss layer. Along narrow flushed channels, where there is a greater degree of surface water flow visible, the flush vegetation is typified by bog pondweed (*Potamogeton polygonifolius*), marsh St. John's wort (*Hypericum elodes*) and a range of sedge (*Carex*) species, most notably star sedge (*Carex echinata*).

No Equivalent EU Annex 1 Habitat

Dry Humid Acid Grassland (GS3)

Dry humid acid grassland occurs on the drier mineral soils in the upland areas of the site.

The largest area of the vegetation type is to be found in the north-west of the Grousemount section of the site where it dominates old field systems associated with a long-abandoned farm. The vegetation is typically dominated by a range of grass species especially velvet bent (*Agrostis canina*), sweet vernal grass (*Anthoxanthum odoratum*) and mat grass (*Nardus stricta*). Other frequent species in the low-growing vegetation include heath bedstraw (*Galium saxatile*), tormentil and mosses such as *Rhytidiadelphus loreus*, *Hylocomium splendens* and *Pleurozium schreberi*. Occasional small patches of the habitat are also to be found around rock outcrops and the small areas of mineral rich soils that have resulted from the reclamation of wet heath in the past.

The vegetation is lightly grazed by livestock which maintains its low-growing appearance.

No Equivalent EU Annex 1 Habitat

Improved Agricultural Grassland (GA1)

Much of the low lying land towards the northern end of the Grousemount section of the site is dominated by improved agricultural grassland. High yielding grass species such as perennial rye-grass (*Lolium perenne*), Yorkshire fog (*Holcus lanatus*) and common meadow-grass (*Poa pratensis*) are generally dominant and these species are usually accompanied by creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), creeping thistle (*Cirsium arvense*) and common mouse-ear (*Cerastium fontanum*).

The vegetation is heavily grazed by livestock and also probably receives regular fertilizer application. Many of the fields have been used for silage production in the recent past.

No Equivalent EU Annex 1 Habitat

Wet Grassland (GS4)

Areas of wet grassland dominated by soft rush (*Juncus effusus*) and compact rush (*Juncus conglomeratus*) occur on the lower slopes of the site where the habitat is often associated with areas of dry humid acid grassland. There are obvious floristic similarities with the closely related poor flush vegetation dominated by *Juncus* and *Sphagnum* however wet grassland vegetation occurs in the slightly drier areas where peat development is limited and there is less flushing surface water. In the Barnastooka section of the site wet grassland occurs in mosaic with wet heath on south-facing slopes.

No Equivalent EU Annex 1 Habitat

Scrub (WS1)

Narrow fringes of scrubby woodland occur in the low-lying northern portion of the Grousemount section of the site, where the habitat is associated with the banks of the Roughty River. Common shrub species occurring include downy birch (*Betula pubescens*), hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), holly (*Ilex aquifolium*), willow (*Salix aurita*, *S. cinerea*) and rowan (*Sorbus aucuparia*). Common gorse (*Ulex europaeus*) is locally frequent in places. Where the tree/shrub canopy is tall a well developed woodland ground flora occurs in places, with woodrush (*Luzula sylvatica*) particularly prominent.

No Equivalent EU Annex 1 Habitat

Conifer Plantation WD4

There is one area of recently planted coniferous plantation in the northern part of the Barnastooka section of the site. Sitka spruce (*Picea sitchensis*) is the main species planted with small amounts of Larch (*Larix* sp.) also present locally. These trees have

been planted in areas of wet heath on a steep slope and the shallow peat soils were extensively drained prior to planting. The ground layer of these young plantation areas tends to be dominated by a high cover of purple moor-grass.

Recently planted second rotation conifer plantation also occurs at the easternmost end of the new access track (from where it adjoins the public road).

No Equivalent EU Annex 1 Habitat

Exposed Siliceous Rock

Exposed sandstone bedrock is a prominent component of the site. Gently sloping bedrock outcrops are frequent throughout with areas of tall cliff occurring in the southern half of the site. The vegetation of exposed rock surfaces is typically sparse as a result of the scarcity of soil cover although dry heath vegetation can occur on some of the wider cliff ledges. In suitable cliff crevices species such as St. Patrick's cabbage (*Saxifraga spathularis*), hard fern (*Blechnum spicant*), ling heather, bell heather, sheep's-bit scabious (*Jasione montana*) and fir clubmoss (*Huperzia selago*) are characteristic.

Equivalent EU Annex 1 Habitat – Siliceous rocky slopes with chasmophytic vegetation (8220)

Eroding/upland Rivers (FW1)

Several fast flowing tributary streams and join the main channel of the Roughty River. These are very typical of upland headwater streams.

No Equivalent EU Annex 1 Habitat

Rare Plant Species

There were no plant species which are protected under the Irish Flora Protection Order or listed as rare or threatened in the Irish Plant Red Data Book (Curtis & McGough 1988) found growing at the site or are known from the area.

The status of three Irish endemic hawkweed species (*Hieracium spp.*) from Co. Kerry has been reviewed recently (Rich et al., 2008). Historically these endemic hawkweeds were found along sections of the Roughty River where they occur on rocks within or alongside the river (especially between winter flood levels and normal summer flow) and on stone walls and bridges. The Roughty River pNHA, which is centred on a 2 km section at Morley's Bridge, was selected for these rare hawkweed species.

In the recent review by Rich et al., surveys in 2006-2007 identified a new site, Sillahertane, Roughty River (grid ref. W086722) for *Hieracium argentatum* (14 plants) and *Hieracium scullyi* (30 plants). Also present was a population of *Hieracium sparsifrons* (15 plants), which has been known from the location since 1904. The Sillahertane site is within the boundaries of the Grousemount Wind Farm and it is of particular importance as it hosts three rare endemic species (confined to Co. Kerry) in close proximity.

A specific survey for these hawkweed species carried out in July 2015 located two further populations within the wind farm site – these were at the locations of watercourse crossings nos. 44 and 46. Here the hawkweed plants occurred within the river channel on bedrock exposures and large boulders. At both sites the plants were sparsely distributed both upstream and downstream of the locations of the proposed crossing structures. While not identified to species level, it is likely that these are *Hieracium argentatum* and/or *Hieracium scullyi*. The crossing location no. 44 is just downstream (within 200 m) of the Sillahertane record identified by Rich et al., while the crossing location no. 46 is

approximately 1 km downstream. This suggests that the plants may be sparsely distributed along this entire stretch of river.

Some rare bryophyte species have been recorded from the Grousemount locality, notably *Calliergon sarmentosum* at Sillahertane Bog (Mooney & Goodwillie 1991),

Evaluation of Habitats, Vegetation & Flora

In overall terms, the wind farm site is dominated by wet heath vegetation which is generally in good condition reflecting relatively low levels of livestock grazing in recent times. However, the cover of the main diagnostic species of the habitat, cross-leaved heath, is relatively low and this may be due to past high levels of grazing and possibly burning. Despite being listed in Annex I of the EU Habitats Directive, wet heath is a common habitat in the upland regions of counties Cork and Kerry where it is found on shallow peat and in areas of degraded blanket bog. In general the wet heath habitat within the development site is a good representative of its type and the habitat is rated as having considerable conservation value (rated local, higher value according to NRA scheme).

Other important habitats such as dry heath and scrub woodland also occur but have a relatively restricted distribution within the site. The Roughty River is an important riverine system.

Areas of blanket bog occur within the site on deeper peat at higher altitudes and especially on plateau areas. Although these areas of blanket bog support a typical flora, the habitat has generally been affected in past times by drainage, peat-cutting and possibly overgrazing. These disturbances have affected the hydrology of the blanket bog areas although it is noted that recent disturbance levels appear to be low. In general, the blanket bog habitat within the development site is limited in extent (approximately 28 ha) and distribution and in a regional context much better and more representative areas of blanket bog occur, especially in the nearby designated sites. However, as blanket bog is listed in Annex I of the EU Habitats Directive (and 'active' blanket bog is listed with priority status), all examples are of some conservation importance. The blanket bog at this site is rated at least as of local importance (higher value).

The presence of rare and endemic species of hawkweeds on the Roughty River within the site boundary is of note.

9.1.10 Habitats, Vegetation & Flora – Cable Route

In the following sections the vegetation composition of the principal habitats within the route corridor is described. An ecological evaluation of the importance of the habitats is given, along with linkages with the EU Habitats Directive classification system where relevant. A table listing the plant species occurring on site is presented in Appendix F.3 and representative photographs of the study corridor are presented in Appendix F.4.

Improved Agricultural Grassland (GA1)

Improved grassland is a principal habitat throughout the route corridor. While especially frequent in the low lying areas between Ballyvourney and Coolea, it also occurs in the higher areas including the Coom. Agricultural grass species such as perennial rye-grass (*Lolium perenne*), Yorkshire fog (*Holcus lanatus*) and common meadow-grass (*Poa pratensis*) are dominant and these species are usually accompanied by creeping buttercup (*Ranunculus repens*), meadow buttercup (*Ranunculus acris*), white clover (*Trifolium repens*), creeping thistle (*Cirsium arvense*) and common mouse-ear (*Cerastium fontanum*). Rushes (*Juncus* spp.) may be present but coverage is less than 50%. The habitat is primarily managed for grazing livestock (sheep and to a lesser extent cattle) and

to some extent silage production.

Evaluation: This common and widespread habitat is of low ecological value. The habitat is of low value to wildlife species. Rated of Local importance (lower value).

No equivalent EU Annex 1 habitat

Amenity Grassland (GA2)

This type of grassland is improved or species-poor and is managed for amenity use. The habitat is associated mainly with gardens and park areas.

Evaluation: This common and widespread habitat is of low ecological value and is of little value to wildlife species. Rated of Local importance (lower value).

No equivalent EU Annex 1 habitat.

Wet Grassland (GS4)

Wet grassland is a further frequent habitat. It is often associated with peat soils and areas of former bog that are now managed for agriculture. Wet grassland swards are generally rush dominated, with soft rush (*Juncus effusus*) and compact rush (*Juncus conglomeratus*) the commonest species. Other characteristic species include silverweed (*Potentilla anserina*), meadowsweet (*Filipendula ulmaria*), marsh thistle (*Cirsium palustre*) and yellow iris (*Iris pseudacorus*), although some of these are localised in their distributions.

Evaluation: The examples of the habitat recorded within the study area are species poor and are rated of Local importance (lower value).

No equivalent EU Annex 1 habitat

Dry Meadows and Grassy Verges (GS2)

This habitat is common along roadside edges. The vegetation can vary according to adjoining habitats and especially the degree of wetness. However, frequent species include false oat grass (*Arrhenatherum elatius*), cock's-foot (*Anthoxanthum odoratum*), Yorkshire fog (*Holcus lanatus*), common bent (*Agrostis stolonifera*), common nettle (*Urtica dioica*), ribwort plantain (*Plantago lanceolata*), vetches (*Vicia spp.*) and thistles (*Cirsium spp.*). Along drier margins, such as on high ground at the eastern end of the route, species characteristic of heath may be found including bilberry (*Vaccinium myrtillus*), western gorse (*Ulex gallii*), foxglove (*Digitalis purpurea*) and in places bracken (*Pteridium aquilinum*).

Evaluation: Generally this habitat is considered to be of low ecological value though in places can be species rich. Rated of Local importance (lower value).

No equivalent EU Annex 1 habitat.

Wet Heath (HH3)

Wet heath vegetation is found generally on sloping ground where the peat depth is generally 300–800 mm. It occurs mostly at the eastern (Mullaghanish) and western (Grousemount) ends of the corridor, although it is scattered elsewhere and often in association with dry heath or remnant bog. The heath vegetation is relatively species-poor with purple moor-grass (*Molinia caerulea*), ling heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), heath rush (*Juncus squarrosus*) and tormentil (*Potentilla erecta*) among the more common associates. The moss cover in wet heath areas is generally low in comparison to other peatland habitats, with *Sphagnum capillifolium* the main species

encountered.

Evaluation: Most of the examples of wet heath have been disturbed by grazing or drainage though some more intact areas exist. A rating of Local importance (high value) is given. In general, wet heath vegetation dominated by purple moor-grass is a common and widespread habitat in the uplands of counties Cork and Kerry.

Equivalent EU Annex 1 habitat – Northern Atlantic wet heaths with *Erica tetralix* (4010).

Dry Heath (HH1)

Dry heath is also a widespread habitat throughout the route corridor though it rarely covers large areas. Typically the habitat is most commonly associated with areas of rock outcrop or steep slopes where the peat depth is less than 30cm. Ling heather is the dominant species with western gorse (*Ulex gallii*), bell heather (*Erica cinerea*) and green ribbed sedge (*Carex binervis*) also frequent. The main mosses occurring in the vegetation are *Hypnum jutlandicum*, *Hylocomium splendens* and *Sphagnum capillifolium*. Often the habitat grades into adjoining areas of wet heath which occupies the slightly deeper peats or areas of scrub (especially gorse and willow).

Evaluation: While well scattered through the corridor, there are no extensive examples of dry heath. However, the areas present provide useful habitat diversity. A rating of Local importance (high value) is given.

Equivalent EU Annex 1 habitat – European dry heaths (4030).

Upland Blanket Bog (PB2)

Blanket bog vegetation within the corridor is largely confined to a number of small patches where the peat depth exceeds 1 m. These all appear to have been disturbed to some extent in the past. These occur between Coolea and Lumnagh More. Ling heather (*Calluna vulgaris*), deer grass (*Trichophorum cespitosum*), common bog-cotton (*Eriophorum angustifolium*) and hare's tail bog-cotton (*Eriophorum vaginatum*), purple moor-grass (*Molinia caerulea*) and bog asphodel (*Narthecium ossifragum*) are the principal higher plant species. The moss layer is variable, with *Sphagnum capillifolium*, *Sphagnum cuspidatum*, *Racomitrium lanuginosum* and the liverwort *Pleurozia purpurea* among the most conspicuous species.

Evaluation: The examples of blanket bog are small in area and have been disturbed. Nevertheless, these provide useful habitat diversity. A rating of Local importance (high value) is given.

Equivalent EU Annex 1 habitat – Blanket bog (7130).

Semi-natural Woodland (WN)

In sections of the route corridor, and especially west of Coolea, there are woodland stands, often on sloped or steep ground, that appear entirely deciduous and natural in character. However, these may be of relatively recent origin having developed on former farmed lands. Species present include ash (*Fraxinus excelsior*), oak (*Quercus* spp.), birch (*Betula pubescens*), holly (*Ilex aquifolium*) and hawthorn (*Crataegus monogyna*). Some non-native deciduous species, mainly sycamore (*Acer pseudoplatanus*) are present but these are not dominant. The woodland understorey comprises ivy (*Hedera helix*), bramble (*Rubus fruticosus* agg.), herb-robert (*Geranium robertianum*) and various ferns (*Dryopteris* spp.).

Further investigation would be required to classify these woodlands to a more specific type

and as this is not merited for the present assessment, the areas are classified merely as semi-natural woodland (WN).

Evaluation: these woodland stands are of high value for local wildlife.

Oak-birch-holly Woodland (WN1)

St. Gobnet's and Cascade Woods (south and north respectively of Ballyvourney) contain examples of this native woodland type (details are contained in the AA Screening Report). In parts, the woodland is compromised by the presence of Rhododendron as well as other non-native species such as sycamore and some conifers.

Evaluation: Ecologically, native oak woodland is of high importance and provides valuable habitat for wildlife (including species such as the Kerry Slug).

Equivalent EU Annex 1 habitat – Old Oak Woodlands (91A0).

Riparian Woodland (WN5)

Much of the main channel of the Sullane River is edged by riparian strips, which in places broaden into patches of woodland that extend to the road edge. The woodland areas are best developed in the stretch between Ballyvourney and Coolea. In one example of this woodland, a small ponded area (classified as eutrophic lake FL5) occurs to the other side of the road and may be hydrologically linked. Willows (*Salix* spp.) are the main tree species, with alder (*Alnus glutinosa*), birch (*Betula pubescens*) and, to a lesser extent, ash (*Fraxinus excelsior*) also present. Ground conditions are characterised by waterlogged substrates.

Evaluation: Ecologically, riparian woodland is a valuable habitat for local wildlife. The areas where this habitat occur are at least of Local importance (higher value).

Equivalent EU Annex 1 Habitat – while there is a linkage with the priority habitat: *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion*, *Alnion incanae*, *Salicion albae*) (91E0), the examples within the study area are relatively minor in extent and development and could hardly be described as 'gallery' woodland.

Conifer Plantation (WD4)

Coniferous forestry, comprise non-native conifer species managed for commercial timber production, occurs widely throughout the study area, especially on higher ground in the eastern and western sectors. Plantations include pre-thicket, thicket and mature stages of growth, with some ongoing clear-felling. Species diversity within the study area is low; plantations most commonly comprise single species stands of Sitka Spruce (*Picea sitchensis*). Some of the plantations are fringed with narrow bands of broadleaved trees and scrub species, mainly willow, alder and birch.

Evaluation: The habitat is rated of low ecological importance with limited potential to support biodiversity. However, conifer plantation may provide cover and nest sites to common bird and mammal species. Rated as Local importance (lower value).

No equivalent EU Annex 1 habitat.

Scrub (WS1)

Scrub is widespread, ranging from scattered patches to extensive scrubby woodland. Common shrub species occurring include downy birch (*Betula pubescens*), hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), holly (*Ilex aquifolium*), willow (*Salix aurita*, *S. cinerea*) and rowan (*Sorbus aucuparia*). Common gorse (*Ulex europaeus*) is locally frequent in places. Where the tree/shrub canopy is tall a well developed woodland

ground flora occurs in places, with woodrush (*Luzula sylvatica*) locally prominent.

Evaluation: While scrub is a common and widespread habitat throughout most of the country it provides valuable cover to terrestrial mammals and nest sites for common bird species. The habitat is rated as Local importance (varying from lower to higher value).

No equivalent EU Annex 1 habitat.

Hedgerows (WL1)

Hedgerows form the main field boundary type and are commonplace along roads and tracks (apart from the higher ground in the easternmost sector (Mullaghanish area) and towards Coomataggart Substation. Species occurring most commonly include hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), willows (*Salix* spp.), hazel (*Corylus avellana*), holly (*Ilex aquifolium*) and common gorse (*Ulex europaeus*). Ash (*Fraxinus excelsior*) is the most common larger tree, with occasional oak (*Quercus* spp.) and sycamore (*Acer pseudoplatanus*). The hedges are typically of low to moderate stature (3-6 m), with occasional taller stretches (>10 m). Bramble (*Rubus fruticosus*) is frequent in the ground layer, along with ivy (*Hedera helix*), tufted vetch (*Vicia cracca*), herb-robert (*Geranium robertianum*), common nettle (*Urtica dioica*) and various fern species such as harts-tongue (*Asplenium scolopendrium*).

Evaluation: Hedgerows serve as important corridors for wildlife linking areas of semi-natural habitat within an agricultural landscape. Good examples of hedgerow habitat form well developed intact structures that provide suitable habitat for terrestrial mammals, bats, and birds and are generally regarded as being of Local importance (low to higher value).

No equivalent EU Annex 1 habitat.

Treelines WL2

Treelines of deciduous trees, such as beech and lime, are not a feature of the study area. However, there are several coniferous treelines along the route corridor, with tall spruce and cypress species.

Evaluation: Treelines of conifer species are of low ecological interest. Ranked Local importance (lower value).

No equivalent EU Annex 1 habitat.

Drainage Ditches (FW4)

Drainage ditches, which vary greatly in size and ecological interest. are abundant along roadside verges and field margins. The larger drains support aquatic plants such as water cress (*Nasturtium officinale*), creeping bent (*Agrostis stolonifera*), starwort (*Callitriche* spp.) and common duckweed (*Lemna minor*). Yellow flag (*Iris pseudacorus*) occurs in places.

Evaluation: Drainage ditches provide habitat for a range of flora and fauna species, including the common frog. They are, however, a very widespread habitat throughout Ireland. Ranked Local importance (lower value, occasionally higher value).

No equivalent EU Annex 1 habitat.

Eroding/upland Rivers (FW1)

Rivers and streams are a feature of the study corridor. Watercourses are considered in detail elsewhere in the EIS.

Buildings and Artificial Surfaces (BL3)

This broad category includes all buildings and lands that are covered with artificial surfaces including tarmac, cement and gravel. All public and private roads are in this category, along with bridges and culverts.

Evaluation: Artificial surfaces have no intrinsic ecological value. However, buildings and bridges could support roosting bats. Ranked Local importance (lower value).

No equivalent EU Annex 1 habitat.

Spoil and Bare Ground (ED2)

Spoil and bare ground occurs occasionally, being mainly associated with recent or ongoing land clearing activities. Vegetation is absent from this habitat type.

Evaluation: Bare ground has no intrinsic ecological value.

No equivalent EU Annex 1 habitat.

Rare Plant Species

No plant species protected under the Irish Flora Protection Order or listed as rare or threatened in the Irish Plant Red Data Book (Curtis & McGough 1988) was found within the study corridor or is known from the area.

However, some rare bryophyte species have been recorded from the locality (Mooney & Goodwillie 1991), notably *Calliergon sarmentosum* at Sillahertane Bog.

Invasive Alien Species

Japanese Knotweed (*Fallopia japonica*) can tolerate a wide range of environments and is usually found near water sources such as river banks, low lying disturbed areas and coastal shores. The plant attains 2–3 m in height and can dominate an area to the exclusion of most other plants. It can form an extensive network of rhizomes (roots) which cause problems when managing this species.

Japanese knotweed was recorded from one location along the route corridor – at the road junction just west of joint bay no. 20. Here a large stand of the plant was present along the road (see Plate 9 in Appendix F.4).

The other principal invasive non-native species present is Rhododendron (*Rhododendron ponticum*). Rhododendron is very frequent along roads and within the woods at the western end of the route corridor, but also occurs elsewhere within the corridor, including the St. Gobnet's Woods SAC. In places it can be described as being abundant (see Plate 6 in Appendix F.4) Rhododendron is very invasive and causes serious damage to native habitats.

9.1.11 Fauna - Mammals, Amphibians & Reptiles

The open and exposed character of the wind farm site results in few countryside mammal species being present, but the cable route corridor supports a range of common mammal species.

The Irish hare (*Lepus timidus hibernicus*) was observed sparsely on the heath and bog habitats and is considered a widespread species in the vicinity. It occurs sparsely throughout the cable route corridor, with three sightings (two in fields north of Ballyvourney and one on heath at Grousemount).

Pine marten is expected to occur in the various woodland habitats along the route corridor.

Otter (*Lutra lutra*) is a species of high conservation value as it is listed on Annex II of the Habitats Directive. Signs, i.e. spraints, of otter presence were recorded on rocks along the main channel of the Roughty River during searches carried out in 2003 and 2010 and the species is expected to be also present on any of the main tributary streams which support fish stocks. Signs of recent otter activity, i.e. spraints, were found c.20 m west of the bridge over the Bohill River (Droichead An Cheapach) in January 2015.

Badger (*Meles meles*) feeding activity was observed in grassland fields within the Barnastooka component of the wind farm site. However, due to the generally wet nature of the habitats on site, it is considered unlikely that badgers breed within the site boundary. Surprisingly, no signs of badger were found along the cable route, though the species does occur in the wider area and would be certain to be present. However, badgers would not be expected to construct setts in banks along the road carriageway, which was the focus of the study.

Evidence of fox (*Vulpes vulpes*) and deer were found in the lower lying areas of the site. Sika deer and/or red deer hybrids are widespread in this sector of the country and would pass through the site at times. Other ubiquitous mammals, including pygmy shrew (*Sorex minutus*), long-tailed field mouse (*Apodemus sylvaticus*) and bank vole (*Clethrionomys glareolus*) would be expected on site.

The common frog (*Rana temporaria*) was recorded in heath, bog and wet grassland habitats at several locations at the wind farm site and would be widespread throughout the cable route corridor, occurring in drains, flooded areas and on bog. The common lizard (*Lacerta vivipara*), a species often found in upland habitats, was recorded in the Knockanruddig sector of the site and is probably widespread on site. It would also be expected on the drier heath habitats along the cable route.

Sika deer or possibly hybrids are widespread throughout the area with regular sightings during site visits. The mix of forest, bog/heath and open lands provides excellent habitat for deer.

Fox (*Vulpes vulpes*) is widespread in the area, with an animal sighted in a field just west of Coolea and a dead fox on the road located approximately 1 km west of Ballyvourney. Other ubiquitous mammals such as pygmy shrew (*Sorex minutus*), the Irish stoat (*Mustela erminea*), hedgehog (*Erinaceus europaeus*) and long-tailed field mouse (*Apodemus sylvaticus*) would be expected.

9.1.12 Fauna – Bats

Both the wind farm and the cable route are within the range of the lesser horseshoe bat (Kelleher 2004) and roosts of the species are known in the local area. The nearest of these are at Gortloughera and Barnastooka townlands. These roosts are confined to lower areas where the habitat is more suitable for the species' hunting needs. Both of these roosts were visited in June 2000 and only droppings of lesser horseshoe bat were present, indicating that the roosts are minor, transitional sites used by 1 - 5 bats during the summer months (pers. obs., C. Kelleher). Neither of these roosts will be impacted by the wind farm development or the cable route.

The lower elevations within and adjoining the wind farm site include open fields with hedgerow boundaries, the Roughty River with riparian vegetation and some scrub habitats that provide sheltered areas in which insects can swarm. These are favourable for foraging bats and several bat species are known to occur in these areas, including common *Pipistrellus pipistrellus* and soprano pipistrelle *P. pygmaeus*, brown long-eared

Plecotus auritus, Leisler’s *Nyctalus leisleri* and lesser horseshoe *Rhinolophus hipposideros* bats (pers. obs., C. Kelleher) and others are expected.

Bats are expected to be widespread throughout the cable route corridor, especially in the low-lying areas where hedgerows and woodland are frequent. Buildings, stone bridges and mature trees provide potential roosts for bats. Cascade Wood (north of Ballyvourney) is known to be frequented by at least seven species of bat: Soprano and Common Pipistrelle, Brown Long-eared, Leisler’s, Daubenton’s, Natterer’s and Whiskered/Brandt’s bat.

The local area was systematically searched for lesser horseshoe bat roosts in 1999, 2000 and 2002 by the *Vincent Wildlife Trust* (Kelleher 1999, 2000, 2002) and, apart from the two nearest roosts above, 42 other lesser horseshoe bat roosts of varying significance were found in the immediate area, but these are all more than 3-4 km from the wind farm site (NPWS, *National Lesser Horseshoe Bat Roost Database*). Some of these are important breeding sites and the most important breeding sites in the wider area have been designated as candidate SACs as follows: Kilgarvan Ice House (0364), Old Domestic Building, Curraglass Wood (no. 2041) and Glanlough Woods (02315)

These are not expected to be impacted by the development.

Table 9.1: Protected Mammal Species Recorded Or Expected* In Study Area

Common Name (<i>Scientific Name</i>)	Habitats Directive Annex	Irish Red List Status
Badger (<i>Meles meles</i>)	-	Least concern
Otter (<i>Lutra lutra</i>)	II, IV	Near threatened
Pine Marten* (<i>Martes martes</i>)	V	Least concern
Hedgehog* (<i>Erinaceus europaeus</i>)	-	Least concern
Irish Hare (<i>Lepus timidus hibernicus</i>)	V	Least concern
Pygmy Shrew* (<i>Sorex minutus</i>)	-	Least concern
Irish Stoat* (<i>Mustela erminea Hibernica</i>)	V	Least concern
Sika deer (<i>Cervus Nippon</i>)	-	Least concern
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	IV	Least concern
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	IV	Least concern
Daubenton’s bat (<i>Myotis daubentonii</i>)	IV	Least concern
Leisler’s bat (<i>Nyctalus leisleri</i>)	IV	Near threatened
Natterer’s bat (<i>Myotis nattereri</i>)	IV	Least concern
Whiskered bat (<i>Myotis mystacinus</i>)	IV	Least concern
Brown long-eared bat (<i>Plecotus auritus</i>)	IV	Least concern
Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>)	II, IV	Least concern

All of the above species are protected under Wildlife Act (1976) and Wildlife [Amendment] Act (2000)

The Irish Red List Status is after Marnell et al., 2009.

9.1.13 Fauna - Birds

Breeding and Summering Birds

The birds that breed on the wind farm site can be broadly divided between those associated with the open peatland habitats and those associated with areas of woodland, scrub and hedgerow such as occurs along the river valleys or in patches in the low lying grassland areas. A third group of birds is associated with the rivers on site. A list of breeding or summering birds is presented in Table 9.2, along with their breeding status and conservation status (after Colhoun & Cummins 2013).

Meadow pipit (*Anthus pratensis*) was by far the most frequently encountered species within the site, occurring on the peatland habitats and the various grassland habitats. Skylark (*Alauda arvensis*) was also present, mainly on the heath and bog habitats. Both species breed on site. Grasshopper warbler (*Locustella naevia*), a species typical of wet grassland, was heard in several of the rushy fields. Wheatear (*Oenanthe oenanthe*), a summer visitor typical of open exposed habitats, was well represented within the site, with at least 5 pairs in the survey area. Stonechat (*Saxicola rubetra*) was recorded in the lower areas of the site typically where patches of gorse occurred. Mistle thrush (*Turdus viscivorus*) bred locally, probably within the site.

Signs of red grouse (*Lagopus lagopus*) were recorded on bog in the Knockanruidig sector of the site in November 2010. Overall, the cover of heather on site is fairly poor and grouse are likely to be sparsely distributed across the bog and heath habitats.

Several sightings were made of hunting kestrels (*Falco tinnuculus*), indicating local breeding though probably outside of the site boundary.

Ravens (*Corvus corax*) and hooded crows (*Corvus corone cornix*) are widespread in the area and both species certainly breed locally (though not necessarily within the site). Of some interest was a party of four choughs (*Pyrhcorax pyrrhcorax*) in July 2003 – these were present along the high cliffs in the southern part of the Grousemount sector of the site and also were seen feeding in the partly improved fields in the northern sector. While suitable breeding cliffs and crags occur in the general vicinity, all four birds appeared to be adults (though good views were only had of two of them), perhaps indicating a non-breeding flock. Chough is listed as possibly breeding (1-2 pairs) in the Derryclogher Bog cSAC to the south-west.

Dipper (*Cinclus cinclus*) was recorded on the main channel of the Roughty River in September 2008 and probably breeds on the river. Grey wagtail nests at several locations along the Roughty River.

Species recorded in the low-lying areas of the river valleys where scrub and low woodland occurs included wren (*Troglodytes troglodytes*), blackbird (*Turdus merula*), robin (*Erithacus rubecula*), coat tit (*Parus ater*), willow warbler (*Phylloscopus trochilus*) and chaffinch (*Fringilla coelebs*).

Table 9.2: Breeding and Summering Bird Species Recorded at Grousemount Wind Farm, 2003-15

Species	Breeding Status	Conservation Status
Grey Heron	Non-breeder	Green
Mallard	Probable	Green
Kestrel	Non-breeding (but breeds locally)	Amber

Species	Breeding Status	Conservation Status
Red Grouse	Probable	Red
Moorhen	Probable	Green
Woodpigeon	Probable	Green
Cuckoo	Probable	Green
Dipper	Probable	Green
Skylark	Confirmed	Amber
Swallow	Confirmed (nest in buildings)	Amber
Meadow Pipit	Confirmed	Red
Grey Wagtail	Probable	Red
Pied Wagtail	Possible	Green
Goldcrest	Probable	Amber
Wren	Confirmed	Green
Robin	Probable	Amber
Stonechat	Confirmed	Amber
Wheatear	Possible	Amber
Blackbird	Probable	Green
Song Thrush	Probable	Green
Mistle Thrush	Probable	Amber
Grasshopper Warbler	Probable	Green
Willow Warbler	Confirmed	Green
Blue Tit	Confirmed	Green
Coal Tit	Confirmed	Green
Magpie	Probable	Green
Hooded Crow	Probable	Green
Raven	Non-breeder	Green
*Chough	Non-breeder	Amber
Starling	Probable	Amber
Chaffinch	Confirmed	Green
Goldfinch	Possible	Green
Linnet	Confirmed	Amber
Lesser Redpoll	Confirmed	Green
Reed Bunting	Confirmed	Green

The Conservation Status (Red, Amber, Green) is after Colhoun & Cummins (2013). Species listed on Annex I of the EU Birds Directive are highlighted with an asterisk.

Wintering Birds

Birds are generally scarce within the site during winter, reflecting the altitude and the

inhospitable character of much of the site. Most of the bird activity was concentrated within the lower lying areas along the river valleys and within the grassland fields.

Meadow pipit still occurred widely throughout the site and was particularly abundant in October 2014 with loose flocks of 20-30 birds being frequent. This probably reflected post-breeding flocking and possibly local migration. By March 2015, meadow pipits were already holding breeding territories.

Skylark was absent from the site in the main winter period but breeding birds had returned by March 2015.

Otherwise, the only birds recorded regularly on the bog and heath habitats during winter were wren, hooded crow, and raven. Red grouse, a resident species, was recorded in the Barnastooka component of the site in December 2008. Snipe was recorded on the bog and heath and also in wet grassland fields. Most of the observations were of single birds though eight birds were flushed from an area of wet heath near T10 in November 2014.

Raven was commonly recorded within the site during winter, with up to 18 present together in December 2008. Hooded crows were also regular on site during winter.

Fieldfares and Redwings, both wintering thrush species, were observed within the Roughty River valley area between October and December.

A flock of 110 golden plover (*Pluvialis apricaria*) was recorded flying over the eastern part of the Barnastooka sector of the site in December 2008. A further observation of c.30 birds just north of the site was made in November 2010. Golden plover is likely to be an occasional visitor to the area during the periods of migration and in winter. Birds could be expected to land within the site on occasions.

Kestrel was recorded hunting in the low-lying areas of the site in November and December 2014 – all records were of single males and possibly refer to the same individual. A single sparrowhawk was observed hunting along the Roughty River valley on 21st December 2014.

A male hen harrier was seen hunting over farmland at Coomalough, to the northeast of the site, on 7th January 2009.

Two juvenile white-tailed eagles were seen flying from the area around Lough Nabuddoga (c.1.5 km north of site) eastwards towards Coolknoohil (c.2 km northeast of site) during the November 2009 survey. A third eagle was seen in trees across the valley towards Coolknoohil and at least 8 eagles were later seen circling together and landing in trees at this location. Remains of pig and calf carcasses were found close to Lough Nabuddoga in December 2009 and it was considered likely that these were attracting the eagle to this area. A further sighting of white-tailed eagles was made on 27th February 2015 - this involved two adults flying along the boundary of the existing wind farm and then just east of the locations for turbines T1-T3 before ascending the hill between the locations for turbines T5 and T6 and continuing southwards. All sightings of white-tailed eagle are associated with the White-tailed Eagle Re-introduction Programme, which is discussed in the following section on birds of conservation importance.

Table 9.3: Wintering Bird Species Recorded at Grousemount Wind Farm, 2003-15

Species	Comment	Conservation Status
Grey Heron	Along rivers	Green
Mallard	Along rivers, ponds	Green

Species	Comment	Conservation Status
White-tailed Eagle	One record on site	Red
Sparrowhawk	Occasional in low-lying areas	Amber
Kestrel	Hunts in site through winter	Amber
Red Grouse	Resident	Red
Golden Plover	Occasional	Red
Snipe	Sparsely on bogs and wet fields	Amber
Woodpigeon	In low-lying areas	Green
Dipper	Resident on Roughty River	Green
Skylark	Absent in main winter period	Amber
Meadow Pipit	Present though in small numbers	Red
Grey Wagtail	Along Roughty River	Red
Pied Wagtail	Near residences	Green
Goldcrest	In scrub	Amber
Wren	Present throughout site	Green
Robin	In low-lying areas	Amber
Blackbird	In low-lying areas	Green
Song Thrush	In low-lying areas	Green
Mistle Thrush	Sparsely distributed	Amber
Redwing	In low-lying areas	Green
Fieldfare	In low-lying areas	Green
Blue Tit	In low-lying areas	Green
Great Tit	In low-lying areas	Green
Magpie	Present	Green
Hooded Crow	Widespread	Green
Raven	Regular – flocks up to 18	Green
Starling	In fields	Amber
Chaffinch	In low-lying areas	Green
Lesser Redpoll	Regular in local woods	Green
Reed Bunting	In marginal wet habitats	Green

The Conservation Status (Red, Amber, Green) is after Colhoun & Cummins (2013). Species listed on Annex I of the EU Birds Directive are highlighted with an asterisk. 'In low-lying areas' refers to the Roughty River valley and associated fields.

Summary of Conservation Status of Bird Species

White-tailed Eagle

EU Birds Directive Annex I; Red listed (Colhoun & Cummins 2013)

Between 2007 and 2011 a total of 100 young white-tailed eagles were released into the

wild in Killarney National Park as part of a re-introduction programme for the species in Ireland (see www.goldeneagle.ie). In the first few years after their release, the eagles used the upland areas throughout the Iveragh Peninsula and the Killarney Mangerton Mountain area where they found good foraging areas and suitable overnight roost sites (Golden Eagle Trust unpublished data).

The presence of the eight eagles in the vicinity of Lough Nabuddoga and the Coolknoohil valley (both outside of wind farm) in December 2009 was considered to be due to the presence of animal carcasses dumped near the lough. At the time, consultations were undertaken between the project ornithologist (Mr Colin Barton) and The Golden Eagle Trust, and the Golden Eagle Trust were in agreement with the above scenario. While further sightings of juvenile white-tailed eagles were made near the Barnastooka wind farm in the early months of 2010, it was noted that the site does not contain suitable breeding habitat for the species and that it would not be a future breeding site.

Surveys for white-tailed eagles were carried out for the proposed Derrincullig Wind Farm in winter 2009/10, summers 2010 and 2011, and winter 2012/13 (details in EIS for proposed Derrincullig Wind Farm). Derrincullig is situated approximately 5 km to the northwest of the Grousemount wind farm site. These surveys recorded consistent eagle activity over the southern slopes of Mangerton Mountain and a known eagle communal roost on the slopes of Mangerton was confirmed by Dr Allan Mee of the Golden Eagle Trust.

Due to the recent presence of eagles in the wider area of Grousemount, a survey focused on the white-tailed eagle was carried out at the Grousemount site in winter 2014/15. From a total of 108 hours of vantage point watches over the site, one observation was made on 27th February 2015 of two white-tailed eagles flying over the extreme eastern boundary. Several visits were made during the winter to Lough Nabuddoga and the Coolknoohil valley areas where eagles had been present in winter 2009/10 but no birds were observed at these locations.

Following on from the February 2015 sighting of the White-tailed Eagles at Grousemount, Dr Allan Mee, Project Manager of the Re-introduction Project, was contacted by Mr Joe Adamson (BES) – the following points were raised during the conversation.

- A pair of White-tailed Eagles had been sighted in The Gearagh/ Lee Valley area in the weeks prior to the February sighting at the proposed windfarm site, which could well have been the same birds observed at the site.
- Occasional sightings of White-tailed Eagles have been made at Gouganebarra Lake in the past.
- In the years following the initial re-introduction of young birds, a roost site of up to twelve immature individuals was located to the northeast of the proposed wind farm site. However, in subsequent years, this site has been used less frequently and is now all but abandoned. It is thought that as the birds matured they dispersed over a wider area throughout Ireland and thus have abandoned many of the local Kerry sites that had been used in the first few years of the programme.

As white-tailed eagles require large lakes for nesting (such as the Killarney lakes), the Grousemount site would not present nesting opportunities. Similarly, the site would not be suitable as a night roost due to the absence of stands of tall trees. However, as with any open location in the wider area, the presence of carcasses could attract feeding birds to the site (as was considered the case at Lough Nabuddoga in December 2009). Birds may also be expected at times to pass through the site while travelling to lakes further afield,

such as Gouganebarra Lake (less than 2 km from the southern boundary of the Grousemount Wind Farm) or Lough Allua (c.5 km east of Grousemount). However, the survey in winter 2014/15, with 108 hours of systematic observations over the site producing just one sighting of a pair, indicated that the frequency of birds passing through the site is low.

Hen Harrier

EU Birds Directive Annex I; Amber listed (Colhoun & Cummins 2013)

One record (off-site) in January 2009. One also reported from Sillahertane Bog and adjacent forest in 2002. There are no known breeding records from the wind farm site or its surrounding areas (Barton et al. 2006, Ruddock et al. 2012, NPWS personal communications to B. Madden).

The species occurs in the study area, mainly within the Mullaghanish to Musheramore Mountains SPA. As hen harriers wander widely in autumn and winter, birds could be expected to pass through the wind farm area on occasions outside of the breeding season. However, in general, hen harriers would winter in the more hospitable low-lying farm areas. A discussion on Hen Harriers is presented in the **Appropriate Assessment Screening Report**.

Other Birds

- Sparrowhawk (Amber listed - Colhoun & Cummins 2013): Single bird recorded within Roughty River valley in December 2014. Probably nests in the local forests.
- Kestrel (Amber listed - Colhoun & Cummins 2013): Recorded hunting on the wind farm site in both summer and winter – probably breeds locally.
- Red Grouse (Red listed - Colhoun & Cummins 2013): Resident on the wind farm site, although sparsely distributed.
- Golden Plover (EU Birds Directive Annex I; Red listed - Colhoun & Cummins 2013): Flocks recorded over the wind farm site and just to north of site in December 2008 and November 2010 respectively. Such records are not unexpected as golden plover is a widespread species throughout much of Ireland in autumn and winter. Breeding however is nowadays confined to the west coast from Co. Galway north to Donegal.
- Snipe (Amber listed - Colhoun & Cummins 2013): Occurs sparsely throughout the wind farm site in winter. While not recorded breeding on site, it is possible that breeding does occur.
- Chough (Amber listed - Colhoun & Cummins 2013): While there was only one record of this localised corvid species, the high cliffs and crags provide good habitat and feeding flocks may pass through the wind farm site at times.
- Skylark (Amber listed - Colhoun & Cummins 2013): Occurs widely as a breeding species on bog and grassland habitats throughout the wind farm site. Scarce in winter and totally absent in the mid-winter period.
- Mistle Thrush (Amber listed - Colhoun & Cummins 2013): Breeds locally, possibly on the wind farm site. Post-breeding flock (up to c.30 birds) present on site in July.
- Stonechat (Amber listed - Colhoun & Cummins 2013): Several pairs breed in the low lying areas of the wind farm site where there is a scattering of scrub.

- Wheatear (Amber listed - Colhoun & Cummins 2013): Summer migrant which breeds on the wind farm site (at least 5 pairs estimated).
- Meadow Pipit (Red listed - Colhoun & Cummins 2013): The most frequently encountered bird within the wind farm site. Breeds widely and also present in winter. Post-breeding flocks form in late summer and autumn.
- Grey Wagtail (Red listed - Colhoun & Cummins 2013): Grey wagtail occurs on the Roughty River and its main tributaries. Nesting sites are usually bridges or culverts.
- Linnet (Amber listed - Colhoun & Cummins 2013): Breeds on site (several pairs). Occasional in winter.

In addition, two Amber listed species, Goldcrest and Robin, are widespread amongst scrub and woodland habitats within and around the wind farm site. Swallow is also common over site in winter and breeds in various farm buildings. Starling occurs in the low-lying sectors of the site and breeds locally in buildings and is widespread in fields during winter.

Ravens (*Corvus corax*) breed locally in the upland areas, while hooded crows are common throughout.

Dipper (*Cinclus cinclus*) occurs on the main rivers, along with mallard (*Anas platyrhynchos*), grey heron (*Ardea cinerea*) and moorhen (*Gallinula chloropus*).

The hedgerows and woodland areas along the cable route support a range of common species, including wren (*Troglodytes troglodytes*), blackbird (*Turdus merula*), coat tit (*Parus ater*), chaffinch (*Fringilla coelebs*) and bullfinch (*Pyrrhula pyrrhula*). Summer visitors such as willow warbler (*Phylloscopus trochilus*) are known to be widespread throughout the study area

9.1.14 Fauna - Kerry Slug

Full details of the preliminary results of the survey for Kerry Slug within the wind farm site, using the metric trap methodology, are presented in Appendix F.5.

In summary, a total of seven individual Kerry Slugs were recorded in metric traps (four traps had individuals present) during the first site visit following traps being laid (see Appendix F.5). All records were from traps laid on outcropping rock. A further five individuals (four observations) were recorded from outcropping rock elsewhere on the site during site visits (see Appendix F.5).

For the underground cable component of the project, a specialised survey for this important species was not considered necessary due to the fact that its usual habitats, namely deciduous woodland, blanket bog or unimproved oligotrophic open moor and lake shores, will not be affected by the proposed works (including the section through the St. Gobnet's Wood cSAC).

9.1.15 Evaluation of Fauna

The fauna recorded during the surveys or expected on the wind farm site is fairly typical of the habitats present and the geographical location, with a limited number of species adapted to the open and exposed environment.

Otter is by far the most important mammal species present, as otter is listed in Annex II & IV of the EU Habitats Directive and is listed as a Near Threatened Species on the Red List (Marnell et al. 2009). Otter, however, is still widespread in Ireland and is present on most

river systems (Bailey & Rochford 2006). Various mammal species protected by the Wildlife Acts occur on site, with the Irish hare the most widespread of these.

The lesser horseshoe bat, a species listed in Annex II of the Habitats Directive, occurs in the general area, although the nearest known roost site is c.3 km from wind farm site boundary.

The Kerry Slug, a species listed in Annex II of the Habitats Directive and legally protected under the Wildlife Acts, occurs where outcropping rock is dominant within the wind farm site.

Red Grouse, a species confined to peatland habitats, is resident within the wind farm site, although sparsely distributed. Red Grouse is of conservation importance as it is Red listed (Colhoun & Cummins 2013) due to a marked decline in its national distribution. It is considered that Red Grouse is the most significant bird species associated with the Grousemount site. Two further Red Listed species, Meadow Pipit and Grey Wagtail, occur on the site and are Red Listed due to short-term declines in the breeding populations. Meadow Pipit is very frequent throughout the site, while Grey Wagtail breeds on the main rivers and streams. Golden Plover, both a Red listed and an Annex I Birds Directive species, was recorded over the site in autumn/winter and may on occasions land within the site. However, the species does not breed in southwest Ireland.

While White-tailed Eagle (Red listed & Annex I listed) has been recorded on site and in the wider area, the site is not suitable for breeding or night roosting purposes. At most, feeding birds may be attracted to a carcass or birds may on occasions pass through the site in transit to large lakes in the region.

A host of Amber listed species occur commonly within the site though some of these (such as Robin) are confined to the low-lying areas with scrub and/or woodland and are not necessarily associated with peatland type sites. Amber listed species occurring on site and which are typical of open peatland habitats are Kestrel, Snipe, Skylark, Stonechat, Wheatear, Linnets and, to a lesser extent, Mistle Thrush. The occurrence of Chough (Amber listed & Annex I Birds Directive) is of some note though its presence on site is expected to be very occasional. While Chough is mainly a bird of coastal areas, it also occurs inland and two pairs were recorded in the Kilgarvan area (10 km square W06) in the 1992 national survey (Thomas et al. 2003).

9.2 IMPACT OF THE DEVELOPMENT

The principal ecological impact by the wind farm development will be loss and disturbance of habitats, some of which are of conservation value. A potential impact is water pollution due to construction works. As this is dealt with in detail elsewhere in the EIS, it is not considered further in this Section). Some species of fauna may be affected directly or indirectly and appropriate mitigation will be implemented as required.

9.2.1 Predicted Impacts - Habitats and Flora – Wind Farm

The construction of the turbine foundations, hardstand areas, access tracks, anemometer masts, borrow pits and Coomataggart Substation will lead to the permanent loss of an amount of habitat (total development land requirement is estimated at 38 ha. In the context of the site area (approximately 1,465 ha) this is a low proportion (less than 3%).

Practically all of the turbines and associated roads and other infrastructure will be on wet heath or wet heath in combination with wet grassland. The loss of an estimated 28 ha of wet heath habitat in the context of the site (which supports approximately 1,070 ha of heath and surrounding areas (where heath continues to be dominant) is considered an

impact of moderate significance

In the Grousemount section of the site sensitive design has ensured that turbines are not located within the three relatively intact plateau areas of blanket bog within that sector of the site. However, due to local topographical conditions roads will traverse two of these areas (in areas of turbines T10-T11 and T17-T19). While habitat loss will be low, the tracks will fragment these areas of bog. Where peat depth is greater than 1 m and subject to consideration of geotechnical safety, floating roads may be used with a view to minimising the impact on local hydrological conditions. Overall, the impact on the blanket bog resource within this site is considered of low to moderate significance (assuming mitigation measures will be taken to minimise disturbance during construction).

In addition to habitat loss, there will be some physical disturbance from the excavation works to the immediate adjoining areas of habitats, although this can be minimised with care. Observations at other wind farm developments located in areas of bog and heath habitats suggest that areas of excavated peat around turbine bases and along roads quickly become colonised by a range of rushes and grasses, with soft rush (*Juncus effusus*), bulbous rush (*Juncus bulbosus*), bent grasses (*Agrostis* spp.) and sweet vernal grass (*Anthoxanthum odoratum*) typically prominent. Over time, various other bog species (*Calluna vulgaris*, *Eriophorum angustifolium* etc.) are likely to colonise. Scrub, mainly gorse and willow, may also develop, especially if there is a local seed source and also a mineral component in the soil mix present.

Adjoining vegetated habitats to tracks and turbine bases will be subject to drying where water losses occur. This is especially relevant to bog and heath habitats. The extent of such drying depends on slope and the depth and wetness of the peat present (and also on past disturbance). Generally, it is considered that a drying effect is unlikely to extend more than 10 m from the construction areas. Robust species such as ling heather, purple moor-grass and deer grass would be expected to become more common in such areas.

Hawkweed Species

Two of the proposed crossings of the Roughty River are over stretches of river where the rare hawkweed (*Hieracium* spp.) species occur. The plants grow on exposed bedrock or large boulders within the river channel. While the bridge construction will not involve in-stream works or alter the flooding pattern of the river, plants which occur at the immediate locations would be expected to be affected by shade from the bridge platform (5 m wide). While this is a negative impact, it is localised to a short stretch of the river where the plants occur in stretches for several of tens of metres.

9.2.2 Predicted Impacts – Habitats – Cable Route

Habitats along the route corridor will be affected by trench excavations, joint bay construction and water course crossings (open cut and trenchless).

Trenches: The main impact will be disturbance to various habitats during the construction of the trench for the cable. However, this impact is temporary as the trench will be backfilled immediately when the section is completed. The main habitat affected will be the actual road carriageway, but grass verges may need to be cleared during the works. In places the adjoining clay banks and ditches may be disturbed. It is not expected that hedging or trees will need to be removed. The impact by trenching works along roads, tracks and paths is rated as an imperceptible impact.

Joint Bays: The joint bays will result in permanent loss of habitat (each bay c.6m x 2.5 m). Along roads and tracks, the habitats affected comprise built land. In some places, the

joint bay will extend off the road carriageway into marginal grassy verge habitats and in some instances clay banks and ditches may need to be cut into to accommodate the bays. Additionally, disturbance will result from the work zone around the joint bays, extending to up to 6 m at either end of the bay.

The permanent loss of habitat arising from by joint bay construction will be almost entirely within the road carriageway and adjoining marginal strips. This is rated as an imperceptible impact.

Disturbance to marginal vegetation from construction works is a temporary impact and recovery would be expected within 1-3 years. It is noted that where joint bays are located along the edge of the road, grass verge vegetation will become established over the bay (as is normal along edges of newly surfaced roads).

Water Crossings - Open Cut: Open cut crossing locations will require removal of bankside vegetation to accommodate the works. This will involve removal of a section of approximately 3 m width from each bank.

Riparian vegetation and bankside scrub will be present at some crossing points, although others will be merely marginal grassland, whose natural recovery would be expected within 1-2 seasons. Recovery of scrub, such as willow, could take up to 3-5 years. Where well developed riparian scrub is present, replanting will be undertaken as part of the reinstatement works.

The impact on bankside vegetation by the crossings is rated as a slight impact, although temporary to short-term in duration and at a local level.

Water Crossings - Horizontal Directional Drill: The use of horizontal directional drilling (HDD) to cross the main river channels is a positive feature of the project as it avoids disturbance to the watercourses and marginal riparian habitats. While setting up of the drill sites will result in local disturbance, this is not of significance as habitats disturbed are largely agricultural fields and the disturbed areas will be reinstated. This is rated as a slight impact of temporary duration.

9.2.3 Predicted and Potential Impacts - Otters

As described in the baseline assessment, otter is considered widespread on the main rivers and streams within the wind farm and along the cable route. Otter could be affected by open cut crossing works from (i) direct disturbance to holts (dwellings) if present in the banks, (ii) release of solids to the water which could affect the food supply of otters such as fish, and (iii) disturbance during construction. Impacts on otter holts or food supplies are not expected where crossing is by HDD.

It is noted that the main crossings of watercourses within the wind farm will be by span structures and will not present obstacles to the movements of otters along the rivers and streams. At the crossing locations, the potential impact on otter is rated as slight, temporary and localised

While the present baseline assessment did not record the presence of holts at any of the main crossing locations, further survey is recommended prior to construction at the watercourses that have potential for holts, namely the main channels of the Roughty and the Sullane rivers as well as the main tributaries. Should a holt be located, appropriate mitigation recommended by the otter expert would be followed.

The open cut crossing works on the cable route could cause local disturbance to otters. However, this is not considered as a significant impact as the works at each crossing will

be temporary in duration (ranging 1-3 days) and carried out mostly in daylight hours (otters are largely nocturnal).

At the crossing locations, the potential impact on otter is rated as slight, temporary and localised. Where the crossing is by HDD, otters will be largely unaffected by the works above the stream banks.

9.2.4 Predicted and Potential Impacts - Bats

The works on the cable route will not require the felling of any mature trees that could accommodate roosting bats. Similarly, the works will not involve disturbance to buildings, including stone bridges, which could accommodate roosting bats. Overall, it is not anticipated that the local bat populations will be affected in any way.

The occurrence of bats within the wind farm site is expected to be limited due to the elevation of the site and its low vegetated bog/heath habitats. The open and windswept nature of the landscape is not favourable for bats, as there is little shelter for insects to amass to act as prey items for these animals.

While the development site is within the range of the lesser horseshoe bat, the nearest roosts (within Gortloughera and Barnastooka townlands) would not be affected due to the distances apart. Similarly, the important lesser horseshoe bat roosts that are designated as Special Areas of Conservation (namely Glanlough Woods SAC, Kilgarvan Ice House SAC & Old Domestic Building, Curraglass Wood SAC) would not be affected due to their distances, i.e. at least 5 km, from the wind farm site.

Apart from one, each of the bat species confirmed or expected on site are normally low fliers, e.g. <10 m above ground level, and thus are considered to be at a low risk from turbine impacts. The exception is Leisler's bat which is a high-flying species. Leisler's bat is classified as a high risk species in relation to wind turbines, as it is a high flier (Carlin and Mitchell-Jones 2012), and travels considerable distances between roosts and foraging areas.

In general, bat species could potentially be affected by both the construction phase and subsequent operation of the wind farm.

Wind Farm Construction: Construction may involve some minor widening of existing public roads to allow unimpeded haulage of the large turbine sections. This road widening is likely to involve some element of tree and hedgerow removal which may affect bats. Existing bridges and culverts which may (at the time) be in use by bats may also require strengthening to cope with increased loads during turbine delivery or works to facilitate cable placement. New access tracks on the site may also result in the loss of vegetation which may be in use as flight path features by bats. Mitigation, including pre-construction survey, will be required to minimise such impacts.

Wind Farm Operation: Bat mortality due to collisions with wind turbines is well known and studies have further shown that bats may be killed without physically contacting turbine blades. The planned turbine development is to be sited within an area which is potentially over-flown by Leisler's bat and whose hedgerow, scrub and river corridor habitats at lower elevations are currently in use by at least four other bat species. Although, as yet, there are no published results of bat mortality from Irish wind turbines, considering recent research from mainland Europe and North America, there is an increasing amount of detailed published evidence that wind turbines cause bat fatalities.

However, many of these overseas turbine/bat mortality studies are at wind farms with significantly large numbers of turbines and sited along known bat migration routes where

many hundreds or even thousands of bats commute seasonally, resulting in numerous deaths and injuries. There is currently no evidence that mortality of bats on the same scale occurs here. Additionally, although it is known that Nathusius' pipistrelle *P. nathusii* migrates from Scandinavia to Scotland and to the north of Ireland and back again (Russ et al. 2001), apart from this species, there is currently no evidence that internal or external bat migration routes of other bat species exist elsewhere in Ireland. Nevertheless, risks to bats from wind turbines are acknowledged and it is possible that some bat mortality may occur due to the operation of the planned development. Mitigation measures are recommended to reduce the likelihood of such fatalities.

9.2.5 Predicted & Potential Impacts - Mammals, Amphibians & Reptiles

The loss of relatively small amounts of habitat due to the proposed development would not have any measurable impacts on the terrestrial mammal species, such as Irish hare, which inhabit the wind farm site and all should continue to retain a presence in the vicinity after the turbines are constructed. As the construction works on the cable route will be confined almost entirely to roads and tracks, habitats suitable for supporting mammal species will be largely unaffected.

The loss of relatively small amounts of habitats within the wind farm site used by the common frog is not expected to affect its overall distribution within the wind farm site. The species is expected to be widespread throughout the cable route. Generally, the works will not affect large drains or ponds, which provide their main breeding locations. However, works during the main breeding season (late-February to May) could affect areas along roads subject to ephemeral flooding (possibly overflowing drains) and used opportunistically as spawning sites. While this is an adverse impact, it is not rated as significant, since such sites are marginal with low breeding success (due to likelihood of drying) and generally would not be important in the context of the local population. Furthermore, where works are in progress during the main spawning period, the Project Ecologist can advise on the necessity for mitigation measures, such as removal of spawn (under licence).

The loss of relatively small amounts of habitats within the wind farm site used by the common lizard frog is not expected to affect its overall distribution within the wind farm site and the works would not be expected to affect their habitats (mainly dry heath and exposed rock) on the cable route

9.2.6 Predicted & Potential Impacts - Birds

Common Bird Species

The loss of relatively small amounts of habitat due to the wind farm development would not be expected to have any significant impacts on the populations of the bird species that currently frequent the site and its surroundings.

Generally, wind farm developments can be expected to have fewer effects on passerine species (such as meadow pipit, skylark, wheatear) than compared to waterfowl or birds of prey (Devereux et al. 2008). A recent UK study by Pearce-Higgins et al. (2009) on open bog sites found that the effect of turbine proximity on skylark distribution were of marginal significance. Further, as all of these species occur commonly in the area, the effect of possible displacement is unlikely to have a significant impact on the overall populations of any species.

There is no evidence to show that the site is within a regularly used migration route by birds or a route used by wintering waterfowl. Furthermore, from the location and

topography of the area there is no reason to believe that it would be used by significant numbers of migrating birds or waterfowl. Therefore, the possibility of an impact by disturbance on migrating birds can be disregarded.

Evidence from comparable modern wind farm sites elsewhere in Europe indicates that the risk of collision by birds striking wind turbines is low, even in coastal sites where there are large concentrations of wintering waterfowl close by (see review by Percival 2005). There may be a small number of casualties per year amongst the local bird populations. However, it is considered unlikely that such losses could be of a scale whereby there would be significant adverse effects on the local bird populations.

The common bird species along the cable route are widespread species of the countryside and no specific impact on these species would be expected.

Birds of Conservation Importance

Meadow pipit is a widespread species throughout the cable route corridor but would be largely unaffected by the works. Grey wagtail occurs on the rivers and larger streams throughout the route corridor. The location for the nest is often within a bridge structure. It is considered unlikely that the in-stream works would affect nesting wagtails.

It would not be expected that the various Amber listed species occurring along the cable route, e.g. kestrel, snipe and starling, would be affected.

Red Grouse

Red grouse, a Red listed species, occurs sparsely within the wind farm site. Grouse could be disturbed during construction works, although this would be of temporary duration and at any one time limited to only part of the site. It is noted that a recent review of monitoring data from upland wind farms in the United Kingdom has suggested for the first time that wind farm construction can have greater impacts through disturbance upon birds than wind farm operation (Pearce-Higgins et al. 2012). The study found that red grouse, as well as species such as Snipe and Curlew, densities all declined on wind farms during construction. However, red grouse densities recovered after construction within the first year post-construction.

The birds could also show some displacement behaviour when the turbines are operational though it is likely that they would habituate to the presence of turbines – at the Derrybrien windfarm in Co. Galway, red grouse were observed feeding along the margins of the wind farm roads during monitoring in 2009, 2011 and 2015. Additionally, a recent United Kingdom study of the effects of wind farms on upland breeding birds found no evidence of turbine avoidance by red grouse (Pearce-Higgins et al. 2009).

Red grouse is a species that is not considered to be at risk from collision with wind turbines due to the fact that they seldom fly and when they do the flight line is invariably close to the ground (<10 m).

Red grouse have previously been recorded on bog and heath at Knockanruddig to the east of the location of the permitted Coomataggart Substation, and it is expected that the species is sparsely distributed on bog and heath within this area of the route corridor. As the works could cause disturbance to breeding grouse, best practice requires that works in this area, i.e. section of route across open heath, be undertaken outside of the nesting season.

White-tailed Eagle

White-tailed eagles from the ongoing Reintroduction Programme (based in Killarney) have

been recorded to the north of the wind farm in the past and a pair was observed moving southwards along the easternmost margin of the site in February 2015. White-tailed eagle is listed as being vulnerable to disturbance displacement and collision with wind turbines (Langston & Pullan 2003).

The Grousemount site does not offer potential nesting sites for eagles or stands of trees suitable as night roost sites. As with any other location in the wider area, eagles could be attracted to the site should carrion or carcasses be present, or they may pass through the site while in transit to other locations. With 108 hours of systematic observations over the site producing only one sighting in winter 2014/15, it has been shown that there is no regular movement of eagles in this area. Additionally, nowadays the eagles are travelling much further afield from the release locations in Killarney National Park than in the early days of the programme and hence there is less of a focus on the immediate area around Killarney.

Taking these factors into account, it is considered that the wind farm does not introduce a significant risk to white-tailed eagles from the Reintroduction Programme. Furthermore, the recommended bird monitoring programme for the site will detect feeding and/or roosting eagles should they be in the area and mitigation can be taken to discourage eagles from feeding within the site (such as removal of carcasses of domestic stock).

As there is no evidence of recent presence of white-tailed eagles in the vicinity of the cable route corridor, no impacts will arise.

Hen Harrier

While breeding hen harriers are not known to have a presence in the vicinity of the wind farm, it is possible that one or two pairs could nest in the region in the future. The Grousemount site does not provide nesting habitat (due to absence of dense heather or young conifer plantation) but could be used by foraging birds. If present in the area, birds could be deterred from using parts of the site due to the presence of the turbines (though there is no evidence from other sites in Ireland to show that this is the case). As suitable foraging habitat for harriers does not appear to be a limiting factor in this region, the potential loss of a relatively small amount due to the presence of turbines would not be of significance should harriers become established in this region.

While the cable route passes through and alongside the Mullaghanish to Musheramore Mountains SPA, it is not expected that the works would have adverse impacts on the local hen harrier population. This reflects the scale and nature of the works.

Peregrine

Peregrines nest at Gouganebarra Lake, approximately 3 km south of the wind farm site. Birds may on occasions pass through the site while foraging as peregrines typically have territories of several tens of square kilometres. Even if visiting peregrines were deterred from using parts of the site due to the presence of the turbines (and there is no evidence to show that this would happen), this is not likely to have a significant adverse impact on the well-being of the birds as the area that might be avoided is only a small fraction of the area of suitable habitat potentially available to foraging peregrines.

Golden Plover

Golden plover may use the wind farm site on occasions, probably mainly during the spring and autumn migration periods or possibly in winter. Such usage would normally be for short periods.

As usage of such sites outside of the breeding season is somewhat opportunistic, the

presence of turbines would not be expected to have any effects on the birds. Additionally, Golden Plover have been seen roosting within an operating wind farm in North Cork in late spring, indicating that they are tolerant of wind farms (C. Barton personal observation).

Chough

Chough is a species of conservation importance that occurs at the site, although it is not suspected that they actually nest within it. Its main use appears to be for feeding, where they utilise partly improved grassland swards, including those in the northern 'valley' area. The presence of the turbines is unlikely to deter choughs from feeding within the site as choughs are readily found in areas where there is human activity. Additionally, the main potential feeding habitat is not affected by the development.

9.2.7 Potential impacts on Kerry Slug

Results from the survey confirm the presence of Kerry Slug within the wind farm site. These results also suggest a preference for exposed siliceous rock. This is in line with previous surveys undertaken amongst similar habitat complexes (McDonnell and Gormley 2011a). The species is thought to be widespread throughout suitable habitat within its known range (NPWS 2013).

The development of the wind farm could potentially impact on the local population of Kerry Slug due to loss and disturbance of suitable habitat. Based on the likely extent of habitat loss throughout the wind farm site, this impact is likely to be minor and localised as only a very small proportion of suitable Kerry Slug habitat within the site will be impacted. During construction, works could also result in the death of low numbers of Kerry Slug due to machinery movements in areas of suitable habitat.

Mitigation measures are recommended to minimise the above potential impacts on the local Kerry Slug population.

9.2.8 Potential Impacts - Sites Designated for Nature Conservation

A detailed assessment of possible impacts by the proposed project on Natura 2000 sites, i.e. SACs & SPAs, is presented in the accompanying Appropriate Assessment Screening Report. That evaluation considered four principal sites (St. Gobnet's Wood SAC, Mullaghanish Mountain SAC, Mullaghanish to Musheramore Mountains SPA and Kenmare Bay SAC) and concluded that the project would not have significant adverse impacts on these sites.

Consideration is given to possible impacts on the NHAs and pNHAs within a 10 km radius of the development site.

Sillahertane Bog NHA lies to the east-northeast of the site, with a section of shared boundary. It is the only site that is physically close to the works area for the cable. The nearest turbines, i.e. turbines T4, T5 & T6, will be at least 200 m from the NHA boundary, with no track construction within 100 m. With such distances apart, and with peat stability in this area known to be stable, it can be shown objectively that there would be no impacts on the NHA.

Ballagh Bog pNHA lies to the south of the wind farm site, with some overlap between the pNHA and the site. While T16 and the associated track is within c.100 m of the pNHA boundary, hydrological and peat stability studies have shown that the proposed development would not have any (indirect) impacts on the bog and heath habitats within the pNHA.

The Roughty River pNHA comprises a section of river approximately 3 km downstream of

the wind farm and approximately 4 km downstream of the westernmost section of the route corridor. Detailed assessments carried out on possible aquatic impacts by the project on this river showed that there would not be any significant impact on aquatic life within the river. It is noted that the main interest of the pNHA is the presence of a rare plant (hawkweed species) which occurs on rocks between the winter floods and the low summer flows, as well as on mortar on bridges. On this basis, it can be concluded that the interests of the pNHA will not be affected.

The proposed development (both the wind farm and cable) could not have any impacts on any of the other designated NHA or pNHA sites in the wider vicinity as all of these are several kilometres from the development areas and lack hydrological linkages.

9.3 MITIGATION

9.3.1 *Ecological Clerk of Works and Project Ecologist*

An Ecological Clerk of Works will be appointed by the developer for the duration of the works so as to ensure compliance of ecological mitigation measures as detailed in the various planning documentation.

The Ecological Clerk of Works will be supported by an independent Project Ecologist to provide advice as necessary on all matters relating to ecology. The ecologist will prepare written reports on the various mitigation measures undertaken.

The appointment of these personnel will ensure that all ecological mitigation measures as outlined in the EIS are implemented during the construction period according to best practices.

9.3.2 *Mitigation - Blanket Bog*

A sensitive design for the wind farm has endeavoured, as far as is feasible, to avoid the main areas of relatively intact blanket bog on site.

The impact of the crossing by tracks in two of the three main areas of bog can be minimised by the use of floating roads where peat depths exceed 1 m, subject to considering geotechnical safety. Additionally, particular care will be taken during construction works in the vicinity of the areas of blanket bog to minimise the impact. On no account will excavated or other materials be stored in areas shown as blanket bog on the habitat map.

The design of the road network has also, where feasible, avoided localised pockets of deeper peats and wet flushes associated with the various tributary streams.

9.3.3 *General Measures for Maintenance of Habitat Integrity*

As the wind farm site supports a range of natural and semi-natural habitats (mainly wet heath, wet grassland, exposed rock), the following measures will keep disturbance of habitats to a minimum:

- Allowance will be made for minor alterations to road routes by micro-siting to avoid deeper pockets of peat or particularly wet flush areas which may be identified during detailed design stage.
- Construction works will be confined to the smallest area possible. Minimum removal of vegetation will take place so as to reduce the area of bare peat or soil. Minimal traversal of surface vegetation by machinery will be aimed for.
- Excavated peat from the turbine and road foundations will not be stored on areas

of intact wet heath or blanket bog or near streams and drains. Suitable disposal areas will be identified in advance.

- Aggregates of similar chemistry as site bedrock will be used for road construction and foundations. This will minimise alterations to current site chemistry and waterbodies in catchment.
- Tracks on sloped ground will be positioned so as to cause minimal damage to the natural hydrology by following contours where possible (as opposing to running perpendicular to contours) and by frequent placing of drainage pipes to allow natural diffusion of water.
- Areas of disturbance around the turbines and alongside the roads will be profiled to reflect adjoining levels. Previously excavated material from local areas, which will contain a seed source (as well as rhizomes etc.), can be used in this process. Re-vegetation of disturbed areas is expected to occur naturally.

Specific mitigation for habitats along the cable route is not required along the sections of the route corridor that are within roads and tracks. However, as the route passes through (albeit within the road) two European sites (Mullaghanish to Musheramore SPA & St. Gobnet's Wood SAC), the Project Ecologist will be in attendance as considered necessary at these locations to ensure that best practices are adhered to throughout.

At open cut crossings where bankside vegetation comprising a strip of continuous woodland or scrub is breached, replanting will take place. Willow would probably be used in most cases as this is widespread along the various streams in the area and fast growth would be expected. The Project Ecologist will advise where replanting is necessary and the species to be used.

9.3.4 Mitigation - Hawkweed Species

Survey has shown that the construction of two bridges over the Roughty River may affect some hawkweed plants as a result of shade. While only a small number of plants within the local populations would be affected, best practice would be to resurvey these locations in the summer before bridge construction and identify the exact number of plants likely to be affected by shade from the bridge platform. As translocation of these plants would probably not be feasible, it is suggested that ripe seeds be collected for ex-situ conservation in seed banks. In the recent study of these rare hawkweed species by Rich et al (2008), the following is noted:

Additional ex situ collections of seeds or living plants would be valuable. Two seed collections of H. argentatum and one of H. sparsifrons are held in the Irish Rare and Threatened Seed Bank at Trinity College Botanic Gardens, Dublin, and one collection of each can be found in the Millennium Seed Bank at Wakehurst Place, Sussex. No seed collections of H. scullyi are currently held in any seed bank, but live material is held in cultivation in locations such as DBN. DNA samples of all three species are held in the DNA bank at the Royal Botanic Gardens, Kew.

Collection of seed would be carried out in collaboration with the National Parks and Wildlife Service and the Trinity College Botanic Gardens. Consideration could also be given to the collection of living plants for cultivation in Trinity College Botanic Gardens.

9.3.5 Mitigation - Alien Species

Japanese knotweed (*Fallopia japonica*) was recorded at one location along the cable route corridor (just west of Joint Bay No. 20) and could occur elsewhere. Japanese knotweed is

sterile and spreads exclusively by vegetative means. Any movement of excavated materials that is contaminated with fragments of the plant can become a source of further spread. Similarly, fragments of the plant can be transported accidentally by machinery movements from a contaminated site to another.

The introduction and spread of this invasive plant species will be avoided during the construction phase of the project by ensuring that appropriate precautionary measures are in place. Guidelines produced by the NRA (2010) on 'The management of noxious weeds and non-native invasive plant species on national roads' will be adhered to. It is of particular importance that excavated material from areas where Japanese Knotweed is known to be present be appropriately managed.

9.3.6 Monitoring for Habitats and Vegetation

At the end of construction a survey on the wind farm site will take place by a qualified ecologist. The extent of bare or disturbed areas will be recorded and recovery will be monitored over a period as follows: Years 1, 3, 5, 7, 10, 15, 20.

Particular attention will be given to the areas of blanket bog and wet heath on site. If erosion-related problems are detected, corrective actions will be taken as necessary. Such actions could include sodding of bare patches with turves taken from elsewhere (not from a site of conservation interest) or reseeded with suitably sourced seed appropriate for the site.

A protocol for monitoring will be agreed with the National Parks and Wildlife Service prior to the commencement of works on the site.

9.3.7 Mitigation - Otters

A pre-construction survey for otters will be carried out at all watercourse crossings classified (in Aquatic Reports) as 'rivers', 'larger streams' and 'small to moderately sized streams' along the cable route corridor and at the wind farm site. This will focus on search for holts and regular otter activity. Mitigation will be recommended as considered necessary and in compliance with the Wildlife Acts 1976 and 2000.

9.3.8 Mitigation - Bats

Buffer Zones

Bats commuting and foraging along onsite hedgerows will be safeguarded by providing a 50 m minimum distance buffer zone between the rotors of the planned turbines and the nearest vegetation to reduce the risk of collision and/or barotrauma. This is in line with present best practice guidelines (Carlin and Mitchell-Jones 2012) and will prevent impacts to bats that mainly fly low along such linear features, e.g. the pipistrelles. Such a buffer zone can be provided by either siting the turbines so that rotors are a minimum of 50m away from existing vegetation or removing vegetation within 50 m of rotors. Such cleared vegetation will be managed and maintained during the operational life of the development

It is to be noted that the buffer zone is to be measured from the path of the wind turbine rotor rather than from the base of the turbine. For the turbine with the largest size rotor being considered for deployment at Grousemount (112 m diameter), this requires a buffer zone of 90 m from the turbine base for vegetation height of 15 m. A lesser buffer zone is required for turbines with smaller rotor diameters.

Removal of Deciduous Trees

Should it be necessary to remove mature broadleaved trees on site or elsewhere, these will be surveyed in advance by a suitably experienced specialist to determine the presence

of bats. If bats are found, an application for a derogation licence will be made to the National Parks and Wildlife Service to allow its legal removal. Such trees will ideally be felled in the period late-August to late-October, or early-November, to avoid disturbance of any roosting bats as per NRA guidelines (NRA 2006a & 2006b) and to avoid the bird breeding seasons. Tree felling will be completed by mid-November at the latest, as bats roosting in trees are very vulnerable to disturbance during their hibernation period (November – April). Any felled trees with ivy (*Hedera helix*) cover will be left intact on site for 24 hours prior to disposal to allow any bats beneath foliage to escape overnight.

Bridges and Culverts on Haulage Routes

If any structures along the proposed cable and haulage routes show potential for use by bats or any local bridge or culvert is to be strengthened prior to use for haulage of construction materials, it will first be surveyed for bat presence prior to any upgrading or maintenance works. Bats, especially Daubenton's *Myotis daubentonii*, regularly use bridges for roosting and are vulnerable within such structures due to infilling of crevices during which they may be entombed. If bats are found, some crevices beneath the bridge will be retained for their continued use according to best practice bat mitigation measures for bridge works (Billington & Norman 1997, Highways Agency 2001, Joint Nature Conservation Committee 2004, NRA 2006a & 2006b and Shiel 1999). Any re-pointing or pressure grouting of bridges will only proceed after an inspection of the structure for bats and, should bats be found, an application for a derogation licence to legally allow works on or near a bat roost, which is a notifiable action under current legislation, will be made to National Parks and Wildlife Service.

Lighting Restrictions

In general, artificial light creates a barrier to bats, so lighting will be avoided where possible. Where lighting is required, directional lighting, i.e. lighting that shines only on work areas and not on surrounding areas, will be used to prevent overspill. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only. Any aircraft warning lights on the turbines will not negatively impact bats.

9.3.9 Mitigation - Other Mammals, Amphibians & Reptiles

Specific measures are not required for any other species of mammal or for amphibian and reptile species as the measures already described relating to habitats and water quality (in aquatic ecology section) will benefit fauna in general.

9.3.10 Mitigation - Birds

Removal of Vegetation Suitable for Nesting

Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, restricts the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches during the nesting and breeding season for birds and wildlife, from 1 March to 31 August. It is noted, however, that Section 40(2) (e), as amended by Section 46 of the Wildlife (Amendment) Act 2000, provides that Section 40(1) shall not apply in relation to the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided.

Where feasible, vegetation clearance at construction areas will take place outside of the bird nesting season. However, due to the scale of the project and the remoteness of the site it is expected that clearance works will be required through the summer period. In this

respect, a derogation will be sought from the Department of Arts, Heritage and the Gaeltacht as required. It is noted that a commitment can be given that areas with sensitive breeding bird species will be avoided until nesting attempts are complete, as outlined hereunder regarding pre-construction survey.

Pre-construction Breeding Survey

A pre-construction breeding bird survey will take place on the wind farm site in the spring/summer before the main construction works commence. Should breeding sites for sensitive species, such as those listed on Annex I of the Birds Directive or Red listed (other than Meadow Pipit which occurs commonly throughout the site), be located, measures will be taken to ensure that nesting attempts are complete prior to works commencing within 500 m of the bird's breeding site.

Post-construction Breeding Survey

A breeding bird survey will be implemented for the operational lifetime of the wind farm project. The purpose will be to document how bird species on site adapt to the presence of the wind farm. Bird monitoring will take place in the following years of operation: Years 1, 2, 3, 5, 7, 10, 15 & 20. A detailed protocol for monitoring will be agreed with the National Parks and Wildlife Service prior to the commencement of works on the site.

Measures for White-Tailed Eagle

Should the regular presence of eagles be detected in the vicinity of the wind farm (either through the bird monitoring programme or from other sources such as wind farm staff or third parties), an investigation will be undertaken to determine what is attracting the eagles to the site (as the site does not have potential for breeding). If it is found that the birds are attracted by the presence of carrion or discarded carcasses (as was the case in December 2009), arrangements will be made immediately for the removal and proper disposal of such material so as to discourage the eagles from feeding near the site. Any sightings of eagles in the Grousemount vicinity will be passed on to the co-ordinators of the White-tailed Eagle Reintroduction Programme.

9.3.11 Mitigation - Kerry Slug

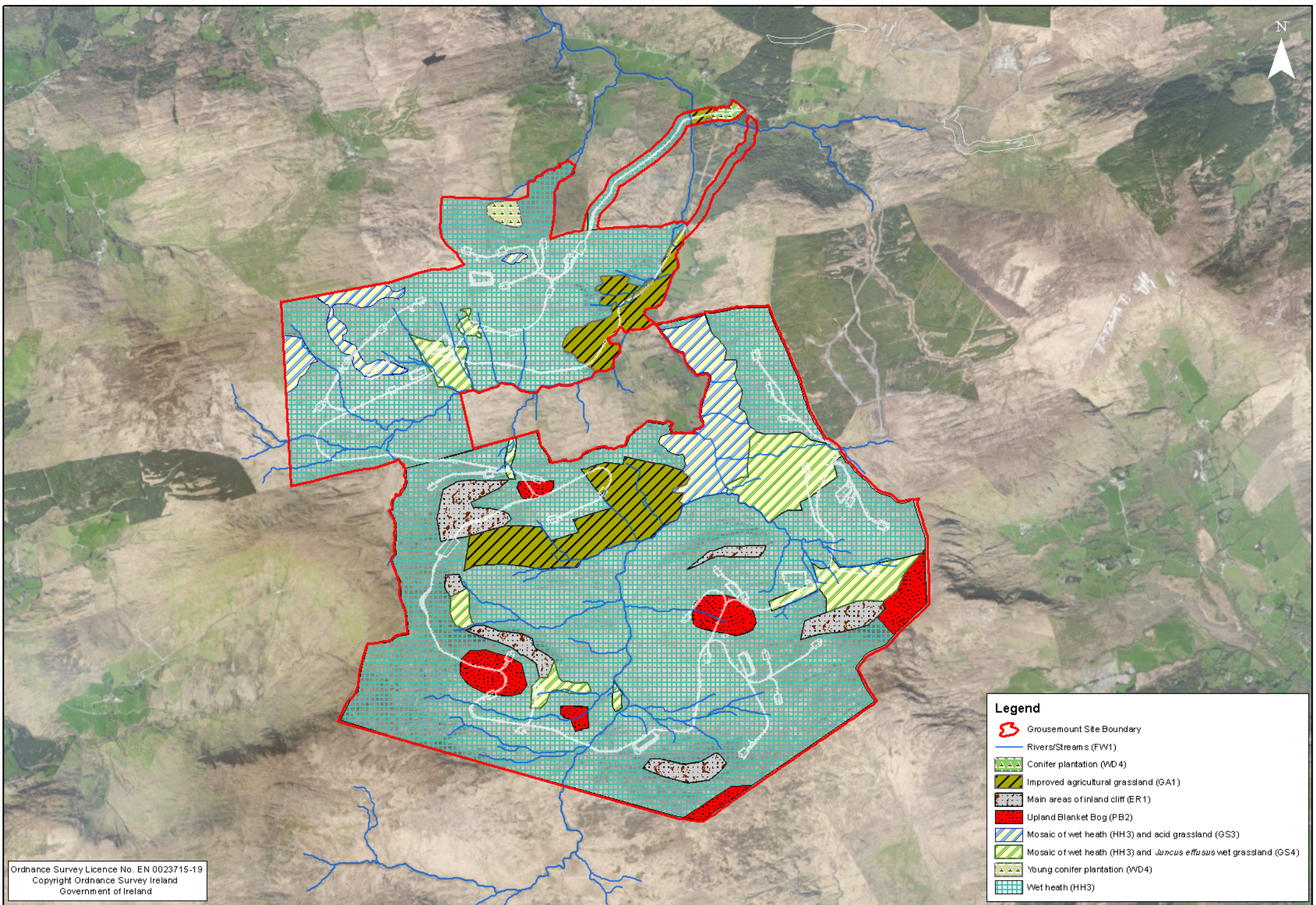
The following measures will minimise the potential impacts due to construction works on the local Kerry Slug population:

- Areas of suitable habitat that occur outside of the footprint of the development will be avoided during the course of construction, thereby minimising the loss and disturbance of Kerry Slug habitat.
- Immediately prior to undertaking works in areas of suitable habitat, the Project Ecologist will check for the presence of Kerry Slug. Should slugs be discovered then they will be transferred to suitable habitat in the surroundings. Similar ongoing monitoring of suitable habitat within works areas will continue throughout the construction phase. Such monitoring will be undertaken during periods of wet weather when slugs are most active and feeding on the surface and therefore at greater risk of impacts by movement of machinery.
- Due to the unavoidable disturbance to Kerry Slug habitat, a derogation license will be sought from the NPWS prior to the commencement of construction. Works will be carried out in compliance with any conditions set by such the license.

9.4 CONCLUSION

While habitats and fauna species of conservation interest are present within the wind farm site, it is considered that the overall impact of the development on terrestrial ecology will be of Low significance in the medium to long term, due to the sensitive project design and the mitigation measures which will be implemented to minimise identified adverse impacts.

Taking the project design and best practice controls during construction into account, along with focused mitigation measures where considered necessary, the predicted residual impacts arising from the cable works will range from imperceptible to slight (or moderate if wet heath included), and of temporary to short term duration at a local level. In particular, the proposed development will not affect adversely the qualifying interests of any site designated for nature conservation in the vicinity of the wind farm.



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Figure 9.2 -Habitat Map Wind Farm



Figure 9.3. General view of site showing the dominance of wet heath habitat. Grazing by sheep is locally intense.



Figure 9.4. The heath vegetation is usually dominated by purple-moor grass, with heathers relatively scarce.



Figure 9.5. View of area of relatively intact blanket bog in the Knockanruddig sector of the site.



Figure 9.6. Further blanket bog occurs on the plateau in the SE sector of the site (Foiladuff area).



Figure 9.7. Exposed siliceous rock is a feature of the site.



Figure 9.8. The Roughy River is a fine example of an upland river. View is of section of main channel which flows through the central part of site.



Figure 9.9. Fields of improved grassland (central part of photo) occur in parts of the northern sector of the site, with areas of semi-improved acid grassland (foreground of photo) in the Knockanruddig area.