

**GROUSEMOUNT WIND FARM
APPROPRIATE ASSESSMENT
SCREENING**

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Prepared for

ESB International

by

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Mullaghanish To Musheramore Mountains SPA

Mullaghanish Bog SAC

Blackwater River (Cork/Waterford) SAC

Glanlough Woods SAC

Kilgarvan Ice House SAC

Derryclogher (Knockboy) Bog cSAC

Old Domestic Building, Curraglass Wood SAC

Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC

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1. INTRODUCTION

1.1 Background

This report has been prepared by Dr. Brian Madden of BioSphere Environmental Services, in association with ESBI, to determine the potential impacts, if any, of the proposed Grousemount project on nearby sites with European conservation designations (i.e. Natura 2000 sites).

The project comprises two main components, the wind farm development at Grousemount in County Kerry and the installation of a new 110 kV underground cable circuit to form a link between the existing Ballyvouskill 220/110 kV substation, County Cork and the permitted but as yet unbuilt Coomataggart 110 kV substation in County Kerry (latter physically within the Grousemount Wind Farm site). For descriptive purposes, and taking account of the very different characters both in construction and operation, these two components are generally referred to separately throughout this report.

1.2 Regulatory Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as “The Habitats Directive” provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC) (better known as “The Birds Directive”).

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment:

“Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public”

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage, and designing the project in order to avoid such impacts. Second, mitigation measures should be applied, if necessary, during the AA process to the point,

where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, then it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

1.3 Stages of the Appropriate Assessment (AA)

This Appropriate Assessment Screening Report has been prepared in accordance with the following guidance:

- *Appropriate Assessment of Plans and Projects in Ireland*. Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, 2009.
- *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. European Commission Environment DG, 2002.
- *Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC*. European Commission, 2000.

There are up to four successive stages involved in the Appropriate Assessment process (European Commission 2002). The outcome at each stage determines whether the next stage in the process is required. The following describes each of the four stages:

Stage 1 – Screening

This is the first stage in the process and is carried out to determine the necessity for a more detailed Stage 2 Appropriate Assessment (and preparation of an Natura Impact Statement) where potential impacts on European sites are deemed to be of significance. The following steps are involved in the Stage 1 Screening:

- Description of the project and site characteristics (existing environment)
- Identification and description of Natura sites that could potentially be affected
- Identification and description of potential impacts
- Assessment of potential impacts
- Exclusion of sites where no significant effects are foreseen

Stage 2 – Appropriate Assessment

This stage involves the consideration of the impact on the integrity of the European site of the project, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts is required. If adequate mitigation is proposed to ensure there are no significant adverse impacts on European sites, then the process may

end at this stage. However, if the likelihood of significant impacts remains, then the process must proceed to Stage 3.

Stage 3 – Assessment of Alternatives

The process which examines alternative ways of achieving the objectives of the plan or project that may avoid adverse impacts on the integrity of the European site.

Stage 4 – Assessment where no Alternative Solutions Exist and where Adverse Impacts Remain

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First, the project should aim to avoid any impacts on European sites by identifying possible impacts early in the process and writing the plan in order to avoid such impacts. Second, mitigation measures should be applied, if necessary, during the AA process to the point where no adverse impacts on the site(s) remain. If the plan is still likely to result in impacts on European sites, and no further practicable mitigation is possible, then it must be rejected. If no alternative solutions are identified and the plan is required for imperative reasons of overriding public interest (IROPI test) under Article 6(4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

2. SCREENING FOR APPROPRIATE ASSESSMENT

Screening determines whether appropriate assessment is necessary by examining:

1. Whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of a Natura 2000 site.
2. Whether the project will have a potentially significant effect on a Natura 2000 site, either alone or in combination with other projects or plans, in view of the site's conservation objectives.

Screening involves the following:

- i. Description of plan or project.
- ii. Identification of relevant Natura 2000 sites, and compilation of information on their qualifying interests and conservation objectives.
- iii. Assessment of likely effects – direct, indirect and cumulative – undertaken on the basis of available information as a desk study or field survey or primary research as necessary.
- iv. Screening Statement with conclusions.

2.1 Description of the Project

The proposed development will comprise 38 wind turbines. It is the amalgamation of two previously permitted wind energy projects, namely Barnastooka Wind Farm (14 wind turbines) (Planning Ref. 10/0197) and Grousemount Wind Farm (24 wind turbines) (Planning Ref. 10/1333). Overall, it comprises the same number of turbines as previously approved, all being located at equivalent locations to those approved and with a maximum overall dimensions of 126 metres (m), also effectively the same as approved.

The proposal includes wind turbine transformers and turbine hardstands at each turbine, construction of new tracks, underground electrical and communication cables linking the turbines with Coomataggart 110 kV Substation, four anemometer masts, nine borrow pits / repositories that will be used as a source of stone fill material during construction and for storage of excess excavated material in their restoration, and all related site works and ancillary development.

The wind turbines will have a maximum overall dimension of 126 m. In line with recognised best practice, all turbines will be located a minimum of 500 m from dwellings outside the site.

Other elements of the overall project are Coomataggart 110 kV Substation, which is located within the wind farm site, and an underground cable (UGC) connection from the Substation to ESB Networks' Ballyvouskill Substation near Millstreet, Co. Cork.

Wind Farm and Substation

Construction of the wind farm will principally involve the following:

- Provision of turbine access tracks (approximately 28 km of unsurfaced tracks similar to forestry roads) and cranepads (approximate size 50 m x 25 m), and excavation and construction of reinforced concrete bases (approximately 18 m diameter) with cast-in steel foundation sections for towers.
- The erection by crane of the pre-fabricated turbine towers and the installation of turbines and rotor blades.
- Installation of underground ducts and cabling (total approximately 55 km) from each turbine to Coomataggart 110 kV Substation, which is within the wind farm site.

There are two potential routes for delivery of wind turbines to the site. One is from the N22 at Clonkeen via an access track that was used historically for delivery of wind turbines to other wind farm developments in the area to connect to the L3021 near the site entrance. The other is from the N22 from Ballyvourney via the L3400 / L3021. Both routes require some works to facilitate deliveries. The route from Clonkeen requires some tree felling and approximately 500 m of additional track to complete it, while the Ballyvourney route requires a temporary crossing of the Sullane River there to avoid works to the existing arch bridge.

The permitted Coomataggart 110 kV Substation (Planning Ref. 15/262) at the site will occupy an area of approximately 16,350 m² and will consist of a compound containing outdoor switchgear comprising busbars, line bays, grid transformers and associated bays, house transformers and three Control Buildings. The size of the Station, which provides for potential future expansion, has been determined by EirGrid's design requirements.

The Control Buildings will be unmanned, but sanitary facilities comprising a single toilet and wash hand basin will be provided for occasional use, with discharge to holding tanks that will be sized to reflect the anticipated frequency of use. These will be located outside of the fenced area to allow them to be maintained without requiring access. Potable water supply will be from a private well which will be constructed so as to prevent contamination and thereafter water will be tested and treated as necessary to meet the requirements of the European Communities (Quality of Water Intended for Human Consumption) (Amendment) Regulations 2000.

Each grid transformer will be located within an impermeable bund capable of oil retention in the event of a total leakage from the transformer. The bund will have a capacity of at least 110% of the volume of oil to preclude any release of contaminants to the environment. Drainage arising from the transformer bund will be discharged following passage through an appropriate oil interceptor.

When constructed, Coomataggart 110 kV Substation will be owned and operated by ESB Networks (ESBN). It will function as a node on the national electricity grid

and will allow renewable energy being generated in the surrounding areas to feed into the national grid.

Underground Cable

The electricity generated at Grousemount Wind Farm will be exported to the national Electricity Network via underground cables (UGC) from Coomataggart Substation, which is located within the wind farm site, to the ESB Networks' Ballyvouskill Substation near Millstreet, Co. Cork. The circuit will be installed over a distance of approximately 31 km. Approximately 23.5 km of the UGC will be located in Co. Cork and approximately 7.3 km in Co. Kerry.

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 to this practice 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.

The construction of the UGC will involve the following elements:

- Approximately 31 km of 110 kV cable and associated trenching.
- Joint bays at intervals of approximately 600-800m.
- Trench excavation, duct laying, cable pulling and jointing.
- Filling the cable ducts with bentonite (a lubricating and insulating type of grout).
- Backfilling and reinstatement works.
- Commissioning.
- All ancillary temporary construction works, plant, traffic management and health and safety measures associated with the project.

The trench for the cables will measure approximately 1.2m in depth and approximately 0.6m in width and will run along the public road network. An example of a typical trench on a public road is shown in **Plate 1**.

Within the trench there will be three pipes called ducts laid in flat formation (these will contain the cables) and held in place by a cement bound granular mixture. On top of this plastic warning strips are laid (for health and safety requirements) and two further ducts are laid side by side (to contain communication lines) also bedded in the granular mixture and topped also by plastic warning strips. The remainder of the trench is then backfilled (including the laying of cable warning tape) and the road surface is reinstated as per the specification of the appropriate authority.

Joint bays (40 No.) will be required approximately every 600-800m and may be located off but adjacent to the public road. These joint bays are where the separate cable lengths are joined together. The joint bays measure approximately 2.5m x 6m by 2.5m in depth. The joint bays will be located underground and will be

completely reinstated/back filled during reinstatement works. An example of a typical joint bay is shown in **Plate 2**. All locations for joint bays are shown in **Appendix C** to the Environmental Impact Statement for Grousemount Wind Farm (ESBI Report QR-320171-11-GK0715-R01).



Plate 1 Example of UGC trench and ducting on public road.



Plate 2 Example of typical UGC joint bay adjacent to public road.

There are also two ancillary inspection chambers constructed adjacent to the joint bay and while these are also located underground, inspection covers will be visible following reinstatement.

During the construction of the joint bays it will be necessary to construct a temporary works area around the location and immediately adjacent to the public

road where the joint bay is to be constructed to allow for excavation equipment, cable pulling and cable joining works. The works area will be fenced off and both the fence and the works area will be removed and the area fully reinstated once construction works are complete.

A detailed UGC construction methodology is included **Appendix C** to the Environmental Impact Statement for Grousemount Wind Farm (ESBI Report QR-320171-11-GK0715-R01).

Regular maintenance of the cable will be carried out throughout the lifetime of the project. The cable is expected to be a permanent piece of electrical infrastructure and therefore decommissioning is not foreseen. In the event of decommissioning, it will involve removing the cable from the ducting but leaving the ducting and associated supporting structure in place.

2.2 Description of the Site

2.2.1 Wind Farm description overview

A detailed description of the terrestrial ecology within the Grousemount Wind Farm is presented in the EIS which accompanies the planning application.

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 250 m along the Roughty River valley in the northern sector to 530 m at the summit of Coomataggart in the south-east and up to 550 m 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 dominant habitat within the 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.

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 (WD4) occurs in the northernmost part of the site, with extensive

established forestry to the north-east of the site. A series of wind farm developments occur in the wider area.

2.2.2 Underground Cable Route description overview

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

Detailed descriptions of the terrestrial and aquatic ecology of the entire UGC route are presented in Sections 9 & 11 of the Environmental Impact Statement for Grousemount Wind Farm (ESBI Report QR-320171-11-GK0715-R01). This Appropriate Assessment Screening Report should be read in conjunction with these ecological assessments.

A summary description of the UGC route is as follows:

- The route is approximately 31 km in length. It commences at the Ballyvouskill 220 / 110 kV substation approximately 1 km west of the R582 road. The route exits the station to the west onto a local road following a west to south-westwards route for approximately 10 km. All of this section is within or alongside the 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 turns southwards with the road skirting the Bohill River for a stretch. A tributary and then 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 semi-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 the lands start to rise again, with 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. At Sillahertane there is a road junction and the route turns south for the final stretch towards the permitted but as yet unbuilt Coomataggart 110 kV substation.
- 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). This stretch is alongside the valley of the Roughty River, with small pasture fields characteristic of the area. The final stretch 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 1.6 km of road internal to the Grousemount Wind Farm.

2.3 European Sites Identification

In accordance with the European Commission Methodological Guidance (EC2001) and Guidance for Planning Authorities issued by the Department of Environment, Heritage and Local Government, all Natura 2000 sites within a distance of up to approximately 15 km of the Grousemount Wind Farm site are considered (see Figure A).

Taking the nature of the underground cable component of the project into account (i.e. cabling works predominantly within roads), as well as consultations with the Department of Arts, Heritage and the Gaeltacht (dated 17 December 2014), emphasis is placed on European sites in the immediate construction area. However, for completeness, sites within a distance of up to 10 km are considered (see Figure B).

The list of European sites identified (no. 11) is given below, with outline details of their interests and conservation objectives in the following sections. Site synopses for these sites are given in Appendix 1.

- Mullaghanish to Musheramore Mountains Special Protection Area (code 04162)
- Killarney National Park Special Protection Area (code 04038)
- St. Gobnet's Wood candidate Special Area of Conservation (code 0106)
- Mullaghanish Bog candidate Special Area of Conservation (code 01890)
- Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment (code 0365)

- Blackwater River (Cork/Waterford) candidate Special Area of Conservation (code 02170)
- Derryclogher (Knockboy) Bog candidate Special Area of Conservation (code 01873)
- Glanlough Woods candidate Special Area of Conservation (code 02315)
- Kilgarvan Ice House candidate Special Area of Conservation (code 0364)
- Old Domestic Building, Curraglass Wood candidate Special Area of Conservation (code 02041)
- Kenmare River candidate Special Area of Conservation (code 02158)

2.3.1 Mullaghanish to Musheramore Mountains SPA (code 04162)

The Mullaghanish to Musheramore SPA comprises a substantial part of the Boggeragh/Derrynasaggart Mountains. It is divided roughly into two sections by the R582 road between Macroom and Millstreet. Most of the site is over 200m in altitude. Several important rivers rise within the site, notably the Foherish and Awboy. The site consists of a variety of upland habitats, though approximately one-third is afforested. Almost one-third of the site is unplanted blanket bog and heath. The remainder of the site is largely rough grassland that is used for hill farming. This SPA is a stronghold for Hen Harriers. A survey in 2005 resulted in 5 confirmed breeding pairs, which represents over 3% of the national total. However the population had dropped to 1 or 2 confirmed pairs and 1 possible pair in 2010, which represents a significant decline. The site also supports a breeding population of Merlin, a further Annex I listed species.

SPA Qualifying Interests

The SPA has been selected for the following Annex I species:

- Hen Harrier (*Circus cyaneus*) [breeding]

SPA Conservation Objectives

The general conservation objective for the site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA. *NPWS (2011) Conservation objectives for Mullaghanish to Musheramore Mountains SPA [004162]. Generic Version 4.0. Department of Arts, Heritage & the Gaeltacht.*

2.3.2 Killarney National Park SPA (code 04038)

This 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 - while the numbers are now very low (<20), the population is still of importance as it is the most southerly in the country and also one of the remaining populations that feeds entirely on bogs. Upland species which breed within the site include Peregrine (at

least 1 pair), Merlin (up to 5 pairs), Red Grouse and Ring Ouzel (1-2 pairs). Both Red Grouse and Ring Ouzel are Red listed species in Ireland. The extensive woodlands support some scarce breeding birds, notably Redstart (1-2 pairs), Wood Warbler (1-2 pairs) and Garden Warbler (possibly up to 10 pairs).

SPA Qualifying Interests

The SPA has been selected for the following Annex I species:

- A098 Merlin *Falco columbarius*
- A395 Greenland White-fronted Goose *Anser albifrons flavirostris*

SPA Conservation Objectives

The general conservation objective for the site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA. *NPWS (2015) Conservation objectives for Killarney National Park SPA [004038]. Generic Version 4.0. Department of Arts, Heritage & the Gaeltacht.*

2.3.3 St. Gobnet's Wood cSAC (code 0106)

St. Gobnet's Wood cSAC includes St. Gobnet's Wood itself and an area of woodland to the north, called Cascade Wood. St. Gobnet's Wood is situated on the north-east side of a hill immediately south of Ballyvourney village in County Cork. Cascade Wood is situated immediately to the north of Ballyvourney. Together they form a relatively large but fragmented stand of woodland. The site supports old oak woodland, as well as a small area of alluvial woodland alongside the Sullane River. The underlying rock is Old Red Sandstone and the soil is a mosaic of acidic, shallow brown earths and brown podzolics, locally skeletal, mostly well-drained but with gleys associated with impeded drainage around flushes and watercourses. The woodland stands support Kerry Slug (*Geomalacus maculosus*), a species listed in Annex II of the E.U. Habitats Directive, and parts of Cascade Wood are known to be frequented by at least seven species of bat. Overall, St. Gobnet's Wood is a good example of a native woodland typical of the south-west.

SAC Qualifying Interests

The cSAC has been selected for the following Annex I habitat:

- Old sessile oak woods with *Ilex* and *Blechnum* in British Isles [91A0]

SAC Conservation Objectives

The general conservation objectives for the site are to maintain or restore the favourable conservation condition of the Annex 1 habitats and Annex II species for which the cSAC has been selected. *NPWS (2015) Conservation objectives for St. Gobnet's Wood SAC [000106]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.*

2.3.4 Mullaghanish Bog cSAC (code 01890)

Mullaghanish Bog is located approximately 5 km north-east of the village of Ballyvourney, and is centred around the summit of Mullaghanish Mountain on the Cork/Kerry border. The site is underlain by Old Red Sandstone and is at an altitude of 575-650m. Mullaghanish Bog is a good quality, small, mountain blanket bog, a habitat type which is listed with priority status on Annex II of the E.U. Habitats Directive. It is remarkable for its intactness, and is one of the few such sites in the country where the vegetation has not been damaged by over-grazing or erosion.

SAC Qualifying Interests

The cSAC has been selected for the following Annex I habitats:

- Blanket Bogs (Active)* [7130]

SAC Conservation Objectives

The general conservation objective for the site is to maintain or restore the favourable conservation condition of the Annex 1 habitats for which the cSAC has been selected. *NPWS (2015) Conservation objectives for Mullaghanish Bog SAC [001890]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.*

2.3.5 Derryclogher (Knockboy) Bog cSAC (code 01873)

This cSAC is situated under the summit of Knockboy Mountain (707 m) on the Cork/ Kerry border. It comprises active blanket bog in mosaic with related habitats, including heath, acid grassland, and exposed rock.

SAC Qualifying Interests

The cSAC has been selected for the following Annex I habitats:

- Blanket Bogs (Active)* [7130]

SAC Conservation Objectives

The general conservation objective for the site is to maintain or restore the favourable conservation condition of the Annex 1 habitats for which the cSAC has been selected. *NPWS (2015) Conservation objectives for Derryclogher (Knockboy) Bog SAC [001873]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.*

2.3.6 Kilgarvan Ice House cSAC (code 00364)

This cSAC is situated approximately 2 km west of Kilgarvan. The site consists of several buildings which are used by Lesser Horseshoe Bats. An ice house is used as a hibernating site. Some adjoining woodland is included within the site.

SAC Qualifying Interests

The cSAC has been selected for the following Annex II species:

- Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]

SAC Conservation Objectives

The general conservation objective for the site is to maintain or restore the favourable conservation condition of the Annex 1 habitats and Annex II species for which the cSAC has been selected. *NPWS (2015) Conservation objectives for Kilgarvan Ice House SAC [00364]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.*

2.3.7 Old Domestic Building, Curraglass cSAC (code 002041)

This cSAC is situated 6 km north of Kilgarvan. The site consists of several buildings which are used as a maternity roost for Lesser Horseshoe Bats. Adjacent habitats include deciduous woodlands which provide foraging areas for the bats.

SAC Qualifying Interests

The cSAC has been selected for the following Annex II species:

- Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]

SAC Conservation Objectives

The general conservation objective for the site is to maintain or restore the favourable conservation condition of the Annex 1 habitats and Annex II species for which the cSAC has been selected. *NPWS (2015) Conservation objectives for Old Domestic Building, Curraglass SAC [002041]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.*

2.3.8 Glanlough Woods cSAC (code 002351)

This cSAC is situated 4 km south of Kilgarvan. The site consists of a derelict farmhouse which contains a maternity roost for Lesser Horseshoe Bats. Adjacent habitats include deciduous woodlands which provide foraging areas for the bats.

SAC Qualifying Interests

The cSAC has been selected for the following Annex II species:

- Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]

SAC Conservation Objectives

The general conservation objective for the site is to maintain or restore the favourable conservation condition of the Annex 1 habitats and Annex II species for which the cSAC has been selected. *NPWS (2015) Conservation objectives for Glanlough Woods SAC [002315]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.*

2.3.9 Blackwater River (Cork/Waterford) cSAC (code 002170)

This very large site drains a major part of County Cork and five mountain ranges. The site supports a high diversity of Annex I habitats and Annex II species, including Atlantic salmon and freshwater pearl mussel.

SAC Qualifying Interests

The cSAC has been selected for the following Annex I habitats and Annex II species:

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Perennial vegetation of stony banks [1220]
- Salicornia and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation [3260]
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]
- *Taxus baccata* woods of the British Isles [91J0]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Austroptamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Alosa fallax fallax* (Twait Shad) [1103]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- *Trichomanes speciosum* (Killarney Fern) [1421]

SAC Conservation Objectives

The conservation objectives for the site are detailed in: NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170, Version 1. NPWS, Department of Arts, Heritage & the Gaeltacht (dated 31 July 2012). The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest.

2.3.10 Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment cSAC (code 00365)

This very large site extends from southwest of Millstreet to west of Killarney and supports a high diversity of Annex I habitats and Annex II species.

SAC Qualifying Interests

The cSAC has been selected for the following Annex I habitats and Annex II species:

- Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]

- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260]
- Northern Atlantic wet heaths with Erica tetralix [4010]
- European dry heaths [4030]
- Alpine and Boreal heaths [4060]
- Juniperus communis formations on heaths or calcareous grasslands [5130]
- Calaminarian grasslands of the Violetalia calaminariae [6130]
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]
- Blanket bogs (* if active bog) [7130]
- Depressions on peat substrates of the Rhynchosporion [7150]
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
- Taxus baccata woods of the British Isles [91J0]
- Geomalacus maculosus (Kerry Slug) [1024]
- Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]
- Euphydrias aurinia (Marsh Fritillary) [1065]
- Petromyzon marinus (Sea Lamprey) [1095]
- Lampetra planeri (Brook Lamprey) [1096]
- Lampetra fluviatilis (River Lamprey) [1099]
- Salmo salar (Salmon) [1106]
- Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]
- Lutra lutra (Otter) [1355]
- Trichomanes speciosum (Killarney Fern) [1421]
- Najas flexilis (Slender Naiad) [1833]
- Alosa fallax killarnensis (Killarney Shad) [5046]

SAC Conservation Objectives

The general conservation objective for the site is to maintain or restore the favourable conservation condition of the Annex 1 habitats and Annex II species for which the cSAC has been selected. *NPWS (2015) Conservation objectives for Killarney Park, Macgillycuddy Reeks and Caragh River Catchment SAC [00365]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.*

2.3.11 Kenmare River cSAC (code 02158)

Kenmare River SAC 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. Exposure to prevailing winds and swells at the mouth diminishes towards the head of the bay. 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.

SAC Qualifying Interests

The cSAC has been selected for the following Annex I habitats and Annex II species:

- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- European dry heaths [4030]
- Calaminarian grasslands of the *Violetalia calaminariae* [6130]
- Submerged or partially submerged sea caves [8330]
- *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014]
- *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]
- *Lutra lutra* (Otter) [1355]
- *Phoca vitulina* (Common Seal) [1365]

SAC Conservation Objectives

The conservation objectives for the site are detailed in: NPWS (2013) Conservation Objectives: Kenmare River SAC 002158, Version 1. NPWS, Department of Arts, Heritage & the Gaeltacht (dated 25 April 2013). The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest.

2.4 Identification and Assessment of Potential Impacts

Potential impacts of the Grousemount Wind Farm project on the identified Natura 2000 sites are discussed below. For convenience, and due to the markedly different characters of the components, the wind farm site and the underground cabling circuit are discussed separately.

For the cabling component, the three main elements of the construction phase that could give rise to potential impacts on the ecology of the Natura sites in the surroundings are: (i) trench construction, (ii) joint bay construction, and (iii) watercourse crossings.

2.4.1 Potential impacts on Mullaghanish to Musheramore Mountains SPA Wind Farm

As there is a separation distance of approximately 12 km between the wind farm and the nearest section of the SPA (northeast of Ballyvourney), there could be no direct impacts by the wind farm on the interests within the SPA.

Similarly, indirect impacts are not anticipated as foraging Hen Harriers from the SPA area would not be expected in the vicinity of the wind farm during the breeding season. Generally, foraging birds do not travel more than 5 km from the nesting site.

Cable Circuit

Approximately 10 kilometres of the cable route corridor passes alongside or through the SPA site. This comprises the section of the route extending from the Ballyvouskill substation to approximately 1.5 km north of Ballyvourney and includes joint bays 1 to 14. A description of this section of the route corridor follows:

Description of route section within or alongside the SPA

This is along the northwest boundary of the SPA. Principal habitats in this area of the SPA are conifer plantation (WD4), wet (rushy) grassland (GS4), semi-improved to improved grassland (GA1) and, to a lesser extent, heath (both dry HH1 & wet HH3) and exposed rock (ER1). Sheep grazing is the main farming activity though cattle occur in the pockets of more improved lands, especially towards Ballyvourney.

There follows a general habitat description of this sector of the cable route corridor. A series of photographs included below illustrate parts of the cable route.

Note re. SPA boundary: from mapping on the NPWS website, it is apparent that the boundary of the SPA was drawn on the OS six inch map series. When the SPA includes lands only to one side of the public road, the boundary has been drawn usually to the road edge as shown on the OS map. However, due to road improvements over the years, the SPA boundary is sometimes not aligned to the present road (which one would expect is the intention).

On leaving the Ballyvouskill Substation complex, joint bay No. 1 is located within the road just west of the entrance. The UGC route runs southwest in a straight section of road lined by grass verges (up to several metres wide in places) and low banks with scrub (mainly willow, gorse and brambles) (see **Plate 3**). All of the area to the south of the road is afforested and is within the SPA. Forestry also occurs to the north of the road (outside of SPA), along with agricultural fields.

Joint bay No. 2 is located within the road at a cluster of houses and is outside of the SPA boundary. Wet grassland fields occur to the south of the road here.

Running westwards, the UGC route passes forestry to the south and then fields of improved grassland to both sides (outside of the SPA). Joint bay No. 3 is located within the road just east of the entrance to Caherdowney Wind Farm. Improved grassland occurs to the north (outside of SPA) and semi-improved rushy grassland to the south (within SPA) (see **Plate 4**).



Plate 3 Route corridor just south of Ballyvouskill substation, looking south-westwards. This is a typical stretch for the area, with wide grassy margins and conifer plantations to both sides. Area south of road (left side in picture) is within the SPA.



Plate 4 Joint bay No. 3 is located within road carriageway at this location near the entrance to Caherdowney Wind Farm. Looking eastwards, with SPA to south of road (right hand side of picture).



Plate 5 Route corridor within SPA just south of Garrane Bridge, looking southwards. Heath occurs to west (right hand side of picture) and wet grassland to east.



Plate 6 Route corridor within SPA at Garranecarney showing improved grassland to east (left hand side of picture) and heath to west. Joint bay No. 5 is located within the road carriageway at the bend just out of view of this picture.

The route turns south at Garrane Bridge and passes well developed heath to the west (see **Plate 5**). South of the heath there is a series of improved grassland

fields within the SPA, with improved grassland also to the east. Joint bay No. 4 is located in a wide grassy margin alongside the grassland fields within the SPA.

Moving southeast, the route again passes good quality heath to the west of the road, with improved grassland to the east of road (all within SPA) (see **Plate 6**). Joint bay No. 5 is located within the road.

The route then turns westwards with fields of improved and wet grassland to both sides.

For the next stretch, the route runs southwest and passes through conifer plantation on both sides of the road. Only the area to the south of the road is included in the SPA. Joint bay No. 6 is within a wide margin alongside the forestry (outside of SPA). It continues along the road running west through continuous forest, with joint bays No. 7 and 8 both within the road. The route continues west and then turns south and crosses two streams. Joint bay No. 9 is located within a wide margin alongside forest, which is within the SPA. Joint bay No. 10 is further south and also in a wide margin. All of the afforested area to the south and east of the road is within the SPA (see **Plate 7**).



Plate 7 A substantial part of the route corridor is through conifer plantations. In this photograph, the SPA includes only the forest to the south of road (left hand side of picture).

The route leaves the afforested area and turns westwards for a stretch and then southwest. The fields to both sides of the road comprise grassland varying from improved to wet rushy grassland, with the area to the north of the road outside of the SPA. Joint bay No. 11 is located within a wide margin of heath type vegetation though is outside of the SPA.

Running southwest, the route skirts semi-improved grassland to both sides of the road, with frequent rock outcrops on the north side. All of this stretch is within the SPA (see **Plate 8**). Joint bay No. 12 is within a wide grassy verge off the road.



Plate 8 View, looking southwards, of section of route corridor within SPA at Coomnagire. Area west (right hand side of picture) is former heath and area east is improved grassland. Joint bay No. 12 is located within a wide section of road margin below the slope.



Plate 9 Western-most section of route corridor within SPA, close to Ballyvourney. Habitats here vary from wet rushy grassland to improved grassland. Looking westwards. Joint bay No. 14 will be located within a grassy margin along road.

Further west, a farm complex with improved grassland fields to the north of the road is excluded from the SPA. Joint bay No. 13 is located within a grassy margin at the corner of this excluded plot.

The remainder of the UGC route that is within the SPA runs westwards, with fields of improved or wet grassland to both sides of the road. Joint bay No. 14 is within a wide grassy margin along the road (within the SPA) (see **Plate 9**).

Impact by trench construction

Habitats

The trench for the cable will be almost entirely within the original foundation of the road carriageway. The exceptions are where it will deviate to the locations for the stream crossings but it is understood that these points will be as close as practical to the road. Grass verges may require to be cleared to facilitate the works and in some cases there may be a need to cut into roadside banks. After the works are complete the trench will be backfilled and disturbed marginal roadside vegetation is expected to become re-established within 1 - 2 years.

It is noted that for substantial stretches (i.e. sections where lands to only one side of road are included in SPA), the SPA boundary extends only to the road edge and so the works will be outside of the designated land. In instances where lands to both sides of road are included, the road is also within the SPA boundary though obviously of no ecological value. As the affected habitats alongside the road (within and outside of SPA) would not be expected to be used by foraging hen harriers (except in some locations opportunistically by passing birds), and as good recovery of marginal vegetation is expected, the impact on hen harriers by the construction of the trench is rated as temporary and not of significance.

Disturbance to birds

The operation of machinery and presence of people during construction could potentially cause disturbance to hen harriers using adjoining lands. Should a nesting pair be present within 500m (approximately) of the road at the time of the works, this could potentially cause disturbance. Foraging birds would be less concerned and could easily divert around the works. While an issue to be considered, this is not regarded as significant for the following reasons:

- From the baseline habitat assessment, it seems that the habitats alongside the road would not be used by nesting birds, as the habitats are largely closed canopy plantation, grassland and limited areas of heath. However, as a precautionary measure and to ensure that no potential for disturbance related impacts on breeding Hen Harriers arise, monitoring for nesting Hen Harriers within a corridor 500 m (approx.) to either side the cable route will be carried out prior to the commencement of works within or alongside the SPA. Such monitoring will be carried out by an ecologist experienced in Hen Harrier survey methods. Should a pre-breeding or breeding site be identified, any works within 500 m of same will be halted until the breeding activity ceases.
- Foraging birds, if in the area, are already accustomed to passing traffic (albeit at a low volume) and farming activities.

- The works will be temporary, with activity confined to a relatively short stretch at any one time. It is estimated that a civil contractor carrying out the standard 110kV trenching and ducting specification will complete between 30 and 50 linear metres of trench in a roadway per day depending on the site conditions.

Impact by joint bay construction

Habitats

As with the trench construction, the area for the joint bay construction will largely be within the original foundation of the road. However, a construction area is required around the unit which may involve digging into banks. Disturbed marginal vegetation is expected to become re-established within 1-3 years.

It is noted that the majority (i.e. 9 No.) of joint bay locations in the vicinity of the SPA (i.e. 14 No.) are actually outside of the designated lands as the road edge often forms the boundary of the SPA. Nine of the 14 joint bays are therefore planned to be outside of the SPA (see Table 1). Details of the five joint bays within the SPA are as follows:

- Joint bay No. 4 - within a grass verge adjoining a grassland field
- Joint bay No. 5 - within the road carriageway
- Joint bay No. 9 - within a grass verge adjoining closed canopy forest
- Joint bay No. 12 - within a grass verge adjoining semi-improved grassland
- Joint bay No. 14 - within a grass verge adjoining a wet grassland field

As the affected habitats (within and outside of the SPA) at the joint bay locations generally would not be expected to be used by foraging hen harriers (except opportunistically by passing birds), and as good recovery of marginal vegetation is expected, the impact on hen harriers by the construction of the joint bays is rated as not significant.

Table 1. Summary of the 14 Joint Bays in area of SPA

Joint Bay Number	Location	Within SPA	Joint Bay Number	Location	Within SPA
1	In road	No	8	In road	No
2	In road	No	9	Verge off road	Yes
3	In road	No	10	Verge off road	No
4	Verge off road	Yes Shannon	11	Verge off road	No
5	In road	Yes	12	Verge off road	Yes
6	Verge off road	No	13	Verge off road	No
7	In road	No	14	Verge off road	Yes

Disturbance to birds

The operation of machinery and presence of people during construction of joint bays could potentially cause disturbance to hen harriers using adjoining lands. Should a nesting pair be present within 500m (approximately) of the road at the time of the works, this could potentially cause disturbance. Foraging birds would be less concerned and could easily divert around the works. While an issue to be considered, this is not regarded as significant for the following reasons:

- From the baseline habitat assessment, it seems that the habitats alongside the road would not be used by nesting birds, as these are largely closed canopy plantation, grassland and limited areas of heath. However, as a precautionary measure and to ensure that no potential for disturbance related impacts on breeding Hen Harriers arise, monitoring for nesting Hen Harriers within a corridor 500 m (approx.) to either side the joint bay locations will be carried out prior to the commencement of works within or alongside the SPA. Such monitoring will be carried out by an ecologist experienced in Hen Harrier survey methods. Should a pre-breeding or breeding site be identified, any works within 500 m of same will be halted until the breeding activity ceases.
- Foraging birds, if in the area, are already used to passing traffic (albeit at a low volume) and farming activities.
- The works will be temporary and confined to one joint bay at a time.

Impact by stream crossings

Habitats

There will be 27 stream crossings within or adjoining the SPA. Two will be by directional drilling) and the remainder by open cut method. Details of construction are provided in **Appendix C** to the Environmental Impact Statement for Grousemount Wind Farm (ESBI Report QR-320171-11-GK0715-R01).

For the HDD crossings, of relevance to the SPA is that the drilling contractor prepares a site area of approximately 30 m x 25 m. If areas are overgrown with thick vegetation, a section of it will be removed appropriately and disposed of via a licensed waste contractor. The directional drilling pits at S13 may require the felling of up to 10-15 conifer trees (spruce) to accommodate send exit pits. The area is levelled to facilitate the works. On completion of the works, the site will be reinstated as per the landowner and statutory requirements.

For open trench stream crossings, construction of an access track to the watercourse crossing point may require removal of surface vegetation, including scrub. At the stream bank, riparian vegetation will be removed to accommodate the works (approximately 3 m section on each bank). On completion of the works, the site will be reinstated as per the landowner and statutory requirements. In addition, the project ecologist will advise where replanting is necessary and the species to be used. Replanting would be along banks where scrub had been removed.

The affected habitats (within and outside of SPA) at the stream crossing locations will largely be grassland, scrub and strips of riparian vegetation. However, the areas involved are small in scale and full recovery of vegetation is expected within 1-3 years (i.e. short term impact). From this assessment, it is considered that the impact on hen harriers by habitat disturbance at the stream crossing works is rated as not significant.

Disturbance to birds

The operation of machinery and presence of people during the stream crossings could potentially cause disturbance to hen harriers using adjoining lands. Should a nesting pair be present within 500m (approximately) of the stream crossing location at the time of the works, this could potentially cause disturbance. Foraging birds would be less concerned and could easily divert around the works. While an issue to be considered, this is not regarded as significant for the following reasons:

- From the baseline habitat assessment, it seems that the habitats at the stream crossing locations would not be used by nesting birds, as these are largely grassland and limited areas of scrub, heath or conifer forest. However, as a precautionary measure and to ensure that no potential for disturbance related impacts on breeding Hen Harriers arise, monitoring for nesting Hen Harriers within a corridor 500 m (approx.) to either side the stream crossing locations will be carried out prior to the commencement of works within or alongside the SPA. Such monitoring will be carried out by an ecologist experienced in Hen Harrier survey methods. Should a pre-breeding or breeding site be identified, any works within 500 m of same will be halted until the breeding activity ceases.
- The works will be in proximity to public roads and foraging birds, if in the area, are already used to local traffic (albeit at a low volume) and farming activities.
- The works will be temporary and confined to one stream crossing at a time.

Conclusion on possible impacts by project on SPA

While the UGC route passes within or alongside the SPA for up to 10 km, it is concluded that the project would not have any significant impacts, direct or indirect, on the local hen harrier population.

The habitats affected are mostly road and marginal grassland strips, which would not be used by foraging birds at all or at most occasional (latter in case of the marginal strips). Works at stream crossings would be very localised. Areas disturbed from construction activities would be expected to become re-vegetated within 1-3 years.

Possible disturbance to hen harriers (should birds be in the area) from construction works would be short term at any one location and is not expected to have any impacts on the hen harrier population within the SPA. However, as a precautionary measure and to ensure that no potential for disturbance related impacts on

breeding Hen Harriers arise, monitoring for nesting Hen Harriers within a corridor 500 m (approx.) to either side the work areas will be carried out prior to the commencement of works within or alongside the SPA. Such monitoring will be carried out by an ecologist experienced in Hen Harrier survey methods. Should a pre-breeding or breeding site be identified, any works within 500 m of same will be halted until the breeding activity ceases.

2.4.2 Potential impacts on St. Gobnet's Wood cSAC

Wind Farm

As there is a separation distance of approximately 11 km between the wind farm and the nearest section of the SAC (just west of N22 and Ballyvourney), there could be no direct impacts by the wind farm on the interests within the SAC.

Similarly, indirect impacts are not anticipated as there are no indirect linkages (via hydrology) between the wind farm area and the SAC.

Cable Circuit

The area of the cSAC in close proximity to the UGC route is Cascade Wood to the north of Ballyvourney. The St. Gobnet's Wood section is on high ground to the south of the Sullane River. While the route crosses the Sullane River, the crossing will be by directional drilling and the river and associated habitats (notably alluvial woodland) and species will not be affected.

The UGC route runs within the third class road which splits Cascade Wood into east and west sections.

The eastern section, which is the largest, is an undulating, rocky site with several paths and tracks running through it. The Bohill River skirts the northern edge. The woodland canopy consists of a mix of old Beech, oak (*Quercus robur* and *Q. x rosacea*) and Sycamore. Occasional clumps and individuals of old conifers - Scots Pine, Norway Spruce (*Picea abies*) and firs - emerge above this layer. Birch is common, locally forming almost pure stands. The shrub layer is dominated by dense thickets of Rhododendron and Cherry Laurel. Native species, such as Hazel, Holly and Hawthorn are only occasional and chiefly confined to the vicinity of the river where the Rhododendron is more or less absent. As a consequence of the dense shade the herb layer is very poorly developed. The remnants of the native vegetation here suggest that the wood was originally an example of acid Oak woodland. Several houses and gardens have been developed within the wood.

Cascade Wood West is very different in structure and species composition, consisting of a mosaic of wet and dry stands. An area in the centre has been felled recently. The wet areas, influenced by seepages and small springs, are dominated by alder with scattered Oak, Ash and Birch. The herb layer is grassy, being dominated by bent grasses (*A. capillaris* and *A. stolonifera*) and Creeping Buttercup with prominent clumps of Lady-fern. The drier areas are dominated by Oak, with occasional Alder, Ash and Rowan. In the north-east corner of the wood there is a relatively young stand of Alder and Willow on very wet soil. Unlike the

eastern section, Rhododendron is almost absent and Beech and Sycamore are far less prominent

Impact by trench construction

A section of approximately 300 m of the route (which is in the road) passes through or alongside the cSAC. Running southwards, the trench will pass through the cSAC for approximately 125 metres. On the eastern side of the road a house and garden has recently been constructed within the cSAC.

The route continues along the road for another 75m (approximately), with a disused field to the west (outside of cSAC) and woodland to the east (outside of cSAC).

A further section runs for approximately 100m alongside cSAC woodland to the west and woodland which is outside of the cSAC to the east (see **Plate 11**). The cSAC boundary is mostly along the western edge of the road though for a short section crosses to the east side to include the actual road (for no apparent reason). Refer to **Plate 10** herein.

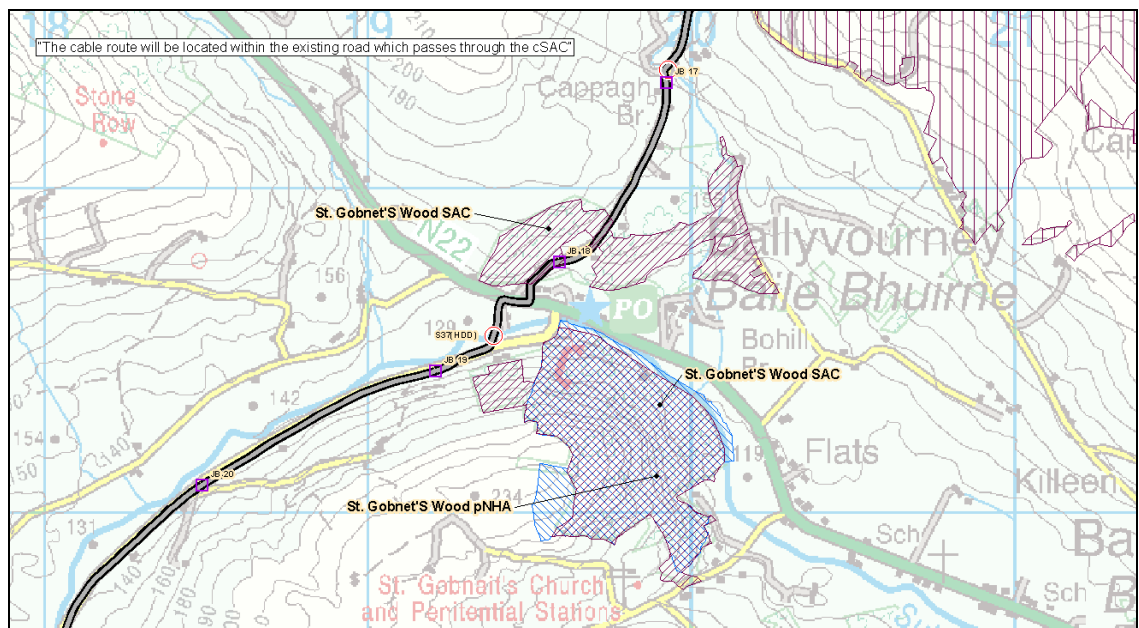


Plate 10 Cable Route adjacent to St. Gobnet's cSAC

As the trench is entirely within the road, and with a steep clay embankment rising to the woodland along the western side of the road, the works could have no impact on the woodland vegetation. Also, the works will not affect the drainage of the area and hence the wetter areas of woodland.

The fauna associated with the woodland, especially the Kerry Slug and bat species, will not be affected in any way by the trench works.



Plate 11 View of UGC route in section of road which skirts the St. Gobnet's Wood cSAC (August 2014). View is looking south towards Ballyvourney junction. Woodland to west of road (right hand side of picture) is within the cSAC.

Impact by joint bay construction

One joint bay, No. 18, occurs within the section of the route associated with the cSAC. This will be constructed within the eastern half of the road extending into the margin where verge vegetation will need to be cleared and protruding and overhanging scrub cut back. The works will not extend into the actual woodland to the east (which is outside of the cSAC). On completion of the works, the marginal vegetation will be allowed to grow back.

The proposed works will not have any impact on the woodland within the cSAC, which is to the west of the road. While this section of road carriageway is within the cSAC (according to NPWS website), the road is obviously of no ecological interest. While verge vegetation and protruding branches will be cut back to facilitate the works, this is a temporary impact as re-vegetation will be allowed to proceed after the works are complete. It is noted that Rhododendron and Cherry Laurel is frequent along the woodland edge which skirts the road margin (see **Plate 12**).



Plate 12 View of location for Joint Bay No. 18, looking north-eastwards. The works will require clearing of verge vegetation and cutting back protruding branches. While road carriageway is within the cSAC, the woodland to east of road (shown in picture) is outside the cSAC. Rhododendron and Cherry Laurel are frequent along road here.

Conclusion on possible impacts on St. Gobnet's Wood cSAC

The main sector of the cSAC to the south of the Sullane River is geographically separate from the works and will not be affected in any way.

While the trench will be within the road which passes through and alongside sections of Cascade Wood (cSAC), the works will not have impacts, direct or indirect, on the woodland flora and fauna. It is noted that for the section of the route which passes through the cSAC, a house has been built on the eastern side (within cSAC).

The joint bay (No.18) will be constructed within the road. While this road section is within the cSAC, the woodland to the east is excluded (though would not anyway be affected).

The works will not affect the population of Kerry Slug (Annex II species) within the adjoining woodland areas.

It is noted that the contractor will be aware of the sensitivity of the section of the UGC route within and alongside the cSAC and that an Ecological Clerk of Works (appointed by ESB Wind Development Ltd.) will be available throughout the construction period to advise the contractor as necessary.

2.4.3 Potential impacts on Mullaghanish Bog cSAC

Wind Farm

As there is a separation distance of approximately 17 km between the wind farm and the SAC (just west of N22 and Ballyvourney), it can be concluded with

certainty that there could be no direct or indirect impacts by the wind farm on the interests within the SAC.

Cable Circuit

Mullaghanish Bog is located approximately 1 km north of the eastern section of the route corridor. The cSAC site comprises the summit area of Mullaghanish Mountain rising to 648m. A track leads to the summit where there is a television transmitter station. The cSAC is a fine example of upland blanket bog.

While the cable route corridor is relatively close to the cSAC there are no linkages between the two locations, and it can be concluded with certainty that the proposed works could not have any impacts, direct or indirect, on the cSAC site.

2.4.4 Potential Impacts on Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment cSAC

Wind Farm

As there is a separation distance of approximately 7 km between the wind farm and the SAC, and with no hydrological connectivity between the two locations, it can be concluded with certainty that there could be no direct or indirect impacts by the wind farm on the interests within the SAC.

Cable Circuit

While this very large SAC is within 4 km of the cable route corridor, the two areas are separated by the Derrynasaggart Mountains, which are heavily afforested over much of the range. With such a separation and with no hydrological linkages, it is concluded with full scientific certainty that the proposed cabling project could not have any impacts, direct or indirect, on the conservation objectives of the cSAC site.

2.4.5 Potential Impacts on Killarney National Park SPA

Wind Farm

With a separation distance of approximately 11 km between the wind farm and the SPA, it can be concluded with certainty that there could be no direct impacts by the wind farm on the interests within the SAC.

The bird species listed as special conservation interests for the SPA, namely Greenland White-fronted Geese and Merlin, are not found in the vicinity of the Grousemount site. In particular, the goose flock is more or less resident within the National Park throughout the winter period and does not commute to sites to the south or east of Grousemount – hence there is no risk of flying geese colliding with the wind turbines.

Cable Circuit

At the closest, the cable route is at a distance of 13 km from the SPA. Taking into account this distance, and the character of the project (i.e. underground cable), it is concluded with full scientific certainty that the proposed cabling project could not

have any impacts, direct or indirect, on the special conservation interests of the SPA site.

- Blackwater River (Cork/Waterford) candidate Special Area of Conservation (code 02170)

2.4.6 Potential Impacts on Blackwater River (Cork/Waterford) cSAC

Wind Farm

As there is a separation distance of at least 15 km between the wind farm and the SAC, and with no hydrological connectivity between the two locations, it can be concluded with certainty that there could be no direct or indirect impacts by the wind farm on the interests within the SAC.

Cable Circuit

The cSAC includes a section of the Finnow River from just south of Millstreet. This is at a distance of approximately 4 km north of the westerly most section of the cable route. However, as there is no hydrological connectivity between the Finnow River and the proposed cable route, it can be concluded with full scientific certainty that the proposed cabling project could not have any impacts, direct or indirect, on the conservation objectives of the cSAC site.

2.4.7 Potential Impacts on Derryclogher (Knockboy) cSAC

Wind Farm

As there is a separation distance of approximately 4 km between the wind farm and the SAC, and with the peak of Carran (567 m) between the two locations and the absence of any hydrological connectivity between the two locations, it can be concluded with certainty that there could be no direct or indirect impacts by the wind farm on the interests within the SAC.

Cable Circuit

As the cSAC is at a distance of approximately 7 km southwest of the south-western end of the cable route, it is concluded with full scientific certainty that the proposed cabling project could not have any impacts, direct or indirect, on the conservation objectives of the cSAC site.

2.4.8 Potential Impacts on Glanlough Woods cSAC

Wind Farm

As there is a separation distance of approximately 5 km between the wind farm and the SAC, and considering the relatively inhospitable conditions at the wind farm site in the context of habitats for bats, it can be concluded with certainty that there could be no direct or indirect impacts by the wind farm on the qualifying interest for the SAC (i.e. Lesser horse-shoe bat).

Cable Circuit

As the cSAC is at a distance of approximately 8 km west of the south-western end of the cable route, it is concluded with full scientific certainty that the proposed cabling project could not have any impacts, direct or indirect, on the conservation objectives of the cSAC site.

2.4.9 Potential Impacts on Kilgarvan Ice House cSAC**Wind Farm**

As there is a separation distance of approximately 7 km between the wind farm and the SAC, and considering the relatively inhospitable conditions at the wind farm site in the context of habitats for bats, it can be concluded with certainty that there could be no direct or indirect impacts by the wind farm on the qualifying interest for the SAC (i.e. Lesser horse-shoe bat).

Cable Circuit

As the cSAC is at a distance of approximately 9 km west of the western end of the cable route, it is concluded with full scientific certainty that the proposed cabling project could not have any impacts, direct or indirect, on the conservation objectives of the cSAC site.

2.4.10 Potential Impacts on Old Domestic Building, Curraglass Wood cSAC**Wind Farm**

As there is a separation distance of approximately 5 km between the wind farm and the SAC, and considering the relatively inhospitable conditions at the wind farm site in the context of habitats for bats, it can be concluded with certainty that there could be no direct or indirect impacts by the wind farm on the qualifying interest for the SAC (i.e. Lesser horse-shoe bat).

Cable Circuit

As the cSAC is at a distance of approximately 6 km northwest of the western end of the cable route, it is concluded with full scientific certainty that the proposed cabling project could not have any impacts, direct or indirect, on the conservation objectives of the cSAC site.

2.4.11 Potential Impacts on Kenmare River cSAC

The site of the Grousemount wind farm is located entirely within the catchment of the Roughty River. Part of the underground cable route is also within the Roughty catchment. This is a medium sized river, c.19 miles long and drains a catchment of approximately 78 square miles. It rises in the mountains on the borders of West Cork and flows in a westerly direction through the village of Kilgarvan and then into the top of Kenmare Bay (and the Kenmare River cSAC).

As there is a hydrological linkage between the project area and the SAC, consideration is given as to whether the construction and/or operation of the wind farm and underground cable could have any impacts on the conservation

objectives of the SAC. Focus is placed on the qualifying interests of the SAC which are dependent on the maintenance of water quality within the bay, namely:

- Large shallow inlets and bays [1160]
- Reefs [1170]
- *Lutra lutra* (Otter) [1355]
- *Phoca vitulina* (Common Seal) [1365]

Wind Farm

The project will involve large scale works during the construction phase which have the potential (in absence of mitigation) to cause significant impacts on the aquatic interests within the Roughty River as a result mainly of pollution of watercourses with suspended solids and other substances (such as fuels, waste concrete etc.). However, after consultations with Inland Fisheries Ireland the project aquatic ecologist has prepared a series of strict mitigation measures to ensure that the project will have, at most, minor negative impacts on the aquatic interests of the Roughty River system (all detailed in Section 11 of the Environmental Impact Statement for Grousemount Wind Farm (ESBI Report QR-320171-11-GK0715-R01)).

While there is a hydrological linkage between the wind farm site and the Kenmare River cSAC, it can be concluded that there is no realistic potential for adverse impacts on the relevant qualifying interests of the SAC (and hence the conservation objectives for the site) due to (i) the distance between the two locations, i.e. straight-line distance of c.15 km and channel distance in excess of 20 km, and (ii) the design of the project and the mitigation measures which will be taken to minimise the potential for adverse impacts on the Roughty River.

Cable Circuit

The route of the underground cable traverses two main river catchments - the River Roughty to the west which contains about 25% of the route and the Sullane to the east which contains the remaining 75%.

Although the western part of the cable route is within the Roughty River catchment, it doesn't cross the main channel of the river at any point. The most significant crossing in terms of width of channel is at the bridge at Sillahertane toward the downstream end of this medium sized stream flowing from the east. The crossing in question is about 400m upstream of the main channel of the Roughty. Elsewhere within the Roughty catchment, the cable crosses mostly very small drains or streams and a few more sizeable streams which eventually drain to the main channel itself.

While there is a hydrological linkage between the western sector of the cable route corridor and the Kenmare River cSAC, it can be concluded that there is no realistic potential for adverse impacts on the relevant qualifying interests of the SAC (and hence the conservation objectives for the site) due to (i) the distance between the two locations, i.e. straight-line distance of c.17 km and channel distance in excess

of 20 km, and (ii) the design of the project which has minimised the potential for adverse impacts on the Roughty River.

A thorough assessment of the potential impacts by the cabling works on the aquatic environment is contained in Section 12 of the Environmental Impact Statement for Grousemount Wind Farm (ESBI Report QR-320171-11-GK0715-R01)).

2.5 Analysis of “In-combination” Effects

The Habitats Directive requires competent authorities to make an appropriate assessment of any plan or project which is likely to have a significant effect alone or in-combination with other plans and projects.

There are many operational and permitted wind farm developments in the general region (up to 30 km distance) of the Grousemount project. Table 1 presents details including the number of permitted turbines and the overall turbine dimensions.

Of most relevance are the wind farms within the 0-10 km band width distance. With a total of 68 existing or permitted turbines, the Grousemount project will increase the total to 108 turbines. When the much larger area of 30 km distance is considered, there is a total of 152 existing or permitted turbines, with the Grousemount project increasing the total to 220.

As all of these wind farm developments have been assessed rigorously by the relevant planning authority, it can be assumed that the projects are not resulting in significant adverse impacts on any designated European site. As it can be shown objectively that the Grousemount project, including the underground cable component, will not have significant impacts on any European site it follows that the Grousemount project will not contribute to a possible cumulative impact when considered with the other wind farm developments in the wider area.

Table 2: Regional Wind Farm Developments

Location	Name	Distance	Turbines	Dimension
Development Within 0 - 10 km of Grousemount				
Kerry	Sillahertane	2.2 km	10	81 m
Kerry	Foilgreana / Coolknoohil Kilgarvan	4.0 km	6	86 m
Kerry	Coolknoohil Kilgarvan (Everwind)	4.2 km	11	86 m
Kerry *	Coolknoohill, Inchee	4.7 km	2	125 m
Kerry	Inchee	5.2 km	6	125 m
Kerry *	Coolea	5.6 km	1	125 m
Kerry	Lettercannon	6.6 km	7	125 m
Kerry	Coomagearlahy	6.0 km	15	125 m
Kerry	Inchincoosh	6.8 km	6	125 m

Location	Name	Distance	Turbines	Dimension
Kerry *	Gortnakilla	8.1 km	4	125 m
Development Within 10 - 20 km of Grousemount				
Kerry	Clydaghroe, Clonkeen	16.5 km	3	101 m
Kerry *	Cummeenabuddoge, Clonkeen	17.3 km	2	101 m
Development Within 20 - 30 km of Grousemount				
Cork	Coomacheo	20.0 km	15	121 m
Cork	Caherdowney, Millstreet	20.3 km	4	121 m
Cork	Gneeves, Millstreet	20.8 km	11	91 m
Cork	Curragh, Millstreet	21.1 km	8	91 m
Cork	Curraghglass	21.2 km	10	99 m
Cork *	Carriganimmy, Macroom	25.0 km	6	121 m
Cork	Carrigduff, Millstreet	27.2 km	20	125 m
Cork	Aghabullogue (Bawnmore)	28.6 km	5	126 m

* These wind farms are permitted and await construction. All other wind farms are operational.

There are other landuses and activities which are impacting, or have the potential to impact, upon the conservation objectives of the various European sites. These activities include afforestation, grazing and agricultural run-off to watercourses. A specific threat to the conservation objectives of St. Gobnet's Wood cSAC is the continued spread of Rhododendron and Cherry Laurel, as well as Sycamore and Beech.

As the Grousemount Wind Farm development will not affect current farming or forestry activities within and around the site, it can be concluded that the development will not lead to any changes in these activities.

It is concluded from this evaluation that while there are activities which are affecting, or have the potential to affect, the conservation objectives of European sites in the area, the Grousemount Wind Farm project will not impact upon these sites in any way and hence will not contribute to possible in-combination impacts.

2.6 Screening Conclusion and Statement

Appropriate Assessment screening has been undertaken on the proposed Grousemount Wind Farm development, which includes a 110 kV Underground Cable Circuit between the existing Ballyvouskill substation in County Cork and the permitted but as yet unbuilt Coomataggart 110 kV substation in County Kerry.

The potential effects that may arise from construction and operation of the development on the Natura 2000 network have been examined by considering the

potential for significant effects, alone or in-combination with other projects, on eleven designated European sites that occur in the surroundings.

On the basis of the findings of this Screening for Appropriate Assessment, it is concluded that the project:

- (i) is not directly connected with or necessary to the management of a Natura 2000 site, and
- (ii) significant impacts on the Natura 2000 network are not foreseen.

Therefore, in accordance with Article 6(3) of the Habitats Directive, it is considered that a Stage 2 Appropriate Assessment is not required.

APPENDIX 1
SITE SYNOPSES

SITE NAME: ST. GOBNET'S WOOD SAC**SITE CODE: 000106**

St. Gobnet's Wood SAC includes St. Gobnet's Wood itself and an area of woodland to the north, called Cascade Wood. St. Gobnet's Wood is situated on the north-east side of a hill immediately south of Ballyvourney village in Co. Cork. Cascade Wood is situated immediately to the north of Ballyvourney. Together they form a relatively large but fragmented stand of woodland. The site supports old oak woodland, as well as a small area of alluvial woodland alongside the Sullane River. The underlying rock is Old Red Sandstone and the soil is a mosaic of acidic, shallow brown earths and brown podzolics, locally skeletal, mostly well-drained but with gleys associated with impeded drainage around flushes and watercourses. There is a distinct increase in fertility downslope.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[91A0] Old Oak Woodlands

In St. Gobnet's Wood the canopy is dominated by a mixture of birch (*Betula* sp.) and oak (*Quercus petraea*, *Q. robur* and *Q. x rosacea*), with abundant old Beech (*Fagus sylvatica*) and Rowan (*Sorbus aucuparia*). Ash (*Fraxinus excelsior*) and Sycamore (*Acer pseudoplatanus*) occur widely, especially on more fertile soils, and Alder (*Alnus glutinosa*) is occasional, particularly on wetter areas. The trees vary in height from 14 m to 17 m or more in height, although a few old Scots Pine (*Pinus sylvestris*) and fir (*Abies* sp.) occur as emergents. Coppicing has clearly occurred in the past and there are some very large oak and birch stools.

The shrub layer consists mainly of Hazel (*Corylus avellana*), Rusty Willow (*Salix cinerea* subsp. *oleifolia*), Holly (*Ilex aquifolium*), Hawthorn (*Crataegus monogyna*), along with regeneration of the canopy tree species, especially Ash, and locally oak and Rowan. There are also a few Rhododendron (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*) bushes. There is a patchy dwarf shrub layer of Bilberry (*Vaccinium myrtillus*).

The herb layer is species-rich, although Bluebell (*Hyacinthoides non-scripta*), Great Wood-rush (*Luzula sylvatica*) and Bramble (*Rubus fruticosus* agg.) in mosaic tend to dominate. Wood Anemone (*Anemone nemorosa*) is locally frequent. Other species include St. Patrick's-cabbage (*Saxifraga spathularis*) on rock outcrops, Herb-Robert (*Geranium robertianum*), Cleavers (*Galium aparine*), Yorkshire-fog (*Holcus lanatus*), Wood-sorrel (*Oxalis acetosella*), Enchanter's-nightshade (*Circaea lutetiana*), Honeysuckle (*Lonicera periclymenum*), Ivy (*Hedera helix*), Common Dog-violet (*Viola riviniana*) and Irish Spurge (*Euphorbia hyberna*). Ivy is common, both in the field layer and as a liane. Ferns include Lady-fern (*Athyrium filix-femina*), Hard fern (*Blechnum spicant*), Scaly Male-fern (*Dryopteris affinis*), Hay-scented Buckler-fern (*D. aemula*), Broad Buckler-fern (*D. dilatata*) and Tonbridge Filmy-fern (*Hymenophyllum tunbridgense*) on rocks, Polypody (*Polypodium vulgare*) both on the ground and as an epiphyte, and Bracken (*Pteridium aquilinum*). Wet areas are characterised by the local abundance of Meadowsweet (*Filipendula ulmaria*), with Lesser Spearwort (*Ranunculus flammula*), Creeping Buttercup (*R. repens*) and Golden-saxifrage (*Chrysosplenium oppositifolium*). The ground layer is rich in bryophytes, with species such as *Dicranum majus*, *D. scoparium*, *Hylocomium brevirostre*, *Isoetecium myosuroides*, *Polytrichum formosum*, *Rhytidiadelphus triquetrus*, *Thuidium tamariscinum*, *Diplophyllum albicans*, *Pellia epiphylla* and *Scapania gracilis*. The bog moss *Sphagnum* cf. *quinquefarium* occurs in wet sites.

At the bottom of the hill on the northern edge of the wood is an area of alluvial woodland containing old river channels and hollows. A stand of planted young oak and Ash dominate here with Alder and willow in the depressions. Large spreading Oaks occur on the margins. The field layer is characterised by species of wet ground such as Remote Sedge (*Carex remota*),

Meadowsweet, Creeping Buttercup, Water Mint (*Mentha aquatica*) and Creeping Bent (*Agrostis stolonifera*). An area of wet meadow occurs near the car park, with Common Bent (*A. capillaris*), Bracken and Bramble. At the top of the hill, two fields are being invaded by birch and Gorse (*Ulex europaea*) scrub.

Throughout the wood there is a large amount of dead, wind-thrown and fallen timber. The wood is largely ungrazed, or only very lightly grazed, although signs of deer are present in the upper parts of the wood.

The main body of the woodland conforms to the phytosociological unit *Blechno-Quercetum* sub-association *coryletosum*, while the alluvial woodland is probably close to the *Corylo-Fraxinetum deschampsietosum*, with small pockets of *Carici remotae-Fraxinetum*, although this needs confirmation.

Cascade Wood is divided into two sections by a minor road. The eastern section, which is the largest, is an undulating, rocky site with several paths and tracks running through it. The Bohill River skirts the northern edge before flowing through an impressive, narrow defile that divides the wood into two unequal-sized sections. Several houses and gardens have been developed within the wood on both the western and eastern edges. The western section lies on a rocky slope containing numerous springs and seepage areas. As the two sections are very different in character they are described separately.

At Cascade Wood East the canopy consists of an intimate mixture of old Beech, oak (*Quercus robur* and *Q. x rosacea*) and Sycamore. Occasional clumps and individuals of old conifers - Scots Pine, Norway Spruce (*Picea abies*) and firs - emerge above this layer. Birch is common, locally forming almost pure stands, especially towards the western side of the wood. The shrub layer is dominated by dense thickets of Rhododendron and Cherry Laurel, up to 6 m or more in height. Native species, such as Hazel, Holly and Hawthorn are only occasional and chiefly confined to the vicinity of the river where the Rhododendron is more or less absent.

As a consequence of the dense shade cast by the Rhododendron and Cherry Laurel the herb layer is very poorly developed or absent over extensive areas. Like the shrubs, most of the species are confined to a narrow strip alongside the river before it enters the gorge, in the occasional light gaps and along the tracks where there is a certain amount of disturbance. Amongst these are elements typical of woods of the south-west that are also found in St. Gobnet's Wood, including Irish Spurge, St. Patrick's-cabbage and Tonbridge Filmy-fern. The stand of Birch towards the western side partly occurs on old cultivation ridges and is accompanied by Gorse, Heather (*Calluna vulgaris*), Bracken and Purple Moor-grass (*Molinia caerulea*). This area is shown as rough grazing on the O.S.I. six-inch map and is clearly reverting to woodland.

The moss layer is also poorly developed, except on relatively well-lit rock outcrops. Epiphytes are locally abundant, especially near the river, where there are pendulous curtains of mosses in places, a feature of extremely moist and sheltered areas. A recent survey of lichens found over 90 species to be present. There is a considerable amount of dead and fallen timber.

The remnants of the native vegetation here suggest that the wood was originally an example of acid Oak woodland within the phytosociological category *Blechno-Quercetum*.

Cascade Wood West is very different in structure and species composition, consisting of a mosaic of wet and dry stands. An area in the centre has been felled recently. The wet areas, influenced by seepages and small springs, are open and relatively light. Alder dominates with scattered Oak, Ash and Birch. The herb layer is grassy, being dominated by bent grasses (*A. capillaris* and *A. stolonifera*) and Creeping Buttercup with prominent clumps of Lady-fern. The drier areas are dominated by Oak, with occasional Alder, Ash and Rowan. Under the heavier shade the herb layer is poorly developed, the most common species being Common Bent, Foxglove (*Digitalis purpurea*), ferns (mostly Broad Buckler-fern and Lady-fern) and Wood-sorrel. Throughout the wood the shrub layer is very poorly developed, with Holly the principal species. The moss layer is

well developed, especially on rock outcrops, although in general epiphytes are less abundant than in the eastern section.

In the north-east corner of the wood there is a relatively young stand of Alder and Willow on very wet soil. Associated species include rushes (*Juncus* spp.), Marsh Violet (*Viola palustris*), Lesser Spearwort and abundant *Sphagnum* mosses.

Many of the Alders and some Oak are multi-stemmed, indicating past felling or coppicing. A number of trees, especially Holly, show signs of damage from bark stripping and there are numerous dead and moribund stems. This is undoubtedly a result of past heavy grazing pressure and the sparsely developed herb and shrub layers indicate continued heavy grazing; there were signs of recent cattle grazing in the northern part of the wood. Unlike the eastern section, however, Rhododendron is almost absent and Beech and Sycamore are far less prominent.

The vegetation on the drier sites falls into the acid Oak woodland category *Blechno-Quercetum* subassociation *coryletosum*; that on the wetter sites is harder to classify but it would appear to be closest to the association *Carici-remotae-Fraxinetum*.

The woodland stands support Kerry Slug (*Geomalacus maculosus*), a species listed in Annex II of the E.U. Habitats Directive, and parts of Cascade Wood are 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.

St. Gobnet's Wood is a good example of a native woodland typical of the south-west. It contains old oak woodlands, a habitat listed on the E.U. Habitats Directive, and also supports rich herb, bryophyte and lichen communities.

SITE NAME: MULLAGHANISH TO MUSERAMORE MOUNTAINS SPA

SITE CODE: 004162

The Mullaghanish to Museramore SPA comprises a substantial part of the Boggeragh/Derrynasaggart Mountains. It is divided roughly into two sectors by the R582 road between Macroom and Millstreet. Most of the site is over 200 m in altitude, rising to heights of 475 m in the eastern sector (Muserabeg) and 462 m in the western sector (Knockullane). Several important rivers rise within the site, notably the Foherish and Awboy. The site is underlain by Old Red Sandstone.

The site consists of a variety of upland habitats, though approximately one-third is afforested. The coniferous forests include first and second rotation plantations, with both pre-thicket and post-thicket stands present. The principal trees are sitka spruce (*Picea sitchensis*) and lodgepole pine (*Pinus contorta*). Almost one-third of the site is unplanted blanket bog and heath, with both wet and dry heaths present. The vegetation is characterised by such species as ling heather (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), bilberry (*Vaccinium myrtillus*), common cottongrass (*Eriophorum angustifolium*), deergrass (*Scirpus cespitosus*) and purple moor grass (*Molinia caerulea*). The remainder of the site is largely rough grassland that is used for hill farming. This varies in composition, with some wet areas with rushes (*Juncus* spp.) and some areas with scrub encroachment.

This SPA is a stronghold for Hen Harriers. A survey in 2005 resulted in 5 confirmed breeding pairs, which represents over 3% of the national total. A similar number had been recorded in the 1998-2000 period. The mix of forestry and open areas provides optimum habitat conditions for this rare bird, which is listed in Annex I of the Birds Directive. The early stages of new and second-rotation conifer plantations are the most frequently used nesting sites, though some pairs

may still nest in tall heather of unplanted bogs and heath. Hen harriers will forage up to c.5 km from the nest site, utilising open bog and moorland, young conifer plantations and hill farmland that is not too rank. Birds will often forage in openings and gaps within forests. In Ireland, small birds and small mammals appear to be the most frequently taken prey.

The site also supports a breeding population of Merlin, a further Annex I listed species. The population size is not well known but is likely to be one or two pairs.

The main threat to the long-term survival of Hen Harriers within this site is further afforestation which would reduce the amount of foraging habitat, with a possible reduction in breeding density and possibly productivity (as foraging areas become further fragmented).

Overall this site provides excellent nesting and foraging habitat for breeding Hen Harriers and is an important stronghold for the species.

SITE NAME: MULLAGHANISH BOG SAC

SITE CODE: 001890

Mullaghanish Bog is located approximately 5 km north-east of the village of Ballyvourney, and is centred around the summit of Mullaghanish Mountain on the Cork/Kerry border. The summit of the mountain itself is the location of a television transmitter station. The site is underlain by Old Red Sandstone and is at an altitude of 575-650 m.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[7130] Blanket Bogs (Active)*

Mullaghanish Bog comprises a small area of mountain blanket bog which extends towards a col in the north-east and a small way down the north-west slope of Mullaghanish Mountain. Despite its small size the site is particularly interesting because of its intact surface. The summit itself is typically ombrotrophic, but lower down some flushing occurs.

About the summit of the mountain there is a very uniform blanket peat cover, with vegetation dominated by Heather (*Calluna vulgaris*), Common Cottongrass (*Eriophorum angustifolium*), Hare's-tail Cottongrass (*E. vaginatum*) and Crowberry (*Empetrum nigrum*). Bog mosses, largely *Sphagnum capillifolium*, form an even, spongy understorey. The north-west facing slopes of the site have a tussocky vegetation dominated by Heather, Bilberry (*Vaccinium myrtillus*), Hare's-tail Cottongrass, Common Cottongrass and the moss *Polytrichum commune*. Occasional flushing occurs in this area, as indicated by the presence of several other species, such as the bog moss *Sphagnum recurvum* and Cuckooflower (*Cardamine pratensis*).

The ridge running north-east from Mullaghanish is well vegetated and includes a number of interesting stream headwater flushes which contain uncommon species such as Large-flowered Butterwort (*Pinguicula grandiflora*) and the moss, *Calliergon sarmentosum*, as well as the more common moss, *Drepanocladus revolvens*. A species of liverwort, *Barbilophozia atlantica*, which occurs on the site is otherwise known only from Co. Donegal.

There appears to be only minimal disturbance caused by sheep, fire or erosion at the site.

Mullaghanish Bog is a good quality, small, mountain blanket bog, a habitat type which is listed with priority status on Annex II of the E.U. Habitats Directive. It is remarkable for its intactness, and is one of the few such sites in the country where the vegetation has not been damaged by over-grazing or erosion.

SITE NAME: BLACKWATER RIVER (CORK/WATERFORD)**SAC SITE CODE: 002170**

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which include the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The portions of the Blackwater and its tributaries that fall within this SAC flow through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Nearby towns include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1130] Estuaries

[1140] Tidal Mudflats and Sandflats

[1220] Perennial Vegetation of Stony Banks

[1310] Salicornia Mud

[1330] Atlantic Salt Meadows

[1410] Mediterranean Salt Meadows

[3260] Floating River Vegetation

[91A0] Old Oak Woodlands

[91E0] Alluvial Forests*

[91J0] Yew Woodlands*

[1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)

[1092] White-clawed Crayfish (*Austropotamobius pallipes*)

[1095] Sea Lamprey (*Petromyzon marinus*)

[1096] Brook Lamprey (*Lampetra planeri*)

[1099] River Lamprey (*Lampetra fluviatilis*)

[1103] Twaite Shad (*Alosa fallax*)

[1106] Atlantic Salmon (*Salmo salar*)

[1355] Otter (*Lutra lutra*)

[1421] Killarney Fern (*Trichomanes speciosum*)

The Blackwater rises in boggy land in east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeragh Mountains before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old

Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

Wet woodlands are found where river embankments have broken down and channel edges are subject to daily inundation. This is particularly evident in the steep-sided valley of the River Bride, between Cappoquin and Youghal. The river side of the embankments was often used for willow growing in the past (most recently at Cappoquin) so that the channel is lined by narrow woods of White and Almondleaved Willow (*Salix alba* and *S. triandra*), with isolated Crack Willow (*S. fragilis*) and Osier (*S. viminalis*). Rusty Willow (*S. cinerea* subsp. *oleifolia*) spreads naturally into the sites and occasionally, as at Villierstown on the Blackwater and Sapperton on the Bride, forms woods with a distinctive mix of woodland and marsh plants, including Gypsywort (*Lycopus europaeus*), Guelder-rose (*Viburnum opulus*), Bittersweet (*Solanum dulcamara*) and various mosses and algae. These wet woodlands form one of the most extensive tracts of the wet woodland habitat in the country.

A small stand of Yew (*Taxus baccata*) woodland, a rare habitat in Ireland and in Europe, occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. While there are some patches of the wood with a canopy of Yew and some very old trees, the quality is generally poor due to the dominance of non-native and invasive species such as Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*) and Douglas Fir (*Pseudotsuga menziesii*). However, the future prospect for this Yew wood is good as the site is proposed for restoration under a Coillte E.U. Life Programme. Owing to its rarity, Yew woodland is listed with priority status on Annex I of the E.U. Habitats Directive.

Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. Common Reed (*Phragmites australis*) is ubiquitous and is harvested for thatching. There is also much Marsh-marigold (*Caltha palustris*) and, at the edges of the reeds, the Greater and Lesser Pond-sedge (*Carex riparia* and *C. acutiformis*). Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Reed Canary-grass (*Phalaris arundinacea*), Meadowsweet (*Filipendula ulmaria*), Common Nettle (*Urtica dioica*), Purple Loosestrife (*Lythrum salicaria*), Common Valerian (*Valeriana officinalis*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*) are all also found. At Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the water table and several different communities have developed on the acidic or neutral sediments. Many of the ponds are ringed with Rusty Willow, rooted in the mineral soils but sometimes collapsed into the water. Beneath the densest stands are woodland herbs like Yellow Pimpernel (*Lysimachia nemorum*), with locally abundant Common Water-starwort (*Callitriche stagnalis*) and Marsh Ragwort (*Senecio aquaticus*). One of the depressions has Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Crab Apple (*Malus sylvestris*) and a little Pedunculate Oak (*Quercus robur*) in addition to the willows.

Floating river vegetation is found along much of the freshwater stretches within the site. The species list is quite extensive, with species such as water-crowfoots, including Pond Water-crowfoot (*Ranunculus peltatus*), Canadian Pondweed (*Elodea canadensis*), pondweed species, including Broad-leaved Pondweed (*Potamogeton natans*), water-milfoil species (*Myriophyllum* spp.), Common Club-rush (*Scirpus lacustris*), water-starwort species (*Callitriche* spp.), Lesser Water-parsnip (*Berula erecta*) particularly on the Awbeg, Water-cress (*Nasturtium officinale*), Hemlock Waterdropwort, Fine-leaved Water-dropwort (*O. aquatica*), Common Duckweed (*Lemna minor*), Yellow Water-lily (*Nuphar lutea*), Unbranched Bur-reed (*Sparganium emersum*) and the moss *Fontinalis antipyretica* all occurring.

The grasslands adjacent to the rivers of the site are generally heavily improved, although liable to flooding in many places. However, fields of more species-rich wet grassland with species such as Yellow Iris (*Iris pseudacorus*), Meadowsweet, Meadow Buttercup (*Ranunculus acris*) and rushes

(*Juncus* spp.) occur occasionally. Extensive fields of wet grassland also occur at Annagh Bog on the Awbeg. These fields are dominated by Tufted Hair-grass (*Deschampsia cespitosa*) and rushes.

The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech and a few conifers, and sometimes of the invasive species *Rhododendron* (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*). Oak woodland is well developed on sandstone about Ballinatray, with the acid oak woodland community of Holly (*Ilex aquifolium*), Bilberry (*Vaccinium myrtillus*), Great Wood-rush (*Luzula sylvatica*) and the ferns *Dryopteris affinis* and *D. aemula* occurring in one place. Irish Spurge (*Euphorbia hyberna*) continues eastwards on acid rocks from its headquarters to the west, but there are also many plants of richer soils, for example Wood Violet (*Viola reichenbachiana*), Goldilocks Buttercup (*Ranunculus auricomus*), Broad-leaved Helleborine (*Epipactis helleborine*) and Red Campion (*Silene dioica*). Oak woodland is also found in Rincrew, Carrigane, Glendine, Newport and Dromana. The spread of *Rhododendron* is locally a problem, as is over-grazing. A few limestone rocks stand over the river in places showing traces of a less acidic woodland type with Ash, False Brome (*Brachypodium sylvaticum*) and Early-purple Orchid (*Orchis mascula*). In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. These valleys retain something close to their original cover of oak with Downy Birch (*Betula pubescens*), Holly and Hazel (*Corylus avellana*) also occurring. There has been much planting of Beech (as well as some of coniferous species) among the oak on the shallower slopes and here both *Rhododendron* and Cherry Laurel have invaded the woodland. The oak wood community in the Lismore and Glenmore valleys is of the classic upland type, in which some Rowan (*Sorbus aucuparia*) and Downy Birch occur. Honeysuckle (*Lonicera periclymenum*) and Ivy (*Hedera helix*) cover many of the trees while Great Wood-rush, Bluebell (*Hyacinthoides non-scripta*), Wood-sorrel (*Oxalis acetosella*) and, locally, Bilberry dominate the ground flora. Ferns present on the site include Hard Fern (*Blechnum spicant*), Male Fern (*Dryopteris filix-mas*), the bucklerferns *D. dilatata* and *D. aemula*, and Lady Fern (*Athyrium filix-femina*). There are many mosses present and large species such as *Rhytidiadelphus* spp., *Polytrichum formosum*, *Mnium hornum* and *Dicranum* spp. are noticeable. The lichen flora is important and includes 'old forest' species which imply a continuity of woodland here since ancient times. Tree Lungwort (*Lobaria* spp.) is the most conspicuous and is widespread. The Araglin valley consists predominantly of broadleaved woodland. Oak and Beech are joined by Hazel, Wild Cherry (*Prunus avium*) and Goat Willow (*Salix caprea*). The ground flora is relatively rich, with Pignut (*Conopodium majus*), Ramsons (*Allium ursinum*), Garlic Mustard (*Alliaria petiolata*) and Wild Strawberry (*Fragaria vesca*). The presence of Ivy Broomrape (*Orobanche hederaceae*), a local species within Ireland, suggests that the woodland, along with its attendant Ivy, is long established. Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g. Sycamore, Ash and Horsechestnut (*Aesculus hippocastanum*). In places the alien invasive species Cherry Laurel dominates the understorey. Parts of the woodlands are more semi-natural in composition, being dominated by Ash, with Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europaea*) also present. However, the most natural areas of woodland appear to be the wet areas dominated by Alder and willows (*Salix* spp.). The ground flora of the dry woodland areas features species such as Pignut, Wood Avens (*Geum urbanum*), Ivy and Soft Shield-fern (*Polystichum setiferum*), while the ground flora of the wet woodland areas contains characteristic species such as Remote Sedge (*Carex remota*) and Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*). In places along the upper Bride, scrubby, semi-natural deciduous woodland of willow, oak and Rowan occurs, with abundant Great Wood-rush in the ground flora.

The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher

levels of moisture here enable a vigorous moss and fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches. At Banteer a type of wetland occurs near the railway line which offers a complete contrast to the others. Old turf banks are colonised by Royal Fern (*Osmunda regalis*) and Eared Willow (*Salix aurita*), and between them there is a sheet of Bottle Sedge (*Carex rostrata*), Marsh Cinquefoil (*Potentilla palustris*), Bogbean (*Menyanthes trifoliata*), Marsh St. John's-wort (*Hypericum elodes*) and the mosses *Sphagnum auriculatum* and *Aulacomnium palustre*. The cover is a scraw (i.e. floating vegetation) with characteristic species like Marsh Willowherb (*Epilobium palustre*) and Early Marshorchid (*Dactylorhiza incarnata*). The soil high up the Lismore valleys and in rocky places is poor in nutrients but it becomes richer where streams enter and also along the valley bottoms. In such sites Wood Speedwell (*Veronica montana*), Wood Anemone (*Anemone nemorosa*), Enchanter's-nightshade (*Circaea lutetiana*), Barren Strawberry (*Potentilla sterilis*) and shield-fern (*Polystichum* sp.) occur. There is some Ramsons, Three-nerved Sandwort (*Moehringia trinervia*) and Early-purple Orchid (*Orchis mascula*) locally, with Opposite-leaved Golden-saxifrage, Meadowsweet and Bugle (*Ajuga reptans*) in wet places. A stand of Hazel woodland at the base of the Glenakeeffe valley shows this community well. The area has been subject to much tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow and Downy Birch. The ground in the clearings is heathy with Heather (*Calluna vulgaris*), Slender St John's-wort (*Hypericum pulchrum*) and the occasional Broom (*Cytisus scoparius*) occurring.

The estuary and the habitats within and associated with it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site, with the best examples at Kinsalebeg in Co. Waterford, and between Youghal and the main bridge north of it across the river in Co. Cork. Other areas occur along the tributaries of the Licky in east Co. Waterford, and Glendine, Newport, Bride and Killahaly Rivers in Waterford west of the Blackwater. There are also large tracts along the Tourig River in Co. Cork. There are narrow bands of intertidal flats along the main river as far north as Camphire Island. Patches of green filamentous algae (*Ulva* sp. and *Enteromorpha* sp.) occur in places, while fucoid algae are common on the more stony flats, even as high upstream as Glenassy or Coneen. The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The species list at Foxhole consists of Common Saltmarsh-grass (*Puccinellia maritima*), small amounts of Greater Seaspurrey (*Spergularia media*), glasswort (*Salicornia* sp.), Sea Arrowgrass (*Triglochin maritima*), Annual Sea-blite (*Suaeda maritima*) and Sea Purslane (*Halimione portulacoides*) - the latter a very recent coloniser. Some Sea Aster (*Aster tripolium*) occurs, generally with Creeping Bent (*Agrostis stolonifera*). Sea Couch (*Elymus pycnanthus*) and small isolated clumps of Sea Club-rush (*Scirpus maritimus*) are also seen. On the Tourig River additional saltmarsh species found include sea-lavenders (*Limonium* spp.), Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvygrass (*Cochlearia officinalis*) and Sea Plantain (*Plantago maritima*). Oraches (*Atriplex* spp.) are found on channel edges. Species such as Saltmarsh Rush (*Juncus gerardi*) and Sea Rush (*J. maritimus*) are found in places in this site also, and are indicative of Mediterranean salt meadows. Areas of *Salicornia* mud are found at the eastern side of the townland of Foxhole above Youghal, at Blackbog, along the Tourig and Kinsalebeg estuaries. The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well developed and diverse flora. At the lowest part, Sea Beet (*Beta vulgaris* subsp. *maritima*), Curled Dock (*Rumex crispus*) and Yellow Horned-poppy (*Glaucium flavum*) occur, while at a slightly higher level Sea Mayweed (*Matricaria maritima*), Cleavers (*Galium aparine*), Rock Samphire (*Crithmum maritimum*), Sea Sandwort (*Honkenya peploides*), Spear-leaved Orache (*Atriplex prostrata*) and Babington's Orache (*A. glabriuscula*). Other species present include Sea Rocket (*Cakile maritima*), Herb-Robert (*Geranium robertianum*), Red Fescue and Kidney Vetch (*Anthyllis*

vulneraria). The top of the spit is more vegetated and supports lichens and bryophytes, including *Tortula ruraliformis* and *Rhytidiadelphus squarrosus*.

The site supports several Red Data Book plant species, i.e. Starved Wood-sedge (*Carex depauperata*), Killarney Fern (*Trichomanes speciosum*), Pennyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neottia nidus-avis*), Golden Dock (*Rumex maritimus*) and Bird Cherry (*Prunus padus*). The first three of these are also protected under the Flora (Protection) Order, 1999, while the Killarney Fern is also listed on Annex II of the E.U. Habitats Directive. The following plants, relatively rare nationally, are also found within the site: Toothwort (*Lathraea squamaria*) - associated with woodlands on the Awbeg and Blackwater; Summer Snowflake (*Leucojum aestivum*) and Flowering Rush (*Butomus umbellatus*) on the Blackwater; Common Calamint (*Calamintha ascendens*), Red Campion, Sand Leek (*Allium scorodoprasum*) and Wood Club-rush (*Scirpus sylvaticus*) on the Awbeg.

The site is also important for the presence of several E.U. Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population of White-clawed Crayfish (*Austropotamobius pallipes*). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers. The Blackwater is noted for its enormous run of salmon over the years. The river is characterised by significant pools, streams, glides, and generally, a good push of water coming through except in very low water. Spring salmon fishing can be carried out as far upstream as Fermoy and is highly regarded especially at Careysville. The Bride, main Blackwater upstream of Fermoy, and some of the tributaries are more associated with grilse fishing. The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. The bat species Natterer's Bat, Daubenton's Bat, Whiskered Bat, Brown Long-eared Bat and Pipistrelle, can be seen feeding along the river, roosting under the old bridges and in old buildings. Common Frog, a Red Data Book species that is also legally protected (Wildlife Act, 1976), occurs throughout the site. The rare bush cricket *Metrioptera roselii* (Order Orthoptera) has been recorded in the reed/willow vegetation of the river embankment on the Lower Blackwater River. The Swan Mussel (*Anodonta cygnea*), a scarce species nationally, occurs at a few sites along the freshwater stretches of the Blackwater.

Several bird species listed on Annex I of the E.U. Birds Directive are found on the site. Some use it as a staging area, others are vagrants, while others use it more regularly. Internationally important numbers of Whooper Swan (average peak 174, 1994/95-95/96) and nationally important numbers Bewick's Swan (average peak 5, 1996/97-2000/01) use the Blackwater Callows. Golden Plover occur in regionally important numbers on the Blackwater estuary (average peak 885, 1984/85-86/87) and on the River Bride (absolute maximum 2,141, 1994/95). Staging Terns visit the site annually, with >300 Sandwich Tern and >200 Arctic/Common Tern (average peak 1974-1994). The site also supports populations of the following: Red Throated Diver, Great Northern Diver, Barnacle Goose, Ruff, Wood Sandpiper and Greenland Whitefronted Goose. Three breeding territories for Peregrine Falcon are known along the Blackwater Valley. This, the Awbeg and the Bride River are also thought to support at least 30 pairs of Kingfisher. Little Egret breed at the site (12 pairs in 1997, 19 pairs in 1998). The site holds important numbers of wintering waterfowl. Both the Blackwater Callows and the Blackwater Estuary Special Protection Areas (SPAs) hold internationally important numbers of Black-tailed Godwit (average peak 847, 1994/95-95/96 on the callows, average peak 845, 1974/75-93/94 in the estuary). The Blackwater Callows also hold Wigeon (average peak 2,752), Teal (average peak 1,316), Mallard (average peak 427), Shoveler (average peak 28), Lapwing (average peak 880), Curlew (average peak 416) and Black-headed Gull (average peak 396) (counts from 1994/95-95/96). Numbers of

birds using the Blackwater Estuary, given as the mean of the highest monthly maxima over 20 years (1974-94), are Shelduck (137 +10 breeding pairs), Wigeon (780), Teal (280), Mallard (320 + 10 breeding pairs), Goldeneye (11-97), Oystercatcher (340), Ringed Plover (50 + 4 breeding pairs), Grey Plover (36), Lapwing (1,680), Knot (150), Dunlin (2,293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4,000) and Lesser Black-backed Gull (172). The greatest numbers (75%) of the wintering waterfowl of the estuary are located in the Kinsalebeg area on the east of the estuary in Co. Waterford. The remainder are concentrated along the Tourig estuary on the Co. Cork side. The river and river margins also support many Heron, non-breeding Cormorant and Mute Swan (average peak 53, 1994/95-95/96 in the Blackwater Callows). Heron occurs all along the Bride and Blackwater Rivers: 2 or 3 pairs at Dromana Rock; approximately 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and around 20 pairs at Rincrew Wood have been recorded. Some of these are quite large and significant heronries. Significant numbers of Cormorant are found north of the bridge at Youghal and there are some important roosts present at Ardsallagh Wood, downstream of Strancally Castle and at the mouth of the Newport River. Of note are the high numbers of wintering Pochard (e.g. 275 individuals in 1997) found at Ballyhay quarry on the Awbeg, the best site for Pochard in Co. Cork. Other important species found within the site include Long-eared Owl, which occurs all along the Blackwater River, and Barn Owl, a Red Data Book species, which is found in some old buildings and in Castlehyde, west of Fermoy. Reed Warbler, a scarce breeding species in Ireland, was found for the first time in the site in 1998 at two locations. It is not known whether or not this species breeds on the site, although it breeds nearby to the south of Youghal. Dipper occurs on the rivers. Land use at the site is mainly centred on agricultural activities.

The banks of much of the site and the callows, which extend almost from Fermoy to Cappoquin, are dominated by improved grasslands which are drained and heavily fertilised. These areas are grazed and used for silage production. Slurry is spread over much of this area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of E.U. Habitats Directive Annex II animal species within it. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the Blackwater and its tributaries, and there are a number of angler associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. Other recreational activities such as boating, golfing and walking are also popular. Water skiing is carried out at Villierstown. Parts of Doneraile Park and Anne's Grove are included in the site: both areas are primarily managed for amenity purposes. There is some hunting of game birds and Mink within the site. Ballyhay quarry is still actively quarried for sand and gravel. Several industrial developments, which discharge into the river, border the site. The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, over-grazing within the woodland

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SITE NAME: GLANLOUGH WOODS

SAC SITE CODE: 002315

Glanlough Woods is situated 4 km south of Kilgarvan, Co. Kerry. The site consists of a two storey, derelict, stone farmhouse and its adjacent out-buildings. It contains an important maternity roost of the Lesser Horseshoe Bat.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*)

At Glanlough Woods SAC the bats roost in the ceiling and roof apex of the old farmhouse. Approximately 150 bats were counted using this breeding site in July 2000, making it a site of international importance. Adjacent habitat includes deciduous woodland which provides suitable foraging areas for the bats. However, the exact feeding areas and the winter roost of this population remain unknown. The building used by the bats is in a state of disrepair - the floors have collapsed and slates are missing from part of the roof. However, careful renovation could improve the conservation status of the bat population here and in general the conservation potential of the site is good

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SITE NAME: KILGARVAN ICE HOUSE

SAC SITE CODE: 000364

This site contains three buildings and some woodland used by the Lesser Horseshoe Bat. An ice house, situated within Glannaserha Wood on a fairly steep slope above the Roughty River is used as a hibernating site by the bats. It is situated about 2 km west of Kilgarvan in Co. Kerry. The two other buildings, Caher Bridge Cottage which is situated approximately 3 km west of the ice house, and William King House, approximately 4 km east of the ice house, contain nursery roosts.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*)

The stone ice house, formerly used for storing food, satisfies the necessary temperature and humidity requirements of this species during hibernation. The surrounding coniferous woodland, forms part of the site as it provides both suitable foraging habitat and shelter for bats. This wood comprises approximately 80% commercial conifer species, with the remainder being a mix of Beech (*Fagus sylvatica*), Oak (*Quercus* spp.) and other species. A fringe of riverine habitat occurs along the northern boundary of the site and near the ice house. The number of bats using the ice house has increased since a metal grille was fitted in 1987. In the winter of 1995/96, 300 bats were recorded here making this a site of international importance. This is probably one of the largest hibernating sites for the species in Europe. Both of the summer roosts are in good condition and are now being managed for the bats. They both support roosts of international importance. During the summer of 2001 up to 191 bats were counted in Caher Bridge Cottage and 175 in a barn at William King House. These are the closest known maternity roosts to the hibernaculum and it is assumed that the bats in these summer roosts are associated with the ice house. The Roughty River connects all three sites and this is lined with riparian woodland which provides good foraging habitat and a suitable commuting corridor for the bats. Clear-felling of the woodland around the ice house, which would lead to a decline in the number of bats, is the main threat to this population. This site is one of the most important in the country for Lesser Horseshoe Bat.

SITE NAME: DERRYCLOGHER (KNOCKBOY) BOG cSAC**SITE CODE: 001873**

Derryclogher (Knockboy) Bog is situated under the summit of Knockboy Mountain (707 m). The western boundary is marked by the ridge which runs from the summit northwards to a subsidiary summit (695 m) and a further ridge which runs westwards to Lough Boy (578 m). These ridges run along the county border. The extreme southern point of the site falls to 240 m while the extreme eastern point falls sharply to less than 150 m.

The Cummeendarrig River rises on the eastern flank of the Knockboy ridge as a series of parallel streams which coalesce and flow southwards to the head of Bantry Bay as the Coomhola River. The southern part of the site contains the headwaters of the Derryduff River. Two medium sized lakes occur, Lough Nambrackderg and Curramore Lough, as well as several small loughs.

The main conservation interest of the site is the active mountain blanket bog, an EU Habitats Directive Annex I priority habitat. The bogs occur as a complex mosaic with other upland habitats, namely grassland, heath, stream flushes and exposed rock. The bogs are mostly small (1-2 ha) but they occur with regularity on a series of gently sloping shelves across the mountainside. The largest expanses of bog are beneath the two lakes. Slope appears locally to define the composition of the bog vegetation, with the flattest areas being the wettest. The vegetation is dominated by Deer Sedge (*Trichophorum cespitosus*), Purple Moor-grass (*Molinia caerulea*), Bog Cottons (*Eriophorum angustifolium* and *E. vaginatum*) and a good diversity of mosses including *Campylopus atrovirens*, *Racomitrium lanuginosum*, and a variety of *Sphagnum* spp. The *Racomitrium* forms hummocks in the drier places. Some linear pools occur, with *Sphagnum cuspidatum* and *S. tenellum*, and White Beak-sedge (*Rhynchospora alba*) around the margins.

The more nutrient-rich areas which surround the bogs are dominated by *Molinia*, often with *Sphagnum palustre*, the Soft Rush (*Juncus effusus*), Star Sedge (*Carex echinata*) and the moss *Polytrichum commune*. *Sphagnum auriculatum* and *S. recurvum* are a feature of many of the flushed areas, with Bulbous Rush (*Juncus bulbosus*), Bogbean (*Menyanthes trifoliata*) and White Beak-sedge, particularly at the lower levels. Nearer the stream banks species such as Sharp-flowered Rush (*Juncus acutiflorus*), Common Sedge (*Carex nigra*), Sweet Vernal-grass (*Anthoxanthum odoratum*) and Common Sorrel (*Rumex acetosa*) occur, with Blinks (*Montia fontana*), Bog Pimpernel (*Anagallis tenella*) and the moss *Campylium stellatum* close to springs. The Kerry Butterwort (*Pinguicula grandiflora*) occurs locally.

This site is largely in a natural state. Although sheep grazing occurs throughout, it is at low density and has only caused some localised damage to an area south of Curramore Lough. The site has not been burnt in the recent past. Some afforestation occurs outside of the site boundary and this is probably the main threat to the site.

This site is of conservation interest for its blanket bog habitat, which shows gradations to heath, grassland and stream flushes.

SITE NAME: OLD DOMESTIC BUILDING, CURRAGLASS WOOD**SITE CODE: 002041**

This site consists of a small, two-roomed, stone dwelling situated in Rossacrué Wood, approximately 6 km north of Kilgarvan, County Kerry. It is used as a nursery site by the Lesser Horseshoe Bat (*Rhinolophus hipposideros*), a species listed on Annex II of the EU Habitats Directive.

The building is derelict and the bats gain access through an opening over a doorway at the rear of the building and through a window leading to a small loft. The bats hang from the roof timbers in the loft.

The surrounding wood provides suitable foraging habitat within a small radius of the day roost site - this is of paramount importance to this species which avoids flying across open areas.

Since its discovery in 1991, remedial work on the building has been carried out to secure the site and make it more suitable for breeding bats. In addition, part of the ground floor was modified to create an artificial hibernating site which was used by 15 bats during December 1995.

In July 1996, approximately 100 Lesser Horseshoe bats were counted at this site, which makes it of international importance. 143 bats were recorded here in August 1999.

The site appears not to be threatened at present, though any future removal of the surrounding woodland would be detrimental to the bats.

SITE NAME: KILLARNEY NATIONAL PARK, MACGILLYCUDDY'S REEKS AND CARAGH RIVER CATCHMENT SAC

SITE CODE: 000365

This very large site encompasses the mountains, rivers and lakes of the Iveragh Peninsula, and the Paps Mountains which stretch eastward from Killarney towards Millstreet. The majority of the site is in Co. Kerry, with a small portion in Co. Cork. This is the most mountainous region in Ireland and includes Carrauntoohil, the highest peak in the country at 1,039 m. The underlying geology is almost entirely Old Red Sandstone, although Carboniferous limestone occurs on the eastern shores of Lough Leane, and rhyolitic lavas occur above Lough Guitane. The dramatic sandstone ridges and valleys have been shaped by glacial processes and many of the lakes are impounded by glacial moraines. Located close to the Atlantic in the southwest of Ireland, the site is subject to strong oceanic influences. Generally, Lusitanian flora and fauna is well-represented, while the high peaks and cliffs support arctic-alpine relicts.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

- [3110] Oligotrophic Waters containing very few minerals
- [3130] Oligotrophic to Mesotrophic Standing Waters
- [3260] Floating River Vegetation
- [4010] Wet Heath
- [4030] Dry Heath
- [4060] Alpine and Subalpine Heaths
- [5130] Juniper Scrub
- [6130] Calaminarian Grassland
- [6410] Molinia Meadows
- [7130] Blanket Bogs (Active)*
- [7150] Rhynchosporion Vegetation
- [91A0] Old Oak Woodlands
- [91E0] Alluvial Forests*
- [91J0] Yew Woodlands*
- [1024] Kerry Slug (*Geomalacus maculosus*)

- [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- [1065] Marsh Fritillary (*Euphydryas aurinia*)
- [1095] Sea Lamprey (*Petromyzon marinus*)
- [1096] Brook Lamprey (*Lampetra planeri*)
- [1099] River Lamprey (*Lampetra fluviatilis*)
- [1103] Twaite Shad (*Alosa fallax*)
- [1106] Atlantic Salmon (*Salmo salar*)
- [1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*)
- [1355] Otter (*Lutra lutra*)
- [1421] Killarney Fern (*Trichomanes speciosum*)
- [1833] Slender Naiad (*Najas flexilis*)

The Oak woodlands, occurring mostly around the Killarney lakes, are the habitat for which the area is perhaps best known. They form the most extensive area of native woodland remaining in Ireland and include Derrycunihy Wood, described as perhaps the most natural Sessile Oak (*Quercus petraea*) wood in the country. The woods are typically dominated by Sessile Oak, with an understorey of Holly (*Ilex aquifolium*). The Strawberry-tree (*Arbutus unedo*) is a notable component of the woods and there are scattered areas of Yew (*Taxus baccata*). The herb layer is not particularly species-rich, but the woods support perhaps the best developed Atlantic bryophyte community in Europe. Several rare species are present including *Lejeunea flava*, *Cyclodictyon laetivirens*, *Daltonia splachnoides*, *Sematophyllum demissum* and *Radula carringtonii*. The only sizeable Yew woodland in Ireland is found on the limestone of the Muckcross peninsula. Here, some of the trees are up to 200 years old. The dense shade beneath the tree results in few herbs in the ground flora, but the bryophyte layer is well-developed and almost continuous. Wet woodland, or carr, occurring on the low-lying limestone areas within the floodplain of Lough Leane, forms one of the most extensive areas of this woodland type in Ireland. The dominant canopy species are Alder (*Alnus glutinosa*), willows (*Salix* spp.), Ash (*Fraxinus excelsior*) and Downy Birch (*Betula pubescens*), while the field layer is dominated by Remote Sedge (*Carex remota*) and Creeping Bent (*Agrostis stolonifera*). Adding to the diversity of the woodland component of this site are a number of mixed woodlands, including those of Ross Island which support one of the richest herb layers of the Killarney woods.

The most common habitat types within the overall site are blanket bog, heath and upland grassland. The heath and grassland generally occur on areas with shallow peat and on the mineral soils of the steep mountain sides, while the blanket bog occurs on the more gentle slopes, plateaux and other level ground. Often the habitats occur in a mosaic, with exposed rock frequently occurring. A variety of blanket bog types are represented from lowland valley to mountain blanket bog. Some of the best include: Cumberagh River Bog Nature Reserve, a domed bog which is perhaps the most southern intact blanket bog in the country; Ballygisheen, which contains one of the most extensive areas of intact lowland blanket bog in Co. Kerry; Coomacheo/Caherbarnagh, which combine to form the largest mountain blanket bog in the south-west; Eirk Bog Nature Reserve, a classic example of a bog intermediate between a raised and blanket bog; Mangerton Bog, an upland bog which grades into an unusual lichen heath seen at no other site; and Oolagh East, a quaking basin mire. Generally, the bogs have a characteristic flora. The Lusitanian species, Large-flowered Butterwort (*Pinguicula grandiflora*), is common. The bogs also support a number of unusual species, including mosses (*Sphagnum pulchrum*, *S. fuscum*, *S. platyphyllum*, *S. strictum*, *S. contortum* and *Calliergon stramineum*), liverworts (*Cladopodiella francisci* and *Calypogeia azurea*) and lichens (*Cladonia mediterranea*, *C. macilenta*, *C. rangiferina*, *C. arbuscula* and *Cetraria islandica*). Rhynchosporion vegetation is confined to wet areas within the lowland blanket bogs, with one of the best areas for the habitat being to the north-east of the Ballygisheen Pass. On a portion of this bog there is an extensive area of quaking

flats and pools dominated by the bog mosses *Sphagnum cuspidatum* and *S. auriculatum*. These areas have a typically species-poor flora which includes Bogbean (*Menyanthes trifoliata*), White Beak-sedge (*Rhynchospora alba*), Bog Asphodel (*Narthecium ossifragum*), Common Cottongrass (*Eriophorum angustifolium*) and Great Sundew (*Drosera anglica*). Brown Beak-sedge (*R. fusca*), a locally rare plant of wet bog pools, is occasional within the site. Although the habitat is best developed in very wet areas of intact bog, it may also occur in wet areas of regenerating cutover blanket bog. Wet heath often occurs in association with blanket bog and features Cross-leaved Heath (*Erica tetralix*). Dry heath is more frequent in this site, and is dominated by Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*) and Western Gorse (*Ulex gallii*), with occasional Bilberry (*Vaccinium myrtillus*). This habitat is well-developed on the Paps Mountains. Elsewhere it is often over-grazed, with upland grassland becoming more frequent. Some of the highest ridges support alpine heath (referable to the *Lycopodium alpinum* - *Racomitrium lanuginosum* association). Widespread plant species of the alpine heath include Bog-myrtle (*Vaccinium myrtillus*), Crowberry (*Empetrum nigrum*) and Fir Clubmoss (*Huperzia selago*), while species such as Juniper (*Juniperus communis* subsp. *nana*) and Dwarf Willow (*Salix herbacea*) have a much more restricted distribution.

The site contains many lakes, but these can be broadly divided into two types: small upland corrie lakes and larger lowland lakes. Examples of the first type are Lough Murtagh and Lough Gortavehy in the Paps Mountains. They are oligotrophic and typically species-poor, with Quillwort (*Isoetes lacustris*), Water Lobelia (*Lobelia dortmanna*) and Shoreweed (*Littorella uniflora*) occurring most commonly. The lowland lakes are mostly oligotrophic, although Lough Leane, the largest freshwater body in the region, has become somewhat mesotrophic as a result of pollution from Killarney town. These lowland lakes tend to be more species-rich than those at higher altitudes, with additional species such as Awlwort (*Subularia aquatica*), Sixstamened Waterwort (*Elatine hexandra*) and Alternate Water-milfoil (*Myriophyllum alterniflorum*). Good examples include Lough Caragh, Upper Lake and Muckcross Lake. The rivers associated with these lakes are also of importance. The Caragh is relatively unpolluted from headwater to estuary, a rare phenomenon in Europe. The Flesk runs over Old Red Sandstone in its upper reaches and limestone as it nears Lough Leane. Both rivers support floating and submerged vegetation and rare invertebrates. Rocks around the smaller mountain streams often support a lush vegetation of ferns and bryophytes, most notably at Torc Waterfall.

Other habitats of note include: Juniper scrub found on islands in the Upper Lake and on dry ridges in nearby Newfoundland Bog; damp meadows, with Purple Moorgrass (*Molinia caerulea*), supporting scarce species such as Whorled Caraway (*Carum verticillatum*) and Ivy-leaved Bellflower (*Wahlenbergia hederacea*); and Calaminarian grasslands, associated with the old copper mines on Ross Island, with species such as Sea Campion (*Silene vulgaris* subsp. *maritima*) and Thrift (*Armeria maritima*).

A large number of plant and animal species of interest occur within the site. For example, two plant species listed on Annex II of the E.U. Habitats Directive occur. Slender Naiad (*Najas flexilis*) is found in some of the lakes at the site. The Killarney Fern (*Trichomanes speciosum*) is another listed and well-known rarity. An additional twenty-two Red Data Book plant species have been recorded, but only twelve of these have been seen recently. These are Pillwort (*Pilularia globulifera*), Kerry Lily (*Simethis planifolia*), Irish Lady's-tresses (*Spiranthes romanzoffiana*), Slender Cottongrass (*Eriophorum gracile*), Small Cudweed (*Logfia minima*), Betony (*Stachys officinalis*), Heath Cudweed (*Omalotheca sylvatica*), Alder Buckthorn (*Frangula alnus*), Alpine Saw-wort (*Saussurea alpina*), Hoary Whitlowgrass (*Draba incana*), Smooth Brome (*Bromus racemosus*) and Holly Fern (*Polystichum lonchitis*). The first seven of these species are legally protected under the Flora (Protection) Order, 1999, as are Slender Naiad and Killarney Fern. Additional plant species of interest include a fern (*Dryopteris affinis* subsp. *stilluppensis*) and a Whitebeam (*Sorbus anglica*), both at their only Irish locations. The site is very important for oceanic bryophytes, particularly the woodland species. It also contains good representative

examples of the Northern Atlantic Hepatic Mat community and other oceanic montane communities. Killarney Oak woods and mountains have been nominated as a site of international importance for bryophytes. The Killarney Woods are notable for the number of rare species of Myxomycete fungus that have been recorded, namely *Collaria arcyronema*, *Craterium muscorum*, *Cribraria microcarpa* (only known Irish site), *C. rufa*, *C. violacea*, *Diderma chondrioderma*, *D. lucidum*, *D. ochraceum*, *Fuligo muscorum* and *Licea marginata*.

The site has six bird species which are listed on Annex I of the E.U. Birds Directive. A small flock of Greenland White-fronted Goose, which winters on the boglands within the National Park, is now the only regular flock in the south-west. The site has one of the highest concentrations of breeding Peregrines in the country, as well as some breeding Merlin. Chough is found both in the coastal and inland areas of the site, with possibly up to 30 pairs breeding. Kingfisher is a species associated with the lakes and rivers, especially in the National Park and probably breeds. Finally, a few pairs of Common Tern breed within the site. The woodlands provide habitat for a variety of breeding birds, most notably Garden Warbler, Blackcap, and probably a few pairs each of the rare Redstart and Wood Warbler. Lough Leane is a site for wintering wildfowl with the following average counts for the two winters 1995/96 and 1996/97: Teal (208), Mallard (350), Pochard (81), Tufted Duck (323) and Coot (169).

The site supports most of the Irish mammal species. Of particular note is the occurrence of two E.U. Habitats Directive Annex II species: Lesser Horseshoe Bat, with a total population of about 300 individuals distributed at several locations, including both nursery and hibernation sites, and Otter. Perhaps the best known mammals of the Killarney National Park are the Red Deer, which form the only remaining native herd in Ireland, comprised of around 600 animals. Sika Deer also occur. Pine Marten is another notable species.

The site is valuable for its rare fish species, five of which are listed on Annex II of the E.U. Habitats Directive: Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Sea Lamprey (*Petromyzon marinus*), Atlantic Salmon (*Salmo salar*) and Killarney Shad (*Alosa fallax killarneyensis*). The Killarney Shad is a unique land-locked subspecies confined to the Killarney lakes. Also of note is the glacial relict, Arctic Char (*Salvelinus alpinus*), a Red Data Book species, a unique form of which is found in Lough Coomasaharn.

There are numerous rare invertebrates within the site. These include three E.U. Habitats Directive Annex II species: Kerry Slug (*Geomalacus maculosus*), the Freshwater Pearl Mussel (*Margaritifera margaritifera*) and the Marsh Fritillary (*Euphydryas aurinia*). The Kerry Slug and Pearl Mussel populations are of particular importance in a national context. Other species of note include: three chironomids of international importance found in the River Flesk; a wood ant (*Formica lugubris*) at one of only four Irish sites; a snail (*Limnaea involuta*), in Lough Crincaum, at its only known location; two dragonflies (*Cordulea aenea* and *Somatochlora arctica*), the former at one of only two known sites in Ireland and the latter at its only known Irish location; and several other aquatic and woodland species at their only known Irish locations.

The main land use within the site is grazing by sheep. In and around the National Park deer grazing is also common. The extensive grazing has caused damage to many of the terrestrial habitats, resulting in degradation of heath and blanket bogs and prevention of woodland regeneration. In the upland habitats the erosion caused by grazing is exacerbated by the exposed nature of the terrain. Apart from grazing, the woodlands are particularly threatened by Rhododendron (*Rhododendron ponticum*) invasion: approximately two thirds of the Oak woodlands are affected, although a Rhododendron removal programme is underway in the National Park. The Yew wood has been adversely affected by heavy grazing for many years, but it is intended to control this in the near future by erection of a deer fence. The bogs are sensitive to grazing and are also threatened by turbary, burning and afforestation. Most of the lakes are very acid-sensitive and therefore vulnerable to afforestation within the catchment areas. Lough Leane has been subject to some eutrophication, although water quality appears to have improved

since phosphates were removed from the sewage in 1985. A management plan was drawn up for the Killarney National Park in 1991. The park is managed primarily for conservation purposes although recreation is also provided for. Overall, the site is of high ecological value because of the diversity, quality and extensiveness of many of the habitats, and impressive list of rare species of flora and fauna. In recognition of its importance the Killarney National Park has been designated a World Biosphere Reserve.

SITE NAME: KENMARE RIVER

SAC SITE CODE: 002158

Kenmare River SAC in Co. Kerry, 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. Exposure to prevailing winds and swells at the mouth diminishes towards the head of the bay. 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.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

- [1160] Large Shallow Inlets and Bays
- [1170] Reefs
- [1220] Perennial Vegetation of Stony Banks
- [1230] Vegetated Sea Cliffs
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [2120] Marram Dunes (White Dunes)
- [2130] Fixed Dunes (Grey Dunes)*
- [4030] Dry Heath
- [6130] Calaminarian Grassland
- [8330] Sea Caves
- [1014] Narrow-mouthed Whorl Snail (*Vertigo angustior*)
- [1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*)
- [1355] Otter (*Lutra lutra*)
- [1365] Common (Harbour) Seal (*Phoca vitulina*)

Kenmare River SAC has a wide range of marine communities from exposed coast to ultra-sheltered areas. The site contains three marine habitats listed on Annex I of the E.U. Habitats Directive, namely reefs, large shallow bay and marine caves. There is also a very high number of rare and notable marine species present and some uncommon communities. Kenmare River is the only known site in Ireland for the Northern Sea-fan (*Swiftia pallida*) and is the only known area where this species and the Southern Sea-fan (*Eunicella verrucosa*) co-occur. In the more exposed areas within Kenmare River SAC the sublittoral sediment is composed mainly of coarse shelly sand and gravel forming small dunes frequently with sparse bivalves, including *Lutraria* sp. In sheltered areas the muddy sand has communities characterised by burrowing megafauna. Some areas have the Norwegian Prawn (*Nephrops norvegicus*) and others the burrowing sea cucumber *Neopentadactyla mixta*. Kenmare River SAC is one of only four known locations in Ireland for the burrowing anemone *Pachycerianthus multiplicatus*. Communities characterised by burrowing brittlestars including the uncommon *Ophiopsila annulosa* also occur. Red calcareous

free living algae generally termed 'maerl' (also known as 'coral') occur in the sheltered bays and at one site the rare burrowing brittlestar *Amphiura securigera* occurs. Beaches in outer parts of Kenmare River SAC are composed of coarse, mobile sand and have sand hoppers in the high shore and polychaete worms in the low shore. More sheltered coves, sometimes backed by sand dunes, have sandhoppers in the upper shore, Lugworm (*Arenicola marina*) in the mid shore and Razor Shell (*Ensis arcuatus*) and the burrowing sea-urchin *Echinocardium cordatum* in the lower shore. Midway along the south coast of Kenmare River SAC, a series of sea caves stretch back into the cliff. They typically support encrusting sponges, ascidians and bryozoans. At the mouth of the bay, Kenmare River SAC contains very good examples of littoral, infralittoral and circalittoral reef communities that are typically found in extremely exposed areas. The characteristic shifts that occur in community composition with depth are very strong. Likewise, the shifts that occur with exposure are well represented along the length of the bay.

Perennial vegetation of stony banks is well represented at two locations within Kenmare River SAC - Pallas Harbour and Rossdohan Island. Characteristic species recorded here include Thrift (*Armeria maritima*), Common Scurvygrass (*Cochlearia officinalis*), Rock Samphire (*Crithmum maritimum*) and Sea Campion (*Silene vulgaris* subsp. *maritima*).

Within the Derrynane Bay area on the south side of the Iveragh Peninsula there are good examples of a number of habitats listed on Annex I of the E.U. Habitats Directive including dry heath, fixed dunes, Marram dunes, sea cliffs and salt meadows (both Atlantic and Mediterranean types). Of particular note within the dry heath habitat here is the occurrence of the rare Red Data Book species, Kerry Lily (*Simethis planifolia*). This species, which is protected under the Flora (Protection) Order, 1999, is unknown as a native in Britain, and in Ireland it is restricted to the Kenmare River SAC area. Another protected plant, Betony (*Stachys officinalis*), is found on rocky knolls in the site. Several other locally uncommon plant species add to the importance of this area, for example, Chaffweed (*Anagallis minima*), Crowberry (*Empetrum nigrum*), Wild Madder (*Rubia peregrina*) and Roseroot (*Rhodiola rosea*).

Salt meadows are well distributed in sheltered areas from Derrynane Bay to Kilmakilloge Harbour. Six of these have been surveyed in detail, and five are of the fringe type on peat. The saltmarsh at Derrynane is of the bay type and is found on mud on sand, and is associated with a sand dune system. Species which have been recorded from saltmarshes at this site include Sea Rush (*Juncus maritimus*), Seamilkwort (*Glaux maritima*), oraches (*Atriplex* spp.), Thrift, Red Fescue (*Festuca rubra*), Sea Plantain (*Plantago maritima*), Common Saltmarsh-grass (*Puccinellia maritima*) and Sea Aster (*Aster tripolium*).

Heath also occurs along the extensive coastal strips within the site, from sea level to the higher slopes. Dry heath is especially well represented, and occurs in association with wet heath, coastal grassland and exposed rock. Widespread species of the heath habitat are Heather (*Calluna vulgaris*), Western Gorse (*Ulex gallii*) and Bell Heather (*Erica cinerea*). Also present are species such as Gorse (*Ulex europaeus*), Bracken (*Pteridium aquilinum*), Bilberry (*Vaccinium myrtillus*), Sheep's-bit (*Jasione montana*), Creeping Willow (*Salix repens*), Mat-grass (*Nardus stricta*) and Purple Moor-grass (*Molinia caerulea*). In places Juniper (*Juniperus communis*), Burnet Rose (*Rosa pimpinellifolia*) and the protected Kerry Lily and Betony are components of the heath. Sea cliffs occur in places along the length of the site and are often well vegetated, supporting plant species typical of the habitat, including Thrift, Sea Campion, Rock Sea-spurrey (*Spergularia rupicola*), Rock Samphire and Sea Spleenwort (*Asplenium marinum*).

Excellent examples of Calaminarian grassland occur in association with old mine workings about Allihies. The habitat is particularly notable for the range of rare bryophytes that it supports. Within this site fixed dune is largely confined to Derrynane where a small area occurs on the northern shores. The most common species include Red Fescue, Common Bird's-foot-trefoil (*Lotus corniculatus*), Smooth Meadow-grass (*Poa pratensis*), Lady's Bedstraw (*Galium verum*), Bulbous Buttercup (*Ranunculus bulbosus*) and Ribwort Plantain (*Plantago lanceolata*). The moss species

Homalothecium lutescens can be locally abundant, while *Rhytidiadelphus squarrosus* and *Hypnum cupressiforme* are also found.

A reasonably extensive area of white dune dominated by Marram (*Ammophila arenaria*) occurs at the mouth of Derrynane bay. Species such as Sea Bindweed (*Calystegia soldanella*), Ribwort Plantain, Yorkshire-fog (*Holcus lanatus*), Red Fescue, Sea-holly (*Eryngium maritimum*), Portland Spurge (*Euphorbia portlandica*), Kidney Vetch (*Anthyllis vulneraria*) and Common Ragwort (*Senecio jacobaea*) are also found here. Kenmare River SAC holds an important population of Common Seal (maximum count of 391 in the all-Ireland survey of 2003). The seals frequent rocky islets near Sneem, Templenoe and Castle Cove, as well as Brennel Island, Illaunsillagh, Kilmackilloge Harbour and Ballycrovane Harbour. Otter also uses the site. Both Common Seal and Otter are listed on Annex II of the E.U. Habitats Directive.

Two internationally important roosts for Lesser Horseshoe Bat, another Annex II species, are included in the site: approximately 100 bats were recorded hibernating in a souterrain near Dunkerron in 2001, while over 100 bats have been counted in recent summers in a two-storey cottage near Killaha.

In damp slacks amongst the sand dunes at Derrynane, the rare Narrow-Mouthed Whorl Snail (*Vertigo angustior*), also an Annex II species, has been found. The nationally endangered and protected Red Data Book species, Natterjack Toad, has also been recorded from this area and, following a re-introduction programme, has re-established itself at the site.

Common/Arctic Tern (95+ pairs in 2008) have been recorded breeding on rocky islands in Derrynane Bay and on other islands within the site including Eyeries Island, Spanish Island and Brennel Island. In 1995 two pairs of the scarce Little Tern bred, and Sandwich Tern occasionally breed.

Impacts arising from aquaculture, fishing, dumping of wastes and water pollution are the principal threats to the nature conservation interests of Kenmare River. There are several resorts for water sports and a number of popular beaches within this large coastal site and impacts associated with such recreational activities may also pose a threat. Bait digging is also a potential threat in some areas. Housing developments within the areas of dry heath present another possible threat to the integrity of the site. The seals and bats may be vulnerable to disturbance. Grazing at Derrynane is managed for the conservation of the dune habitats and the rare species they contain. Kenmare River SAC contains an exceptional complement of marine and terrestrial habitats, many of which are listed on Annex I of the E.U. Habitats Directive, as well as four species that are listed on Annex II of this Directive. The presence of populations of rare Red Data Book species, in particular of Kerry Lily, together with the ornithological interest of the area, adds to the conservation significance of the site.

SITE : KILLARNEY NATIONAL PARK SPA

CODE: 0004038

This large site encompasses the lakes and part of the Macgillycuddy's Reeks in the vicinity of Killarney. The underlying geology is Old Red Sandstone, although Carboniferous Limestone occurs on the eastern shores of Lough Leane. Lough Leane is the most important and largest (8.6 km along long axis) of the lakes, and is classified as a mesotrophic system. Muckross Lake and the Upper Lake are both high quality oligotrophic systems. Aquatic vegetation includes such species as Quillwort (*Isoetes lacustris*), Water Lobelia (*Lobelia dortmanna*) and Shoreweed (*Littorella uniflora*)

The oak woodlands are the habitat for which the area is best known. They form the most extensive area of native woodland remaining in Ireland and include Derrycunihy Wood, described

as perhaps the most natural Sessile Oak wood in the country. The woods are typically dominated by Sessile Oak (*Quercus petraea*) with an understorey of Holly (*Ilex aquifolium*). The Strawberry Tree (*Arbutus unedo*) is a notable component of the woods and there are scattered Yew (*Taxus baccata*). The herb layer is not particularly species-rich, but the woods support perhaps the best developed Atlantic bryophyte community in Europe. Yew, which favours the limestone of Muckcross peninsula, forms the only sizeable Yew woodland in Ireland and some of the trees are up to 200 years old. The dense shade beneath the tree results in few herbs in the ground flora, but the bryophyte layer is almost continuous. Wet woodland or carr, occurring on the low-lying limestone areas within the flood plain of Lough Leane, forms one of the most extensive areas of this woodland type in Ireland. The dominant canopy species are Alder (*Alnus glutinosa*), willows (*Salix* spp.), Ash (*Fraxinus excelsior*) and Downy Birch (*Betula pubescens*). Mixed woodland also occurs, as well as some conifer plantations.

The higher areas of the site are dominated by blanket bog and wet heath. Generally, the bogs have a characteristic flora, with such species as Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*) and Western Gorse (*Ulex gallii*), with occasional Bilberry (*Vaccinium myrtillus*). The Lusitanian species, Large-flowered Butterwort (*Pinguicula grandiflora*) is common. The bogs also support a number of unusual species, including mosses (*Sphagnum pulchrum*, *S. fuscum*, *S. platyphyllum*, *S. strictum*, *S. contortum* and *Calliergon stramineum*), liverworts (*Cladopodiella francisci* and *Calypogeia azurea*) and lichens (*Cladonia mediterranea*, *C. macilenta*, *C. rangiferina*, *C. arbuscula* and *Cetraria islandica*). Outcropping rock, cliffs and crags are features of the site.

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 - while the numbers are now very low (<20), the population is still of importance as it is the most southerly in the country and also one of the remaining populations that feeds entirely on bogs. Upland species which breed within the site include Peregrine (at least 1 pair), Merlin (up to 5 pairs), Red Grouse and Ring Ouzel (1-2 pairs). Both Red Grouse and Ring Ouzel are Red listed species in Ireland. The extensive woodlands support some scarce breeding birds, notably Redstart (1-2 pairs), Wood Warbler (1-2 pairs) and Garden Warbler (possibly up to 10 pairs). Lough Leane, and to a lesser extent the other lakes, support a variety of wintering waterfowl species, though all in relatively low numbers. The following counts are the average peaks for three of the five winters in the period 1995/96-1999/00 : Cormorant 86, Teal 184, Mallard 361, Pochard 54, Tufted Duck 271, Goldeneye 23 and Coot 124. Several research programmes have been carried out on the birds in the site, including studies on the communities associated with the yew woodlands and the wildfowl associated with the lakes.

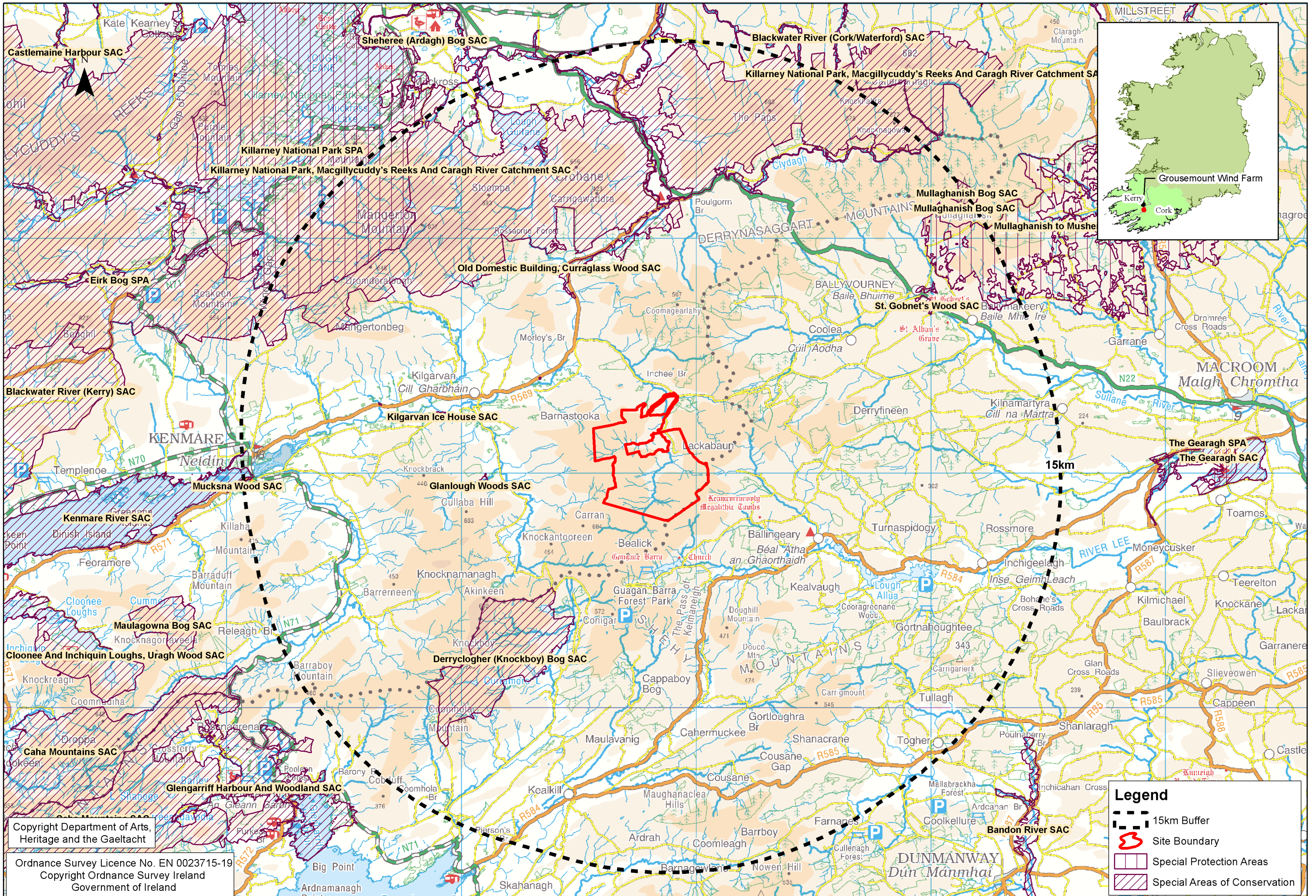
A large number of plant and animal species of interest occur within the site, including most of the Irish mammal species, several important fish species including Arctic Char, and a range of scarce and rare plant species.

The main landuse within the site is grazing by sheep and deer. The extensive grazing has caused damage to some of the habitats, resulting in degradation of heath and blanket bogs and prevention of woodland regeneration. In the upland habitats the erosion caused by grazing is exacerbated by the exposed nature of the terrain. Apart from grazing, the woodlands are particularly threatened by Rhododendron (*Rhododendron ponticum*) invasion, although a Rhododendron removal programme is underway in the National Park. Lough Leane has been subject to eutrophication (mainly from sewage) in the past and remains vulnerable. A management plan was drawn up for the Killarney National Park in 1991. The park is managed primarily for conservation purposes although recreation is also provided for.

Overall, this SPA site is of importance because it supports good diversities of birds typical of upland and woodland habitats. Several nationally rare woodland species are present, and notably Redstart. Two species, Red Grouse and Ring Ouzel, are Red listed species of high conservation

concern. Of note is that three of the species which occur regularly are listed in Annex I of the Birds Directive : Peregrine, Merlin and Greenland White-fronted Goose. The goose population is also significant as it is the most southerly in Ireland.

APPENDIX 2
FIGURES

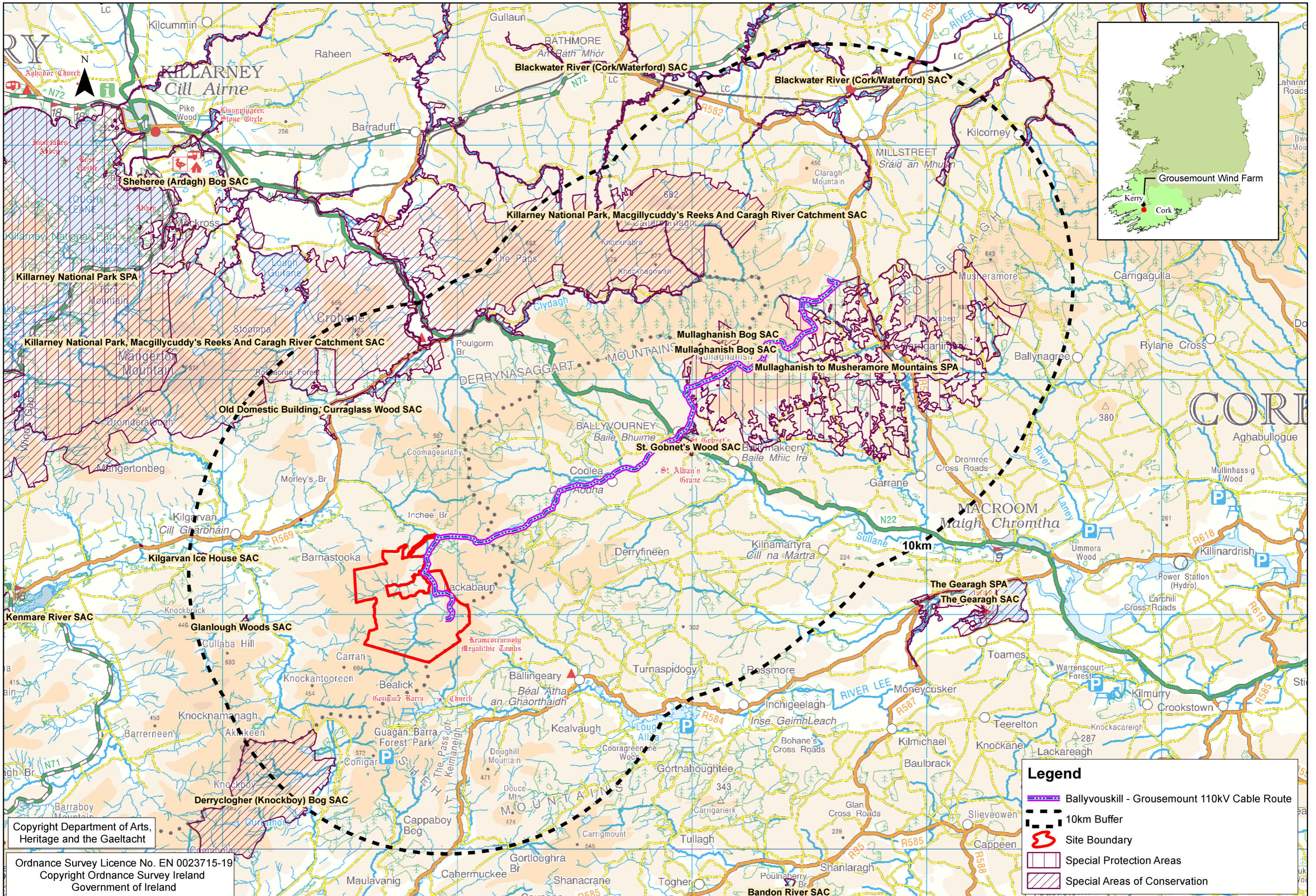


Distribution of SACs & SPAs within 15 km of Wind Farm

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Legend

- 15km Buffer
- Site Boundary
- Special Protection Areas
- Special Areas of Conservation



Distribution of SACs & SPAs within 10 km of Cable Route

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