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**APPROPRIATE ASSESSMENT**

**STAGE 1 SCREENING**

**ALPS ELECTRIC IRELAND LTD**

**CLARA ROAD**

**MILLSTREET**

**COUNTY CORK**

**Prepared For: -**

Alps Electric Ireland Ltd  
Clara Road  
Millstreet  
County Cork

**Prepared By: -**

O'Callaghan Moran & Associates  
Unit 15, Melbourne Business Park  
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Cork

**October 2023**

Project		Stage 1 Screening Assessment Change to Generator Operational Hours		
Client		ALPS		
Report No.	Date	Status	Prepared By	Reviewed By
232470201	17/10/2023	Initial Draft	Austin Hynes	Jim O'Callaghan MSc
	17/10/2023	Final		

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**APPENDIX 1**            Natura 2000 Site Synopsis

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## 1. INTRODUCTION

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ALPS Electric (Ireland) Limited (ALPS) manufactures parts for the automotive industry, which include electronic components, car electronics, communications and broadcasting-related equipment at its plant in Millstreet. The plant operates under an Integrated Pollution Control (IPC) licence (Reg No. P0835-01) issued by the Environmental Protection Agency (the Agency).

The licensable activity as prescribed in the First Schedule of the EPA Act 1992, as amended is Class 12.2.2. The manufacture or use of coating materials in processes with a capacity to make or use at least 10 tonnes per year of organic solvents, and powder coating manufacture with a capacity to produce at least 50 tonnes per year, not included in paragraph 12.2.1.

Schedule A1 of the licence stipulated that other than an emergency, the standby diesel generator may be operated only between the hours 16:45 and 19:15, Monday to Friday, November to February and where the stack height is at least 16.5m above ground.

The operational hours specified in Schedule A1 were requested by ALPS in the licence application and were based on the generator operational hours specified in Winter Demand Scheme operated by the ESB at the time the application was made. The scheme encouraged companies with high-energy requirements to generate their own electricity during periods of peak demand for an economical benefit.

ALPS is preparing a licence alteration request to amend Schedule A1 to allow the operation of the generator in accordance with a Demand Side Management Agreement with Eirgrid and this requires the completion of an Appropriate Assessment Screening report. ALPS requested O'Callaghan Moran & Associates (OCM) to prepare the report.

The European Union (EU) Habitats Directive (92/43/EC) and the EU Birds Directive (2009/147/EC) identify designated areas (Special Areas of Conservation (SAC) and Special Protection Areas (SPA) respectively), are collectively known as European Sites and otherwise as Natura 2000 Sites.

The Habitats Directive, which is implemented under the European Communities Birds and Natural Habitats) Regulations 2011 (S.I. No 477 of 2011), requires an "appropriate assessment" of the potential impacts any proposed development that may have an impact on the conservation objectives of any Natura 2000 site.

Article 6(3) of the Directive stipulates that *any plan or project not directly connected with or necessary to the management of a Natura 2000 site, but likely to have a significant effect thereon...shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.*

Guidance documents issued by Department of Environment, Heritage and Local Government (DEHLG) and the National Parks and Wildlife Services (NPWS) recommend that the assessment be completed in a series of Stages, which comprise:

### *Stage 1: Screening*

The purpose of this Stage is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in combination with other plans or projects, could have significant effects on a Natura 2000 site in respect of the site's conservation objectives.

### *Stage 2: Appropriate Assessment*

This Stage is required if the Stage 1 Screening exercise identifies that the project is likely to have a significant impacts on a Natura 2000 site.

### *Stage 3: Assessment of Alternative Solutions.*

If Stage 2 determines that the project will have an adverse impact upon the integrity of a Natura 2000 site, despite the implementation of mitigation measures, it must be objectively concluded that no alternative solutions exist before the plan can proceed.

### *Stage 4: Compensatory Measures:*

Where no alternative solutions are feasible and where adverse impacts remain but imperative reasons of overriding public interest require the implementation of a project an assessment of compensatory measures that will effectively offset the damage to the Natura 2000 Site is required.

## **1.1 Methodology**

The Screening Assessment was based on a site inspection and the proposed change to facility operations. It followed the guidance presented The DEHLG (2009, revised February 2010) Appropriate Assessment of Plans and Projects in Ireland; the NPWS (2010) Circular NPW 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities and the European Communities (Birds and Natural Habitats) Regulations 2011.

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## **2. DESCRIPTION OF PROJECT**

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### **2.1 Site Location**

The facility is located in the Mount Leader Industrial Estate on the southern outskirts of Millstreet, as shown on Figure 2.1.

### **2.2 Environmental Setting**

#### *2.2.1 Hydrology*

The site is the catchment of the Finnow River, whose main channel is approximately 150m east of the site and flows to the north. A tributary of the Finnow rises approximately 270 m south of the site, flows north, passing approximately 100 m to the west of the site and enters the Finnow River approximately 550 m north-west of the facility. The Finnow River joins the Blackwater River that subsequently flows east into Youghal Harbour. There is a lake close to the southern boundary of the site.

#### *2.2.2 Geology & Hydrogeology*

The site is underlain by a layer of made ground, which overlies approximately 3m of sandstone derived till. The bedrock comprises green-grey sandstones and purple siltstones of the Gun Point Formation. The subsoils are not significantly water bearing. The bedrock aquifer is classified as a locally important aquifer, which is only moderately productive in local zones (LI). The aquifer vulnerability rating is High. The regional direction of groundwater flow is north, towards the River Blackwater, but locally flow is likely to be influenced by the Finnow River.

### **2.3 Surrounding Land Use**

The site is located in a small industrial estate. Within the estate the Clover Hill Food Ingredients plant is to the east of the Main Production Plant. The lands to the west are in agricultural use, while immediately to the north are residential dwellings. There is a logistics depot to the east of the K & L warehouse and to the south of the warehouse is a lake. Further east and south the lands are in agricultural use.

### **2.4 Site Layout**

The site layout is shown on Drawing No 190247-01-1. The main production plant covers 5,916m<sup>2</sup> and comprises a main production building that houses product assembly with annexes containing offices; a canteen; workshop; chemical storage building; air abatement unit; bunded gas oil storage tank and boiler house; sprinkler room; liquefied petroleum gas storage tanks; bunded electrical transformer; back-up electricity generator; paved open yards; car parks and landscaped areas.

127000

90000



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CLIENT

ALPS

Details:

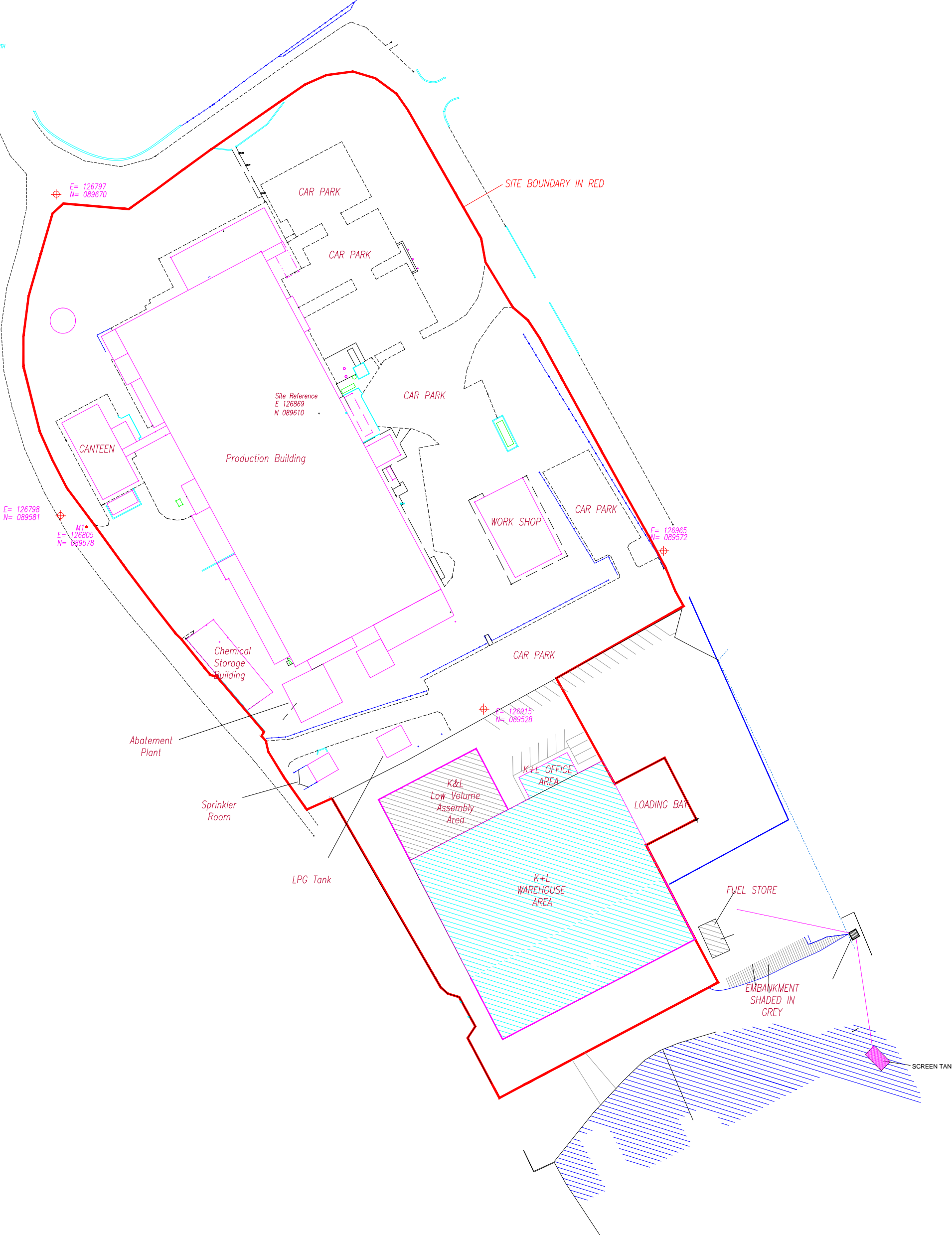
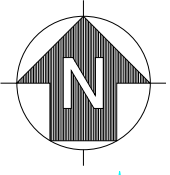
— Site Layout

TITLE

Site Location

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Figure 2.1



**OM**  
 environmental management for business

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CLIENT  
 ALPS

TITLE  
 Revised Licence Boundary

DWG No.  
 19-247-01-1

SCALE  
 1:1000

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There is a warehouse to the south of the main production plant and at a higher elevation. It occupies 4,112m<sup>2</sup> and comprises four adjoining and interconnected buildings with a paved open yard at the northern side. The low volume assembly area is located in an annex (850m<sup>2</sup>) at the northern side of the building. An oil storage tank and fuel dispenser close to the south-eastern side of the building are used by the warehouse landlord and are outside the licensed area.

## **2.5 Site Operations**

### *2.5.1 Main Production Building*

The production process involves the fabrication of plastic parts and the assembly of components onto printed circuit boards and comprises the following stages:

#### Fabrication of Plastic Parts:

Plastic pellets undergo injection moulding. The moulds are annealed, cooled and cleaned. Depending on end-use a number of the parts are coated with a mixture of paint, thinner and hardener using high volume low pressure (HVLP) technology and are then cured by a combination of heating to 40°C for 15 minutes (Flash Off) followed by curing in an oven at 80°C. The parts are then labels using laser etching.

#### Printed Circuit Boards:

Removal of the packaging from printed circuit boards and components that are delivered to the site and packaging is removed.

#### Surface Mounting Technology (SMT) Process:

The printed circuit boards are loaded into a surface mount device, where they are cleaned with solvent, solder paste and adhesive coatings are applied and the various components are mounted automatically onto the boards. The boards are then cured to harden the solder paste.

#### Manual Assembly Process:

Larger components are manually fitted onto the printed circuit boards after the SMT process. Solder is applied with either a wave solder or by point spraying application. A solvent based protective coating (conformance coating) is applied to the board, followed by curing.

#### Final Assembly Process:

Moulds and circuit boards are assembled and parts are manually cleaned using solvent and the products are then packed in returnable tote boxes and stored pending shipment to the customers.

## **2.6 Operational Hours**

The licence authorises operations 24 hours, 6 day weeks a day.

## **2.7 Drainage**

### *2.7.1 Foul Water*

The manufacturing activities do not generate a process wastewater. Sanitary wastewater from the toilets and wastewater from the canteen discharge directly to the Irish Water foul sewer.

### *2.7.2 Surface Water*

Storm water arises from rainfall from the building roofs, paved open yards and the car parks. In the main production plant the run-off from all areas combines and discharges to the Finnow River at one discharge point. There are oil interceptors on the drains that take the run-off from the car parks. At the warehouse and the paved yard discharges to the storm sewer serving the estate, which also outfalls to the Finnow River.

## **2.8 Chemicals/Oil**

Main production plant chemicals, including waste chemicals, are stored in the chemical storage building at the south-west corner of the production building. All chemicals used in the daily production processes are stored at this location and brought to the production areas as required. The building is bunded and all loading and unloading of chemicals is done using a fork lift and a bunded pallet, driven by trained personnel.

Lubricating oil and hydraulic oils are stored on a bunded pallet in the workshop area, varying in container size from 5 litres to 100 litre. Diesel (gas oil) is stored in an above ground, bunded tank. The gas oil is used use to fuel the boiler that heats the water system. The fill point is within the bund. All gas oil deliveries are monitored by an ALPS facilities personnel.

Chemicals and oils are not stored in the warehouse and the only chemical used in the assembly area is the IPA.

## **2.9 Emissions**

The current licence authorises four point emissions (A1-3, A2-1, A2-3, A2-4) to atmosphere and one storm water emission to surface water. The licence specifies the emission limit values that must be achieved and the monitoring programme that must be implemented. The licence also specifies noise emission limits. There is no emission of process wastewater to sewer and no emission to ground/groundwater.

## **2.10 Emergencies**

An emergency is an accident/incident that has the potential to result in environmental pollution and harm to human health & safety. The current licence requires ALPS to ensure that a documented procedure is in place that addresses the hazards on-site, particularly in relation to the prevention of accidents that have a possible impact on the environment. The licence also requires ALPS to ensure that an Emergency Response Procedure (ERP) is in place that addresses any emergency situation that may originate on-site.

## **2.11 Proposed Development**

The proposed development solely involves amending the operational hours of the stand by generator to allow ALPS participate in the Demand Side Agreement with Eirgrid. This will not result in any new emission point or any material change/increase in:

- The nature and quantity of the authorised emissions;
- The existing abatement/treatment or recovery systems;
- The range of processes to be carried out, and
- The fuels, raw materials, intermediates, products or wastes generated.

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### 3. NATURA 2000 SITES

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SACs are selected for the conservation and protection of habitats listed on Annex I and species (other than birds) listed on Annex II of the Habitats Directive, and their habitats. The habitats listed in Annex I require special conservation measures. SPAs are selected for the conservation and protection of bird species listed on Annex I of the Birds Directive and regularly occurring migratory species, and their habitats, particularly wetlands. The selected habitats and species are termed Qualifying Interests.

A statement of Conservation Objectives is prepared for each designated site which identifies the qualifying interests or conservation features. The Conservation Objectives are intended to ensure that the relevant habitats and species present on a site are maintained, and where necessary restored, at a Favourable Conservation Status.

Favourable Conservation Status of a habitat, as defined in 2011 Birds and Natural Habitats Regulations, is when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable

Conservation Status of a species is when:

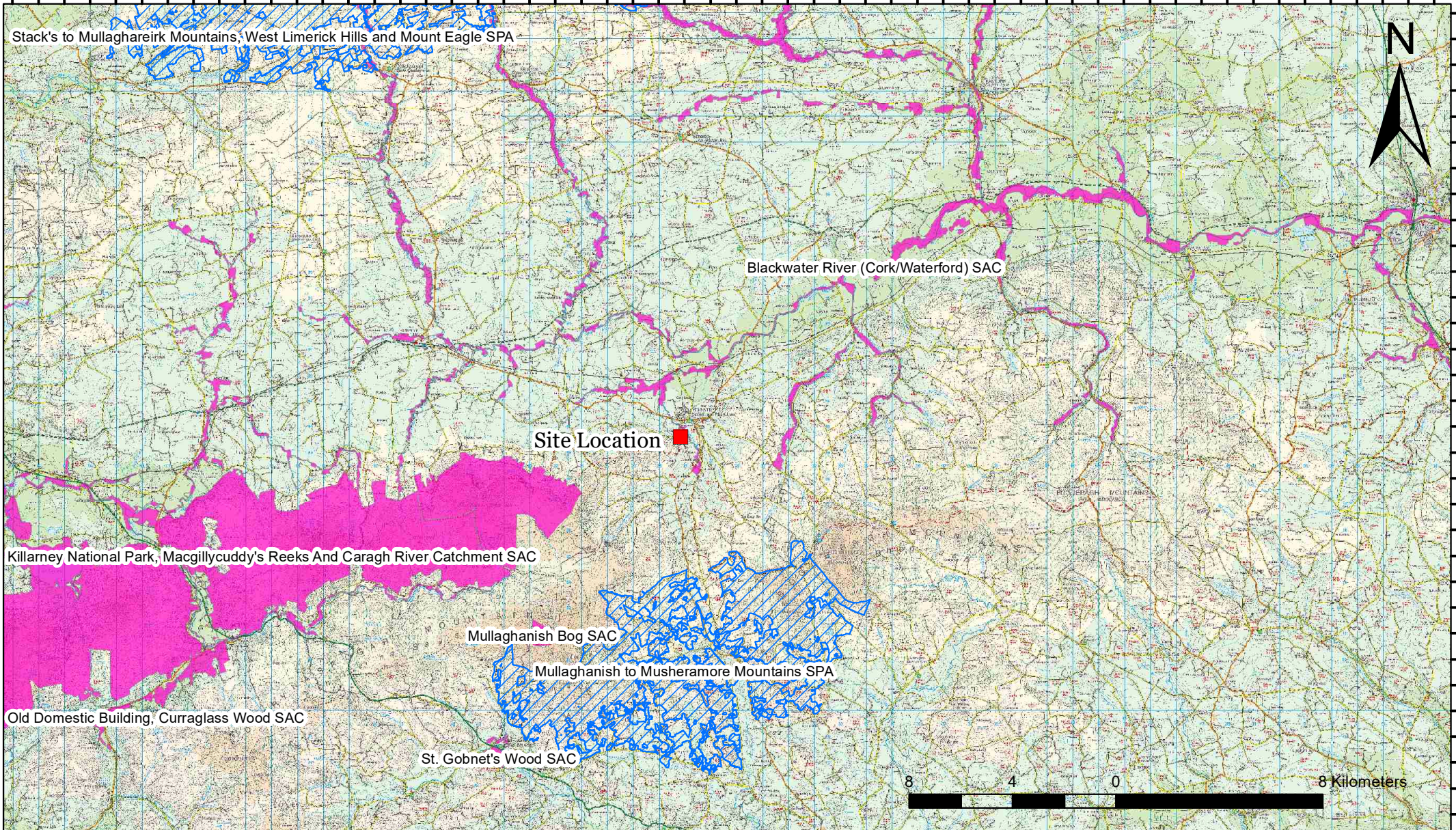
- the favourable population dynamics data on the species concerned indicates that it is maintaining itself on a long-term basis as a viable component of its natural habitats,
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The designated SACs and SPAs within 15km of the site that could potentially be affected by the proposed changes are listed in Table 3.1 and shown on Figure 3.1. The closest site is the Finnow River, which is part of the Blackwater (Cork Waterford) SAC

**Table 3.1. Natura 2000 Sites within 15 km of the ALPS Facility**

Site	Code	Distance
<b>SAC</b>		
Blackwater River (Cork Waterford)	002170	170m east
Killarney National Park, Macgillycuddy Reeks and Caragh River Catchment SAC	000365	4.2 km southwest
Mullaghanish Bog SAC	001890	9 km
St Gobnet's Wood SAC	000106	13.2 km
Old Domestic Building, Curraglass Wood SAC	002041	25.1 km southwest
<b>SPA</b>		
Mullaghanish to Musheramore Mountains SPA	004162	4.7 km south
Stacks to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	004161	17.1 km northwest

101000 103000 105000 107000 109000 111000 113000 115000 117000 119000 121000 123000 125000 127000 129000 131000 133000 135000 137000 139000 141000 143000 145000 147000 149000 151000 153000 155000



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CLIENT

Alps

Details:

■ Site Location

▨ SPA

■ SAC

TITLE

NPWS

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Figure 3.1

### **3.1 SAC**

#### **Blackwater River (Cork/Waterford) SAC**

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 4m 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.

The Site Synopsis, which lists the full Qualifying Interests and the Conservation Objectives is in Appendix 1 and the information is summarised below.

#### *Qualifying Interests*

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore it is of high conservation value for the populations of bird species that use it and two SPAs are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

#### *Conservation Objectives*

The conservation objectives are to maintain or restore the favorable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

#### **Killarney National Park, Macgillicuddy Reeks and Caragh River Catchment SAC**

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 County Kerry, with a small portion in County Cork. This is the most mountainous region in Ireland and includes Carrauntoohil, the highest peak in the country at 1,039 m. The Site Synopsis, which lists the full Qualifying Interests and the Conservation Objectives is in Appendix 1 and the information is summarised below.

#### *Qualifying Interests*

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.

### *Conservation Objectives*

The conservation objectives are to maintain or restore the favorable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

#### **Mullaghanish Bog SAC**

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 Synopsis, which lists the full Qualifying Interests and the Conservation Objectives is in Appendix 1 and the information is summarised below.

#### *Qualifying Interests*

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. The presence of some uncommon plant species adds further to the interest of the site.

#### *Conservation Objectives*

The conservation objectives are to maintain or restore the favorable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.

#### **St Gobnet's Wood SAC**

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 Site Synopsis, which lists the full Qualifying Interests and the Conservation Objectives is in Appendix 1 and the information is summarised below.

#### *Qualifying Interests*

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.

#### *Conservation Objectives*

The conservation objectives are to maintain or restore the favorable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.

## **Old Domestic Building, Curraglass Wood SAC**

This site consists of a small, two-roomed, stone dwelling situated in Rossacrue Wood, approximately 6 km north of Kilgarvan, County. Kerry. It is used as a nursery site by a colony of Lesser Horseshoe Bat. The Site Synopsis, which lists the full Qualifying Interests and the Conservation Objectives is in Appendix 1 and the information is summarised below.

### *Qualifying Interests*

The surrounding woodland provides suitable foraging habitat within a small radius of the bats day roost site. This is of great importance to this species which avoids flying across open areas.

### *Conservation Objectives*

The conservation objectives are to maintain or restore the favorable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

## **3.2 SPA**

### **Mullaghanish to Musheramore Mountains SPA**

The Mullaghanish to Musheramore Mountains 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 475m in the eastern sector (Musherabeg) and 462 m in the western sector (Knockullane).

The Site Synopsis for the SPA, listing the full Qualifying Interests, and the Conservation Objectives are in Appendix 1 and the information is summarised below.

### *Qualifying Interests*

The site consists of a variety of upland habitats, though approximately one-third is afforested. The principal tree species present 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 site designated as an SPA due to the conservation interest for Hen Harrier and the presence of a breeding population of Merlin.

### *Conservation Objectives*

The conservation objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (Hen Harriers and Merlin).

## **Stacks to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA**

The Stacks to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is a very large site centred on the borders between the counties of Cork, Kerry and Limerick. The site consists of a variety of upland habitats, though almost half is afforested.

The Site Synopsis for the SPA, listing the full Qualifying Interests, and the Conservation Objectives are in Appendix 1 and the information is summarised below.

### *Qualifying Interests*

The principal tree species present are Sitka Spruce (*Picea sitchensis*) and Lodgepole Pine (*Pinus contorta*). A substantial part (28%) of the site is unplanted blanket bog and heath, with both wet and dry heath present. The vegetation of these habitats is characterised by such species as Ling Heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Common Cottongrass (*Eriophorum angustifolium*), Hare's tail Cottongrass (*Eriophorum vaginatum*), Deergrass (*Scirpus cespitosus*) and Purple Moor-grass (*Molinia caerulea*). The site is designated as an SPA due to the special conservation interest for Hen Harrier.

### *Conservation Objectives*

The conservation objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

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## **4. LIKELY EFFECTS**

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### **4.1 Direct Effects**

The site is not located within or adjoining to a Natura 2000 Site. The proposed extension of the licence boundary will not result in any direct habitat loss or fragmentation of any SPA or SAC.

### **4.2 Indirect Effects**

Rainwater run-off from the roof of the warehouse and the adjoining external paved yard discharges to the Finnow River, which is part of the Blackwater River (Cork/Waterford) SAC. The proposed change will not result in any new processes or raw material usage, there will be no changes to the existing main emissions from facility and it will not give rise to any new direct or indirect emission to air, surface water or ground. There will be no change to the authorised operational hours.

### **4.3 Assessment of Effects**

The assessment of the effects was based on the source- pathway- and receptor (S-P-R) model. The source, is the location where an effect can arise i.e. emissions to air from the standby generator. The pathway is the means by which the effect can travel through the environment e.g. atmosphere, surface water and groundwater. The receptors are the Natura 2000 Sites.

The only potential pathway that exists between the emissions from the generator and a Natura 2000 site is the atmosphere. ALPS commissioned Odour Monitoring Ireland Ltd (OMI) to carry out air dispersion numerical modelling of the operation of the generator in accordance with the Demand Side Management Agreement.

The generator will operate up to a maximum of 500 hours per year. However for modelling purposes it was assumed that the generator will operate for 1095 hours per year, which is a worst-case analysis. The modelling was based on a stack height of 16.5m and included the cumulative assessment of the emissions from the authorised emission points.

The modelling confirmed that in the worst case scenario the operation of the generator in conjunction with the other authorised main emission points will not breach the statutory air quality regulations and that all predicted ground level concentrations at sensitive receptor locations will be well in compliance with the relevant air quality limit values.

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## **5. SCREENING CONCLUSION & STATEMENT**

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### **5.1 Conclusion**

The proposed change will not have any direct effects on a Natura 2002 Site. The atmosphere is a potential pathway between the standby generator and the Blackwater SAC; however air dispersion modelling has confirmed that operating the generator in accordance with a Demand Side Agreement will not result in any breach of any specified air quality limit.

### **5.2 Statement**

The proposed development does not present a risk of significant effects on the Qualifying Interests and Conservation Objectives of the Blackwater SAC.

**APPENDIX 1**



**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\*
- [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 Almond-leaved 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 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, it does have the potential to develop into a Yew dominated stand in the long term and the site should continue to be monitored.

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 Water-dropwort, 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 buckler-ferns *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 hederæ*), 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 Horse-chestnut (*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 europæa*) 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 Marsh-orchid (*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 furoid 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 Sea-spurrey (*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 Foxbole 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, 2015, 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*), Twaites 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 White-fronted 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 areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

**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 south-west 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 Muckross 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*), Six-stamened 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 Moor-grass (*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 Whitflowgrass (*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 arcyriionema*, *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 killarnensis*). 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: 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)*
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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. The presence of some uncommon plant species adds further to the interest of the site.

**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
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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*, *Isoetium 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: Old Domestic Building, Curraglass Wood SAC**

**Site Code: 002041**

This site consists of a small, two-roomed, stone dwelling situated in Rossacrue Wood, approximately 6 km north of Kilgarvan, Co. Kerry. It is used as a nursery site by a colony of 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 ( <i>Rhinolophus hipposideros</i> )
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The building is derelict and the bats gain access through an opening over a doorway at the rear and also through a window leading to a small loft. The bats hang from the roof timbers in the loft.

The surrounding woodland provides suitable foraging habitat within a small radius of the day roost site. This is of great 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, which makes this a site of international importance. 143 bats were recorded here in August 1999.

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

## SITE SYNOPSIS

**SITE NAME: MULLAGHANISH TO MUSHERAMORE MOUNTAINS SPA**

**SITE CODE: 004162**

The Mullaghanish to Musheramore Mountains SPA comprises a substantial part of the Boggeragh/Derrynasaggart Mountains in Co. Cork. 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 (Musherabeg) 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 tree species present 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 mostly rough grassland that is used for hill farming. This varies in composition and includes some wet areas with rushes (*Juncus* spp.) and some areas subject to scrub encroachment.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier.

This site is a stronghold for Hen Harrier. A survey in 2005 recorded 5 pairs, which represents over 2% of the all-Ireland 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 on Annex I of the E.U. 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. The population size is not well known but is likely to be one or two pairs.

The site is of ornithological importance because it provides excellent nesting and foraging habitat for breeding Hen Harrier. The presence of two species, Hen Harrier, and Merlin, which are listed on Annex I of the E.U. Birds Directive is of note.

25.1.2012

## SITE SYNOPSIS

**SITE NAME: STACK'S TO MULLAGHAREIRK MOUNTAINS, WEST LIMERICK HILLS AND MOUNT EAGLE SPA**

**SITE CODE: 004161**

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is a very large site centred on the borders between the counties of Cork, Kerry and Limerick. The site is skirted by the towns of Newcastle West, Ballydesmond, Castleisland, Tralee and Abbeyfeale. The mountain peaks included in the site are not notably high or indeed pronounced, the highest being at Knockfeha (451 m). Other mountains included are Mount Eagle, Knockanefune, Garraunbaun, Taur, Rock Hill, Knockacummer, Mullaghmuish, Knight's Mt, Ballincollig Hill, Beennageeha Mt, Sugar Hill, Knockanimpuba and Knockathea, amongst others. Many rivers rise within the site, notably the Blackwater, Owentaraglin, Owenkeal, Glenlara, Feale, Clydagh, Allaghaun, Allow, Oolagh, Galey and Smerlagh.

The site consists of a variety of upland habitats, though almost half is afforested. The coniferous forests include first and second rotation plantations, with both pre-thicket and post-thicket stands present. Substantial areas of clear-fell are also present at any one time. The principal tree species present are Sitka Spruce (*Picea sitchensis*) and Lodgepole Pine (*Pinus contorta*). A substantial part (28%) of the site is unplanted blanket bog and heath, with both wet and dry heath present. The vegetation of these habitats is characterised by such species as Ling Heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Common Cottongrass (*Eriophorum angustifolium*), Hare's-tail Cottongrass (*Eriophorum vaginatum*), Deergrass (*Scirpus cespitosus*) and Purple Moor-grass (*Molinia caerulea*). The remainder of the site is mostly rough grassland that is used for hill farming. This varies in composition and includes some wet areas with rushes (*Juncus* spp.) and some areas subject to scrub encroachment.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier.

This SPA is a stronghold for Hen Harrier and supports the largest concentration of the species in the country. A survey in 2005 recorded 45 pairs, which represents over 20% of the all-Ireland total. A similar number of pairs 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 on Annex I of the E.U. 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.

Short-eared Owl, a very rare species in Ireland, has been known to breed within the site. Nesting certainly occurred in the late 1970s and birds have been recorded intermittently since. The owls are considered to favour this site due to the presence of Bank Voles, a favoured prey item. Merlin also breed within the site but the size of the population is not known. Red Grouse is found on some of the unplanted areas of bog and heath – this is a species that has declined in Ireland and is now Red-listed.

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is of ornithological importance because it provides excellent nesting and foraging habitat for breeding Hen Harrier and is one the top sites in the country for the species. The presence of three species, Hen Harrier, Merlin and Short-eared Owl, which are listed on Annex I of the E.U. Birds Directive is of note.

**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 south-west 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 Muckross 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*), Six-stamened 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 Moor-grass (*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 Whitflowgrass (*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 arcyriionema*, *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 killarnensis*). 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: 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)*
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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. The presence of some uncommon plant species adds further to the interest of the site.

## SITE SYNOPSIS

**SITE NAME: MULLAGHANISH TO MUSHERAMORE MOUNTAINS SPA**

**SITE CODE: 004162**

The Mullaghanish to Musheramore Mountains SPA comprises a substantial part of the Boggeragh/Derrynasaggart Mountains in Co. Cork. 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 (Musherabeg) 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 tree species present 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 mostly rough grassland that is used for hill farming. This varies in composition and includes some wet areas with rushes (*Juncus* spp.) and some areas subject to scrub encroachment.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier.

This site is a stronghold for Hen Harrier. A survey in 2005 recorded 5 pairs, which represents over 2% of the all-Ireland 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 on Annex I of the E.U. 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. The population size is not well known but is likely to be one or two pairs.

The site is of ornithological importance because it provides excellent nesting and foraging habitat for breeding Hen Harrier. The presence of two species, Hen Harrier, and Merlin, which are listed on Annex I of the E.U. Birds Directive is of note.

25.1.2012

**Site Name: Old Domestic Building, Curraglass Wood SAC**

**Site Code: 002041**

This site consists of a small, two-roomed, stone dwelling situated in Rossacruie Wood, approximately 6 km north of Kilgarvan, Co. Kerry. It is used as a nursery site by a colony of 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 ( <i>Rhinolophus hipposideros</i> )
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The building is derelict and the bats gain access through an opening over a doorway at the rear and also through a window leading to a small loft. The bats hang from the roof timbers in the loft.

The surrounding woodland provides suitable foraging habitat within a small radius of the day roost site. This is of great 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, which makes this a site of international importance. 143 bats were recorded here in August 1999.

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



**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\*
- [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 Almond-leaved 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 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, it does have the potential to develop into a Yew dominated stand in the long term and the site should continue to be monitored.

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 Water-dropwort, 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 buckler-ferns *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 hederæ*), 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 Horse-chestnut (*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 europæa*) 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 Marsh-orchid (*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 furoid 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 Sea-spurrey (*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 Foxbole above Youghal, at Blackbog, along the Tourig and Kinsalebeg esturaies.

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, 2015, 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*), Twaites 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 White-fronted 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 areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.



**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
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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 SYNOPSIS

**SITE NAME: STACK'S TO MULLAGHAREIRK MOUNTAINS, WEST LIMERICK HILLS AND MOUNT EAGLE SPA**

**SITE CODE: 004161**

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is a very large site centred on the borders between the counties of Cork, Kerry and Limerick. The site is skirted by the towns of Newcastle West, Ballydesmond, Castleisland, Tralee and Abbeyfeale. The mountain peaks included in the site are not notably high or indeed pronounced, the highest being at Knockfeha (451 m). Other mountains included are Mount Eagle, Knockanefune, Garraunbaun, Taur, Rock Hill, Knockacummer, Mullaghmuish, Knight's Mt, Ballincollig Hill, Beennageeha Mt, Sugar Hill, Knockanimpuba and Knockathea, amongst others. Many rivers rise within the site, notably the Blackwater, Owentaraglin, Owenkeal, Glenlara, Feale, Clydagh, Allaghaun, Allow, Oolagh, Galey and Smerlagh.

The site consists of a variety of upland habitats, though almost half is afforested. The coniferous forests include first and second rotation plantations, with both pre-thicket and post-thicket stands present. Substantial areas of clear-fell are also present at any one time. The principal tree species present are Sitka Spruce (*Picea sitchensis*) and Lodgepole Pine (*Pinus contorta*). A substantial part (28%) of the site is unplanted blanket bog and heath, with both wet and dry heath present. The vegetation of these habitats is characterised by such species as Ling Heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Common Cottongrass (*Eriophorum angustifolium*), Hare's-tail Cottongrass (*Eriophorum vaginatum*), Deergrass (*Scirpus cespitosus*) and Purple Moor-grass (*Molinia caerulea*). The remainder of the site is mostly rough grassland that is used for hill farming. This varies in composition and includes some wet areas with rushes (*Juncus* spp.) and some areas subject to scrub encroachment.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier.

This SPA is a stronghold for Hen Harrier and supports the largest concentration of the species in the country. A survey in 2005 recorded 45 pairs, which represents over 20% of the all-Ireland total. A similar number of pairs 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 on Annex I of the E.U. 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.

Short-eared Owl, a very rare species in Ireland, has been known to breed within the site. Nesting certainly occurred in the late 1970s and birds have been recorded intermittently since. The owls are considered to favour this site due to the presence of Bank Voles, a favoured prey item. Merlin also breed within the site but the size of the population is not known. Red Grouse is found on some of the unplanted areas of bog and heath – this is a species that has declined in Ireland and is now Red-listed.

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is of ornithological importance because it provides excellent nesting and foraging habitat for breeding Hen Harrier and is one the top sites in the country for the species. The presence of three species, Hen Harrier, Merlin and Short-eared Owl, which are listed on Annex I of the E.U. Birds Directive is of note.