

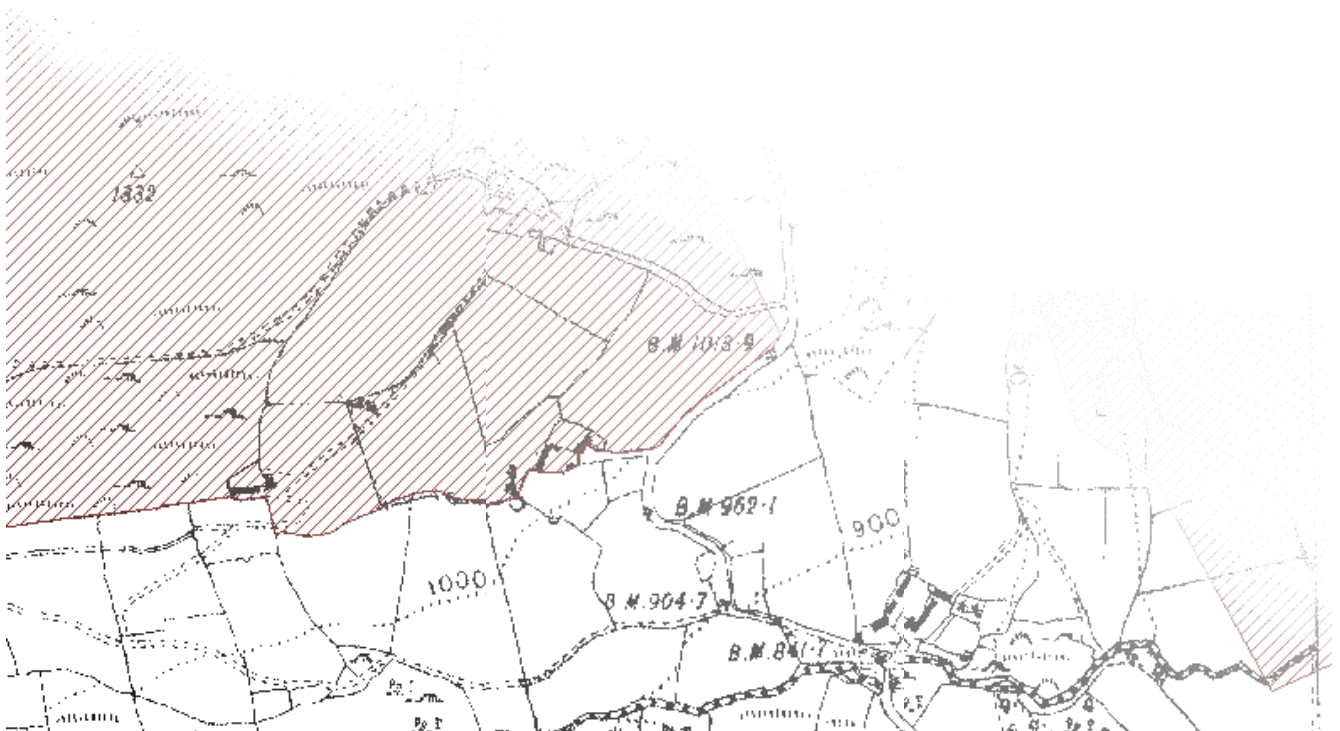


# National Parks and Wildlife Service Conservation Plan for 2005-2010



## Barrigone cSAC

Site Code 432  
Co Limerick





# SUMMARY

## Introduction

Barrigone cSAC has been designated as a candidate Special Area of Conservation under the EU Habitats Directive. Barrigone was selected as a cSAC due to the presence of three habitats listed in Annex I of the EU Habitats Directive. Two of these are priority habitats: Limestone pavement and semi-natural dry grasslands and scrub facies on calcareous substrates (*Festuco-Brometalia*) (important orchid sites). The third Annex I habitat is *Juniperus communis* formations on heaths or calcareous grassland. The site was also designated to protect a significant population a species listed in Annex II of the Habitats Directive, namely Marsh Fritillary.

## Description of Barrigone cSAC

Barrigone cSAC is a low-lying grassland site located approximately 5km west of Askeaton, Co. Limerick, comprising several fields with limestone outcrops. The site is bordered by the N69 to the north, and slopes gently from a maximum height of 54m towards the Shannon estuary in the north.

In addition to the Annex I habitats and Annex II species, the cSAC supports areas of Hazel, Hawthorn and Blackthorn scrub and improved grassland. Barrigone is notable for the diverse range of plants and habitats present within a relatively small area.

The semi- natural dry grasslands and scrub facies on calcareous substrates (*Festuca-Brometalia*) (important orchid sites) habitat present on the site is a very fine example of its type. It covers nearly 23ha of the site, which is c. 0.5% of the national total for this habitat. It is noted for its rich and diverse flora, including an excellent array of orchids and Hairy Violet, which is a protected species and is also listed in the Irish Red Data Book.

The limestone pavement does not have the clint and gryke form typical of such areas, but occurs as limestone outcrops with associated orchid-rich calcareous grassland. The substrate, bedrock, microclimate and maritime influence contribute to the specific and substantial range of plants it shares with the orchid-rich calcareous grassland, including Sea Plantain. It is a small and isolated example of this habitat – there are no other similarly protected \*limestone pavement sites in Co. Limerick.

The Annex I habitat *Juniperus communis* formations on heaths or calcareous grasslands occurs in association with the orchid-rich calcareous grassland and limestone pavement, particularly in the north of the site. It is a good example of the habitat but limited in extent. Together with notable botanical interest, it supports a diverse range of invertebrates including Marsh Fritillary.

Barrigone cSAC is an important invertebrate site. It supports an estimated 2-15% of the national population of Marsh Fritillary. Barrigone now represents the most southerly outpost for this species in Ireland. The site supports ten of Ireland's twenty ant species, plus two rare bumblebees.

Badger and Irish Hare, which are listed as Internationally Important in the Irish Red Data Book, occur on the site.

The principal land use on Barrigone cSAC is cattle grazing during autumn/winter. On some areas of the site, supplementary feeding and fertiliser applications may occur.

## Main conservation objectives

- To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status; namely limestone pavement (20% of site), semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*) (31%) and *Juniperus communis* formations on heaths or calcareous grasslands (9%)
- To maintain the Annex II species for which the cSAC has been selected at favourable conservation status, Marsh Fritillary (2-15% national population), as well as the protected plant, Hairy Vetch
- To maintain other habitats at favourable conservation status, namely scrub (34%), improved grassland (5%), old walls (<1%) and roads (<1%)
- To establish effective liaison and co-operation with landowners, legal users and relevant authorities

## Main management issues

- Access to site
- Grazing
- Quarrying
- Scrub encroachment

## Main strategies to achieve objectives

- Establish and maintain sustainable grazing levels via REPS farm plans to maintain notable habitats and species. Discontinue supplementary feeding across the site
- Reduce scrub cover on limestone pavement and orchid-rich calcareous grassland where necessary by hand cutting and grubbing out roots. Juniper and Hazel will not be removed
- Survey the plant and marsh fritillary populations on the site
- Prevent damaging operations occurring on site, including fertiliser application and land reclamation

# TABLE OF CONTENTS

Summary .....	1
Table of Contents .....	3
Reader's Guide .....	5
Introduction .....	6
Legal Background for Conservation Plans.....	6
Implications of Site Designation for Landowners and other Site Users .....	8
Site Description .....	9
Location Including Site Boundaries.....	9
Legal Status .....	9
Government Departments and Agencies.....	10
Physical Features.....	11
Biological Features.....	11
Land Use .....	14
Conservation Value of Barrigone cSAC .....	16
Management Framework.....	17
Conservation Objectives .....	17
Management Issues .....	18
General Strategies .....	19
Specific Strategies.....	20
Zoning.....	22
Summary of Specific Strategies .....	23

# APPENDICES

Appendix I:	Glossary .....	24
Appendix II:	Reference Material .....	30
Appendix III:	Climate .....	32
Appendix IV:	Detailed Information on Flora and Fauna .....	33
Appendix V:	Notifiable Actions .....	38
Appendix VI:	Compensation and Appeals Procedures .....	47
Appendix VII:	National Parks and Wildlife Service Management Staff .....	49

# MAPS

Map 1 Location and Boundary Map (Version 1.01)

Map 2 Ownership Map

Map 3 Indicative Habitat Map

Map 4 Management Zoning Map

# READER'S GUIDE

The National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government (DEHLG) has produced this plan to provide ecological information about the site and to outline the main objectives for the conservation of the special features of the site. The purpose of this draft is to provide stakeholders the opportunity to input into the development of the plan.

The **Introduction** section outlines the **policy background** to the site's designation and the relevant legislation.

The **Site Description** section contains **general information** on the site's boundaries and ownership and on the statutory bodies with responsibility for its conservation. It also contains sections on the **physical aspects** of the site such as the geology and hydrology as well as the **biological features**, in particular, the habitats and species found there. **Land use** and cultural features are also described.

The **Conservation Value** section assesses the main ecological attributes of the site.

The **Management Framework** section outlines the management necessary for the conservation of the site. It starts with a set of specific **conservation objectives**. These are followed by the main **management issues** that may impact on the conservation of the site and the **strategies** that are proposed to achieve the conservation objectives. In the final section, the site is divided into management **zones** to indicate where each strategy applies.

The appendices include a **glossary** where scientific and technical terms are explained, **reference material** consulted in the preparation of the plan and a list of **notifiable actions** relevant to each habitat within the site.

By preparing, implementing and reviewing this plan on a five-year basis, DEHLG aims to achieve the objectives of the EU Habitats Directive in relation to this site.

# INTRODUCTION

## Legal Background for Conservation Plans

The legal basis for selection and designation of **Special Areas of Conservation** (SACs) is the **EU Habitats Directive**, which was adopted in 1992. Focusing on the conservation of natural and semi-natural habitats and species of flora and fauna, the Habitats Directive seeks to establish “Natura 2000”, a network of protected areas throughout the European Community. The Habitats Directive includes a list of habitats that require SAC designation and specific conservation measures. This list is known as Annex I and the habitats are referred to as Annex I habitats. On this list, habitats that require special attention because they are in danger of disappearance, are termed ‘priority habitats’. A second list, Annex II in the Habitats Directive comprises species that must be afforded special protection.

In Ireland, the habitats and species that must be afforded protection under the Habitats Directive include:

- 16 Annex I priority habitats that require particular attention – including raised bogs, active blanket bogs, turloughs and machair,
- 45 other Annex I habitats – such as certain types of heaths, lakes and woodlands,
- 25 Annex II species – including Otter, Freshwater Pearl Mussel and Killarney Fern.

It is the responsibility of each member state to designate SACs to protect the Annex I habitats and Annex II species. These sites, together with the **Special Protection Areas** (SPAs) designated under the **EU Birds Directive** (1979), form the European “Natura 2000” network.

The Birds Directive contains annexes, which are lists of birds that require particular conservation measures (Annex I), and also species that may be hunted, and species that may be sold. There are 28 Annex I species regularly occurring in Ireland including Whooper Swan, Greenland White-fronted Goose, Peregrine Falcon, Corncrake and Terns. Member states are also required to protect sites that are important for migratory species such as ducks, geese and waders.

The Habitats Directive was transposed into Irish law through the **European Communities (Natural Habitats) Regulations 1997**. The **Wildlife Act 1976** is the main statute governing the protection of wildlife in Ireland and was amended in 2000 to take account of European law, particularly the Habitats and Birds Directives. The **Wildlife (Amendment) Act 2000** also makes legal provision for the designation and protection of a national network of **Natural Heritage Areas** (NHAs). Over 1,100 proposed NHAs were published in 1995 and almost 400 of these are also selected as candidate SACs.



The European Communities (Natural Habitats) Regulations 1997 include the following points:

The Minister for the Environment, Heritage and Local Government must transmit a candidate list of sites to the European Commission for consideration.

Following adoption of this list by the Commission, the Minister will formally designate the sites as SACs.

Sites are legally protected once they are publicly advertised.

Landowners and other users with a legal entitlement should be notified of designation, and the Minister must make all reasonable efforts to do so. Notification also includes a list of activities that may alter, damage, destroy or interfere with the integrity of the site. A person who illegally damages a site may be prosecuted or required to repair damage.

Landowners and other users with a legal entitlement may appeal the designation of lands on scientific grounds.

Landowners and other users with a legal entitlement will be compensated for actual loss of income arising from restrictions imposed as a result of designation.

DEHLG is the government department with responsibility for the designation and protection of wildlife habitats, species and areas of conservation interest. As part of their responsibility in relation to biodiversity and wildlife under the Wildlife Acts (1976 and 2000), the Minister's brief extends far beyond the habitats and species listed in the annexes of the Habitats and Birds Directives. For this reason, cSAC conservation plans may deal with species that are not mentioned in these annexes.

## Reasons for Designation of Barrigone cSAC

HABITATS LISTED IN ANNEX I OF THE EU HABITATS DIRECTIVE	CONSERVATION VALUE
<ul style="list-style-type: none"> <li><b>*Semi-natural dry grasslands and scrub facies on calcareous substrates (<i>Festuco-Brometalia</i>) (*important orchid sites)</b> (EU Habitat Code 6210)</li> </ul>	Barrigone represents a fine example of this habitat and is noted for its diverse flora, including eight species of orchid and the protected Hairy Violet.
<ul style="list-style-type: none"> <li><b>*Limestone pavement</b> (EU Habitat Code 8240)</li> </ul>	Limestone outcrops occur throughout the site and support a diverse flora. It is the only protected limestone pavement in Co. Limerick.
<ul style="list-style-type: none"> <li><b><i>Juniperus communis</i> formations on heaths or calcareous grassland</b> (EU Habitat Code 5130)</li> </ul>	An important area of Juniper ( <i>Juniperus communis</i> ) scrub occurs on limestone in the north of the site.

\* indicates priority habitat as listed in Annex I of the Habitats Directive

SPECIES LISTED IN ANNEX II OF THE EU HABITATS DIRECTIVE	CONSERVATION VALUE
<ul style="list-style-type: none"> <li><b>Marsh Fritillary</b> (<i>Euphydryas aurinia</i>)</li> </ul>	Barrigone supports a considerable proportion of the national population of this scarce species.

## Implications of Site Designation for Landowners and other Site Users

In most areas designated as cSACs, current practices will not have to change significantly.

In cases where users with a legal entitlement are required to change practices or restrict activities to protect the wildlife interest of the site, compensation will be payable based on actual loss of income.

If a user with a legal entitlement wishes to carry out certain activities, not covered by licence or consent from another statutory body, within the designated area, they must consult with, and get consent from, the Minister for the Environment, Heritage and Local Government. These activities are listed as “Notifiable Actions” for each habitat (see Appendix V).

The designation of the site can be appealed by landowners and legal users on scientific grounds. Details of the appeals procedure are also given in Appendix VI.

# SITE DESCRIPTION

## Location Including Site Boundaries

The site is situated approximately 5km west of Askeaton, Co. Limerick, just south of the N69 (see Map 1).

**Grid Ref.:** R 29 50

**Latitude:** N 52°36'

**Longitude:** W 19°02'

**Area:** 73 ha

**Altitude Range:** 15 m to 54 m

**Townlands:** Glenbane East, Hazelfield, Morgans South and Mulderricksfield

### Site Boundaries

The site is bordered to the north and north-west by roads. The remaining boundaries are defined by existing field boundaries, and by a quarry that has been excluded from the centre of the site (see Map 1).

### Site Infrastructure

Two tracks run across the site from the main N69 road, one to the quarry and one to a farmhouse off-site. There are no buildings within the cSAC.

## Legal Status

### Ownership

Roadstone plc own approximately one third of the site. The remainder is in multiple private ownership (see Map 2).

## Designations of the Site

<b>candidate Special Area of Conservation</b>	Sitecode IE0000432	Published on 1 <sup>st</sup> March 1997.
<b>proposed Natural Heritage Area</b>	Sitecode 432	Unpublished

## Past Status and Designation of the Site

The site was first surveyed in 1971 and included on the list of Areas of Scientific Interest (ASI).

## Government Departments and Agencies

<b>Department of the Environment, Heritage and Local Government (DEHLG)</b>	DEHLG is the government department with responsibility for the protection and conservation of Ireland's natural heritage.
<b>National Parks &amp; Wildlife Service (NPWS)</b>	NPWS is the section of the DEHLG responsible for maintaining the nature conservation value of the site. Periodic inspection of the site is carried out by the local Conservation Ranger.  Regional staff also participate in research and survey projects by collecting data on the site, provide advice to planning authorities on the impacts of development applications and provide an education and advisory service to the public (see Appendix VII) for further details of NPWS regional staff.
<b>Limerick County Council</b>	Limerick County Council is the planning authority for the site. As such they are obliged to ensure appropriate assessment of the implications of developments requiring planning permission that may have an impact, either individually or in combination with other developments on the designated area.
<b>Environmental Protection Agency (EPA)</b>	The EPA is an independent state sponsored body with a wide range of statutory duties including monitoring environmental quality and overseeing the performance by local authorities of their statutory environmental protection functions.

## Local Authority Policy in relation to the Site

Limerick County Council have prepared a draft County Development Plan for 2005-2011, which will be adopted before the 4<sup>th</sup> April 2005. The plan states that it is the policy of Council to:

*“ensure the sustainable management and conservation of areas of natural environmental and geological value within the county”;*

*“endeavour to protect species, whether plant, animal or bird, and sites which have been designated as being of conservation interest by the Parks and Wildlife Service of the DoEHLG. These sites include Natural Heritage Areas, Special Areas of Conservation and Special Protection Areas” and*

*“seek to protect plant, animal and bird species which have been identified by the Habitats Directive, Birds Directive, Wildlife Act and the Flora Protection Order in line with national legislation”.*

# Physical Features

## Climate

The closest synoptic meteorological station to Barrigone is at Shannon Airport. This region receives an average of 927mm rainfall per annum. The annual mean daily air temperature is 10.1°C and the area receives approximately 1270 hours of bright sunshine on average annually. More detailed climate data is included in Appendix III. The site is exposed to maritime influences from the Shannon estuary to the north.

## Geology & Geomorphology

The underlying geology is comprised of Carboniferous limestone; principally massive unbedded lime-mudstone of the Waulsortian series (Whitow 1974, Sleeman & Pracht 1999). Throughout the site, outcrops of limestone, showing all the signs of weathering and erosion, are visible. However, these outcrops do not form a pavement in the usual sense, as it lacks the typical clint and gryke features. The limestone bedrock is very close to the surface across the site.

The site slopes gently from a maximum height of 54 metres in the south of the site towards the Shannon Estuary to the north.

## Soils & Soil Processes

Where limestone does not reach the surface, it is covered by a thin layer of calcareous soil.

# Biological Features

## Habitats and Vegetation

**Note:** Throughout the conservation plan, habitats are named and described under two different systems: the Annex I habitats are as listed in the EU Habitats Interpretation Manual Version 15/2(1999), while all other habitats are as listed according to the NPWS NHA classification system.

The following table lists the habitats within the site. The Annex I habitats of the Habitats Directive for which the site was selected are listed, with the relevant NHA habitats category also shown. Annex I priority habitats are marked with an asterisk (\*). The Indicative Habitat map for the site is presented in Map 3. The percentage area presented for each habitat type is based on the approximate geographic area of each habitat, as shown in Map 3.

**Habitats Found within Barrigone cSAC**

ANNEX I HABITAT TYPE	HABITAT CATEGORY	% AREA
*Limestone pavement (EU Code 8240)	Limestone pavement	20%
*Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> ) (*important orchid sites) (EU Code 6210)	Lowland dry grassland (not improved)	31%
<i>Juniperus communis</i> formations on heaths or calcareous grasslands (EU Code 5130)	Scrub /Heath	9%
-	Scrub	34%
-	Improved grassland	5%
-	Old walls	<1%
-	Roads	<1%

## Annex I Habitats:

### **\*Limestone Pavement** (20% of total site area or 14.6ha)

Limestone outcrops occur throughout the site in close association with \*orchid-rich calcareous grassland (below). The \*limestone pavement is more extensive towards the north of the site and Juniper (*Juniperus communis*) is well established here. The protected Red Data Book species Hairy Violet (*Viola hirta*), Burnet Rose (*Rosa pimpinellifolia*) and Carlina Thistle (*Carlina vulgaris*) are found on \*limestone pavement throughout the site. Variation in substrate, bedrock and microclimate contribute to the diversity of plant species, with a maritime influence being notable in species such as Sea Plantain (*Plantago maritima*).

### **\*Semi-natural dry grasslands on scrubland facies on calcareous substrates** (31% of total site area or 22.6ha)

This habitat is best represented in the west of the site where it forms in soil pockets within the \*limestone pavement. The habitat contains many characteristic calcicole species, including Salad Burnet (*Sanguisorba minor*), the eyebrights (*Euphrasia salisburgenensis* and *E. rostkoviana*) and Kidney Vetch (*Anthyllis vulneraria*), as well as eight species of orchid, including the scarce Dense-flowered Orchid (*Neotinea maculata*). Hairy Violet is also present in this habitat. These grasslands also support a large number of ant colonies (*Lasius flavus*) and anthills covered in Thyme (*Thymus praecox*) are dotted throughout the site.

### ***Juniperus communis* formations on heaths or calcareous grasslands** (9% of total site area or 6.6ha)

In the north of the site, there is an area where Juniper is the dominant species. It grows on and over the \*limestone pavement. Other species present here include Burnet Rose, Carlina Thistle, orchids and Columbine (*Aquilegia vulgaris*). Some Gorse (*Ulex europaea*) is also present.

## Other Habitats:

### **Scrub**

There is considerable variation in this habitat across the site. In addition to the Juniper scrub (see above), Hazel (*Corylus avellana*) forms a dense stand to the south of the site. Blackthorn (*Prunus spinosa*) and Hawthorn (*Crataegus monogyna*) are most important in the west of the site; elsewhere Gorse predominates. This habitat grades into \*orchid-rich calcareous grassland with isolated shrubs. It is not particularly species-rich.

### **Improved grassland**

Two small areas of improved grassland are included in the site adjacent to the \*orchid-rich calcareous grassland. They are of low conservation importance and support some Hawthorn and Gorse scrub.

### **Old Walls**

Most of the field boundaries are stone walls, but many of them are overgrown by scrub, particularly Hawthorn. In other places the walls have been breached to allow for cattle movement and some walls have been completely removed. The wall that runs along the western side of the southern portion of the site is well constructed, largely intact and is the best remaining example of a stone wall in the site. These stone walls provide habitats for many invertebrates and can be important refuges and transport corridors for small mammals (e.g. Stoat (*Mustela erminea*)). Some stretches are also well endowed with lichens.

### **Roads**

Roadstone plc have developed a rough, gravel roadway from the N69 to the north of the site into the quarry area. A new track connects a farm (off-site) to the N69.

## Notable Flora:

### Lower Plants

The NHA survey (1994) noted that where rock outcrops are associated with earthen hummocks, they are rich in bryophytes. Lichens are a feature throughout the site. Neither of these groups has been fully investigated, but Appendix IV lists those already identified. Additionally, giant puffball fungi (*Lycoperda* sp.) have been recorded from the site.

### Higher Plants

Over 130 vascular plant species have been recorded from the site (see Appendix IV). These include the vulnerable Red Data Book species Hairy Violet (Curtis & McGough 1988), which is protected under the Flora (Protection) Order 1999. In addition, many notable calcicolous species occur, including: Juniper, Burnet Rose, Field Rose (*Rosa arvensis*), Stone Bramble (*Rubus saxatilis*), Carlina Thistle, Dense-flowered Orchid, Pyramidal Orchid (*Anacamptis pyramidalis*), Heath Spotted Orchid (*Dactylorhiza maculata*), Common Spotted Orchid (*Dactylorhiza fuchsii*), Lesser Butterfly Orchid (*Platanthera bifolia*), Early Purple Orchid (*Orchis mascula*), Frog Orchid (*Coeloglossum viride*), Fragrant Orchid (*Gymnadenia conopsea*), Cowslip (*Primula veris*), Columbine, Yellow-wort (*Blackstonia perfoliata*), two eyebrights, a gentian (*Gentianella amarella*), Madger (*Rubia peregrina*), Salad Burnet and Dodder (*Cuscuta epithymum*).

## Fauna:

The species list supplied below is derived from the Natura 2000 form, the NHA site card, Dr Ferdia Marnell's field visits, the local NPWS staff, Dr John Breen (University of Limerick) and Dr Ken Bond (University College Cork).

### Invertebrates

A large population of the Annex II species Marsh Fritillary (*Euphydryas aurinia*) was recorded by Lavery (1993), possibly comprising between 2-15% of the national population. Its food plant, Devil's Bit Scabious (*Succisa pratensis*) is frequent across the site. However, no more recent records are available for the site, making a current estimate of population size impossible.

*Marsh Fritillary on Heath  
Spotted Orchid*





Other Lepidoptera identified include Common Blue (*Polyommatus icarus*), Small Tortoiseshell (*Aglais urticae*), Meadow Brown (*Maniola jurtina*) and Peacock (*Inachis io*) butterflies and the Burnet Moth (*Zygaena* sp.). Over one hundred moth species have been recorded from the site – these are listed in Appendix IV.

The grassland areas of the site are dotted with anthills (*Lasius flavus*). Ten of Ireland's twenty species of ants have been recorded from this site, including the tiny *Leptothorax aservorum*, as have two rare bumblebee species, *Bombus distinguendus* and *B. sylvarum*.

## Birds

The EU Birds Directive Annex I species Peregrine Falcon (*Falco peregrinus*) hunts over the site. Other species using the site include Sparrowhawk (*Accipiter nisus*), Kestrel (*Falco tinnunculus*) and Meadow Pipit (*Anthus pratensis*).

## Mammals

Two Internationally Important Red Data Book species occur on the site, the Irish Hare (*Lepus timidus hibernicus*) and the Badger (*Meles meles*); both are listed in Annex III of the Bern Convention (Whilde 1993). Other species that occur on site include Fox (*Vulpes vulpes*), Stoat and Mink (*Mustela vison*).

# Land Use

## Land use on the site

### Agriculture

The site consists of three stock-proof areas in the north, north-east and south.

Extensive winter grazing of cattle is the only form of agriculture practiced to the north of the quarry, with 50-60 animals present from November until first week January (stock removed earlier if wet). Over much of the site this practice is the principal management and is probably important in controlling scrub encroachment. Following over-grazing damage around ring feeders, all supplementary feeding on site has been stopped in the northern part of the site (L. Lenihan, *pers comm*). In areas less favoured by cattle, scrub encroachment due to under-grazing is an issue.

The north-east section has changed owners recently and is currently unmanaged.

There is no current information available about the southern section of the site.

## Land use adjacent to the site

### Industry

The main land use adjacent to the site is quarrying. Roadstone plc have been extracting limestone from the Barrigone quarry for approximately twenty years and have plans to continue quarrying for a further thirty years. The quarry works dominate the immediate landscape and a large expanse of \*limestone pavement and \*orchid-rich calcareous grassland has been lost to this development. Roadstone owns the northern section of the cSAC, but have no plans to develop this area.



<b>Agriculture</b>	<p>Much of the land adjacent to the site is improved grassland. This is normally cut once, for silage, in early summer and may then be used for aftermath grazing by cattle.</p> <p>Burning of Gorse scrub may occur close to the site boundary at the southern end.</p>
<b>Roads</b>	The site is bounded to the north by the N69.
<b>Residential</b>	There are a few houses adjacent to the site.

## Past human use

A number of old field enclosures are evident on the six inch map and are still visible on the ground in the west of the site and in the area proposed for quarrying. These may represent areas of former cultivation, but there is no evidence of lazy beds and the soil appears to be thin in this area. It is likely, therefore, that the fields were formed to hold stock. Furthermore, the extensive network of anthills also suggests that these grasslands have not been ploughed or fertilised for hundreds of years (J. Breen, *pers. comm.*). Consequently, it would appear that this site has never been used for anything other than occasional grazing. In an area where intensive land use (including silage cutting and quarrying) is common, the importance of this unimproved grassland is highlighted.

The site has been regularly visited since the 1970's by local Botanical Society of the British Isles recorders.

## Recorded Monuments and Other Features

The National Monuments catalogue for Limerick shows two enclosures within the site (see below) and a further two enclosures just to the west of the site.

MONUMENT NO.	DESCRIPTION	NAT. GRID	TOWNLAND
LI010-093	Enclosure	R130150	Hazelfield
LI010-085	Enclosure	R129151	Glenbane East

# CONSERVATION VALUE OF BARRIGONE CSAC

Barrigone supports three habitats listed in Annex I of the EU Habitats Directive, including two priority habitats: \*Limestone Pavement and \*Semi-natural dry grasslands and scrub facies on calcareous substrates (*Festuca-Brometalia*) (\*important orchid sites), as well as *Juniperus communis* formations on heaths or calcareous grasslands. These habitats are notable for their high botanical diversity. The site also supports areas of Hazel, Hawthorn and Blackthorn scrub. The site is important for the large population of the Annex II species, Marsh Fritillary that it supports. In addition, the protected and vulnerable Red Data Book species, Hairy Violet, occurs on the site.

The \*semi- natural dry grasslands and scrub facies on calcareous substrates (*Festuca-Brometalia*) (\*important orchid sites) present on the site is an excellent example of this habitat. It covers nearly 23ha of the site (c. 0.5% of the national total for this habitat) and is noted for its rich and diverse flora, including an excellent array of orchids and the protected Hairy Violet. Threats to this habitat, and the others on site, include overgrazing, scrub encroachment due to under grazing and the adjacent quarry. This grassland is dependent on sensitive management for its continued existence.

The \*limestone pavement does not have the clint and gryke form typical of such areas, but occurs as limestone outcrops with associated \*orchid-rich calcareous grassland. The site has, however, satisfied the criteria in “Selection of a Provisional List of Special Areas of Conservation for Ireland. Appendix I”. The substrate, bedrock, microclimate and maritime influence contribute to a “specific and substantial” range of plants including Sea Plantain. It is a small and isolated example of this habitat – there are no other similarly protected \*limestone pavement sites in Limerick.

The Annex I habitat *Juniperus communis* formations on heaths or calcareous grasslands occurs in association with the \*orchid-rich calcareous grassland and \*limestone pavement, particularly in the north of the site. At 6.6ha, it is a good example of the habitat but limited in extent. Together with notable botanical interest, it supports a diverse range of invertebrates including Marsh Fritillary, making this area the most ecologically important on the site. Encroachment by Gorse could alter the species composition and affect invertebrate populations.

Barrigone has records of Marsh Fritillary (Lavery 1993), at that time it had one of the largest populations in Ireland, estimated at 2-15% national population. While the size of the national population is unknown, Barrigone now represents one of the most southerly outposts for this species (K. Bond, *pers comm*). It is notable that the species is found on unimproved calcareous grassland here – the majority of Irish colonies occur on unimproved acid grassland. The site holds sizeable areas of good quality habitat suitable for the species, but is threatened by over-grazing.

The site supports ten of Ireland’s twenty ant species, plus two rare bumblebees. The Internationally Important species Badger and Irish Hare occur on the site.

# MANAGEMENT FRAMEWORK

## Conservation Objectives

European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status areas designated as candidate Special Areas of Conservation. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

According to the EU Habitats Directive, favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, is stable or increasing, and
- the ecological factors that 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 as defined below.

The favourable conservation status of a species is achieved when:

- population data on the species concerned indicate that it is maintaining itself, and
- the natural range of the species is neither being reduced or 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.

- |                     |   |
|---------------------|---|
| <b>Objective 1:</b> | To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status; namely *limestone pavement (20% of site), *semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuca-Brometalia</i> ) (31%) and <i>Juniperus communis</i> formations on heaths or calcareous grasslands (9%). |
| <b>Objective 2:</b> | To maintain the Annex II species for which the cSAC has been selected at favourable conservation status, Marsh Fritillary (2-15% national population), as well as the protected plant, Hairy Vetch.   |
| <b>Objective 3:</b> | To maintain other habitats at favourable conservation status, namely scrub (34%), improved grassland (5%), old walls (<1%) and roads (<1%).   |
| <b>Objective 4:</b> | To establish effective liaison and co-operation with landowners, legal users and relevant authorities.  |

# Management Issues

While many activities in or adjacent to the site have the potential to cause deterioration/disturbance, it is important to determine the significance of such activities relative to the conservation objectives at a particular site. To that end, all known potential environmental effects of the sites principal activities (in alphabetical order) have been listed and the biological and chemical impacts that may cause change to the biological communities present have been described.

- **Access to site**
- **Grazing**
- **Quarrying**
- **Scrub encroachment**

## Access to site

The Conservation Ranger has been unable to monitor the whole site due to access difficulties.

## Grazing

The site depends on a fine balance of grazing to avoid both scrub encroachment and damage associated with overgrazing. The grazing regime in the northern section of the site is monitored by the Conservation Ranger and is not damaging the \*orchid-rich calcareous grassland. Overgrazing will reduce the species diversity of the site, particularly if grazing commences before the orchids can set seed, and may damage the anthills that are such a characteristic feature of the site.

## Quarrying

The neighbouring quarry has been excluded from the site but may impact indirectly in terms of dust deposition on site.

## Scrub encroachment

In places, Gorse and Blackthorn scrub grows densely and is avoided by grazing animals. Burning has been used on some areas previously to control its spread, but this may actually encourage the development of dense Gorse stands. Uncontrolled burning has implications for the conservation of the \*orchid-rich calcareous grassland and invertebrate populations and must be prevented. Alternative methods for scrub control include grazing, but where an area would be damaged by overgrazing if stocking levels were high enough to control scrub, then hand removal or grubbing up by digger must be considered.

## General Strategies

Specific strategies that relate to the above objectives are outlined below. However, there are a number of strategies that relate to the site as a whole. These are as follows:

### Implement plan

DEHLG will seek to ensure that the aims of this conservation plan are achieved through:

- liaison with the landowners, relevant authorities and interested parties.
- implementation of REPS or DEHLG farm plans, which will use this document as a guideline for prescribing management on a farm by farm basis, and also will ensure that the agreed prescriptions for the relevant habitats are adhered to
- enforcement of Regulations under the Habitats/Birds Directives and the Wildlife Acts.

### Establish a monitoring regime

The monitoring regime for the site will comprise:

**Scientific monitoring** Monitoring of the conservation status of the \*limestone pavement, \*orchid-rich calcareous grassland and *Juniperus communis* formations on heath or calcareous grassland and the population of Marsh Fritillary will be done by, or on behalf of, the staff of the Monitoring Section of the NPWS or staff working to NPWS in accordance with the procedures laid down by that section.

Protocols for monitoring Barrigone cSAC will be developed, in consultation with other agencies where appropriate, to determine if the site is being maintained at favourable conservation status.

**Site surveillance** Regular inspection of the site by the NPWS staff, with special attention to the \*limestone pavement, \*orchid-rich calcareous grassland and *Juniperus communis* formations on heath or calcareous grassland and the population of Marsh Fritillary will identify any major changes, damaging operations, or threats should they arise.

### Enforce notifiable actions

Certain activities may be restricted in SACs. Notifiable Actions for particular habitats and species are listed in Appendix V of this plan. Consent from the Minister may be required before these actions may be carried out within the designated area. For example, fertiliser/lime application, burning, rock removal, ploughing, supplementary feeding, re-seeding, infilling and other land reclamation activities are notifiable actions relevant to this site.

## Specific Strategies

### Objective 1.

To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status; namely \*limestone pavement (20% of site), \*semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*) (31%) and *Juniperus communis* formations on heaths or calcareous grasslands (9%).

### Strategies:

- |  |   |
|--|---|
| <b>1.1. Implement sustainable grazing regime</b>     | For non-commonage land, NPWS will seek to ensure that sustainable grazing levels are maintained/established and monitored via REPS and DEHLG farm plans. Grazing levels should be sufficient to control encroaching scrub. The use of supplementary feeding should be discontinued.   |
| <b>1.2. Control existing scrub</b>                   | Where grazing cannot be intensified in case of damage to the grassland, removal of existing scrub by hand cutting, or grubbing up with a digger will be necessary in limited areas to protect the open habitats on site. Scrub cover will be monitored using existing aerial photographs. Juniper and Hazel scrub will not be removed.<br><br>In the Juniper scrub, Gorse encroachment should be heavily restricted, using hand cutting or grubbing up where appropriate.<br><br>Bulldozing scrub is a Notifiable Action. |
| <b>1.3. Prevent agricultural improvement on site</b> | Fertiliser application, re-seeding, ploughing and other land reclamation activities are Notifiable Actions for this site, requiring permission from the Minister. NPWS will liaise with landowners and REPS planners to ensure that such damaging operations do not occur without authorisation.  |
| <b>1.4. Land Purchase</b>                            | Should any areas of the site become available on the open market, NPWS may seek to purchase such areas. The purchase of the entire site may not occur within the time period of this plan, but this will be an ongoing conservation strategy.   |
| <b>1.5. Commission site survey</b>                   | NPWS will seek to commission a full vegetation and species survey of the site. A survey would allow the re-mapping and re-assessment of habitats, particularly in regard to scrub encroachment.   |

### Objective 2.

To maintain the Annex II species for which the cSAC has been selected at favourable conservation status, Marsh Fritillary (2-15% national population), as well as the protected plant, Hairy Vetch.

### Strategies:

- |  |  |
|--|--|
| <b>2.1. Maintain habitats for Marsh Fritillary and other invertebrates</b> | Strategies described above that are designed to protect the site from overgrazing and other damaging activities aim to protect the habitats of notable invertebrate species, particularly Marsh Fritillary. The relevant list of notifiable actions should be consulted. |
|--|--|

**2.2. Maintain habitats for notable plant species**

Strategies described above that are designed to protect the site from overgrazing and other damaging activities aim to protect the habitats of notable plant species, particularly Hairy Violet.

### **Objective 3.**

**To maintain other habitats at favourable conservation status, namely scrub (34%), improved grassland (5%), old walls (<1%) and roads (<1%).**

#### **Strategies:**

**3.1. Maintain Hazel scrub**

Dense hazel scrub to the south of quarry does not require management and is not encroaching on open habitat. No intervention is required.

**3.2. Maintain stone walls**

The stone walls on site do not need active management. No stone wall should be breached or removed without consultation with NPWS.

**3.3. Manage scrub**

Scrub provides shelter and food for birds and small mammals. However, the site has been designated for the open habitats of \*limestone pavement and \*orchid-rich grassland and scrub encroaching into these areas will be removed. See Strategy 1.2.

**3.4. Manage improved grassland**

The areas of improved grassland should be managed by a grazing regime suitable for the adjacent areas of \*orchid-rich calcareous grassland. See Strategy 1.1.

### **Objective 4.**

**To establish effective liaison and co-operation with landowners, legal users and relevant authorities.**

#### **Strategies:**

**4.1. Liaise with interested parties**

NPWS will strive to initiate and maintain effective liaison with landowners, legal users (particularly through the Liaison Committee), relevant authorities and interested parties on achieving the objectives for conservation of the site.

**4.2. Liaise with REPS planners**

REPS planners should consult with local NPWS staff when they are developing plans for land within the site.

# Zoning

**Note:** Zoning is the division of a nature conservation site and neighbouring areas into a number of sub-units. Four types of zones are identified (not necessarily all occurring within a site): A, B and C are zone types within the site. D is a zone type outside the site where activities may have an impact on the site. The relevant strategies are listed for each site.

## Zone A: A Natural Zone

Areas of high conservation value, that require no or little management intervention.

### 1A: NON-INTERVENTION AREAS

#### 1A1: Hazel scrub, stone walls

Strategies 3.1-3.2 and the general monitoring strategies apply.

### 2A: MAINTENANCE AREAS WITH LIMITED MANAGEMENT INTERVENTION

#### \*2A1: \*Limestone pavement/\*orchid-rich calcareous grassland/juniper and other scrub mosaic on privately owned land

Strategies 1.1-1.5, 2.1-2.2, 3.3-3.4 and the general monitoring strategies apply.

## Zone C: Intensive use Zone

Intensively used areas/infrastructure, which form an integral part of a nature conservation site.

### C1: Access track

Any alterations to roads, tracks or built infrastructure within the site should not be made without prior consultation with NPWS.

## Zone D: Impact Zone

Areas outside the site where activities may have an impact on the site.

### D1: Quarry

While excluded from the site, sympathetic management of the quarry would greatly improve the long-term prospects of the site. Liaison with Roadstone plc will continue, and any effects of the quarry on the site (and boundaries) will be monitored.

The general monitoring strategies apply.



## Summary of Specific Strategies

**Note:** It is implicit with all the strategies presented that their implementation is dependent on availability of adequate resources in terms of staff, expertise and financial resources. Also, that cooperation with landowners and other key stakeholders is key to achieving the stated objectives.

	Strategy	Action required	Who to implement	When/Duration/Frequency	Estimated Total Cost	Additional Resources needed
1.1	Implement sustainable grazing regime	Establish/maintain sustainable grazing levels via REPS and DEHLG farm plans. Supplementary feeding should be stopped.	REPS planner			
1.2	Control existing scrub	Control scrub where necessary by hand cutting, or grubbing up with a digger. Monitor scrub encroachment using aerial photographs.	NPWS			
1.3	Prevent agricultural improvement on site	Liaise with landowners and REPS planners to ensure that damaging operations do not occur.	NPWS/ REPS planner			
1.4	Land Purchase	Should areas of the site become available, NPWS will seek to purchase them.	NPWS			
1.5	Commission site survey	Commission a full habitat and species survey of the site.	NPWS			
2.1	Maintain habitats for Marsh Fritillary and other invertebrates	Protect site from overgrazing and damaging activities (Strategies 1.1-1.3)	NPWS/ REPS planner			
2.2	Maintain habitats for notable plant species	Protect site from overgrazing and damaging activities (Strategies 1.1-1.3, 1.5).	NPWS/ REPS planner			
3.1	Maintain Hazel scrub	Dense Hazel scrub to the south of quarry does not require active management.	NPWS/REPS			
3.2	Maintain stone walls	Stone walls on site to be retained.	NPWS/REPS			
3.3	Manage scrub	See Strategy 1.2.	NPWS			
3.4	Manage improved grassland	See Strategy 1.1.	REPS planner			
4.1.	Liaise with interested parties	NPWS will initiate & maintain effective liaison with landowners, relevant authorities and interested parties on achieving the objectives for conservation of the site.	NPWS			
4.2.	Liaise with REPS planners	REPS planners are required to consult with NPWS staff when they are developing plans for land within the site.	NPWS			

# APPENDIX I:

## GLOSSARY

**ABIOTIC FACTORS** – Non-living factors such as geology and climate.

**ACIDIC** - When applied to soils, refers to soils which are of a low pH i.e. below 7. The term is often used in relation to the plant communities that an acid soil may support e.g. acidic grassland.

**ALKALINE** - When applied to soils it refers to soils of a calcareous nature and of a high pH, i.e. above 7. The term is often used to describe plant communities associated with such soils e.g. Alkaline Fens.

**ALTITUDE** - Vertical height above sea level.

**ANNEX I** - of the EU Birds Directive, lists birds that are strictly protected so that they cannot be killed, captured, disturbed or traded.

**ANNEX I** - of the EU Habitats Directive, lists habitats including priority habitats for which SACs have to be designated.

**ANNEX II** - of the EU Birds Directive lists birds which may be hunted.

**ANNEX II** - of the EU Habitats Directive is a list of species for which SACs have to be designated.

**ANNEX III** - of the EU Habitats Directive gives the criteria for selecting sites to be designated as SACs.

**ASIs** - Areas of Scientific Interest. Areas that were identified in the 1970s as being of conservation interest. The NHA designation developed from ASIs.

**ATYPICAL** - Not typical/uncommon.

**BERN CONVENTION** – Convention on the Conservation of European Wildlife and Natural Habitats. It obliges contracting States to protect a wide range of plant and animal species and their habitats through the formation of Biogenetic Reserves

**BIODIVERSITY** – A general term used to describe all aspects of biological diversity, including: the number of species present in a given environment; the genetic diversity present within a species; the number of different ecosystems present within a given environment.

**BIOTIC FACTORS** – The influence of living components of the environment on organisms.

**BIOTOPE** - An environmental region, defined by certain conditions characteristic organisms that typically inhabit it

**BIRDS DIRECTIVE** (Council Directive 79/ 409/ 2nd April 1979) - Under this Directive Ireland is required to conserve the habitats of two categories of wild birds: 1) Listed rare and vulnerable species and 2) Regularly occurring migratory species. The Directive also obliges Ireland to conserve wetlands, especially those of international importance and regulates the hunting and

trading of wildbirds. It was transposed into Irish legislation by the EU (Natural Habitats) Regulations, 1997.

**BRYOPHYTES** - A group of simple non-vascular spore-bearing green plants comprising the mosses, liverworts and hornworts.

**CALCAREOUS** - Made of or containing calcium carbonate (CaCO<sub>3</sub>) and therefore alkaline. limestone for example

**CALCICOLE** – Term describing a plant species that is adapted to growth on calcareous substrates.

**CHEMICAL WEATHERING** - The processes of weathering in which chemical reactions transform rocks and minerals into new chemical combinations that are stable under conditions prevailing at or near the Earth's surface.

**CLINTS** - Regular blocks of limestone pavement with loose flags separated by a network of vertical fissures known as grykes.

**CONSERVATION STATUS** - The sum of the influences acting on a habitat and its typical species that may affect its long term distribution, structure and functions. Also refers to the long-term survival of its typical species within the European territory of the Member States.

**DEHLG** - Department of Environment, Heritage and Local Government

**DEVELOPMENT PLANS** - Local Authorities (Co. Councils & Corporations) are obliged under statute to produce a document which sets out the planned development of their areas for a given number of years. In the future Local Authorities will be asked to incorporate designated NHAs, SACs and SPAs classifications into their development plans.

**DIVERSITY** - see biodiversity.

**ECOLOGY** - The study of the interactions between organisms, and their physical, chemical and biological environment.

**ENCROACHMENT** - The invasion of a species (usually plants) into areas previously uncolonised. This term is often used when an undesirable species advances at the expense of a desirable species or habitat.

**ENVIRONMENT** – The biological and physical conditions in which an organism lives.

**EPA** – Environmental Protection Agency

**EROSION** - The processes whereby the materials of the Earth's crust are dissolved, or worn away and simultaneously moved from one place to another by natural agencies which include weathering, solution, corrosion and transportation.

**EUROPEAN BIRDS DIRECTIVE (79/ 409/ 2nd April 1979)** - See Birds Directive.

**EVALUATION** - A considered or measured assessment of available information leading to a ranking or valuing.

**FAUNA** - Animal life.

**FAVOURABLE CONSERVATION STATUS** - The conservation status of a natural habitat will be taken as "favourable" when: its natural range and areas 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.

**FLORA** - plant life.

**FLORA PROTECTION ORDER** - under the 1976 Wildlife Act, particular plants can be protected under a Flora Protection Order. Under such an order it becomes an offence to cut, uproot or damage these plants unless under licence from the Minister. The same order prohibits damage to the habitats of these species.

**GEOMORPHOLOGY** – The study of the form and structure of the landscape, which is shaped by the underlying geology.

**GRYKES** - A term used for describing limestone pavement. The term gryke is used to refer to the vertical fissures that form a network separating loose flags of limestone blocks known as clints. The grykes provide a cold humid microclimate where shade tolerant vascular plants occur.

**HABITAT** - Refers to the environment defined by specific abiotic and biotic factors, in which a species lives at any stage of its biological cycle. In general terms it is a species home. In the Habitats Directive this term is used more loosely to mean plant communities and areas to be given protection.

**HABITATS DIRECTIVE** - (Council Directive 92/43/EEC). The Directive on the conservation of Natural Habitats and of Wild Flora and Fauna. This Directive seeks to legally protect wildlife and its habitats. . It was transposed into Irish legislation by the EU (Natural Habitats) Regulations, 1997.

**HERBICIDE** - A chemical or biological preparation which kills plants.

**INVERTEBRATES** - Animals without backbones.

**IUCN** – World Conservation Union

**JUNIPERUS COMMUNIS FORMATIONS ON CALCAREOUS HEATH** (or grassland) - A habitat listed in Annex I of the EU Habitats Directive. This habitat is characterised by formations with *Juniperus communis* (Juniper) of plain to mountain levels.

**LATITUDE** – The angular distance measured in degrees north or south of the equator.

**LEPIDOPTERA** - Moths and butterflies.

**LIAISON COMMITTEE** - This is a special group set up to discuss the contents of a conservation management plan and the implementation of the plan. The committee will include representation of landowners, right-holders and other interest groups. It shall be the function of the committee to advise NPWS managers on the interaction between site conservation management and local interests. The Liaison Committee will nominate a member to the official Appeals Board which will consider appeals against site designation and other issues. The Liaison Committee will be independent from the NPWS.

**LICHENS** – An organism that consists of a fungus growing in close association (symbiosis) with an alga.

**LIMESTONE** - Sedimentary rock composed predominantly of calcium carbonate, often containing fossils.

**MANAGEMENT** - a) Controlling processes within a site (this can be actively carrying out work or can be doing nothing), preferably in accordance with a conservation plan. - b) The practical implementation of the management plan. - c) Undertaking any task or project identified in the management plan, including the identification of new opportunities.

**MECHANICAL WEATHERING** - The processes of weathering by which frost action, salt-crystal growth, absorption of water, and other physical processes break down a rock to fragments, involving no chemical change. See also chemical weathering.

**MICRO CLIMATE** -The climate within a very small area, usually close to the ground, where the ground surface affects the climate.

**MONITORING** – A repeat or repeats of a survey using the same methodology. Designed to look for or measure specific changes and the rate or extent of change. Used to check the “health” quantity or quality of a habitat or species.

**MOSAIC** - Used to describe habitats that occur together and cannot easily be mapped separately.

**MUDSTONE** - Fine-grained sedimentary rock, formed from mud.

**MULTIPLE PRIVATE OWNERSHIP-** Lands that are divided into areas which are privately owned. There must be more than one private landowner under this heading. (lands in commonage are not described under this heading).

**NATIONAL PARKS AND WILDLIFE SERVICE (NPWS)** – the section of the Environment Infrastructure and Services division of the Department of Environment, Heritage and Local Government with responsibility for nature conservation and implementation of Government conservation policy as enunciated by the Minister for the Environment, Heritage and Local Government.

**NATURA 2000** - A network of sites across the European Community, selected for the purpose of conserving natural habitats and species of plants and animals which are rare, endangered or vulnerable in the European Community. SACs and SPAs form the Natura 2000 network.

**NATURAL HABITAT** - Can be aquatic or terrestrial areas distinguished by geographic, abiotic and biotic features, whether entirely natural or semi-natural.

**NATURALNESS** - Refers to how much or little a site/habitat/species has been modified by mankind.

**NHAs** - Proposed Natural Heritage Areas. These are areas that are important for wildlife conservation. Some of these sites are small, such as roosting areas for rare bats; others can be large such as a blanket bog or a sand dune system.

**NOTABLE SPECIES** - Plants or animals which are worthy of mentioning either because they are particularly typical of a habitat, or because they are rare/ scarce/ atypical.

**NOTIFIABLE ACTIONS** - Actions specified under the cSAC regulations and are listed in the appendices of a conservation plan. These are actions which could cause damage to the site, and for which prior approval is required before they can be carried out.

**NPWS** - National Parks and Wildlife Service

**ORGANISM** - Any living thing.

**OS** – Ordnance Survey

**PATROL MONITORING** - Regular monitoring of a site usually carried out by the Conservation Ranger to check for damaging activities and to carry out other activities such as to assess the vegetation, to assess the effectiveness of the management regime on the condition of the site, etc.

**PER-ANNUM** - Each year.

**pH** - A quantitative expression for the acidity or alkalinity of a solution or soil. The scale ranges from 0-14: pH 7 is neutral, less than 7 is acidic and greater than 7 is alkaline.

**PHLOEM** - The principle food conducting tissue of vascular plants.

**POACHING** - Damage caused to the vegetation by excessive numbers of large grazers.

**PRECIPITATION** - Water moving from the atmosphere to the ground in the form of rain, fog, mist, snow or hail.

**PRIORITY HABITAT** - A subset of the habitats listed in Annex I of the EU Habitats Directive. These are habitats which are in danger of disappearance and whose natural range mainly falls within the territory of the European Union. These habitats are of the highest conservation status and require measures to ensure that their favourable conservation status is maintained.

**PRIVATE OWNERSHIP** - Land which is owned by one private landowner.

**RARE** - An ecological term applied to distribution of species when assessed on a national grid reference system. The assessment is made on the basis of the number of occupied 10 km National Grid squares. A species is described as rare if has been recorded in to 3-10, 10 km squares.

**RECLAIMED LAND** - this is applied to lands which have been modified from their natural state by intervention in the form of: a) drainage, b) bulldozed, c) clearance of scrub, d) infilling of wetland, e) ploughed and reseeded.

**RED DATA BOOK** – A register of threatened species that includes definitions of degrees of threat.

**RED DATA BOOK (lower plants)** - This Red Data Book deals with Stoneworts which are recognised as a separate class, Characea, of the Green Algae Chlorophyta). Many of these species are threatened by loss of habitat or pollution.

**RED DATA BOOK 1 (vascular plants)** This Red Data Book deals with rare and threatened flowering plants and ferns of Ireland with an account of their present distributions and conservation status.

**RED DATA BOOK 2 (mammals, birds, amphibians and fish)** - identifies those species threatened in Ireland or those species whose populations are considered to be of international importance, though not necessarily threatened in Ireland. It details the current state of Irish vertebrates and provides a concise summary of the various legislation for each species.

**REPS** - Rural Environmental Protection Scheme. This is an Agri-Environmental programme which seeks to draw up agreements with farmers, according to the type of farming, landscape and features on the land. The overall objectives of REPS are to achieve: the use of farming practices which reduce the polluting effects of agriculture by minimising nutrient loss- an environmentally favourable extensification of crop farming, and sheep farming and cattle farming; - ways of using agricultural land which are compatible with protection and improvement of the environment, the countryside, the landscape, natural resources the soil and genetic diversity; - long-term set-aside of agricultural land for reasons connected with the environment; - land management for public access;- education and training for farmers in types of farming compatible with the requirements of environmental protection and upkeep of the countryside.

**SACs** - Special Areas of Conservation have been selected from the prime examples of wildlife conservation areas in Ireland. Their legal basis from which selection is derived is The Habitats Directive (92/43/EEC of the 21st May 1992). SAC's have also been known as cSAC's which stands for "candidate Special Areas of Conservation", and pcSAC's which stands for "proposed candidate Special Areas of Conservation."

**SCARCE** - This is an ecological term, which is applied to distribution of species when assessed on a national grid reference system. The assessment is made on the basis of the number of occupied 10 km National Grid squares. Scarce applies to 11-25, 10 km squares in this context.

**SCIENTIFIC MONITORING** - this is carried out by the monitoring section of the NPWS, whose function here is to ensure that the favourable conservation status of the site is maintained and where possible improved.

**SEDIMENT** - Solid particles that can originate by the weathering and erosion of pre-existing rock, by chemical precipitation from water, or by the breakdown of organisms.

**SEDIMENTARY** - Formed by the deposition of sediment, i.e. rock particles or chemical precipitate, or pertaining to the process of sedimentation.

**SEMI-NATURAL DRY GRASSLANDS (AND SCRUBLAND FACIES ON CALCAREOUS SUBSTRATES - IMPORTANT ORCHID SITES)** - A priority habitat listed under the EU Habitats Directive dry to semi-dry calcareous grasslands of the Festuco-Brometea. This habitat in Ireland often supports rich Orchid flora.

**SPECIES** - the lowest unit of classification normally used for plants and animals.

**STRATEGY** - A course of action or a broad approach towards achieving an objective . It is the general thrust of management towards achieving an objective. It is a description of how the objective is to be achieved.

**SUPPLEMENTARY FEEDING** - The practice of providing livestock with additional food, usually carried out in winter. This term is most often used when hay, silage or other foods are brought into a site to supply Cattle or Sheep with food during times when growing conditions are poor.

**SURVEY** - a) Study/visit to produce an inventory of what is present / record a situation.- b) Establishing a baseline (study).

**SUSTAINABLE** - The highest rate at which a renewable resource can be used without reducing its supply (without causing damage to the resource).

**TERRESTRIAL** - A term used to refer to living on land. The opposite of aquatic.

**TRADITIONAL MANAGEMENT PRACTICES** Land management practices which were carried out prior to the 1950s. These practices were often less intensified than today's management practices. In REPS prescriptions traditional means an activity which has been carried out for a specified number of years on a site (usually 10 years).

**TURLOUGHES** – A priority habitat listed in Annex I of the Habitat Directive describing temporary lakes in limestone areas which fill and empty through underground passages. Usually filling during the Winter and drying out in the Summer, but often with more rapid fluctuations in response to local rainfall. They are mainly found in counties Clare, Galway and Roscommon. The vegetation of their basins is a mixture of aquatic, terrestrial and especially amphibious plants, usually forming a distinct and characteristic concentric zonation pattern.

**TYPICALITY** - Assessment of whether a site is typical of the habitat it represents.

**VASCULAR** - Consisting of, or containing vessels adapted for the carriage or circulation of fluid, in plants refers to xylem and phloem.

**VERTEBRATES** - Animals with backbones.

**WEATHERING** - The process by which rocks are broken down and decomposed by the action of wind, rain temperature changes, plants and bacteria. See also chemical and mechanical weathering.

**ZONING** - The division of a nature conservation site (& neighbouring lands) into a number of sub-units. Within each zone the management prescriptions will be reasonably uniform and will differ in type or intensity from the other zones in the plan.

# APPENDIX II: REFERENCE MATERIAL

## Map References:

- O.S. 1/2 inch (1:126,720) map: 17
- O.S. Discovery (1:50,000) map: 64
- O.S. 6 inch (1: 10,560) map: LK 010

## Databases :

- NHA database, NPWS, The Department of Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.
- Natura 2000 database, NPWS, The Department of Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.
- Rare Plants Database, NPWS, Department of Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.

## Photographic Coverage:

- Aerial photo No. 2033/4, Flight Line 47. Date: May 2000 and B/W aerial photo No. 5951, Flight Line 51, Date 1995. NPWS, The Department of Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.
- Additional oblique aerial photos from summer 2003 and 1994 (Film No. 0894, Photo Nos. 17-19) are held by Regional Staff.

## Relevant Legislation:

- S.I. No. 39 of 1976: Wildlife Act 1976
- S.I. No. 38 of 2000: Wildlife (Amendment) Act 2000
- S.I. No. 94/1997: European Communities (Natural Habitats) Regulations 1997.
- Local Government (Planning and Development) Acts 1963-2002.

## Bibliography:

- Breen, J. and O'Brien, A. 1995 *Species richness in oldfield limestone grassland*. In: Irish Grasslands, their Biology and Management. Pp 204-209. Royal Irish Academy, Dublin.
- Curtis, T.G.F. and McGough, H.N. 1988 *The Irish Red Data Book. 1 Vascular Plants*. The Stationary Office, Dublin.
- European Commission, 1999. *Interpretation Manual of European Habitats Eur 15/2*.
- Lavery, T. 1993 *A review of the distribution, ecology and status of the Marsh Fritillary (*Euphydryas aurinia*) Rottenberg, 1775 (Lepidoptera: Nymphalidae) in Ireland*. Irish Naturalists' Journal Vol 24, No. 5.
- Limerick County Council 1999 *County Development Plan 1999-2005*.



- O'Críodáin, C. 1992 *Conservation of grassland sites of scientific interest in Ireland*. Internal Report to the National Parks and Wildlife Service, Dublin.
- Praeger, R.L. 1934 *A Botanist in Ireland*. Hodges, Figgis and Co., Dublin.
- Sleeman, A.G. & Pracht, M. 1999 *Geology of the Shannon Estuary*. Geological Survey of Ireland, Dublin.
- Whilde, A. 1993 *Threatened Mammals, Birds, Amphibians and Fish in Ireland*. *Irish Red Data Book 2: Vertebrates*. HMSO, Belfast.
- Whittow, J.B. 1974 *Geology and Scenery in Ireland*. Pelican Books, Suffolk.

# APPENDIX III:

## CLIMATE

<b>SHANNON AIRPORT</b>													
<b>monthly and annual mean and extreme values</b>													
<b>1961-1990</b>													
<b>TEMPERATURE</b> (degrees Celsius)	<i>jan</i>	<i>feb</i>	<i>mar</i>	<i>apr</i>	<i>may</i>	<i>jun</i>	<i>jul</i>	<i>aug</i>	<i>sep</i>	<i>oct</i>	<i>nov</i>	<i>dec</i>	<i>year</i>
<i>mean daily max.</i>	8.2	8.5	10.5	12.7	15.3	17.9	19.4	19.2	17.2	14.2	10.4	8.9	<b>13.5</b>
<i>mean daily min.</i>	2.6	2.7	3.6	4.8	7.3	10.1	12	11.7	10.1	8	4.5	3.6	<b>6.8</b>
<i>mean</i>	5.4	5.6	7	8.8	11.3	14	15.7	15.5	13.6	11.1	7.5	6.3	<b>10.1</b>
<i>absolute max.</i>	14	14.8	20.2	22.2	25.6	31.6	30.6	28.7	25.5	21.8	18.2	15.2	<b>31.6</b>
<i>absolute min.</i>	-11.2	-9.8	-7.8	-4.1	-0.9	1.5	5.2	2.9	1.3	-1.4	-6.1	-8.3	<b>-11.2</b>
<i>mean no. of days with air frost</i>	6.5	5.4	3.2	1.6	0	0	0	0	0	0.3	3.5	5	<b>25.4</b>
<i>mean no. of days with ground frost</i>	13.2	11	9.5	8.2	2.5	0.4	0	0	0.6	2.7	9.6	11	<b>68.6</b>
<b>RELATIVE HUMIDITY (%)</b>													
<i>mean at 0900UTC</i>	88	87	85	81	77	79	81	83	85	88	88	89	<b>84</b>
<i>mean at 1500UTC</i>	82	75	70	65	64	67	68	69	71	77	81	84	<b>73</b>
<b>SUNSHINE (hours)</b>													
<i>mean daily duration</i>	1.58	2.34	3.34	4.93	5.77	5.13	4.59	4.44	3.69	2.65	1.93	1.42	<b>3.48</b>
<i>greatest daily duration</i>	7.8	9.5	11.6	13.6	15.3	15.8	15.7	14.8	11.6	9.9	8.8	7.1	<b>15.8</b>
<i>mean no. of days with no sun</i>	10	7	5	3	2	2	2	2	3	6	8	11	<b>62</b>
<b>RAINFALL (mm)</b>													
<i>mean monthly total</i>	97.2	72.1	71.8	55.5	60.1	62.4	57.1	82.3	81.8	92.4	94.7	99.6	<b>926.8</b>
<i>greatest daily total</i>	29	33.5	28.5	29.6	27	29.7	42.5	35.9	35.5	33	33	50.4	<b>50.4</b>
<i>mean no. of days with <math>\geq 0.2\text{mm}</math></i>	20	16	19	16	17	16	15	18	18	20	19	20	<b>214</b>
<i>mean no. of days with <math>\geq 1.0\text{mm}</math></i>	16	12	14	11	13	11	10	13	13	15	15	16	<b>160</b>
<i>mean no. of days with <math>\geq 5.0\text{mm}</math></i>	7	5	5	4	4	4	4	5	6	6	7	7	<b>66</b>
<b>WIND (knots)</b>													
<i>mean monthly speed</i>	10.9	11.1	11	9.5	9.5	8.9	8.7	8.6	9.6	10	9.6	10.5	<b>9.8</b>
<i>max. gust</i>	82	80	65	62	61	57	52	55	93	84	64	81	<b>93</b>
<i>max. mean 10-minute speed</i>	55	53	44	41	39	42	33	39	60	57	45	51	<b>60</b>
<i>mean no. of days with gales</i>	2.1	1.2	1.4	0.5	0.5	0.1	0	0.1	0.6	0.9	1	1.5	<b>9.8</b>
<b>WEATHER (mean no. of days with...)</b>													
<i>snow or sleet</i>	3.4	3.2	1.8	0.6	0.1	0	0	0	0	0.1	0.3	1.5	<b>10.9</b>
<i>snow lying at 0900UTC</i>	0.8	0.7	0.1	0	0	0	0	0	0	0	0.1	0.3	<b>2</b>
<i>hail</i>	3.7	3.1	4.3	2.5	1.7	0.2	0.1	0.2	0.3	1.1	1.8	2.7	<b>21.7</b>
<i>thunder</i>	0.9	0.5	0.4	0.3	0.4	0.8	0.8	0.5	0.4	0.4	0.4	0.4	<b>6.3</b>
<i>fog</i>	4.1	2	1.8	2.2	1.7	1.8	1.7	3.1	3	3.3	3.4	3.6	<b>31.8</b>

Source: Met Eireann

# APPENDIX IV: DETAILED INFORMATION ON FLORA AND FAUNA

## Flora

A list of the vascular plants recorded at Barrigone cSAC are presented in the table below. The \*limestone pavement, scrub and \*orchid-rich calcareous grassland cannot be meaningfully separated (NHA survey 1994) and are listed together.

### Vascular Plant Species of Barrigone.

The list of plant species supplied below is derived from site visits by Drs T. Curtis, N. Lockhart and C. O'Criodain (3/7/97), Dr Ferdia Marnell (1997) and Sylvia Reynolds, the BSBI recorder for Limerick. Additional information was collated from the 1971 ASI survey, NHA site card and the Natura 2000 database.

English name	Latin name
Yarrow	<i>Achillea millefolium</i>
Agrimony	<i>Agrimonia eupatoria</i>
Common bent	<i>Agrostis capillaris</i>
Silver hair grass	<i>Aira caryophyllea</i>
Pyramidal orchid	<i>Anacamptis pyramidalis</i>
Mountain everlasting	<i>Antennaria dioica</i>
Sweet vernal grass	<i>Anthoxanthum odoratum</i>
Kidney vetch	<i>Anthyllis vulneraria</i>
Columbine	<i>Aquilegia vulgaris</i>
Thale cress	<i>Arabidopsis thaliana</i>
Thyme-leaved sandwort	<i>Arenaria serpyllifolia</i>
False oat-grass	<i>Arrhenatherum elatius</i>
Black spleenwort	<i>Asplenium adiantum-nigrum</i>
Wall-rue	<i>Asplenium ruta-muraria</i>
Maidenhair spleenwort	<i>Asplenium trichomanes</i>
Downy oat-grass	<i>Avenula pubescens</i>
Daisy	<i>Bellis perennis</i>
Yellow-wort	<i>Blackstonia perfoliata</i>
False brome	<i>Brachypodium sylvaticum</i>
Quaking grass	<i>Briza media</i>
Ling heather	<i>Calluna vulgaris</i>
Shepherd's purse	<i>Capsella bursa-pastoris</i>
Spring sedge	<i>Carex caryophyllea</i>
Glaucous sedge	<i>Carex flacca</i>
Carnation sedge	<i>Carex panicea</i>
Carline thistle	<i>Carlina vulgaris</i>
Knapweed	<i>Centaurea nigra</i>
Common centaury	<i>Centaurium erythraea</i>
Common mouse-ear	<i>Cerastium fontanum</i>

Spear thistle	<i>Cirsium vulgare</i>
Frog orchid	<i>Coeloglossum viride</i>
Pignut	<i>Conopodium majus</i>
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Smooth hawk's beard	<i>Crepis capillaris</i>
Dodder	<i>Cuscuta epithymum</i>
Crested dogs tail	<i>Cynosurus cristatus</i>
Cocksfoot	<i>Dactylis glomerata</i>
Common spotted orchid	<i>Dactylorhiza fuchsii</i>
Heath spotted orchid	<i>Dactylorhiza maculata ssp ericetorum</i>
Heath grass	<i>Danthonia decumbens</i>
Wild carrot	<i>Daucus carota</i>
Spindle	<i>Euonymus europaeus</i>
Eyebright	<i>Euphrasia rotkoviana</i>
Irish eyebright	<i>Euphrasia salisburgensis</i>
Tall fescue	<i>Festuca arundinacea</i>
Sheeps fescue	<i>Festuca ovina</i>
Meadow fescue	<i>Festuca pratensis</i>
Red fescue	<i>Festuca rubra</i>
Wild strawberry	<i>Fragaria vesca</i>
Lady's bedstraw	<i>Galium verum</i>
Autumn gentian	<i>Gentianella amarella</i>
Field gentian	<i>Gentianella campestris</i>
Long-stalked crane's-bill	<i>Geranium columbinum</i>
Dove's-foot crane's-bill	<i>Geranium molle</i>
Herb Robert	<i>Geranium robertianum</i>
Fragrant orchid	<i>Gymnadenia conopsea</i>
Ivy	<i>Hedera helix</i>
Mouse-ear hawkweed	<i>Hieracium pilosella</i>
Imperforate St Johns wort	<i>Hypericum maculatum</i>
Slender St Johns wort	<i>Hypericum pulchrum</i>
Common cats-ear	<i>Hypochaeris radicata</i>
Juniper	<i>Juniperus communis</i>
Crested hair-grass	<i>Koeleria macrantha</i>
Meadow vetchling	<i>Lathyrus pratensis</i>
Autumn hawkbit	<i>Leontodon autumnalis</i>
Rough hawkbit	<i>Leontodon hispidus</i>
Lesser hawkbit	<i>Leontodon taraxacoides</i>
Ox-eye daisy	<i>Leucanthemum vulgare</i>
Fairy flax	<i>Linum catharticum</i>
Honeysuckle	<i>Lonicera periclymenum</i>
Birds foot trefoil	<i>Lotus corniculatus</i>
Wood-rush	<i>Luzula sp.</i>
Black medick	<i>Medicago lupulina (on path by quarry)</i>
Corn mint	<i>Mentha arvensis</i>
Purple moor-grass	<i>Molinia caerulea</i>
Dense-flowered orchid	<i>Neotinea maculata</i>
Red bartsia	<i>Odontites verna</i>
Early purple orchid	<i>Orchis mascula</i>
Orchid	<i>Orchis sp.</i>
Burnet saxifrage	<i>Pimpinella saxifraga</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Greater plantain	<i>Plantago major</i>
Sea plantain	<i>Plantago maritima</i>
Lesser butterfly orchid	<i>Plantanthera bifolia</i>
Smooth meadow grass	<i>Poa pratensis</i>
Rough meadow grass	<i>Poa trivialis</i>
Common milkwort	<i>Polygala vulgaris</i>
Tormentil	<i>Potentilla erecta</i>
Barren strawberry	<i>Potentilla sterilis</i>
Cowslip	<i>Primula veris</i>
Primrose	<i>Primula vulgaris</i>
Self-heal	<i>Prunella vulgaris</i>
Blackthorn	<i>Prunus spinosa</i>
Bracken	<i>Pteridium aquilinum</i>
Meadow buttercup	<i>Ranunculus acris</i>
Bulbous buttercup	<i>Ranunculus bulbosus</i>
Yellow rattle	<i>Rhinanthus minor</i>

Field Rose	<i>Rosa arvensis</i>
Burnet rose	<i>Rosa pimpinellifolia</i>
Madder	<i>Rubia peregrina</i>
Bramble	<i>Rubus fruticosus</i> agg.
Stone Bramble	<i>Rubus saxatilis</i>
Annual pearl-wort	<i>Sagina apetala</i>
Knotted pearl-wort	<i>Sagina nodosa</i>
Grey willow	<i>Salix cinerea</i> ssp. <i>oleifolia</i>
Elder	<i>Sambucus nigra</i>
Salad burnet	<i>Sanguisorba minor</i>
Rue-leaved saxifrage	<i>Saxifraga tridactylites</i>
Black bog-rush	<i>Schoenus nigricans</i>
Ragwort	<i>Senecio jacobaea</i>
Hedge mustard	<i>Sisymbrium officinale</i>
Golden rod	<i>Solidago virgaurea</i>
Prickly sowthistle	<i>Sonchus asper</i>
Rowan	<i>Sorbus aucuparia</i>
Bog chickweed	<i>Stellaria uliginosa</i>
Devil's bit scabious	<i>Succisa pratensis</i>
Dandelion	<i>Taraxacum officinale</i>
Wood sage	<i>Teucrium scorodonia</i>
Thyme	<i>Thymus praecox</i>
Upright hedge-parsley	<i>Torilis japonica</i>
Hop trefoil	<i>Trifolium campestre</i>
Lesser trefoil	<i>Trifolium dubium</i>
Red clover	<i>Trifolium pratense</i>
White clover	<i>Trifolium repens</i>
Gorse	<i>Ulex europaeus</i>
Germander speedwell	<i>Veronica chamaedrys</i>
Tufted vetch	<i>Vicia cracca</i>
Hairy violet	<i>Viola hirta</i>
Dog Violet	<i>Viola riviniana</i>

This list may be incomplete and may include species that now occur outside site boundaries, following several boundary changes. Additionally, in compiling species lists from several surveyors, differences in identification occur – e.g. *Trifolium dubium* may have been recorded as *T. campestre* by a different surveyor (also the *Leontodon* sp.). Hence, the total of recorded species may be an over-estimate

A range of bryophytes and lichens also occur on site (NHA survey 1994), but these species have not been fully investigated. During a field visit in 1997, Drs. Curtis, Lockhart and O'Criodain recorded the following species:

*Rhytidiadelphus triquetrus*; *R. loreus*; *Hylocomium splendens*; *Pseudoscleropodium* sp.; *Hypnum cupressiforme*; *Ctenidium molluscum*; *Tortula* sp.; *Neckera crispa*.

Additionally, giant puffballs (*Lycoperda* sp., Fungi) were recorded during the 1997 survey.

## Fauna

Moth records collected from Barrigone during 3 night visits in July and August 1990 by Dr Ken Bond (UCC) are listed below. Species listed in bold were collected from the mercury vapour trap at R296508, others were collected from light traps along the farm track in the eastern part of the site, and to the south of the old schoolhouse (R297507).

Common Name	Scientific Species Name
Magpie moth	<i>Abraxas grossulariata</i> (also in MV trap)
	<i>Acleris aspersana</i> (also at MV trap)
Garden Rose Tortrix	<i>Acleris variegana</i> (also at MV trap)
	<i>Agapeta zoegana</i> (also in MV trap)
	<i>Agonopterix</i> sp.
	<i>Agriphila</i> sp.
	<i>Agriphila straminella</i> (also in MV trap)
Heart and dart moth	<i>Agrotis exclamationis</i>
Dark Sword-grass moth	<i>Agrotis ipsilon</i>
	<i>Amphipoea oculea</i>
	<i>Ancylis badiana</i>
Dark Arches moth	<i>Apamea monoglypha</i> (Also MV trap)
Treble-bar moth	<i>Aplocera plagiata</i>
Garden Tiger moth	<i>Arctia caja</i>
	<i>Blastobasis lignea</i>
	<i>Borkhausenia fuscescens</i>
	<i>Bryotropha senectella</i>
	<i>Bucculatrix</i> sp.
Pale Mottled Willow	<i>Caradrina clavipalpis</i>
The Crescent	<i>Celaena leucostigma</i>
	<i>Celeophora virgaureae</i>
	<i>Celypha cespitana</i>
	<i>Chiasmia elathrata</i>
	<i>Chrysoteuchia culmella</i> (also at MV trap)
Barred Yellow moth	<i>Cidaria fulvata</i>
	<i>Cnephasia</i> sp.
Grey Tortrix moth	<i>Cnephasia stephensiana</i>
Green Carpet moth	<i>Colostygia pectinataria</i>
Purple Bar moth	<i>Cosmorhoe ocellata</i>
	<i>Crambus perlellus</i> (also in MV trap)
	<i>Crambus pascuellus</i>
Burnished Brass moth	<i>Diachrysia chrysitis</i>
Small Square-spot	<i>Diarsia rubi</i>
	<i>Dichrorampha acuminatana</i>
	<i>Dichrorampha alpinaea</i>
Common Footman moth	<i>Eilema lurideola</i>
	<i>Elachista atricomella</i>
	<i>Elachista</i> sp.
	<i>Endothenia quadrimaculata</i>
	<i>Eona osseana</i>
	<i>Epiblema roborana</i>
Common Carpet moth	<i>Epirrhoe alternata</i> (also at MV trap)
	<i>Eucosma campoliliana</i> (also MV trap)
	<i>Eucosma cana</i> (also MV trap)
	<i>Eucosma hohewartiana</i> (also MV trap)
	<i>Eudonia</i> sp.
	<i>Eulamprotes atrella</i> (also at MV trap)
Barred Straw moth	<i>Eulithis pyraliata</i>
Sharp-angled Carpet moth	<i>Euphyia unangulata</i>
A Pug moth	<i>Eupithecia</i> sp.
Lime-speck Pug Moth	<i>Eupithecia centaureata</i>
A Pug moth	<i>Eupithecia pimpinellata</i>
Double Dart moth	<i>Graphiphora augur</i>
Buff Arches Moth	<i>Habrosyne pyritoides</i>
Common Emerald moth	<i>Hemithea aestivaria</i>
The Uncertain moth	<i>Hoplodrina alsines</i>

The Rustic moth	<i>Hoplodrina blanda</i>
Riband Wave moth	<i>Idaea aversata</i>
Small Fan-footed Wave moth	<i>Idaea biselata</i> (var)
Single-dotted Wave moth	<i>Idaea dimidiata</i>
Bright-line Brown-eye moth	<i>Lacanobia oleracea</i>
Dog's Tooth moth	<i>Lacanobia suasa</i>
True Lover's Knot	<i>Lycophotia porphyrea</i>
Lackey Moth	<i>Malacosoma neustria</i>
	<i>Maniola jurtina</i>
	<i>Mesaparnaea sp.</i>
Cloaked Minor moth	<i>Mesoligia furuncula</i>
Brown-line Bright-eye moth	<i>Mythimna conigera</i> (also MV trap)
The Clay moth	<i>Mythimnia ferrago</i>
Smoky Wainscot moth	<i>Mythimna impura</i>
	<i>Nemophora minimella</i>
Lesser Yellow Underwing moth	<i>Noctua comes</i>
Least Yellow Underwing moth	<i>Noctua interjecta</i>
Lesser Broad-bordered Yellow Underwing	<i>Noctua janthe</i> (ianthina)
Large Yellow Underwing Moth	<i>Noctua pronuba</i>
Rush Veneer moth	<i>Nomophila noctuella</i>
Rufous Minor moth	<i>Oligia versicolor</i>
Brimstone moth	<i>Opisthograptis luteolata</i>
Swallowtailed Moth	<i>Ouropteryx sambucaria</i>
	<i>Paltodora cytisella</i>
Barred Fruit-tree Tortrix	<i>Pandemis cerasana</i>
	<i>Paraswammerdamia albicapitella</i>
	<i>Pempeliella dilutella</i>
Grass Rivulet moth	<i>Perizoma albulata</i>
Buff-tip Moth	<i>Phalera bucephala</i>
Drinker Moth	<i>Philudoria potatoria</i>
Ruby Tiger Moth	<i>Phragmatobia fuliginosa</i>
	<i>Phycitid sp.</i>
	<i>Phycitodes saxicola</i>
Grass Emerald moth	<i>Pseudoterpna pruinata</i>
Pyralid Moth	<i>Pyralid sp.</i>
Pyralid Moth	<i>Pyrausta purpuralis</i>
	<i>Schreckensteiniella festaliella</i>
Pyralid Moth	<i>Scoparia subfusca</i>
Shaded Broad-bar moth	<i>Scotopteryx chenopodiata</i>
Buff Ermine Moth	<i>Spilosoma lutea</i>
	<i>Swammerdamia sp.</i>
Straw Underwing moth	<i>Thalophila matura</i> (also MV trap)
Peach Blossom Moth	<i>Thyatira batis</i>
	<i>Udea prunalis</i>
Dark-barred Twin-spot Carpet moth	<i>Xanthorhoe ferrugata</i>
Double Square-spot moth	<i>Xestia triangulum</i>
Square-spot Rustic moth	<i>Xestia xanthographa</i>

103 species identified.

# APPENDIX V: NOTIFIABLE ACTIONS

The notifiable actions relating to the habitats that occur within the site are listed below:

- Notifiable Action 2.2 – Dry lowland grassland
- Notifiable Action 2.4 – Limestone pavement
- Notifiable Action 3.2 – Heaths (including Juniper scrub)
- Notifiable Action 5.2 – Scrub



## HABITAT TYPE 2.2

### DRY LOWLAND GRASSLANDS

Under STATUTORY INSTRUMENT 94 of 1997, made under the EUROPEAN COMMUNITIES ACT 1972 and in accordance with the obligations inherent in the COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992 (the Habitats Directive) on the conservation of the natural habitats and species of wild fauna and flora, all persons must obtain the written consent, (in circumstances prescribed at section A and B below) of the Minister for The Environment, Heritage and Local Government before performing any of the operations on, or affecting, the following habitats where they occur on lands / waters within the candidate Special Area of Conservation.

Please note that where a landowner has a current approved plan under the Rural Environmental Protection Scheme or any scheme which the Minister considers to be equivalent s/he need only notify the Minister of activities not covered in the plan.

#### **SECTION A**

Please note that the activities listed in *Section A overleaf* are required to be notified to the Minister for The Environment, Heritage and Local Government and should not be undertaken before consent.

#### **SECTION B**

Please note that the activities listed in *Section B overleaf* may, and in most cases do, require a Minister for the Marine and Natural license or consent from another statutory authority (e.g. the local planning authority, the Resources, or the Minister for Agriculture and Food).

If so, these notifiable actions do not apply.

However, if such activities are not regulated by another statutory authority, the said activities are required to be notified to the Minister for The Environment, Heritage and Local Government.

## HABITAT TYPE 2.2

### DRY LOWLAND GRASSLANDS

<u>Section A</u>	<u>Section B</u>
<p>THE MINISTER FOR THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT IS REQUIRED TO BE NOTIFIED IN RELATION TO THE FOLLOWING ACTIVITIES AND SUCH ACTIVITIES SHOULD NOT PROCEED WITHOUT PRIOR CONSENT</p> <p>grazing of livestock above a sustainable density (as defined in approved farm plans)/grazing by livestock treated within the previous week with a pesticide which leaves persistent residues in the dung</p> <p>changing of traditional use from hay meadow (to either grazing or silage making), or from grazing to silage cutting</p> <p>adding lime/adding fertiliser of any sort to areas not previously fertilised/ applying fertiliser which would increase the level of nitrogen in the soil/applying fertiliser which would increase the level of phosphorous in the soil/ applying phosphorous to soils which already have in excess of the REPS index 2 levels mowing grass before the 30th June (<i>Note; if you have been notified that your lands hold breeding corncrakes, or certain rare meadows, special provisions will apply</i>)</p> <p>burning of vegetation /ploughing or cultivation of lands which have not been so managed for the last 20 years</p> <p>reclamation, infilling, or land drainage/ reseeding, planting of trees or any other species use of any pesticide or herbicide</p> <p>dumping, burning or storing any materials</p> <p>alteration of the banks, bed or low of watercourses</p> <p>operation of commercial recreation facilities (e.g. pony trekking)/introduction (or re-introduction) into the wild of plants or animals of species not currently found in the area</p> <p>any other activity of which notice may be given by the Minister from time to time</p>	<p>(NO REQUIREMENT TO NOTIFY IF ALREADY LICENSED BY ANOTHER MINISTER/BODY)</p> <p>developing leisure facilities including golf courses, sports pitches, caravan or camping facilities.</p> <p>removal of soil, mud, gravel, sand or minerals</p> <p>developing roads or car parks</p> <p>construction of fences, buildings or embankments</p> <p>afforestation</p>

In a very limited number of cases it may be necessary for the Minister for The Environment, Heritage and Local Government to restrict existing activities. In these cases compensation will be payable for actual losses arising out of any such restriction. In the event of restrictions being imposed by the Minister for The Environment, Heritage and Local Government, an appropriate appeals procedure will be put in place.

## HABITAT TYPE 2.4

### LIMESTONE PAVEMENT

Under STATUTORY INSTRUMENT 94 of 1997, made under the EUROPEAN COMMUNITIES ACT 1972 and in accordance with the obligations inherent in the COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992 (the Habitats Directive) on the conservation of the natural habitats and species of wild fauna and flora, all persons must obtain the written consent, (in circumstances prescribed at section A and B below) of the Minister for The Environment, Heritage and Local Government before performing any of the operations on, or affecting, the following habitats where they occur on lands / waters within the candidate Special Area of Conservation.

Please note that where a landowner has a current approved plan under the Rural Environmental Protection Scheme or any scheme which the Minister considers to be equivalent s/he need only notify the Minister of activities not covered in the plan.

#### **SECTION A**

Please note that the activities listed in *Section A overleaf* are required to be notified to the Minister for The Environment, Heritage and Local Government and should not be undertaken before consent.

#### **SECTION B**

Please note that the activities listed in *Section B overleaf* may, and in most cases do, require a license or consent from another statutory authority (e.g. the local planning authority, the Minister for the Marine and Natural Resources, or the Minister for Agriculture and Food).

If so, these notifiable actions do not apply.

However, if such activities are not regulated by another statutory authority, the said activities are required to be notified to the Minister for The Environment, Heritage and Local Government.

## HABITAT TYPE 2.4

### LIMESTONE PAVEMENT

<u>Section A</u>	<u>Section B</u>
<p>THE MINISTER FOR THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT IS REQUIRED TO BE NOTIFIED IN RELATION TO THE FOLLOWING ACTIVITIES AND SUCH ACTIVITIES SHOULD NOT PROCEED WITHOUT PRIOR CONSENT</p> <p>rock removal or blasting of rock</p> <p>grazing of livestock above a sustainable density (as defined in approved farm plans)/grazing by livestock treated within the previous week with a pesticide which leaves persistent residues in the dung</p> <p>grazing of stock from 1st April to 31st October, except as defined in REPS guidelines</p> <p>changing of traditional use from hay meadow (to either grazing or silage making), or from grazing to silage cutting/ supplementary feeding of stock, except as defined in REPS guidelines</p> <p>removal of scrub by bulldozer or similar machinery (cutting scrub is permitted)/grazing by sheep</p> <p>adding lime/adding fertiliser or organic material of any sort/ creation of new tracks or paths/</p> <p>burning of vegetation/ reclamation, importing of soil, infilling, ploughing or land drainage/ reseeding, planting of trees or any other species/ use of any pesticide or herbicide</p> <p>dumping, burning or storing any materials</p> <p>alteration of the banks, bed or low of watercourses</p> <p>operation of commercial recreation facilities (e.g. pony trekking)/introduction (or re-introduction) into the wild of plants or animals of species not currently found in the area</p> <p>any other activity of which notice may be given by the Minister from time to time</p>	<p>(NO REQUIREMENT TO NOTIFY IF ALREADY LICENSED BY ANOTHER MINISTER/BODY)</p> <p>developing leisure facilities including golf courses, sports pitches, caravan or camping facilities.</p> <p>removal of soil, mud, gravel, sand or minerals</p> <p>developing roads or car parks</p> <p>construction of fences, buildings or embankments</p> <p>afforestation</p> <p>erecting or operating a windfarm</p>

In a very limited number of cases it may be necessary for the Minister for The Environment, Heritage and Local Government to restrict existing activities. In these cases compensation will be payable for actual losses arising out of any such restriction. In the event of restrictions being imposed by the Minister for The Environment, Heritage and Local Government, an appropriate appeals procedure will be put in place.

## HABITAT TYPE 3.2

### HEATH (INCLUDING JUNIPER SCRUB)

Under STATUTORY INSTRUMENT 94 of 1997, made under the EUROPEAN COMMUNITIES ACT 1972 and in accordance with the obligations inherent in the COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992 (the Habitats Directive) on the conservation of the natural habitats and species of wild fauna and flora, all persons must obtain the written consent, (in circumstances prescribed at section A and B below) of the Minister for The Environment, Heritage and Local Government before performing any of the operations on, or affecting, the following habitats where they occur on lands / waters within the candidate Special Area of Conservation.

Please note that where a landowner has a current approved plan under the Rural Environmental Protection Scheme or any scheme which the Minister considers to be equivalent s/he need only notify the Minister of activities not covered in the plan.

<b><u>SECTION A</u></b>	<b><u>SECTION B</u></b>
<p>Please note that the activities listed in <i>Section A overleaf</i> are required to be notified to the Minister for The Environment, Heritage and Local Government and should not be undertaken before consent.</p>	<p>Please note that the activities listed in <i>Section B overleaf</i> may, and in most cases do, require a license or consent from another statutory authority (e.g. the local planning authority, the Minister for the Marine and Natural Resources, or the Minister for Agriculture and Food).</p> <p>If so, these notifiable actions do not apply.</p> <p>However, if such activities are not regulated by another statutory authority, the said activities are required to be notified to the Minister for The Environment, Heritage and Local Government.</p>

## HABITAT TYPE 3.2

### HEATH (INCLUDING JUNIPER SCRUB)

<u>Section A</u>	<u>Section B</u>
<p>THE MINISTER FOR THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT IS REQUIRED TO BE NOTIFIED IN RELATION TO THE FOLLOWING ACTIVITIES AND SUCH ACTIVITIES SHOULD NOT PROCEED WITHOUT PRIOR CONSENT</p> <p>grazing of livestock above a sustainable density or type of stock (as defined in approved farm plans)/grazing by livestock treated within the previous week with a pesticide which leaves persistent residues in the dung</p> <p>supplementary feeding of stock, except as defined in REPS guidelines</p> <p>introduction of stock to formerly ungrazed areas</p> <p>adding lime/adding fertiliser of any sort</p> <p>Creation of new tracks or paths</p> <p>burning areas of vegetation over 5 ha, or burning any area more often than once every 15 years</p> <p>reclamation, infilling, ploughing or land drainage</p> <p>reseeding, planting of trees or any other species</p> <p>rock removal/cutting turf except from existing banks; no cutting from intact (uncut) areas</p> <p>commercial peat moss or turf extraction</p> <p>use of any pesticide or herbicide, including sheep dip</p> <p>dumping, burning or storing any materials</p> <p>alteration of the banks, bed or flow of watercourses</p> <p>operation of commercial recreation facilities (e.g. pony trekking)</p> <p>introduction (or re-introduction) into the wild of plants or animals of species not currently found in the area/any other activity of which notice may be given by the Minister from time to time</p>	<p>(NO REQUIREMENT TO NOTIFY IF ALREADY LICENSED BY ANOTHER MINISTER/BODY)</p> <p>developing leisure facilities including golf courses, sports pitches, caravan or camping facilities.</p> <p>removal of soil, mud, gravel, sand or minerals</p> <p>developing roads or car parks</p> <p>construction of fences, buildings or embankments</p> <p>afforestation</p> <p>erecting or operating a windfarm</p>

In a very limited number of cases it may be necessary for the Minister for The Environment, Heritage and Local Government to restrict existing activities. In these cases compensation will be payable for actual losses arising out of any such restriction. In the event of restrictions being imposed by the Minister for The Environment, Heritage and Local Government, an appropriate appeals procedure will be put in place.

## HABITAT TYPE 5.2

### SCRUB

Under STATUTORY INSTRUMENT 94 of 1997, made under the EUROPEAN COMMUNITIES ACT 1972 and in accordance with the obligations inherent in the COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992 (the Habitats Directive) on the conservation of the natural habitats and species of wild fauna and flora, all persons must obtain the written consent, (in circumstances prescribed at section A and B below) of the Minister for The Environment, Heritage and Local Government before performing any of the operations on, or affecting, the following habitats where they occur on lands / waters within the candidate Special Area of Conservation.

Please note that where a landowner has a current approved plan under the Rural Environmental Protection Scheme or any scheme which the Minister considers to be equivalent s/he need only notify the Minister of activities not covered in the plan.

#### **SECTION A**

Please note that the activities listed in Section A overleaf are required to be notified to the Minister for The Environment, Heritage and Local Government and should not be undertaken before consent.

#### **SECTION B**

Please note that the activities listed in *Section B* overleaf may, and in most cases do, require a license or consent from another statutory authority (e.g. the local planning authority, the Minister for the Marine and Natural Resources, or the Minister for Agriculture and Food).

If so, these notifiable actions do not apply.

However, if such activities are not regulated by another statutory authority, the said activities are required to be notified to the Minister for The Environment, Heritage and Local Government.

## HABITAT TYPE 5.2

### SCRUB

<u>Section A</u>	<u>Section B</u>
<p>THE MINISTER FOR THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT IS REQUIRED TO BE NOTIFIED IN RELATION TO THE FOLLOWING ACTIVITIES AND SUCH ACTIVITIES SHOULD NOT PROCEED WITHOUT PRIOR CONSENT</p> <p>grazing of livestock above a sustainable density (as defined in approved farm plans)/grazing by livestock treated within the previous week with a pesticide which leaves persistent residues in the dung</p> <p>supplementary feeding of stock (as defined in approved farm plans)</p> <p>adding lime /adding fertiliser of any sort</p> <p>reclaiming land covered by scrub; if scrub is cut it must be allowed to regrow</p> <p>reclamation, infilling, ploughing or land drainage</p> <p>reseeding, planting of trees or any other species</p> <p>felling of trees, removal of timber</p> <p>removal of foliage, moss or other materials</p> <p>killing ivy</p> <p>use of any pesticide or herbicide /dumping, burning or storing any Materials</p> <p>alteration of the banks, bed or flow of watercourses</p> <p>operation of commercial recreation facilities (e.g. walking tours)</p> <p>introduction (or re-introduction) into the wild of plants or animals of species not currently found in the area</p> <p>any other activity of which notice may be given by the Minister from time to time</p>	<p>(NO REQUIREMENT TO NOTIFY IF ALREADY LICENSED BY ANOTHER MINISTER/BODY)</p> <p>developing leisure facilities including golf courses, sports pitches, caravan or camping facilities.</p> <p>any activity which may cause pollution of the site</p> <p>removal of soil, mud, gravel, sand or minerals</p> <p>developing roads or car parks</p> <p>construction of fences, buildings or embankments</p> <p>felling trees or reafforestation</p>

In a very limited number of cases it may be necessary for the Minister for The Environment, Heritage and Local Government to restrict existing activities. In these cases compensation will be payable for actual losses arising out of any such restriction. In the event of restrictions being imposed by the Minister for The Environment, Heritage and Local Government, an appropriate appeals procedure will be put in place.



# APPENDIX VI: COMPENSATION AND APPEALS PROCEDURES

## Compensation

The Government is committed, as part of the social partnership process, to the payment of a fair and proper level of compensation to landowners who have lands proposed as part of an SAC or SPA and to other users who have a legal entitlement in the site.

A landowner or user with a legal entitlement may seek compensation for actual losses incurred due to restrictions imposed as a result of designation. Eligible persons should submit to NPWS details of the losses incurred as a result of the inclusion of lands in an SAC/SPA and outlining the basis for the calculations. Documentary evidence of past earnings and the activities that produced these should be included with the claim. Should the applicant be dissatisfied with a compensation offer, the case may be referred to an independent arbitrator who will review the matter and make a final decision.

Where a landowner or user with a legal entitlement is restricted in carrying out an activity on their land or licensed area, the compensation due will exclude any payments that have been attracted under grant schemes.

For farmers, there are two options available for receiving compensation for possible restrictions to their farming practices. Farmers may also receive payments for carrying out actions that enhance a nature conservation area.

## Rural Environment Protection Scheme (REPS)

Lands within SACs, SPAs, NHAs or commonages are defined as 'Target Areas' under this scheme. A REPS plan usually covers an entire farm, but a farmer with land in a target area receives a higher payment for that area. Farmers with small areas of land in a designated area can get REPS payments for that part of their farm. In either case, the farmer is subject to certain conditions regarding farming and land use practices, set out in the REPS plan for the farm. REPS is administered by the Department of Agriculture, Food and Forestry.

## NPWS Farm Plan Scheme

Where a farmer chooses not to participate in REPS, and NPWS seeks to change the farm operation in some way or to restrict a particular activity, NPWS will pay for preparation of a farm plan. This scheme also applies to land within SACs, SPAs, NHAs and commonages.

An NPWS farm plan will normally be confined just to the designated land and will address the conservation requirements, as well as any costs arising. Payment may also be made for work carried out that enhances the nature conservation value of the designated area. The farmer will have a substantial input into the plan.

A list of trained and approved farm planners is available for farmers to choose from. For further information, contact NPWS.

## Appeals Procedure

Objection or appeal can be made against the inclusion of a piece of land in a cSAC or SPA. A person can only make objections if they have a legal interest in the site (i.e. an owner or legal user). They must be made on scientific grounds, e.g. a landowner would show that the relevant habitats/species/geological features were not present in such a condition as to warrant designation. Appeals can also be made for the inclusion of lands. Appeals should be accompanied by a map of the area of concern and be as informative as possible. There are two stages to the appeals process:

**Internal Appeals** are initially dealt with by regional staff. If necessary, they may refer the case to other NPWS staff. If there is no agreement following the internal appeal, the case becomes an external appeal.

The option of an **External Appeal** is available only where an internal appeal is unsuccessful. If so, the appellant may have the case referred to an Appeals Advisory Board, which is independent of NPWS. A grant to defray the cost of an expert scientific report is available to the appellant. The Board is comprised of equal representation of landowners/users and conservationists, with an independent chairperson. The Board makes a recommendation on each appeal to the Minister who then decides on the outcome of the appeal.

# APPENDIX VII: NATIONAL PARKS AND WILDLIFE SERVICE MANAGEMENT STAFF

## **Conservation Ranger**

Liam Lenihan  
Glenduff  
Ashford  
Ballagh  
Co. Limerick  
Ph (063) 84066  
Email [lleanihan@duchas.ie](mailto:lleanihan@duchas.ie)

## **District Conservation Officer**

Stefan Jones  
Government Buildings  
St Conlon's Road  
Nenagh  
Ph (067) 32386  
Email [sjones@duchas.ie](mailto:sjones@duchas.ie)

## **Deputy Regional Manager**

Tom Ryan  
Tircullen  
Tallow  
Co. Waterford  
Ph (058) 56260  
Email [tryan@duchas.ie](mailto:tryan@duchas.ie)

## **Regional Manager**

Dr. Enda Mooney  
Government Buildings  
St Conlon's Road  
Nenagh  
Co. Tipperary  
Ph (067) 44135  
Fax (067) 32386  
Email [emooney@duchas.ie](mailto:emooney@duchas.ie)

## **Divisional Manager**

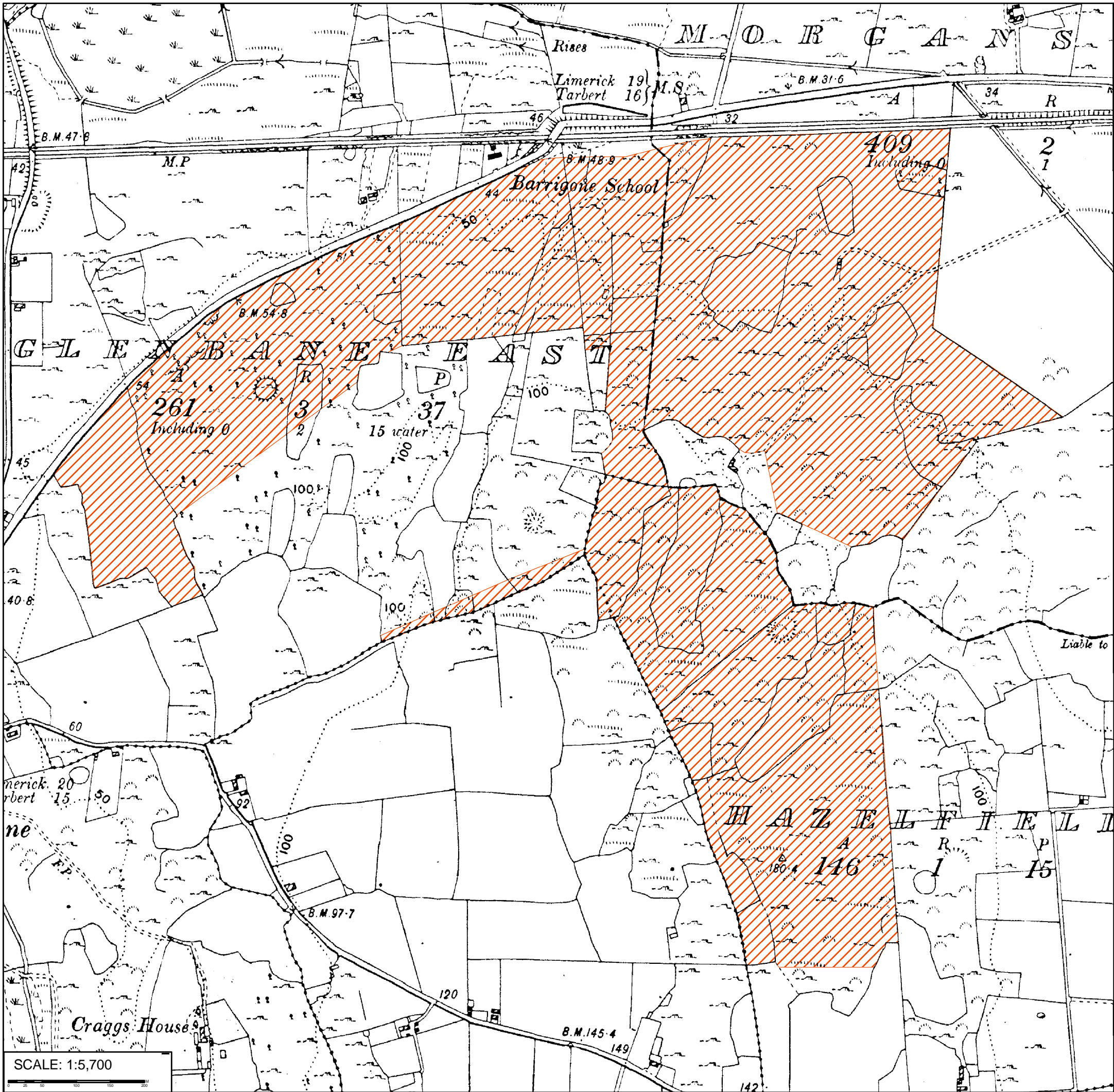
Paddy O Sullivan  
Killarney National Park  
Muckross House  
Killarney  
Co. Kerry  
Phone (064) 70150  
Fax (064) 33926  
Email [posullivan@duchas.ie](mailto:posullivan@duchas.ie)

## **Divisional Ecologist**

Dr. Jervis Good  
Government Buildings  
Sullivan's Quay  
Cork  
Phone (021) 4961920  
Email: [jgood@duchas.ie](mailto:jgood@duchas.ie)

## **National Parks and Wildlife Service**

The Department of the Environment, Heritage  
and Local Government  
7 Ely Place  
Dublin 2  
Phone Lo Call 1890 202021, (01) 8882000  
Fax (01) 8883272  
[www.npws.ie](http://www.npws.ie)

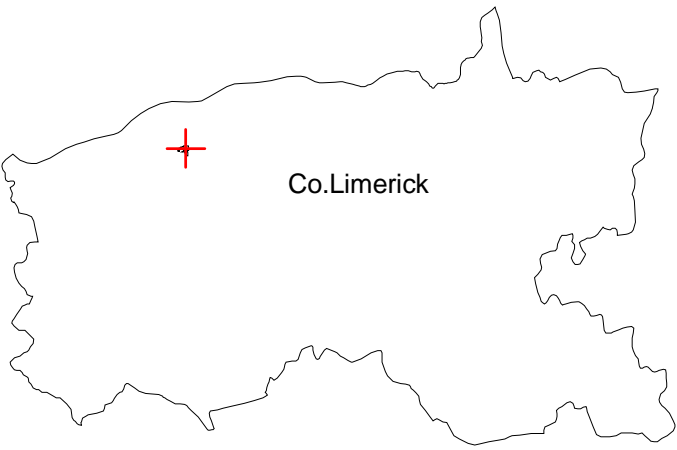
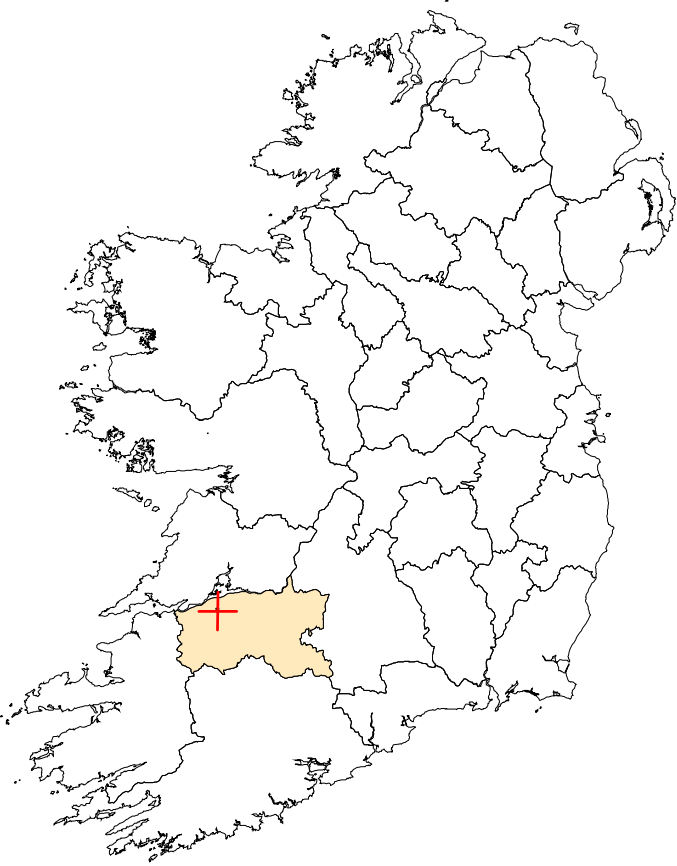


CEANTAR SPEISIALTA CAOMHNATHE  
CANDIDATE SPECIAL AREA OF CONSERVATION

BARRIGONE 000432  
Version 1.01

The mapped boundaries are of an indicative and general nature only.  
Boundaries of designated areas are subject to revision.  
Reproduced from Ordnance Survey material by permission of the Government (Permit number 5953).

Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta.  
Féadfar athbheithnithe a déanamh ar theorainneacha na gceantar comharthaithe.  
Macasamhail d'ábhar na Suirbhéaracha Ordonáis le chead ón Rialtas (Ceadúnas Uimh. 5953)



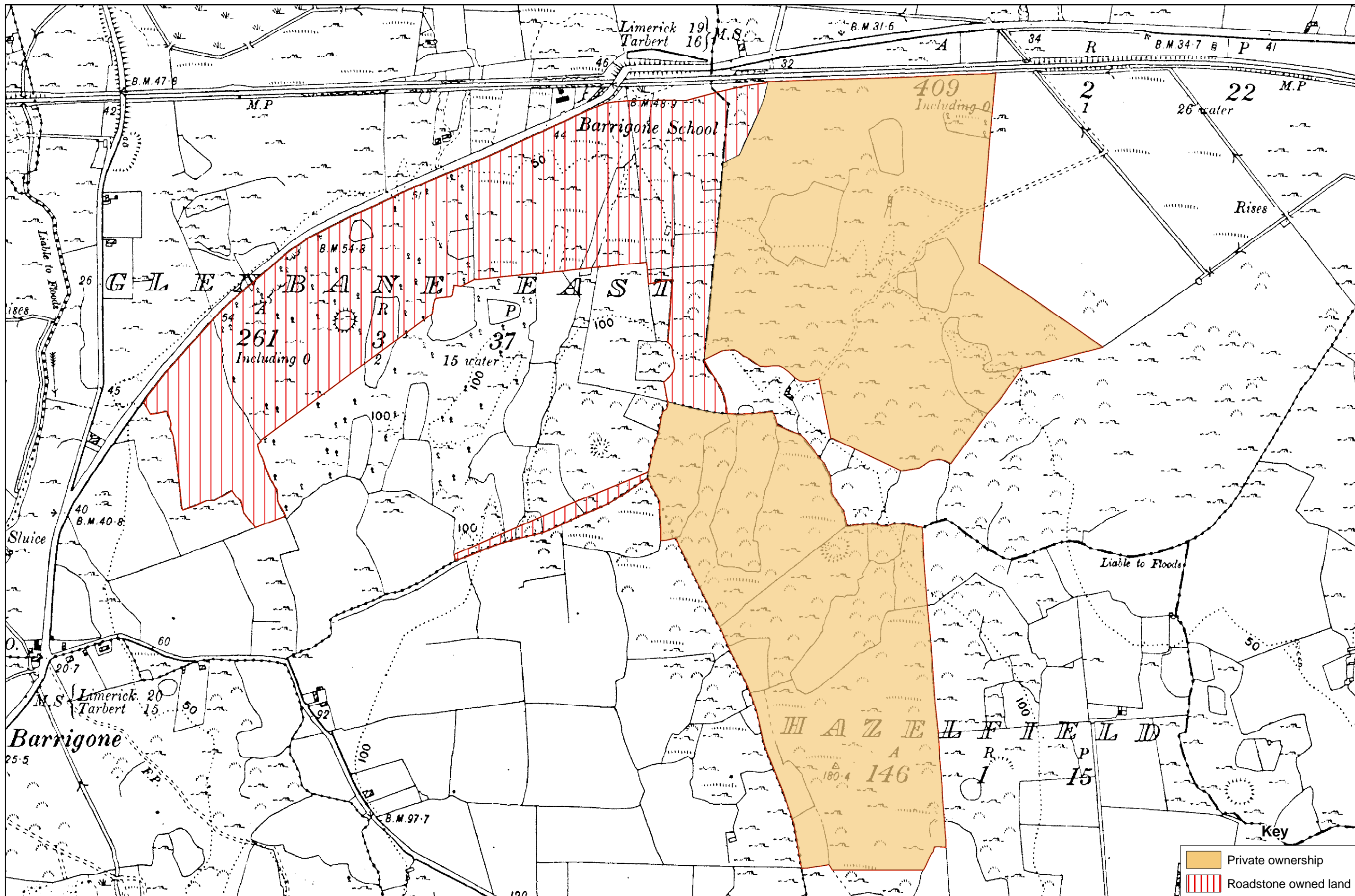
Map 1  
LOCATION MAP: BARRIGONE SAC 000432

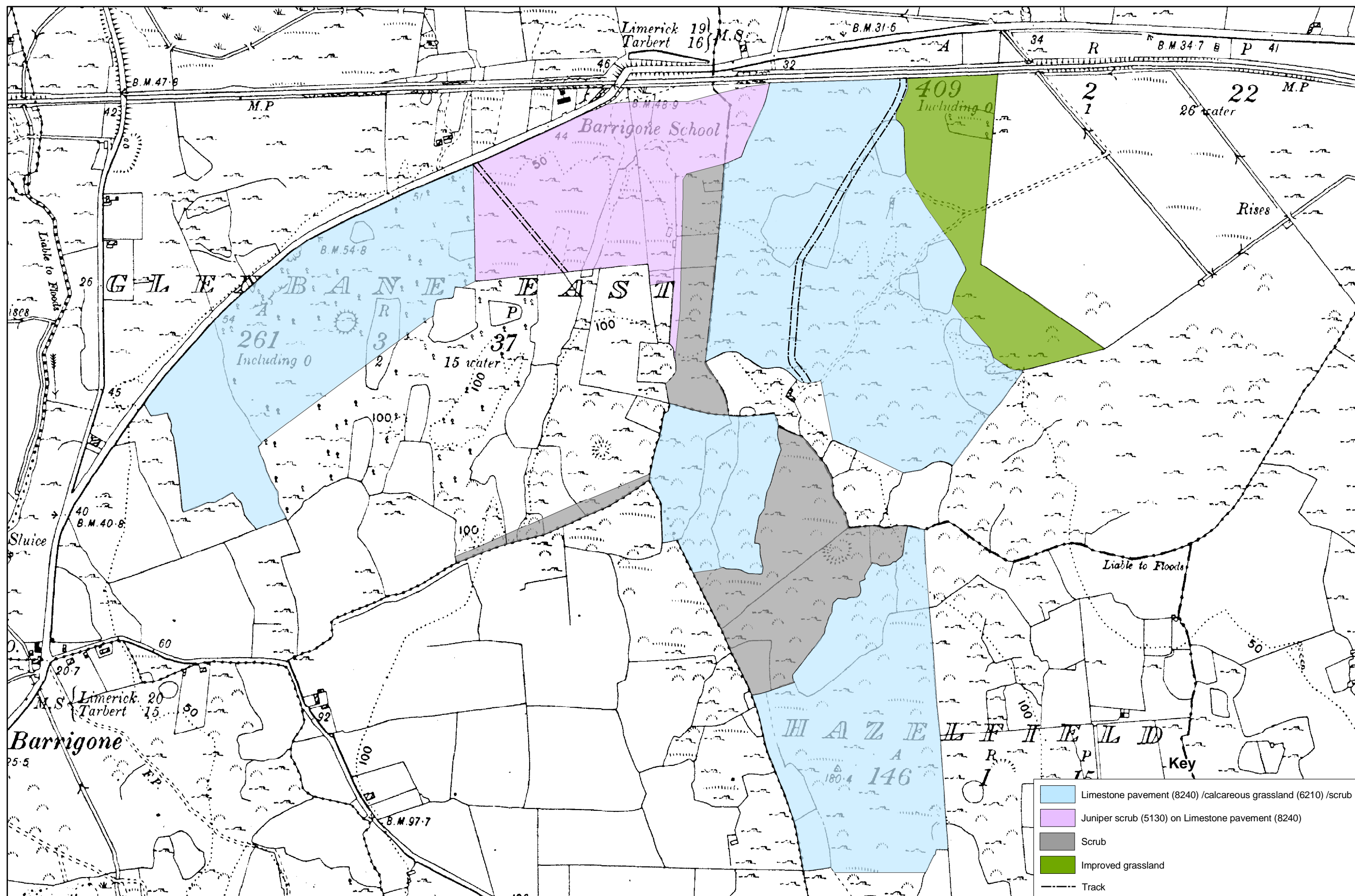


Department of Environment, Heritage and Local Government  
An Roinn Comhshaoil, Oidhreacht agus Rialtais Áitiúil

Co-financed through 'Life' EU funding  
Chomh-mhaoinithe trí chiste 'LIFE' an AE





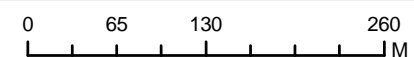


CEANTAR SPEISIALTA CAOMHNAITHE  
CANDIDATE SPECIAL AREA OF CONSERVATION

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Reproduced from Ordnance Survey material by permission of the Government (Permit number 5953).

Níl sna teorainneacha ar na léarscáileanna ach ndóigheas gearrátha. Féadfaid athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaíthe. Macasamhail d'ábhar na Suirbhéaraachta Ordonáis le chead ón Rialtas (Ceadúnas Uimh. 5953)

BARRIGONE SAC 000432



Scale 1: 5,500

### MAP 3: INDICATIVE HABITAT MAP

Map to be read in conjunction with conservation plan

SITE CODE

000432

Version 1.01

Date: Feb 2004



