



Strasbourg, 21 December 2011
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T-PVS/DE (2012) 6

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

**GROUP OF SPECIALISTS -EUROPEAN DIPLOMA OF PROTECTED AREAS
9-10 FEBRUARY 2012, STRASBOURG
ROOM 14, PALAIS DE L'EUROPE**

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**APPLICATION PRESENTED BY THE DEPARTMENT OF ARTS,
HERITAGE AND THE GAELTACHT, IRELAND**

“THE BURREN REGION”

*Document prepared by
the Directorate of Culture and Cultural and Natural Heritage*

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Information form for new application for the European Diploma of Protected Areas

Logo European Diploma	Council of Europe European Diploma Information form for Candidate Sites
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This form is also available on diskette

Site code (to be given by the Council of Europe)									
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1. Site identification

1.1. Site name

The Burren Region

1.2. Country	Ireland							
1.3. Date of application	2	0	1	1	1	2	0	9
1.4. Site information compilation date	2	0	1	1	1	1	3	0
	Y	Y	Y	Y	M	M	D	D

1.5. Addresses: administrative authorities

National authority	Regional authority	Local authority
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1.6. Addresses: site authorities

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1.7. Summary description

The Burren (from the Gaelic word Boireann or ‘rocky place’) is located along Ireland’s Atlantic coastline, between the counties of Clare and Galway. Extending over 720km², it is widely considered to be Ireland’s flagship heritage landscape. The Burren is widely renowned for its striking glacio-karstic limestone landforms, an archaeological legacy that spans six millennia, and a very rich and diverse array of habitats and species. In recognition of these attributes, much of the region has been designated as part of the Natura 2000 network, while the region has also been awarded Geopark Status and is listed on Ireland’s Tentative list of World Heritage Sites. But the Burren is a living landscape, and the hundreds of farm families who own and farm the Burren are the basis of its future conservation. This role is being supported in a very innovative and pioneering way through the Burren Farming for Conservation Programme which supports the sustainable management of this exceptional landscape.

1.8. European interest justifying the application

The Burren is an extensive area (72,000ha) that is defined by the presence of exposed karst. The ‘core area’ of this application is less than 50% of this area and consists of three ‘Special Areas of Conservation’ which are part of the Natura 2000 network of sites. These sites are exemplary in terms of the scale, quality and condition of priority Annex I habitats (as defined under the EU Habitats Directive) present. These habitats include:

Limestone pavement - a glacio-karstic feature of limited distribution in Europe. The core area accounts for c.60% of the National area of this habitat which is of exceptionally high quality and contains an excellent array of karren (microsolutional) features.

Orchid-rich limestone grasslands are closely associated with the Burren which is estimated to contain over 25% of the National area of this priority habitat.

Turloughs are seasonal lakes found in limestone areas and contain many unique plant and animal species. An Irish speciality, turloughs are very common in the eastern Burren.

Petrifying springs with tufa formations are found scattered across the Burren, where the calcium rich water precipitates out to coat the local vegetation.

Cladium fens are another priority habitat found widely in the east Burren.

The Burren is probably best known for the profusion of plants which are considered rare elsewhere and the unique plant assemblages that see the juxtaposition of arctic-alpine and northern European species with southern European and Mediterranean species. The Burren also contains a number of rare plants protected under the Flora Protection Order (1999) - the narrow leaved helleborine (*Cephalanthera longifolia*), small white orchid (*Psuedorchis albida*), hairy violet (*Viola hirta*) and chives (*Allium schoenoprasum*). Several Irish Red Data book species of plant and animal are also found within this area.

Part of the core area of the Burren has been designated as a National Park. The smallest of Ireland’s National Parks, the Burren National Park is less than 5% of the core area but is of exceptional importance given the range and quality of habitats present. It contains examples of all the major habitats within the Burren: Pavement, Calcareous grassland, Hazel scrub, Ash/hazel woodland, Turlough, Lake, Petrifying spring, cliff and fen.

Beyond the ecological significance of the Burren, its geological value has also been recognised by the award (in 2011) of membership of the UNESCO-supported Global and European Geoparks Network.

Furthermore, the importance of the Burren as a Cultural landscape has been recognised through its listing (since 1992, reviewed in 2010) on Ireland’s tentative list of World Heritage Sites as an outstanding example of human interaction with the environment. It has yet to be put forward for

nomination to the full list.

Finally, the Burren is also home to the most successful and innovative conservation programme in Ireland, 'Burren Farming for Conservation' which currently manages 42% of the core area of this application on a modest budget of €1.2m per annum (of which €1m goes directly to farmers for conservation friendly works). The BFCP is based on the BurrenLIFE project (winner of a 'Best of the Best' LIFE Nature award 2011) and has been presented as a Flagship project by the EC on the theme of 'Financing Natura 2000'. It is anticipated that this programme will expand in the Burren in the years ahead until 2014 and thereafter through the next RDP cycle (2014-20). The scheme is unique in that it is the only Pillar I agri-environment support operated across the EU. The scheme is a model for other member states but also for the future management of other terrestrial designated sites and HNV areas in Ireland.

The Burren is also home to a pioneering Burren Charter initiative which seeks to help conserve, and sustainably manage, the Burren through a community led approach. This is loosely based on the French model of Regional Park Charters.

1.9. Selection methodology

Natura 2000 Designation The reason for the selection and nomination for designation by the National Parks and Wildlife Service of the three SACs that form the core area of this application was the presence of the priority habitats (Section 1.8) and species therein, and the need to protect these habitats and their associated species. Areas of low conservation value were not included except, in some cases, as buffer sites (to help protect water quality for instance). www.npws.ie

Burren National Park Located in the southeastern corner of the Burren and over 1500ha in size, this area was purchased by the Government for nature conservation and public access. www.burrennationalpark.ie

Geopark Award A European Geopark must comprise a certain number of geological sites of particular importance in terms of their scientific quality, rarity, aesthetic appeal or educational value. The Burren and Cliffs of Moher Geopark application was coordinated by Clare County Council through the Burren Connect project, with the support of the Geological Survey of Ireland and Shannon Development. The Burren was selected for nomination in recognition of the established network of specific sites of geological interest, (geosites) the existing Burren Ecotourism Network, and association of education and conservation organisations - and a very busy annual calendar of community-based events and activities. www.burrenconnect.ie/geopark

Tentative World Heritage Site Listing A Tentative List is an inventory of those properties which a country intends to consider for nomination to the World Heritage List. In October 2008, the Minister for the Environment, Heritage and Local Government set up an Expert Advisory Group to review Ireland's Tentative List of properties for future nomination to the World Heritage List. The review was undertaken during 2008 and 2009, when the Group considered which properties best met the criteria required for inscription on the World Heritage List. Following public consultation, assessment of proposals and consideration of submissions, the new Tentative List was approved by the Minister and submitted to UNESCO in March 2010. www.worldheritageireland.ie/tentative-list

The Burren was selected for inclusion on this list based on two main criteria: Criterion (v): that it is 'an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change' and Criterion (viii): that it is 'an outstanding example representing major stages of earth's history, including the record of life, significant ongoing geological processes in the development of landforms, or significant geomorphic or physiographic features'.

The Burren Community Charter Project This pioneering project which commenced in 2010 brings together a wide range of Burren stakeholders – farmers, conservationists, tourism interests, local authorities – to work together to safeguard the Burren while supporting the local economy and enhancing community wellbeing. The Burren was chosen as the pilot area for this initiative on the basis of the progress being made at a local level in the areas of sustainable farming, tourism and education. www.burrenbeo.com/trust/burren-charter

The motivation for the designation of the core area as Natura 2000 sites was determined by article 6.1 of the Habitats Directive: “to establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans, and appropriate statutory, administrative and contractual measures which correspond to the ecological requirements of the natural habitat types in Annex I and the species in Annex II present on the sites”. This designation is designed to restore, maintain or enhance the overall conservation status of the habitats and species found in the sites in question.

Burren National Park This park was purchased by the Government for nature conservation and public access. As an IUCN Category II Park it is managed mainly for ecosystem protection and recreation. It is in a very spectacular location and has a number of particularly interesting turlough species present.

The motivation behind the European Geopark award is to ensure that no loss or destruction, directly or via sale, of the geological values of a Geopark occurs and that local inhabitants can re-appropriate the values of the territory's heritage and actively participate in the territory's cultural revitalisation as a whole.

The motivation behind the World Heritage Site Convention is to promote cooperation among nations to protect heritage around the world that is of such outstanding universal value that its conservation is important for current and future generations. If the Burren is nominated successfully in future this could also help encourage sustainable tourism development in the region.

The main aim of the BFCP is to ensure the sustainable agricultural management of high nature value farmland in the Burren.

The main aim of the Burren Charter is to safeguard the Burren, its people and heritage while supporting the local economy and enhancing the community life of its residents.

Date of first examination Date of expert visit

Y	Y	Y	Y	M	M	D	D			Y	Y	Y	Y	M	M	D	D

Y	Y	Y	Y	M	M	D	D			Y	Y	Y	Y	M	M	D	D

2.1. Site centre location

Longitude Latitude

0	0	5	3	°	0	2	′	1	6	″	N	0	9	°	0	4	′	3	3	″
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W/E (Greenwich)

2.2. Area (ha) 2.3. Site length (km)

Total Area					7	2	,	0	0	0										
Core					3	0	,	4	6	2										
Buffer							,													
Transition							,													

Total area: The Burren as per the attached map of the Burren Farming for Conservation Programme Area; Core: The 3 SACs contained in BFCP area

2.4. Altitude (m)

Minimum Maximum Mean

0	0	0	0					0	3	3	0					0	1	5	0
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2.5. Administrative region

Region name % cover

County Clare																		7	0
County Galway																		3	0
Marine area not covered by the terrestrial part																			

3. Natural heritage

3.1. General abiotic description (Geomorphology, geology and hydrogeology)

The Burren is composed of Carboniferous limestone, sculpted by glacial, tectonic and solutinal forces and shaped by six thousand years of human activity. It forms an almost-horizontal plateau, reaching average altitudes of 2-300m in the north and 1-200m in the south, bounded by steep scarps and intersected by valleys with richer, brown-earth soils where farming activity is increasingly concentrated. The eastern part of the Burren is, in contrast, very flat and low lying, c.20-30m above sea level on average.

The characteristic limestone that earned the Burren its name (from the gaelic word Boireann, meaning rocky place), were laid down some 340 million years ago, during the Carboniferous period. This visibly fossil-rich limestone is up to 800m thick in places, and is arranged in distinctive tiers or bands that are separated by lines of weakness in the limestone, or in some cases by thin layers of shale. A thick cover of this Namurian shale was once deposited on top of the Burren limestone, and though glaciation stripped much of it away, outcrops still remain contrasting starkly with the surrounding limestone.

Through the action of glaciers, and the solutinal effects of rainfall, the Burren's limestone has been, and continues to be, sculpted over time into a rich array of unusual forms. These include enclosed depressions known as poljes and dolines, disappearing lakes called turloughs, and innumerable networks of caves. These are collectively referred to as karst features. At a more

minute scale, the mild natural acidity of rainfall gradually burns through the exposed limestone to form innumerable etchings – ridges, hollows and runnels – collectively referred to as karren features. The Burren is so rich in these glacial, karst and karren features that it is widely recognised as one of the finest examples of a ‘glaciated karst’ landscape in Europe.

The soils that sporadically clothe the skeletal limestone of the Burren are mainly rendzinas: a very thin (usually <5cm), dark, free-draining organic soil that dominates many upland grasslands. Rendzinas are quite limited agriculturally, but are well suited to winter grazing, as they are very resistant to poaching, and remain relatively dry and warm throughout the year. These thin soils retain little moisture, are usually heavily leached, and thus nutrient-poor, facts of enormous ecological significance.

Elsewhere in the Burren, deeper and more fertile mineral soils are found, usually deposited by glaciers (running north-east to south-west) along valleys or hillsides, often forming distinctive green islands or pockets that contrast with the surrounding rocky grey expanse. These boulder clay soils are quite free draining and fertile, eminently suitable for tillage or silage production or year round grazing.

It has been claimed, with some justification, that water, not rock, is the essence of the Burren. Most of the water courses in the Burren have worked their way underground over thousands of years, forming labyrinthine networks of caves, both fossil and active. Some of these water flows reappear suddenly and briefly after heavy rainfall. Others, such as turloughs are usually slower to respond, rising and falling in accordance with fluctuations in the water table.

3.2. Habitats

Within the core area of the Burren there are sixteen Annex I habitats, five of them listed as ‘priority’ habitats. The quality and extent of these priority habitats found within the Burren region is unrivalled elsewhere in Ireland. Accurate estimates of the relative proportions of various habitats present in the Burren are difficult to assess as the landscape is composed of a mosaic of bare pavements, orchid rich grasslands, dry limestone heaths and, increasingly, pockets of scrub. Classification of this vegetation has proven notoriously complex, with the main vegetation communities present having been described as a ‘continuum’ between rich mesotrophic grasslands and depauperate limestone heaths, with a range of *Sesleria*-dominated calcareous grasslands in between.

The main habitat present in the Burren is limestone pavement. This is a priority habitat (8240) for conservation under the EU Habitats Directive, and it is estimated that almost 18,000ha of this habitat are found within the core area. Limestone pavement consists of blocks of limestone bedrock, known as clints, separated by fissures called grikes. A variety of pavement forms are visible – smooth, blocky and shattered. Many of the pavements are very well developed with impressive arrays of karst and karren features.

Orchid-rich, dry calcareous grassland is a priority habitat (6210) for conservation under the EU Habitats Directive. Widespread in the Burren, which contains over one quarter of the estimated 6,000ha of orchid-rich calcareous grasslands remaining in Ireland, these include unimproved or semi-improved dry grasslands on thin soils that are rich in calcium. They are normally species-rich with an abundance of orchids as well as classic ‘Burren’ species such as *Gentiana verna* and *Dryas octopetala*.

Turloughs are a priority habitat (3180) for conservation under the EU Habitats Directive. These are areas where a depression in a limestone area is intermittently flooded mainly from groundwater. The water levels fluctuate markedly during the year, generally flooding in winter and drying out during the summer months. They normally fill through underground springs and swallow holes. Across the turlough basin the flooding depth and duration vary and there may be some pools of permanent water in the centre.

Petrifying springs are a priority habitat (7220) for conservation under the EU Habitats Directive. Springs occur throughout the Burren in areas where there is an upwelling of calcareous groundwater or seepage from the limestone. Areas of wetland vegetation are associated with the springs. Tufa formation and marl deposition occur in a relatively small number of the Burren springs and these are said to be 'petrifying'.

Calcareous fens with *Cladium mariscus* are a priority habitat (7210) for conservation under the EU Habitats Directive. Calcareous fen vegetation is associated with the springs, turloughs and lakes of the Burren. Fed by base-rich waters they contain a variety of plants including black bog rush and many sedge species. In the south east of the Burren some of the fens include greater fen-sedge.

A large number of other habitats are found in the core area including lowland dry grassland, hazel scrub, alpine and subalpine heaths, juniper scrub, hard water lakes, lowland hay meadows, semi-natural woodland and improved agricultural grassland.

The site does not include the adjacent (predominantly) marine SAC (Galway Bay Complex) which borders the Burren to the north and west, or the 3 SACs that comprise the Aran Islands in Galway Bay. While these sites are also of immense value, the current focus is the management of habitats in the Burren. A LIFE+ application was submitted in 2011 for an extension of the type of works carried out in the Burren to the 3 Aran Islands.

3.3. Flora

The Burren region is thought to contain over 640 of Ireland's 900 native plant species in less than 0.5% of its area, including many species of very limited distribution. Four plant species found in the project area are protected under the Flora Protection Order (1999) - the narrow leaved helleborine (*Cephalanthera longifolia*), small white orchid (*Psuedorchis albida*), hairy violet (*Viola hirta*) and chives (*Allium schoenoprasum*). Several Irish Red Data book plant species are also found within this area. But the reputation of the Burren has more to do with the abundance of otherwise 'rare' species and the unique communities where plants from Arctic, Alpine and Mediterranean climes grow side by side, rather than the presence of any particular rarity.

The pavement flora is dominated by a limited array of species which invariably include: mountain avens (*Dryas octopetala*), wall lettuce (*Mycelis muralis*), wild thyme (*Thymus praecox*), burnet rose (*Rosa pimpinellifolia*), carline thistle (*Carlina vulgaris*), wood sage (*Teucrium scorodonia*), herb robert (*Geranium robertarium*), blue moor grass (*Sesleria caerulea*), dark-red helleborine (*Epipactis atrorubens*), and ferns such as rustyback (*Asplenium ceterach*), wall rue (*Asplenium ruta muraria*) and harts tongue (*Asplenium scolopendrium*) and a rich array of mosses including *Breutelia chrysocoma*, *Ctenidium molluscum* and *Neckera crispa*. The lusitanian maidenhair fern (*Adiantum capillis veneris*) and Irish eyebright (*Euphrasia salisburgensis*) are strongly associated with this habitat.

Very species-rich, the grassland pastures of the Burren contain orchid species such as the pyramidal orchid (*Anacamptis pyramidalis*), frog orchid (*Coeloglossum viride*), fragrant orchid (*Gymnadenia conopsea*), bee orchid (*Ophrys apifera*), fly orchid (*Ophrys insectifera*), Autumn lady's tresses (*Spiranthes spiralis*) and spotted orchids (*Dactylorhiza* spp.) among others. It is within these pastures that the dense flowered orchid (*Neotinea intacta*) – a Mediterranean species – is found, growing in the company of the Arctic mountain avens and alpine spring gentian (*Gentiana verna*).

The most common plant species present in the limestone grasslands of the Burren are blue moor grass (*Sesleria caerulea*), bird's-foot trefoil (*Lotus corniculatus*) and tormentil (*Potentilla erecta*), but the diverse flora also features characteristic species such as bloody cranesbill (*Geranium sanguineum*), ladies bedstraw (*Galium verum*), eyebrights (*Euphrasia* spp.), yellow rattle (*Rhinanthus minor*), squinancywort (*Asperula cynanchica*), harebell (*Campanula rotundifolia*)

and mountain everlasting (*Antennaria dioica*).

Intermixed with these grasslands, particularly on more exposed rocky areas, are a range of limestone heaths, frequently in a community characterised by mountain avens and slender St. John's Wort (*Hypericum pulchrum*). A rarer Alpine-Boreal type heath dominated by mountain avens but including juniper (*Juniper communis*), crowberry (*Empetrum nigrum*) and bearberry (*Arctostaphylos uva-ursi*) also occurs. Where levels of grazing are quite low, Burren grasslands tend to develop a rather species-poor flora dominated by blue moor grass (*Sesleria caerulea*), bryophytes and in some areas purple moor grass (*Molinia caerulea*) and heathers (*Calluna vulgaris*, *Erica cinerea*).

The turloughs support and mix of aquatic and terrestrial plants which grow in specific zones according to their ability to withstand submersion. Shrubby cinquefoil (*Potentilla fruticosa*) is a red data species that occurs in profusion around the upper flood zone of many turloughs in the Burren. They are also home to species including northern bedstraw (*Galium boreale*), fen violet (*Viola persicifolia*) and the prostrate form of alder buckthorn (*Frangula alnus*) - food plant of the Irish Annulet moth (*Odontognophos dumetata hibernica*).

In some places, particularly where grazing levels have been low for some time hazel (*Corylus avellana*) and blackthorn (*Prunus spinosa*) scrub is encroaching onto pavements and grasslands. Well-grazed, wind sculpted yew (*Taxus bacatta*), spindle (*Euonymus europaeus*), juniper (*Juniperus communis*), holly (*Ilex aquifolium*) and guelder rose (*Viburnum opulus*) are also quite common components of Burren scrub communities, particularly on pavement areas. Somewhat more frequent are whitethorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*) and mountain ash (*Sorbus aucuparia*), where a good soil cover exists.

3.4. Fauna

The Burren's rich range of habitats enables a good diversity of animals to survive. The core area contains two mammals listed on Annex II of the Habitats Directive, the otter (*Lutra lutra*) and an internationally important population of the lesser horseshoe bat (*Rhinolophus hipposideros*). In addition, the Irish Red Data book species badger (*Meles meles*), Irish hare (*Lepus timidus hibernicus*) and the internationally important Pine marten (*Martes martes*) are also found here, among 13 animals listed in the Irish Red Data book.

The most common large mammal is the feral goat (*Capra hircus*), large numbers of which roam the Burren. Reptiles present include the slow worm (*Anguis fragilis*) and green lizard (*Lacerta viridis*) while over 70 species of land snail are also known from the Burren, as are all of Ireland's native bat species.

The core area contains over 100 breeding birds, including the Annex I bird species chough (*Pyrrhocorax pyrrhocorax*), whooper swan (*Cygnus Cygnus*), Bewicks swan (*Cygnus columbianus bewickii*), Greenland white-fronted goose (*Anser albifrons flavirostris*), golden plover (*Pluvialis apricaria*), ruff (*Philomachus pugnax*), peregrine falcon (*Falco peregrinus*), hen harrier (*Circus cyaneus*) and merlin (*Falco columbarius*), and seven regularly occurring migratory birds not listed on Annex I.

The Burren is very rich in butterflies - twenty-nine of Ireland's thirty-five residents and regular migrants are found in the region. Three species are more or less limited to this area - the pearl bordered fritillary (*Boloria euphrosyne*), the wood white (*Leptidea sinapis*) and the brown hairstreak (*Therla betulae*). Moths are also very common including the endemic sub-species of the Burren green (*Calamia tridens occidentalis*) and the Irish Annulet (*Odontognophos dumetata hibernica*) neither of which are found elsewhere in the world. The transparent Burnet moth (*Zygaena purpuralis*) is also very common. The water-beetle (*Ochthebius nilssoni*) is found in Burren lakes, the only known location outside of Sweden.

The existence of flower-rich habitats over a considerable area means that the Burren is an

important refuge for many species of bumblebee that are in decline elsewhere including the shrill carder (*Bombus sylvarum*), Red-shanked carder (*Bombus ruderarius*) and great yellow bumblebee (*Bombus distinguendus*).

3.5. Landscape

The Burren is bounded by water on two sides: by Galway Bay to the north and by the Atlantic Ocean to the west. The southern limit is broadly defined by the expanse of wet, Namurian shales running from the town of Doolin in the south west, looping around to Corofin via Kilfenora. The eastern limit is more difficult to define as the terraced hills of the west yield to vast expanses of low-lying pavement known as the 'Gort lowlands' which stretch as far east as Gort, and as far north as Ardrahan or beyond, in Co. Galway. It is estimated that the Burren uplands region (rising to a height of 300m) occupies 36,000ha, while the Burren lowlands to the east cover a similar area.

The lowland Burren landscape is quite flat, except for the occasional presence of rounded hills (drumlins). The lowlands contain a large number of wetlands – lakes, turloughs, fens and bogs – many of which are very oligotrophic and of high conservation value.

The upland area in contrast is defined by its terraced hills (rising to c.300m on average) the NE slopes of which have been rounded by glaciers. Occasional drumlins and valleys provide a contrast to the stark limestone which otherwise dominates – these areas are the focus for farming and settlements.

The 'underwater' Burren landscape is often overlooked aspect of the region. The Burren limestone extends north into Galway Bay and west into the Atlantic where it emerges to form the Aran Islands, an outcrop of low-lying limestone islands which share many similarities with the Burren's natural and cultural heritage. A dedicated Natura 2000 site – the Galway Bay complex (Site Code 268) – covers almost 14,500ha of this area (mainly marine) - but is not included in the core area of this application. This area is of great significance for a range of marine, recreational and commercial activities.

4. Cultural heritage and socio-economic context

4.1 Cultural heritage

The Burren, though barren by name and appearance, is paradoxically rich in built heritage. It has been aptly likened to 'one vast memorial to bygone cultures' such is the wealth and diversity of heritage in the region. Monuments from as far back as the Stone age grace the Burren, testament to the attraction that this area held for farmers, and the ample supply of building stone readily available. The inherent unsuitability of these hills to the plough or bulldozer helped to preserve these monuments, many of which were sacrificed elsewhere in Ireland in the process of reclamation and cultivation.

The richness and diversity of the Burren's built heritage is truly stunning. A large number of Stone Age tombs are found in the region, from the Neolithic (New stone age) period. These included the iconic 5,500 year old Poulmabrone portal tomb (one of two in the Burren), five court/chambered tombs (c.5,000 years old) and over 70 wedge tombs (c.4,500 years old). One of the lesser known stone age features is the extraordinary network of slab walls which defined the settlements of the Burren's Stone age farmers and can be still seen on the region today.

The Bronze and Iron Ages are also well represented in the Burren with hundreds of Fulacht fiadh (ancient cooking sites, c.3,500 years old), burial cairns with multiple cist graves, several ring barrows and a number of important artefacts. Later, in the early Christian period, hundreds of massive stone forts (Cashels) were built all over the Burren to protect livestock, among them the magnificent triumvallate (three-walled) Cahercummaun fort. Later on in the Medieval period, tower houses were built and over 20 may still be seen today. The Burren contains Ireland's

highest density of ecclesiastical sites, with spectacular examples at Oughtmama, Corcomroe and Kilfenora. The round tower at Kilmacduagh is the tallest and best preserved of its kind in Ireland. Of lower profile, but no less interesting, are the vast assortment of traditional farming structures that are found in the Burren, contributing to what must be regarded as one of the most representative and well-preserved agricultural landscapes in Europe. Cahers and cros for rearing goat kids, turf thuiles, sheep folds and puickets, herdsman's stone cottages, rainwater collection tanks, famine roads and pathways all survive in profusion, reflecting the extent to which, and ingenuity with which, the Burren was once farmed.

The fact that the Burren hills boast such a diverse, representative wealth of monuments, many of which appear to blend seamlessly into the surrounding landscape, has contributed to its inclusion in the list of Ireland's Tentative World Heritage Site list as a 'Cultural Landscape' of outstanding universal value.

4.2 Socio-economic context

Traditionally the Burren was a predominantly rural society. Most economic and social activities would have occurred at a very local level, centred on the local shop, pub and post office. In recent years the social and economic life of the Burren has radiated outwards. The population has increased and large numbers of people, who now live here, work elsewhere, commuting daily to the large urban centres of Galway, Shannon and Limerick. Many of the new houses dotted along the coastal zone are holiday homes, only occupied on a seasonal basis by people from outside the area.

The main settlement nodes create a necklace around the edges of the Burren. Ballyvaughan, Kinvara and Ballinderreen lie along the northern shoreline; Fanore and Doolin on the west; Lisdoonvarna, Kilfenora, Kilnaboy, Corofin and Ruan to the south and Crusheen, Gort and Ardahan to the east. The only exceptions are Carran, Boston and Tubber, small farming communities located within the Burren.

The most recently available population statistics at local level are from the 2006 Census. The estimated population in 2006 was 18,178 people. There is an increasing urban settlement pattern with the main population growth being in the vicinity of the existing villages and towns and particularly concentrated along the main road corridor in the east of the study area. The more rural areas across the centre of the region are becoming increasingly depopulated.

The two main industries in the Burren today are agriculture and tourism, though both have struggled in recent years. Agriculture, which was traditionally dominant, has seen a huge fall off in numbers employed as holdings were consolidated and increased mechanisation took place. Today c.1,000 farm families live in the Burren. Most of these families have an off-farm income and the majority of them specialize in suckler beef production. Other farm sectors – dairying, sheep, tillage – and now only practiced by a few specialised farmers, as compared with the mixed farming system of old.

Large numbers of visitors pass through the Burren every year and a significant tourism industry has developed. However as an industry tourism remains very seasonal (May-August inclusive) and short-stay. The Burren has a relatively limited infrastructure (roads, accommodation etc) which will be difficult to develop. Efforts are being made to attract long-stay visitors who are attracted by specialist pursuits such as botanising, walking etc and a new ecotourism network has been established.

A few other enterprises survive in the Burren – a college of art, a perfumery etc – but most businesses are tourism related and are increasingly capitalising on the Burren's growing reputation as a heritage landscape. Such businesses include tour guides, information centres, heritage attractions (caves, forts etc), accommodation and food provision.

The recent (2011) development of a Community Charter for the Burren represents an important

development, enabling local communities and organisations to take a more active role in the sustainable management of their place and capitalising on the Burren's unique attributes to help ensure better opportunities and a better quality of life for its people.

5. Educational and scientific interest

The Burren has enormous potential as a 'learning landscape' due to the presence of such a wide range of geological, archaeological and ecological features. It is undoubtedly the most researched landscape in Ireland, with hundreds of scientific papers, books and articles written about it over the past 60 years in particular. It is a favourite destination for field trips by schools and universities from all over the world.

In terms of 'educational infrastructure' the Burren has:

The Burrenbeo Trust – a registered charity specialising in education and information provision. It has a resource centre (Kinvara), a portal website for the Burren (www.burrenbeo.com), a heritage education programme for local schools (Eco Beo), a 120 strong conservation volunteers group (name?), monthly walks, talks and e-newsletters.

The Burren Outdoor Education Centre, Turlough – run by the Vocational Educational Committee this specialises in outdoor learning through recreation.

Burren National Park Centre, Corofin – an information centre established by NPWS in 2011 from where guided walks of the Park can be availed of.

The Burren Centre, Kilfenora – a co-operative which provides information on all aspects of the Burren. One of a number of information centres in the Burren, mainly privately run.

The Burren Connect Project – specialising in sustainable tourism, this provides information through signage and information points and supports a local ecotourism network.

The Clare Farm Heritage Tours Co-op – a group of local farmers who take it in turns to host daily tours of their Burren holdings.

National University of Ireland Galway – runs a field research centre (Carron) and a marine research centre (Finavarra) in the Burren which hosts students and researchers on a regular basis.

Guided tours are widely available in the Burren with 4-5 full-time tour guides in the area.

In terms of research, the Burren has acquired a massive associated bibliography and continues to accumulate scientific papers and laypersons publications at an extraordinary rate.

One of the most significant research projects to take place in recent years was that conducted through the 5-year 2.25m BurrenLIFE project which produced some very significant findings on key land management issues. These findings are being implemented across the Burren through the Burren Farming for Conservation Programme.

A major research project named 'BioChange' also took place in the Burren recently. This was an integrative, multi-disciplinary research framework to support national and local biodiversity policy in Ireland. Core research within the project addressed the protection and management of ecological resources in the context of pressures that might lead to environmental change by focusing on habitat fragmentation and loss, impacts of non-native species, climate change, pollution and resource management. The aims of the project included developing fundamental biodiversity research and capacity building in taxonomic skills, as well as the development of biodiversity indicators and biomonitoring tools. Two cross-cutting research projects targeted the production of inventories and output of taxonomic data and the understanding of socio-economic processes that shape biodiversity policies. BioChange also had the aim to bring together groups of researchers from normally disparate areas to develop a coherent research framework that could develop strategically beyond the current project funding.

6. Site description

6.1. Vulnerability

A number of factors threaten the integrity of the natural and cultural heritage of the Burren. As the Burren is predominantly a farmed landscape, and has been for over 5,500 years, the most pressing threats to the Burren arise from the 'imbalance' that has arisen in recent decades between farming and the local environment.

1. Loss of traditional management This is by far the most significant and widespread threat to the heritage of the Burren at present. The number of farmers in the Burren is steadily decreasing and the manner in which these farmers manage their holdings has changed dramatically. Increasingly, farm activity is focused on the more fertile and accessible areas to the neglect of the heritage-rich areas of rough grazing. Grazing seasons have been shortened with the introduction of supplementary feeding and the construction of animal housing. Farming systems have become far more specialised and the breeds of cattle have changed. Farmers need to operate more efficiently to survive and the rough nature of the Burren makes this difficult. High levels of legislation and bureaucracy in this 'protected' landscape also militate against active management.

As a result of these and other factors, many areas of the Burren have seen a major decline in grazing levels. As a result, biodiversity values are declining and scrub is encroaching at a significant rate. Currently 15-20% of the Burren is covered with scrub. This is threatening biodiversity, monuments and farmers livelihoods. This is being addressed under the Burren Farming for Conservation Programme, with incentives being provided for scrub removal and traditional grazing systems.

2. Intensification of land use. Farmers in the Burren have had to adapt to changes in policies, markets, costs and technologies in recent decades. One of the most obvious changes has been the increased intensity of management on more accessible and fertile areas of land which have seen their output increase hugely through the application of manure, chemical fertilisers and the use of new machinery. Excessive levels of inputs may have implications for the biodiversity, water quality, monuments and landscape values of these areas, particularly in a landscape as significant and sensitive as the Burren. This is being addressed under the Burren Farming for Conservation Programme, with traditional low input grazing of winterages being advocated and a diminishing dependence on silage feeding.

3. Tourism. Tourism in the Burren is largely seasonal and focuses mainly on the western Burren. Overall, damage through tourism is relatively limited, though there are common incidents of trampling damage, pavement disturbance and littering. Efforts are currently underway to promote the Burren as an ecotourism destination through the Burren Connect Project www.burrenconnect.ie

4. Development pressures. A range of developments – mainly domestic housing but also some land reclamation – take place in the Burren every year but these are usually subject to the rigours of the planning process and may require Ministerial consent. Mining of limestone pavement for ornamental purposes or for making limestone chip still occurs in non-protected areas but in general development pressure is relatively low at present.

5. Invasive species: This threat includes that posed by invasive exotics such as cotoneaster (*Cotoneaster integrifolius*), sycamore (*Acer pseudoplatanus*) and red valerian (*Centranthus ruber*). The major threat, however, is from invasive natives, particularly hazel (*Corylus avellana*), blackthorn (*Prunus spinosa*) and bracken (*Pteridium aquilinum*). While these species were once strictly controlled, often through harvesting for a variety of purposes, today these control measures no longer exist and therefore high levels of encroachment occur. This is being addressed under the Burren Farming for Conservation Programme, with incentives being provided for scrub removal.

6. Socio-economic change The Burren depends on the presence of a thriving community to continue to manage it and to sustain important traditions such as winter grazing. The local community have a huge bank of knowledge and experience in this regard and are a key resource

for conservation. Unfortunately rural communities in the Burren are dying out and the age profile is increasing all the time. Schools, post offices, pubs and shops are closing down, further accelerating the rate of decline. This relates to the lack of employment opportunities and to what locals feel are excessive demands that must be met to secure planning permission in a highly protected landscape. The loss of rural communities seriously undermines our future capacity to manage the landscape and so is a very real threat. Funding of farmers through the Burren Farming for Conservation Programme indirectly supports the farming family model by recognising the value of farming in preserving biodiversity.

6.2. Protection status

As a geographical region, the Burren has no single protection mechanism. However, a significant part of the Burren has been selected for designation under the European Habitats Directive as 'Special Areas of Conservation (SAC)' and forms part of the Natura 2000 network. The three main terrestrial SACs which form (100% of) the 'core area' for this application extend to 30,462ha, which in itself represents c.42% of the wider Burren Region.

These SACs are:

The Black Head – Poulsallagh Complex (Site code 0020, Area 5,572ha, notified in 1997, 18.3% of core area)

Moneen Mountain (Site code 0054, Area 6,070ha, notified in 1997, 19.9% of core area)

The East Burren Complex (Site code 1926, Area 18,820ha, notified in 1997, 61.8% of core area)

These SAC designations succeeded previous designations such as ASIs (Area of Scientific Interest) and the more recently proposed NHAs (Natural Heritage Area). Within the East Burren Complex SAC alone, some 21 Areas of Scientific Interest were originally designated. Draft Conservation Management Plans have been developed for these SACs (Section 7.1).

Under the SAC designation, certain activities have been restricted and a list of 'Notifiable Actions' have been prepared for each of the habitats present. The primary management objective for each of the Burren SACs is 'to maintain and where possible enhance the ecological value of the priority habitats present', habitats such as orchid-rich grasslands, limestone pavements, Cladium fens, turloughs and petrifying springs'.

Under cross compliance rules, farmers must make an annual declaration that they are in compliance with all relevant legislation, including the Habitats Regulations. Sanctions to single farm payments are applied to those who are found to be in breach or who have not sought the consent of NPWS prior to undertaking a prescribed activity.

The Burren National Park was officially designated in 1991 under Category II of the international criteria set down by the World Conservation Union (IUCN) for National Parks and other protected areas. This category involves management mainly for ecosystem protection and recreation. Slieve Carran Nature Reserve, which also lies in the East Burren Complex, was established in 1986 and is part of the network of Biogenetic reserves.

The Burren is also listed as being of Outstanding Amenity value in the County Development Plan for Clare. In the Galway County Development Plan the 'Burren area along the Galway-Clare border' is listed as a Category 2 High Scenic Amenity area. The Burren is considered to be of major significance in the County Heritage Plan for Clare.

6.3. Ownership

The majority of the Burren is in private ownership with c.1, 000 farmers farming in the region today. While there are some 'commonly owned' areas (commonages) it is estimated that these areas account for <5% of the overall area. Within the 'core area' of the three SACs the only areas of public land are the Burren National Park and Slieve Carran Nature Reserve. The total area of these two sites is 2014.2ha, which represents 6.6% of the core area. Thus, within the core area it

is estimated that c.90% of the land area is privately owned farmland.

6.4. Documentation

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7. Site management

7.1. Management plans

The three designated areas which form the core area for this proposal had Draft Management Plans prepared in the period 1999-2000. These unpublished plans are attached. The Burren National Park has also been the subject of a Draft Management Plan (2009), which has yet to be finalised. These plans have been superseded by developments in recent years, in particular developments in 'farming for conservation' through BurrenLIFE and BFCP.

The Burren Farming for Conservation Programme takes a different approach to management planning with a focus on farm-level plans which are renewed on an annual basis. The plans are governed by the three core objectives of the BFCP:

- To ensure the sustainable agricultural management of high nature value farmland in the Burren.
- To contribute to the positive management of the Burren landscape and the cultural heritage of the Burren.
- To contribute to improvements in water quality and water usage efficiency in the Burren.

Currently 143 BFCP Farm plans covering c.12, 910ha (42.4%) of the core areas have been

compiled with this number expected to grow in future. A sample farm plan is provided in the Appendix. These farm plans are very concise and user friendly, and they are very much 'farmer-led' in terms of the proposed work programmes.

BFCP plans clearly outline all monies allocated to the farmer under three Measures - Measure 1: The production of species rich grassland, Measure 2: Site enhancement works (including scrub removal) and Measure 3: Protection of designated land and other areas of Annex 1 habitat.

Measure 3 payments are relatively small any cover the farmers cost in complying with 'notifiable actions' listed as part of the SAC designation.

Measure 2 works include the removal of scrub, restoration of stone walls, installation of 'conservation infrastructure' (water, access etc) and habitat restoration. Payments are predicated on works being complete to a high standard and farmers cover a percentage of the cost (c.33% on average) of all works undertaken.

Measure 1 payments are output based, depending on the condition of the Annex 1 habitats on the area in question. This is a key innovation in the work of the BFCP. Based on field-level assessments of habitat condition by the farm advisor, each SAC/Annex I field is given a score from 0-10. This score is the basis on which an area-based payment is made. In year 2 of BFCP for example, 908 fields (7,178ha) were 'scored' and €420,114 was allocated to farmers on the basis of these scores. This innovative approach is incentivising the "production" of biodiversity at farm level. The farmer sees that the better (environmental) quality his land is in, the more likely he/she is to receive a premium payment.

7.2. Budget and personnel

The National Parks and Wildlife Service have direct responsibility for managing the designated (core) areas. Two full time park rangers, based in Ennis to the south of the Burren, have responsibility for on-site management. These rangers report to the District Conservation Officer and he in turn reports to a regional manager. The work of the rangers is supplemented on a seasonal basis by the employment of 2-4 General Operatives who undertake conservation activities in the Burren National Park and Slieve Carron Nature Reserve. Additional budgets are made available annually to contractors for the removal of scrub for example, also for the provision of signage and information. In 2011 NPWS opened an information centre in the town of Corofin from where three staff provided information and guided walks for visitors on a seasonal basis.

The NPWS also finances the operation of the Burren Farming for Conservation Programme (BFCP) which works closely with local landowners in the management of designated land and other Annex 1 habitat. The BFCP currently allocates €1m per annum to farmers within the designated areas for a range of conservation farming measures. This funding comes from the Dept of Agriculture, Food and the Marine and is annual funding for the period 2010-2013 inclusive. As farmers co-fund some of the works, an additional contribution (e.g. €335,000 in 2011) is made annually by farmers towards conservation farming works. The BFCP has three full-time staff based at its HQ in the central Burren. An additional three part time staff/consultants work with the project, roughly equating to one additional full time position. Over 143 conservation farmers undertake work on the ground under BFCP and it is anticipated that this number will grow in the coming years.

8. Map of the site

8.1. Physical map:

National map number scale projection

Ordnance Survey Ireland Discovery Series	51	1:50,000	Transverse Mercator	
Ordnance Survey Ireland Discovery Series	52	1:50,000	Transverse Mercator	
Ordnance Survey Ireland Discovery Series	57	1:50,000	Transverse Mercator	

Reference to availability of boundaries in digitised form

Boundaries are available on <http://webgis.npws.ie/npwsvviewer/>

8.2. Map of designated sites described in 6.2

Provide this information on a map with the same characteristics as above.

8.3. Aerial photograph(s) included:

	√		
Yes	Yes		No

Number Area Subject Copyright Date

1			Black head – Poulsallagh Complex SAC	Ordnance Survey Ireland Licence No EN 0059208 © Ordnance Survey Ireland / Government of Ireland.	2005
2			Moneen Mountain SAC	Ordnance Survey Ireland Licence No EN 0059208 © Ordnance Survey Ireland / Government of Ireland.	2005
6			East Burren Complex SAC	Ordnance Survey Ireland Licence No EN 0059208 © Ordnance Survey Ireland / Government of Ireland.	2005

9. Slides

All images taken by Brendan Dunford. All © www.burrenbeo.com

Number Place Subject Copyright Date

1	High Burren	Limestone pavement	burrenbeo.com	2003
2	High Burren	Burren terraces	burrenbeo.com	2001
3	Burren	Burren National Park	burrenbeo.com	2001
4	Burren	East Burren	burrenbeo.com	2002
5	Burren	Poulnabrone dolmen	burrenbeo.com	2003
6	Burren	Neolithic mound wall	burrenbeo.com	2011
7	Burren	Leamanagh Castle	burrenbeo.com	2002
8	Burren	Dry Stone wall	burrenbeo.com	2003
9	Burren	Burren grassland	burrenbeo.com	2011
10	Burren	<i>Gentiana verna</i>	burrenbeo.com	2003
11	Burren	Limestone grassland	burrenbeo.com	2003
12	Burren	Feral goats	burrenbeo.com	2003
13	Burren	Outwintering cattle	burrenbeo.com	2003
14	Burren	Burnet moths	burrenbeo.com	2003
15	Burren	Burren wetlands	burrenbeo.com	2002



