

The Burren – farming for the future of the fertile rock

BurrenLIFE Project



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The Burren is an iconic landscape. It is home to the largest area of limestone pavement in Britain and Ireland and has a unique flora that is internationally renowned. Over 6,000 years of pastoral farming have helped to forge this landscape, and the continuation of grazing is vital to the conservation of the area's rich natural and cultural heritage. Accelerating changes in farming practices over the last three decades are damaging the Burren's heritage. The BurrenLIFE Project was established in 2004 to develop practical solutions to these problems and to help to revitalise farming on the difficult terrain. The project is soon to end, but lessons learned from it can be applied to future nature-conservation efforts here and elsewhere.

Location

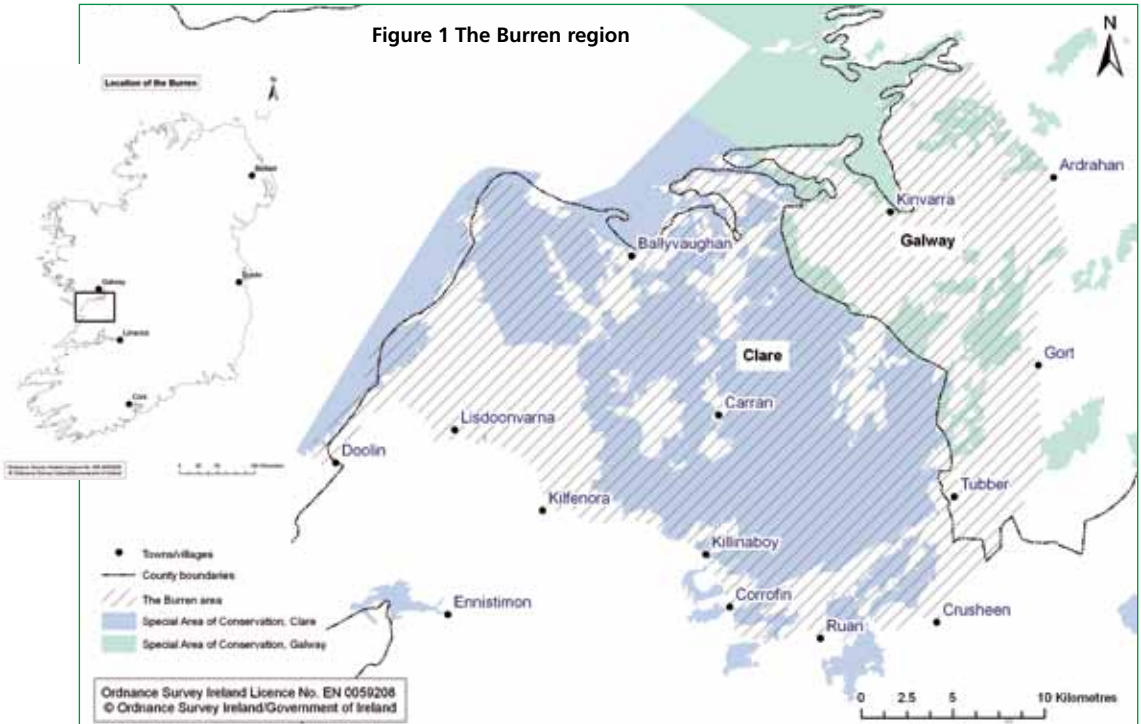
The Burren is situated on the mid-western seaboard of Ireland (Fig. 1) and covers an area of approximately 720km² (277 sq. miles). The limestone geology and mild, oceanic climate have a strong influence on the flora and fauna of the region.

Fauna and flora

Mammals found in the Burren include the Irish Hare *Lepus timidus hibernicus* (a subspecies of the Mountain Hare), Badger *Meles meles*, Otter *Lutra lutra*, Pine Marten *Martes martes*, Stoat *Mustela erminea*, Red Squirrel *Sciurus vulgaris*,

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Figure 1 The Burren region



Wood Mouse *Apodemus sylvaticus*, Bank Vole *Clethrionomys glareolus* and Pygmy Shrew *Sorex minutus*. Feral Goat *Capra hircus* also occurs and it is thought that a rare ‘Old Irish’ goat breed survives in the Burren (Raymond Werner pers. comm.). Eight of Ireland’s ten native bat species have been recorded here, including an internationally important population of the Lesser Horseshoe Bat *Rhinolophus hipposideros*.

The Burren supports seven bird species listed on Annex I of the EU Birds Directive, including White-fronted Goose *Anser albifrons*, Peregrine *Falco peregrinus* and Hen Harrier *Circus cyaneus*. Common Frog *Rana temporaria*, Smooth Newt *Triturus vulgaris*, Common Lizard *Lacerta vivipara* and Slow Worm *Anguis fragilis* are also found here. There are thousands of invertebrate species, including many important pollinators that are in decline elsewhere, e.g. Shrill Carder Bee *Bombus sylvarum*. Notable invertebrates include the Marsh Fritillary *Euphydryas aurinia*, Pearl-bordered Fritillary *Boloria euphrosyne* and Brown Hairstreak *Thecla betulae* butterflies, and the Burren Green *Calamia tridens* and Transparent Burnet *Zygaena purpuralis* moths.

Although the Burren supports a diverse fauna, it is best known for its flora. Three-quarters of Ireland’s 900 native plant species are found here,

including specialities such as the Dense-flowered Orchid *Neotinea maculata*, Spring Gentian *Gentiana verna*, Mountain Avens *Dryas octopetala*, Maidenhair Fern *Adiantum capillis-veneris* and Arctic Sandwort *Arenaria norvegica*. The assemblage of plant species is particularly interesting. It includes Mediterranean/southern European and arctic-alpine species (i.e. from hot and cold climates), open-grassland and dense-woodland species (i.e. light-demanding and shade-tolerant ones) and calcicoles and calcifuges growing side by side. High-altitude alpine plants are found at sea level in the Burren. Many of these species grow in a profusion seen nowhere else in Britain and Ireland.

This striking landscape with its diverse habitat mosaics and colourful flora is not only very attractive, it is also very important in terms of European habitat conservation. The orchid-rich dry calcareous grasslands, limestone pavements, blanket bogs, calcareous fens, turloughs (groundwater-fed temporary wetlands; see Scott & Sheehy Skeffington 2007) and petrifying springs are priority habitats listed in Annex I of the EU Habitats Directive.

Main photograph **Bird’s-foot-trefoil and Bloody Crane’s-bill growing on the Burren limestone.** Bob Gibbons
 Left **Transparent Burnets on Tufted Vetch.** BurrenLIFE Project
 Right **Spring Gentian in the Burren.** Richard Revels





The Burren landscape, with Shrubby Cinquefoil in the foreground. Richard Revels

Other Annex I-listed habitats include hard nutrient-poor lakes, alpine and boreal heaths, Juniper *Juniperus communis* growing on calcareous heaths and grasslands, limestone cliffs and screes, and cave systems. Approximately 30,400ha of the Burren are designated as Special Areas of Conservation (SACs; Fig. 1), of which about 6,000ha are orchid-rich calcareous grassland and 18,000ha are limestone pavement. This is a substantial area of limestone pavement compared with the UK total of 2,600ha (Limestone Pavement Action Group undated).

Past and present farming practices

Farmers have grazed livestock in the Burren for more than 6,000 years, and the thousands of archaeological monuments are testament to this. In the past, livestock grazed the limestone grasslands, heaths and pavements over the winter. This practice is known locally as ‘winterage’ and the areas grazed are called ‘winterages’. Drinking water is more readily available during winter in this usually free-draining karst landscape, while the limestone habitats, with their thin rendzina soils, provide a warm, dry ‘lie’ for stock. In terms of fodder, winterages are essentially a standing hay crop. Livestock were moved to the more fertile lowland pastures for the summer, which allowed

plants on winterages to grow, flower and set seed unhindered. The Burren’s most botanically rich and diverse grasslands and heaths are found on the winterages, owing to the combination of winter grazing and environmental conditions. Plant material accumulated over the summer provides a vital food source for livestock over the winter. However, if these are left ungrazed, the dead vegetation builds up and smothers many of the light-dependent herbs, leading initially to a decrease in species abundance and eventually to loss of species.

Land intensification and abandonment have been identified as the main threats to the natural and cultural heritage of the Burren (Dunford 2002; Parr *et al.* 2009). While advantageous for habitat conservation elsewhere in the country, some aspects of national support schemes for farmers have been potentially damaging to the Burren. For example, the Single Farm Payment scheme encourages stock reductions and grants were available until the end of 2008 for the construction of slatted sheds, both of which are detrimental to the Burren grasslands and heaths as they lead to a reduction in winter grazing.

Present farming practices have changed considerably compared with those from just 30 years ago. This has been driven by changes in market

influences, the Common Agricultural Policy and other factors, such as the ageing farming population and the increase in supplementary, off-farm employment of farmers. A recent survey of farm families in the Burren indicates that the key changes in farming over the last few years are the building of slatted sheds and the related housing of livestock over winter, changes in feeding practices and changes in farm enterprises (Walsh 2009). Farmers indicated that these changes took place to meet entry requirements for the Rural Environment Protection Scheme (REPS, Ireland's agri-environmental scheme), to increase income and to 'make life easier' for the increasing number of part-time farmers and those of retirement age. Housing livestock can be more convenient for checking and feeding animals than are winterage systems, as the animals are easily accessible and the work is not constrained by the long, dark winter nights.

Changes in farming practices have had significant negative implications for habitat conservation in the Burren. Continental crosses have replaced more traditional breeds, calving tends to be earlier to tie in with the export weanling trade, and there has been a shift away from keeping store cattle (cattle waiting to be finished for beef markets) to a suckler-cow system. Feed intake and nutritional requirements are higher for suckler cows, which has contributed to the widespread feeding of silage on winterages and to some farmers housing livestock over winter. Historically, supplementary feeding of stock on the winterages took place only in the most severe weather. Consequently, threats to habitats of conservation importance include scrub encroachment, a decline in plant species richness, poaching and point-source pollution. Such threats are not being adequately addressed by conservation designations under Natura 2000 or national agri-environment schemes such as REPS. One of the key messages of this article is the need for locally targeted and tailored agri-environment schemes, but how can this best be achieved?

BurrenLIFE: A 'farming for conservation' initiative

The BurrenLIFE Project was established to develop practical solutions to agricultural issues that threaten priority habitats in the Burren. This five-year project is the first major 'farming for conservation' project in Ireland. It is 75%-funded



Poul nabrone dolmen, a Neolithic portal tomb.

BurrenLIFE Project

by the EU LIFE-Nature Programme and is a partnership between the National Parks and Wildlife Service, Teagasc (the Agriculture and Food Development Authority) and the Burren Irish Farmers Association. It is a noteworthy factor in the project's success that it brings together all the relevant stakeholders: farmers, researchers, and conservation and agricultural authorities.

Important principles of the project include the development and implementation of practical, local solutions to management problems and rigorous monitoring of the agricultural, environmental and socio-economic implications of agreed management changes. The aim is to have an outcome where the management model is beneficial to the natural heritage and increases the viability of farming in the region, something which is fundamental to the long-term success of conservation efforts in a region where farming is the main land use.

Twenty 'monitor' farms covering more than 3,000ha of farmland, including 2,485ha designated as SAC, are directly involved in the project. Dairy, suckler beef, mixed sheep and beef, conventional and organic enterprises are represented.

Livestock management

Farming for conservation measures included simple ideas based on traditional management practices that are beneficial for both the habitats and farmers. Many of these ideas came from the farmers themselves. Examples of solutions to local problems are presented in Fig. 2. Although presented here as a series of separate issues, the solutions are strongly inter-related and complementary.

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Figure 2 Threats to priority habitats in the Burren paired with measures to address them.

Problems



Housing livestock when winterages need to be grazed



Livestock activity concentrated around feeding points



Grazing areas and/or periods restricted by limited water availability



Lack of influence over grazing distribution (e.g. gaps in internal walls)



Restricted livestock movement around winterages



Scrub encroachment on priority habitats



Solutions



Out-wintering livestock (facilitated by the measures below)



Switching from silage to a specially formulated concentrate feed



Improving water facilities, e.g. installing nose pumps



Restoring internal stone walls



Creating access paths



Clearing encroaching scrub from targeted areas

The practical measures implemented as part of the BurrenLIFE Project aim to encourage and support the grazing of winterages. These include facilitating livestock movement and herding around sites, increasing water availability and restoring internal stone walls. Cutting paths increases access to water sources and areas that need grazing. Providing watering points allows grazing for the duration of the grazing season and improves water quality and animal health. Restoring internal walls facilitates the checking and herding of livestock and more targeted grazing of winterages. All of these measures have the added advantage of providing local employment opportunities for farmers who have the knowledge and skills to carry out the work. Achievements to date include the cutting of approximately 55km of paths and clearance of encroaching scrub (mainly Hazel *Corylus avellana* and Blackthorn *Prunus spinosa*) on 75ha of priority habitats.

In some cases, the restoration or creation of vehicle access tracks is a practical necessity to enable farmers to check and feed livestock on winterages. A system of best practice has been developed, as part of the BurrenLIFE Project, which minimises impacts on priority habitats, archaeological features and the landscape. Access tracks have been created by using limestone chippings that blend into the landscape and can revegetate very quickly.

Grazing and feeding systems

A ‘grazing days’ system has been designed that has a targeted outcome, allows increased flexibility, and is easier for farmers to understand and implement than current agri-environment scheme specifications. A grazing day is one livestock unit/day and the number of grazing days is calculated for a winterage based on the area, forage quality and previous grazing levels. Winter (1st September to 1st May) or late summer and winter (mid-July to 1st May) grazing is recommended depending on forage quality and winterage productivity (or ‘strength’) – weak, medium or strong. Grazing at target levels minimises feed costs, maximises forage usage and affords greater flexibility. For example, 1,800 grazing days in winter were recommended for one medium-strength winterage of 29ha. This means that the farmer should aim to stock 32 cows there for just under two months or 16 cows for nearly four months, and so on.

The nutritional requirements of suckler cows in the last months of pregnancy can be up to 50% higher than those of the store animals that traditionally grazed the winterages. Between January and April, winterages do not provide adequate nutrition for suckler cows, so that supplementary feed is needed. Most farmers therefore resorted to feeding silage and, consequently, livestock foraged far less and spent long periods congregating around feeders, which in turn increased point-source pollution. The BurrenLIFE Project has encouraged farmers to replace silage with concentrate feed and formulated a BurrenLIFE concentrate. This provides the extra protein and energy needed, as well as the full recommended daily allowance of vitamins and minerals.

Together, the tailored grazing systems and the move from silage to the BurrenLIFE ration have benefited both conservation and production; cows forage more, so that grazing levels are much improved, point-source pollution is reduced, farm nitrogen inputs are reduced and animal health is improved, particularly with regard to reduced coccidiosis in calves. The cost of the concentrate feed given at recommended feeding rates over the feeding period is lower than that of feeding silage.

Monitoring

Vegetation-monitoring is being carried out to try to assess the impact of grazing on the relative abundance of the plants present and on the establishment and survival of Hazel seedlings. To date, nearly 1,500 vegetation quadrats have been surveyed, providing a wealth of detailed information. Fixed-point photography has been used to monitor substantial changes such as scrub removal.

Agricultural monitoring (livestock condition-scoring, blood-sampling and animal-health surveys) has allowed us to gauge the effect of any changes in the grazing and feeding regimes. Farmer-opinion surveys have been carried out for each of the 20 monitor farms to compare farmer attitudes near the beginning and end of the project.

All of the project actions have been costed and, when combined with information from the socio-economic monitoring, will facilitate the development of tailored agri-environment support. This support should help to address the unfavourable socio-economic circumstances of farming in marginal agricultural areas.

Case study

Philomena Hynes is a farmer participating in the BurrenLIFE Project. Her farm covers approximately 140ha, of which 124ha are designated as part of a SAC. There are several habitats on the farm, including limestone pavement, species-rich calcareous grassland and limestone heath. The farm is divided into 19 management units. The farming system is suckler-beef production with approximately 35 suckler cows. Calves are generally born in February and March and sold during September and October.



Philomena Hynes.

As can be seen from the aerial photograph (Fig. a), a large proportion of Philomena’s farm is winterage. The dominant habitats on the winterage are limestone pavement, species-rich calcareous grassland and limestone heath, with a substantial proportion of Hazel scrub (Fig. b). Winter grazing is the main land use on the winterage, with stronger winterage areas also grazed in late summer or extensively grazed year-round (Fig. c). The grazing-days system means that Philomena knows how much grazing each management unit needs to get the desired results, while it affords her the flexibility to work around variable weather conditions and farm events such as calving. Additional measures carried out on this farm include creating access tracks and paths, clearing areas of encroaching scrub, repairing internal stone walls, switching from silage to a concentrate feed, and installing gates and watering points (Fig. d).

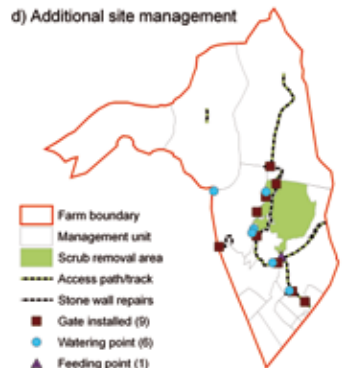
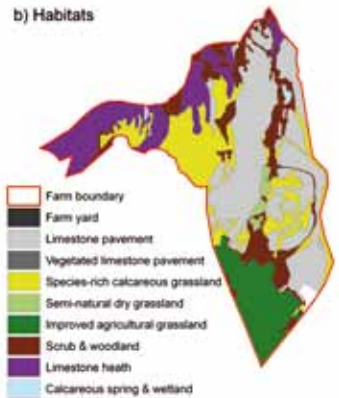
These measures are complementary. For example, the main access track enables Philomena to get feed to a more central feeding point, giving a concentrate feed instead of silage encourages her cattle to forage, clearing encroaching scrub allows cattle to access relatively good forage and, in turn, their grazing helps to suppress scrub encroachment and maintain species-rich grasslands. Constant water availability throughout the grazing period is essential to enable cattle to remain on the winterage, and intact internal stone walls facilitate more targeted seasonal grazing of grassland areas to achieve optimum habitat condition.

The access paths and tracks (through scrub) allow cattle movement between foraging areas and access to feed and watering points, and are necessary for easier herding of animals.

Through the combination of Philomena’s commitment and management recommendations by the BurrenLIFE Project, Philomena has made her winterage considerably easier to farm, maintained livestock health and condition, reduced feeding costs, and improved the ecological value of priority habitats on her farm. She has highlighted how the project helped her to ‘secure access to part of the winterage for the feeding of concentrate’, and as a result she has managed to phase out feeding silage on her winterage. Philomena is very passionate about the work of the BurrenLIFE Project and considers it to be ‘a very practical scheme for the preservation of the Burren’. She is keen ‘that the project will continue after the five-year term and that more farmers will be able to partake in it’.



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Demonstration farms

The best way to convince local farmers of the efficacy of conservation measures is to demonstrate them on actual, working farms. Regular demonstration days on the BurrenLIFE monitor farms have provided farmers and advisers with the opportunity to see and discuss measures such as grazing, feeding and scrub control. This allows the wider farming community to contribute to the development of the proposed measures.

Community involvement and raising public awareness

A better understanding of the heritage and environmental value of the region by the wider community is important in gaining support for conservation initiatives such as the BurrenLIFE Project. The project includes an extensive public-awareness and heritage-education programme targeted at a broad range of audiences, including schoolchildren, local communities, researchers/scientists, farming advisers, policy-makers, government representatives and the general public.

In response to a report commissioned by the project on marketing opportunities for Burren farm produce, the Burren Beef and Lamb Producers' Group was set up. This brings together local farmers who produce and market high-quality meat while actively conserving priority habitats. It raises the profile of farming for conservation while increasing the financial viability of farming in the Burren.

Thoughts for the future

Important factors in the success of the BurrenLIFE Project include involving the local community through ongoing liaison work, having a central office location, promoting the work of the project, taking a multi-disciplinary approach (i.e. ecology, agriculture and socio-economics) and forming working relationships with all involved. These are important considerations in the development of future conservation initiatives and agri-environment schemes.

Habitat assemblages and their management requirements are highly variable within and between countries, yet agri-environment schemes are generally implemented at a national level without being targeted at distinct geographical regions of high nature value (European Environment Agency 2004). The Burren is a prime example of a distinct geographical region that requires an agri-environment scheme tailored to address

local issues. It is worth emphasising that, even at a regional level, schemes need some degree of flexibility (e.g. in grazing and supplementary feeding periods) to allow for between-year variation in weather conditions. Management recommendations to emerge from the BurrenLIFE Project have gained overwhelming support from the local farming community. This project shows that targeted actions, developed and implemented with the full support of local farmers, funded on the basis of work done and closely monitored, can provide excellent value for money. For these reasons, the project provides a model for future conservation efforts in the Burren and beyond.

Acknowledgements

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Weblinks

- Additional information on the BurrenLIFE Project is available online at www.burrenlife.com and a three-minute clip of the project's DVD can be viewed at www.youtube.com/watch?v=8vxeF3Y1ne8&feature=channel_page
- Regional examples of high nature-value farming across Europe can be viewed at www.efncp.org/hnv-showcases

Bryony Williams was the GIS technician and an assistant ecologist with the BurrenLIFE Project. Sharon Parr is the Project's scientific co-ordinator, Brendan Dunford is the project manager and Ruairi Ó Conchúir is the finance and operations officer. James Moran was a conservation/ecology specialist with Teagasc.

****British Wildlife readers' trip to the Burren****
British Wildlife has arranged for a special trip to the Burren in May 2010 in association with Bob Gibbons' Natural History Travel. See page 76 for further details.