

FARMING FOR NATURE

THE ROLE OF
RESULTS-BASED PAYMENTS



EDITED BY
EILEEN O'ROURKE & JOHN A. FINN

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FARMING FOR CONSERVATION IN THE BURREN

BRENDAN DUNFORD AND SHARON PARR

THE BURREN, LAND OF PARADOX

The Burren, *An Bhoireann*, place of stone. Lunar landscape, fertile rock. A landscape abounding in contradictions: apparently barren, desolate hills that continue to sustain a rich and lengthy agricultural tradition; an inhospitable terrain that is saturated with evidence of 6,000 years of human activity; a region dominated by bare rock and whipped by Atlantic winds, yet one which provides refuge and sustenance for a wide diversity of plants, some of which are normally at home in regions as disparate as the Arctic, the Alps and the Mediterranean.

The paradoxical, and deceptively fertile, nature of the Burren has always captured the imagination: from 1317 AD we hear of the '*Burren's hilly grey expanse of jagged points and slippery steeps, nevertheless overflowing with milk and yielding luscious grass*' (O'Grady, 1929). In 1651 the Cromwellian soldier, General Ludlow (cited in Ó Dálaigh, 1998), famously noted:

'Of this barony it is said that it is a country where there is not water enough to drown a man, wood enough to hang one, nor earth enough to bury them. This last is so scarce that the inhabitants steal it from one another and yet their cattle are very fat. The grass grows in tufts of earth of two or three foot square which lies between the limestone rocks and is very sweet and nourishing'.

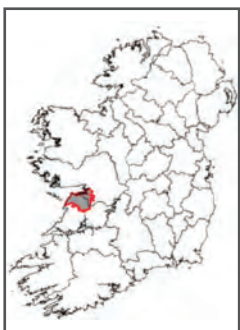
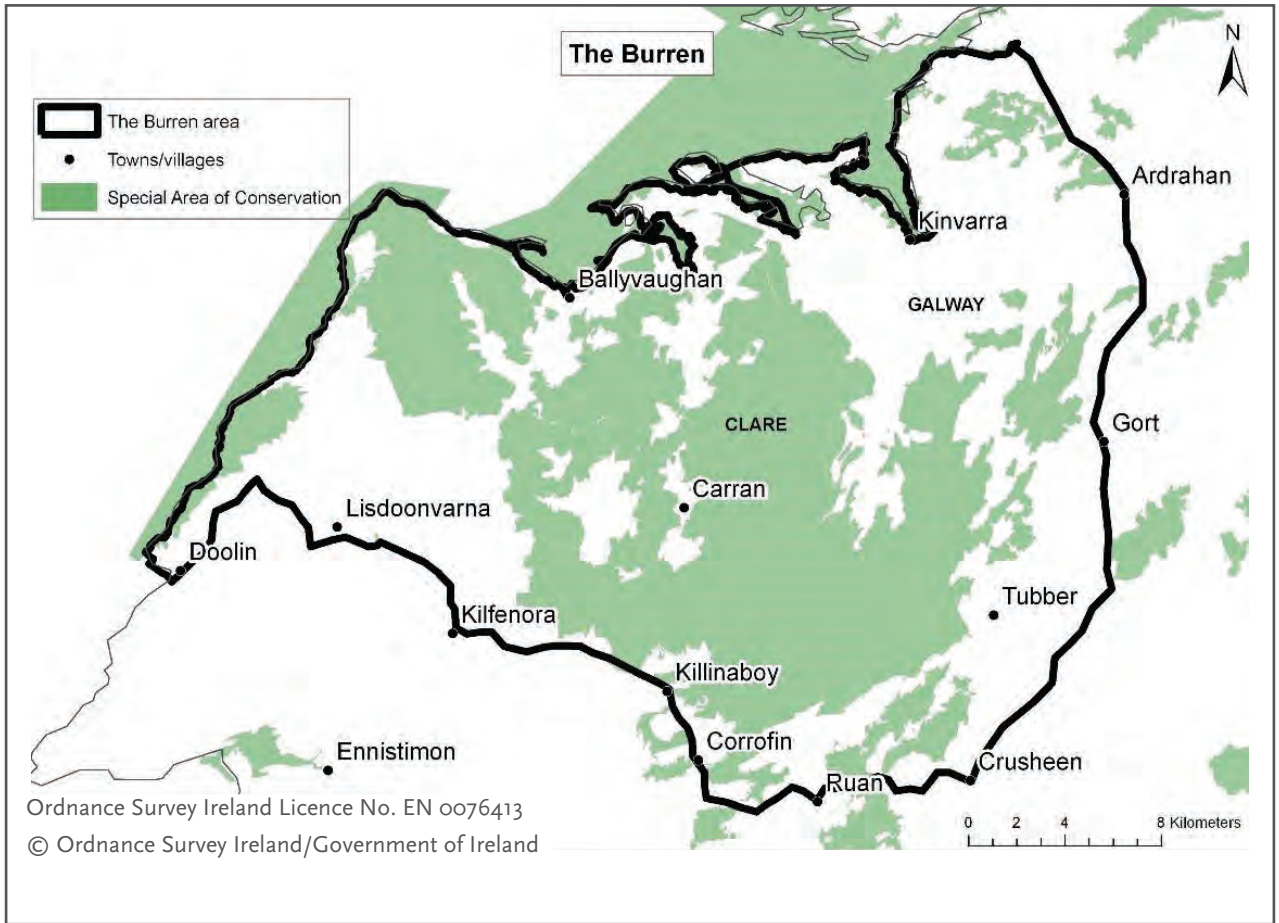


Figure 3.1

Location map of the Burren region (72,000 ha) with SAC designated areas in green

The Burren – extending over an estimated 72,000 ha of land in Counties Clare and Galway (Figure 3.1) – is defined by the presence of exposed limestone – the calcium-rich skeletal remains of marine organisms (e.g. sealilies, ammonites, urchins, corals and brachiopods) that populated the warm, shallow equatorial seas of the Carboniferous period, 340m years ago. Over time, these remains were compressed and elevated to reveal the massive, fossil-rich limestone terraces which we see today. These were shaped by a combination of water solution (creating macro ‘karst’ and micro ‘karren’ solutional features), tectonic forces and several periods of glaciation. While this stunning geological heritage (Figure 3.2) has recently been recognised through UNESCO Geopark Status, for farmers the limestone bedrock has always been valued for the ‘dry lie’ which it affords to overwintering cattle, akin to an underfloor heating system which keeps livestock warm, dry and sheltered.



The story of farming in the Burren goes way back to 5,800 years ago when Poul nabrone Portal Tomb in the central Burren was built – now recognised as the oldest known structure built by farmers in Ireland. The entire landscape has been described as ‘*one vast memorial to bygone cultures*’ – agrarian for the most part – by cartographer Tim Robinson (Robinson, 1999) with 6,500 years of human impact traceable through the region’s extraordinary archaeological palimpsest (Figure 3.3). Farming and the Burren is an old story, but this story has been evolving very rapidly in recent years.

Figure 3.2
Burren limestone pavements with clint-grike features

BOX 3.1 THE BURREN'S NATURAL HERITAGE

The natural wealth of the Burren includes over 70% of Ireland's native flora – the beauty, diversity and intrigue of which has been described in a wide array of publications, TV and radio programmes. A reflection of the quality and scale of this biodiversity is the designation of over 30,000 ha of the terrestrial Burren as Special Area of Conservation (SAC) under the EU Habitats and Species Directive (92/43/EEC) (see Figure 3.1) and an additional 2,000 ha designated as Special Protection Area under the Birds Directive (79/409/EEC).

The main Burren habitats protected include Semi-natural dry grasslands and scrubland facies on calcareous substrates (6210), Lowland hay meadows (6510), Limestone pavements (8240), Alpine and Boreal heaths (4060), Turloughs (3180), Calcareous fens (7210) and Petrifying springs (7220). This rich biodiversity hosted by these 'priority' habitats includes 23 of Ireland's 27 orchid species and regional specialities such as the Alpine *Gentiana verna*, the Arctic *Dryas octopetala* and the Mediterranean *Neotinea maculata* whose main British and Irish populations occur in the region. Other relatively common species - such as *Campanula rotundifolia*, *Antennaria dioica*, *Galium verum* and *Geranium sanguineum* are said to 'flourish so much more exuberantly in the Burren than elsewhere in Ireland' (Webb and Scannell, 1983), (see Figure 3.4)

The Burren is one of the best surviving areas for bumblebees in Ireland, it is home to at least half of the 570 macro-moths recorded in Ireland and 30 of Ireland's 34 butterfly species. Over 60 species of snail are found in the Burren, as are most of Ireland's native bat species. Ireland's only native reptile, the common lizard (*Zootoca vivipara*) and the introduced slow worm (*Anguis fragilis*) are frequently seen. Farmland

birds such as Yellowhammer (*Emberiza citrinella*), Common Cuckoo (*Cuculus canorus*), Red-billed Chough (*Pyrrhocorax pyrrhocorax*), Eurasian Skylark (*Alauda arvensis*) and Common Linnet (*Carduelis cannabina*) are declining elsewhere but can still be found in suitable Burren habitats, as well as birds of prey such as the Peregrine Falcon (*Falco peregrinus*). Given the diversity, scale, connectivity and condition of the Burren's natural heritage, particularly at a time of 'biodiversity emergency' in Ireland, its value cannot be overstated, nor its continued presence taken for granted. Sustaining this biodiversity is the key objective of the Burren Programme.

A fascinating early insight into the diversity of habitats present in the Burren is offered by the Book of Survey and Distribution (Simington, 1641) which was, as the title suggests, a survey of all lands within various baronies (historical county subdivisions) with a view to their subsequent redistribution. Within the Barony of the Burren some 35 categories of land type are described, which in turn are broken down into 121 grades of different value. Under 'pasture' for instance, there are fourteen different classes, such as 'Dwarfwood pasture' and 'Rockie pasture'. These classes are further differentiated into 69 subdivisions based on profitability, such as 'Rockie pasture 1/3 profit', 'Rockie pasture 1/8 profit', etc. Today we rightly describe such areas as 'High Nature Value farmland' (HNVf).



A PERIOD OF UNPRECEDENTED CHANGE

During the decades following Ireland's accession to the EC in 1973, the relationship between Burren farmers and their landscape changed at a pace and scale that was totally unprecedented. For example, a study by Dunford (2001) estimated that stocking levels in Ballyvaughan Rural District (RD) in the north-west Burren increased from 0.38LU/ha in 1970 to 0.66LU/ha in 2000, a 73% jump over a period when the numbers employed in agriculture in the same RD fell by over 50%.

Figure 3.3

A stone ringfort or caher, part of the Burren's rich archaeological heritage



Figure 3.4
A species-rich Burren
winterage pasture

During this time, it is estimated that approximately 30% of the Burren's archaeological sites were lost due to land reclamation (Hickie, cited in O'Rourke, 2005), which, by the mid-1990s had reached an estimated annual rate of 171 ha (Drew and Magee, 1994, Drew, 1996). The Irish Farmers Journal at the time carried a report on a trial to fertilise Aillwee hill in the Burren via helicopter. The expansion in the area of 'reclaimed' land, combined with increased fertiliser and slurry use, enabled a massive increase in stocking levels and winter fodder (mainly silage) production. Silage was fed liberally on winterages (Figure 3.5) to support the growing numbers of in-calf, continental-cross suckler cows which required nutritional inputs beyond what the Burren winterages could provide. Parts of the Burren effectively became outdoor slatted sheds, though grant aid for the subsequent widespread construction of actual slatted houses mitigated this somewhat. In either case, silage gradually replaced the naturally available forage of the winterage pastures, resulting in reduced levels of grazing which contributed to a loss of biodiversity and accelerated levels of scrub encroachment (Figure 3.6).

There were many factors driving these changes – social, economic,



cultural, political – and many, varied manifestations of them across the several hundred farms in the region. To generalise however, there was a growing polarisation of farming activity between fertile accessible lowlands which became very intensively managed with high levels of mechanical and chemical inputs, and extensive uplands where farming activity steadily declined, trends which still continue today. The environmental implications of this growing imbalance between farming and the landscape were generally very negative, particularly given the rate and scale of these changes.

Of course, this scenario was not limited to the Burren; all across Ireland and Europe there has been a growing polarisation of farming activity in recent decades – particularly an expansion in more intensive farming activity – with consequent biodiversity loss at farm and landscape level. Responding to public concern at this environmental degradation, EU policymakers introduced nature conservation directives and agri-environmental schemes which were in turn to have a major impact on the Burren, adding to the many changes of recent decades and creating a new context into which farming needed to fit.

Figure 3.5
Feeding silage on
Burren winterages
– a major source of
groundwater pollution

Figure 3.6a
Scrub encroachment
on the Burren- Image
of Corkscrew Hill
c. 1900
(Lawrence collection)



Figure 3.6b
Image of Corkscrew
Hill in 2000 showing
considerable scrub
encroachment
(compare with the
exposed rock and
stone walls above).



BOX 3.2

FARMING IN THE BURREN

Today, over 1,500 people in the Burren (from a population of c.15,000) describe themselves as farmers (Central Statistics Office (CSO), 2010). With c. 85% of the region's 72,000 ha farmed, the average farm size is 39.4 ha (CSO, 2010), though this varies widely. Census records show that the age profile of these farmers is increasing, with only 6.7% under 35 and almost 25% over 65.

Given the rocky nature of the Burren, it is a pastoral landscape where 'the cowman, rather than the ploughman is king' (Whelan, in Butler et al., 1985). Most Burren farmers are specialist producers of suckler beef, with a typical herd size of 30-40 cows, usually composed of a mixture of continental-cross (Charolais, Limousin and Simmental) animals. Typically, farmers sell the weanlings from these cows at local sales in autumn where generally good prices are made with many male calves destined for the export market and many of the females sold for breeding. A small number of dairy farms continue to operate in the region, while sheep farming persists mainly in parts of the east Burren. A few farms continue to use the Burren for 'store cattle' though far less so than previously. Very few farmers keep goats or horses, or practice tillage – again in contrast to previous generations when farming systems were more mixed and far less specialised than today.

A highly distinctive attribute of Burren farming systems is the traditional practice of winterage. The poor availability of water in summertime in the free-draining karst of the Burren must have been a factor in the adoption of this reverse form of 'transhumance', which has proven to be a significant factor in shaping the biodiversity and cultural heritage of the region. The thin soils and warm bedrock are ideal for livestock in winter, while the standing crop of herbs and grasses ('foggage') provide a good source of winter fodder. Stocking levels on these areas (usually stocked October-March) are generally low - as low

as 0.1 LU/ha on poor ground but up to 0.56 LU/ha on stronger winterages. The cultural significance of Burren winterage was formally recognised in 2019 when it was included in Ireland's list of Intangible Cultural Heritage; it is also informally celebrated every year through a local festival.

Given the poor returns in the beef sector, and the difficulty in expanding or improving the farm holding, many Burren farm families need to supplement their income with an off-farm source – a far cry from the mixed farm systems which were able to support entire farm families in the not too distant past when farming was a relatively more rewarding profession. This off-farm employment has been a significant factor in pushing farmers to be more efficient in managing their extensive, fragmented holdings, often resulting in a shift in the focus of their activity to the more accessible, fertile lowland fields. As a consequence, the Burren's rockier 'upland' grasslands, home to such a stunning natural and cultural heritage, are increasingly under threat from scrub encroachment.

From palaeoecological and archaeological records (Watts, 1984; O'Connell, 1994; O'Connell and Jelicic, 1994) we know that farming activity in the Burren has ebbed and flowed for six millennia and the landscape has responded accordingly. But when we experience change at a scale, rate and nature (often involving heavy machinery) such as we have witnessed in Ireland since the early 1970s, the implications for the landscape – particularly the Burren's waterworn limestone pavement and stunning archaeological heritage - are much more profound and often irreversible. For a landscape of universal heritage significance such as the Burren (included on Ireland's list of tentative World Heritage Sites) such changes give cause for grave concern and urgent action.

EARLY ATTEMPTS TO MANAGE CHANGE

The EU Habitats Directive was transposed into Irish law in 1997 leading to the designation of Special Areas of Conservation (SACs) – 30,000 ha in the Burren alone, almost 50% of the entire region – a move which set out to, and succeeded in, halting a lot of land reclamation work. In 1994 the first national Agri-Environment Scheme (AES), known as REPS (Rural Environment Protection Scheme), was introduced which, among other things, compensated farmers for compliance with SAC restrictions. This represented a sea-change in Burren farming: – ‘through REPS, for the first time ever, farmers are being asked to move beyond their production-orientated mentality and embrace measures that give conservation of the environment precedence over agricultural production. Such a radical shift in perspective will surely take time to sink in’ (Dunford, 2002a).

SAC designations were not greeted positively by local farmers. A report by the Consultative Committee on the Heritage of the Burren (2000) found that farmers were ‘bewildered and some angered by the lack of proper consultation before their lands were lumbered with SAC categorisation’. Similarly, with the introduction of REPS, Burren farmers were very frustrated at the one-size-fits all approach which, they felt, didn’t sufficiently accommodate the unique agricultural or environmental circumstances of the Burren. A study by Bohnsac and Carrucane (1999) found that REPS was not sufficiently ‘strict, specific and proactive to meet the legally-binding objectives of SAC-designated land, a purpose for which though it was not originally intended, it appears to be used’. As a result of these and other factors, it is reasonable to say that, by the late 1990s, there was deep concern, negativity and division regarding the Burren and its management.

Against this backdrop the Burren Irish Farmers Association (IFA) was established, a coming together of farmers from nine local parish branches of the IFA, initially in direct response to the perceived inappropriateness of the REPS guidelines in the Burren. The group, led by Michael Davoren, helped to successfully negotiate new ‘Conditions for the Conservation of the Burren to be applied under REPS’, which included a number of important concessions which made it possible and financially attractive, for Burren farmers to enrol in REPS. Part of the agreement was that research take place into ‘the effects of REPS practices on member farms ... and results should be used to modify the above-listed conditions’ (Department of Agriculture and Food, 1995). Toward this end, a Teagasc Walsh Fellowship research project

(in conjunction with University College Dublin) was initiated to explore ‘*The Impact of Agricultural Practices on the Natural Heritage of the Burren*’.

Significantly, the research was conducted by a locally ‘embedded’ student over a three-year period during which a great deal was experienced, and learnt, about the essence of the Burren and its farming community and their practices, acquiring knowledge and building relationships. This was particularly important when it came to farmer surveys. The slow, local approach allowed relationships of trust and respect to develop and encouraged farmers to have their say in a more open, honest and natural way than would have been possible through, for example, public meetings, anonymous surveys or time-constrained negotiations with public bodies.

The study culminated in 2001 with the submission of a PhD thesis (Dunford, 2001) which traced the evolution of the relationship between farming and the landscape of the Burren over the past six millennia, with a particular focus on more recent (1970 onwards) changes. Ecological and land management surveys were conducted to explore the impact of various grazing regimes on the region’s grassland flora, while a survey of local farmers was carried out to elaborate on changes in farming systems and on attitudes to the land, its management, as well as views on SAC designation and REPS. Key research findings included:

- The central importance of traditional grazing practices, in particular winter grazing, in maintaining the biodiversity of the Burren, and an appreciation that such practices are complex and highly variable, thus requiring flexibility in their interpretation and application.
- The growing trend towards lowland intensification and upland extensification as the number of Burren farmers declined and as the need for off-farm income grew, resulting in a push for more efficient farming systems, many of which entailed negative environmental scenarios.
- The limitations of restriction-based SAC designations and national AESs in addressing the Burren’s unique needs and, by implication, the need for proactive, locally-targeted, alternatives.

The PhD research findings were published in a user-friendly book form as *Farming and the Burren* (Dunford, 2002a), ‘giving back’ the story to those who contributed to it. This helped to address another interesting research finding - the degree to which local farmers felt excluded and disrespected when it came to the ‘story’ of the Burren and its future evolution.

BURRENLIFE – A BLUEPRINT FOR ‘FARMING FOR CONSERVATION’

The PhD research, combined with the relationships and attitudes that began to flourish through the various publications and other initiatives such as Burrenbeo (see below), were the catalyst for a 2004 application to the EU LIFE Nature fund, a fund dedicated to the sustainable management of SACs across Europe. The project application’s stated objective was to ‘*Develop a blueprint for the sustainable agricultural management of the Annex I habitats of the Burren*’. The proposed approach was simple: to implement a range of management interventions across a selection of twenty working farms covering 2,500 ha of SAC land in the Burren in order to address key environmental challenges identified in the PhD research project, and to monitor the agricultural, economic and environmental impact of these interventions.

Among the key environmental challenges identified were: land abandonment, undergrazing, pollution, supplementary feeding, inappropriate grazing regimes, reduced human intervention and loss of management knowledge. The funding application was successful, as indeed was the subsequent €2.23m BurrenLIFE Project (2005-2010), which was adjudged joint winner in 2017 of the Best LIFE Nature Project in the 25-year history of the fund. Fundamental to this success was the partnership approach, most notably the inclusion of farmers, and the clarity and originality of the proposal which built on the foundations provided by the previous PhD research project.

A team of four locally-based staff were appointed to run the project, some with extensive research experience in the Burren, which allowed the team, and the project, to get off on the right foot, with a good level of trust and credibility. The team was led by a Project Manager (Brendan Dunford) with direct experience of working with local farmers and engaging in scientific research. A Project Scientist (Sharon Parr) was employed to oversee project monitoring and advise on planned works, while a Project Administrator and Office Manager (Ruairí Ó Conchúir) was hired to deal with financial oversight, communications etc. A knowledge transfer and ecological research specialist (James Moran) was seconded from Teagasc for the duration. A former schoolhouse in the central Burren village of Carron was refurbished as a base for the project, placing it firmly in the heart of the Burren farming community. This refurbishment was co-funded by Leader and by local farmers, a testament to their commitment to the project.

BOX 3.3 CO-CREATING SOLUTIONS

The BurrenLIFE project appealed to farmers by striving to be innovative and progressive and not simply reverting to traditional practices: farmers, like most small business owners, like to feel that they are moving forward and not being static or restricted. The project respected farmer's ideas and their role in finding solutions: a good example of this was the issue of silage feeding on Burren winterages, a practice that was causing major direct and indirect environmental damage.

Farmers argued that suckler cows needed additional pre-calving nutrition that winterages could not provide. Testing of forage values across the Burren by the project team confirmed this to be the case. Dr. James Moran and colleagues from Teagasc then led the research to develop an alternative to silage; a supplementary Burren ration (concentrate feed) which met all of the cows' mineral requirements, as well as high protein levels to stimulate their appetite for, and enhance their ability to digest, the rough forage of the Burren. Feeding this at a recommended rate and time obviated the need for silage feeding, as long as there was enough available forage. This new feedstuff (the 'BurrenLIFE ration') was originally milled by Kerry foods; today, five companies produce this widely-used ration.

With the farmers' help in monitoring the impacts, the project team were soon able to show that this new

feeding system maintained animal health and calving performance, was very cost-and-time efficient, made herding easier and improved the quality of the winterages through better grazing. This message was confirmed by the project farmers who tested the feed, leading them to reduce silage feeding levels by 61% over the course of the 5-year project, and convincing many of their peers to switch to this 'progressive' new feeding system. Environmentally, this new system reduced localised water pollution and soil erosion while increasing forage uptake and thus improving biodiversity.

Other innovations which helped convince farmers that 'farming for conservation' could be positive and progressive included the use of mechanical brush-cutters to control scrub and the use of solar and wind powered water pumps and fences. A 'Burren beef and lamb producers' group' was also established to try to capture a premium for local produce. This ultimately proved unsustainable given the limited amount of finished produce being generated in the Burren and also because of the distance from market and distribution costs. A broader label for meat from different landscapes or for a wider range of products and services from the Burren may be a more realistic future option.

The BurrenLIFE Project was essentially an exercise in 'learning by doing'; co-creating, with farmers, innovative solutions on actual farms. The project helped to demonstrate in real-time what 'conservation farming' looked like and proved that it can in fact improve agricultural efficiency and performance (e.g. reducing input costs and/or increasing stocking levels). This was a lesson that surprised some farmers and engaged many more.

As well as a large number of conservation works on the pilot farms, BurrenLIFE outputs included:

- A set of best practice conservation guidelines for use by farmers, on the themes of sustainable grazing regimes, feeding systems and the removal of invasive scrub.
- A costed 'menu' of conservation actions and equipment including: wall repair, water provision, scrub removal (using various techniques), gate installation and access provision.
- Monitoring data on the environmental, agricultural and economic impact of the project on the 20 monitor farms, of great relevance to the broader uptake of these actions elsewhere.
- Strong support from all stakeholders, in particular farmers, for the project and its findings as well as excellent working relationships and goodwill between all parties involved.

BurrenLIFE had a very positive impact, not least on the growing engagement and respect of the local farming community. This level of support and partnership, along with a tested, costed, blueprint for the expansion of the work made for a very compelling (low-risk, high impact) funding proposal. In 2010, the Department of Agriculture, Food and the Marine (DAFM) announced €3m funding over 3 years (from unspent Pillar 1 Single Farm Payment money) to expand the project's findings through the Burren Farming for Conservation Programme (BFCP). This ultimately ran from 2010-2015, bringing €6m in funding to the region, significantly improving the local environment on 160 farms and paving the way in 2016 for a further expansion across the entire Burren through the Burren Programme (BP) (2016-present). The development and roll-out of these (largely similar, though ever evolving) highly innovative programmes is now described.

MAKING THE LEAP: FROM RESEARCH TO ROLL-OUT

The stated aim of the BFCP was to conserve and support the heritage, environment and communities of the Burren, defined as an area of c.72,000 ha (Figure 3.1) with a population of approximately 500 target farmers. It had the great advantage of continuity, being able to build on the

research findings and relationships that had grown from the PhD research and subsequent BurrenLIFE project. For example, the Project Manager and Scientist from the LIFE project were re-employed in the BFCP and they retained the same office. The new programme presented a wonderful creative opportunity as it entailed a ‘blank page’ approach to programme design. There was no ready precedent for such a locally targeted AES and the BFCP was small enough in scale, budget and timeframe to enable a more creative approach.

In designing the BFCP, there was one key challenge: for most farmers there was little or no financial incentive for them to manage upland areas beyond the minimum levels required for compliance which were way too low to sustain biodiversity. Clearly, an additional incentive was needed to sustain required management levels and it made sense to link or ‘couple’ this incentive to what the BFCP was ultimately trying to achieve – improved environmental performance.

The resultant programme design is best described as a ‘hybrid’ approach whereby farmers are rewarded annually for their environmental performance while also having access to a fund to carry out self-nominated ‘conservation support actions (i.e. work)’ to help improve this performance over time. So the typical ‘action-led’ approach to AES was enhanced in this case to encourage farmers to undertake conservation actions specifically designed to improve the environmental health of their farm, and so enhance their income through the new, complementary, results-based payment.

The resulting approach, as described below, was applied and continuously refined and adapted over its six years of operation (2010-2015) on c.160 farms covering c.14,500 ha of farmland. It proved very cost-effective, impactful and was well-regarded by farmers, scientists and policymakers. Testament to its success was the decision in 2015 to continue and further expand the programme, closely following the same successful format. Within Ireland’s Rural Development Plan (2014-2020) a new Measure for Locally Led Agri Environment Schemes (LLAES) was included to provide *‘support for a small number of projects identified centrally as being of critical environmental importance, namely the continuance and expansion of the existing Burren Farming for Conservation Project’* as well as other strategic projects such as those relating to the hen harrier and freshwater pearl mussel (DAFM, 2014). Moving from Pillar 1 to Pillar 2 funding, DAFM also agreed to fund a local management team, with National Parks and Wildlife Service (NPWS) covering the costs of the local office.

The new ‘Burren Programme’ (BP) commenced in April 2016, again with many of the same management team and located in the same office, providing further continuity. Its objectives relate to ensuring the sustainable agricultural management of HNV farmland in the Burren, improving water quality and usage, and supporting the landscape and cultural heritage of the region. It offers 5-year contracts to all participating farmers, with the last of the contracts set to expire in December 2022. With an outline budget of up to €15m, c. 328 farmers and c. 23,000 ha of target habitat, it represents a further, substantial expansion of the BFCP in terms of budget, area and timeframe. The ‘hybrid’ payment structure of the new BP is very similar to the BFCP whereby farmers are paid both for work undertaken and for environmental performance. However, under the BP farmers sign up to a five-year plan and are afforded even greater flexibility in undertaking conservation actions.

BOX 3.4 ENGAGEMENT

Complementing the work of the BFCP/BP, another crucial initiative in engaging and empowering Burren farmers was the establishment in 2002 of Burrenbeo (the ‘living’ Burren) Teoranta (later the Burrenbeo Trust), a local environmental NGO, which employed what was, at the time, ‘new media’ – a website www.burrenbeo.com – to tell the story of the ‘living Burren’ and in particular the role of farming. This was in response to the fact that ‘many representatives of local, regional and state management bodies, visitors and even well intentioned ‘conservationists’ remain hopelessly oblivious to the important role that farmers play in protecting and contributing to the Burren’s heritage, and of the constraints within which these farmers operate’ (Dunford, 2002b).

Burrenbeo helped to address these issues and reshape the narrative around the Burren from a somewhat elitist, ‘expert’-led perspective to a more inclusive one which also celebrated local people, place and tradition. This message was brought into local schools and communities through the Eco Beo (now Ait Bheo) programme, a ten-module course on local

heritage and stewardship which has worked with over 1,700 young Burren people since its inception.

Burrenbeo also helped engage the broader community in a more nuanced perspective on the Burren and its management through monthly walks (many of them led by farmers, Figure 3.7) and talks, volunteering events and festivals, including ‘Burren in Bloom’ and the ‘Burren Winterage Weekend’ which is a unique celebration of the rich legacy of pastoral farming in the Burren.

The degree to which Burrenbeo Trust has complemented the farmer-focussed work of the Burren Programme cannot be underestimated, helping to align stakeholder’s perspectives and form a ‘community stewardship’ approach to the conservation and care of the Burren’s heritage. Most recently the Trust has been working to promote farmer-led walks as part of its ‘learning landscape’ initiative, as well as sharing lessons from the Burren’s ‘learning area’ with other HNV landscapes across Europe (www.hnvlink.eu).



HOW THE BURREN PROGRAMME WORKS – A HYBRID APPROACH

While the BP is relatively complex in terms of its technical and administrative requirements, every effort is made to keep the interface with participating farmers as simple, intuitive and responsive as possible. This is reflected, for example, in the simplicity of the farm plans and clarity of the payments (per score and per task) and is enabled by the high level of available support for the farmer from the local BP office and from the trained BP farm advisors. Entry to the BP was on a voluntary but competitive basis. All applications (on simple, one page forms) were rated according to criteria which were approved by the BP Steering Group, including the area and proportion of designated land on the holding, previous participation in AESs and the area of public land on the holding. All farmers who were offered places in the BP were invited to an induction meeting during which they were given the opportunity to find out more about the BP and how it might work for them, helping them to decide whether or not to accept their offer of a place.

A phased approach to farmer recruitment was adopted, with calls for applications made over 3 years (2016-18). Competition for places was

Figure 3.7

Burren walk led by farmers

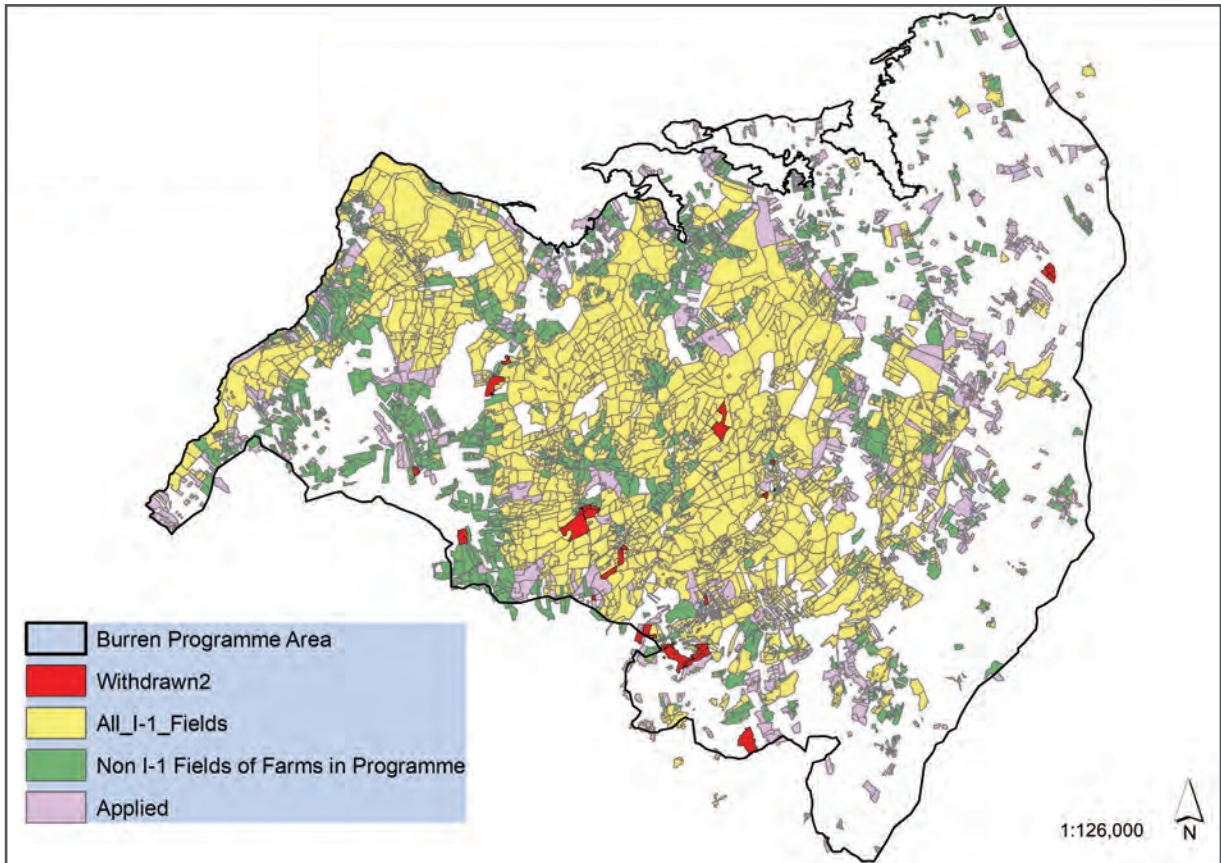


Figure 3.8

Overview of Burren Programme target area and uptake (2019)

initially strong – there were over 400 applications for the first call, with 194 places taken up (3 of whom later withdrew), and 147 of whom had previously been in the BFCP. In 2017 a second tranche of 80 farmers joined, followed by a third tranche of 57 in 2018, giving a total of 328 farmers. The area currently managed by these farmers is 23,191 ha, including 71% of the Burren’s designated area (Figure 3.8). Much of the remaining non-BP area is accounted for by smaller farms, many of which receive Low Input Permanent Pasture (LIPP) and Traditional Hay Meadow (THM) payments through the Green Low-Carbon Agri-Environment Scheme (GLAS), and are thus excluded from the BP environmental performance payment. Most of these farms did not take up their place or ‘withdrew’ from the BP once payment details became clear to them (see purple and red shading in Figure 3.8).

All BP farmers were offered a 5-year contract with the DAFM. This contract takes the form of a simple 5-year plan outlining the baseline

situation on the farm and suggested priority actions to improve the farm environment. By signing this 5-year plan the farmer agrees to abide by the BP Terms and Conditions. A set of procedure manuals translates these T&Cs into detailed procedures to be undertaken by the BP team, who are responsible for the successful delivery of the programme.

Within the BP, there are two key 'Interventions' – Intervention 1 (I-1) which rewards environmental performance, and Intervention 2 (I-2) which supports related conservation actions. The BP farm advisor conducts an annual summer assessment which results in an annual I-1 payment, and the BP advisor and farmer may also choose to produce up to five I-2 work plans within the BP contract (and within a stated budget). The I-2 plans are normally produced separately from the I-1 scoring.

The BP does not take a whole-farm approach: only species-rich areas are currently targeted although I-2 works may take place on species-poor areas to enable better management on target areas. While it is recognised that other parts of the farm may be critically important as conservation support-areas (for example, to hold cattle away from the species-rich pastures during the main flowering season in May-July), support for these areas is generally covered under the national Basic Payment Scheme (BPS) and national Agri Environmental Scheme (AES) measures, so funding these areas through the BP might raise concerns about the potential for double-payments. Future iterations of the BP may try to integrate these national and local AESs more seamlessly and thereby adopt a more holistic, whole-farm approach to environmental management.

INTERVENTION 1 (I-1) – REWARDING GOOD MANAGEMENT

Central to the success of the BP results-based approach to payments is the 'environmental health' assessment system developed by Programme Scientist Dr. Sharon Parr. This is based on the supposition that farm management plays a significant role in determining the ability of Burren pastures to achieve their potential in terms of their conservation status, diversity and abundance of plants present. It sets out to assess the management of each field in terms of both the actual management, the management that is needed to get it into the best condition for it to function as a species-rich limestone grassland/heath, and the ecological integrity of the grazed habitats present.

Detailed instructions, as well as all the required forms, for carrying out I-1 scoring are available on the BP website (www.burrenprogramme.com/burren-programme-resources/) for farmers, advisors and other interested parties. This scoring system is underpinned by evidence-based information built up over many years of field research and practice, and refined over several years' application under the BFCP, all of which helped create a very robust, detailed and objective system.

Within the I-1 scoring system, different approaches are used to assess the two main target habitats - Burren Winterage Pastures and Burren Lowland Grasslands (BLGs). Each qualifying field (species-rich SAC or undesignated Annex I habitat) is assessed annually (May-September) by a trained advisor. The advisor completes a 1-page, 10-point, field sheet for every qualifying field (see Appendices 1 and 2) and inputs this data into a simple Excel calculator which generates a field score ranging from 1 to 10. Scores for all qualifying fields are then transferred into an I-1 sheet which lists the field area, score, payment and management recommendations for each field (Appendix 3). The I-1 sheet is reviewed by the BP team before being submitted to DAFM for payment. Payment rates are presented in Appendix 4; the higher the score, the higher the payment. A high proportion (>50%) of I-1 scores are also validated on-site annually by BP staff to ensure that scoring is accurate and consistent across the BP's twelve trained advisors.

BURREN LOWLAND GRASSLAND (BLG)

For Burren Lowland Grasslands – usually small (c. 2.3 ha average), meadow-like fields, an ecological survey is undertaken by the BP team (every 3-5 years) to determine the 'conservation value' of the field. Using indicator plants from 5 different groups that reflect different levels of conservation value, from low to high (see Appendix 5), the grassland is categorised into one of 5 qualifying classes, with higher classes earning more points. This 'conservation value' score is combined, by the advisor, with scores from a number of other criteria (e.g. grazing management, undesirable species etc.) which reflects the suitability of the management regime. Points from all 10 criteria are tallied to yield an overall BLG field score that ranges from 1 to 10 (see Appendix 5: for further detail on the criterion 'Conservation Value and Ecological Integrity of Burren lowland grasslands').

BURREN WINTERAGE GRASSLANDS

Burren Winterage fields, in contrast to Burren Lowland Grasslands (BLG), are often very extensive (c.12 ha average), highly variable in terms of habitat type (Parr et al, 2009) and quality, and also management history. The use of indicator species would not work effectively in these areas, so the ‘ecological integrity’ is determined by a simple visual assessment (with reduced points, for example, for winterages which were previously fertilised or heavily summer grazed). This is combined with scores from 9 other criteria (slightly different from those in the BLG assessment) to give an overall field score (see Appendix 2).

All scoring criteria are carefully chosen based on previous research in the field and are weighted (positively and negatively) in accordance with their significance. For example, grazing has been shown to be the main driver of biodiversity in the Burren (Dunford, 2001), hence grazing (and litter) levels are assessed to evaluate whether the current grazing level equates to that needed to keep the grazing-dependant habitats in good ecological condition or, to restore them to such. Similarly, the condition of natural water sources and extent of bare ground reflects the suitability of management of the water and soil resources in the field. Invasive species which threaten biodiversity (and other heritage features) are scored negatively if present, and positively if not.

This performance-related scoring system is sensitive to changes in management so it sends an immediate (annual) signal to the farmer about the impact of his/her farming system, while also allowing for flexibility in approach/response. The scoring system rewards those who have managed their land well in the past but encourages all farmers to continue to improve their farming model.

In spite of initial concerns about the I-1 scoring system (that farmers would not accept the scores, that advisors would inflate scores, that scores will be unduly influenced by external factors, etc.), it has worked exceptionally well. The clarity of the scoring system along with the high levels of training and oversight, and the trust in the local team and advisors have been critical in this regard. If farmers are unhappy with their I-1 scores they are encouraged to query them with the BP team: this has rarely happened in over 8 years of operation across up to 1,700 fields scored annually.

BOX 3.5

THE INTERVENTION 1 PAYMENT SYSTEM: USING RESULTS-BASED PAYMENTS TO INCENTIVISE DELIVERY OF ECOLOGICAL BENEFITS

Once an advisor has carried out the annual I-1 assessment, all the data is transferred into a simple (Excel) I-1 calculator (one for BLGs and another for Winterages) to generate a field score of 0-10 (0 only applies where silage is fed, a negative activity which automatically results in a 0 score being applied). These scores are then transferred into an I-1 payment sheet (Appendix 3) where they are listed along with a management recommendation as to how the score might be improved.

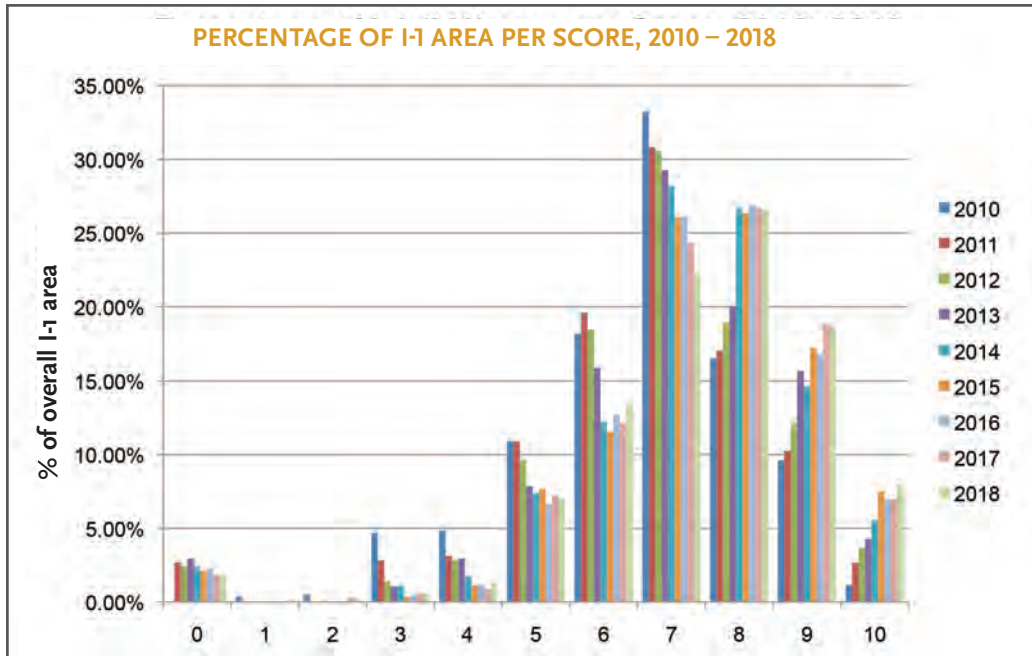
Each score translates into a unit payment per ha (Appendix 4) e.g. a winterage score of 5 yields €60/ha, 6 yields €72/ha, 8 yields €96/ha, and this, multiplied by the I-1 area of that field (usually the BPS eligible area less any species-poor habitat) yields a corresponding payment per field. Higher rates are paid for lowland grasslands (up to €315/ha compared with €180 for winterages) given the higher 'opportunity cost' of not increasing productivity by reclaiming / improving these fields. BLGs, Winterages, Commonages and non-designated Annex I land are listed separately in the I-1 sheet.

Payments for winterage grasslands are banded (40 ha bands), with the payment rate halving for each successive band (the equivalent band for BLGs is 10 ha - see payment box, Appendix 4). This system, which is now also used in other AESs, takes account of some 'economies of scale' and supports smaller holdings.

The payment system (Appendix 4) contains a number of innovations designed to encourage an improvement in management and thus site condition, rather than settling for the *status quo*. For example, no payments are issued for scores less than 5, based on the assumption that this basic level of management is already covered under BPS and/or AES measures,

and so a greater effort is required for payment under the Burren Programme. After 2 years in the BP, scores of 5 no longer receive payment, putting pressure on the farmer to improve his/her management on these fields. Also, the lowest scoring fields are listed first for payment; on larger farms (>40 ha) this means that the farmer is effectively losing more money on the lowest scoring fields (paid at the top-band rate) than is being gained on the highest scoring fields (which are paid at a (50%) lower rate). This offers a clear financial signal to the farmer to focus conservation activities on the lowest scoring fields which need most attention. On the other hand, a bonus of 25% and 50% is paid for scores of 9 and 10 respectively.

All payments are calculated and checked by the BP team before being submitted to DAFM for payment. Farmers receive an A3 copy of the I-1 sheet showing payments per field as well as management recommendations and an ortho-image showing the location of all fields. Farmers and/or their advisors have the chance to appeal any score before sign-off. The average I-1 payment is €2,617 per farmer (range €36-€9,347) or €75 per I-1 assessable ha (2019 figures). Payments are usually issued by DAFM to the farmer within the same calendar year as the I-1 assessment.



Over €4m has been paid to Burren farmers through this results-based approach and it has certainly had an impact. For instance, the average score from 147 farms (on over 1,000 fields covering 7,300 ha) which have been in the BFCP-BP since 2010 increased from 6.61 in 2010 to 7.4 in 2018. This increase may be seen in the shift in I-1 scores away from scores of 3-7 and towards scores of 8-10, as shown in the bar-chart above (Figure 3.9).

Similarly, looking at a subset of 574 fields which have been in the BFCP-BP since 2010, the average score (by area) increased from 6.81 (2010) to 7.56 (2018). This gradual but positive shift toward higher scores (and by implication improved environmental health) is shown below (Figure 3.10) and are visually represented at a landscape scale in Figure 3.11.

Figure 3.9
Percentage of area per I-1 Score, 2010 – 2018 (data from 147 farms, c.7,000 ha)

INTERVENTION 2 – PAYING FOR CONSERVATION WORKS

The main focus of the BP is to improve I-1 scores, and farmers are encouraged to undertake I-2 conservation works to help achieve this. Without these capital works (non-productive investments), improving field scores would be much more difficult to achieve. Although farmers are given recommendations in their I-1 sheet as to how they might improve their field score, the choice of what to do and how to do it is determined by the farmer

Figure 3.10

Change in the average I-1 score 2010-2018 for all fields which were continuously in BFCP-BP since 2010 ('1' above) (574 fields, 4,567 ha)

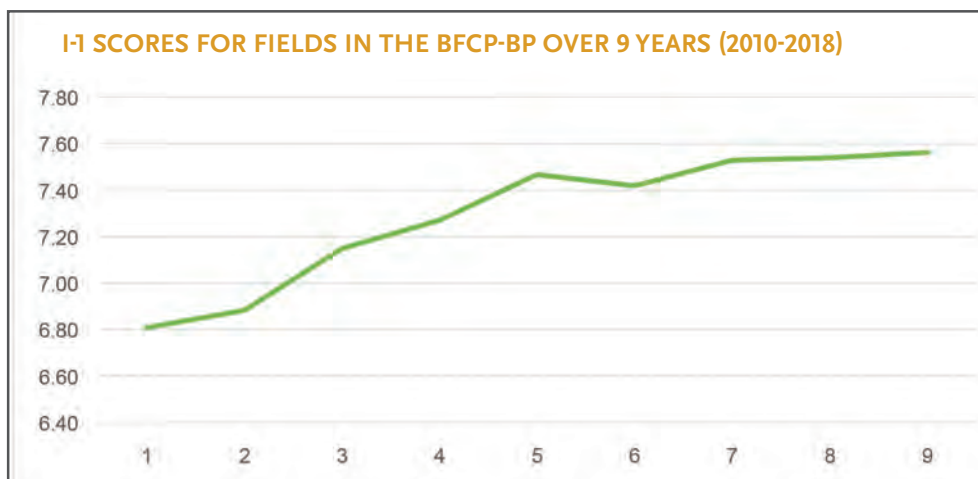
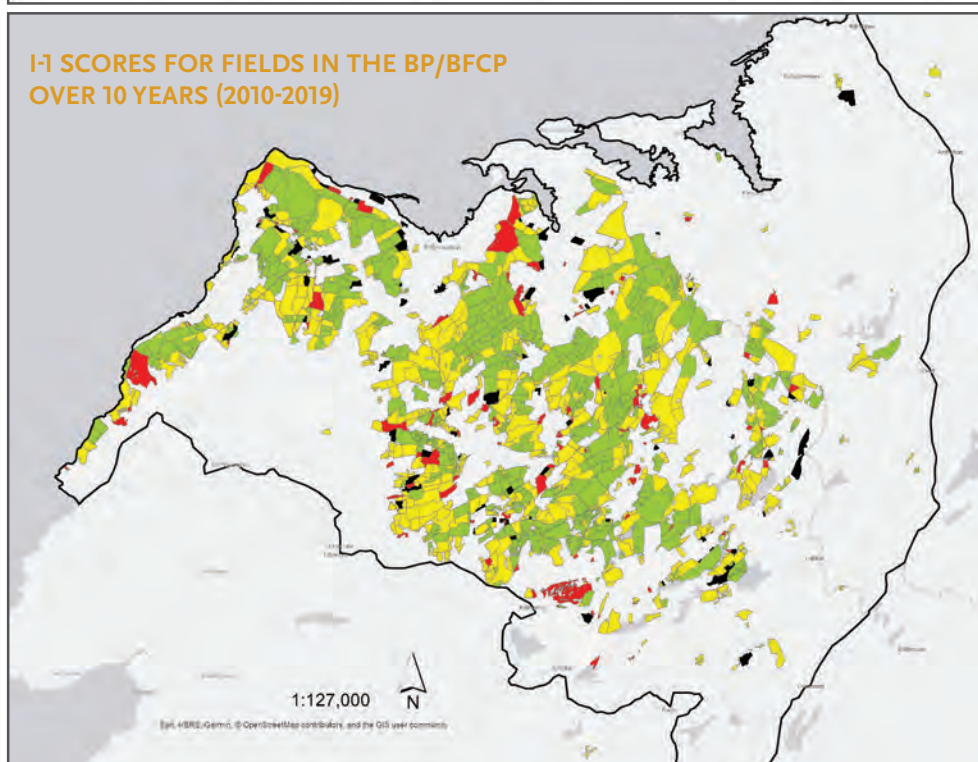
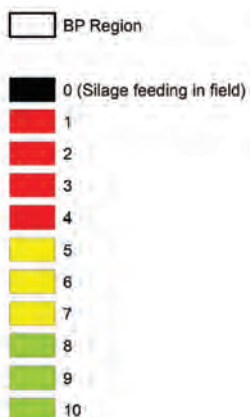


Figure 3.11

BP I-1 field scores in 2019 (grouped)



and his/her farm advisor. Up to five I-2 plans can be developed during the farmer's contract and the work approved in these plans can be completed at the farmer's convenience before payment is claimed. Some farmers may choose to use none, or part of, their I-2 works allowance – for instance between 2010-16 only 56% of the available I-2 budget was spent.

The I-2 process begins with the farmer and BP advisor together planning I-2 works. The advisor plots (using hand-held GPS devices/apps) the agreed

works on each field and back in the office these are overlain onto an ortho map using a dedicated mapping system ('GLAMS' by DAFM). Each task is allocated a cost (see Box 3.6) and this information, along with a task description, is saved in the Excel planning template (the '*Intervention 2 Work Plan*') which is submitted to the local office for review and approval.

The BP team review all proposed tasks with a focus on establishing the environmental benefit, the optimal methodology, the cost and the need for permissions. This often entails a visit to the site and further discussions with the farmer and advisor. For some jobs, permissions must be sought from a number of authorities, e.g. National Monuments Service (NMS), National Parks and Wildlife Service (NPWS), Local Authority, etc. This is co-ordinated by the BP team using a set of agreed procedures; a service which relieves the farmer of a very significant and potentially costly bureaucratic burden. All calculations are carefully reviewed and validated before the draft plan is returned to the farmer and advisor for sign-off.

The final I-2 plan is printed in A3 (usually 1-2 pages) and the advisor meets the farmer to go through the plan before work can begin. Once some or all of the tasks have been completed, the farmer brings the plan to the BP office and indicates which jobs have been done, supplies any required receipts and signs off on a net payment claim approved by the BP team which is then communicated to the paying authority (DAFM), following detailed administrative payment checks by the local team. Payments are usually issued within a few weeks.

The BP team and DAFM inspect I-2 works on a regular basis to ensure compliance, which has generally been excellent. This is a reflection of the high level of oversight and support from the BP team and advisors, but also the buy-in and understanding of the BP farmers. Farmers appreciate the flexibility and trust and generally tend to respond positively and honestly. For example, if a farmer has planned work but later decides not to do it, he/she can simply declare this task 'not done' while claiming payment for whatever work has actually been done.

For farmers who are too busy or perhaps too elderly to undertake works, the BP office helps them to identify other local contractors (mostly farmers) to help with the work from a list of 80 such contractors. These contractors also receive training from the BP team. A list of mainly local suppliers for various products is also circulated, as are best practice guides for I-2 works, while innovations in best practice for I-2 work are shared at an annual 'Innovation Fair'.

BOX 3.6

THE INTERVENTION 2 (I-2) PAYMENT SYSTEM

All farmers are granted a certain allocation for I-2 work – €100 per annum for every digitised hectare of SAC and Additional Annex I habitat. Thus, for example, a farmer with 40 ha of SAC would be able to spend up to €20,000 on I-2 works over a 5-year contract (on up to 5 separate I-2 plans).

Every task proposed in the I-2 work plan is allocated a cost. The cost of each task is calculated using a detailed menu (Figure 3.12) which is updated annually, and, for scrub work, using a dedicated calculator. The scrub calculator uses the area of planned scrub removal, the proportion of scrub cover and the planned methodology to determine the overall cost of the task. The I-2 menu includes unit costs for wall repair and for access tracks – these costs, as with scrub control costs, were initially calculated during the BurrenLIFE project. Costs of water provision, feed equipment and gates are all

based on the prices of these items at local stores, plus the labour cost (based on Targeted Agricultural Modernisation Scheme (TAMS) reference costs). This system greatly reduces the need for producing receipts as the cost per task is known and site visits certify that the task is complete.

All I-2 works are co-funded by the farmer based on their relative agricultural-environmental merit. Access tracks and cattle pens are funded at 25% by the BP, water provision and feed equipment are funded at 50% and wall repair and scrub removal are funded at 75%. Co-funding helps ensure that works tend to be carefully chosen and also ensures that the money is directed to those who do the most work, an approach that most farmers greatly appreciate.

Figure 3.12

Extract from I-2 'Reference costs'

Fencer Units	Unit	Detail	Actual €	Funding rate	Funded €
Solar fencer 12 V	Per fencer	High power (40-60 acre)	479.58	50%	239.79
Solar fencer 12 V	Per fencer	Regular (15 acre span)	257.42	50%	128.71
Electric fencer	Per fencer	High power (e.g. 40 km span)	191.40	50%	95.70
Electric fencer	Per fencer	Regular (e.g.	122.11	50%	61.06
Fencer - other	Per fencer	To be specified in I-2 plan	TBD	50%	TBD
Gates	Unit	Detail	Actual €	Funding rate	Funded €
Burren Gates & Posts	Per gate	All sizes of metal gate	354.00	75%	265.50
Burren gates - retrofit	Per gate	All sizes of metal gate	252.00	75%	189.00
Burren gatespost - fit	Per gate	All sizes of metal gate	62.00	75%	46.50
Burren Gate & RSJ posts	Per gate	All sizes of metal gate	178.33	50%	89.17
Field gate	Per gate	All sizes of metal gate	70.99	50%	35.50
Field gatepost- retrofit	Per gate	All sizes of metal gate	49.00	50%	24.50
B. Water Provision					
Water collection and Storage	Unit	Capacity	Actual €	Funding rate	Funded €
Plastic Storage tanks	Per tank	9000 L (1980 gal)	1138.00	50%	569.00
Plastic Storage tanks	Per tank	6000 L (1320gal)	1016.00	50%	508.00
Plastic Storage tanks	Per tank	3000 L (660 gal)	528.00	50%	264.00
Plastic Storage tanks	Per tank	1000 L (300 gal)	260.00	50%	130.00
Precast Concrete Storage tanks	Per tank	9464 L (2500 gal)	2545.00	50%	1272.50
Precast Concrete Storage tanks	Per tank	6814 L (1800 gal)	1463.00	50%	731.50
Precast Concrete Storage tanks	Per tank	4164 L (1100 gal)	1138.00	50%	569.00
Poured Concrete Storage tanks	Per tank	Various – estimate cost by formula	TBD	50%	TBD
Poured Concrete Storage tanks	Per tank	Various – estimate cost by quote	TBD	50%	TBD

During the period 2010-2015, €2.7m (total value €4.2m when farmers' contributions are taken into account) was spent by farmers to carry out 5,400 individually-costed conservation tasks which contributed to a much better conservation infrastructure in the region. These tasks included:

- 242 ha of invasive scrub removed to help restore Annex I priority grassland habitats (Figure 3.13);
- 163 km of pathways opened through areas of scrub to improve livestock and farmer access;
- 109 km of stone wall repaired (Figure 3.14), 32km of wire fencing erected to aid grazing and herding;
- 703 new gates installed (incl. 144 traditional Burren gates) to improve livestock management;
- 439 water troughs, 33 water pumps and 76 storage tanks installed to help protect water sources;
- 128 feed bins and 180 feed troughs purchased to help reduce silage feeding;
- 21 km of new track built, 32 km of existing track upgraded, to improve winterage access;
- 121 habitat restoration tasks – including bracken control, rubbish removal and water protection (Figure 3.15).



Figure 3.13
Removal of hazel scrub in order to restore grazing access to species-rich grassland

Figure 3.14

Wall repair to enable restoration of grazing



Figure 3.15

Demonstration event looking at ways to protect natural water sources



The completion of this work has contributed significantly to environmental improvement as reflected in the field scores, and has helped to future-proof management on some farms (e.g. by improving access and making it easier to herd and water stock).

INNOVATION IN DESIGN AND DELIVERY

The Burren Programme is clearly different in many respects from conventional action-based AES. Many of these differences arise from the farmer-centred approach adopted in programme design. Some of the key innovations which distinguish the BP approach from other AESs include:

Simplified farm plans and paperwork: Given its farmer-centred approach, the BP needed to engage farmers in a fuller understanding of the programme and how it works on their farm without burdening them with additional paperwork. Avoiding generic, jargon-and-text heavy plans, the BP developed streamlined I-1 and I-2 sheets which are concise (usually one page of information plus maps), visual (all work mapped on aerial images) and relevant (all jobs listed with a price and description for each one, all fields listed with their score and payment). To claim payment, the farmer has to fill out – usually just by signing it and ticking some boxes - one, simple, declaration form, and very few receipts are required for the vast majority of items (as prices are based on fixed costs). Permission requests to undertake work (a cumbersome undertaking) are organised by the BP team, resulting in very little paperwork for the farmer to complete and allowing him/her to focus on getting the work done.

Payment structure: The BP focusses on rewarding positive activity rather than compensating farmers to avoid negative activities. For farmers, the fairness and transparency of payments are almost as important as the amount. With I-2 works, all farmers are given a fair allowance but only tasks fully completed – and to a good standard - are paid upon. Every task is costed so farmers are clear on what they are being paid for. With I-1 scores, the payment structure is designed to reward those who make the effort to manage their land and livestock to deliver for the environment, thus rewarding farmers in an equitable and meaningful way. The payment structure is clearly explained to farmers; at annual training events, they gain a very good understanding of how field scores are arrived at and, most importantly, how they can be improved through targeted management.

Locally led: The research which underpins the BP is local, with farmers and scientists co-creating solutions to Burren problems on Burren farms (e.g. supplementary feeding systems). The BP is managed through a local

office and the staff present all live locally. Local suppliers and contractors are supported to provide the necessary products and services, from locally-made gates to local chainsaw crews. All training takes place in the Burren, mainly on the land and all resources (best practice guides, etc) are locally focussed. The scoring system is targeted specifically at Burren habitats and all management recommendations are locally relevant. As a result of this locally-led approach, the programme has a very strong local identity and benefits significantly from a sense of local pride and ownership.

Freedom to farm: Farmers decide what work they want to take on every year, also when and where they do it. Telling farmers what to do is usually not ideal; in contrast, asking them what needs to be done and to co-fund it, results in work being selected more carefully and strategically, being carried out to a higher standard and proving much more likely to have a positive, long term impact. Under the I-2 ‘allowance’ (rather than fixed payment) system, the money goes to the farmers who want to do the work, not to those who don’t. Under the results-based payment system, farmers get to decide how to graze their land and feed their livestock and are judged on the environmental impact resulting from this. For those farmers who need help in making management decisions, support is always available should they need it through their trained advisor and the local office. Enabling such freedom to farm results in a diversity of approaches and outcomes which is much better for our natural heritage than a uniform ‘one size fits all’ approach.

CHALLENGES

While the BP is often cited as a model for how locally-led results-based AESs should work, it is not without its challenges and limitations. It is still a work in progress – as indeed it needs to be if it is to continue to respond to changing circumstances and emerging challenges (e.g. around climate). Even among its 328 farmers, there remain those who are still not ‘on board’ and whose environmental performance remains largely unchanged – even negative in some cases - though such farmers earn much less than they might under other AESs as a result, while continuing to deliver something.

At a local level, ongoing challenges include keeping farmers on-board and motivated as the BP’s ‘novelty’ wears off; ensuring standards are maintained on the ground as it expands; finding the right level of ‘compromise’ between

farming and environmental needs – e.g. managing the limited but necessary, targeted use of chemicals and heavy machinery. Sourcing sufficient labour to undertake works on the ground is a growing issue for many farmers as much of the work is hard, dangerous and not very attractive e.g. removing encroaching scrub in remote locations.

Also of concern is the administrative burden that regrettably accumulates as such projects evolve. More focus on administration leaves less time for farmer engagement and on-site work which is to the long-term detriment of the programme. At an admin cost of <15% of projected spend, the BP isn't expensive to run, particularly considering the additional amount of technical support and monitoring work that the local team provide, while also dealing with the administration of payments. But it's important that such locally-led schemes don't become bureaucratically burdensome, particularly to the farmer. Currently the (necessary) complexity involved in the delivery of this programme is absorbed almost fully by the local team (and to some degree by the farm advisors), allowing a very simple interface for the farmer. To be successful, such programmes will need to be complex yet simple, so it is inevitable that a strong level of professional support will be needed. To attain long term success, it is essential for farmers' sons and daughters and others to aspire to deliver such services to their communities in future and earn a decent living by doing so.

A future challenge will be to integrate BP with other agri-environmental requirements and incentives that the farmer is engaged in. This is needed to simplify things for the farmer and reduce the risk of overlap (double-payments) for the paying authority. Future proofing to take on board issues around climate and declining rural populations etc. will only add to this challenge. Technological advances should help some activities, e.g. field scoring, works planning and monitoring.

Other ongoing challenges include managing the heightened expectations of funders, farmers and the public; securing continuity of funding without compromising programme structure; ensuring that other policies and programmes do not undermine, or overlap with, the BP; ensuring the BP delivers for evolving priorities such as climate change mitigation; strengthening and capturing the broader social and economic benefit of the programme itself. There is also the challenge of attracting and retaining experienced professional staff; the available pool of skilled staff is diminishing as other projects and opportunities (thankfully) emerge.

BOX 3.7: ECONOMIC RETURNS TO FARMERS AND THE COMMUNITY

Since 2010, €8.5m has been paid to Burren farmers through the BFCP-BP. Given that all tasks are co-funded by farmers (in cash or through work, at rates of 25%, 50% or 75%), the actual value of the programme to the region has been close to €12m. The proportion of funding spent on ‘results-based’ payments (I-1) compared with ‘conservation support measures’ (I-2) in the BP’s ‘hybrid’ approach varies from year to year but it is interesting to note that, from 2010-2015 there was a clear reduction over time in I-2 payments, while I-1 payments increased as the (I-2 funded) conservation infrastructure required for management was enhanced and began to deliver.

The average BP I-1 payment in 2018 was €2,617 while the average I-2 payment was €3,692. In most cases this payment is in addition to payments under GLAS agri-environment scheme (generally up to €4,000 per annum) so for the average Burren farmer, an average annual income of c. €10,000 is available through agri-environmental programmes. Given that average farm income for Irish farmers in the beef sector in 2018 was estimated at €8,300 (Teagasc, 2019) these environmental payments make a significant contribution to farm income, though not enough to make most of these farms economically viable – instead, the best that many can hope for is that they can become economically ‘sustainable’ by gaining off-farm employment or developing new business ideas.

Indirect economic benefits include employment opportunities for farm contractors; the BP maintains a database of 80 locals (mostly farmers) who are willing to do work on other farms, e.g. scrub removal and wall repair work. It also means more business for local products (e.g. gates, tools and water equipment) and service providers, such as plumbers and track

machine operators. Additional funding has also been invested in the BP local office and management team. Several farmers have developed agri-businesses of their own including farmer-led farm tours and farm cafes, while a number of farmers act as farm advisors to other farmers.

Payments for ecosystem services such as the BP provides are no magic bullet but can make an important contribution to income and opportunities for farmers at a time when income from, and respect for, beef farming is eroding.

BOX 3.8 SOCIAL IMPACT

The Burren Programme has enabled farmers to come together to undertake meaningful work at a local level, while training days (6-8 events annually) are very well attended and provide farmers with the opportunity to exchange ideas and experiences for managing their land for themselves, the environment and the wider community. The broader social impact of the BP requires further research but, anecdotally it has helped improve respect for the work of Burren farmers and thus their professional self-esteem as custodians of one of Ireland's most extraordinary landscapes.

To reinforce the 'social capital' around farming for conservation, a series of annual prizes are awarded for the most improved farm, best pasture, best meadow, best standard of work and an overall prize for best 'conservation' farmer and best farm family in the Burren. These Bord Bia 'Origin Green' Awards – now expanded to a national level under the 'Farming for Nature' initiative (www.farmingfornature.ie) represent a powerful affirmation of the work of the best conservation farmers, who can act as role models for their peers within the farming community to emulate.

The work of the Burrenbeo Trust in creating social opportunities for farmers has been immense – monthly walks are often hosted by farmers, monthly talks are organised in local venues, events such as Burren in Bloom and the Burren Winterage Weekend entail a high level of farmer participation e.g. chairing conference sessions, hosting farm walks, hosting the cattle drove and doing promotional pieces for radio, TV and newspapers. Study visits have also been organised – to the UK and Northern Ireland - which are another important social and learning opportunity for farmers.

In terms of behavioural change among farmers, there is a wide spectrum of responses. Some farmers and/or their spouses have become very engaged in heritage conservation and in promoting sustainable farming, leading farm walks (Figure 3.16), taking part in public events, and continually liaising with the local team. Several others remain nonplussed, but the majority appear to have shifted slightly towards a more positive approach to nature conservation on their land, now seen as a more socially acceptable and a less risky part of the overall agricultural and economic future of local farm systems.



Figure 3.16

Burren farmer, Pat Nagle, outlining how the Burren Programme works on his farm

SUMMARY – KEY LESSONS LEARNED

Drawing lessons from the BP experience must come with something of a health warning given that the Burren region is so distinct and unique, as are the circumstances, timing and ‘champions’ involved in the development of the BP, as described above. Thus, not all of the BP learnings may be transferrable, nor should they be, given the diverse range of circumstances (geographies, farming systems and traditions, different environmental challenges, etc.) that exist in other regions.

However, it could equally be argued that if the BP approach can work in such an ecologically and agriculturally complex area as the Burren, it should be possible to adapt and apply its core principles elsewhere where conditions are likely to be far less complex. Indeed, evidence from other projects such as the ‘Results Based Agri-environment Payment Scheme (RBAPS)’ project, described in Chapter 6, and several of the new ‘European Innovation Partnership (EIP)’ projects, do seem to bear this out. The Burren, and these subsequent projects, have shown what can be done and a lot has been learnt in the process, knowledge that can hopefully help inform future projects. Some key learnings include:

The importance of local ownership, leadership and partnership: the initial stimulus for the BP came from local farmers who, feeling threatened by SAC designations and REPS conditions, decided to engage constructively with researchers and public authorities to find a way forward. The knowledge, support and willingness-to-engage of Burren farm leaders – particularly through the Burren IFA group - has been immense. This has helped inform the evolution of the BP, minimise conflict between stakeholders, reassure farmers around new developments and avoid the typical ‘us versus them’ scenario whereby locals feel that external agendas, values and ideas are being imposed upon them.

Taking a broad, inclusive approach to conservation: The initial PhD research phase (1998-2001) was, somewhat atypically, undertaken by a locally-based researcher over an extended period and adopted a very grounded approach, looking at a broad range of issues, social, botanical and agricultural. Such a holistic, ground-up approach to research worked very well in aligning perspectives – agriculturalist, scientist, policymaker, conservationist – towards a set of shared values and benefits. The subsequent ‘re-telling’ of the

Burren story in a more inclusive way helped to give farmers a greater sense of ownership of a story which they felt external ‘experts’ had appropriated. This ‘ownership’ remains a key element of the BP.

The value of practical, local, scientific research: BurrenLIFE afforded the luxury of sufficient time and resources to co-create, with farmers, a blueprint for the future of Burren farming and to overcome some key technical hurdles (e.g. developing alternative feeding systems). In a process which was local but inclusive, practical yet innovative, the research generated critical information on the cost and impact of various management options. It won the respect of local farmers who saw it as relevant and progressive, and cemented working relationships between partners. This research also gave a lot of reassurance to funders who could see the impact, cost and popularity of the programme locally.

Adopting a farmer-centered approach: The BP recognises farmers as the key group in delivering environmental improvements and caters to their key needs by being progressive and fair (payments, inspections, etc.), minimising bureaucracy, maximising flexibility and always being available to help and offer advice and encouragement. A ‘pocket, head and heart’ approach. Every effort is made to think like a farmer in terms of programme design and delivery, and this has been key to the high level of farmer engagement and compliance.

Paying for results: One of the key learnings of the BP has been the impact of its results-based payment system. Initially designed to provide an incentive for farmers to restore grazing on rough grasslands, it has yielded multiple benefits. For the farmer, it offers a clear and simple message about what the BP aims to achieve while allowing him/her flexibility in delivering it. It has also stimulated an appetite among farmers for information on ‘farming for nature’, encouraged innovation and the adoption of conservation actions which are more likely to deliver environmental benefits on the farm. For the funder, it guarantees better value for money and yields real-time information on the programme’s impact.

Continuity, trust and respect: Within the farming community, relationships and trust tend to be built slowly over time. The continuity of funding, and of staff involved in the BP (some for 15 years) and of the local office has really

helped to build trust and to ensure that local learnings were translated into a workable programme. This trust has helped allay farmer's fears, including fears of additional restrictions and paperwork, increased risk of penalties and concerns about the fairness of the results-based approach (in particular how weather and disease events might impact on scores). Over time, fears about the BP have diminished with familiarity of the programme and as the relationship with the local team has grown closer. Farmers feel valued and respected and as a result are much more likely to engage positively.

Being responsive and adaptive: The BP started with a clean slate, and this allowed the local team to address key weaknesses of the former BurrenLIFE approach – such as the unwieldy farm plan and the failure to motivate farmers to improve grazing systems - by streamlining farm plan design and introducing a results-based measure. Equally the I-1 scoring system was refined for several years after its introduction to ensure that the weighted scores and guidelines achieved what they set out to achieve. This again highlights the importance of being able to continually adapt and improve with learnings gained, recognising that AESs, no matter how good, need to continually evolve if they are to continue to deliver.

Having a practical, environmental focus: The BP adopts a simple, practical approach to a quite complex set of environmental challenges. It is not a social programme, though it does deliver socio-economic benefits. It is very focussed on the delivery of clearly defined environmental outputs. Every element of the programme design - from farmer selection to technical evaluations to payment systems - is based on meeting this objective, in the knowledge that the BP will ultimately be judged on its environmental impact.

Institutional support :The BP has been fortunate to enjoy a lot of institutional support, often due to individual champions within Government Departments who worked 'up, down and across the line' to ensure 'top-down' support for the 'bottom up' initiative. Undoubtedly, challenges remain, with many of these stemming from the difficulty in accommodating the pioneering approach of the BP into the very rigid structures of an Article 28 funded programme. As with anything new, relationships between local teams and their funders take time to develop, and this can lead to a duplication in roles and reduced efficiency.

A strong advisory service: Ireland is fortunate to have such a strong public and private farm advisory service; unlike many other EU countries. The 12 BP farm advisors (who had to undertake a 5-day training course plus annual refresher training) provide a critical service, advising the farmer, carrying out I-1 scoring, planning I-2 works and liaising with the BP team. The quality of these advisors, and the trusted relationship they have with their clients (in most cases these advisors also handle the farmer's Basic Payment Scheme, Less Favoured Area and Agri-Environment Scheme returns), has been absolutely critical to the success and scaling of the BP and will be equally critical to the success of other such programmes.

LOOKING AHEAD

If the BP can continue to perform well and be allowed the flexibility to further adapt and improve, it can potentially reach a level at which it can unlock significant additional opportunities for the Burren. These might include: the branding and marketing of products and services; delivering greater local employment and training opportunities for local farmers (including professional roles within the BP); exploring new funding mechanisms such as private capital for delivering ecosystem services; bulk-ordering materials such as gates and feed to reduce costs; and piloting new technologies such as drones and scoring apps. The profile of the BP is already creating increasing opportunities for Burren farmers to share their knowledge of this 'learning landscape' through guided walks.

Ultimately the main success of the BP has been its positive impact on 23,000 ha (c. 71% of the designated area) of the Burren at a time when Ireland has declared a biodiversity emergency. This has been made possible by understanding, empowering and then motivating (a significant proportion of) Burren farmers to adopt a more multifaceted approach to managing their land. Although still in its infancy, this approach of viewing farmers as a conservation resource, trusting and investing in them, has worked well; it has encouraged a welcome diversity of responses at field and farm level while delivering a gradual but marked overall improvement in the environmental health of the Burren. Increasingly, local farmers are taking on roles of environmental leadership, offering a glimpse of a future where these farmers become independent, active stewards of, and spokespeople for their heritage.

The success of the RBAPS project and of the emergent EIPs show that the BP isn't a one-off, isolated success; instead, the principles underpinning the development and delivery of the BP can be applied elsewhere. These principles – locally-led, farmer-centred, results-based, and adaptable - can be applied to a wide range of landscapes, habitats and environmental challenges, which is not to say that a traditional action-based approach won't work better in some circumstances.

To ensure that this trend continues under future Common Agricultural Policies (CAPs), important institutional arrangements can enable this to happen, including a more flexible Rural Development Plan (RDP) Measure, more enabling Departmental structures, a strong farm advisory service and, where necessary, the presence of a local team. However, perhaps the most important factor of all will be an informed and enthused farming community who are prepared to fully engage with the opportunity that such programmes present for their farms, their families and their heritage.

APPENDIX 1A BLG FIELD SCORE SHEET A

I-1 Score Sheet for Burren Lowland Grasslands					<i>Burren Programme v2 May 2017</i>					
Farm:		Field:		Surveyor:			Date:			
Current Pasture Management (circle as appropriate)					Feeding Management (circle as appropriate)					
Main Grazing Period: Mainly Winter Mainly Summer Year round or other		Mowing / topping: Never or rarely Every 2-4 years Most years			Silage/hay: Not fed or Some fed loose, scattered Fed as: Round bales (ring feeder or not) or In/on Trailer			Concentrates: "if known Not Fed" or unknown or Fed in trough(s) or Fed on ground"		
SCORING (circle appropriate value)										
A1. Sward management (grazing & mowing)?					Comments					
Much too intense	Above optimum	Optimum	Below Optimum	Negligible						
-10	-1 4	10	5 0	-5						
A2. Impact of supplementary feeding?										
Negligible	Low-Med	Medium	Med-High	High						
10	5	0	-5	-10						
A3. Impact on natural water sources? (Note if no natural water present)										
None	Low	Medium	High							
0	-7	-15	-20							
A4. Presence of bare soil?										
Insufficient	Optimum	Above Optimum	High							
-3.5	5	-2.5	-10							
B1. What is the level of immature, removable scrub? (% cover)										
None	<2%	2 to 5%	6 to 10%	>10%						
5	-2.5	-10	-15	-20						
B2. What is the impact of / threat from, Bracken?										
Negligible	Low	Medium	High							
5	0	-5	-15							
B3. What is the impact of / threat from, Purple Moor-grass (Molinia)?										
Negligible	Low	Medium	High							
0	-5	-10	-20							
B4. What is the extent of 'weeds'?										
Negligible	<2%	2-5%	6-10%	>10%						
5	0	-5	-10	-15						
C1. Conservation value (flora)? (Enter value provided by BP team)										
A	B1	B2	C1	C2						
60	50	40	25	15						
C2. Additional conservation value (tick boxes as appropriate)										
None	+ 1/2 class	+ 1 class	<input type="checkbox"/> Leaving agreed species-rich areas unmown <input type="checkbox"/> High frequency of nectar sources (clovers, dandelions & dandelion-like flowers, thistle-type flowers, white umbellifers incl. hogweed)							
0	5	10	<input type="checkbox"/> High botanical diversity on field margins incl. grp 4&5 species <input type="checkbox"/> Ant hills frequent <input type="checkbox"/> Other(state in comments box).							
C3. Have any of the habitats or archaeology present been damaged during past year? (circle/mark as appropriate)										
No	Yes	<input type="checkbox"/> Removal of established scrub <input type="checkbox"/> Herbicide <input type="checkbox"/> Reseeding <input type="checkbox"/> Dumping (e.g. spoil, rubbish)								
		<input type="checkbox"/> Infilling or levelling of small banks, hollows (e.g. old quarry pits) or 'ponds' <input type="checkbox"/> Removal of stone from built structures <input type="checkbox"/> Other								
Brief description & extent of damage - contact Burren Team asap for advice on how to adjust the field score.										
Brief description/Comments (e.g. additional habitats present, actions needed & priority, quality of work done):										

APPENDIX 2 WINTERAGE FIELD SCORE SHEET

I1 Score Sheet for Winterage-type Pastures				<i>Burren Programme v1.1 June 2016</i>	
Farm: _____		Field: _____		Surveyor: _____	
Date: _____					
Current Grazing Practice (circle as appropriate)			Feeding Management (circle as appropriate)		
Winter Only	Winter & Light Summer	Year Round	Other	Silage/hay: Not fed or Some fed loose, scattered Fed as: Round bales (ring feeder or not) or In/on Trailer	Concentrates: *where known Not Fed* or Fed in trough(s) or Fed on ground*
SCORING (circle appropriate value)					
A1. What is the grazing level?					Comments
Negligible	Below optimum	Optimum*	Above optimum	V. High	
-35	-25 -5 0 9	15	8 -6	-36	
A2. What is the litter level? (% cover)					
Low <10%	10-25%	>25-50%	>50-75%	High >75	
20	14	8	2	0	
A3. Is there damage around feed sites and/or water troughs?					
Low	Low-Med	Medium	Med-High	High	
15	11	7	2	-7	
A4. Is there damage around natural water sources? (Note if no natural water present)					
Low	Low-Med	Medium	Med-High	High	
15	11	7	2	-7	
A5. Is there bare soil and erosion?					
Low	Low-Med	Medium	Med-High	High	
5	1	-3	-10	-17	
B1. What is the level of immature, removable scrub? (% cover) Use N^a in brackets if seedlings commonly seen or cover is borderline					
<2%	3 - 5%	6 - 10%	11 - 25%	>26%	
15 (13)	9 (7)	3 (1)	-7 (-9)	-18	
B2. What is the impact of / threat from, Bracken?					
Low	Low-Med	Medium	Med-High	High	
5	1	-3	-10	-17	
B3. What is the impact of / threat from, Purple Moor-grass (<i>Molinia</i>)?					
Low	Low-Med	Medium	Med-High	High	
5	1	-3	-10	-17	
B4. What is the extent of 'weeds' &/or agriculturally-favoured species present due to management practices?					
Low	Low-Med	Medium	Med-High	High	
10	6	2	-3	-12	
C1. Does the field retain its ecological integrity (in terms of plant communities present)?					
Vegetation Typical	Veg. slightly modified	Veg. moderately modified	Veg. significantly modified		
5	0 -6	-17	-28		
Have any of the habitats or archaeology present damaged by unauthorised or careless activities during past year?					
Note type & extent of damage and contact Burren Team asap for advice on whether and how to adjust the field score.					
Comments (e.g. actions needed & priority, quality of work done, habitat type and pasture strength):					

APPENDIX 3 EXAMPLE OF AN INTERVENTION 1 (I-1) PAYMENT SHEET

Burren Programme 2019 I-1 Payment Sheet											Farmer X
Payment for Results (I-1)											Maximum payment (if all fields score 10/10) €7,252.40
Field no.	Field name	Pasture type (e.g. strength)	Grazing		Management recommendations	Digitised area (ha)	Assessable I-1 area (ha) (A)	Payment rate (€/ha) (see table below) (B)	Last year's I-1 score	This year's I-1 score	Payment (€) (A x B)
			Winter	Summer							
Winterage											
3	--	Weak-Middling	Yes	Optional	Cease silage feeding if possible, would have scored at least 5 if silage was not fed. Rest May/July, graze lightly in late summer (optional) and graze out in winter. Suggested I-2 works: Open paths through scrub to encourage grazing and control encroaching scrub and weeds.	2.50 ha	0.52 ha	€0	0	0	€0.00
6	--	Weak-Middling	Yes	No	Undergrazed and very rank. Increase levels of grazing, especially over winter. Suggested I-2 works: Open access paths through scrub for livestock, control encroaching scrub.	1.78 ha	0.10 ha	€0	5	5	€0.00
4	--	Middling	Yes	Optional	Improved winter grazing has led to an increase in score on this plot to a '9'. Maintain existing winter and late summer grazing regime. Continue to feed ration at various locations on the ground rather than in troughs. Suggested I-2 works: Control encroaching blackthorn/briars and any weeds or bracken present. Repair walls - including internal walls possibly.	71.53 ha	13.00 ha	€135	8	9	€1,755.00
1	--	Weak-Middling	Yes	No	In excellent condition. Continue existing winter grazing regime. Continue to feed ration at various locations on the ground rather than in troughs. Suggested I-2 works: Build gaps in shelter walls and complete tidying-up around spring.	29.68 ha	24.00 ha	€180	10	★ 10	€4,320.00
Additional Annex 1 (non SAC)											
2	--	Weak-Middling	Yes	Optional	Cease silage feeding if possible, would have scored at least 4 if silage was not fed. Overgrazed in summer. Rest during the main flowering season (May-July). Graze lightly in late summer (optional) and graze out in winter. Suggested I-2 works: Open paths through scrub to encourage grazing and control encroaching scrub and weeds.	5.77 ha	1.20 ha	€0	0	0	€0.00
7	--	Weak-Middling	Yes	Optional	Cease silage feeding if possible, would have scored at least 7 if silage was not fed. Rest May/July, graze lightly in late summer (optional) and graze out in winter. Suggested I-2 works: Control encroaching scrub and regrowth.	3.36 ha	1.54 ha	€0	0	0	€0.00
Total:						85.52 ha	40.36 ha		8.54	8.86	
								Last Year Average	2019 Average		
Total I-1 Payment Due: €6,075.00											

Advisor Details
Advisor: AN Other
Phone: --
Mobile: --

Declaration: We, the undersigned, agree with the information contained above, in particular to the I-1 scores applied to each field and the I-1 payment due this year.

Signed by Farmer(s): _____ Date: _____

Signed by Advisor: _____

Signed by SP: _____

I-1 Score **Winterage Payment Rates** **Meadow-like***

1-40ha	40-80ha	80-120ha	>120ha	1-10ha	10-40ha
<5	€0	€0	€0	€0	€0
5	€ 60	€ 30	€ 15	€ 8	€ 60
6	€ 72	€ 36	€ 18	€ 9	€ 72
7	€ 84	€ 42	€ 21	€ 11	€ 84
8	€ 96	€ 48	€ 24	€ 12	€ 96
9	€ 135	€ 68	€ 34	€ 17	€ 120
10	€ 180	€ 90	€ 45	€ 23	€ 158

*Fields scoring 5 are paid on in Years 1 + 2 only.

Increased payment rates available for fields scoring 9 and 10

High quality grassland, earns an extra 25%

★ Exceptional quality grassland, earns an extra 50%.

Sheet 1 of 1

APPENDIX 4 PAYMENT RATES FOR INTERVENTION 1 (I-1) SCORES

I-1 Score	Winterage Payment Rates				Meadow-like	
	1-40ha	40-80ha	80-120ha	>120ha	1-10ha	10-40ha
<5	€0	€0	€0	€0	€0	€0
5	€ 60	€ 30	€ 15	€ 8	€ 120	€ 60
6	€ 72	€ 36	€ 18	€ 9	€ 144	€ 72
7	€ 84	€ 42	€ 21	€ 11	€ 168	€ 84
8	€ 96	€ 48	€ 24	€ 12	€ 192	€ 96
9 ★	€ 135	€ 68	€ 34	€ 17	€ 240	€ 120
10 ★	€ 180	€ 90	€ 45	€ 23	€ 315	€ 158

Fields Scoring 5 are paid on in Years 1 + 2 only.

APPENDIX 5A **DETAIL ON CONSERVATION VALUE AND ECOLOGICAL INTEGRITY OF BURREN LOWLAND GRASSLANDS**

CONSERVATION VALUE - FLORA

When scoring BLGs, the criterion 'Conservation value – flora' has the highest weighting. As this value is slow to change under normal circumstances, it need only be calculated every 3-5 years unless there is reason to suspect an increase or decrease in the conservation value that would impact on the field score and hence payment. Here, we explain in more detail how it relates to the species composition of the targeted grasslands. Further details are available at: www.burrenprogramme.com/burren-programme-resources/.

To calculate the conservation value in terms of plant diversity, the field should be surveyed as follows:

- Generally, between four and ten recording stops should be made in the field, depending on its size, although more may be needed in particularly large fields. The stops should be representative of the vegetation of the body of the field i.e. avoid other habitats that might be present such as small flushes, and stay at least 5 m in from the field margins. The recording stops should be carried out at random (e.g. walk a pre-determined number of steps between stops so that there is no subliminal influence on stop location) when walking a zig zag route through the field.
- At each stop, record any of the listed species in groups 1-5 (Table 3.1) seen in an area of approximately 2 m radiating from the centre of the stop (i.e. circle with diameter of approx. 4 m) on the score sheet. Additional species of interest not on the sheet should also be recorded. The assessment is designed to be relatively quick, need not be exhaustive and should take a maximum of 15 minutes per stop (although it may take slightly longer depending on the condition of the sward). Where fields are obviously very species-rich, recording can be focused on species in groups 3-5 only.
- Enter the species data into the 'Cons val' sheet of the BLG calculator (in Excel) and it will calculate the conservation value (flora) automatically based on the frequency of occurrence of the recorded species. The frequency definitions are as follows:
 - Rare - found at 25% or fewer stops
 - Occasional – found at 26 to 50% of stops
 - Frequent – found at 51-75% of stops
 - Common – found at 76-100% of stops

Conservation values span a gradient of 5 qualifying classes (Table 3.2), a higher conservation class being assigned to an area with more frequent occurrence of the 'higher quality' indicator species. This gradient is reflected in the points (out of a maximum of 60) awarded for each of the 5 conservation classes as per the final column of Table 3.2. These points are input into the BLG Field Score Sheet (Appendix 1), and the resultant final field score in to the payment calculation (e.g. Appendix 3).

**APPENDIX 5B DETAIL ON CONSERVATION VALUE AND ECOLOGICAL INTEGRITY
OF BURREN LOWLAND GRASSLANDS**

Table 3.1

**INDICATOR SPECIES USED TO CALCULATE THE CONSERVATION VALUE OF BURREN
LOWLAND GRASSLANDS. THE INDICATOR SPECIES REPRESENT AN INCREASE IN
QUALITY AND HENCE CONSERVATION VALUE FROM GROUPS 1 TO 5.**

GROUP 1 SPECIES (low 'quality')				
Cirsium arvense/ vulgare	Heracleum sphondylium	Senecio jacobaea	Taraxacum officinale	Trifolium repens
GROUP 2 SPECIES				
Achillea millefolium	Cirsium palustre	Crepis/Leontodon* sp.	Medicago lupulina	Odontites verna
Plantago lanceolata	Ranunculus acris	Ranunculus ficaria	Rumex acetosa	Veronica chamaedrys
*excluding L. hispidus (in grp 5)				
GROUP 3 SPECIES				
Cardamine pratensis	Hypochaeris radicata	Iris psuedacorus	Leucanthemum vulgare	Luzula campestris
Myosotis arvensis/ discolour	Prunella vulgaris	Ranunculus bulbosus	Trifolium dubium	Trifolium pratense
Viola sp.				
GROUP 4 SPECIES				
Agrimonia sp.	Angelica sylvestris	Carex sp.	Centaurea nigra	Conopodium majus
Daucus carota	Filipendula ulmaria	Lathyrus pratensis	Potentilla erecta	Rhinanthus minor
Stellaria graminea	Trisetum flavescens	Vicia cracca/sepium		
GROUP 5 SPECIES (high 'quality')				
Achillea ptarmica	Ajuga reptans	Alchemilla sp.	Anemone nemorosa	Anthylis vulneraria
Blackstonia perfoliata	Botrychium lunaria	Briza media	Caltha palustris	Campanula rotundifolia
Centaureum erythraea	Cantaurea Scabiosa	Euphrasia sp.	Filipendula vulgaris	Galium verum
Gentiana verna	Geranium sanguineum	Geum rivale	Helictotrichon pubescens	Hyacinthoides non-scripta
Hypericum sp.	Knautia arvensis	Koeleria maculata	Lathyrus linifolius	Leontodon hispidus
Linum catharticum	Lotus corniculatus	Lychnis flos-cuculi	Ophioglossum vulgare	Orchid ¹
Parnasia palustris	Pedicularis sylvatica	Pilosella officinarum	Pimpinella saxifraga	Plantago maritima
Polygala vulgaris	Primula veris	Primula vulgaris	Sanguinum minus	Sesleria caerulea
Succisa pratensis	¹ Note species at bottom of sheet if identified			

**APPENDIX 5C DETAIL ON CONSERVATION VALUE AND ECOLOGICAL INTEGRITY
OF BURREN LOWLAND GRASSLANDS**

Table 3.2
ASSIGNING CONSERVATION VALUE

CLASS	DESCRIPTION	CALCULATION	POINTS
A	<p>VERY HIGH CONSERVATION VALUE</p> <ul style="list-style-type: none"> ● High floral diversity, many plant species characteristic of the local conditions (e.g. wet or dry meadow) present ● High number of Group 3, 4 & 5 'Quality' species that are occasional to common ● High ratio of herbs to grass – usually in excess of 50:50 	<p>TOTAL SCORE FOR GROUP 5 SPECIES ONLY > 30</p> <p>Calculated by:</p> <ul style="list-style-type: none"> ● 5 pts for each Group 5 sp. that is frequent or common ● 3 pts for each Group 5 sp. that is occasional 	60
B1	<p>HIGH CONSERVATION VALUE</p> <ul style="list-style-type: none"> ● Similar to above but fewer Group 5 species occasional to common ● High ratio of herbs to grass – often in excess of 50:50 	<p>TOTAL SCORE FOR GROUPS 4 & 5 SP. > 30</p> <p>Calculated by:</p> <ul style="list-style-type: none"> ● 4 pts for each Group 4 sp. that is frequent or common ● 2 pts for each Group 4 sp. that is occasional ● Plus score for Group 5 sp. calculated as for Class A 	50
B2	<p>GOOD CONSERVATION VALUE</p> <ul style="list-style-type: none"> ● Fewer Group 4 & 5 species occasional to common ● Ration of herbs to grass should be in excess of 30:70 	<p>TOTAL SCORE FOR GROUPS 3, 4 & 5 SP. > 30</p> <p>Calculated by:</p> <ul style="list-style-type: none"> ● 3 pts for each Group 3 sp. that is frequent or common ● 1 pt for each Group 3 sp. that is occasional ● Plus score for Groups 4 & 5 sp. calculated as for Class B1 	40
C1	<p>LOWER CONSERVATION VALUE BUT HAS POTENTIAL</p> <ul style="list-style-type: none"> ● Potential to increase conservation value with tweaking of management ● Group 4 & 5 species if present tend to be restricted to field margins 	<p>TOTAL SCORE FOR GROUPS 2, 3, 4 & 5 SP. > 30</p> <p>Calculated by:</p> <ul style="list-style-type: none"> ● 2 pts for each Group 2 sp. that is frequent or common ● 0 pt for each Group 2 sp. that is occasional ● Plus score for Groups 3, 4 & 5 sp. calculated as for Class B2 	25
C2	<p>LOWER CONSERVATION VALUE BUT HAS POTENTIAL</p> <ul style="list-style-type: none"> ● Similar to above but with few or no Group 4 or 5 sp. 	<p>TOTAL SCORE FOR GROUPS 2, 3, 4 & 5 SP. FROM 20 TO 30.</p> <ul style="list-style-type: none"> ● Calculated as for Class C1 	15
-	INELIGIBLE	TOTAL SCORE FOR GROUPS 2, 3, 4 & 5 SP. <20	-

APPENDIX 5D **DETAIL ON CONSERVATION VALUE AND ECOLOGICAL INTEGRITY OF BURREN LOWLAND GRASSLANDS**

ADDITIONAL CONSERVATION VALUE

Although botanical diversity is a good proxy, it can underestimate the true biodiversity value of some less flower-rich fields. We aimed to recognise this and to reward instances of positive management above and beyond that required. Thus, all fields, other than those with highest conservation value as determined botanically (i.e. Class A), can receive an additional 10 points which will increase the field score by 1. The following are examples of additional conservation management or biodiversity indicators that may qualify for the 10 point bonus:


- Leaving agreed flower-rich areas uncut at the time of mowing.
- Nectar sources that are important for pollinators, butterflies and moths relatively common in the field. For example:
 - Clovers.
 - Dandelions and other yellow dandelion-type flowers.
 - Thistle-type flowers (although classed as weeds, thistles have a high biodiversity value as a nectar source for pollinators, butterflies and moths, and their seeds form an important part of the diet of some birds (e.g. Goldfinch) later in the year).
 - White umbellifers including hogweed.
- Frequent ant hills.
- Higher botanical diversity on field margins e.g. more group 4 and 5 than in body of field.
- Presence of adjacent habitat (e.g. lake, wetland, woodland) whose invertebrates are supported by floral diversity of meadow.
- Participants can contact the Burren Team if they think that there are other examples of additional conservation value present.

OTHER NEGATIVE ACTIVITIES.

Any activity which leads to destruction or damage to all or part of the habitat and not covered elsewhere in the scoring system (e.g. indiscriminate herbicide use, ploughing, reseeded, or dumping of spoil or rubbish) is recorded and can be taken into account when calculating the field score. This can range from a deduction of 0 to 40 points from the overall score. The adjustment to the score will depend on the impact of the activity and is agreed by the farm advisor and the Burren Team.

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An aerial photograph of the Aran Islands, showing a dense grid of small, rectangular fields separated by stone walls. The island is surrounded by deep blue water, and a large lagoon is visible in the center. The sky is a clear, light blue.

**Aran, an incredible jigsaw puzzle
of little fields where farmers clear
their stoney patches and mark their
every increasing subdivision of their
holdings
by building walls...**

Tim Robinson *Stones of Aran* (1986)



Agricultural habitats cover approximately half the European Union (EU) and an estimated 50% of all species and several habitats of conservation concern in the EU depend on agricultural management. Reversing the loss of European biodiversity is clearly dependent on the conservation of farmland biodiversity.

Results-based approaches are the focus of a growing discussion about improved biodiversity conservation and environmental performance of EU agri-environmental policies. This book outlines lessons learned from a collection of Irish case studies that have implemented results-based approaches and payments for the conservation of farmland habitats and species. The case studies include prominent projects and programmes: the Burren Programme, AranLIFE, KerryLIFE, the NPWS Farm Plan Scheme and Result-Based Agri-environmental Payment Schemes (RBAPS) project.

This work is intended for an international audience of practitioners, policymakers and academics interested in results-based approaches for the conservation of biodiversity and the provision of ecosystem services.



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