



Synthesis, part of a Special Feature on [High Nature Value Farming Systems in Europe](#)

# Management of high nature value farmland in the Republic of Ireland: 25 years evolving toward locally adapted results-orientated solutions and payments

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**ABSTRACT.** The effective conservation of high nature value farmland (HNV) will be crucial for the conservation of European and Irish biodiversity, and to meet the growing demand for a wide range of private and public goods and services from farmland. Here, we describe the evolution of policy and management of HNV farmland in the Republic of Ireland over the last 25 years and describe the emerging locally adapted, results-based payment approach that is valorizing a broad range of ecosystem services from these areas, which helps to underpin the future social, ecological, and financial viability of HNV farmland.

HNV farmland in the Republic of Ireland covers approximately 33% of the agricultural land, and 50% of these areas coincide with Natura 2000 land. A broad diversity of landscape types dominated by seminatural vegetation from upland areas to lowland areas is a key challenge when designing policy support for HNV farmland areas. To date, action-based agri-environment schemes have struggled to adapt to these conditions, and to provide sufficient incentive and flexibility to deliver the desired environmental outcomes. In response, several projects and programs have implemented results-based payments, which we illustrate using three case studies from the Burren Programme, the Results Based Agri-environment Pilot Scheme (RBAPS), and European Innovation Partnership Operational Groups: The Hen Harrier and Pearl Mussel Projects. We highlight choices in the design and implementation of these case studies that aimed to better achieve the environmental objectives. We conclude with general lessons from the Irish experience with results-based approaches, and how they may be scaled up for wider implementation.

**Key Words:** *agriculture policy; agri-environment; biodiversity; ecosystem services; European Innovation Partnership; nature value; rural development; viability*

## INTRODUCTION

Agriculture over many millennia has shaped the landscape of the Republic of Ireland and much of Europe. Land managed for agriculture (~67%) and forestry (~11%) covers 78% of the Republic of Ireland. The farmed area extends to over ~4.5 million hectares and comprises 92% pasture, hay, grass silage and rough grazing, with a relatively small area of crop production (8%; EPA 2016). At farm level, this agricultural land base comprises a diverse range of habitat types from grasslands, hedgerows, woodland/scrub, field margins, and peatlands (Sheridan et al. 2017, Larkin et al. 2019, Rotchés-Ribalta et al. 2021), providing a range of provisioning, regulating, habitat, and cultural ecosystem services. There is a broad gradient in intensity of production from the intensive livestock and crop area in the east and southeast of the country to the extensive pasture areas in the west and northwest (Moran 2020), reflecting the distribution of natural/seminatural vegetation with natural constraints on food production due to a range of climatic and edaphic factors.

In the early 1990s, as intensive high input agriculture systems were seen as a major contributor to environmental degradation, there was a growing realization that certain low intensity agricultural systems were essential to maintaining environmental quality (Beaufoy et al. 1994, Oppermann et al. 2012). This low intensity farmland is characterized by the presence of a high proportion of seminatural vegetation, e.g., seminatural grasslands, wetlands, peatlands, heathlands, hedgerows, scrub, and woodland, and a diversity of land cover and land uses (Andersen et al. 2004, Paracchini et al. 2008). These areas are recognized as important

cultural landscapes across Europe and usually only persist in marginal agricultural areas of Europe with significant natural constraints, e.g., poor soils, steep slopes, high altitudes, unfavorable weather patterns, on intensification of land use systems (Oppermann et al. 2012, Gouriveau et al. 2019). They are of particular importance in terms of the provision of supporting, regulatory, and cultural ecosystem services (Paracchini and Oppermann 2012, Lomba et al. 2020). Examples of these important ecosystem services include clean air, clean water, carbon storage, agricultural biodiversity, and aesthetic landscapes (Cooper et al. 2009, Gardi et al. 2016, Plieninger et al. 2019). These services are under significant threat in high nature value (HNV) areas because of the dual forces of intensification and land abandonment often driven by wider societal issues such as aging rural populations, rural depopulation, and declining farm incomes (Oppermann et al. 2012, O'Rourke et al. 2012, McGinlay et al. 2017). In the past these ecosystem services were a by-product of traditional semisubsistence farming systems but today these low intensity farming areas are largely dependent on public funding for their survival (O'Rourke et al. 2012, Lomba et al. 2020).

As a result of their important role in the delivery of EU biodiversity targets, objectives relating to HNV (and the need to maintain and support the extensive farming systems upon which HNV farmland relies) started to appear in EU strategies and policies from the late 1990s onwards (Oppermann et al. 2012). One of the primary objectives of the first EU Biodiversity Strategy (EC 1998) was to promote and support agriculture in HNV areas.

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Building on this, Article 2 and Article 22 of the EC Rural Development Regulation highlighted the need to promote HNV farming environments, including those that were under threat. Since then, the identification, monitoring, and support of HNV farmland has been a policy requirement for EU countries (Oppermann et al. 2012) and remains a key impact and context indicator in the Common Monitoring and Evaluation Framework (CMEF) for the Common Agricultural Policy (CAP; EC 2017).

Despite these policy targets, HNV farmlands remain poorly supported by the CAP because of the link between direct payments and historic production levels, which were low in extensively farmed areas (Lomba et al. 2014). Additional challenges include the difficulty in meeting eligibility rules in areas dominated by seminatural vegetation and the concentration of agri-environment schemes on mitigating the impacts of intensive agriculture with little attention paid to valorizing seminatural vegetation and extensive farming systems for the ecosystem services they provide (Lomba et al. 2020). Thus, despite the CAP prioritization of HNV farmland, there are still few examples of successful implementation of policy goals in HNV regions of Europe (Beaufoy and HNV-Link Partners 2017) and ultimately there has been a reduction in the distribution and condition of HNV farmland across the EU (Lomba et al. 2020).

HNV farmland has the potential to generate a range of important benefits for society and contribute to achieving multiple UN Sustainable Development Goals but the formulation of a more coherent policy framework and implementation for HNV farmland is essential to realize these benefits (Gouriveau et al. 2019). Lomba et al. (2020) highlight potential means of moving HNV farmland toward social-ecological viability such as improved rural services, fostering technological innovation, and rewarding delivery of ecosystem services. They identify approaches within the Republic of Ireland, and specifically the Burren, including innovative results-based payments for ecosystem services, product development, and eco-tourism, which can play an important role in achieving viable HNV farmlands. In this paper we describe the evolution of policy and management of HNV farmland in the Republic of Ireland over the last 25 years. We also describe the emerging locally adapted results-based payment approach that is valorizing (i.e., to establish and maintain the price of, or assign a value to something by government action) a broad range of ecosystem services from these areas, becoming a central strategy in viable HNV farmland systems.

#### **HNV FARMLAND IN THE REPUBLIC OF IRELAND**

HNV farmland in the Republic of Ireland covers a broad range of landscape types dominated by seminatural vegetation (from upland areas to lowland areas) and broadly reflects the natural constraints on land use intensification (Jones et al. 2012, Moran and Sullivan 2017).

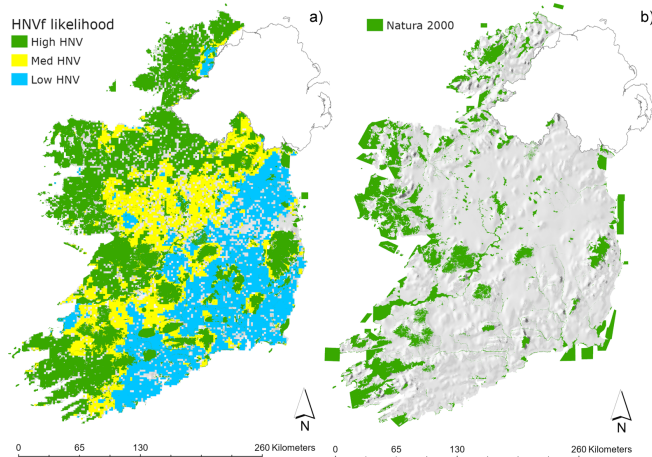
Species-rich seminatural habitats that developed alongside traditional farming methods were still common in many parts of the Republic of Ireland in the early 1990s (Schouten 1994). During the establishment of the EU Natura 2000 network (in the late 1990s) a significant amount of this HNV farmland was legally designated for the protection of a range of habitats and species. The top-down designation process with limited consultation, combined with a lack of baseline data to guide appropriate

management (bar some general prescriptive guidelines) led to widespread opposition from farmers and fueled a “designation controversy” (Visser et al. 2007). Agri-environment schemes first introduced in the Republic of Ireland in 1994 were seen as a potential solution, and a means to reward farming practices compatible with maintenance of the environment. However, initial agri-environment schemes were designed with the broad perspective of protecting the environment from farming and were not specifically targeted at the conservation or maintenance of HNV farmland. Early HNV farmland studies highlighted the need for clear definition, delimitation, and need for targeted supports for HNV farmland (Jones et al. 2003). Given the increasing policy focus on the need to conserve and maintain HNV, e.g., the European Agricultural Fund for Rural Development (EAFRD) established HNV farmland as a key priority for rural development programs from 2007 to 2013 (The Council of the European Union 2005), measures for HNV farmland were therefore incorporated in Ireland’s Rural Development Programme (RDP) 2006–2013. Support was mainly targeted through agri-environment action-based measures for upland common land (areas of farmland owned/managed collectively by a number of farmers) and Natura 2000 areas. Despite these policy efforts, common land management plans (introduced in 2001), and measures included in agri-environment schemes, the conservation status of many Natura 2000 and common land areas remains poor (National Parks & Wildlife Service 2019, *unpublished report*). Additionally, although a promising development in terms of an attempt at targeted support for HNV farmland, this approach neglected the widespread occurrence of HNV farmland outside of common land and designated areas (Oppermann et al. 2012, Matin et al. 2020).

The lack of knowledge of the distribution, extent, and characterization of HNV farmland was highlighted in Ireland’s Biodiversity Action Plan 2011–2016 (DAHG 2010). This led to the initiation by Department of Agriculture, Food and the Marine of funded research (2013–2016) on the identification, distribution, and extent of HNV in the Republic of Ireland. A national-scale validated map of likelihood of distribution of HNV farmland and a typology of HNV farmland in the Republic of Ireland were produced, building on earlier expert-based mapping of potential areas of low intensity farming across the island of Ireland (Beaufoy et al. 1994). This national map (Fig. 1a) estimates that approximately 33% of agricultural areas of the Republic of Ireland has HNV characteristics (dominated by seminatural vegetation with low-intensity farming systems). About 50% of these areas were located within the Natura 2000 network (Fig. 1b) highlighting their international importance for biodiversity (Matin et al. 2020). Correspondingly, 50% were located outside of the Natura 2000 network, highlighting the widespread occurrence of HNV farmland outside of designated areas. HNV farmland areas are concentrated in the west and northwest of the country and are restricted to mainly upland areas of the east where climatic and edaphic factors have limited agricultural intensification. Broad HNV farmland types have been described (Sullivan et al. 2017) ranging from whole-farm HNV farmland dominated by seminatural vegetation to partial HNV farmland with smaller proportions of seminatural vegetation. This research highlighted the need to consider the diversity of HNV landscapes types when designing policy

supports for HNV farmland areas and also the need to consider the large proportions of HNV farmland that occur outside designated Natura 2000 sites and upland areas.

**Fig. 1.** (a) Extent and distribution of high nature value farmland in the Republic of Ireland (adapted from Matin et al. 2020). (b) Natura 2000 network in the Republic of Ireland.



Farmers are confronted by multiple demands to provide a range of ecosystem services. Ecosystem structure and condition determines how an area as a whole functions and its potential to provide ecosystem services to society (Fischer et al. 2006, Mitchell et al. 2013). Given the diverse structure and configuration of the Irish agricultural landscape, it is important that policy objectives for different land use types and the services required from the range of agricultural land use intensities in Ireland is regionally adapted to the natural land use potential of the area. This natural potential is influenced by a range of climatic, hydrologic, edaphic, geomorphic factors and biotic interactions and are the main constraints on the locations of agriculture, forestry, and other land uses (Dale et al. 2000). Despite extensive reference to HNV farmland in Irish and EU policy since 2006, lack of understanding and knowledge of HNV farming systems and context has hampered effective policy design and implementation (ECA 2017, 2020). There is a need for locally targeted and adaptive management to provide locally tailored solutions. It is acknowledged by Irish policy makers that national generic prescription/action-based measures have been unable to adequately respond to particular environmental challenges and that alternative approaches need to be developed (DAFM 2019).

#### **DEVELOPING LOCAL SOLUTIONS TO INTRACTABLE NATIONAL CHALLENGES AND INCENTIVIZING ECOSYSTEM SERVICE PROVISION**

Over several years, a number of projects and programs in the Republic of Ireland have directly responded to the diversity and challenges associated with the effective conservation of biodiversity and livelihoods in HNV farmland systems. Common to many of them is a new focus on results-based approaches and payments. Results-based payments have been trialed across the European Union for over 25 years to improve the link between

payments and delivery of results in agri-environment schemes. They have received increasing attention in the last 10 years (Matzdorf and Lorenz 2010, Burton and Schwarz 2013, Keenleyside et al. 2014, Herzon et al. 2018, Maher et al. 2018), with a range of pure results-based approaches, and hybrid approaches that combine results-based payment with payments for supporting actions (Herzon et al. 2018). Here, we illustrate a selection of innovative, results-based payments systems in the Republic of Ireland with three case studies.

#### **Case study 1: Designing and implementing results-based payments in the Burren**

The Burren landscape is an extensive karst limestone region covering approximately 72,000 ha in the west of Ireland, with thin soils and dominated by a mixture of limestone pavements, calcareous heaths, Atlantic hazel woodland, and grasslands of various production intensities. It is widely recognized for its high natural and cultural heritage value, shaped and maintained by pastoral farming. It has been a focal point for the development of HNV farmland activities in Ireland and in particular elucidating the relationship between extensive farming systems, socioeconomics, and nature conservation. More generally, the Burren exemplifies HNV farmland landscapes in Ireland that have significant challenges because of land use intensification and abandonment. There has been increased polarization in farming activities with intensification on fertile accessible lowlands and continued decline in upland areas and other areas with significant natural constraints (Dunford and Parr 2020). The Burren Programme developed as a locally targeted response to the steady decline in traditional farming practices in the region and the related negative implications for the landscape, biodiversity, and water quality in the region. While environmental designations were taking place in the mid-1990s, when 30,000 ha of the Burren was designated as Special Area of Conservation helped to arrest damaging activities, they also deepened divisions between farmers and environmental authorities (Dunford and Feehan 2001). The introduction of the first national Agri-Environment Scheme “the Rural Environment Protection Scheme (REPS)” at this time brought welcome income to Burren farmers but, despite efforts to take account of the Burren’s unique circumstances, the broad design of REPS failed to address more specific environmental challenges associated with HNV such as scrub encroachment or point source pollution from silage feeding on species-rich grasslands (Dunford and Parr 2020).

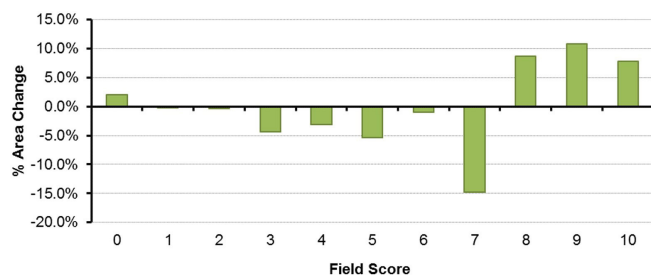
The seeds of the Burren Programme were sown during research on the relationship between farming practices and the natural heritage of the Burren (Dunford 2002). This work highlighted both the pivotal importance of farming to the heritage of the Burren and the need to engage farmers more actively in conservation efforts. The securing of EU LIFE Nature funding in 2004 (BurrenLIFE) enabled key conservation challenges to be addressed and, in an authentic cocreation process between scientists and farmers, led to the development of a blueprint for sustainable farming in the Burren. This tested, costed blueprint was implemented at scale (160 farms) between 2010 and 2015 with funding from the Department of Agriculture, Food and the Marine and the National Parks and Wildlife Service. Its positive environmental impact was recognized by the extension of funding in 2016 to include 328 farmers on 23,000 ha of land (~70% of the Natura 2000 area).

The initial Programme design appreciated that a solely action-based approach (as implemented under BurrenLIFE) did not offer sufficient incentive or flexibility for farmers to actively manage (mainly through grazing) the species-rich grasslands. In response, a results-based payments system with a simple 10-point scoring system was developed to reflect the environmental health of each qualifying field, with higher payments offered for higher scores. This incentive was complemented by a fund for conservation actions to help address key environmental issues with the ultimate objective, for farmers, of improving field scores (and thus, payments). Despite initial concerns in relation to administration and risk, this hybrid approach has worked extremely well; aggregate field scores have steadily improved over time and there has been better targeting of on-farm conservation actions, e.g., protecting water sources, restoring walls, removing invasive scrub (see annual reports at <http://burrenprogramme.com/>).

Paying for results was an immediate hit with farmers in the Burren who appreciated not just the incentive but also the fairness of the payment and the “freedom to farm” that it enabled. Farmers also benefitted from the support of a local office to deal with administration, payment, and planning issues, complementing the work of trained local advisors. The farmer-centered approach also included, for example, the simplification of farm plans (one or two pages typically), the use of reference costs instead of receipts when calculating the cost of farm works, and the farmer-led approach to the planning of conservation works to suit his/her farm.

As well as the strong economic (~€1.1 m p.a.) and environmental impact, with average field scores increasing by 12.4% over a 10-year period (Fig. 2), the Burren Programme has helped improve local social capital. This is evidenced by farmer involvement in leading educational walks for the public and contributing to conferences, helping to restore and enhance the fractured connection between the multigenerational farm families of the Burren and their unique region.

**Fig. 2.** Percentage change in area of Burren Programme field quality scores between 2010 and 2019. Source: BP Annual Report 2019 (<http://burrenprogramme.com/wp-content/uploads/2020/05/Burren-Programme-Year-4-2019-Executive-Summary.pdf>).



Some of the key principles that underpin the Burren approach are (i) a farmer-centered approach to both design and implementation, which respects farmers’ knowledge and rewards their efforts with fair and transparent payment systems; (ii) a focus

on outcomes and results through results-based payments; (iii) a locally led/adapted approach where administration, advisory, and research supports are implemented and designed to be cognizant of the local social-ecological context; while enabling (iv) freedom to farm facilitated by the flexibility built into the results-based payments where farmers decide how best to achieve the results on their farm supported by a local advisory system (Dunford 2016, Dunford and Parr 2020). This facilitates a diversity of approaches adapted to the inherent diversity of HNV farmed landscapes.

### Case study 2: Generalizing the implementation of results-based approaches through the RBAPS project

Although the Burren model is acknowledged as being successful for biodiversity and the farmer, more widespread adoption of the results-based approach has not been evident in Ireland or indeed across Europe until recently. Where results-based payments existed, they were for specific biodiversity priorities, e.g., lynx (*Lynx lynx*) in Sweden, or national biodiversity priorities (Keenleyside et al. 2014). Perceived barriers such as the assumption of higher transaction costs than action/prescription-based schemes, administration load, and potential to only work in areas of very high quality or biodiversity importance may have accounted for reluctance to engage with the approach. Therefore, a stepping stone was needed to test the possibilities and challenges outside of the Burren; this was the results-based agri-environmental pilot scheme (RBAPS).

The RBAPS ran from 2015 to 2018, cofunded by the EU Commission along with Irish and Spanish partners. The project developed and tested the applicability and practicality of results-based payments for biodiversity across diverse HNV farmland landscapes: the nondesignated lowlands of County Leitrim and the designated floodplains of the Shannon Callows in Ireland, and permanent crops in Navarra, Spain (Byrne et al. 2018). A project area in Spain was included in RBAPS because the lead partner (The European Forum on Nature Conservation and Pastoralism) had partners in both Ireland in Spain, and the inclusion of a Spanish area enabled the testing of the approach in a different biogeographical and cultural setting. The overall approach of RBAPS resembled that of the Burren Programme with a common design approach using a 10-point scoring system. Score cards included a range of indicators that assessed ecological integrity (e.g., positive and negative plant indicator species and vegetation structure), threats and future prospects, (e.g., extent of damaging activities) with results indicators specific to the selected biodiversity target(s). Results based payments were accompanied by voluntary supporting action payments and the provision of specialist advice and training. The project resulted in the development of a range of outputs to support the development and design of results-based payment schemes (RBPS) including a step-by-step guidance document (Maher et al. 2018).

Results from monitoring indicated that the score cards could distinguish between grasslands of varying quality for the selected biodiversity targets, providing an objective and valid basis for the assessment and payment for those of higher ecological value. Independent verification of a subsample (10%) of the scoring systems was conducted. The scoring measurements in the Irish areas were also assessed by the participating farmers, farm advisors, and with the Department of Agriculture, Food and the Marine to ascertain their views on their acceptability and

usability. Similar to farmer sentiment in the Burren Programme, the RBAPS pilot farmers (who were enrolled for two years) appreciated the innate fairness of the approach. One County Leitrim farmer commented that “this is the first scheme that has ever fit our type of land.” Farmers did raise concerns about the consistency of scoring between assessors and administrators (inspectors and auditors) on wider roll-out but understood that this worked in the Burren and that it could be addressed satisfactorily with training.

### **Case study 3: Pathway to wider implementation of results-based approaches through European Innovation Partnership Operational Groups**

In recognition that further work was needed at the local level to address specific environmental and biodiversity challenges not addressed in national agri-environment programs, a European Innovation Partnership (EIP) Operational Group measure was introduced in Ireland’s RDP 2014–2020, alongside the expansion of the locally adapted results-based Burren agri-environment scheme (DAFM 2019). This seeks to determine the applicability of the locally led approach to the design, implementation, and development of agri-environment schemes through the funding of EIP-Agri Operational Groups (Moran 2020). EIP Operational Groups offer the opportunity to bring a diverse range of partners (farmers, advisors, scientists, and the wider community) together to develop innovative solutions to specific problems or challenges (EC 2014). The EIP measure essentially seeks to determine if the Burren approach can be adapted and applied across a wider geographic area. The measure included two national priorities, the Hen Harrier (*Circus cyaneus*) and freshwater pearl mussel (*Margaritifera margaritifera*), species reliant on good HNV farmland management, coupled with an open call for locally led environmental and climate projects. The two flagship results-based EIP’s target national priorities identified in Ireland’s prioritized action framework (National Parks & Wildlife Service 2019, *unpublished report*). The approach adopted by these EIP’s draws on the knowledge base and common design principles developed by the Burren Programme and the RBAPS pilot. They have designed and implemented results-based payments systems (with supporting actions) aimed at providing the range of resources required by the target species in the landscape. They adopt a wider payment for ecosystem services approach and incorporate cobenefits for wider biodiversity, carbon, and water in their payment scoring systems in the target areas.

The Hen Harrier Project EIP designed and administers the Hen Harrier Programme (HHP) across six breeding Hen Harrier special protection areas (SPAs). Local farmer input, dominant habitats, ecosystem services, and Hen Harrier requirements were all considered when designing the five-year Programme within the €25 million budget. The Hen Harrier Programme aims to support farmers and farming communities in the enhancement of high nature value farmland landscapes, by working with them, to help ensure that upland management is rewarded and valued for the delivery of vital ecosystem services. Farmers first joined the Programme in 2018 and there are currently over 1600 participant farmers with contracts of up to five years covering ~37,000 ha of SPA land. There are three potential payments annually; the habitat payment (results-based payments based on habitat quality), the supporting actions payment, and the Hen Harrier bonus payment. The main payment is results-based

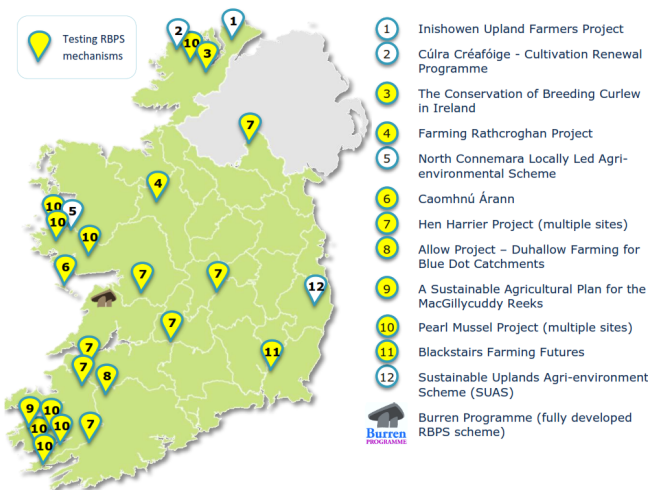
relating to the quality of the farmland habitats. These payments are based on score card structure developed in the RBAPS pilot following design principles of the Burren Programme. The scorecards were developed into mobile phone applications for the 2019 season to allow for the scaling to the high number of farmers in the program. The app feeds the scorecard results back to a central database facilitating timely payments and overall administration. The fields are scored annually by specially trained Hen Harrier Programme advisors. Details on field scores and payments are provided to the farmer, and this, along with a budget for supporting actions (these actions should aid score increases) enables farmers to improve the quality of their habitats. The HHP also includes a unique Hen Harrier bonus payment. The Hen Harrier bonus payments are based on SPA level nest targets being achieved and/or supporting local nest or roost sites. It is the largest results-based program in Ireland and the first to show the scalability of that approach through technological innovations to implement the scoring system and verify supporting actions using the app with geolocation data using a smart phone (HHP 2020).

The Pearl Mussel Project EIP commenced in May 2018 with a budget of €10 million and operates in eight designated catchments for the endangered pearl mussel species. Currently there are ~350 farmers and ~21,500 ha of land enrolled for five-year contracts (PMP 2019). The PMP aims to improve the quality of watercourses to benefit freshwater pearl mussel through incentivizing appropriate land management within the catchments, with cobenefits for wider biodiversity and carbon. Similar to the HHP, this is achieved through a hybrid results-based payment process, based on habitat score cards (grasslands, peatlands, and woodlands) with results indicators focused on ecological, hydrological, and soil integrity. This is combined with an innovative whole farm assessment/scoring system and a floodplain payment focused on risk of nutrient and sediment loss and flow regulation. The whole farm assessment assesses three broad criteria across the farm: (a) condition of watercourses (drains, streams, and rivers), (b) farm nutrient balance, and (c) farmyard risk assessment. The outcome of the whole farm assessment is used as a multiplier whereby the gross results-based payment for habitat and floodplain quality is multiplied by whole farm assessment: “poor” whole farm assessment equals a multiplier of 0.3, “inadequate” is 0.6, “good” is 1.0, and “excellent” equals 1.2 (a 20% bonus payment). Voluntary supporting actions are also available in this whole-farm hybrid results-based payment system. Supporting actions aim to target specific capital works aimed to improve habitat quality or whole farm score with each participant receiving an annual allowance based on their area of land within the catchment. Farmer involvement, training, and advice, as well as technological innovations including development of mobile apps and mapping systems, are similar to the HHP. There is continual dialogue between the various EIPs and Burren Programme facilitating shared knowledge and solutions to potential challenges and together these are evolving into a wider HNV agriculture knowledge and innovation system that could be further developed and supported in Ireland’s CAP Strategic Plans post 2020.

The capacity built and lessons learned from the Burren and RBAPS projects across a range of partner institutions enabled other HNV farmland areas to successfully emerge as funded EIP

Operational Groups across the Republic of Ireland. Of the 23 EIPS Operational Groups currently funded, 12 are located in HNV farmland dominated areas, with ~70% of these specifically testing innovations in results-based agri-environment payments focused on valorizing a range of ecosystem services (Fig. 3). Together with the support, advice, and facilitation of the Burren Programme, RBAPS team and partners, many of these have emerged as test beds for locally adapted results-based projects, providing a range of solutions to upscale the approach across geographical regions and multiple environmental targets, e.g., biodiversity, carbon, and water. This range of projects includes the development of novel mapping systems, mobile phone applications for fieldwork, common land governance models coupled with testing and developing whole farm and landscape/catchment scale results-based payments.

**Fig. 3.** Map of range of European Innovation Partnership Operational Group projects in Ireland with focus on high nature value farmland, with those developing results-based payments approaches highlighted in yellow. Includes location of Burren Programme, which is a hybrid results-based agri-environment payments scheme in Ireland's Rural Development Programme.



The locally adapted hybrid results-based approach highlights that a common design framework across diverse agricultural landscapes is possible. Similar to other RBPS programs across Europe there must be clear definition of the environmental objectives and results indicators used in scoring systems. These need to be locally adapted and capable of capturing the variation in environmental conditions in a target area, while being understandable to farmers and practical, and be based on a sound scientific evidence base and local knowledge (Keenleyside et al. 2014, Herzon et al. 2018, Maher et al. 2018, O'Rourke and Finn 2020). Guidance and training are key via integrated local farm advisory systems (peer to peer; technical and specialist support) and the use of the latest online technology in mobile phone applications and mapping can greatly enhance the efficiency of their implementation.

## ROLE OF RBPS AND LOOKING TO THE FUTURE TO ENABLE VIABLE HNV FARMLANDS IN THE REPUBLIC OF IRELAND

### Lessons learned from conservation initiatives in HNV farmland

To date, public payments for public goods have been associated with a general inability to produce effective policy outcomes for agri-environment schemes or demonstrate environmental effectiveness (ECA 2011), and the EU Court of Auditors recently concluded that CAP payments have failed to halt the decline of biodiversity (ECA 2020). Within the Republic of Ireland, the status of priority habitats and species has failed to improve and has deteriorated in many cases (National Parks & Wildlife Service 2019, *unpublished report*). Relatively little is known about the temporal trends of biodiversity in the significant area of HNV farmland that is outside of protected areas (Matin et al. 2020). Given the strong reliance of EU biodiversity on farmland, effective conservation of HNV farmland will be a cornerstone of any biodiversity conservation strategy.

Various EU institutions, e.g., the European Commission through its Farm to Fork and Biodiversity strategies, and EU Court of Auditors, are signaling the role of results-based payments as a “deep green” measure (ECA 2020) that should be more widely adopted for more effective achievement of environmental objectives. There will be an opportunity to implement results-based approaches in eco-schemes, agri-environment schemes, and higher-tier agri-environment options (in order of increasing likelihood). Here, we briefly consider some of the attributes of RBPS that contribute to their “deep green” status and discuss how they may be scaled up.

Some general lessons from the RBPS implemented to date suggest some general attributes that contribute to success:

- **Local champions:** these can promote community engagement and codesign of objectives, communication about how projects contribute to pride of place, and encouragement to participate.
- **Importance of locally relevant prior knowledge:** high levels of local knowledge facilitate the formulation of specific objectives; specific actions that are targeted at prioritized threats; evidence-based actions that are highly likely to be effective; actions that are feasible and cost-effective, and; monitoring and evaluation programs that reflect performance and thereby confirm effectiveness, or guide learning how to do better.
- **Design of indicators:** the design of indicators is crucial to discern lower and higher performance and allow payments to be differentiated in an objective manner.
- **Importance of specialized farm advice:** appropriate ecological advice needs to be targeted toward individual farms to better deliver substantial benefits for biodiversity and ecosystem service delivery.
- **Rapid monitoring of effectiveness, evaluation, and feedback:** in RBPS, farmers are financially incentivized to improve, and rapid feedback on performance is important to support this.
- **Design and payment structures to deal with risks:** management of risks that affect payment is important to ensure participation, and several options are available to mitigate this risk.

- With the focus on outcomes rather than actions, RBPS can provide the flexibility to incorporate farmers' experience of farming in HNV systems to maximize their payments. Farmers are provided the freedom to farm in an innovative way to best deliver the environmental outcomes.

RBPS is not a panacea for HNV farmland areas but is an important tool to incentivize nature conservation through extensive farming and the broad range of associated ecosystem services. It has been found to work best as part of a hybrid model where agri-environmental schemes (AES) combine both results-based payments and supporting actions. Since 2014 we have seen three broad payment models evolve in the Republic of Ireland. The simplest model is a hybrid results-based payment and supporting actions system based on habitat quality score cards for individual ecosystems, i.e., grasslands, peatlands, and woodlands, with results indicators that relate to a bundle of complementary ecosystem services, e.g., habitat quality, carbon storage, and water services. The second model adds a whole farm assessment multiplier to model one, e.g., Pearl Mussel Project case study three. Model three adds a bonus payment system for specific high priority targets that are delivered across multiple farms, e.g., Hen Harrier Project bonus payment case study three, and can help achieve a desired level of critical mass of participation at the landscape scale.

#### Scaling up from pilot projects to wider programs

A key challenge is how to upscale results-based approaches from pilot projects to larger programs? More specifically, can an economy of scale be achieved in the transaction costs, if results-based approaches are to be implemented more widely? Public transaction costs typically include those costs that arise for agencies that implement agri-environment schemes, for activities that include their design, ex ante evaluation, administration and support, provision of information, provision of training and education (for ministry staff, advisory services and farmers), compliance inspection, monitoring, ex post evaluation, and reporting. Private transaction costs are typically those borne by participants. They include the opportunity cost of information collection and processing when making a decision about whether to participate in a program or not, as well as the costs of application, administration, implementation, and training (following the decision to participate and implement actions).

Novel and innovative projects generally have significant start-up costs as they learn to address initial obstacles for the first time. However, these can be seen as locally implemented pilot projects where innovations can be trialed and improved; they can also be expected to reduce their per-participant transaction costs over time as they become more efficient, and increase the number of participants (O'Rourke and Finn 2020). For example, building on lessons from earlier projects, the Burren Programme has an administration budget that is capped at 15%. The administration costs were also capped at 15% for other similar results-based approaches introduced in the Republic of Ireland recently, including the Hen Harrier Programme (€25 million over several years) and the Pearl Mussel Project (€10 million over several years). These administration fees include most (but not all) of the public transaction costs.

In any case, the assessment of cost-effectiveness is not just about minimizing costs; having lower costs (as a percentage of spend)

for scheme delivery is a false economy if the objectives are not attained. Therefore, results-based approaches that achieve their objectives can offer significant cost-effectiveness (value for money) even if their transaction costs may be higher than action-based approaches (if that is indeed the case). The lessons from Irish case studies is that the transaction costs are targeted at activities that promote effective conservation practices and achievement of more specific objectives, e.g., design of schemes, selection of effective actions, local consultations, training of specialist advisors, training of farmers, monitoring of performance, and rapid feedback on performance.

#### Looking to the future

Looking to the future, the EU Farm to Fork strategy (EC 2020) envisages a greater coherence between the supply chain and policy objectives to enhance biodiversity and ecosystem services. This will likely involve a combination of public payments for public goods, as well as market rewards and payments for the private benefits that accrue from protecting and enhancing the environmental reputation of food production.

RBPS creates a market for ecosystem services and accounts for some of the market failures associated with food production. However, the creation of this additional opportunity alone will not result in viable HNV farmlands. It requires specific HNV innovations across a range of areas including social/institutional, regulation/policy, farming techniques/management, and products/markets, that lead to HNV farming systems that conserve the characteristic nature of these areas (Beaufoy and HNV-Link Partners 2017). To achieve viable HNV systems, together with rewarding ecosystem service delivery while fostering innovation and diversification, we also need to empower HNV farmers and rural communities through capacity building, networking, and cooperation, together with promoting societal demand and recognition for these areas and the services they provide (Lomba et al. 2020). Achieving viable HNV farming requires strengthening the entire social-ecological system in these areas (Strohbach et al. 2015). Recognition of farming for nature, networking, and cooperation are seen as vital elements in sustaining HNV farming in the Republic of Ireland. Initiatives such as the Burren Programme and various EIPS have seen the emergence of innovative multiactor partnerships working together to realize locally adapted and results-orientated solutions. Together with the Farming for Nature initiative (<https://www.farmingfornature.ie/>), which seeks to celebrate farmers' positive work for nature and build capacity, a new narrative around farming for nature is being shaped. This highlights that farming for nature can be agriculturally, economically, and socially progressive. An enabling policy environment is needed to scale up the HNV initiatives and realize the benefits for biodiversity and ecosystem services at a much broader scale. The increased environmental ambition of the future of CAP, the concentration on a results-orientated framework, and the growing demand for broader range of ecosystem services from agricultural land highlights real opportunities for HNV farmland and signals a clear role for results-based payments coupled with improved market initiatives.

*Responses to this article can be read online at:*

<https://www.ecologyandsociety.org/issues/responses.php/12180>

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**Data Availability:**

Data/code sharing is not applicable to this article because no data/code were analyzed in this study.

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