(2017-2023)
HEN HARRIER PROJECT
Final Report

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

The European Agricultural Fund for Rural Development: Europe investing in rural areas

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HEN HARRIER PROJECT LTD

Acknowledgements

The Hen Harrier Project wish to acknowledge the help and support of the following groups and individuals. It was all much appreciated: The project staff and contractors (especially Thady O'Brien, Michael Martyn and Denis Tuohy) who worked hard to achieve deadlines and were committed to making the Project a success. Our Project partners, the Golden Eagle Trust and Brendan O'Gorman Accountants and technology partners Intuity.

Our development farmers Ruairi Costello, Michael Cunningham (RIP) and PJ Conroy (Slieve Aughties), Gabriel Rehill (Slieve Beagh), Jack Lynch (Musheramore), Ray Ryan (Slieve Blooms), Padraig Berkery and Mary Ryan (Slieve felims), Jason Fitzgerald, Daniel O'Donoghue, Denis Hayes and Patrick Trant (Stacks). The participant farmers without whom the Project would have gone nowhere. They took a punt that we hope they feel paid off for them. There were many farmers who worked closely with us over the years and we are grateful to them all but Dan O'Donoghue, Padraig Mullane and the Mullane family, Paddy Joe Egan and Nia O'Malley deserve a special mention. The farm advisors who worked on the Project, scoring fields and submitting supporting actions. Special thanks to those advisors who engaged constructively with the Project team, raising issues, proposing solutions and making the Programme work for their clients. You know who you are. Staff at the Department of Agriculture, Food and the Marine, particularly those in the locally led section (especially Margaret Murray and Ronan O'Flaherty). Morgan Sheehy from Devenish Nutrition and Paul Nolan from Dawn Meats for their generous support of the Project, in particular the upland grazing trials that we carried out. Jack Caffrey of the Pimlico Project, who filmed and edited the training films for us and Bord Bia who assisted with the cost of the initial trailer and introduced us to Jack.

All members of our Project Steering Committee. Dr James Moran, Owen Carton, Gwyn Jones, Dr Brendan Dunford and Dr Declan Little who provided advice in the early stages of the Project in particular. The Burren Programme and the Pearl Mussel Project EIP for working with us to advance the reach of results-based payment schemes in Ireland and beyond. Thanks to Kristina Feeney, Padraig Cronin, and Eoin McCarthy for input into different parts of the report, especially the Local Actions Fund section. And thanks also to Naomi McMorrow, Tracy O'Hara and Alan Haverty for proof-reading, editing and formatting.

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Acronyms

ACRES CP - Agri-Climate Rural Environment Scheme Co-Operation stream
AEOS Agri-Environmental Options Scheme
ARC Activities Requiring Consent
BPS Basic Payment Scheme
CAP Common Agricultural Policy
COVID-19 Corona Virus Disease 2019
CRM Customer Relationship Managemen
CSP CAP Strategic Plan

D-G
DAFM Department of Agriculture, Food and the Marine
EIP European Innovation Partnership
EU European Union
FFNTG Farming for Nature Technical Group
GLAM Generic Land Management System
GLAS Green Low-Carbon Agri-Environment Scheme

H - I
HHP Hen Harrier Project
HNV High Nature Value
I**CMSA** Irish Creamery and Milk Suppliers Association
ICSA Irish Cattle and Sheep Farmers Association
IFA Irish Farmers Association
INHFA Irish Natura and Hill Farmers Association
IT Information Technology

L - S
LIFE French: L'Instrument Financier pour l'Environnement
LPIS Land Parcel Information System
MEA Minimum Eligible Area
NPI Non-Productive Investment
NPWS National Parks and Wildlife Service
NPO Nest Protection Officer
PASS Partially Automated Screening System
RBAPS Results-based Agri-environment Payment Scheme
SPA Special Protection Area

Introduction

The Hen Harrier Project Ltd successfully secured the Hen Harrier Project EIP following a public procurement process. The Operational Group included the Golden Eagle Trust and Brendan O' Gorman Accountants. The team were supported by Michael Martyn Agricultural Consultants and Tir Glas Agricultural Consultants and Dr James Moran. It was the largest EIP in Europe in the 2017-2022 CAP Strategic Plan (CSP).

Many of the natural and semi-natural habitats that the Hen Harrier depends on were created by agriculture. For centuries land management revolved around small scale tillage and the management of wet grassland, heath and bog as a grazing resource. The Hen Harrier and its prey thrived in this ecologically functional landscape. However, in recent decades, this relationship changed dramatically as demographic, economic and regulatory factors impacted on land use. All too often, the result was a deterioration in habitat quality at a landscape level. This has had a particularly adverse impact on a specialist predator like the Hen Harrier as they need large territories of suitable habitat that provide for breeding, foraging and wintering needs.

Afforestation and wind energy developments have had a dramatic impact on Irish upland fragmenting the available habitat and facilitating generalist predators such as foxes and Pine Marten. This had a particularly serious impact on Hen Harriers. Ground nesting birds such as Hen Harrier (and indeed many of their prey species) were directly impacted by nest predation but they have also been impacted by less productive territories with significant areas of forestry unsuitable for foraging forcing adult birds to travel further from the nest to provide for hungry hatchlings increasing the vulnerability of unfledged chicks to predators.

Within the breeding Hen Harrier Special Protection Areas (SPAs) these changes have been both positive and negative for the Hen Harrier. For example, while Hen Harriers, used young conifer plantations for breeding, these areas may have been acting as an ecological trap where elevated levels of nest predation may be contributing to a population decline. In tandem with these landscape changes, farming systems have also changed with increased winter housing of livestock, an increased concentration of production on improved grasslands and lower utilisation of heaths and marginal areas. Land eligibility requirement may have also contributed to the removal of scrub and the burning of rough vegetation.

These pressures have further reduced the quantity and quality of habitat available to Hen Harriers and their prey species. Similarly, these same changes in land use may also be undermining the social fabric of farming communities leading to de-population and land abandonment. The Hen Harrier Project sought to demonstrate that a locally focused scheme with the Hen Harrier as an indicator of a living landscape could help address these challenges. By supporting farming and farming families the project sought to enhance natural and semi-natural landscapes and help ensure that the outputs of vital upland management activity were rewarded and valued as ecosystem services.

A survey of breeding Hen Harriers in 2010 recorded 128 to 172 breeding pairs a number which was broadly similar to the totals recorded in the previous survey in 2005 prior to SPA designation. However notable declines of this species were recorded in some of its previous SPA strongholds. The 2015 survey of breeding Hen Harrier recorded further national declines with 108 to 157 breeding pairs. Further declines were also noted in four of the six of the SPAs. By the beginning of the scheme, the total SPA breeding population of Hen Harriers had declined by 10% since the 2010 survey and 27% since the 2005 survey.

In the years leading up to the commencement of the project, the continued decline of Hen Harriers in the Special Protection Areas designated for the species was evident. As a response to this, Ireland began the preparation of a Threat Response Plan for the Hen Harrier. The Threat Response Plan sought to cease, avoid, reduce or prevent threats, pressures or hazards that may be having an adverse effect on the conservation status of the Hen Harrier and/or causing the deterioration of the habitats of protected species within a European protected site under the Birds Directive (SPA). As an initial step, a moratorium on new forestry plantings was introduced and the licensing decisions for forestry activities began considering Red Zones (High Likelihood of Nesting Attempts) initially based on nesting locations detected in the 2010 and 2015 Hen Harrier National Surveys. In some quarters these measures were seen as restricting landowner's opportunities to earn an income from their land and depreciating the value of these lands. This caused tension among landowners with land designated as Hen Harrier SPAs and demands for compensation. Measures in traditional agri-environment schemes such as AEOS (Agri-Environmental Options Scheme) and GLAS (Green Low-Carbon Agri-Environment Scheme) did not assuage these concerns.

It was against this background of continued decline of the species in the areas designated for its conservation, increasing tensions regarding this designation and the perceived inadequacy of agri-environment schemes up to that point that lead to the decision to use the European Innovation Partnership (EIP) approach to develop an innovative locally led agri-environment scheme. This was innovative as, up to this point, EIPs were smaller, shorter in duration, more technical and not biodiversity focused. The €25,000,000 funding far exceeded the funding for other EIPs in the European Union at that point.

Following a public procurement process in early 2017, the contract to deliver this EIP was awarded to the Hen Harrier Project Ltd. In association with our partners in the Golden Eagle Trust and Brendan O'Gorman Accountants, we commenced the Hen Harrier Project EIP in May 2017.

Our ethos throughout was that by adding real value to the Hen Harrier's presence and by incentivising delivery of habitat quality on farms, the species and its habitats could be sustained. That effective conservation was possible within a cultural landscape where people, the Hen Harrier and wider biodiversity could thrive.

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Project Description

The Hen Harrier Project designed and delivered the Hen Harrier Programme. Throughout this report, the Project is referenced when talking about the team or the EIP in general whereas the scheme that the farmers could join is referred to as the Programme. The Programme differed significantly from previous results-based schemes both in terms of scale and the dispersed nature of the project area. However, there were still opportunities to learn from previous Results-based Schemes.

The Hen Harrier Programme was designed for farmers in the SPAs, with farmers in the SPAs, to ensure maximum uptake and engagement. The aim was to achieve a shift in attitude towards the species while delivering a results-based agri-environment scheme (RBAPS). The principles that the Project team believe were the foundations for success, and on which the design was guided, are outlined below. These were based on experience from past schemes and projects as well as innovative approaches that the Project team felt were essential.

The scale of the project necessitated that the ambition had to be far higher than anything that was attempted in previous Agri-environment schemes or LIFE (French: L'Instrument Financier pour l'Environnement) projects. Achieving favourable participant to staff ratios were essential to demonstrate the scalability of the results-based concept at a regional or national level. The use of technology to allow a small team to administer the programme was essential to achieve this. The Project Team developed a included customised CRM (Customer Relationship Management) databases and the deployment of a bespoke app to enable advisors to enter scorecard details easily, quickly and in a standard format, directly into our databases and to certify the delivery of Supporting Actions.

Hen Harrier Programme Principles

The programme's principles were modelled on those successfully developed by the Burren Farming for Conservation Programme but adapted for the specific needs of the Hen Harrier Project (HHP). They guided all aspects of the Programme's operation. The principles are:

1. **The farmer role is central**

The farmer is the key to farming for conservation. Firstly, farmers own the land, and the livestock needed to graze it. Secondly, farmers have the understanding and experience of how best to manage the land and livestock, knowledge that has been built up over generations. Thirdly, farmers are the ones with the most to lose and the most to gain from farming for conservation. Farmers need to play a vital role in the planning, delivery, monitoring and promotion of farming for conservation.

2. Partnership

Farming for conservation does not rely solely on the farmer, it requires different agencies to work together and to pool their skills and expertise. Our team brought a uniquely experienced group of farm advisors, researchers and raptor experts together to work with farmers and local communities.

3. Farm planning is essential

Every farm is different and must be treated differently. Effective farm planning - where the farmer combines their expertise with that of a trained farm advisor - can help to create a template from which the farmer could work effectively in future years. Without such a plan, works undertaken would have been haphazard and probably fail to deliver the best possible result for both the farmer and the Hen Harrier.

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4**. Practical and innovative**
Farming for conservation is based on sound, traditional principles of managing the land with respect and care but it is not an approach which seeks to 'turn the clock back' to old ways of farming. Instead, this is a practical approach seeking to blend the best aspects of existing farming systems with new innovations and technologies to develop effective ways to feed and water livestock and to optimise habitats for the Hen Harrier.

5. Flexible and locally adaptive
Farming is increasingly a highly unpredictable business. Climate change is leading to unforeseen events, from floods to droughts. Markets are highly volatile and diseases, new and old, continue to impact on livestock. A farmer needs the flexibility to respond to unforeseen events. Farming for conservation sets out conservation goals and gives guidelines, advice and incentives to reach these goals, but ultimately, it allows the farmer the flexibility and discretion to deliver these goals as he/she sees fit.

6. "An honest day's work for an honest day's pay"
Farmers have the knowledge, skills and experience to farm for conservation. Farming on marginal lands in the uplands of the Hen Harrier SPAs is under pressure. Farmers need society's support to apply these 7talents for the benefit of the uplands, for broader biodiversity and for the Hen Harrier. Farming for conservation is based on results – it doesn't just seek to support farmers per se; it supports active farming which helps to maintain or enhance the natural heritage of these uplands.

7. Creating real benefits
Farming for conservation will benefit the biodiversity of the uplands in the Hen Harrier SPA network and the communities that live there. It will help to improve incomes and create new opportunities. It will help to protect the natural and cultural heritage of these areas for the people of these areas so that they can enjoy it and hand it on in a condition of which they can be proud. It will help Ireland meet its legal obligations under the Birds Directive, avoiding hefty fines for the Irish taxpayer. Society too will benefit from the cross cutting environmental services (biodiversity, carbon sequestration and climate adaptation) that these areas can provide.

8. The importance of monitoring
Monitoring is essential to prove that farming for conservation is delivering its goals, and to show that it provides value for money. In this project monitoring informs the project and makes adaptive management possible. Monitoring is essential to the core aims and objectives of the project.

The Hen Harrier Project focused on six breeding Hen Harrier SPAs in Ireland. The six SPAs are, alphabetically, Mullaghanish to Musheramore Special Protection Area (often shortened to Musheramore by the HHP team), Slieve Aughty Mountains Special Protection Area (often shortened to Aughties), Slieve Beagh Special Protection Area, Slieve Bloom Mountains Special Protection Area (often shortened to the Blooms), Slieve felim to Silvermines Mountains Special Protection Area (often shortened to Slieve felims) and the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle Special Protection Area (often shortened to Stack's). The SPAs occur across counties Cork, Kerry, Limerick, Tipperary, Galway, Clare, Laois, Offaly and Monaghan. See Figure 1 for their distribution.

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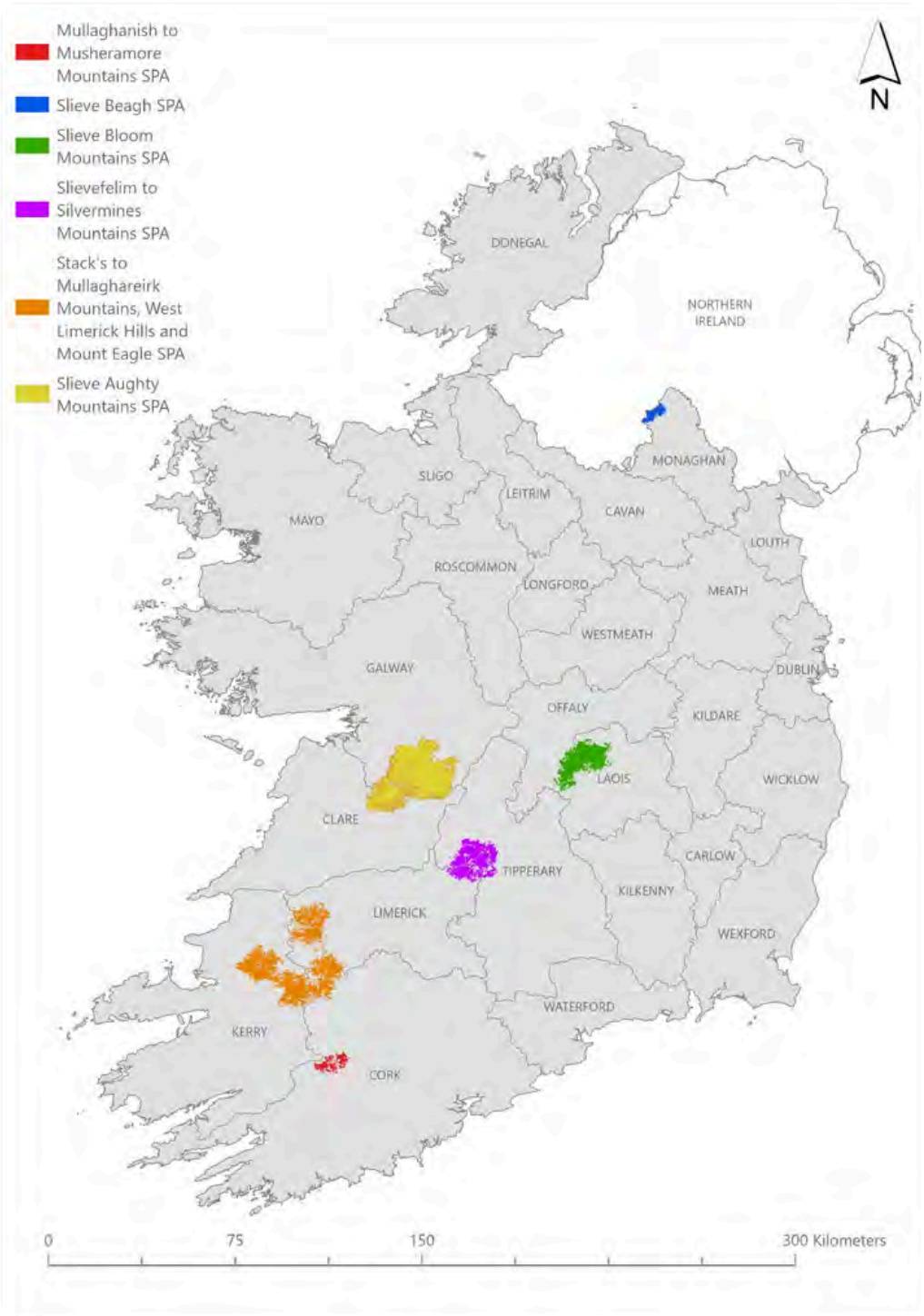

Figure 1. Breeding Hen Harrier SPA distribution across Ireland. The SPAs comprise over 167,000ha of land.

The SPAs comprise over 167,000ha of land. Just a third of this area is farmland with a very high proportion of the remaining two thirds comprising forestry (See Table 1). The dominant farm enterprises in the area were suckler beef, dry stock and some pockets of sheep farming. There were a small number of dairy farms in the Stacks SPA. Around 3,800 farmers farmed land in these areas at the time of the launch of the Hen Harrier Programme. The Programme was designed for, and with, these farmers.

SPA	Area (ha)	Herd numbers	Farmed land (ha)
Stacks	56,610	1546	20,730
Slieve Aughty	59,407	1181	20,648
Slievefelim	20,917	418	7,088
Slieve Bloom	21,771	384	4,275
Musheramore	4,961	159	3,053
Slieve Beagh	3,449	74	823
Total	**167,115**	**3,762**	**56,617**

Table 1. Area of the 6 breeding Hen Harrier SPAs in Ireland along with the numbers of farmers with at least one parcel of land intersecting the SPA layer and the total area of SPA that was farmland.

The Hen Harrier Project relied on a team of dedicated, multi-disciplinary staff open to listening and collaborating with farmers and other stakeholder over the course of the Programme. The people who worked on the Project team are outlined below (Table 2). Most members of the Project team had more than one role, allowing the project to achieve a lot with limited resources. Throughout the project lifetime, there was generally one full time Project Officer per 500 farmers. Additional staff were taken on as required during times of high workload, either as temporary staff or sub-contractors.

Table 2. List of people employed by the Hen Harrier Project in the course of the EIP.

Staff Member	Title	Duration
Fergal Monaghan	Project Manager	May 2017 - April 2023
Dr Caroline Sullivan	Deputy Project Manager, Ecology Specialist & Project Officer for Slieve Aughty Mountains SPA	May 2017 - April 2023
Eoin McCarthy	Agricultural Specialist and Project Officer for Stacks and Musheramore SPA	May 2017 - April 2023
Ryan Wilson-Parr	Ornithological Specialist and Project Officer for Slievefelims, Slieve Blooms and Slieve Beagh	May 2017 - April 2023
Evelyn Joyce	Project Officer for Stacks and Musheramore SPA	Dec 2017 - April 2019
Eibhlín Seoighthe	Administrative Assistant	May 2018 - Sept 2018
Aoife Hanrahan	Administrative Assistant	Oct 2018 - Sept 2019
David Miley	Mapping Assistant	Mar 2019 - Sept 2019
Ciarán Sullivan	Mapping Assistant	Mar 2019 - Sept 2019
Kristina Feeney	Mapping Assistant, Administrative Assistant and Project Officer for Slieve Aughty Mountains SPA	April 2019 - Dec 2022
John Kelly	Project Officer for Slieve Aughty Mountains SPA	Aug 2021 - Dec 2022
Padraig Cronin	Project Officer for Stacks and Musheramore SPA	June 2019 - Dec 2022

The Hen Harrier Project Ltd. established an office in Oranmore, Co. Galway. This location meant that staff in the main office were within 60-90 minutes' drive of the four largest of the six SPAs with good motorway access for the remaining most southerly and northerly SPAs. A small office was opened in Abbeyfeale, Co. Limerick also. The Project Officer for Slieve Beagh, the Blooms and the Slievefelims worked remotely from the east coast which allowed swift access to these SPAs also.

The Golden Eagle Trust were responsible for the Hen Harrier monitoring work during the breeding seasons from 2017 to 2022. Shane O'Neill, Jamie Bailey, Frank Connolly, Tim O'Donoghue, Dougie Ruddock and were key members of the monitoring team headed by Dr Marc Ruddock.

Steering Committee

The Project team were guided through the course of the EIP by a steering committee with representatives from DAFM (Department of Agriculture, Food and the Marine), the Forest Service, NPWS (National Parks and Wildlife Service), private and Teagasc advisors and SPA farmers (Table 3). The private advisor and the farmer representative were appointed as members of the committee for a limited time. These roles were rotated to another private advisor and farmer to gain multiple perspectives from across the SPAs. The COVID-19 pandemic resulted in fewer rotations happening than the team had initially anticipated. Public health considerations meant that steering group meetings had to be in a virtual format for a period, but the in-person meetings recommenced before the end of the Project.

Table 3. Members of the Hen Harrier Project Steering Committee

Member	OrganisaHon
Fergal Monaghan	Hen Harrier Project
Caroline Sullivan	Hen Harrier Project
Marc Ruddock	Golden Eagle Trust
Lorcan O'Toole	Golden Eagle Trust
Margaret Murray	Department of Agriculture, Food and the Marine
Bridgeena Nolan	Department of Agriculture, Food and the Marine
Denis O'Connell	Department of Agriculture, Food and the Marine
Kevin Collins	Forest Service
Andy Bleasdale	National Parks and Wildlife Service
Catherine Keena	Teagasc representative
A farmer representative	Rotating position from different SPAs
Private advisor representative	Rotating position from different SPAs

Denis Hayes and Dan O'Donoghue (Stacks SPA) were the two farmer representatives and Denis Tuohy (Slieve Aughties SPA) and Martin Mulvihill (Stacks SPA) were the two private advisor representatives over the Project term.

The Project team reported to the Steering Committee on progress and developments over the Programme lifetime. The Committee assisted with issues that arose over the course of the Programme such as data sharing arrangements and decisions on setting Hen Harrier Bonus targets and payments for example.

Scheme Design and Development

The next section outlines some of the key elements of the scheme development. It is difficult to capture the full breadth of the issues that were considered during scheme design and development. Some things that seemed like they would be good ideas were trialled and failed or were considered but were not feasible for a programme that had to operate at scale. It's important to remember that actions or approaches that were possible for 30 farms or even 100 farms become impossible, or their value or utility reduced, when more than 1,500 farms were being catered for.

Co-creation of scheme with farmers; Development farms

The Project team recruited twelve development farms across the six breeding Hen Harrier SPAs in Ireland. Nominations were invited from the following farming organisations; Irish Farmers Association (IFA), the Irish Natura and Hill Farmers Association (INHFA), the Irish Farmers with Designated Land 11(IFDL), the Irish Cattle and Sheep Farmers Association (ICSA) and the Irish Creamery and Milk Suppliers Association (ICMSA). With the exception of the ICSA, all of these contributed to the process by nominating suitable farms from their membership. These were supplemented by nominations from advisors operating in those areas and by the National Parks and Wildlife Service (NPWS) (Table 4). The objective was to get at least one development farm per SPA representing a range of farm enterprises, part-time and full-time farmers and farmers with full and partial SPA designations. These farmers received a payment to cover their time interacting with Project team members and for the use of their farms for developing the scheme, including field trips, scorecard development, and testing, trialling and providing feedback on the utility of proposed actions.

Table 4. List of development farm locations, associated SPA, enterprise type and nominator.

County	SPA	Enterprise type	Nominated by
Cork	Mullaghanish	Sheep	IFA
Clare	Slieve Aughties	Suckler cattle and sheep	IFA
Galway	Slieve Aughties	Suckler	IFA
Galway	Slieve Aughties	Suckler	INHFA
Monaghan	Slieve Beagh	Cattle	Michael Martyn
Tipperary	Slievefelim	Cattle	NPWS
Tipperary	Slievefelim	Sheep	IFDL
Cork	Stacks	Replacement Dairy Heifers	IFDL
Kerry	Stacks	Suckler beef	Eoin McCarthy
Limerick	Stacks	Dairy	ICMSA
Kerry	Stacks	Dairy	Eoin McCarthy
Offaly	Slieve Blooms	Suckler	Michael Martyn

The development farms were visited regularly by the HHP team during the development phase of the Programme (Figure 2). The main habitats on the farms were mapped. The condition of those habitats and their contribution to Hen Harrier ecology was also assessed. The scorecards were developed based on high-quality fields achieving a maximum score of 10/10 with fields with lower quality habitats and/or issues of concern receiving a proportionally lower score. The scorecards were tested on these farms and feedback was gathered from the development farmers throughout the process to ensure that terminology and deliverables were clear.

Figure 2. (L) Fergal Monaghan, Michael Martyn and Marc Ruddock listening to development farmer Denis Hayes talk about his farm management in the Stacks Mountains SPA. (R) Michael Martyn discussing land management with development farmer Gabriel Rehill in Sliabh Beagh.

The relationships developed during the design phase of the Programme were long-standing and very valuable. The development farmers were an excellent source of feedback as different elements were rolled out. For example, an initial deadline for the first round of supporting actions was resulting in farmers feeling under pressure to bring heavy machines into fields before the start of the bird nesting season. This had the potential for creating the perverse impact of important HHP fields being damaged and creating areas of bare soil. When this was brought to the attention of the Project team, they were able to the deadline was removed allowing actions to be certified as delivered at any stage.

Co-creation of scheme with farmers; Consultation meetings

Farm organisation consultations

The Project Manager had several meetings with the farming organisations who wanted to input into the scheme design. Meetings were held with the Irish Farmers Association (IFA), Irish Creamery and Milk Suppliers Association (ICMSA), the Irish Natura and Hill Farmers Association (INHFA). The Project Manager also engaged with the Irish Farmers with Designated Land (IFDL) group during this period. The Irish Cattle and Sheep Farmers Association (ICSA) did not participate in this process although they were invited to do so. The meetings outlined the principles of a results-based approach, the consultation process and how the results of that would be incorporated into the scheme. Any concerns raised by these groups were noted and addressed within the scheme where possible. Most concerns related to payments and concerns around farming restrictions in SPAs.

Farmer consultations

Consultations with farmers were a key part of the development process for the Hen Harrier Programme. They were essential to inform the Project team, to establish a commitment to open dialogue and to demonstrate to farmers that the work on the programme had begun. Most importantly, they were necessary to inform the Project team of issues of concern to farmers so that these could be appropriately addressed in the Programme design phase. Here, we summarise the issues raised in the consultation phase, how they contributed to the design of the programme and how the questions asked would now be answered in the Hen Harrier Programme.

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Farmer consultations ran for seven weeks, from early-July to the end of August 2017. During this period, the Hen Harrier Project held 31 farmer consultation meetings throughout the SPA network. Over 500 farmers attended these meetings. These were supplemented by meetings with the Farm Representative Organisations and a seminar for farm advisors.

Attitude Assessments

At the start of the meetings, before any information had been presented, farmers were asked to complete a short exercise. They were asked four questions:

Q1. Thinking about your area and your farm, write down five words that best describe it today.

Q2. Thinking about the Hen Harrier, write down five words that you would associate with it today.

Q3. Describe farming in your area in 20 years' time

Q4. Describe farming in your area in 20 years' time, in an ideal world.

The farmers responses were collated into four-word clouds. A word cloud is a visual representation (image) of word data. In other words, it is a collection, or cluster, of words depicted in different sizes. The bigger the word appears, the more often it's mentioned and therefore, the more important it is.

The results presented below made it clear to the Project team what the key issues were across the SPAs. There were many commonalities among them, and the Project team believed that it would be possible to address some of them through a results-based scheme.

The response to question 1 almost always included the word 'rushy' and 'wet' and so we removed them to allow other words to be visible also. The other commonly used words included 'mountain', 'disadvantaged', 'forestry', and 'hardwork'. 'Hilly', 'suckler', 'poor land', 'marginal', 'scenic', 'not viable', 'unprofitable' also appeared frequently (Figure 3).

Figure 3. Q1. Thinking about your area and your farm, write down five words that best describe it today

The response to question 2 highlighted the key feeling toward Hen Harrier in these areas. Restrictions was the one word that was used most frequently. Other words used regularly in relation to the Hen Harrier by the farming community were ‘protected’, ‘money’, ‘scarce’, ‘don’t know about it’ and ‘land devalued’ (Figure 4).

Figure 4. Q 2. Thinking about the Hen Harrier, write down five words that you would associate with it today.

The farmers outlook for the next twenty years was captured in question 3. They imagined their areas as being ‘forestry’ with ‘no farming’. They saw an elimination of the small farm with ‘big farms only’ and ‘no young farmers’ remaining in the areas (Figure 5).

Figure 5. Q3. Describe farming in your area in 20 years’ time

The outlook was quite different when the same question had the words ‘in an ideal world’ added to it. The hope that farmers had for their area was obvious with profitability, sustainability and still farming being key here. Other words of note were ‘good grazing’, ‘young farmers’, ‘biodiversity’ and ‘proper funding’ (Figure 6).

Figure 6. Q4. Describe farming in your area in 20 years' time, in an ideal world

The consultations themselves comprised of a short presentation on what a results-based approach would mean followed by a discussion on how the farmers felt about the approach and what needed to be incorporated into it. The team realised after the first couple of meetings that attendees were expecting scheme details as opposed to a consultation and so in subsequent meetings it was made clear from the introduction what the meeting was and what it wasn't. This was likely a reflection of farmers experience where schemes were developed centrally, and farmers informed afterwards. That was not our intention. It was important to us that the farmers voice was heard and incorporated into the scheme as much as possible.

Responses to over-arching themes and discussions

Following the consultations, the HHP team put together the most frequently asked questions along with the reasons why certain things were included in the programme, or were not or could not be included, in the programme. This was made available online and was a useful reference document for Project Officers when dealing with queries. The responses to the main over-arching themes and the discussions are outlined below.

Programme payment rates

The Project team had to ensure that the funds available were used to the best possible effect. This required striking a balance between the rate of payment and the number of participants. To do this the Project team had to consider the finite resources available and the need to deliver sustainable agricultural and conservation outcomes. The payment system was designed to deliver a significant payment to those who engaged with the programme and delivered high quality habitats. This approach incentivised success but left the farmer free to choose between a market for agricultural products and one for ecosystem services.

In the consultations with farmers and farming organisations, some were in favour of including every farmer and every hectare in the programme. The idea that participation should be restricted to very large farms was also expressed. Payments of €370 per ha, or payments equivalent to forestry premia, were also proposed. These approaches were not considered to be viable. If every farmer and every hectare was included, the payment rates would be too low (approx. €53/ ha) to achieve the desired results. Such an approach would have presented a high risk of failure and would not have satisfied any 16 of the stakeholders. The higher area-based payments suggested would limit the area covered by the programme to approx. 11,000 ha, and the number of participants to approx. 3-500. Selecting participants, even if the programme were restricted to those with more than 19 ha, would have been an impossible task. A small number of participants would have received very high payments, while the majority would have been paid nothing, such an outcome would have been divisive and was considered likely to cause further discontent.

Even if this approach were permitted by the governing regulation, the area covered would be too small to deliver the required conservation objectives. In addition, the prospects for building community engagement would have been poor as too many people would have been left behind. With both the "paying on every hectare" and the "€370/ ha" models, the net result would be to reduce the prospects of success and potentially undermine future agri-environment schemes. The model chosen was inevitably a compromise, providing worthwhile payments covering as much land and to as many participants as possible.

The project should pay for the farm plans

The Hen Harrier Project produced the initial Farm Plan at no cost to the farmer and advisory costs were incorporated into the habitat payments. This was done as part of a series of measures to reduce the impact of advisory costs on farmers. These costs were a concern for many farmers. A number of issues contributed to this: application risk, cash flow implications and the effect on the net benefit from participation.

1) Application Risk: Advisors and farmers were clearly worried that significant investment in a Farm Plan would be required in advance of an application. If the application was unsuccessful, this investment would be lost. The design of the Programme removed this risk by basing selection on existing data sources, i.e. BPS (Basic Payment Scheme) Land Parcel data and Hen Harrier monitoring carried out by the Project. The operation of the selection process only required a single page Expression of Interest form that could be prepared by the applicant at no cost other than postage.

2) Cash Flow Implications: We recognised that even if participants could recoup their transaction costs from future payments, they still experience a negative cash flow impact in the interim. To minimise this, the Project produced the Farm Plan at no cost to the participant. As advisory support would still be required to assess habitats and to apply for Supporting actions, the design of the Programme also narrowed the interval between the need for advisory support and farmer/ programme payments to 3-4 months.

3) Effect on the Net Benefit from the Programme: The funding for the project was limited. The delivery of the scheme required advisory input, and this had a cost. Payments to cover these costs could be made directly by the Hen Harrier Project to the advisor or be made to the farmer who would then be responsible for paying the advisor. Either way, the money was coming out of the same fund. While direct payments from the project to advisors would reduce cash flow issues for farmers, it could have potentially created other difficulties, including linking the advisor too closely to the Project team raising the question of who does the advisor work for and potentially greater overall advisory costs.

A hybrid approach where the project would pay the initial costs and farmers pay the annual costs was considered. This was rejected as it could lead to an expectation that direct payments to advisors would continue, leading to confusion and frustration on the part of both advisors and farmers alike.

It was decided to incorporate advisory costs into the habitat payments to farmers, rather than pay advisors directly, as it is likely that a farmer dealing with an advisor across a range of schemes would be able to get a more competitive price than the Project. Also, it was deemed that direct payments to 17th advisor could create a risk that the advisor would be seen as an agent of the Project rather than as a support to the farmer and finally, the rules for costing payments to participants included provision for transaction costs. The Project team believed that this approach removed barriers to entry and was a cost-efficient way of utilising public funds for the provision of advisory support to participating farmers.

Confusion and misinformation on rush management

Delivering optimal structural diversity on rushy grassland is best delivered through targeted grazing by livestock. Cutting and weed licking can supplement grazing in achieving the desired outcome but grazing remains indispensable in achieving the complex sward structures that were deemed to provide optimal foraging territory for Hen Harriers. GLAS has its own rules and participants in that scheme had their contractual obligations to DAFM. In GLAS 1 participants were required to cut parallel strips in grassland dominated by rushes (>70%) to improve vegetation structure. The Hen Harrier prescription in GLAS 2 & 3 was different, allowing for rush cutting but not requiring it. The Hen Harrier Project team were concerned that the focus on rush cutting in GLAS was excessive and that this posed a risk to achieving the projects objectives. There was real concern over the risk posed by mowing to ground nesting birds and small rodents, essential parts of the Hen Harriers prey base. We undertook to continue to work with advisors and DAFM to clarify rush management needs on farms participating in the GLAS scheme and to encourage late cutting to minimise impacts on prey species.

Perceived Restrictions/Consent Issues on land management

The Activities Requiring Consent (ARCs) in SPAs designated for breeding Hen Harrier are:

1) Agricultural reclamation of heath or bog. The Hen Harrier Programme recognises the biodiversity value of peatlands and through the bog/heath scorecard rewarded farmers for supporting and enhancing this quality.

2) Construction, removal or alteration of fences, stone walls, hedgerows, banks, or any other field boundary other than temporary fencing. Hedgerows are considered as a landscape feature and must be retained as a condition of the Basic Payment Scheme; this applies to all lands and is not linked to the designation. The Hen Harrier Programme recognised the value of field boundaries including hedgerows and included them in the calculation of the field score on the grassland scorecards

3) Off-road recreational use of mechanically propelled vehicles. The use of all-terrain recreational vehicles is not an agricultural issue and was not part of the programme provided to farmers. We did however engage with Coillte on measures to mitigate harm caused by the unauthorised use of Scrambler motorbikes in certain Coillte properties.

The moratorium on further afforestation in the Hen Harrier SPA areas was an issue for the Hen Harrier Threat Response Plan being developed by the NPWS.

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The requirement for Screening for Appropriate Assessment to be undertaken under Article 6(3) of the Habitats Directives and submitted with any planning application for development of land in SPA areas were a planning issue for the local authority and were beyond the remit of the Hen Harrier Project. The Hen Harrier Project undertook to assist participants with Screening for Appropriate Assessment arising from agricultural activities.

Confusion and misinformation in relation to regulations

Discussions with farmers revealed significant confusion on the extent of the regulations that apply in SPAs designated for Hen Harrier, with many convinced that they are not allowed to cut hedges, remove scrub, clean drains etc. Many farmers believed that the full set of ARCs applied on all NATURA designated sites. Whereas the agricultural operations covered by ARCs in these SPAs only related to 18the drainage of bog or heath and to the removal of field boundaries. The maintenance of drains on grassland was unaffected by the SPA designation and the cutting of hedges or the removal of scrub were limited by the legal restrictions applying everywhere, i.e. the prohibition on cutting from March 1st to August 31st. The moratorium on new forestry was introduced in 2013. It was to be reviewed as part of the Hen Harrier Threat Response Plan.

There was clearly a communication problem with the regulatory requirements arising from the designation being misinterpreted by many stakeholders. We believed that many of the issues created or exacerbated by this could be addressed through improved communication between the parties involved. The Hen Harrier Project worked with DAFM, NPWS and farming stakeholders to assist all parties to reach a common understanding of the regulations that apply in the Hen Harrier SPAs.

On designated land, issues also arose in respect of the planning process, these are a matter for the relevant local authority. The Hen Harrier Project undertook to assist participants with screening for appropriate assessment if this was required by a local authority for developments linked to participation in the programme.

The key issues raised by farmers during the meetings are categorised in Table 5 below.

Issue	Frequency (%)	Mul	SAu	SBe	SBl	SFe	Sta
Compatibility with ANC, BPS & GLAS	77.4	-	1	3	5	1	3
Eligibility issues and DAFM Penalties	67.7	1	4	1	2	2	1
Project should pay for the farm plans	51.6	1	11	4	1	3	5
Payments must be proportionate to forest grants	48.4	1	5	2	6	4	9
Confusion and Misinformation on Rush Management	45.2	1	12	5	7	-	2
Restrictions/Consent on land management	41.9	-	6	6	3	7	6
Confusion and Misinformation of Regulations	38.7	-	7	7	8	8	7
Scoring System will result in small payments for small farms	32.3	1	2	-	-	-	4
Should be paid on with GLAS	29.0	-	-	8	4	-	8
Criticism of NPWS & Designation Process	22.6	-	-	9	9	5	14
Farmers Disadvantaged & Livelihood devalued	19.4	-	-	3	10	6	15
Project should be available to all Farmers in SPAs	16.1	-	8	-	12	9	10
Compensation for designation	16.1	-	13	-	-	-	11

Issue	Frequency (%)	Mul	SAu	SBe	SBl	SFe	Sta
There should be an appeals process for project scores	16.1	-	-	-	-	-	12
Commonage should be allowed	12.9	-	3	-	11	-	16
Pine Marten are an issue	12.9	-	9	-	-	-	17
Payment should be up-front	9.7	-	-	-	13	10	13
Don't want to be dictated to by DAFM or NPWS	9.7	-	-	-	-	-	-
Land that is not designated should be eligible	6.5	-	10	-	-	11	-
There should be funding for infrastructure/access	6.5	-	14	-	-	-	-

Table 5. Main points raised by farmers during the consultation meetings. Issues that were raised with a frequency of 5% or less are not shown here.

Abbreviations: Mul: Mullaghanish to Musheramore Mountain SPA (n=1); SAu: Slieve Aughty Mountains SPA (n=9); SBe (n=2): Slieve Beagh SPA (n=2); SBl: Slieve Blooms Mountains SPA (n=5); SFe: Slieve Felim to Silvermines SPA (n=5); Sta: Stacks to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (n=8).

Scorecards

Scorecard design

Designing scorecards was a key element of the scheme development. They had to reflect the farmed land in the SPAs. The dominant habitat types on these farms were rushy wet grasslands, blanket bog and upland heath, and small patches of scrub and woodland (Figure 7).

Figure 7. The main habitats covered by the scorecards in the Hen Harrier Programme. Clockwise from top left, a typical high quality semi-natural wet grassland field, a species-rich wet grassland field, a bog/heath field with good cover of heather, a scrub/woodland field with birch woodland.

The design of the scorecards took place on development farms with ecology and ornithology input focussing on the elements that needed to be delivered for the Hen Harrier in conjunction with other ecosystem services. Four scorecards were designed which allowed elements specific to particular habitat types to be assessed. They were Wet Grassland, Species-rich Grassland, Bog/heath and Scrub/woodland. All scorecards had two sections. The first section was an assessment of the Ecological Integrity and gained marks for the field. The second section assessed the Threats and Future Prospects of the field, sections generally got a zero if the threat was absent or negative marks if a threat was present. The greater the threat, the more marks were lost. The scorecards were designed to signal to the farmer what management and resulting habitat features were positive and what were negative from a scoring perspective (Figure 8).

Figure 8. Examples of damaging activities on HHP farms recorded over the Project term. Clockwise from top left, bare soil, turbary on a bog/heath field, dumping of farmyard manure and burning.

The Wet Grassland scorecard rewarded some pollinator services such as flowering plant diversity and abundance, but good vegetation structure received a higher weighting as this was considered a key requirement need for Hen Harrier foraging. Field boundary assessments were also included to improve foraging conditions for Hen Harrier. Small areas of scrub were also rewarded on this scorecard. These are important nesting areas for small birds an important forage resource for the Hen Harrier. It was decided to describe these scrub areas but not to set limits on their size as every field is different and values can detract from the key focus of what these areas are providing for the Hen Harrier. Despite being called the Wet Grassland scorecard, it was applied to any grassland habitat in the Programme. The positive indicator species list covered dry, calcareous and acid grasslands also. This approach reduced confusion for farmers and for advisors who, in most cases, had no formal ecology training, while still ensuring that multiple habitat types could be assessed. If details on grassland habitat types were required by the Project team, these could be gleaned from the positive species listed.

The Species-rich Grassland scorecard was exactly the same as the Wet Grassland scorecard, but the weighting of the categories differed, giving a greater weighting to species-richness and abundance over vegetation structure. Because species-rich grasslands are so rare nationally, a premium was paid for farmers whose fields were species-rich within the SPAs i.e. more than 13 positive indicator plants present.

Key threats that would reduce the score on either grassland scorecard, if present, were land abandonment (resulting in rank grassland and scrub encroachment) and damaging activities such as supplementary feeding or bracken cover.

The Bog/heath scorecard covered a range of habitats but predominantly blanket bog, wet heath and acid grassland. It focused on delivering vegetation structure that would be suitable for foraging and nesting Hen Harriers. This ideal habitat was a mosaic of vegetation, tall enough for the Hen Harrier to nest in along with shorter vegetation suitable for small ground nesting birds, such as Meadow Pipit and Skylark, as these are key food supply species for the Hen Harrier. The scorecard also aimed to reward the delivery of additional ecosystem services delivered by good quality peatland habitats such as intact hydrology (marks lost for drains and damaging activities to strongly discourage practices that impacted on these features).

The Bog/heath scorecard strongly discouraged practices that constituted threats and pressures to this habitat through high negative scores. A -30 score was associated with the most severe, negatively affecting activities for each of the scorecards. This was to discourage such activity by sending a clear signal to the farmer and the advisor that those activities are undesirable. For example, burning can have catastrophic short-term effects on bird populations and can alter vegetation structure in a manner that reduces its value to Hen harriers. Widespread turf cutting (or limited turf cutting by sausage machine extraction) can have very significant long-term impacts on peatland hydrology.

The Scrub/woodland scorecard was designed to attribute value to these small, infrequently occurring habitats within the SPAs. While technically these habitats are not farmed to any great extent, they were considered to be valuable areas for Hen Harriers and other birds. Many Hen Harrier nest sites were located in areas of gorse/ furze often mixed with brambles and Bracken which in many cases were technically ineligible for direct payments. Not rewarding these areas at all could also have had the perverse effect of incentivising their removal to increase the grassland and peatland areas that would be eligible for payment.

The scorecard also included areas of woodland. While woodland is not of direct value to Hen harriers it does provide support for a range of prey species. As a rare habitat in the Irish landscape that needs to be valued, the HHP team decided to include these areas in the Programme. Many scrub and woodland sites were ineligible for direct payments under the land eligibility rules at that time. Including them for payment was possible because the Hen Harrier Programme was not a land parcel-based scheme. Their inclusion for payment helped assign a value to these lands and reduced the risk of clearance. The Project team contributed to discussions with DAFM on addressing the anomaly within the land eligibility rules that posed this risk. The key threats and pressures to these habitats were the presence of invasive species and being a dumping ground for waste materials.

The scorecards and the guidance documents on how to use them are available here http://www.henharrierproject.ie/resources.html.

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Scorecard payments

All fields in the Programme were delineated, given a unique identifier and assigned a habitat scorecard based on referencing orthoimagery, on the Department of Agriculture mapping system, Generic Land Management System (GLAM). This work was done by the Project team. All land declared in the Basic Payment Scheme (BPS), regardless of the Minimum Eligible Area (MEA), were considered for payment (even where the MEA was 0) in the Hen Harrier Programme, provided one of the scorecards could be applied to it. Some areas such as farmyards, domestic houses, quarries, lakes and commercial forestry were assigned 'Area Not Scorable'. The delineated maps were issued to farmers and made available to advisors prior to the first scoring season.

From 2019 onwards, scores were submitted on a purpose-built app designed to be used in areas of poor connectivity. This was the first use of an app for habitat reporting in an agri-environment scheme in Ireland. A scorecard could be changed in the field if the assigned scorecard was determined to be incorrect. All scorecards could yield scores of between 0 and 10. Scores of 0, 1, 2 or 3 would not receive a payment. The Potential Habitat Points available on each field were also calculated at the time of delineation. These were based on the available Hen Harrier foraging and nesting resource and a relative habitat value. The relative habitat value varied depending on the habitat type and whether the participant was in GLAS or not (Table 6).

Table 6. Habitat values used to calculate the maximum number of points

Habitat	Not in GLAS	In GLAS
Species-rich Grassland	150	90
Wet Grassland	100	60
Bog / Heath	75	60
Scrub / Woodland	50	50

The reduced value used for participants in the GLAS Scheme was to account for the risk of double payments across both schemes. Compliance with the requirements of GLAS and payments within that scheme were deemed to account for the balance between the rates for land under contract in GLAS and lands farmed outside of that scheme.

The Potential Habitat Points are the maximum points that a field can attain. If a field has a maximum potential score of 100 and receives a score of 5 out of 10, the actual points accrued would be 100 x (5/10) = 50 points. Payments were calculated based on accrued points.

The Programme implemented a degressive payment system. The payments were highest for the first 1,000 points, dropping to a lower level for the next 1,000 points with every point after 2,000 attracting the lowest rate (Table 7).

Points range	Payment per point (€)
1-1000	2.25
1001-2000	1.50
2001+	1.00

Table 7. Payment rates per point accrued for Hen Harrier Programme

This approach ensured that smaller farms could still draw down a meaningful payment while also ensuring that farmers with large farms remain incentivised to improve their scores. There was no cap on the amount that a farmer could receive as the use of digressive payments ensured that the risk of an inefficient use of funds was addressed. This system retained the flexibility to adjust the payment rate per point as the budget allowed over the lifetime of the Programme.

Expressions of Interest and Contract offers to the Hen Harrier Programme

The Project Team sought to remove barriers to entry to the Hen Harrier Programme. We sought to address the high upfront cost experienced by farmers in Agri Environment Schemes up to that point. Farmers simply had to submit an Expression of Interest form. This was a simple one-page form requesting details of name, herd number, address, phone number and consent for the Project team to access certain LPIS (Land Parcel Information System) data from DAFM. Forms were available online and hard copies were distributed through Farm Advisors and were sent to farmers on request. There was no cost to the farmer other than postage and no advisor was required at this point.

The Hen Harrier Project team operated a rolling intake process, this differed from the tranche-based system operated in previous Agri-Environment Schemes. Offers of contracts to successful applicants were made monthly from December 2017 (just seven months after the award of the contract to the Operational Group). This approach was necessary as there was a real limit to how many farms plans could be produced by the team each month. The date of a contract offer had no real impact on the farmer as payment was for each breeding season as opposed to each calendar year. Intake each month was prioritised as follows.

Category 1: Development Farmers. The farmers who assisted with the development of the Hen Harrier Programme had to make an Expression of Interest, but they were prioritised in the selection process. All development farmers applied and were offered a contract by the end of February 2018.

Category 2: Critical Sites. All farms with land (from 2017 BPS application) within a defined distance of a 2017 Hen Harrier nest site.

Category 3: All other applicants.

Applicants in Categories 2 & 3 were ranked in accordance with a formula that considered the area of designated land they farmed and the proportion of their land that was designated. This was deemed fairer than the simpler metric of designated area. It allowed the small farmer with a large proportion of his land designated to be competitive with his neighbour with a larger holding. Eighty contract offers were made in December 2017 and January 2018; the numbers increased to a minimum of 100 per month from February 2018. The intake ceased temporarily in the summer when it would no longer be possible for farmers to have their lands assessed. The offers made each month were divided between the SPAs based on the proportion of the total herd numbers (in the six SPAs) present in each SPA.

In total 695 contracts were offered in advance of the 2018 breeding season. Over 90% of these were accepted. These farmers represented the largest group ever taken into a results-based agri-environment scheme to that point. Following discussions with the Department of Agriculture, Food and the Marine, a decision was made to continue offering new contracts to interested farmers and to accommodate all that applied. The majority of the additional intake joined the scheme in advance of the 2019 field assessment season, although small numbers continued to be accepted in later years. Ultimately, over 1,600 farmers joined the Hen Harrier Programme (Table 8). Together these farmers managed 36,157.27ha of privately owned SPA land and a further 10,213.9ha of shares in commonages within the SPA network a total of 46,371.21 ha.

The area under contract accounted for almost 70% of the agricultural area in the six SPAs that the project operated in. This made the Hen Harrier Programme the largest results-based agri-environment scheme in Ireland. All these farmers were free to leave the programme at any time without penalty. Barring deaths of participants and a very small number who lost their SPA land due to the expiry of leases (<5), only two farmers left the programme, both of these never submitted an assessment and their participation lapsed in accordance with the specifications.

SPA	No of farmers
Stacks to Mullaghareirk's Mountains	673
Slieve Aughty Mountains	594
Slievefelim to Silvermines	151
Slieve Bloom Mountains	80
Mullaghanish to Musheramore	88
Slieve Beagh	30
Total	1616

Tabel 8. Maximum number of farmers in each SPA at the end of the Hen Harrier Programme

Supporting Actions and Annual Works Plans

A crucial component of the Hen Harrier Programme was the supporting actions fund that allowed farmers to apply for, and draw down, funding for actions that would assist with improving scores and thus payments for farmers. Supporting Actions included both direct habitat and wildlife support actions and infrastructure actions such as fencing and the provision of drinking water for livestock. The inclusion of infrastructure actions was both to enhance the capacity of the farmer to deliver improved habitats through improved management, and to ensure the continuation of farming on marginal lands where under-investment had been a feature for many years. Specifications for each supporting action, with details of suitable locations, minimum standards of delivery and payment rates were published by the Project Team and are available here http://www.henharrierproject.ie/HHPActions.pdf. Costings were based on income forgone, costs incurred and transaction costs.

Each farmer was allocated a personal fund of €40/ha of land in the Programme for use on supporting actions. These actions were applied for through GLAM by the advisor. The suitability and location of each supporting action proposed in the Hen Harrier Programme was assessed by the Project team in the context of habitat type and quality, and the potential for disturbance of Hen Harrier nests or roosts during either the undertaking and/or the operational phase of the supporting actions. The assessment also considered if seasonal work restrictions on the delivery of certain actions were required. A Partially Automated Screening System (PASS) made it possible to screen the large numbers of actions proposed (Text box 1).

Text box 1. Details on how the PASS system worked.

Screening of actions was carried out using a Partially Automated Screening System (PASS) which applied a series of tests to proposed actions. For example, one test was “Are there more than 13 positive indicator species present?”. The answers to all tests were either Yes or No. Where the answer was “No”, the test was not relevant, where the answer was “Yes”, a default response was determined by reference to a Rules Matrix. If the action had no “Yes” then it could be approved. If the action had one or more “Yes” then it was examined in more detail before a decision was made. For example, a Wild Bird Cover Strip proposed in a field with more than thirteen positive indicators would be rejected as it would replace an existing important habitat, but a water trough could be approved if it didn’t pose a threat to the semi-natural grassland habitat.

Without the PASS, the effective delivery of the supporting actions part of the programme would not have been possible. This approach was subsequently expanded and incorporated into the screening of Non-Productive Investments (NPIs) and Landscape Actions in the ACRES Co-operation Scheme in the following CAP cycle.

The operation of the supporting actions aspect of the Programme was technically challenging at the scale planned in the Hen Harrier Project. Initially, the approval of actions was intended to be time limited and that undelivered actions would expire. This was to avoid the risks associated with having to retain funds to cover the cost of previously authorised actions until the conclusion of the Programme. However, the impact of COVID-19 (specifically the impact of the lockdowns) delayed the 25delivery of many actions and forced the extension of the authorisation for approved supporting actions.

A total of 992 farmers (61%) applied for at least one supporting action through the Hen Harrier Programme. The actions that were applied for are listed in Table 9. In all, 7,949 actions were applied for. Of those, 682 farmers (42%) delivered 4,057 Supporting Actions over the course of the Hen Harrier Programme. This accounts for 51% of the actions applied for.

Supporting Action	Number delivered	Delivered length/area
Gates	1,149	N/A
Fencing (Permanent Electric Fencing)	714	149,061 m
Fencing, (Post and Wire)	523	88,793 m
Water Trough	414	N/A
Water Piping	317	38,543 m
Wild Bird Cover Strip	304	44,378m
Fencing (Post and Wire) - Hill Sheep	133	26,730 m
Access Track - Upgrade	126	21,635 m
Culvert	94	N/A
Scrub Rides	67	6,355 m
Flail Cutting	52	233ha
Planting new hedgerows	37	3,694 m
Solar Powered Fence	34	N/A
Pheasant Feeders	18	N/A
Pasture Pump	17	N/A
Solar Powered Pump	13	N/A
Bord Bia Quality Assurance Scheme	7	N/A
Targeted Grazing Infrastructure	6	N/A
Other (misc and less than 5)	25	N/A
Totals	4,057	N/A

Table 9. List of delivered actions and their frequency. Miscellaneous actions and actions with fewer than 5 instances are omitted from this list.

Aside from the standard available actions, participants had the option of proposing any action that they believed might assist with achieving the goals of the programme. There were several actions proposed by participants that the Project team felt would go toward these goals and so were approved by the team and delivered by the participants. These included well, water tanks, drain blocking, wader scrapes, multi-purpose ponds, Willow firebreaks, ram pumps, water storage tanks and rainwater harvesting systems. The flexibility of a bespoke action proposal option promoted innovation within local farming communities. They could assess their own areas, propose solutions, discuss and firm up these solutions with a team of people who wanted to see the solution implemented, submit a defined fundable solution that the Project team could screen and deliver that action with payment following shortly thereafter.

Hen Harrier Monitoring

The Golden Eagle Trust carried out extensive monitoring work annually from 2017 until 2022. This work informed the Hen Harrier Bonus payment (described below). Nest and roost site data were used in the supporting actions screening to ensure that actions that might disturb breeding pairs, chick rearing or overwintering birds wouldn't be approved or would be approved with seasonal conditions attached. Monitoring work commenced annually in April and continued across all 6 SPAs until all chicks had fledged from successful nests (usually in July). The data contributed to decisions on nest protection efforts across the SPAs and assisted with decisions on local campaigns such as our wild bird cover demonstration sites. There had never been such an intensive monitoring campaign for Hen Harrier before this. The annual data gave important insights into the impact of weather conditions, fire events and land management on the Hen Harrier breeding pairs and their ability to fledge chicks (Table 10). The monitoring was able to identify pairs that failed early in the season who established a second nest. This data was shared with the National Parks and Wildlife Service and was used to update the boundaries of red zones used in the licensing of forestry activities.

SPA	2017 Nests	2017 Fledged Nests	2018 Nests	2018 Fledged Nests	2019 Nests	2019 Fledged Nests	2020 Nests	2020 Fledged Nests	2021 Nests	2021 Fledged Nests	2022 Nests	2022 Fledged Nests
Stacks to Mullaghareirk's Mountains	27	13	22	6	28	17	30	13	34	9	21	8
Slieve Aughty Mountains	9	2	6	1	6	4	6	3	7	3	3	3
Slievefelim to Silvermines	7	3	8	2	7	1	6	3	4	2	3	1
Slieve Bloom Mountains	10	6	10	2	10	6	10	1	10	0	8	3
Mullaghanish to Musheramore	2	1	2	1	2	2	5	4	4	2	1	0
Slieve Beagh	3	1	5	4	3	2	3	2	3	2	2	0
Total	58	26	53	16	56	32	60	26	62	18	38	15

Table 10. Number of confirmed nests and number of fledged nests for every year that monitoring took place from 2017 to 2022.

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Hen Harrier Bonus

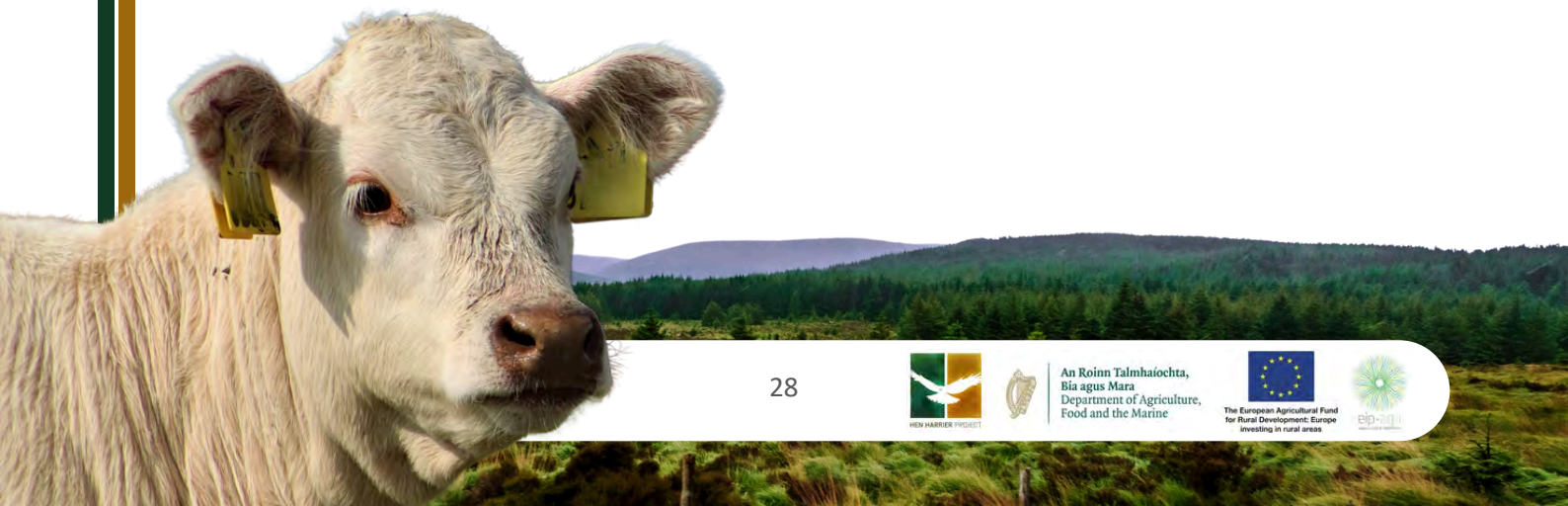
The Hen Harrier Bonus payment was a key innovation in an Irish Agri-Environment Scheme. The decision was made to pay a bonus based on models developed in Sweden (Lynx and Wolverine) and Finland (Golden Eagle). These bonuses rewarded relevant stakeholders for population numbers of target species. All payment claims received in a given year were considered for the Hen Harrier Bonus Payment. Eligibility required a single field having a minimum score of 6/10 on at least one field, demonstrating a higher than the minimum level of delivery required for a habitat payment. There were two bonus payments that participants could qualify for.

Firstly, the SPA level payment based on SPA level objectives agreed with the steering committee in advance of the following field season. The SPA level payment recognised that due to low numbers of birds and landscape characteristics, that not all areas could expect to have a nesting pair of Hen Harriers, yet these farms may still be making a valuable contribution through the provision of habitat suitable for hunting throughout the year. Those farmers in SPAs which continued to support a stable or increasing Hen Harrier population deserved recognition.

If SPA level goals were achieved, then all participating farmers in that SPA with a field scoring 6 or higher in that SPA qualified for the Hen Harrier bonus. For example, if an SPA reached its objective, then all participants in that SPA with at least one field that scored a 6/10 received a payment. See example below (Table 11) from 2018. Of the 610 eligible participants, 147 received a share in the €100,000 fund. Each share was worth €680.27 (i.e. €100,000/147).

SPA	2018 Objective	2018 Confirmed	Eligible Herd Numbers	Qualified Herd Numbers
Stacks to Mullaghareirk's Mountains	23	22	258	0
Slieve Aughty Mountains	8	6	198	0
Slievefelim to Silvermines	4	8	66	64
Slieve Bloom Mountains	10	10	41	39
Mullaghanish to Musheramore	1	2	23	22
Slieve Beagh	3	5	24	22
	49	53	610	147

Table 11. Example of an annual SPA level targets and eligible and qualifying participant numbers.



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Secondly, a local nest or winter roost payment was also available. Participants qualified for the local nest or winter roost payment based on having at least one field with a field score of 6 or higher within 1km of a breeding site/winter roost site, or a successful nest site. They qualified for two shares if that land was within 1km of a successful nest, i.e. a nest where the breeding pair successfully fledged at least one chick. Qualifying participants were identified by intersecting their LPIS parcels with nest and roost data with a 1km buffer added. Any participant with a field within the intersects qualified for the nest/winter roost bonus payment. For example, of the 610 eligible participants in 2018, 124 received a share in the nest/roost €100,000 fund. 36 of those people received a double share. This gave 160 shares. Each share was worth €625. For participants who qualified for two bonus payments, the payment was capped at €1,000.

Farmers could receive both payments up to a maximum of €1000 in 2018 (this increased to €1200 by the end of the Programme. The operation of the bonus payment was analogous to a dividend with dedicated funding being divided each year between qualifying participants. This ensured financial certainty on the overall cost to the project each year. While it did result in some annual variation in the size of the bonus received by participants, this was never a cause of contention. The bonus payment varied annually depending on whether the SPA reached its objective and how many nests were successful. The fund available was reviewed regularly to ensure that the bonus payment remained meaningful. For example, if more people qualified but the fund remained the same, there would have been a reduction in the bonus payment that those people would receive. This was the case in 2020 for example, when farmers in the Stacks SPA qualified for the SPA level bonus (Table 12). The Project team, in conjunction with the steering committee, reviewed the bonus figures on an ongoing basis to ensure that payments were meaningful and in 2020 the available fund was increased to maintain payment levels.

SPA	2019	2020	2021	2022
Blooms	41	70	71	72
Musheramore	24	86	85	87
Slieve Aughty	17	30	109	9
Slieve Beagh	16	26	26	4
Slievefelims	66	145	145	2
Stacks	64	640	630	637
Total	228	997	1066	811

Table 12. Number of herds qualifying for a Hen Harrier Bonus Payment from 2019 to 2022. Numbers from 2018 available in Table 11.

Farmer training

Mandatory farmer training was delivered to farmers in the Hen Harrier Programme. This training was an opportunity to ensure that every farmer who signed up to the Programme knew what it was about. Training topics included the operation of the Result-based Agri-environment Scheme, Hen Harrier Programme Scorecards, Hen Harrier Ecology and Supporting Actions. Training was delivered in the evenings and ran for three hours. This ensured that farmers with off-farm jobs were catered for. Several training sessions were organised in each SPA throughout the winter months to provide as much flexibility as possible.

COVID-19 had a serious impact on the ability to deliver in person training in 2020 and 2021. When the first cases of COVID-19 occurred in Italy, the Project team, with the support of the steering committee, accelerated the delivery of farmer training. By the time of the first COVID-19 lockdown, training had been delivered to over 90% of participants. Following the lockdowns, the HHP team focused on the production and delivery of educational videos.

Links to these films were sent by text message to relevant participating farmers. For example, farmers with cattle and bog or heath habitats would have received a link to the “Managing cattle on the hill” film. Links to showcases showing films on related topics were sent to Hen Harrier farm advisors. Views on the Vimeo site were principally people who followed the link sent to them by the Project team. A significant proportion of participating farmers received a level of training that would not have been possible otherwise.

The direct contact between the project team and every farmer participating in the scheme was very important to the success of the programme. Hearing directly from the programme administrators that they had flexibility, that they didn’t have to do anything additional, or different, and that they could leave at any time, gave the farmer the space, and the peace of mind, to engage with the programme and to try out supporting actions without big risks or outlays.

Advisor training

Advisors played a critical role in the large-scale rollout of this results-based agri-environment scheme. While the Project team surveyed the commonage, it would have been impossible to score the private land annually without significant additional resources. The Hen Harrier Project were totally dependent on the use of the advisor resource to operate this large results-based programme. Ensuring that these advisors were equipped to fulfil the important tasks assigned to them was an essential task for the Project team. Training was offered to any advisor who wanted to be a HHP approved advisor. The training consisted of two days in the Winter and two days in late Spring immediately prior to the field season. This comprehensive training included topics listed in table 13.

Table 13: A list of key training topics provided to advisors

Introduction-need for the EIP
RBAPS for HNV farmland; a new approach
The Hen Harrier Project Team; Composition/ Role
Agriculture in the SPAs
Hen Harrier Ecology- life cycle, behaviour, habitat and prey preferences
Hen Harrier population trends and monitoring
Hen Harrier Threats- predation, habitat loss and fragmentation
Land abandonment and wildfire risk
Animal health issues in the uplands
The Hen Harrier Programme-design and development
The role of the HHP advisor, key habitats and how they will be scored
Payments structure
Farm Plan & Annual Works Plan
Quality control, inspections and penalties
Activities requiring consent, archaeological sites etc
Interactions with DAFM schemes
Training for participants and advisors
HHP Supporting Actions Specifications
Habitat assessments
Threats and Future Prospects
HHP mapping system and score submission system
Planning a field survey
Bog/Heath scorecard and Scrub scorecard
Wet grassland scorecard and Scrub scorecard.

The Spring training had a significant field element. Final approval of advisors was dependent on passing an examination as proof that a minimum standard had been achieved. Scoring fields wasn't possible unless the examination was passed. Advisors who failed this examination were offered a second opportunity to take it. The small number who failed a second time were given one to one instruction, focusing on their weaknesses, before they had a final, third attempt. As payments were dependent on an assessment of the ecosystem services delivered by the farmer it was vital that all concerned; the general public, the farmer, advisors, DAFM and the EU (European Union) Commission had full confidence in the veracity of these assessments. Training for advisors was essential to give this assurance that the scores and the payments based on them reflected the reality on the ground.

The time taken by advisors to do this training was a signal of their (and their employers) commitment to being HHP advisors. To supplement the basic training provided to all advisors, the Project team provided additional one-on-one support or group training where requested. All fields in the Programme were surveyed annually and the time commitment for the advisors in completing this for all their clients was significant. The Project team ran voluntary feedback sessions in the Autumn with advisors to get feedback on the previous season and to identify things that could be done to assist advisors with efficiencies before the next field season. This included feedback on the text in the guidance documents, requests for clarity, suggestions on how things could run better etc. An advisor resource was developed using a shared digital space containing scheme level resources which was available to all advisors. They also had access to the annual field scores and score reports (details of what each field scorecard contained) for their own clients only. The HHP team also implemented a system of farm verification visits annually that helped to inform advisor training needs.

Verifications

Farms in the HHP were not subject to inspections by DAFM (inspections were of the Project, not the farmer). Instead, each year between 80 and 90 farms, covering between 2,000 and 4,000ha, were selected for a verification visit by the Project team. The HHP selected 89 farms at random in year one. These farms had all fields with a payment claim in that year (i.e. fields scored) scored again by a Project Officer following the advisor visit. This helped to compile a risk profile that was used in the following 31years. Where the scores submitted by the advisor were different to those assessed by the Project Officer, the farmer was paid based on the Project Officer scores. The verifications were also used to identify training needs for the advisors in two general categories. Firstly, they assisted with highlighting general training needs, for example, when the same issue came up repeatedly, across multiple advisors, the HHP team knew that the scorecard guidance document should be reviewed, and additional training may need to be delivered before the next field season. Secondly, they identified individual advisors who had specific training needs, for example, those who had high numbers of misidentified positive indicators or incorrect vegetation structure assessments. Where this was the case, more targeted one-on-one training was provided to individuals to address specific issues.

Information and Communication Technology Development

The Project team in conjunction with our IT (Information Technology) partners (Intuity Technologies) developed a file sharing system using Sharepoint. This allowed secure access to appropriate files by Project Staff and DAFM. A sub-site of this system acted as a support site for HHP advisors. It permitted them to access material relevant to their individual clients including maps, farm plans etc in a secure and confidential manner. Advisors were also able to access reference material that would assist them in their work through the support site. Working with Intuity, the Hen Harrier Project team developed the Dynamics database. This database was used for the collation of annual habitat data, for the calculation of payments, and the screening of proposed actions. It was also used to give appropriate suggestions for field-level management change to improve habitat scores. This gave the farmer and their advisor specific management advice.

A revolutionary innovation for the large-scale administration of results-based agri-environment schemes was the development of an app that was used by HHP approved advisors in the field to score fields and verify the delivery of supporting actions. The roll out of the app to advisors commenced in 2019. The HHP team had some very specific requirements of the app, namely that it could work effectively offline due to the nature of the areas that the app needed to work in. The Hen Harrier SPA farms are in some of the most remote High Nature Value (HNV) landscapes in Ireland.

The IT unit within DAFM worked with the HHP team to further develop the GLAMS system to facilitate the production, approval and printing of Annual Works Plans. Procedures to transfer data from GLAMS to the HHP database were developed in association with DAFM and Intuity.

Our digital partners were shortlisted for the Irish Technology ITAG awards for Best Digital Project, and Best New Talent for one of their staff, who worked on its development in 2019.

The Dynamics CRM also dealt with the screening and authorisation of proposed Supporting Actions. The Annual Works Plan was generated by the CRM and the app that we developed also served as a mechanism for claiming payments for delivered actions. The calculation of payments to participating farmers was calculated on the CRM, the reports generated were shared with DAFM through a shared SharePoint library. In the case of Supporting Actions the CRM produced two reports, the first included the gross value of all Supporting actions approved for payment in the preceding month, the second showed the value of the payment due to each farmer who delivered one or more of these actions. The totals of both of these should be the same. These reports were published on a set date (the 25th of the month and published to the SharePoint site. This facilitated a rapid drawdown of the funds required to make these payments.

The suitability and location of each supporting action approved in the Hen Harrier Programme was assessed in the context of the habitat type and quality, and the potential for disturbance of Hen Harrier nests or roosts during either the installation and/or the operational phase of the supporting actions. The assessment also considered if seasonal restrictions were required. The Project team developed a Partially Automated Screening System (PASS) that gave the Project Officer rapid access to all key data sources enabling a faster decision-making process with a reduced risk of error. Using this system, huge numbers of supporting actions were assessed and approved in reasonable timeframes by a small team of people.

Text Box 2. Nest Protection App

An app was also designed to assist Nest Protection Officers with carrying out their work during the 2021 and 2022 seasons. The app was designed to capture location, time and frequency of activity in real time. It reduced the administrative burden on the NPOs and increased the reliability and efficiency of receipt of data. The HHP team also collaborated with NPWS staff to make the app available for nest protection activity beyond the Project.

Local Actions Fund

The Local Actions Fund was perhaps one of the most innovative elements of the Hen Harrier Programme. It assisted engagement with local communities and ensured that solutions to issues could be trialled and supported where appropriate (Table 14). Nest Protection activities over the course of the Programme represented the largest drawdown type from the Local Action Fund drawdown.

The fund facilitated several trials over the course of the Programme. The hugely successful feed bucket trial began in 2018 and ran until the end of the programme with demand for feed buckets increasing year on year. Wild Bird Cover demo sites and seed preparation were another important investment. This resulted in Wild Bird Strips becoming the most popular non-infrastructure supporting action delivered over the programme term, a big achievement in areas without any tradition of tillage. Other important investments included Local Area Partnership and Demonstration Farm development activities. The initiation of several of these will benefit the roll-out of ACRES CP (Agri-Climate Rural Environment Scheme Co-Operation stream) in the same areas.

Local Action Fund	**Total (€)**
Nest Protection	412,631
Local Action Grant	153,784
Feed Buckets Trial	91,360
Wild Bird Cover	31,532
Demo farm development	19,834
Mob Grazing Trial for Gorse Management	9,136
Fire Recovery	3,994

Table 14. Key Local Action Fund headings and expenditure

Nest Protection

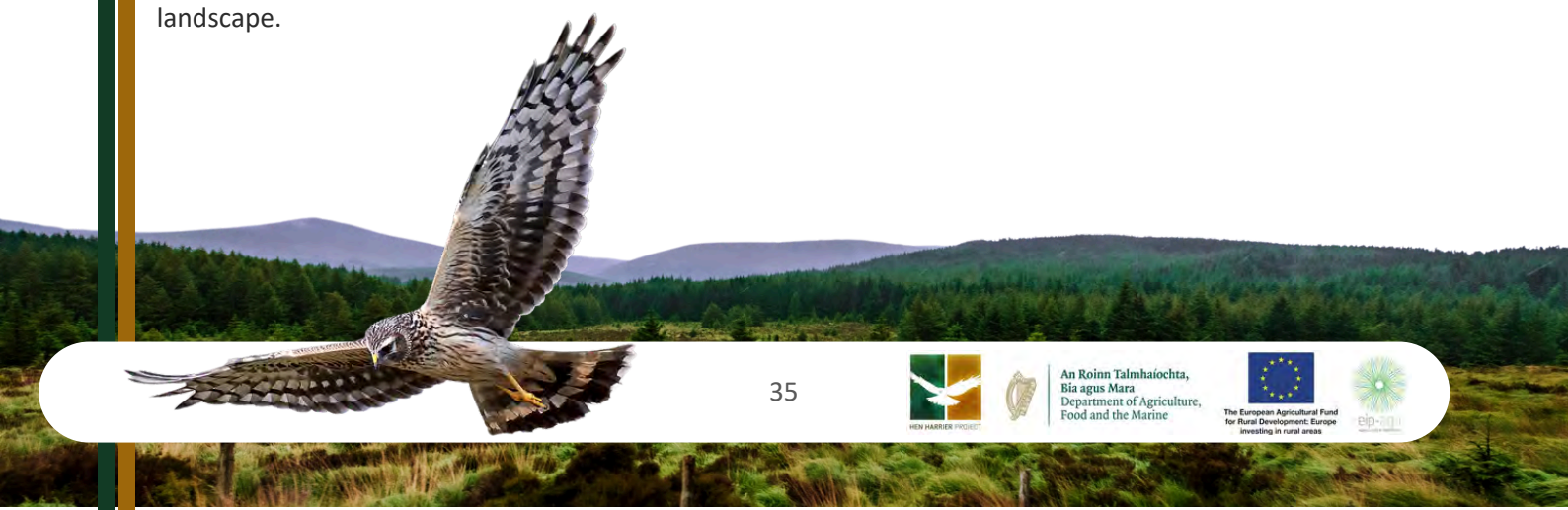
It is recognised that Hen Harrier populations may be influenced by factors such as food availability, illegal killing, poisoning, habitat quality, disease, grazing/livestock movement, human disturbance and predation. The Hen Harrier Project team recognised the multiple pressures facing the Hen Harrier and aimed to address as many of those as possible. The results-based element was designed to help address habitat quality. Education and local outreach campaigns aimed to reduce disturbance caused by activities such as topping rushes during the breeding season or turf cutting. However, nest predation was widely considered to be one of the most significant threats to breeding Hen Harriers.

In the 2015 national survey, 20% of the breeding failures (10 of 49 pairs) was due to predation. Predation by mammals was the third most frequently recorded pressure on the Hen Harrier population in Ireland. Predation by crows and foxes were recorded to be most frequent pressure in the Stacks and Slieve Aughties SPAs. During HHP monitoring conducted in 2017 there were eight nests where predation was deemed the cause of nest failure. It was noted that the risk of predation was particularly high during the late nesting stage. This loss affected approximately 13% of the total SPA nesting population in 2017.

The team felt that, if adequately protected, breeding success at these nests could result in a rapid, direct increase in fledging rates and recruitment to the population. Predation can be a limiting factor in Hen Harrier nest success and studies indicate that (provided no illegal killing of Hen Harriers occurs) predator management could positively influence Hen Harrier populations. Although the evidence for the effects of predation varies widely, losses of Hen Harrier nests in Ireland were relatively high and predator control could serve as a rapid means to increase the productivity of the SPA populations. This could have increased the number of juveniles available for recruitment into the future breeding populations and thereby help reverse population declines. This would be especially beneficial where large scale habitat management was also taking place through the Hen Harrier Programme in Ireland.

It was hoped that the effects of nest protection within the SPAs would have two key benefits. Firstly, direct reduction of predation of Hen Harrier nests and chicks thus increasing breeding success and reduction in mobbing by Corvids improving Hen Harriers energy levels and the delivery of food to the nest; and secondly, indirectly increasing bird biodiversity and helping to increase abundance and breeding success of other ground nesting birds of conservation concern such as Red Grouse and Curlew and prey species for the Hen Harrier such as Lapwing, Snipe, Meadow Pipit and Skylark.

A request to provide a nest protection service was advertised in 2018, 2019, 2020, 2021 and 2022, though the regions covered varied from year to year. This strategy was funded from the local actions fund of the Hen Harrier Programme. Due to the difficulty in providing a comprehensive nest protection service over the entire area of the six SPAs designated for breeding Hen Harrier, resources were concentrated near selected nests based on their vulnerability to predation. This assessment was made by the HHP team considering the previous history of nests at each location and the setting of the nest in the local landscape.



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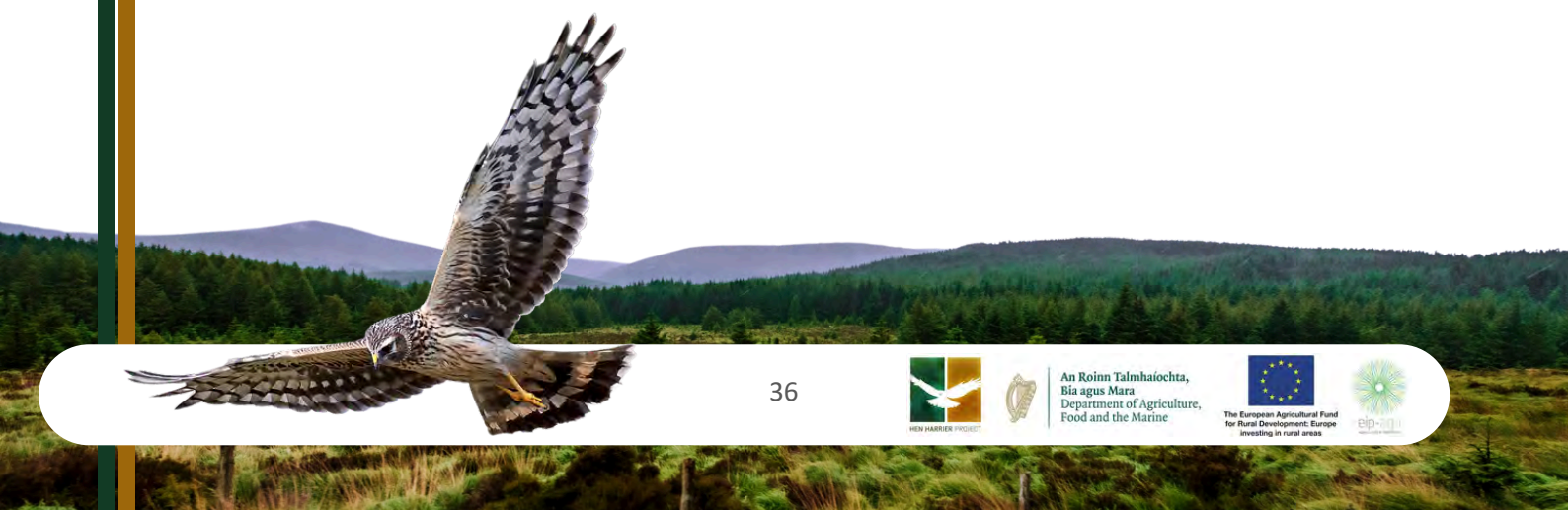
This strategy sought to reduce the predation risk to Hen Harriers (and other ground nesting birds), but the results were not as good as had been hoped for. There were three reasons for this. Firstly, nest protection efforts could only reduce the pressures on Hen Harrier, not remove them. A key issue was that Pine Marten were a predator in some areas. They were noted close to nests shortly before fledgling loss in the Slieve Aughties for example, but they are a protected species and so could not be targeted. So, while the team focused on foxes and corvids, this did not remove the threat of predation. There was a real concern that control of foxes just led to an increase in predation by Pine Marten, however it was not possible to prove or disprove this hypothesis.

Secondly, the availability of local people with the skills and time to do the job was not consistent throughout the SPAs. While the hunting skills were often present, the conservation focus of this work required full-time management during the field season and the seasonal and dispersed nature of the work mitigated against the recruitment and retention of suitable people. Thirdly, there were significant challenges with the licensing process for this activity. The operation of Nest Protection Officers in pairs was found to be very effective, ensuring that traps could be checked daily and spotter/shooter teams providing more effective fox control. From the perspective of the Project team, the establishment of a formal training and certification for those involved in nest protection, with (if possible) the offer of year-round employment would be beneficial for future schemes.

While nest protection is a hugely important element in the management of landscapes for ground-nesting birds in a fragmented landscape, it is at best just buying time for threatened species. A permanent solution for ground nesting birds must be based on re-establishing the large areas of open habitat that these birds depend on, and the availability of suitable nesting sites remote from the cover that sustains the activity of generalist predators. Agri-Environment Schemes with short funding cycles are not suited to this task or to the development and management of a long-term nest protection resource.



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Local Action Fund Grants

The Local Actions Fund Grant was the second biggest drawdown of the Local Action Fund with over €150,000 spent in local communities where project and community goals aligned. The HHP Local Actions Grant fund accepted applications from farmers either individually or in groups, community groups, small local businesses, schools and sports or social clubs serving the community in breeding Hen Harrier SPAs. This fund aimed to provide support for actions that could not be delivered through an individual farm plan. There were three open calls during the lifetime of the Hen Harrier Programme with 42 successful applications (Table 15). Applications could be made under specific themes that aligned with the goals of the Programme, for example, Enhancing Biodiversity, Agricultural Sustainability, Education & Training and Support for local food or craft producers. Anyone within (or close to) the SPA could draw down funds for innovative ideas. Schools, individuals and small businesses all benefited from the fund while the Hen Harrier Project benefited from the local engagement and outreach opportunities that the operation of the fund created.

Year	Number of Successful Local Action Fund Grant Applications
2019	14
2020	10
2021	18
Total	42

Table 15. Number of successful local Action Fund Applications per year.

The successful projects included the Vincent Wildlife Trust, who installed roosts for Lesser Horseshoe Bats in the Slieve Aughties. Cobbs Road Wildlife Trail in Co. Limerick put in plants to provide feeding opportunities for pollinators and birds, installed bird and bat boxes and insect logs, improved their trail surface and improved signage. They also installed a bird hide & viewing equipment. Meenkilly National School, Abbeyfeale, Co. Limerick planted wild bird cover and put in an outdoor classroom with a nature trail, sensory garden & seating. Loughfouder National School, Tralee, Co. Kerry put in a mural, wildflower bed, outdoor classroom/seating area and redeveloped the school's bug hotel while Lough Graney Nature Sanctuary, Co. Clare ran free biodiversity workshops on Hen Harrier for local schools. A river walk was established by the Tidy Towns Committee in Athea, Co. Limerick complete with a statue of a Hen Harrier that was christened "Hedwig" by local school children. The Tidy Towns Committee in Ballyvourney in Co. Cork established a sensory garden, complete with another Hen Harrier statue (selection of images of these in Figure 9).

Figure 9. Top, l-r; Cobbs Road Trail Ashford Co Limerick showing wild bird cover and the bird hide. Middle l-r; Loughfouder National School mural and Meenkilly National School polytunnel and outdoor classroom. Bottom l-r; 'Hedwig', archway, path and tree planting in Athea Co. Limerick.







The amounts of money that were distributed through the Local Actions Fund were small for the individual applicants with the call recommending a maximum value of €5,000 for each grant. The value of these small grants in educating and engaging local communities on the Hen Harrier, the threats the bird faces and its value as something special about their area was immense. Administering these types of grants took staff time and was resource heavy. In many cases, the first application was unsuccessful but where the Project Team could see potential, they worked with groups to improve applications in the future. The ability of the Project to directly pay contractors who delivered works for local communities was also very beneficial as it avoided cash flow issues that could have resulted in no actions taking place in these areas.

These micro grants were part of a strategy to shift attitudes towards the Hen Harrier in areas where the designation of the SPAs had proved unpopular. In conjunction with the Hen Harrier bonus payment, it allowed farmers and communities to access some of the value in the presence of the birds in their area. It helped achieve an attitudinal shift from a situation where the majority were indifferent to the bird's plight, to one where people began to see the Hen Harrier as a shared resource for the community.

Trials

Wild Bird Cover Strips

While bird cover plots were largely accepted as beneficial for wildlife and were being implemented in traditional agri-environment schemes, they were generally applied to large areas. Wild Bird Cover plots were included in GLAS but their uptake in Hen Harrier areas was close to zero. The reasons for this were obvious. Firstly, establishing a crop requires tillage equipment. The Hen Harrier SPAs are upland areas with no recent tradition of tillage and farmers were simply not equipped to deliver this task. Secondly, many of these farms had very limited areas of good quality land, the little they had was needed for hay/silage or to support livestock with early grazing. These farmers simply could not afford to commit one of their best fields for a crop for wildlife for 5 years. Finally, the benefits of a wildlife crop were never adequately explained to farmers, for most this action was just not a viable option.

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To realise the benefits of a Wild bird cover crop, the approach had to change we had to demonstrate that it could fit in with farming operations, the payments had to recognise the costs involved and farmers had to be convinced of both the practicality and the value of the action. The Project team decided to change from a plot, as provided for in GLAS, to a 10 m wide strip. This allowed the farmer to commit a small portion of the field to a crop for wildlife while retaining most of the field for agricultural purposes. The payments had to be increased, recognising the outlay involved in hiring in a contractor for works related to crop establishment and covering the mobilisation costs that this would involve irrespective of area.

Farmers had to be convinced that this was a viable option for them, that a crop could be established and that this crop did support wildlife, not just Hen Harriers, but a host of other species as well. To achieve this, the Project team recruited farmers with suitable land who were willing to host open days on their farms, to establish a crop. This was done outside of the Supporting Actions system so that these farmers retained their allowance for other works on their farm. These open days were a great success, farmers could see a successful crop on land that looked very like their own and on a farm with a similar farming enterprise. Many of them could identify places on their own farm where this approach could work and subsequently signed up for this as a supporting action. The fact that, unlike GLAS, this choice was an annual one and that they were free to change the location, increase, decrease or cease providing a crop, on an annual basis and were not tied into a 5-year commitment was very important, it reassured the farmer that the delivery of this action could adapt to the needs of the farm.

Wild Bird cover crops were the fastest way to increase the food supply for Hen Harriers. Increasing the productivity of habitats close to nests to boost the supply of food to chicks and improving the defence of the nest against predators by reducing the time adult birds spent away from the nest, were key objectives of the Wild Bird Cover strip initiative. Supporting small birds through the Winter leading to an increase in population to breed the following Spring was also important as it was providing hunting opportunities for newly fledged chicks.

The delivery of this crop required that the project team address as many of the barriers to entry as they could. The team developed specifications and guidance for the action, produced training films and organised the delivery of appropriate seed mixes. The strip would be most beneficial when established next to a mature field boundary, ideally a hedgerow (or a treeline or an earthbank), as Hen Harrier like to hunt along linear features and the cover from the nearby boundary maximises the benefit of the bird seed for small birds and mammals. The team devised a seed mix that would grow effectively in fields with poorer drainage and more acidic soils which were typical in the SPAs. The seed mix was packaged by the Project team and distributed directly to farmers approved for this action. This action was delivered on SPA designated lands and on undesignated land within 1km of the boundary of a breeding Hen Harrier SPA. It was not available on Special Area of Conservation (SAC) designated sites or on species rich grassland, Bog/Heath or Scrub/Woodland fields. On wet grassland fields this action was not available if the number of positive indicators was greater than 5 and the cover of positive indicators was above a certain level to ensure that an important permanent semi-natural grassland habitat was not replaced by a temporary crop. The crops were sown as a 9m wide strip, running parallel to an existing boundary with a further uncultivated area at least 1m wide between the crop and the boundary. The crop had to contain a cereal crop (preferably Triticale) and Linseed. Other seeds such as Buckwheat, Mustard, Fodder Radish, Forage/ Oil Seed Rape and Vetch could also be included in the seed mix (Figure 10).

The sowing rate was 7.5 Kg of Triticale/ 100m strip and 1.5 Kgs of Linseed. Other seeds were included in much smaller quantities. Triticale was the recommended cereal crop as it had considerable advantages over Oats. It is better suited to acidic soils and poor ground conditions. It also had stronger straw which delayed lodging and the chaff on the seed triticale made it less attractive to birds and rodents, ensuring that seed consumption was delayed until other food sources were depleted, thus ensuring that a significant feed resource was retained into the mid-winter period. All of this required testing and recommended seed mixes changed over the course of the Project in response to lessons learned. Buckwheat was dropped and fodder radish or stubble turnips promoted.

Figure 10. Clockwise from the top left, wild bird cover seed mix provided to HHP farmers, field preparation in advance of seed being sown, seed being sown, triticale and buckwheat in flower, triticale, seed heads of radish, linseed, triticale and buckwheat.

The team worked with farmers in the Programme to trial Wild Bird Cover across the SPAs. Once the seed mix was confirmed, the Project team also had to establish local demonstration sites that farmers could visit to see that these strips would work on their farms. While small-scale crops would have been planted on many of these farms in living memory, the practice is not current, and many farmers would not have planted a crop in decades.

The establishment of these demonstration sites and the running of the open days took significant time and resources. The result of this investment was the delivery of over 44km of Wild Bird Cover strips delivered by 120 farmers as supporting actions before the end of the Programme. The investment in piloting and demonstrating Wild Bird Cover strips was necessary to engage and mobilise farmers in these areas early in the Programme cycle. This investment was rewarded by the establish of significant extra food sources for the Hen Harrier throughout the Programme. The lessons learned here allowed Wild Bird Cover strips to be included as a Non-Productive Investment (action) in ACRES CP which began in 2023.

Upland Grazing Trial

The grazing of upland pastures (particularly peatlands) by cattle at suitable stocking densities can have a beneficial effect on biodiversity. It could also reduce wildfire risk by preventing the excessive dominance of Purple Moor Grass (Molinia caerula). Reducing the dominance of Purple Moor Grass could benefit other plant species and thus plant biodiversity. Carefully managed extensive grazing can also improve the utilisation of these upland pastures, securing their continued eligibility for direct payments and freeing up lowland areas in summer for silage production. Summer grazing of uplands was traditional practice, we sought to demonstrate that it could still be used to deliver valuable ecosystem services that supplement the value of agricultural output from the land.

The forage available on the uplands changes dramatically during the growing season. In early summer, Purple Moor Grass growth is supported by nutrients stored over the winter in the plant's roots. In early summer, the nutritional value of this grass can be quite high, but this falls off dramatically after July. Cattle introduced to the hill from August onwards may avoid areas of dense Purple Moor grass due to its reduced palatability that late in the summer. This can result in under-grazed Purple Moor Grass dominating large areas. In Autumn the plant begins transferring resources to its roots and the leaves start to die off. Its dead leaves give many peatlands a familiar beige grassy look in winter and spring.

The dead leaves dry out rapidly during periods when moisture levels are low, particularly when the wind is coming from the Southeast and create a substantial spring wildfire risk. Burning (controlled or otherwise) does not address the problem as the living part of the plant at this time of year is below ground and is unharmed by spring fires, allowing it to flourish again after the fire has passed. In fact, fires kill off competing plants leading to increased dominance by Purple Moor Grass. These spring fires pose a serious risk to wildlife, including the Hen Harrier. They also threaten the eligibility of land for direct payments and are a risk to people and property. They destroy agricultural infrastructure, including fencing, and tackling them uses important fire brigade and defence force resources.

One way to address these issues is through grazing cattle on the uplands during the summer months. Introducing a few cattle or ponies is unlikely to be enough, particularly on large sites where animals may just congregate in favoured areas, leaving large areas under grazed. Management is needed to achieve a more targeted grazing pattern. The HHP sought to support suitable stock in upland sites in June and July when the nutritional value of Purple Moor grass was at its highest. Defoliation through grazing at that time of year could reduce the amount of litter available as fuel the following Spring. It could also prevent the transfer of nutrients to the plants roots in Autumn reducing the vigour of the plant the following year.

We wanted to encourage cattle to utilise areas of the site that they would tend to ignore. Finally, we wanted to ensure that cattle extracted the maximum nutritional value from the grazing available and retained, or better still, put on condition, whilst delivering a valuable ecosystem service.

To achieve these objectives, we needed to optimise land management in a manner that delivered a profit from the animals used to deliver ecosystem services. Ideally, the farmer could derive an income from both strands of this process, an income from the sale of cattle and a payment for the delivery of ecosystem services from the Hen Harrier Programme. The HHP team worked with Devenish Nutrition, Dawn Meats and participating farmers to achieve these objectives and unlock the potential of cattle grazing in the uplands.

In conjunction with Devenish Nutrition, we developed a Low Moisture Feed Block (Figure 11). This was a new product unlike anything else on the market. It had a high protein content which helped with weight gain, but it also provided an additional nitrogen source in the form of feed grade Urea. This supported bacteria in the animal's gut and helped ensure that plant matter was fully digested and its nutritional value to the animal maximised. Bacteria in the rumen are very important for the cow. They produce amino acids and proteins that the animal then absorbs, and they help break down cellulose in the diet. However, the animal's diet can determine how effectively these microbe's work. A diet of upland vegetation is often low in nitrogen, and this can reduce microbial activity and consequently the value that the animal gets from its diet.

Figure 11. Devenish Nutrition feed buckets developed for the Hen Harrier Programme.

By supplying vitamins, minerals and nitrogen, the feed blocks help improve the efficiency of the animal's digestive system. This provides the energy the animal needs to carry out the desired conservation grazing while putting on weight and condition.

The blocks developed by Devenish for the Project are not safe for sheep or horses due to the levels of trace elements such as copper, iodine and selenium. On lands where horses were present an alternative commercial block was used instead. The blocks can attract animals into the parts of the site where there is a need to focus grazing. The opposite is also true, the buckets can be used to reduce grazing pressure in particularly sensitive habitats by drawing animals away during part of the grazing season.

As part of a demonstration, the blocks were initially supplied free of charge to a small number of farmers in the Slieve Aughties SPA and the Stacks to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA Mullagherierks SPA in 2018 and 2019. These farmers' animals grazed upland Purple Moor Grass dominated sites for 60-81 days during June, July and August over two years. Older cattle, often cull cows were used as it was thought that animals with a mature digestive system would do better on the upland vegetation. Older animals with a mature skeleton may also be better suited to environments with low levels of calcium and phosphorous in the vegetation available as forage.

Cattle in participating herds were weighed (free of charge) before going to the hill and again after coming down. In 2018, of 44 animals across 10 herds, 42 animals gained between 0.22 and 1.87kg per day. The average weight gain was 0.81kg/day. In 2019, of 49 animals across 4 herds, 45 animals gained between 0.05 and 1.73kg per day. The average weight gain was 0.91/day. The best performance was on Purple Moor Grass dominated sites at low stocking rates (the best performing herd was grazed at a stocking density of 1 LU/ 6 ha for 60 days). This herd consumed 0.8gs of feed block per animal per day in 2018. The planned intake was 0.35 Kgs. This led to the development of a harder lick in 2019 to reduce intake in future seasons.

In 2018, animals were finished on grass before going to the factory. The cattle were fit for slaughter after coming down from the hill and didn't put on any notable additional weight on the lowlands in 2018 before going to the factory (Figure 12). In response to this, animals went straight from the hill to the factory in the 2019 trial.

Figure 12. Aberdeen Angus Cull Cow at the beginning of the trial (left-hand side) and at the end of the trial (right-hand side) in the Slieve Aughty Mountains in 2018.

Devenish Nutrition supplied the feed buckets required for the demonstration and adjusted the feed bucket composition based on feedback from participating farmers. For example, following feedback from farmers who used the product in 2018 the size of each bucket was reduced from 25Kg to 18Kg, and an improved handle was incorporated to address ergonomic concerns. The results helped fine tune the feed block which was subsequently supplied to Hen Harrier Programme farmers until the Programme ended in 2022.

The HHP paid for the transport of animals from where they were purchased, to the farm, paid for a veterinary check and the cost of any dosing or vaccinations required and provided the livestock weighing service as mentioned above. The Project team managed the logistics of distributing the feed buckets and salt licks while the farmer was paid €216 for their time in engaging with the project team. This payment was in addition to any payment due under the Hen Harrier Programme.

Dawn Meats supported the trials by guaranteeing a processing outlet for finished livestock; and providing a production premium. They bought the animals from the farmer at the end of the demonstration. They paid 10c/kg over and above the national average price for animals of that grade as quoted in the Farmers Journal for the week that the animals were sold. They paid an additional 4c/kg if these animals met Dawn Meats quality standards. Dawn Meats used the meat from these animals for market testing to establish how a market can be developed for meat produced through sustainable farming in the uplands (Figure 13)

Figure 13. Hen Harrier Project farmer Dan O'Donoghue with representatives of Bord Bia and Dawn Meats.

Beef from some of the animals in these trials was served at a number of events in 2018 and 2019. It was an option on the menu at the Teagasc Agri-Environment Conference in Gort, Co Galway on October 25th, 2018, where it was a hugely popular choice, and the feedback was excellent. It was also on the menu at the awards dinner for the Listowel Food Fair on Saturday November 9th, 2019. Two farmer events were held to show the Project teams appreciation to the farmers involved in the trial and to give them an opportunity to sample the mountain beef that they had produced. These were held in Kennedy's, Rearcross, Co Tipperary on 12th November 2019 and the Horseshoe Bar, Listowel, Co. Kerry on 30th October 2021.

In 2020 the feed blocks were offered at a supplemented rate to farmers in the Hen Harrier Programme. Pallets of blocks were delivered around the SPAs where there was demand. This approach was very resource intensive and as a result, in 2021 and 2022, the blocks were delivered to local independently owned co-ops where Hen Harrier Programme farmers could collect them. The cost of the blocks was supplemented by the HHP, and the remainder deducted from the farmer through the Hen Harrier Programme Habitat Payment (this ensured that there were no barriers to trying this innovation for the farmer).

This trial was instrumental in bringing abandoned and under-utilised lands back to active management across the SPAs. The benefits extended beyond fire control. The support from the HHP team gave farmers the ability to incorporate SPA uplands into their upland farming enterprise with more certainty from a habitat management, animal health and forage perspective. The score for many of the fields involved in these trials also increased.

Grazing gorse trials

In the Musheramore SPA, 90 farmers participated in the Hen Harrier Project EIP between 2018 and 2022. Large parts of the area are peatlands, mountain and upland grassland but some more iintensively managed lowlands are also present. The main farming enterprise in this area are sheep, beef, dairy and a mix of each on some farms. Farmers regularly commented during information meetings and training days that their uplands are becoming undergrazed and hence, a fire risk. The main issues being Purple Moor Grass dominance and the presence of European Gorse and Western Gorse on the land. Farmers asked if the HHP team could focus on this issue and assess what could be done to help them manage their land better and in an environmentally friendly way.

The team undertook to explore the targeted grazing solutions to both the Gorse and mixed Autumn Gorse/ Purple Moor Grass situations. The trials consisted of three separate approaches,

1. Using Goats to control mixed Gorse (Ulex europaeus), Brambles (Rubus spp), Willow (Salix spp) scrub

2. Using Horses/ Goats to manage mature Gorse (U. europaeus).

3. Using Horse to manage mixed Autumn Gorse (U. galli) and Purple Moor Grass (Molinia caerula)

Three sites were identified for these trials, Trials 1 & 2 were on a farm in Ullanes East near Ballymakeera, Co. Cork, trial 3 was on a farm in Ullanes West. On the land used for the Goats trial an area of approx. 0.3 ha was fenced off with three strands of temporary electric fencing and a water supply laid on. The water supply was a gravity fed system sourced from a nearby stream feeding two water troughs within the trial area. The site contained a small number of mature trees and a large area of Gorse with Brambles and Willow, there was a small area of grassland around the periphery. The site was stocked with 20 Saanen Goat (a dairy breed) wethers but most of them were relatively young c. 2 yrs old. The animals were introduced in March 2021 and remained on the site for 3 weeks.

Goats on mixed Gorse, Bramble and Willow Scrub

The Goats browed the Brambles and Willow preferentially, only moving to the Gorse after the other species were largely exhausted. Browsing on the Gorse was predominantly on the tips with limited bark stripping, however some of the mature trees present did suffer some bark damage, when this was observed the trees were protected with welded 2cm mesh wrapped around their trunks to a height of 2m. The goats remained on the site for three weeks. Interestingly although the goats could clear the fence, their strong social habits meant that animals that did clear the fence did not venture far and, in all cases, returned ty themselves to rejoin their flock.

Overall, the results were disappointing while much of the scrub was cleared, recovery after the removal of the goats was very rapid. The team accepts that the animals used were too young and too light and that larger/ older animals form a meat breed may have performed better. Recovery of fast-growing Brambles and Willow is inevitable in the absence of continued management in the summer months. It is possible that a mixed flock of Sheep and Goats could provide this. The Sheep could compete with Goats for summer grass and encourage them to browse on recovering Brambles and Willow although this approach was not tested in the trial. Using Goats to control scrub can be effective but is likely to be of very limited utility in an Irish context, primarily due to the difficulty in sourcing large numbers of suitable animals.

Horses on Gorse

The site had a dense, high cover of European Gorse, up to 3m high in places with brambles also widespread. The farmer had cleared the site of gorse mechanically five years previously, but with a large seed bank and no competing vegetation recovery was rapid resulting in a dense even aged stand up to 3m tall due to the difficulty of access and the abundant alternative grazing available on nearby grassland.

The farmer agreed to help manage a grazing of European Gorse trial through a combination of horses and goats for a payment of €200 plus a daily rate of €24.80 for the 9-week duration of the trial. The trial commenced in February 2021 and ran until April 2021. The farmer agreed to the following:

1. Allow mulching of narrow strips of gorse to allow HHP team erect required fencing for animals
2. Check animals daily and ensure they are in good health
3. Retain animals in the prescribed plots for the duration of the trial
4. Ensure adequate water and feed buckets were always available to animals
5. If weather was to deteriorate, the farmer would have to provide hay to the animals as an additional feed source.
6. Fences were to be checked daily including solar powered fence units
7. Animals to be re dosed if required
8. Allow video recording of the trial on three occasions by HHP
9. Assist the project officers where required

The area involved was approx. 0.4 ha (c.1 acre). It was fenced off with a temporary electric fence powered by a solar charger and stocked with six horses in early February 2021 (Figure 14). The horses were mature females. No pregnant animals or mares with foals at foot were used. The trials were restricted to non-breeding females to avoid possible risks from poorer nutrition to animals with high nutrient requirements. Stallions were not used due to the perceived difficulty of containing them in a small area. If suitable Gelding had been available, they would have been considered. They were in good, healthy, condition at the start of the trial. The animals grazed the site for 6 weeks and left at the end of March. After the horses left, a small herd of goats were introduced, and they stayed in the field for a further 4 weeks. Daily monitoring of the trial was very important to ensure there was no animal welfare issues.

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Before the start of the trial, there was very little vegetation under the gorse, the canopy kept the ground in deep shade and there was a thick layer of litter (mostly dead gorse leaves and twigs). During their time on the site, the horses grazed the grassy areas in between the gorse first and as this resource was depleted, they turned to the gorse. At this time of year, the sap is starting to rise in the gorse stems increasing their palatability. From the beginning horses browsed the Gorse focusing largely on stripping the bark from the ground up. They also grazed the spikey leaves of the gorse, but the bark was more attractive for them. The passage of large animals through the site physically broke a lot of gorse stems and created paths through the previously impenetrable scrub. These were of value later on when the goats were introduced which opened the site up for the goats and allowed them to access the entire area. By the end of the grazing period evidence of bark stripping and stem breakage were widespread.

Figure 14. Site preparation for the gorse grazing trial. L-R Trial site before grazing, site preparation and fencing.

Members of the Project team visited the site at the end of July 2021 to see how the vegetation had developed over the summer. During the follow-up visit, it was observed that many gorse plants had died, and others had a sickly yellowing appearance. This level of die off apparent after just 4 months was a surprise. The bare soil was completely colonised by grasses and annual weeds. The growth was very lush as a result of the canopy opening up and light reaching the ground. Trampling by the horses incorporated much of the gorse litter into the soil and probably resulted in faster decay times and the release of nitrogen to the soil. This undoubtedly helped many of the grasses. Gorse recovery from seed was very limited, but new shoots from root stocks were relatively common. New growth from once dormant buds along the stems was also commonplace. This may have been encouraged by damage higher up on the stem and by the increased light levels nearer the ground.

Brambles were abundant, although still small. While these were always present at some level, there was a risk that they could become problematic without further management. Brambles likely benefitted from the increased light levels, the disturbance of the litter layer and the high levels of available nitrogen arising from the breakdown of gorse litter. It was clear that ongoing management would be required. Grazing continued with sheep for the rest of that summer. The gorse regrowth was still very soft and vulnerable to grazing, knocking it back by targeted goat and sheep grazing could prevent recovery of some plants. Simply abandoning the site would allow much of the gorse to recover. It was considered likely that recovery of Gorse would initially be mixed in with a lot more brambles and as recovery proceeded with a diminishing supply of grasses, until eventually a dense Gorse canopy re-established.

The Horses were reintroduced in the following January/ February. The dead stems of gorse were very brittle by this stage. It was expected that trampling by the horses would break them down opening the site up further. Grazing and trampling by horses in January/ February could also help control brambles before they got out of hand, as well as causing further damage to the remaining gorse plants. This helped complete the transition of the site to the more open mosaic of grassland and scrub that was planned.

In hindsight, the contribution of the goats was probably minimal. There were too few of them and they were physically too small. The timing and duration of their grazing ensured that most of their browsing was on the soft young growth of Gorse, a pattern that was unlikely to have had a long-term impact on the vegetation. The horses on the other hand appeared to have a dramatic effect. Grazing at a high stocking rate (11-13 LU/ Ha) for a short period in late Winter/early Spring, had a considerable impact on the gorse. Stem breakage and bark stripping causing almost immediate, and long term, impacts.

In summary, late Winter/early Spring grazing of horses holds a lot of promise for managing gorse. However, it must be focused, i.e. the animals must be confined at a relatively high stocking rate at a very specific time of year, and it has to be followed up with summer grazing. All of this requires careful management, and this has a cost. At key sites, where the management of gorse is beneficial, the increased management costs could be supported as a landscape level intervention in a future agri-environment scheme. Overall, the trial went very well and showed that great progress can be made on sites like these with some planning and investment. Targeted grazing of gorse using horses is now a landscape action in the ACRES CP scheme.

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Horse on Autumn Gorse and Purple Moor Grass

Project staff worked with farmers in Ullanes West area of the Mullaghanish to Musheramore SPA to trial the use of the targeted grazing of horses to manage dense Autumn Gorse/ Purple Moor Grass with the aim of increasing biodiversity and reducing wildfire risk. This approach was inspired by similar work in Northern Spain where Autumn gorse poses a serious fire risk and rural depopulation and a reduction in farming activity is contributing to its spread.

In 2021 approx. 3ha was temporarily fenced off and grazed with up to 5 horses for July and August. In early September, the fences were lifted, and the horses allowed to graze the entire site. In 2022, another 3ha adjacent, to the 2021 site was fenced off and grazed in a similar way. Ideally a rotational grazing system where horses graze each block hard for one summer in four would be introduced.

To date the results have been very encouraging, with reduced levels of Purple Moor Grass litter in the area that had targeted grazing in 2021 and a greater diversity of other grasses, hard rush and flowering plants, less large tussocks of Purple Moor Grass compared to the areas outside the 2021 trial.

There are considerable benefits in using horses for this purpose,
1. Their method of grazing, biting the Purple Moor Grass off very close to the ground greatly weakens the plant and reduces the amount of litter produced and the dominance of the species
2. Horses have large appetites and consume a lot of vegetation
3. There is no risk of the animals contracting TB from deer
4. They are active and cover a lot of ground and create a lot of structural diversity by breaking down paths through tall vegetation. Autumn Gorse is not susceptible to bark stripping in the same way as European Gorse but it is vulnerable trampling. Large animals like horses can break it down in places allowing recovery of Heather and herbaceous species.

While they are hardy they do need to be looked after, feed blocks to supply minerals are essential, horses should not be kept on site for too long and they have to be checked on a regular basis.

Conservation grazing can be used to improve habitats and reduce fire risk. As we move into the new ACRES scheme the Hen Harrier Project will be disseminating the lessons learned in trials like this. Employing cattle and horses for the summer control of Molinia and horses for the winter/ early spring management of Gorse.

The use of Horses for targeted grazing on mixed Autumn Gorse/ Purple Moor Grass dominated sites is being introduced as a Landscape Action in the Acres Co-operation Scheme.

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Conifer treeline removal trial

A farmer in the Slieve Aughty Mountains SPA approached the HHP team about restoring a riparian area along the Corra river on their farm. Following field visits and discussions, a riparian rehabilitation plan was proposed. This involved removing the conifer treelines along the riparian edge of the field and encouraging natural regeneration by excluding grazing animals along with additional native tree planting on surrounding boundaries. A total of 72 mature conifer trees were removed in Turkenagh, County Clare. This work was carried out in October and November in 2022 by specialist contractors. Approximately 40 of these trees were situated on a 200m long earth bank, the rest of the trees were along the Corra river itself. Many of the trees were very large with a circumference of 120cm at chest height. The subsequent planting of native trees along the earth bank was done to stabilise it and provide good foraging habitat for Hen Harrier. In comparison, the conifer treeline provided a vantage point for predatory/nuisance species to Hen Harriers such as corvids and little in the way of hunting opportunities.

The large conifers blocked light reducing the diversity of plant species with consequent impacts on wider biodiversity. The trees also posed a risk to the ecology of this stretch of the Corra river by keeping the river in almost permanent shade. Care was taken when removing the conifer trees to ensure that they landed in the field and not in the river (Figure 15). The brash was removed and left in piles to decay naturally, the logs were cut into 3-meter lengths. These logs were then removed from the site by the farmer. Each side of the earth bank was fenced with sheep wire fencing, as was the boundary along the river. Two crossing points were maintained by installing gates to ensure access for grazing on the plots on the other side of the river.

Figure 15. Field boundary in Turkenagh Valley, Co. Clare before and after conifer treeline removal

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Two staff members carried out a baseline survey of the plant community present on the site where conifer trees were removed and where tree planting took place. 100 native trees were planted on the site in February 2023. Sixty on the earth bank and 20 along the riverbank (some cuttings of the willow already present on the site were also taken and planted here). Another 20 trees were planted in an area where erosion had caused the existing fence to collapse into the river – this corner of the field was fenced off to encourage the existing vegetation to develop and help stabilise the bank. The trees species planted were Birch, Oak and Mountain Ash. Biodegradable, spiral tree guards were used to protect the trees from deer and hares.

This type of restoration plan would not have been possible without the willingness of the farmer, their trust in the Project team and the flexibility of the Local Action Fund. Similar to the Wild Bird Cover strips, lessons learned here allowed conifer treeline removal to be included as a Landscape Action in ACRES Co-operation scheme.

Invasive species treatments

The presence of invasive species was recorded on a field level in the HHP scorecards. These data were analysed and, the areas where invasive species were concentrated, identified. Japanese Knotweed was the most recorded invasive species. Farmers in areas with Japanese Knotweed on their farm were invited to attend workshops run by a specialist contractor on the correct method to treat Japanese Knotweed. Two injector kits were bought by the Project team and were loaned to farmers who had completed the training, on request. Additionally, a specialist contractor was funded by the HHP to treat infestations on farms where the farmer couldn't deal with it themselves. Follow up treatments were funded in subsequent years to ensure that this invasive species was appropriately dealt with. The experience gained in these trials was hugely beneficial for two key reasons. Firstly, they were useful proof of concept exercises. It proved that data collected through the scorecards could be used for more than just calculating a payment, it could also be used to identify training needs and target interventions to address environmental challenges. Secondly, this approach allowed the team to develop the specifications and costings that would be required for the roll-out of such actions on a large-scale. These lessons provided a good basis for Landscape Actions for removal of invasive species in the ACRES CP scheme.

A stand of Japanese Knotweed was removed from a commonage in Co. Clare through this process. Commonage shareholders attended the workshop where we established that the infestation was too well established for them to be able to effectively treat it themselves. A specialist contractor was funded by the HHP to treat it beginning in 2021, with a follow up treatment in 2022.

Text box 3. Japanese Knotweed treated on farms during the Hen Harrier Programme

Key Performance Indicators

Field scores

The total land area in the Hen Harrier Programme in 2022 was over 46,000 ha. The dominant habitats were wet grassland and bog/heath. Less than 10% of the farmed land in the six SPAs for breeding Hen Harrier comprised species-rich grassland or scrub/woodland (Table 16).

Habitat	Commonage area (ha)	Private land area (ha)	Total area (ha)
Wet Grassland	361.98	21,151.47	21,513.45
Bog/Heath	9665.03	11,363.80	21,028.83
Species-Rich Grassland	21.70	2,062.15	2,083.85
Scrub/Woodland	165.23	1,579.85	1,745.08
Total	10213.94	36,157.27	46,371.21

Table 16. The total area of private land and commonage in the Hen Harrier Programme in 2022 by habitat type

The Hen Harrier Programme success can be measured through the scored land. Year one of this type of scheme provides an essential baseline for the condition of the target habitats. The average score per habitat can give us an overall picture of what is happening in an area in any given year (Table 17).

Private field scores

Overall, there was a significant increase in the field scores from 2019 to 2022 (Table 17). The wet grassland fields rose from an average of 5.21 in 2018 to 5.86 in 2022. In whole number terms, this is an increase from a score of 5 to a score of 6. This is important as the farmer was paid on the whole number score. The species-rich grassland scores were higher on average. This is not surprising as these fields are, by definition, unimproved, semi-natural grasslands. Again, in whole number terms there was an increase in score from 6 to 8. Bog/heath fields showed a similar pattern moving from a score of 6 to a score of 7 in whole number terms. The scrub/woodland fields had no significant increase. The average score tells a lot but can also hide some of the finer details.

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Table 17. The number of fields, average score per habitat type and standard deviation of the mean for private fields across each year of the Hen Harrier Programme

	2018			2019			2020			2021			2022		
Habitat	**No of fields**	**Avg Score**	**Std Dev**	**No of fields**	**Avg Score**	**Std Dev**	**No of fields**	**Avg Score**	**Std Dev**	**No of fields**	**Avg Score**	**Std Dev**	**No of fields**	**Avg Score**	**Std Dev**
Wet Grassland	6,377	5.21	2.71	13,390	5.42	2.53	13,661	5.64	2.57	13,735	5.63	2.46	13,102	5.86	2.47
Species-Rich Grassland	219	6.41	2.14	1,087	7.76	1.38	1,402	8.06	1.35	1,327	8.02	1.29	1,364	8.11	1.31
Bog / Heath	862	6.48	2.40	1,560	7.20	2.06	1,579	7.24	2.12	1,625	7.44	2.04	1,630	7.39	2.09
Scrub / Woodland	558	7.10	2.55	1,240	7.00	2.53	1,353	7.16	2.48	1,373	7.09	2.46	1,343	7.18	2.43
Total	8,016	5.51	2.72	17,277	5.84	2.56	17,995	6.08	2.58	18,060	6.08	2.50	17,439	6.28	2.48

Another way of looking at the scores that provides some insight into the effectiveness of the results-based approach, is to look at the number of fields in each of the paying categories from zero to ten and examining the changes over time in these. Scores from 2018 are excluded here as farms that entered the scheme in 2018 were offered places using a ranking and selection system. Of the approximately 600 farms that entered the programme in 2018, these were generally larger and had a high proportion of SPA land. From 2019 onward, there were approx 1,600 farms in the Programme each year. From a data analysis perspective, comparisons from 2019 onward are more meaningful as the number of farms are similar and there is no rank and selection bias (Note: all eligible farms were accepted into the programme in 2019).

The numbers of fields scoring less than 4 in 2019 and 2020 was quite high at almost 1,900 fields but this fell to 1,506 fields in 2022. This is a drop of over 20%. Similarly, the number of fields scoring an 8 in 2019 was just over 2,900 with an increase to almost 3,700 in 2022. This is an increase of over 25%. There is a general trend of the numbers of fields scoring less than 6 falling over time and the number of fields scoring greater than 8 increasing over time with the number of fields scoring a 7 having a bell curve appearance as the scheme progressed (Figure 16).

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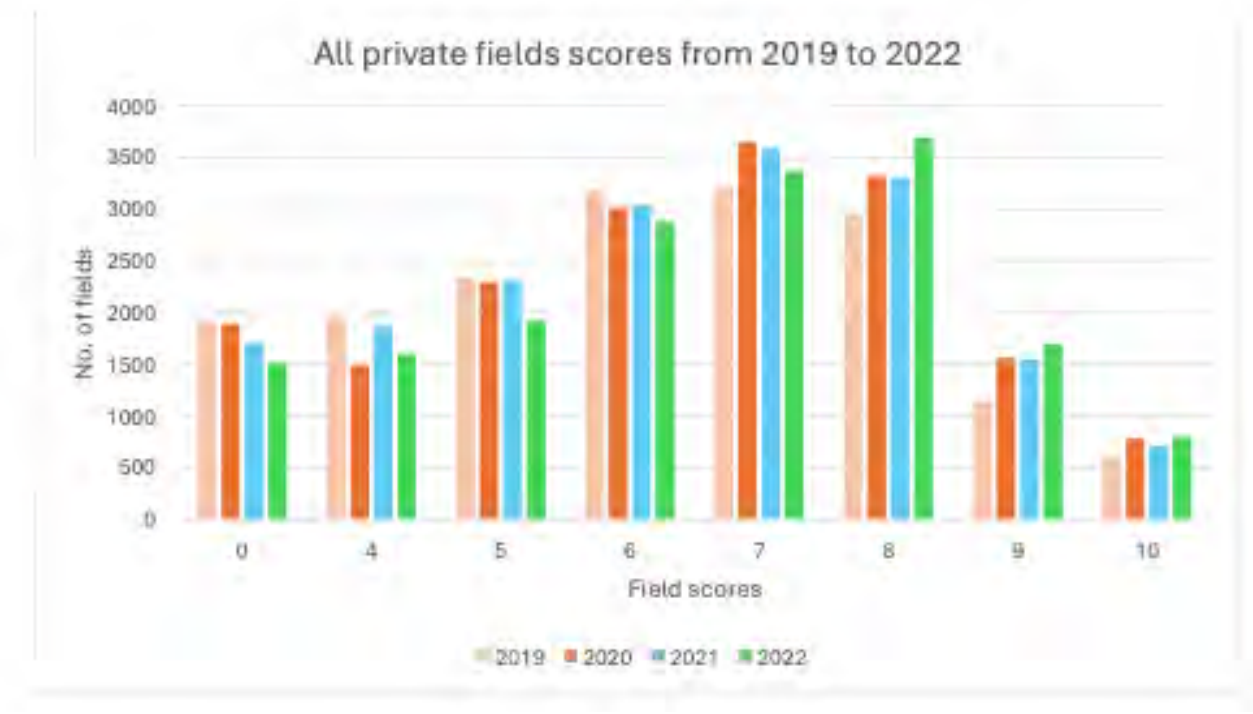

Figure 16. Numbers of privately owned fields receiving non-payable scores (<4), and scores of 4,5,6,7,8,9 and 10 per year from 2019 through to 2022

To more easily visualise the changes from 2019 to 2022, figure 17 shows the data for years 2019 (year 1/2) and 2022 (year 4/5) only (weather it was year 1/2 or 4/5 of the Programme depends on the original year of entry of the farmer i.e. 2018 or 2019).

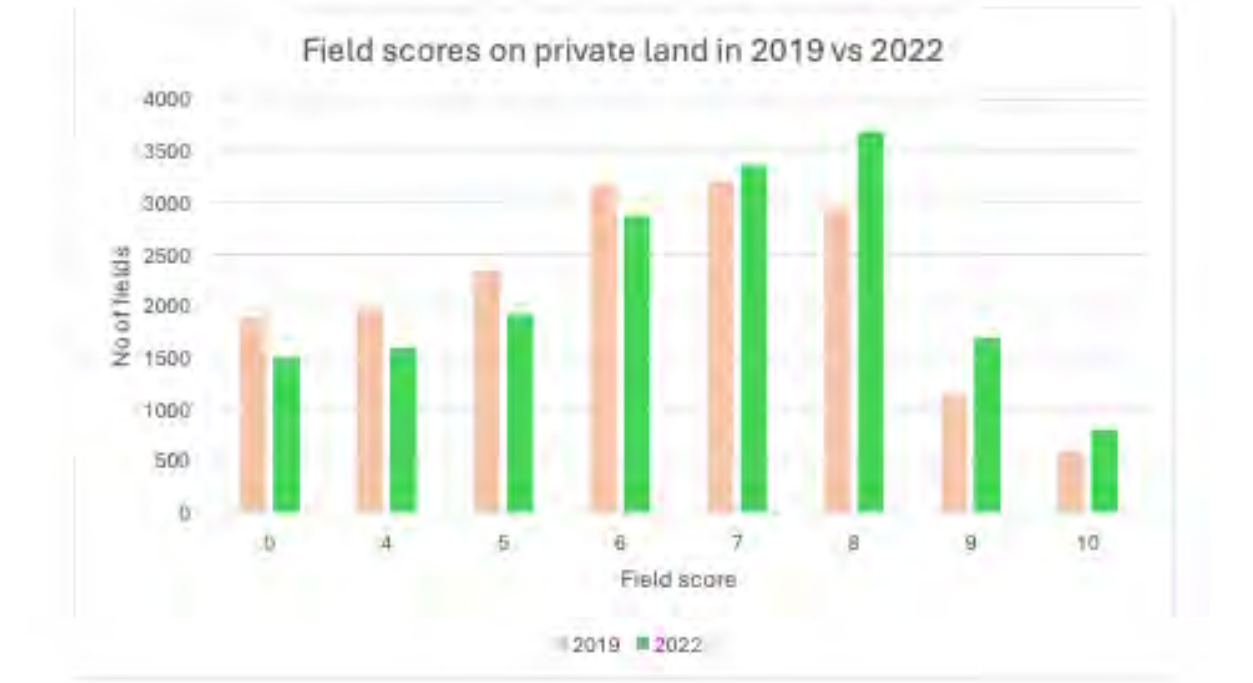

Figure 17. Same data as provided in figure 16 but excluding data from 2020 and 2021 to show more clearer changes from year 1/2 in the programme versus year 4/5 in the programme (depending on the year of entry). Numbers of privately owned fields receiving non-payable scores (<4), and scores of 4,5,6,7,8,9 and 10 in 2019 and 2022

From an ecological perspective, different habitats have different response times to management changes. Generally speaking, grassland habitats (unless they are improved agricultural grasslands), are likely to respond positively to management changes in a shorter timeframe than bog/heath habitats. For example, grasslands have a more defined growing season during the summer months, and delaying mowing, or topping rushes early or late in the season, can result in the delivery of very good vegetation structure from a suboptimal vegetation structure baseline, in a single growing season. The response of Bog/heath vegetation structure management changes is slower, particularly if the past management has resulted in short vegetation.

That said, there are many things considered on the scorecards that can be dealt with quickly, particularly in relation to threats and pressures, for example removing dumping or ceasing supplementary feeding will have a response within a single season. A huge component of the HHP was ensuring that farmers knew what the programme was paying for and that it was providing advice on how to achieve it. Through the delivery of key messages over the lifetime of the programme on how different issues could be tackled, farmers improved scores consistently across the dominant habitats. See figures 18, 19, and 20 below.

Figure 18 shows the changes in scores for privately owned wet grassland fields from 2019 to 2022. The trends follow those of the full dataset shown in Figure 17.

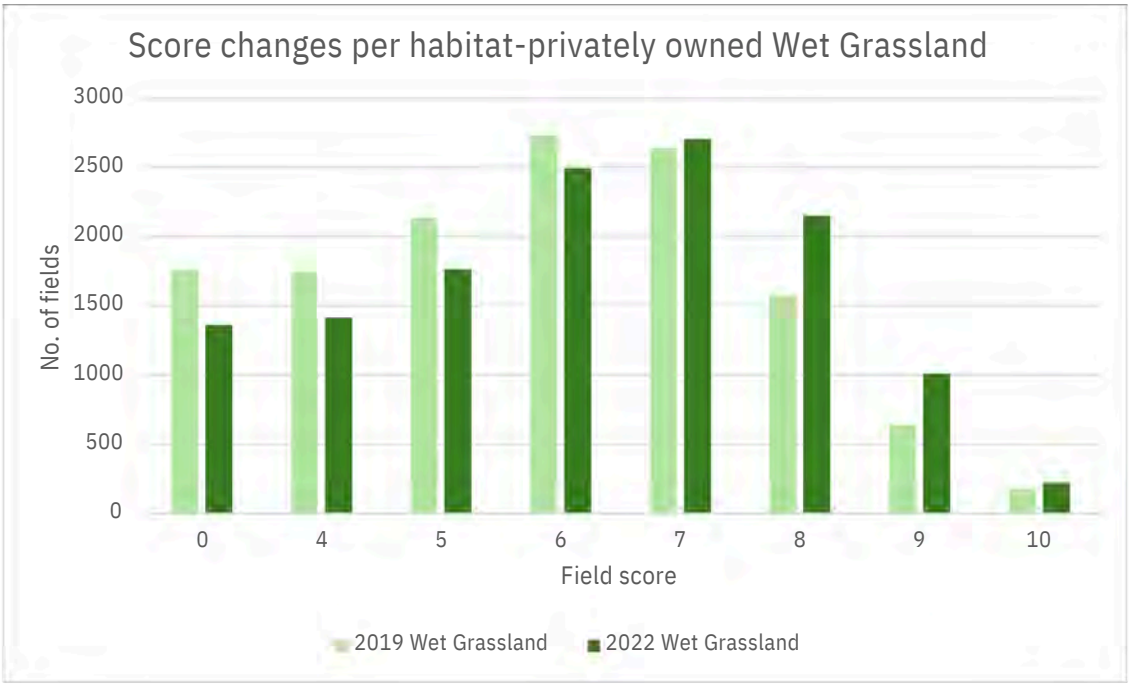

Figure 18. Numbers of privately owned wet grassland fields receiving non-payable scores (<4), and scores of 4,5,6,7,8,9 and 10 in 2019 and 2022.

The number of species-rich grassland fields was a lot fewer than wet grassland fields. They accounted for less than 5% (4.6%) of the area under contract in the HHP . These fields are a high-quality subset of the wet grassland fields, so unsurprisingly, the species-rich grassland fields scoring less than 7 was low (Figure 19). The key mechanism for improving scores in these fields was to remove the threats that were present. An increase in the number of fields identified as species-rich grassland fields increased over the course of the scheme. This may be related to advisor confidence in plant identification over that time as they gained experience and received annual training.

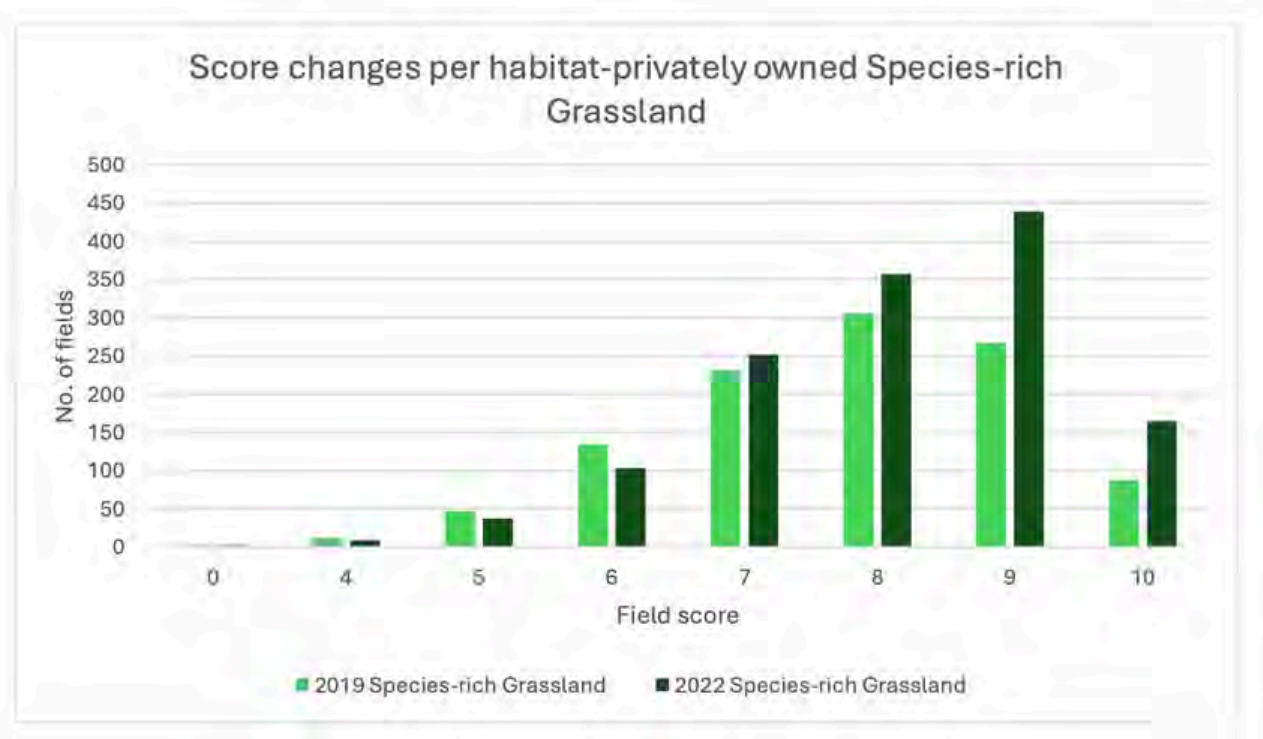

Figure 19. Numbers of privately owned species-rich grassland fields receiving non-payable scores (<4), and scores of 4,5,6,7,8,9 and 10 in 2019 and 2022.

Similar to the species-rich grasslands, the bog/heath fields were predominantly semi-natural and so the numbers receiving scores of less than 6 were small, even in the first year of scoring. The number of fields scoring a 6 dropped from 243 to 185 over the course of the programme (a 31% drop). There was a 20% drop in the number of fields scoring in the 0-6 range overall. The number of fields scoring a 7, 8, 9 or 10 increased from 1,074 fields to 1,240 fields or 15% (Figure 20).

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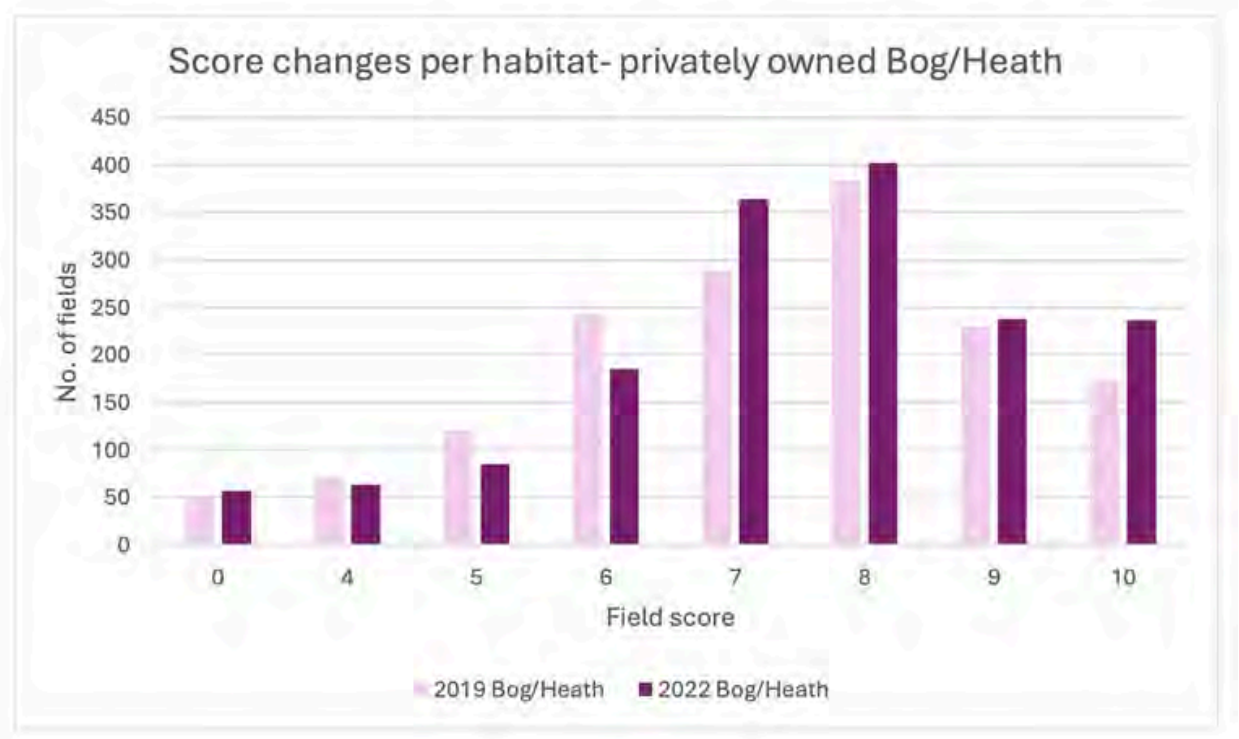

Figure 20. Numbers of privately owned bog/heath fields receiving non-payable scores (<4), and scores of 4,5,6,7,8,9 and 10 in 2019 and 2022.

Scrub/woodland scorecards accounted for around 3.5% of the contracted area in the Hen Harrier Programme. These areas were a small component of farms in the SPA but the HHP team felt that where they were present that they needed to be rewarded for two reasons. Firstly, they are an important habitat for Hen Harrier and additionally, not paying for scrub/woodland fields could result in the perverse outcome where farmers could be incentivised to remove them to increase the grassland or bog/woodland areas eligible for the Programme.

The scores show that, in general, the quality of these fields is high (Figure 21). The scorecards still provided signals for the farmers to reduce the threats to these habitats such as dumping and provided value for them resulting in a slight increase in higher scores across these fields.

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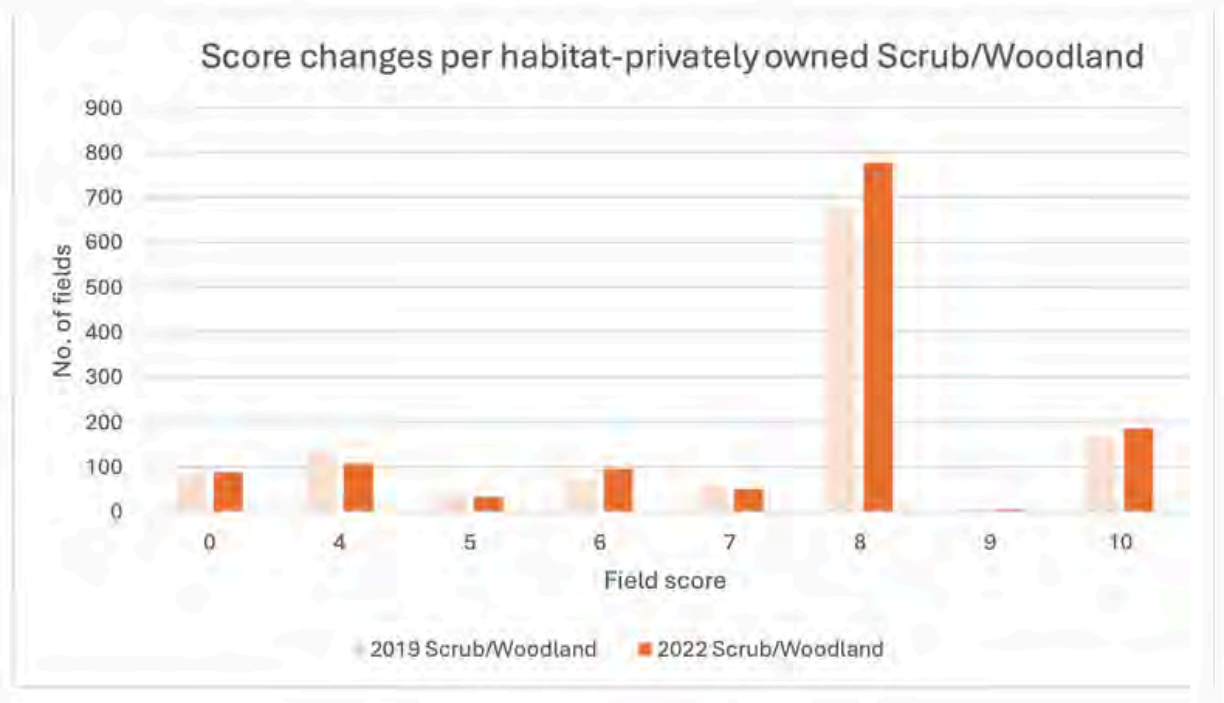

Figure 21. Numbers of privately owned scrub/woodland fields receiving non-payable scores (<4), and scores of 4,5,6,7,8,9 and 10 in 2019 and 2022.

Again, while the data can be viewed across habitats or divided by scores, it is interesting to see if the responses was similar across the six SPAs. Geographically, the SPAs span nine counties from Ulster to West Munster. A testament to the approach is that the response was similar across all areas. If a results-based approach was scalable, it would need to be applicable across a high number of farms and be administered effectively by a small team. Figures 22, and 23, show that while the landscape in each of the SPAs differ slightly, for example, in Musheramore to Mullaghanish SPA, a higher proportion of the lowlands are more intensively managed, the trends across the different SPAs with different farm numbers and in different geographic regions are similar. The scorecard data allows teams working in the area to investigate unusual occurrences, such as a reduction in fields scoring a 10, to see what the underlying causes might be.

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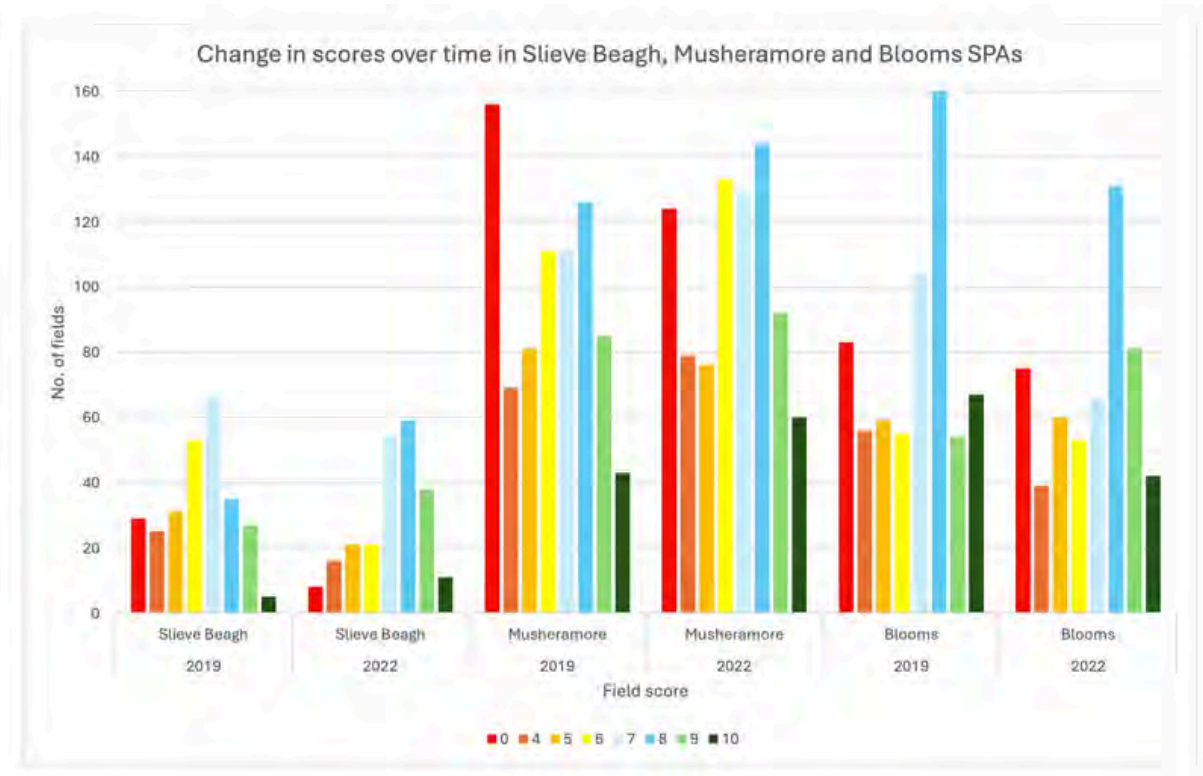

Figure 22. Score ranges in 2019 and 2022 for the three smaller SPAs in the Hen Harrier Programme

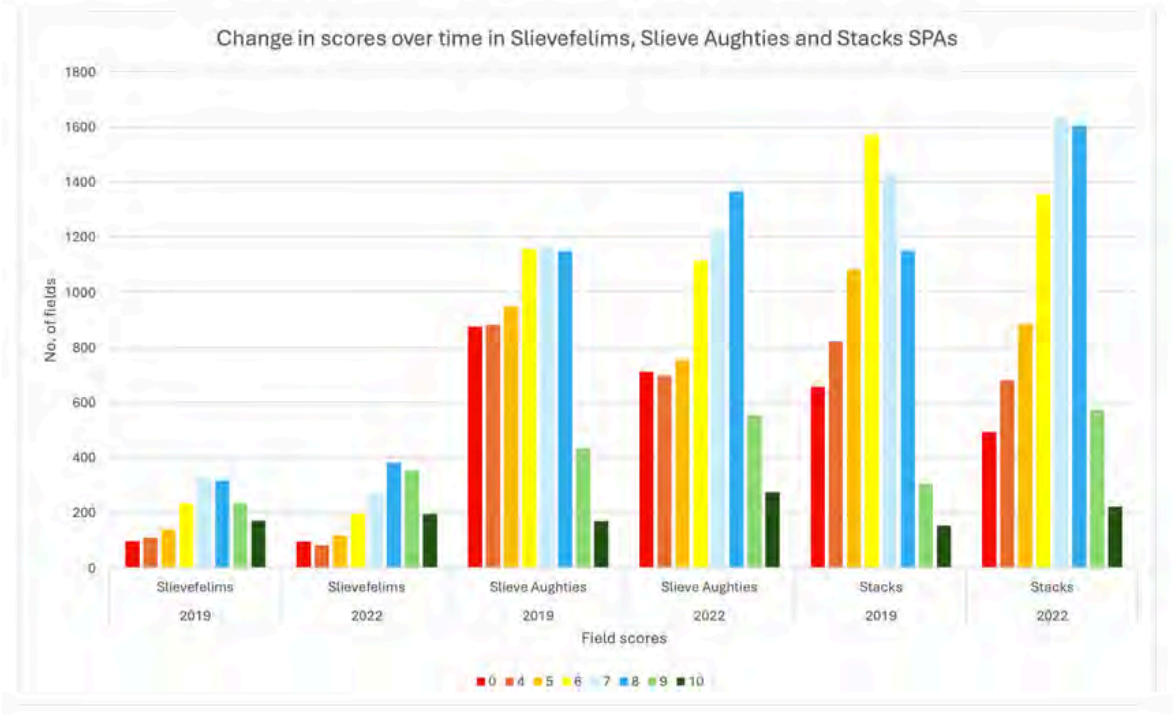

Figure 23. Score ranges in 2019 and 2022 for the three larger SPAs in the Hen Harrier Programme

Commonage Field Scores

Commonage scoring was carried out by the HHP team. This was an important innovation. It removed the complications associated with shareholders with multiple advisors having to agree on a single advisor to submit scores for their commonage. It also removed some of the pressure on advisors during the field season. All habitats were present on commonage but the proportions were very different to those on privately owned land. Almost 95% of the commonage in the HHP was assigned a Bog/heath scorecard. Around 5% was assigned a grassland scorecard of one kind or other and less than 1% was assigned a scrub/woodland scorecard. The commonages were all surveyed in the first year that they came into the Programme and were surveyed twice more before the end of the contract i.e. Year 1, 2 and 4 or year 1, 3 and 5. This is because changes in management on commonage habitats generally take time to take effect. Any shareholder who had carried out actions on a commonage that could change the score, such as removing a damaging activity or an invasive species, could request a rescore to ensure that the value of carrying out that action was seen as soon as possible. Despite the slower response rates of commonage habitats to management changes, the scores from 2018 compared with 2021 show a progression towards higher scores (Table 18).

Table 18. The number of fields, average score per habitat type and standard deviation of the mean for commonage fields across each year of the Hen Harrier Programme

Habitat	2018 No. of fields	2018 Avg Score	2018 Std dev	2019 No. of fields	2019 Avg Score	2019 Std dev	2020 No. of fields	2020 Avg Score	2020 Std dev	2021 No. of fields	2021 Avg Score	2021 Std dev	2022 No. of fields	2022 Avg Score	2022 Std dev
Bog/ Heath	101	6.1	1.9	139	6.3	2.1	144	6.3	2.1	150	6.6	1.9	151	6.6	1.9
Scrub/ Woodland	26	7.5	2.7	37	6.8	2.6	35	7.8	1.9	35	7.8	1.7	35	7.8	1.7
Species-Rich Grassland	4	9.3	1.0	4	7.3	1.3	4	7.8	1.5	5	8.0	1.2	5	8.0	1.2
Wet Grassland	44	4.3	3.9	51	1.8	2.5	50	3.1	3.3	53	4.2	3.0	53	4.2	3.0
Total	175	5.9	2.9	231	5.4	2.9	233	5.8	2.8	243	6.3	2.5	244	6.3	2.5

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The figure below shows scores from bog/heath scorecards only as they represent the majority of the commonage scores (Figure 24). The scores from 2018 v 2021 (the last big year of scoring) are shown to provide a good comparison. Unlike the private land, the majority of the commonage came in to the Programme in 2018 when 40% of the Programme's farmers joined. These 40% brought almost 80% of the Programme's area of commonage with them (78%) since just one shareholder joining the Programme required the whole commonage to be surveyed.

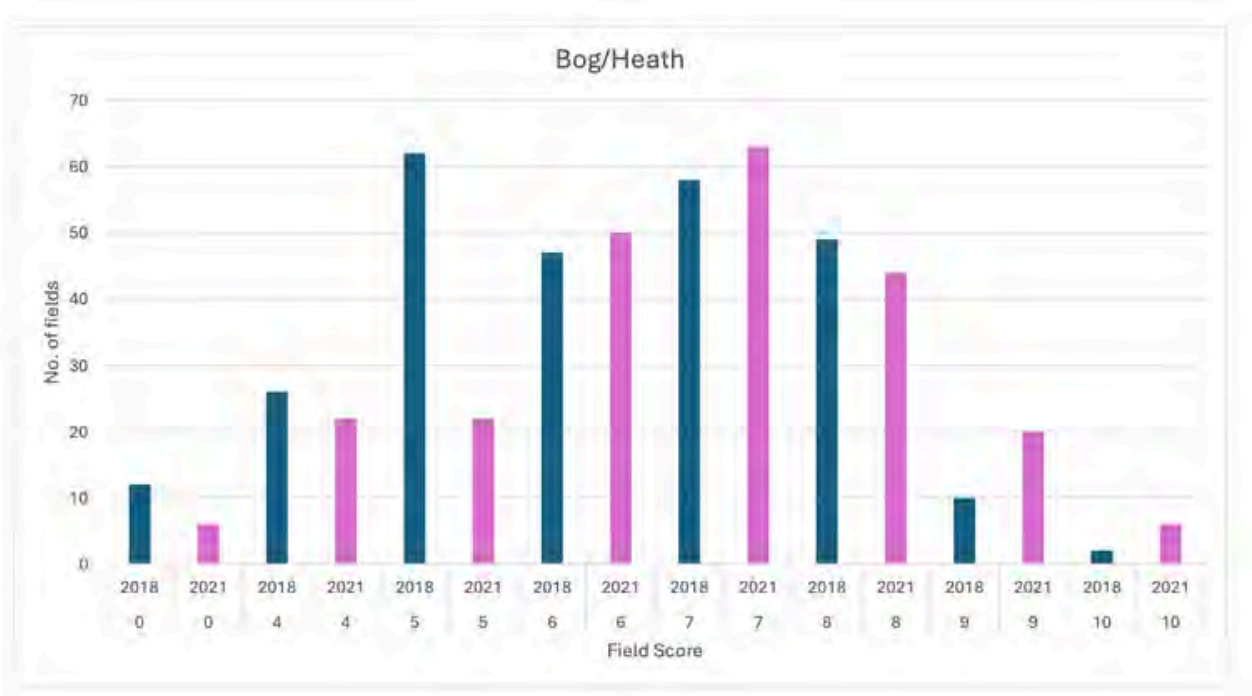

Figure 24. Score ranges in 2018 and 2021 for the bog/heath fields in SPAs in the Hen Harrier Programme

A total of 55% of bog/heath commonage fields scored 0-6 in 2018 (147), with 45% scoring a 7 or higher (119). These represented 60% and 40% of the commonage land area respectively. In 2021, the numbers of bog/heath commonage fields scoring 0-6 had dropped to 43% (100), with 57% (133) scoring a 7 or higher. These represented 38% and 62% of the commonage land area respectively. The area of commonage fields with a bog/heath scorecard scoring a 7 or greater doubled between 2018 and 2021. This was an excellent result and if the Programme had continued the trend indicates that more fields would move out of the 0-6 scoring range and move into the 7+ scoring range, especially if a budget for peatland restoration works were made available as supporting actions.

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Rate of attrition

The scheme officially launched on December 8th, 2017, just 6 months after the contract was awarded to the Hen Harrier Programme Ltd. Expressions of Interest were invited in November of 2017, by March 31st, 2018, the team had received 1,635 applications for the Programme. By the end of the contract, we had received 2,198 applications. 1,616 of those applications resulted in a farmer taking up a contract. Some applications were invalid, while others resulted in an offer of a place in the programme that wasn't availed of. Four applicants were offered places in the HHP but were not active participants at the end of 2022. Two of those were applicants who withdrew from the Programme as the land that was designated SPA was rented and their rental agreements ended. The other two signed a contract but never submitted a payment claim. These contracts were terminated after two seasons with no payment claim. This represents an attrition rate of 0.25% over the course of the Programme. By any standards this is an incredible retention rate for any scheme which we believe is a testament to the Hen Harrier Programmes efficacy for the farmers it was designed for.

Programme reception and legacy

There were no 'before' and 'after' surveys for the Hen Harrier Programme but anecdotally, the reception was excellent. Farmers who joined the Programme didn't leave it (as the rate of attrition confirms above). At the beginning of the Programme, difficult phone calls, animated meetings and even Hen Harrier persecution were not unusual. By the end, the Project team felt that they had a good working relationship with the farmers in the Programme and the two-way communication throughout the term of the Programme meant that there was an adaptability that farmers appreciated. In simple terms, if something didn't work, it was changed or stopped. Farmers in Hen Harrier SPAs campaigned for the retention of the Hen Harrier Programme in 2022 when the new CSP details were announced.

During a national Land Use Review looking into community engagement, the Hen Harrier Programme was put forward as a good example of how to positively engage farmers. As outlined above, many of the pilots and trials carried out during the Hen Harrier Programme, including the results-based approach at a large scale, were incorporated into a high ambition national agri-environment scheme, ACRES CP , that commenced in 2023.

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Financial Report

A summary of all project expenditure is detailed in table 19. On 31 December 2022, the project was mostly complete. For several months after this, any outstanding claims for supporting actions or local actions funds were dealt with. Once all these were claimed, expenditure was at 94.4% of the funds made available to the EIP . This represents a small underspend, but all the project objectives were met.

Table 19. Overview of costs across the spend categories over the term of the Hen Harrier Project EIP

Spend category	€
Habitat Payment	15,673,794
Hen Harrier Bonus Payment	2,275,537
Supporting Actions Payment	1,153,575
Local Actions Fund	738,171
Administration	3,749,474
Total Project Cost	23,590,551

Payments

The total amounts paid out in farmer payments per year are listed below (Table 20). These values relate to payments made in a given year as opposed to the reporting periods for the annual reports. Every hectare of land that was eligible for payment could receive a payment as there was no cap. Because of this, there is an increase in payments associated with the increase in scores over the lifetime of the programme.

Table 20. Total funds received from DAFM and paid to farmers for Habitat, Hen Harrier Bonus and Supporting Actions Payments over the course of the Hen Harrier Programme (Figures are to the nearest euro)

Payment type	2018 (€)	2019 (€)	2020 (€)	2021 (€)	2022 (€)	Total (€)
Habitat	1,583,461	3,021,908	3,570,928	3,620,745	3,876,752	15,673,794
Hen Harrier Bonus	156,717	452,733	11,149	620,947	1,033,991	2,275,537
Supporting Action	0	226,253	21,551	388,475	517,296	1,153,575
Total	1,740,178	3,700,894	3,603,628	4,630,167	5,428,039	19,102,906

Note: The annual variation in the value of some payment types was influenced by Covid related restrictions and payments being made before years end in some years and following the new year in others.

Hen Harrier Payments were not made to seven participants totalling €58,004. There are several reasons why funds may not have been disbursed. The primary ones were that the participant passed away or there were issues with bank account details. Funds were held for an agreed length of time before being returned to DAFM or until these issues were resolved, whichever happened first.

Details of dissemination of project findings

Dissemination of information to raise public awareness and provide technical advice to farmers and environmental managers was an important part of the Hen Harrier Project. Dissemination of the project findings was important to increase knowledge in the scientific and policy arena on the importance of farming to Hen Harrier conservation, how future support mechanisms could work better using result-based schemes and labour-saving methods to determine habitat quality which fed into agri-environment programme implementation. Details of staff dissemination activities are listed in Appendix 1.

Dissemination of the project and its findings were achieved at a broad level through the use of a website (www.henharrierproject.ie) and social media (Hen Harrier Project on Facebook and @HenHarrierProj on Twitter/X) and at a local level through public meetings, farm walks and information guides. The Facebook page was particularly successful at engaging with farmers and other members of local communities. On a national and international level, the project team have facilitated college visits, postgraduate studies, information meetings combined with farm walks and by engaging in conferences.

Two Scientific Papers were published by members of the Project Team on the lessons learned in the operation of the Hen Harrier Project. These were 'Management of high nature value farmland in the Republic of Ireland: 25 years evolving toward locally adapted results-orientated solutions and payments' https://www.ecologyandsociety.org/vol26/iss1/art20/ and 'The delivery of ecosystem services through results-based agri-environment payment schemes (RBPS): three Irish case studies'
Biology and Environment
https://www.jstor.org/stable/10.3318/bioe.2020.13refreqid=excelsior%3Ad4ed2da6d3c4710cf64f2e63ca1076e7#metadata_info_tab_contents.

The project will maintain a website presence into the foreseeable future and information and reports will be accessible from this. As the Project team is continuing work through the ACRES Mid-West Southern Uplands (MWSU) and ACRES North Connaught Ulster (NCU) Co-operation Projects which cover all the Hen Harrier SPA areas, personnel can still be contacted to provide information or support to other projects.

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Conclusions and Recommendations

Results-based approach works for farmers

The Results-based approach resulted in an increase in scores from year one to year five across all habitats, though the changes in wet grassland and peatland fields are the most significant since they represent a land area of ~40,000ha. The 0.65 increase in the wet grassland scores probably represents a bigger change in some fields than it appears, as even improved agricultural grassland with little prospect of improvement are included in these numbers. Additionally, peatland scores increased by 0.94. These improvements were voluntary by the farmers and, where this type of scheme continues, would likely continue to improve also. This was the case in the Burren Programme which ran for longer.

Bonus payment is effective for engaging communities

The bonus payment was effective in showing communities that farming landscapes used by Hen Harrier are valuable, that the bird was a resource. The timing of the issuing of the Hen Harrier bonus payments was key also. It followed the field scores from the previous season and arrived in bank accounts around the same time that the Hen Harrier was returning to their breeding grounds. While the payments weren't huge, they were substantial enough to feel meaningful and to change a negative sentiment toward the Hen Harrier to something more positive.

Technological solutions are key for effective rollout

The timing of the Hen Harrier Project EIP was ideal for optimising the advent of mobile applications for the delivery of a detail-oriented results-based agri-environment scheme. The programme would not have been possible at scale within meaningful timeframes without the ability to develop and roll out the app and the CRM for managing the data in the background.

The scoring of over 17,500 fields (both private and commonage) on a regular basis, screening almost 8,000 supporting actions and ensuring participants received the various payments that they were eligible for, in a timely manner, all required technological solutions without which, the roll out of this type of programme at scale, would not have been possible.

Flexible local actions funds are key for innovating and engaging

The local actions fund was very valuable for two reasons. It allowed the team to trial ideas from both the project team and the farmers. The ideas that were trialled were all successful and were either incorporated into the next national agri-environment scheme or were commercially successful (farmers in the Slievefelims still order feed buckets from Devenish every year). Having an adaptable and flexible fund that encouraged innovative thinking was very powerful. It also engaged the local communities beyond farmers. This was very important for changing attitudes to Hen Harrier throughout the SPAs.

Actions to carry forward

The Hen Harrier Project EIP farm plans finished in December 2022. This coincided with the commencement of the new agri-environment scheme ACRES. The Hen Harrier Project SPAs are part of the ACRES MWSU and ACRES NCU Co-operation Projects. The Hen Harrier Project Ltd tendered successfully to be the Co-operation team for both those regions and so will carry on working with farmers in managing and conserving the rich ecological, archaeological, geological and cultural heritage of these areas. Therefore, the results-based approach operated by the Hen Harrier Project will continue for the next 5 years. Lessons learned and knowledge acquired by the Hen Harrier Project team will continue into the new ACRES scheme aided by the experience of the Hen Harrier Project EIP. The Hen Harrier Project manager and deputy manager were members of the Farming for Nature Technical Group (FFNTG), under the auspices of the HNV Ireland programme. This brought together a range of initiatives and pilot programmes in Ireland working on High Nature Value farming, high status objective water bodies, testing and developing novel agri-environment schemes. This allowed the experiences of the Hen Harrier Project to feed directly into policy and the new national agri-environment scheme (ACRES).

Overall, the new ACRES scheme, with its results-based approach, and Non-Productive Investments (NPIs) to assist with improving scores, ensures the continuity of the maintenance and enhancement of important Hen Harrier habitats, while working with the same experienced project team.

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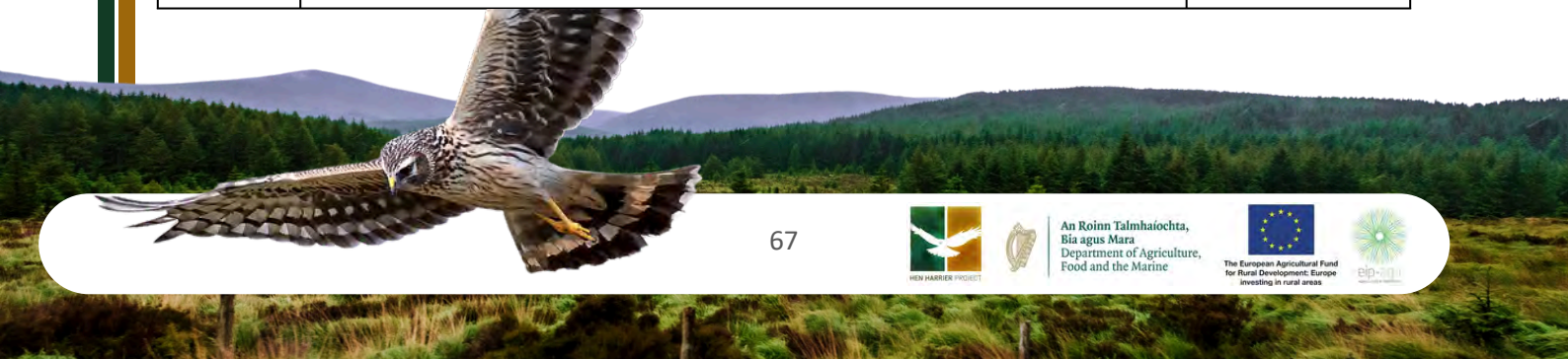
Appendix 1. A list of many of the dissemination events that the Hen Harrier Project team were involved in during the project term

Date	Event	Staff Involved
15/06/2017	RBAPS Conference in IT Sligo	Fergal Monaghan and Caroline Sullivan
28/06/2017	Visit to KerryLIFE Project	All staff
04/07/2017	Meeting with National Rural Network	Fergal Monaghan
12/09/2017	Invited to speak at RDP Monitoring Committee	Fergal Monaghan
18/09/2017	National Ploughing Championship 2017	Fergal Monaghan
04/10/2017	Pine Marten Workshop organised by NPWS	Caroline Sullivan
27/10/2017	Guest speaker at the Burren Winterage School	Fergal Monaghan
04/12/2017	Foodwise 2025 conference	Fergal Monaghan
27/01/2018	Presentation on the Hen Harrier Programme at the Irish Raptor Study Group Conference	Caroline Sullivan
31/01/2018	Invited to address the Oireachtas Agriculture Committee	Fergal Monaghan
13/02/2018	Paying for 'results' in agri-environment schemes Conference in Blaenafon, Torfaen, Wales	Caroline Sullivan
22/02/2018	Lecture to Master's Course in NUIG Biodiversity and Landscape Management on Results-based Agri-environment Schemes	Caroline Sullivan
05/06/2018	Attended a HNV Link meeting in Tully, Co. Galway	Caroline Sullivan
22/06/2018	RBAPS Conference in Athlone. Delivered a talk on the development of the Hen Harrier Project.	Fergal Monaghan
22/08/2018	Launch of Droimeann Cattle Herd Book Fermoy	Fergal Monaghan
05/09/2018	Dawn Meats Open Day on their demonstration farm in Athenry, Co. Galway	Fergal Monaghan and Eoin McCarthy
06/09/2018	EIP Agri Group briefing about the progress of the Hen Harrier	Fergal Monaghan
04/10/2018	Irish Uplands Forum in Mulranny, Co. Mayo	Evelyn Joyce
25/10/2018	Invited speaker at the Teagasc National Agri-Environment Conference held in Gort	Fergal Monaghan
26/10/2018	Burren Winterage School field trip to a Hen Harrier Programme farm	Caroline Sullivan
02/11/2018	IFA meeting on the rollout of the Hen Harrier Programme	Fergal Monaghan and Eoin McCarthy
12/11/2018	Talk at Listowel Food Festival	Fergal Monaghan
28/11/2018	Attended a conference, "Rewarding the Delivery of Public Goods Conference", Edinburgh, Scotland	Caroline Sullivan
29/11/2018	Invited to address the Cross-Party Group in the Scottish Parliament on Rural Policy on "Why a focus on public funding for public groups"	Caroline Sullivan
17/01/2019	Attended and spoke at the meeting on "2018 Wildfire Lessons Learned" meeting held in the National Emergency Co-ordination Centre	Fergal Monaghan
12/02/2019	Presentation at a training event for DAFM inspectors in the Hodson Bay Hotel in Athlone	Fergal Monaghan
21/02/2019	Chaired a session "Payment for Ecosystem Services" at the National Biodiversity Conference Dublin Castle	Caroline Sullivan



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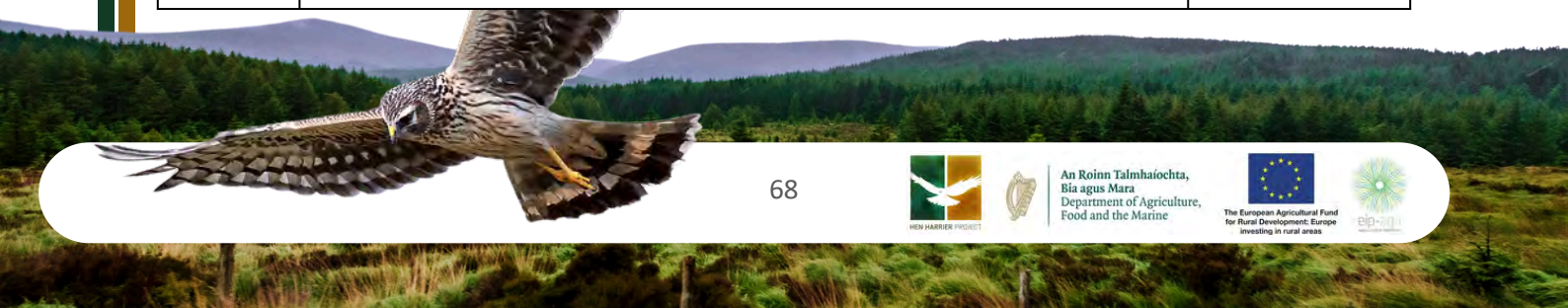
Date	Event	Staff Involved
21/03/2019	Speaker at an International Conference on Hen Harrier held in Groningen University in the Netherlands High-Level Conference	Ryan Wilson-Parr
06/04/2019	Bucharest. Invited presentation on the development of the Hen Harrier Project demonstrating feasibility of large-scale results-based programs as part of CAP	Fergal Monaghan
09/04/2019	Hen Harrier Project jointly chaired a meeting on fire resilience strategy for the Slieve Blooms and improved cross-sector co-operation	Fergal Monaghan
15/04/2019	Launch of publication and exhibition on Environmental Innovation	Fergal Monaghan
17/04/2019	Partnerships / Locally Led Environmental Schemes in Ireland. Presentation to delegates to showcase the innovation in the Hen Harrier Programme	Fergal Monaghan
21/08/2019	Hosted a visit from NUIG Geography students	Fergal Monaghan
21/10/2019	England Wales Wildfire Forum in Cardiff	All staff
21/11/2019	Addressed international wildfire experts on agriculture and conservation, highlighting fire resilience strategies	Fergal Monaghan
17/02/2020	Interview on RTE Mooney Goes Wild radio show	Fergal Monaghan
20/02/2020	Lecture to Master's Course in NUIG on Results-based Agri-environment Schemes	Caroline Sullivan
22/04/2020	Presentation on ecosystem services at the Chartered Institute of Ecology and Environmental Management Conference	Caroline Sullivan
22/09/2020	Presentation on the Hen Harrier Project at the Northern Real Farming Conference	Ryan Wilson-Parr
26/11/2020	Participated in a workshop on post-2020 CAP, eco-schemes, and biodiversity indicators	Fergal Monaghan
10/12/2020	Presentation to the Galway Environmental Network on Hen Harrier Project	Fergal Monaghan
28/01/2021	Presentation on agriculture, wildlife, and biodiversity to Transition Year students in Presentation Secondary School Tralee	Padraig Cronin
28/01/2021	Webinar with senior Welsh Govt officials on RBPS approach	Caroline Sullivan
01/02/2021	Presentation on Irish Wildlife Trust Webinar - Birds on the Edge	Ryan Wilson-Parr
09/02/2021	Webinar with senior Natural Resources Wales staff on RBPS approach	Caroline Sullivan
11/02/2021	Presentation to the Scottish Environment LINK roundtable: The Future of Rural Support in Scotland (session 3 - supporting skills and knowledge transfer).	Caroline Sullivan
16/02/2021	Presentation to Teagasc staff on Extensive Farming – Feedback on Learnings from EIPs to Teagasc.	Fergal Monaghan
17/02/2021	Mooney Goes Wild Programme interview about the work of the Hen Harrier Project	Fergal Monaghan
18/02/2021	Presentation to the CAP Consultative Committee on the need for a Results Based, landscape level approach to ta future Agri-Environment and Climate Measure in the next CAP.	Fergal Monaghan
24/02/2021	Participated in Structured Approaches for Forest fire Emergencies in Resilient Societies. International User Requirements Workshop (SAFERS IURW2021).	Fergal Monaghan
25/02/2021	Presentation to the Upland EIP meeting o the work of the Hen Harrier Project.	Fergal Monaghan
25/02/2021	Webinar presentation with major farming/landowning bodies (Farmers' Union of Wales, National Farmers Union Cymru, National Sheep Association and Country Landowners Association Wales) in Wales,	Caroline Sullivan
04/03/2021	RTE News showed the Horse in the Gorse Grazing trial in Musheramore. This included a short interview with the Project Manager, the local Project Officer and with the farmer hosting the trial.	Fergal Monaghan and Padraig Cronin
04/03/2021	RTE Nuacht with regard to the grazing trial and management of gorse in the Musheramore SPA in Ballymakeera Cork	Padraig Cronin



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Date	Event	Staff Involved
11/03/2021	Interview on Connemara Community Radio about the use of targeted grazing by horses for the management of Gorse	Fergal Monaghan
24/03/2021	Input into the NPWS review with Michael O Cinneide.	Caroline Sullivan
20/04/2021	Webinar for farmers involved in the NPWS farm plan scheme on the issue of creating farms ponds. This event was organised by Teagasc.	Fergal Monaghan
26/04/2021	Interview on the RTE Radio 1 news about the impact of the Wildfires in Co. Kerry.	Fergal Monaghan
01/07/2022	Local Area Partnership Open Day Kerry held near Listowel on a HHP farm.	Eoin McCarthy and Padraig Cronin
03/12/2022	Guest speaker at Inagh EIP Seminar	Kristina Feeney
05/07/2022	Local Area Partnership meeting Limerick held near Abbeyfeale on a HHP farm.	Eoin McCarthy and Padraig Cronin
07/10/2021	Guest lecture to 3rd year Agricultural Science students from Munster Technological University in Tralee Co. Kerry	Padraig Cronin
10/11/2021	School visit Knocknaclarrig NS, Meenkilly NS, Knocknagoshel NS and Loughfouder NS as part of the Local Actions Fund initiative	Padraig Cronin
12/04/2022	Wildfire event, Millstreet Country Park, Co. Cork	Kristina Feeney
14/10/2021	HHP farm heifer selected to represent Ireland in Europe meat quality competition	Eoin McCarthy
14/09/2022	Hosted a study trip on results-based agri-environment schemes for a group from Wales	Fergal Monaghan
14/10/2021	Cork Wildfire Co-operative Group meeting in Musheramore- field trip to grazing trial sites in the SPA	Fergal Monaghan and Padraig Cronin
22/02/2022	Cork Wildfire Co-operative Group meeting in Musheramore	Padraig Cronin
24/08/2021	DAFM field visit to Stacks Complex – Margaret Murray last Steering Group meeting	All staff
24/09/2021	School visit Muinefliuch NS and Clondrohid NS Co. Cork as part of the Local Actions Fund initiative at project delivery phase	Padraig Cronin
26/06/2021	Write-up in Irish Examiner on the success of grazing trials in Musheramore and the recent success of hen harrier numbers in the area https://www.irishexaminer.com/farming/arid-40321646.html	Padraig Cronin
28/02/2023	Guest Lecture to students in Environmental Science in National University of Galway	Caroline Sullivan
28/09/2022	Talk on results-based agri-environment schemes to Welsh government	Caroline Sullivan
30/06/2022	Local Area Partnership Open Day Cork held near Millstreet on a HHP farm.	Eoin McCarthy and Padraig Cronin
30/10/2021	HHP Beef tasting dinner – Horseshoe Restaurant Listowel Co.Kerry	Eoin McCarthy, Fergal Monaghan and Padraig Cronin
31/10/2022	Presentation on Hen Harrier Project at a farmer meeting as part of Listowel food fair	Eoin McCarthy

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