FORUM Connemara CLG, Ellis Hall, Letterfrack, Galway, H91CD45

North Connemara Locally Led Agri-Environmental EIP Scheme

Final Project Report

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1 Executive Summary

This document details the operation and conclusion of the 3-year pilot European Innovation Partnership Scheme, the North Connemara Locally Led Agri-Environmental Scheme (NCLLAES). The project was a pilot scheme which ran from Jan 2019 till 31st March 2023.

The NCLLAES was a European Innovation Programme which was awarded to FORUM by the Department of Agriculture Food and the Marine.

Figure 1 Minister McConlogue Launching the EIP project with Project Ecologist Cathy Connelly, and Project Manager Joseph Mannion.

FORUM Connemara CLG is a local development company operating in the Connemara region of Ireland since 1990. Through their work in the region, FORUM saw the need for a locally led, farmer-centric program that would promote positive farming practices that could protect the ecologically sensitive landscapes while simultaneously ensuring a viable future for the participant farmers. From this goal, the North Connemara Locally Led Agri-Environmental EIP (NCLLAES) Scheme was developed.

The projects' main aim was to ensure the long-term economic viability of hill farming in the Northwest Connemara area. The project also aimed to improve and maintain the important habitats in this ecologically sensitive area. The scheme ran in areas covered by two Special Areas of Conservation (SACs), The Twelve Bens/Garraun Complex (002031) and the Maumturk Mountains SAC (002008). This steep and hilly terrain comes with increased dangers as well as reduced farming land and animal management difficulties for the resident farmers.

FORUM wanted to ensure that the scheme was locally led and sought to implement a ground-up approach from the outset. As can be seen from the farmer's testimonials in the Appendices section, the participants agree that this goal was achieved. The project was very successful, and we enjoyed enthusiastic buy-in from all the staff and participants throughout the scheme.

This report contains a:

- Brief description of the EIP project
- A detailed analysis of the project deliverables including:
    - Actions and Incentives undertaken throughout the 3-year programme.
    - Baseline data
    - Key Performance Indicators
    - Closing Evaluation
    - Value For Money
    - Financial Report
- Lessons learned.
- Actions to carry forward.
- Details of dissemination of project findings
- Appendices of all reports and surveys undertaken

2 Project Overview

2.1 Project Origins

The Twelve Bens/Garraun Complex and Maumturk mountain range SACs are a unique upland landscape that encompasses over 30,000 hectares of Natura designated, privately owned High Nature Value farmland. As well as high nature value the area is also a region rich in natural cultural diversity. The landowners in the Twelve Bens/Maumturks area face increasingly difficult challenges in farming this landscape due to land abandonment brought about by decreasing economic viability, the decrease in the numbers of traditional grazers, the encroachment of Rhododendron Ponticum and labour-intensive practices required to continue farming these upland habitats.

Farming in this vast upland area presents unique challenges subject to these pressures and this project aimed to develop practical, achievable actions, and innovative solutions, to address the issues facing farmers in the Twelve Bens/Maumturks area.

The lands mass is made up of privately owned and commonage lands. The two areas are extensively farmed by Bovine, Ovine and Equine farmers. The Blackface Connemara Mayo Mountain sheep being the most favoured animal due to its durability in grazing on the high altitudes in the area. Mixed grazing of animals does take place, but it is not as common as it was in previous generations.
Connemara, like other upland regions, has been affected by socio economic changes. The majority of the farmers in this project also hold off farm jobs/professions. With less time available, farmers are unable to spend as much time on land management as previous generations. There are fewer people choosing farming as a career because other sectors have a better financial return and offer greater security with a dependable wage. Ensuring farming is a viable career option now and in the future is crucial for the continued protection of these unique upland habitats.

Figure 2 Map of the Twelve Bens / Garraun Complex (SAC 002031) & Maumturk Mountains (SAC 002008)

The North Connemara Locally Led Agri-EIP Scheme operated in a subset of the two SACs as shown on the map in Figure 2.

Figure 3 Map of area covered by the North Connemara Locally Led Agri-EIP Scheme

From meetings held with the steering committee, local farmers and agricultural advisors, the specific initiatives of the scheme were decided upon prior to the commencement of the scheme.
These initiatives were:

- Habitat surveys and
- Farm improvement plans
- Improving the Blackface sheep flock
- Increasing the social interaction within the local farming community
- Controlling and removing Rhododendron at a farm level

Following consultation with the Steering Committee and local farmers the specific actions to be carried out by scheme participants were created for these initiatives.
We then set about inviting participants to engage on the scheme.
The first stage of the selection process was to advertise the scheme amongst the farming community. All farmers who are actively farming inside the project area were contacted based on information provided by the Department of Agriculture.
We arranged several meetings withing the proposed scheme area. The meetings were also publicised on Connemara Community Radio, Raidió na Gaeltachta and in the Connacht tribune. In October 2019, three public meetings were held in different centres within the project area, with a high level of attendance at each meeting. The three meetings, with a total attendance of 150 individuals, were held in:

- Ellis Hall, Letterfrack,
- Maam Community centre and
- Recess Community Centre,

The different aspects of the scheme were presented to the potential participants at the meetings. Farmers were provided with information booklets about the scheme and expression of interest forms to be returned to the Project Team by the 13th of November (2 weeks after the final meeting).

140 farmers had expressed an interest in joining the scheme by the closing date. From these 140 expressions of interest, 116 farmers were invited to join the scheme. The selection process used was based on the percentage of land an individual had in the project area and the farmers interest in taking part in the scheme initiatives based on one-to-one meetings, which were held in January 2020 with the Project team.
96 individual contracts were returned to the NCLLAES. These 96 farmers would be the main participants in the scheme for the first year. Another 19 participants were brought into the scheme at a later date as the scheme budget allowed for expansion.

The 96 farmers who joined the scheme in early 2020 carried out habitat surveys as well as flock and farm improvements throughout the 3 years of the scheme. Each year the participants lands were surveyed. This amounted to 10,000ha and gave a detailed level of data on the quality of the habitats in the project area.

Figure 4 Farm Walk on the Connemara National Park native farmlands

Notably, 31 of the participants were already involved in The Fresh Water Pearl Mussel project, resulting in their exclusion from receiving additional habitat surveys or payments to prevent the possibility of double funding.
The remaining 65 participants were earmarked to receive both a habitat survey and a comprehensive habitat improvement plan.
Covid affected the Group Management meetings which were planned for 2020 and these were postponed to 2021/ 2022.

This summary highlights the successful journey from initial expressions of interest to the active engagement of a significant number of farmers in the scheme, with the overall aim of enhancing habitat quality and farming viability for these participants.

Ground up Approach

Throughout the process of defining the scheme local farmers and agricultural advisors were consulted on the actions that should be included to achieve the overall ecological goals of the project.
The main take-away message from these meetings was that a plan specific to each individual farm would need to be created if farmers were to take ownership of the ecology on their farmland. Therefore, we ensured that the habitat improvement initiative was flexible enough to capture the variety of habitats and different landscapes of the North Connemara area.

The other aspect that was raised was the fact that there are limited social options for farmers in the region and some farmers are not always aware of new agricultural practices and technologies that may benefit them. With the removal of the national knowledge transfer scheme as an option for farmers, a replacement was needed. From discussions with the farmers, it was understood that productive meetings would need to include areas of interest to the local farmers. If successful, these meetings would be a foundation for continued social meetings in the future.

2.2 Aims and Objectives

Run by FORUM Connemara CLG, in conjunction with farmers and other stakeholders, the main aim of the NCLLAES scheme was to tackle the decline in economic and social viability of farming in this environmentally important area of Connemara using an environmentally and ecologically sustainable ground-up approach.
The project also aimed to improve communication and knowledge sharing and maintain the important habitats in this ecologically sensitive area.

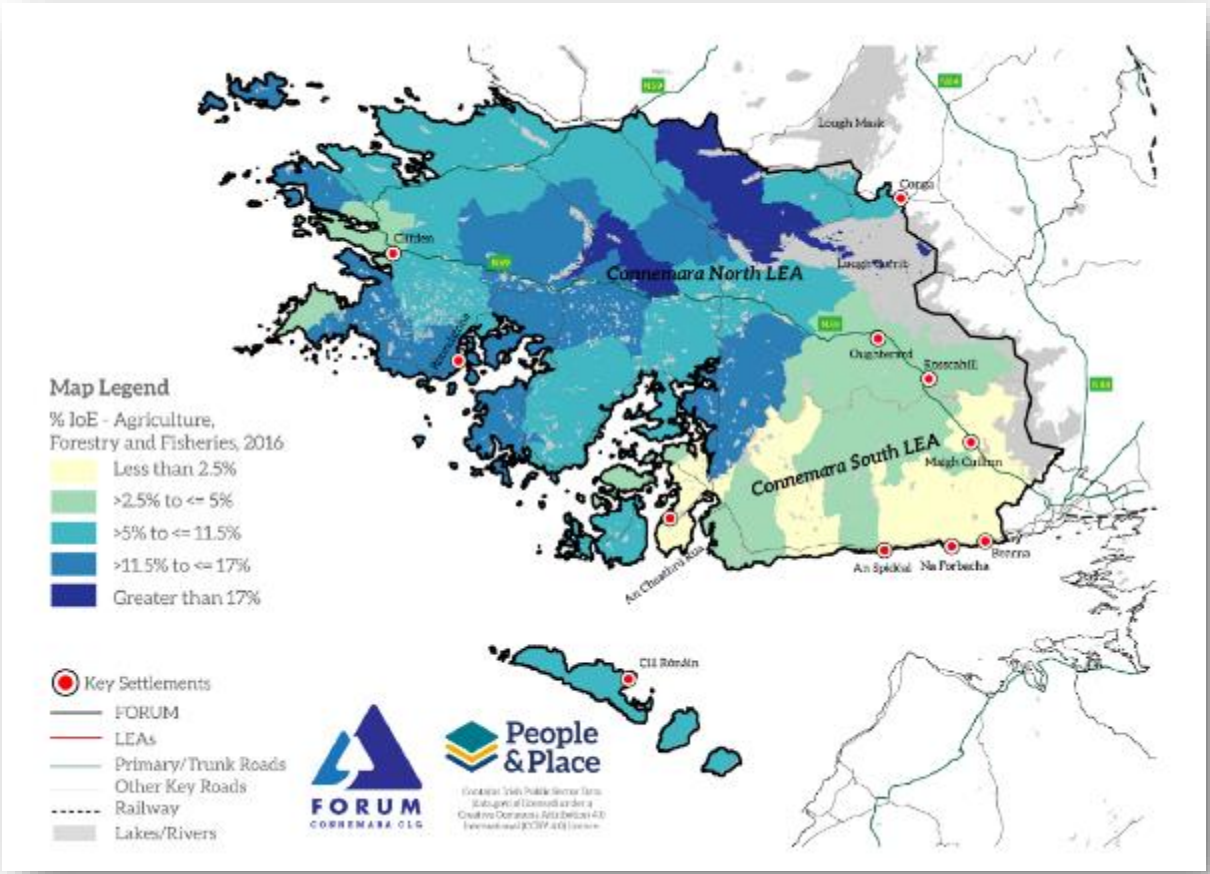
Primary goal:
Address the economic and social challenges facing farming in the environmentally significant area of Connemara through an environmentally sustainable grassroots approach.

***Secondary objectives**:*
Improve and maintain the important habitats in this ecologically sensitive area.

Enhancing communication, fostering social interactions, and facilitating information-sharing, training, and knowledge dissemination within farming families.

As previously mentioned, farming in these upland SAC areas has its challenges. It is difficult for farmers to make a living in this area of Ireland. Most of the farmers in the area, approx 90%, are sheep farmers and most have low farming incomes. This means most of the farming population have off-farm jobs. Our survey showed 62% of our participants had second jobs. (See Appendix for survey details)

To fully understand why the economic viability of farming in this area was one of the main aims of the NCLLAES EIP we need to look at the statistics for the region.



The Local Development Strategy for the Connemara Municipal District profiled the nature of farming and fisheries. It states that County Galway has amongst the lowest area of agricultural land utilised in Ireland at under 26% (2020) compared with a national average (owing partly to the mountainous areas of Connemara). It is predominantly a sheep and beef farming area (with no cereal production and no dairy cows). There were 2,981 farms recorded in 2020 in the area shown above, this was down by 255 farming units from 2011 when 3236 farms in the study area were recorded. This substantial reduction of 11% being farmed is a reduction of 697 hectares.

Connemara and Mayo also have the oldest average age of farmers, at over 59 years, as highlighted in the figure below. While there has been an increase of over 750 young female farmers in Ireland over the 2010-2020 period, this has not been the case in the rural west.

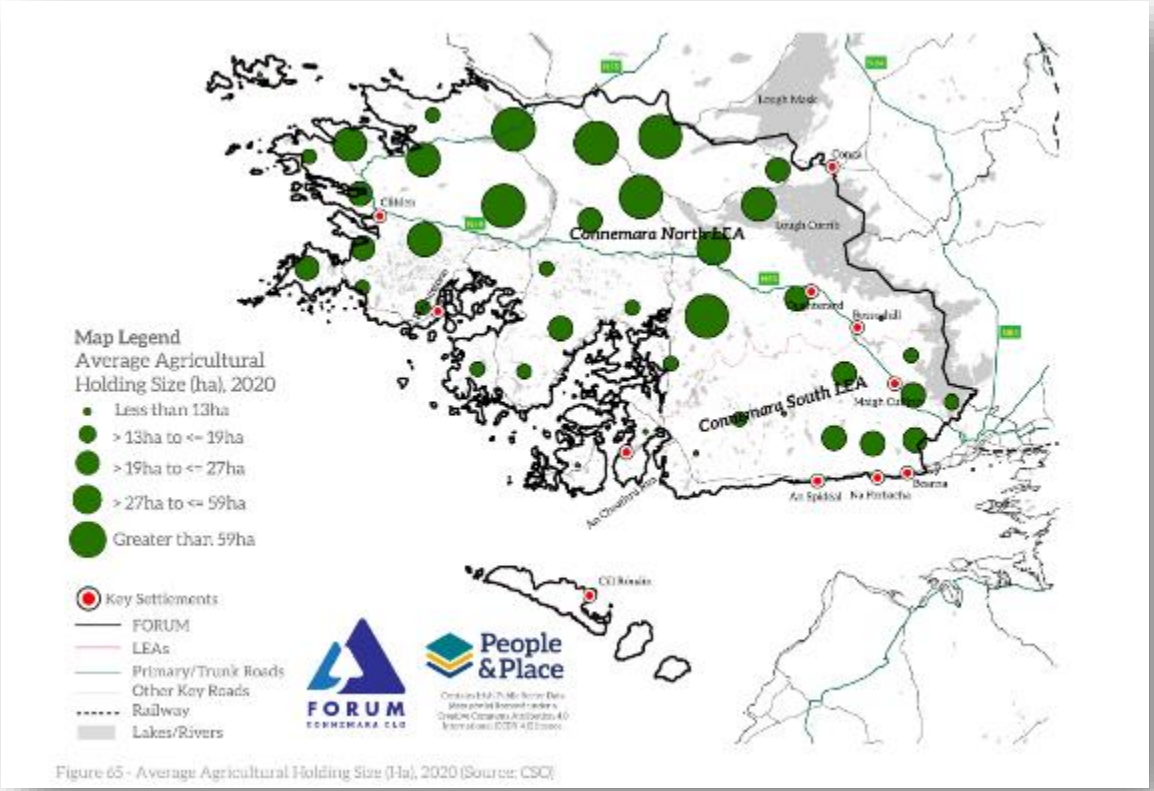
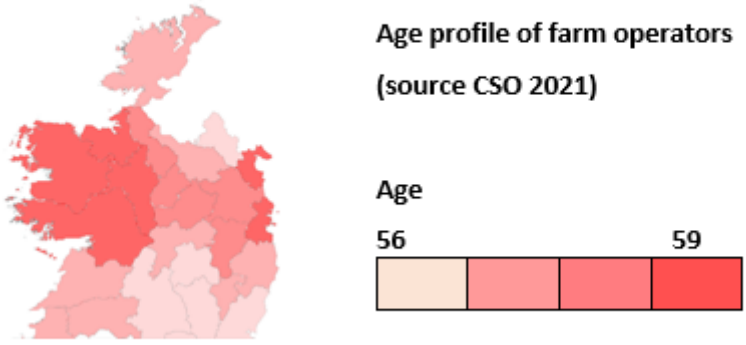


Figure 65 - Average Agricultural Holding Size (Ha), 2020 (Source: CSO)



There are a smaller number of farms in districts across The Twelve Pins and the Maumturk Mountains, indicating upland farms that are larger to compensate for poorer natural resources. For example, the average farm size rises to 149 hectares in Letterbrickaun and 91 hectares in the ED of An Ros.
Conversely there are a relatively large number of smaller farms in the South Connemara Gaeltacht heartland (and on the islands). Teagasc's national farm viability survey defines farms as vulnerable if the farm business is not viable and neither farmer nor spouse works off the farm. In the 2019 farm structures survey (Teagasc), the northern and western region at 37% have the highest proportion of vulnerable farms. Farm income is dependent on government and EU support.

The average payment in Connemara per farm in 2019 was €5,820, the second lowest in the country. The 2016 Farm Structures Survey found that of the 16,400 farms engaged in gainful non-agricultural activities, 2,900 were located in the west of Ireland.

The NCLLAES scheme gave a financial incentive to farmers who undertook specific actions which would improve their flock, attend workshops/training as well as improve biodiversity on their farms. Farmers received compensation for their time and materials and also obtained certification in relevant training.

The team also aimed to improve communications, increase social interactions, and facilitate information-sharing, training and knowledge distribution among farming families as a secondary goal alongside improving the biodiversity and viability of farming in the Connemara area.

The scheme also helped to recapture the historical traditions of local traditional farming practices by recording and sharing interviews on social media.

3 Detailed Project Overview

3.1 Project Team

The project team over the course of the scheme was as follows:

Figure 5 Project Team overview

Staff Member	Title	Duration on Project
Joseph Mannion	Project Manager	Jan 2019 – Dec 2022
Cathy Connolly	Project Environmental Specialist,	Jan 2019 – Sept 2021
Tommy Nee	Project Administrator	Jan 2019 – Sept 2022
Sinéad Grimes	Project Administrator	Sept 2022 – Dec 2022
Sinéad Grimes	Project Manager	Dec 2022 – March 2023
Lisa Kane	Project Administrator	Dec 2022 – March 2023
Aishling Finnerty	Project Environmental Specialist,	Nov 2022 – March 2023
Laney Mannion	Heritage Project officer	Oct 2022 – March 2023
Dermot Flaherty	Rhododendron Control Supervisor	Oct 2022 – March 2023

3.1.1 Project Manager

The position of Project Manager was advertised in February of 2019. Joseph Mannion was appointed following a recruitment process. Joseph is from a Connemara farming family and an agricultural consultant with a BSC in Agriculture in Land Management as well as having experience in working with National agricultural schemes. It was felt that Joseph's previous experience of working on Agri schemes and his local knowledge would add value to the project.
Joseph joined the team in January 2019 but subsequently left the role in 2022 to start on the new ACRES scheme.
Sinéad Grimes took over the position as Project Manager as she was working on the project in the admin role and was up to speed on the scheme and its objectives. Sinead's background in team leading and project management were ideal for the growing team. She held the position from Dec 2022 until the scheme finished in March 2023.

3.1.2 Administrator

The position of administrator was advertised at the same time as the Project Manager. After a recruitment process Tommy Nee was appointed as the Project Administrator. Being from a local farming family and with a background in accounting, it was felt Tommy would add an extra branch to the administration and budgeting side of the scheme.
Sinéad Grimes took over the position as she was already on the staff in a Grant writing part time role and held the position from Sept 2022 – Dec 2022, when she assumed the role of Project Manager.
The role of Administrator was then taken on by Lisa Kane from Dec 2022 – March 2023. Lisa was also working in FORUM on a part time basis and being from a local farming family was an ideal candidate.

3.1.3 Project Ecologist

It was decided that a project ecologist would be hired for the scheme directly. The position was advertised in October 2019. After a recruitment process Cathy Connelly was appointed. Cathy has a background in Ecology and has worked in the Connemara area previously. She also has experience with Government policy which will be a benefit for multiple areas of the scheme.
Aishling Finnerty took on the role from Nov 2022 until March 2023 when the scheme ended.

3.1.4 Steering Committee

The steering committee for the NCLLAES include individuals from numerous areas of the Agricultural sector:

Meetings were held throughout the year where the aims and direction of the scheme were discussed. A plan was created at these meetings which was then implemented by the Project Team.

Name	Organisation / Occupation	Time Contribution %
William Cormacan	National Parks and Services	10%
Brendan Joyce	Farmer. INFHA rep with 20 years of experience working with farmers in the Connemara area	10%
Eamonn Nee	Farmer. IFA representative from the IFA local Branch	10%
Marie Mannion	Galway County Council	10%
Ivan Kelly	Teagasc Agricultural Consultant	10%
Catherine Keena	Teagasc Countryside Management Specialist Agricultural consultant and specialist on EIP process	10%
Dr Thomas Van Rensburg	National University of Ireland Galway	10%
Martin Gavin	Farmer. Lead of Leenanne Development Association and head of the Bundooracha Catchment project on Rhododendron removal	10%
Geisler Kaule	National University of Ireland Galway	10%

3.1.5 Groups involved throughout the project

The team have cooperated with the following groups throughout the duration of the scheme

- HSA
- HSE
- TEAGASC
- IFA
- Irish Natura & Hill Farmers Association – INHFA
- Wild Atlantic LIFE IP
- Galway County Council;

3.2 Project Achievements

The NCLLAES results-based payment scheme successfully engaged 115 farmers from various corners of Northwest Connemara in its mission. Their combined efforts not only contributed to the scheme's objectives but also provided gainful employment to 13 full-time staff members and 2 part-time workers, bolstering the local job market.

A noteworthy outcome of these endeavours was the creation of an additional income stream amounting to EUR 776,674.26 for the local farming community. Simultaneously, over 10,000 hectares of farmed land underwent comprehensive habitat surveys, establishing a crucial baseline for future projects in the area. This extensive effort resulted in the identification and mapping of over 200 plant species, a testament to the program's dedication to environmental stewardship.

Throughout the three-year program's duration, farmer results-based payments totalling €776,674.26 were directly disbursed to participating farmers for their diligent work on the scheme. Furthermore, the invasive Rhododendron ponticum was effectively controlled on 48 farms, totaling approx. 323ha, preserving the delicate local ecosystem.

In a bid to foster sustainable practices, local farmers and members from tidy towns groups etc received training on the proper methods of Rhododendron control, while also gaining a deeper understanding of the threat it poses to local flora and fauna.
Additionally, a 10-member team of Rhododendron Control Workers was hired, trained and now stands poised for potential employment opportunities in other local projects with agencies like Coillte, IFI and NPWS, thus ensuring continued job stability in an area that often faces economic challenges.

Furthermore, the scheme's efforts extended beyond the immediate community, as they successfully raised awareness through interviews with both national and local newspapers, as well as radio broadcasts that reached thousands of listeners. These outreach efforts not only showcased the program's achievements but also underscored the importance of their conservation work.

Lastly, participating farmers experienced improved productivity on their farms, achieved through strategic changes in livestock management and the implementation of structural improvements. These multifaceted achievements collectively reflect the positive impact and holistic approach of the NCLLAES results-based payment scheme as well as the Training and Rhododendron control initiative on the local environment, economy, and community.

Figure 6 ***Summary of Project Achievements***
• **115 Farmers engaged in the NCLLAES results-based payment scheme.**
• **250 farmers from across Northwest Connemara are involved in the Training and scheme.**
• **The scheme gave employment to 13 full-time staff members and 2 part time.**
• **Additional income of €776,674.26 was created for local farmers.**
• **Over 10,000 ha of farmed land was surveyed – this gives a baseline for other projects in the area in the future.**
• **65 participants of the NCLLEAS received a habitat survey and are undertook habitat improvement works. The total land area farmed by these participants is 10,503ha. There are 262 individual LPIS numbers in this area.**
• **232 habitat surveys were carried out and over 200 plant species were identified and mapped.**
• **Throughout the 3-year programme farmer results-based payments of €776,674.26 were made directly to participating farmers for works completed on the scheme.**
• **Rhododendron was properly controlled on 48 farms on an area over 323ha**
• **Local groups were trained in how to control Rhododendron correctly and made fully aware of the reasons it presents a threat to local flora and fauna.**
• **The team of 10 Rhododendron Control Workers are currently contracted to NPWS, IFI, Coillte, so these 10 jobs should continue to give employment in a blackspot area.**
• **We have raised awareness by doing interviews to both national and local newspapers and completed radio interviews which have reached thousands of listeners.**
• **Farmers have increased the productivity of their farm through implementation of changes to their livestock and carrying out structural improvements on their farm.**

3.3 Project Beneficiaries

3.3.1 Indirect Beneficiaries:

- Green cert students
- Secondary school agricultural students and teachers
- Followers of our Facebook page
- Listeners to the “Community Matters” & “Forum Farming” segments on Connemara Community Radio
- Local Students & their Families
- Participants of the ABILTY program run by FORUM Connemara
- Participants of the Adolescent Support Program run by FORUM Connemara

3.3.2 Direct Beneficiaries:

- Participant Farmers and their families
- All who attended workshops and training.
- All primary schools in Connemara and their staff
- The children who took part in our Easter camps
- Members of the public who took part in the nature competition.

3.4 Project Activities

The project encompassed a diverse range of activities aimed at addressing various facets of environmental and community improvement:

Figure 7 Project Activities Summary

The initiatives undertaken for the 3 years of the NCLLAES project were:

- **Habitat Surveys:** One of the primary components of the initiative involved conducting thorough habitat surveys. These surveys served as the foundation for understanding the ecological landscape and will also provide valuable data for subsequent conservation efforts.
- **Group Management Training & Meetings:** To foster effective collaboration and ensure the success of the project, group management training sessions and regular meetings were organised. These gatherings served as platforms for sharing insights, strategies, and progress updates among stakeholders.
- **Rhododendron Control**: The project took proactive measures to combat the invasive Rhododendron, which posed a significant threat to the local ecosystem. By controlling its spread, the project aimed to protect native flora and fauna.
- **Community Engagement**: Engaging the local community was a vital aspect of the initiative. Community outreach activities and engagement efforts were implemented to ensure that the project's objectives were well-understood and supported by the people living in the area.

- **Blackface Sheep Flock Improvement:** Recognising the significance of livestock management in the region's economy, the project included activities to enhance Blackface Sheep flocks. These improvements aimed to boost the overall sustainability and productivity of local farming.
- **Farm Improvements:** The project also addressed the need for farm infrastructure and structural improvements. This facet aimed to provide farmers with the necessary resources and facilities to optimise their agricultural practices.
- **Connemara Rural Heritage Gathering & Recording**: In an effort to preserve and celebrate the region's rich cultural and agricultural heritage, the project undertook the task of gathering and recording oral histories and traditions. This initiative served as a means of preserving the area's unique rural heritage for future generations.
- **Innovation**: Towards the end of the scheme we concentrated on innovative uses for farming by products such as wool and the brash from treated rhododendron as well as topped rushes, furze and gorse. We investigated the use of biochar to deal with the problem of rhododendron brash and built a mobile biochar unit based on a design from America. It was the first of its kind in Ireland. We successfully made biochar from the rhododendron brash and will continue to test the effectiveness of the product. (See Appendix for details on the production of Biochar). With regards to wool, we pioneered a new product to be used in bog restorations to replace coir logs – these are currently in use in a bog restoration in Ballycroy, Mayo by the Wild Atlantic Nature LIFE IP project. We hope to be able to secure funding to further explore both of these initiatives.

In summary, the project encompassed a holistic approach that combined environmental conservation, community engagement, and agricultural enhancement. These various activities collectively contributed to the overall betterment of the Connemara area and its residents.

Figure 8 Project Activities:	
1.	**Habitat Surveys**
2.	**Group Management Training & Meetings**
3.	**Rhododendron Control**
4.	**Community Engagement**
5.	**Blackface Sheep flock improvement**
6.	**Farm Improvements**
7.	**Connemara Rural Heritage Gathering & Recording**
8.	**Innovation**

The project undertook several key initiatives to achieve its environmental goals:
All of the above activities are described in detail in the following sections.

3.4.1 Habitat Surveys

Habitat surveys are a tool to identify and measure the ecology in a specific area. Knowing what different habitats, flora and fauna, is key to creating a conservation and/or improvement plan. Previous to the NCLLAES there was very little ecological information documented on individual farms in the project area.
Peatlands offer a multitude of invaluable ecosystem services, encompassing critical functions such as carbon sequestration, water management, and flood mitigation. These unique landscapes also provide a distinctive habitat for a diverse array of flora and fauna, including some species that are exclusively adapted to peatland environments.
To determine what value was on these unique habitats a score card was created and used for each survey. The scorecard used was an alteration of score cards in use in other schemes with a large emphasis on the level of biodiversity in the parcels of land. Negative areas of the parcel such as invasives and turbary would reduce the score.

Peat is the dominant soil type within the NCLLAES project area, with exception of the coastal areas which have sandy soil. The Irish Peatland Conservation Council estimate that only 28% of Ireland's 774,367ha of blanket bog remains today. (IPPC, 2009)
One of the most remarkable attributes of peatlands is their exceptional capacity to store carbon over extended periods. However, when subjected to drying, degradation, or excavation, peatlands undergo oxidation, releasing the previously stored carbon back into the atmosphere. This transformation underscores the urgency of preserving these ecosystems to maintain their vital role as long-term carbon sinks and guardians of environmental stability.

A State of the Environment Report issued in 2020 from the Environmental Protection Agency highlights that Ireland's peatlands are in an unfavourable state. The report acknowledges that if restored, bogs could play a vital role in carbon sequestration and provide a space for nature. (EPA, 2020)

3.4.1.1 Main Aims

The NCLLAES aimed to improve the conservation status of the habitats of the Maumturk and Twelve Bens mountain ranges in cooperation with the farming community. In order to achieve this, habitat surveys were carried out on lands used by 65 participating farmers in the project area. The main

objective of the habitat surveys was to identify any issues with habitat quality and address those issues through habitat improvement works.
The participant farmers received a habitat payment which was linked to the score and therefore to the quality of the habitat. By carrying out these surveys, a snapshot of the types and quality of habitats that existed in North Connemara in 2020 was also recorded.
Additionally, the project established a robust foundation by creating baseline data. This initial step involved gathering crucial information about the ecological status of the region, providing a starting point from which progress could be measured.

3.4.1.2 Methodology

Any farmer who accepted their invitation to join the scheme and had their land inside the catchment area was surveyed by the project team.
Habitat surveys were carried out by Joseph Mannion, project manager and Cathy Connelly, project ecologist between May and September 2020. The survey was carried out using qualitative and quantitative ecological markers observed on the land at the time of the survey.

The main objective of the surveys was to assess the quality of the habitats on land used by the participating farmers and to award a payment based on the quality of the habitat. This payment rewarded the farmer for the service that they provide to biodiversity through their farming practices. The habitat survey also provided the base for habitat improvement works to be undertaken by the farmers for the duration of the project.
65 participants of the NCLLEAS received a habitat survey and undertook habitat improvement works. The total land area farmed by these participants is 10,503ha. There are 262 individual LPIS numbers in this area. In some cases, a parcel may have more than one LPIS number associated with it but is being utilised as one large area without internal fences. In these cases, the whole area was scored on one score card as the habitat and the management is the same throughout. In some cases, there were two or more distinct habitats within a land parcel and they were scored on separate score cards. In total, 232 habitat surveys were carried out. A species list with DAFOR (Dominant, Abundant, frequent, Occasional, Rare) cover values was recorded for each survey. Scores were awarded based on quality of the habitat.
The surveys were carried out using the following procedure:

1. Each land parcel was walked in a “w” shape with every species that was observed is recorded. The abundance of each species was recorded using the DAFOR scale. The decision was made to this method rather than relying on indicator species or relevés for two reasons. The project team felt that only recording indicator species would mean that the variety of flora in the project area would not be captured. Due to the mosaic nature of the habitats within land parcels, it was felt that relevés [1] may miss variances in habitat that occur within a land parcel.
2. An assessment was made in the field on the condition of the habitat. Any impact on the quality of the habitat was recorded. A score was then given based on the points awarded during the assessment.

[1] *A number of small plots of* vegetation, analysed *as a sample of a wider area.*

3. The scores for each survey were added together and an average was given to give one overall figure which formed the basis for the payment to the farmer in respect of the habitat payment.

Improved agricultural grassland- wet grassland was by far the most commonly recorded habitat type (73 score cards). This type of habitat is typical of lowland areas that have had some intensification and fertilisation in the past but also have a high presence of wet grassland or bog species. This habitat, however, only covers 634Ha. By area size, the most common habitats in the project area are blanket bog (upland and lowland, 3448.5Ha) and heath (5643Ha). Dry grasslands and woodlands make up 103Ha and 38Ha respectfully. Scrub, which was included as in the project plan with a target of 100Ha removal, only amounted for 11Ha of land.

There were 26 different habitat type amalgamations assigned to the habitat surveys. These were:

Bog woodland - wet grassland WN7 – GS4	Cutover bog PB4	Dry meadows & grassy verges GS2
Dry-humid acid grassland GS3	Eroding blanket bog PB5	Improved agricultural grassland - Lowland blanket bog GA1 – PB2
Improved agricultural grassland - Machair GA1 – CD6	Improved agricultural grassland - Wet grassland GA1 – GS4	Lowland blanket bog PB2
Machair CD6	Mixed broadleaf woodland - Wet grassland WD1 – GS4	Montane heath - Marsh HH4 – GM1
Oak-Ash-Hazel Woodland WN2	Oak-Ash-Hazel Woodland - wet grassland WN2 – GS4	Oak-birch-holly woodland WN1
Scrub WS1	Upland blanket bog PB1	Upland blanket bog - Montane heath PB1 – HH4
Upland blanket bog - wet heath PB1 – HH3	Wet grassland GS4	Wet grassland - Lowland blanket bog GS4 – PB2
Wet grassland - wet heath GS4 – HH3	wet heath HH3	Wet heath - Bracken HH3 – HD1
Wet heath - montane heath HH3 – HH4	Wet heath - wet grassland HH3 – GS4	

Figure 9 Habitat types in NCLLAES

The habitat surveys were started in 2020 and the process was repeated for 2021 staggering the dates in which the previous year's surveys were carried out (in reverse order from 2020). Having surveyed the lands at different stages of plant growth highlighted a more accurate picture of the habitat. This allowed for information to be collected at different growth stages of plants and also different grazing times and different seasons. The results of the 2021 surveys were similar to 2020 with some areas scoring better as there was more vegetation growth than previous years. The presence of invasive species and turbary were again seen as the most common reduction of the scores.

A bespoke habitat scorecard was developed to assess and evaluate the health and vitality of the area's habitats. This tool allowed for a systematic and detailed analysis of the region's environmental conditions. See the Appendix for a sample blank score card.

With regards to scoring on each parcel, 100 points is the maximum score that can be awarded per parcel. Points are deducted for activities or impacts to the biodiversity of the area.
There are 9 categories where the impact to biodiversity is examined.
These are:

1. evidence of damage to habitat,
2. bare soil,
3. turbary,
4. artificial drainage,
5. invasive species,
6. diversity in flora,
7. vegetation structure,
8. pollinator potential
9. scrub.

Points are deducted depending on the type of activity and the impact that it has on biodiversity.
Extensive turbary which results in exposed peat with little or no vegetation cover will receive a zero score. This is because the site contains little or no species of flora at the time of the survey.
Extensive cover of an invasive species will mean a loss of 25 points to the score. Maximum points are deducted in this category when growth of an invasive species is so great that no other species can sustain itself in that area.

The following is an extract from a farmer's report from 2020

1a. Results of Habitat survey

Date of survey: 06/07/2020

EOI	
Plot number	Score
2009	80
2010	80
2146	80
2117	100
2136	95
2154	95
2155	95
2156	100
0121 +0059	90
2119 2120	95
6146	100
Total parcels	Total score
11	1010
Overall average score	91.81

3.4.1.3 Results

Extensive surveys were conducted, covering an impressive expanse of over 10,000 hectares of land. These surveys were instrumental in gathering comprehensive data, including the identification of over 200 different plant species. This wealth of information provided valuable insights into the region's biodiversity.

Furthermore, the project focused on addressing the challenge of invasive species, actively identifying and mapping these ecological threats. By understanding the extent of invasive species and their impact on the ecosystem, the project was better equipped to implement targeted mitigation strategies.

The majority of land parcels scored over 70. Very few parcels had a score under 50. Three parcels were given zero score. Two of these were commonage and one was privately owned. Both commonage parcels were scored zero because of excessive active turbary. In the case of the private parcel, it was given no score because the damage to the ecology is so great that it was deemed to be the same as the effects of turbary. The private plot is classified as eroding blanket bog. Three parcels were given a score of 40. These were one commonage and two private. Classified as lowland blanket bog; scrub and improved agricultural grassland – wet grassland. The reason for the score is different in each case but include invasive species, rubbish, scrub, little diversity in species, low sward height.

The following table shows the spread of scores per survey

Score	Number of Surveys
100	35
95	31
90	30
85	36
80	30
75	26
70	12
65	12
60	10
55	3
50	0
45	1
40	3
0	3

Table 2. Collated scores

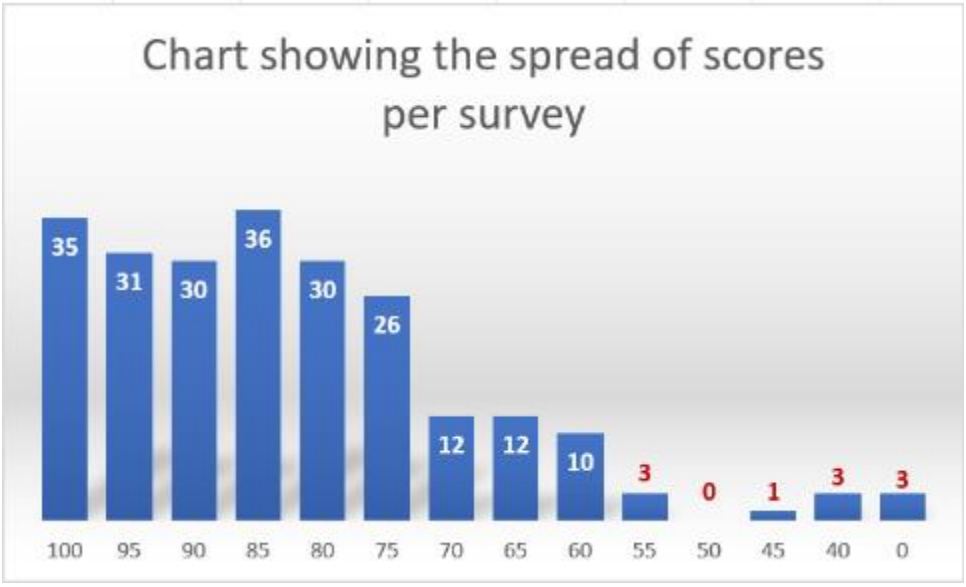


Figure 10 Chart showing the spread of scores per survey (Total 232 surveys)

At the end of the scheme 232 individual habitat surveys had been carried out on habitats that included blanket bog, heath, improved grassland, semi-natural grassland, woodland, machair. Many areas that were surveyed contained a mosaic of two or more habitats.
Over 200 individual species of flowering plant have been recorded.
Most commonly recorded species include ling heather, purple moor grass, clovers, bog cotton, tormentil and improved grass species, i.e., Yorkshire fog, perennial rye grass.
Fauna species recorded include grasshoppers, bees, butterflies, frogs, lizard.

Throughout the surveys to date, it has been apparent that the most species rich grassland occur where management is grazing by cattle. Impact by cattle on a field allow for diversity in sward height as well

as a higher number of individual flowering species. Sheep grazing is the most commonly observed land management. On improved grassland, sheep graze the sward to an evenly low level, prohibiting flora from reaching flowering height.
Lichens and mosses have been recorded in most blanket bog plots. This is significant as they are slow growing species, which indicates that grazing levels are adequate to permit the long-term growth of flora.
Impacts to the quality of the habitat include, grazing pressure, turbary, rubbish, invasive species.
Invasive species, especially rhododendron, is the most commonly encountered negative impact. However, two areas of significant turbary and one of extensive grazing have been surveyed and recorded as suffering from significant damage.

4201 individual records of flora species were made during surveys. Score cards are divided by type: flowering plants, mosses and lichens, trees, shrubs, invasive species and grasses, reeds and sedges.

Flowering Plants

113 species of flowering plant were found in the 2020 surveys. Tormentil was the most encountered plant (145 records). It was found in 55% of surveys. The widespread occurrence of tormentil is due to its preference for multiple habitats, including grassy, heath, boggy, wet, or dry habitats. Therefore, unlike other species of flora which have a more limited range, tormentil was found across the entire project area.

Picture 4. Tormentil (*Potentilla erecta*)

Mosses, Lichens & Fungi

While there is a wealth of mosses and lichens to be found in Ireland, identification to species level in the field is difficult. Therefore, there are only 6 moss species and one lichen on our score card with space to record “other species” where identification is not known. In the 2020 surveys, we found 11 different species of mosses and lichens and also recorded “other” for the species that we could not identify in the field. (11 species + other species of mosses, lichens, liverworts and fungi)

Trees

Trees observed during surveys include alder, ash, downy birch, silver birch, blackthorn, hazel, hawthorn, juniper, oak, rowan, scots pine and willow. The most commonly encountered trees were hawthorn and willow. 15 different species of trees were found during surveys. Most of the habitats within the project area are grassy, heath and bog habitats with few pockets of wooded areas and few hedgerows.

Grasses, Reeds & Sedges

Grasses, reeds and sedges were the most frequently encountered group of flora as they were found in almost all habitat surveys. There were 32 species of grass, reeds and sedges found during surveys. The most numerous species found were black bog rush (178 records), Yorkshire fog (113 records), purple moor grass (112 records), bog cotton (109 records).

Shrub Layer

19 shrub species were found during surveys with ling heather being the most commonly recorded. Ling heather was found in 109
parcels. Bracken was found in 73 parcels. However, bracken was only dominant in one location and abundant in 9 locations which indicates that bracken is not causing undue pressure to ecology in the project area.

Habitat improvement plans

Invasive species were found to be present on high percentage of farms, with the most pervasive being Gunnera (Giant Rhubarb) and Rhododendron. Improvement plans were based on controlling these species as a priority.

Participants received training for chemical use to carry out control of the plants. Training was provided for by a licenced pesticide training company. Due to Covid 19 the training was delayed until 2022.

Lastly, the project prioritised knowledge sharing and initiated meaningful conversations within the community via radio show and articles as well as meetings. This open dialogue not only disseminated valuable information but also engaged local stakeholders in the collective effort to protect and enhance the environment. Together, these initiatives formed a comprehensive approach to environmental conservation and habitat restoration.

Improvement plans were based on what ecological or agricultural problems are found on the ground when the surveys are being carried out. The plans were individual, had participant input and were agreed before implementation.

Meetings were held with the participants to discuss the outcome of their habitat survey; the improvement plan was then created. These plans were formalised between July and September as surveys were completed. The plans were implemented by the end of November pf that year if farmers were to receive the payment based on the completed work.

3.4.2 Group Management Training & Meetings

There are limited social options for farmers in the region as some farmers are not always aware of new agricultural practices and technologies that may benefit them. With the removal of the national knowledge transfer scheme as an option for farmers, a replacement was needed.
Social interactions are very important for mental health and wellbeing of people especially those that live in rural areas.
The scheme aimed to highlight the importance of social interaction and inclusion in the farming community locally. Farmers generally work in a socially isolated environment. The NCLLAES hosted a series of talks and training events which were beneficial to the farmer's work but also had the benefit of bringing people with a common interest together in a social setting.

EIP's are set up to try and ensure there are continuing outcomes from the scheme after the funding is removed. Social interactions through training events are a great way to ensure continued interaction allowing for networking opportunities between farmers. This is an area of the scheme we would love to see continue.

3.4.2.1 The effect of Covid-19

COVID affected the usual opportunities for social interactions of farmers and the public as a whole.

Figure 11 Participants attending herbicide spraying course training during COVID-19 in keeping with guidelines.

As the restrictions slowly lifted in 2021 opportunities opened for the scheme to meet the participants in group settings. The first of which was a sheep shearing course which 22 local farmers attended, 15 of whom were scheme participants.

Figure 12 Scheme participants taking part in sheep shearing training.

It is the view of FORUM Connemara that continuous professional development is needed for farmers of all ages. We believe that practical skills training is important for all farm workers, particularly in the case of biodiversity as well as smart technology and farmer health & safety.
This was the core belief behind this activity. Participants were required to attend group meetings during the scheme. The aim of these meetings was to get feedback from scheme participants, provide information on trends, upcoming events, schemes etc which would be beneficial to the farmer. Farmers were incentivised for taking part in these meetings.

3.4.2.2 Main Aims

Group meetings and workshops can be important for the mental health and social cohesion of rural farmers for several reasons:

1. **Social support:** Farmers in rural areas often work in isolation, and social support can be a critical factor in maintaining mental health. Group meetings and workshops provide an opportunity for farmers to connect with others who share similar experiences and challenges, and to offer and receive support.
2. **Skill-building:** Workshops can provide farmers with the opportunity to learn new skills, which can increase their confidence and competence in their work. This can lead to a sense of accomplishment, which can be beneficial for mental health.
3. **Access to resources**: Group meetings and workshops can also provide farmers with access to resources they may not have otherwise, such as information about new technologies, markets, or government programs. This can help farmers to improve their productivity and profitability, which can be beneficial for mental health and wellbeing.
4. **Sense of community**: Group meetings and workshops can help to create a sense of community among farmers, which can be beneficial for social cohesion. This can help to reduce feelings of isolation and loneliness, which can contribute to poor mental health.

In a broader context, group meetings and workshops play a significant role in bolstering the mental well-being and social solidarity of rural farmers. They offer a platform for social camaraderie, skill enhancement, resource accessibility, and the fostering of a strong sense of community.

3.4.2.3 Methodology

We provided a Group Meeting programme delivering training on topics such as chainsaw use, pesticide use, fencing, Sheep Shearing, etc. as well as a series of talks on topics of interest to farmers, such as: Farming Finances, The Acres Scheme, a vet discussing animal health etc.

3.4.2.4 Results

The courses & Workshops delivered were discussed and agreed with the farmers and agricultural advisors. For example, the reasoning for hosting **Sheep Shearing training** was as follows:
Wool price has reduced greatly in the recent years with the price of shearing those same sheep remaining the same. Sheep must be shorn annually for their welfare. The farmer pays €1.50 to €3.00 per sheep and receives only 5 cent per kg when selling the fleece. Being able to shear their own sheep will reduce the cost and increase the profits on a sheep farm. It also can open an avenue of work for some farmers who may be able to shear other people's sheep.

Training delivered was as follows:

MODULE	Trainer	# People	When?
1. Electric Sheep shearing	George Graham	30 people	July 2021. July 2022
2. Chainsaw 2 day QQI level 5	FRS Training	40 people	March 2022, November 14h, 15th 2022, Oct 18th 2022
3. Pesticide applicator	FRS Training	50 people	Early 2021, 21st 22nd July 2022 / 10,11th & 18, 19th Oct /10,11th & 14, 15th November
4. Agricultural Fencing	Paddy Cosgrove Training	13 people	July 23rd 2022
5. First Aid	Marie Lyons	10 people	21st March 2022
6. Drone usage	Sheep drone skills	13 people	09th April 2022
7. Animal husbandry	Western Veterinary	15 people	07th April 72022
8. Rhododendron control	Dermot Flaherty / Conor Ryan	50 people	October 2020, 2021, 2022
9. Horticulture and personal vegetable production	Frank Conroy	8 people	May 10th 2022

Figure 13 Meetings and training held during COVID-19 followed guidelines.

The following group meetings or events were held:

Meeting	**DELIVERY**	**# People**	**When?**
The heritage project team was invited to give a talk on farming practices in rural Connemara in the Connemara National Park as part of culture night	Joseph Mannion / Laney Mannion & Lisa Kane.	15	Sept 2022
Biodiversity Talk (See poster)	All EIP project leaders and the NPWS	30	May 16th 2022
Maam Group Meeting	Joseph Mannion	16	Oct 5th 2022
Letterfrack Group Meeting	Joseph Mannion	44	Oct 4th 2022
Recess Group Meeting	Joseph Mannion	12	Oct 6th 2022
Financial Matters	Rory Coll, Financial expert	48	April 27th & Sept 29th 2022
Organic Farming	Organic Trust	21	Oct 13th 2022
Group meeting updates, Letterfrack	Joseph Mannion	18	April 27th 2022
Maam	Joseph Mannion	8	April 28th 2022
The Irish Uplands Forum conference. The conference incorporated a farm walk on Kevin Laffey's farm. Kevin was a NCLLAES participant. Joseph Mannion also spoke.	Joseph Mannion / Kevin Laffey	22	Oct 28th 2021

Figure 14 The NCLLAES hosted a Biodiversity Networking Event in Connemara

The Connemara biodiversity networking event was a hugely successful event with speakers from:

- Farming Rathcroghan EIP project
- Freshwater Pearl Mussel EIP project
- The Caomhnú Árann EIP project
- Dr. Derek mcLoughlin from the Wild Atlantic Nature LIFE IP
- Conor Ruane from Lawpro
- Galway County Council biodiversity
- Guided walk in Connemara National Park

3.4.3 Rhododendron Control

One of the biggest problems in the NCLLAES area is the invasion of Rhododendron, primarily on the North side of the Catchment area.
Alien invasive species have a negative effect on biodiversity. Invasive plant species can cover large areas of land in a relatively short period of time, to the detriment of other plant species and wildlife. Alien invasive plant species can spread rapidly due to fast growth rates and reproduction as well as lack of disease or predator. The only way that they are controlled is through human effort. Gunnera, Japanese knotweed and Rhododendron are the most common invasive species in the region. The NCLLAES has shared information to both the public and farmers on the best method for control and removal. Correct techniques are very important with these species as incorrect treatments can result in the plant spreading further.

Rhododendron ponticum and other invasive species have a detrimental effect on the biodiversity in any habitat. From the habitat surveys carried out as part of the scheme it has been confirmed that over 10% of the fields surveyed within the EIP area contain invasive species. The level of which ranges from newly infested, in the last 10 years, to highly infested with plants growing and spreading for 30+ years. Each invasive needs specific control techniques and information on these have been provided to the participants of the scheme and also the wider public.

This project aimed to clear 200ha of Rhododendron during its lifetime in order to enable restoration of upland heaths and peatlands. However, the surveys carried out in 2020 found that there were far more than 200ha of invasive species in the project area. This figure only refers to the 10,503Ha that were surveyed in the summer of 2020. The project team have noted however, that there is extensive coverage of rhododendron and to a lesser extent other invasive species on land that is not part of the project. Where invasive species occur along roadsides or on public land, the project team have endeavoured to record this over the duration of the project.
88 parcels or 37% of parcels surveyed have invasive species in them. This amounts to 1543.40Ha or 14% of the survey area affected by invasive species. Invasive species found are rhododendron, gunnera, Himalayan balsam, Japanese knotweed, montbretia, Himalayan knotweed. (6 species). Rhododendron was by far the most numerously encountered invasive species. The NCLLAES project surpassed the 200ha by the end of the scheme having treated an area of 323ha across Northwest Connemara.

For rhododendron control the NCLLAES incentivised farmers to use stem treatment as the control method. In this method a small incision is made in the stem with a chainsaw, knife, or hatchet and then spray into the incision with a 10:1 (or 7:1 where needed) solution of glyphosate to water. A training video was created with the help of the Fresh Water Pearl Mussel project and the National Parks and Wildlife Services. This was then distributed to the public and to farmers. After a number of weeks, the plant will die and can then be removed. Removing without knowing if the plant is dead can result in the plant coming back stronger. We advised the participants to leave the plant standing for as long as possible to ensure a good kill.
Scheme participants carried out this control method on close to 200ha. The method, although it is physically demanding, is very effective and training as many people as possible to control rhododendron will have a long-term positive effect on the spread of the plant being reduced. In 2021 there was an increased participant uptake in this initiative. This was a hugely positive segment of the scheme that can continue into the future after the scheme is finished.

The farmers started the work in 2021 and by Dec 2021 125ha of Rhododendron had been controlled by 32 farmers. The scheme then hired and trained a team of 10 rhododendron control workers who would specifically target the rhododendron on a farmer's lands. In the last 16 weeks of the NLLAES scheme this team had worked on 123ha. By March 2023 over 323ha of rhododendron had been controlled on a further 16 farmers lands. (See reports on these 16 farms in the Appendix sections)

3.4.3.1 Main Aims

The aim of the initiative was to encourage farmers to begin treatment of rhododendron by giving them a payment based on land type (private or commonage) and reimbursing them on costs, such as pesticide. This would prevent the rhododendron from further encroachment and spread.
The initiative also aims to help spread correct information on how to treat rhododendron. It will facilitate training for farmers on rhododendron control, informing them on the safest, most effective techniques.
Invasive species, particularly Rhododendron, are a significant problem within the project area, and surrounding areas. It is worth noting that the densest thickets of rhododendron occur on land that was not included for survey, particularly in Letterfrack and Kylemore.

Rhododendron can form very dense thickets which prevent access to fields because of its sheer mass. It out-competes native plants resources such as sunlight and space. It is poisonous to livestock. Land has been lost, and more will continue to be lost to agriculture where Rhododendron takes hold. Treatment and eradication are not a quick solution, but results from NPWS, whose treatment the NCLLAES recommends, from their work in Killarney National Park, suggests that it is possible to control rhododendron.

Article 17 of the Habitats Directive indicates that many Irish habitats are in unfavourable status. The NPWS report on the countrywide status of habitats. The NCLLAES is focusing on a very small area in one location. The Article 17 status depends on factors such as long-term maintenance of the habitat and whether the range that the habitat covers is stable or increasing. As the purpose of the habitat surveys carried out by the NCLLAES was to allocate a score based on ecology for every individual land parcel the parameters used to assess conservation status under the Habitats Directive are not applied in this project.

3.4.3.2 Methodology

Farmers who were accepted into the Rhododendron Initiative had to carry out habitat improvements based on the control/removal of rhododendron specifically. A plan of work was created with the farmer and payments were made once work was completed. Individuals were trained in best practice removal. Equipment needed was purchased by the farmer and was reimbursed once a receipt was provided to the project team.
We also included tidy towns and interested groups in training to carry out rhododendron removal.

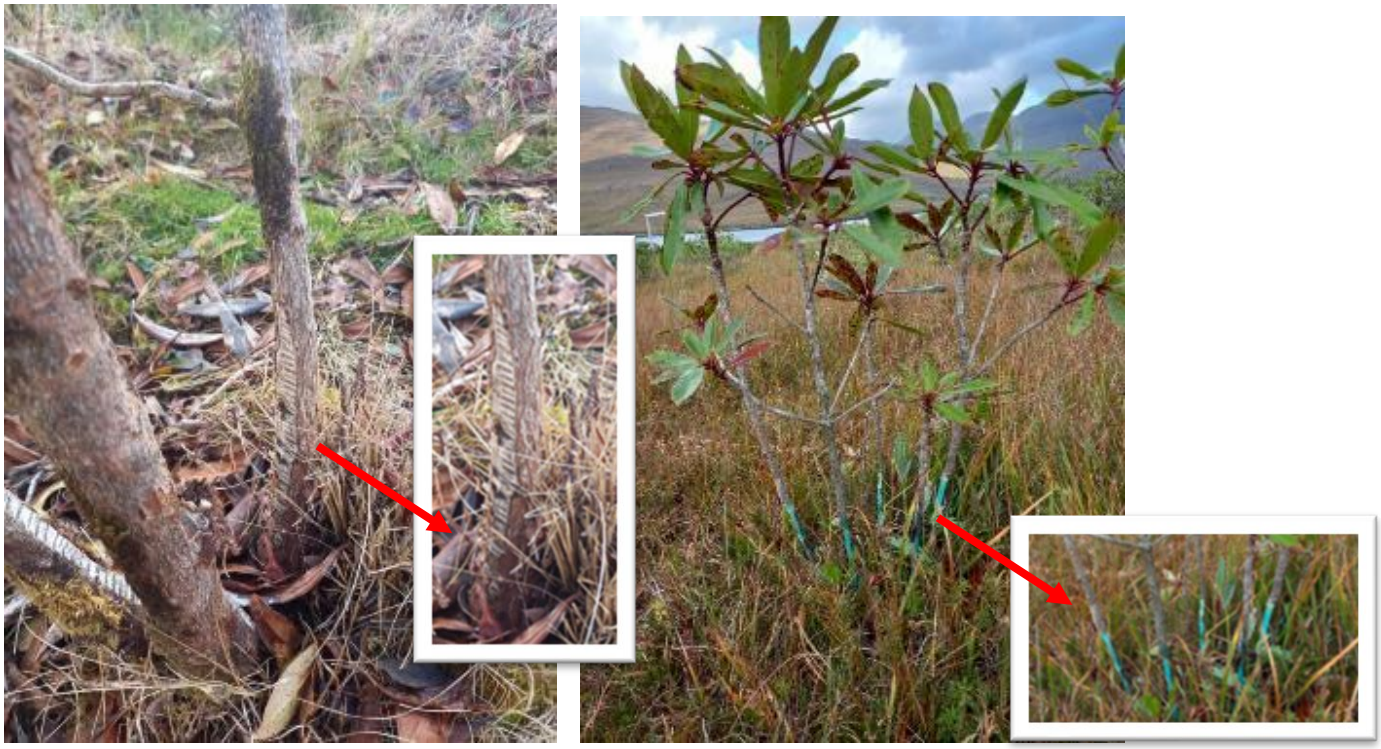


Figure 15 Rhododendron scraped with chainsaw and herbicide applied.

When the initiative was underway it became clear that even with financial incentive farmers, who are generally part time, have little time to carry out land management actions.

A new approach was taken, and a group of specially trained rhododendron operatives were hired by FORUM Connemara in November 2022 and after training and orientation they began treatment of rhododendron for farmers. Thus, two options were available for the treatment of rhododendron.

Option 1: If a farmer wanted to treat rhododendron on their own land, the famer informed the project team of any invasive species found on their land. This was carried out by ticking a box on the Expression of interest form. The area was then surveyed by the project team and the farmer prior to acceptance to the scheme. Upon successful application the farmer attended specific training for Rhododendron control (herbicide spraying course / chainsaw training). In conjunction with the project team, project ecologist and the farmer a plan was created which best suited the level of infestation. A payment was then given based on the number of hours the farmer spent treating the invasive species.

Option 2: If a farmer wanted the team of rhododendron operatives to come onto their land and treat the rhododendron for them. The farmer informed the team of their interest and where the sites were located. The site was then surveyed by the project ecologist and team supervisor. If the site was deemed suitable and the appropriate contracts were signed, the farmer was then given five days of rhododendron control on their land. Reports were written on the level of infestation, spread, weather conditions etc during each engagement. The team supervisor and ecologist returned to ensure proper control was achieved.
In this capacity we worked with 16 farmers (listed below) and the complete breakdown of the works carried out on each site can be seen in the Appendix section “Rhododendron Site Visit Reports”.

A total of 16 Farmers had the team of rhododendron operatives work on their farms to control rhododendron on their lands.
These are anonymised here for GDPR reasons:

#	Name	Address
1	Farmer A	Moyard, Co. Galway
2	Farmer B	Curr, Maam, Co.Galway
3	Farmer C	Mullagloss, Renvyle, Co Galway
4	Farmer D	Letterfrack, Co.Galway
5	Farmer E	Cahir, Recess, Co.Galway
6	Farmer F	Moyard, Co. Galway
7	Farmer G	Creagha, Leenane, Co.Galway
8	Farmer H	Derrynacleigh, Leenane, Co. Galway,
9	Farmer I	Bunowen, Leenane, Co Galway.
10	Farmer J	Letterettrin, Renvyle,Co Galway
11	Farmer K	Curr, Maam, Co.Galway
12	Farmer L	Ross, Co.Galway
13	Farmer M	Ross, Co.Galway
14	Farmer N	Letterettein, Co.Galway
15	Farmer O	Gorrom, Recess, Co. Galway
16	Farmer P	Lissoughter, Recess, Co. Galway

3.4.3.3 Results

Between the two different approaches the initiative took to treat rhododendron a vast amount of area has been covered. Approximately 3000 hours have been put in by farmers themselves in 2022. The team of operatives have covered 123 ha in 16 weeks. Approx. 50 farmers have treated or had the rhododendron treated as a result of this initiative. Each of them gaining the knowledge on how to continue the work safely and effectively.

This is only a start. In order for complete eradication of rhododendron in Connemara the work needs to continue and at a much larger scale.

For a complete breakdown of the works carried out on each site please see the Appendix section “Rhododendron Site Visit Reports”.

3.4.4 Connemara Rural Heritage Project

The development of the Connemara Rural Heritage project came about as the North Connemara Locally Led Agri-Environmental scheme progressed into its final leg in 2022.

It became apparent, from our many discussions with farmers on the scheme, that there was a rich farming history as well as a system of locally adapted farming traditions and practices that had gone undocumented and risked being lost to future generations.
It was this rich incredibly vibrant diversity of human endeavour and agricultural knowledge of those living and working within the Connemara landscape that needed to be captured.

While the Connemara landscape has inspired countless artists, writers and philosophical day dreamers, from an agricultural standpoint it is a marginal, boggy, rocky landscape that by its nature is difficult to control and create a livelihood from. Yet countless generations have done just that, generations of people have lived and worked within this stunning yet stubborn landscape. As one farmer admitted, “You have to really have a love for it (the landscape) and be equally as mad”.

The Connemara Rural Heritage Project is a glimpse into the lives of some of those who currently live in and farm the Connemara landscape. The team set out to capture the stories of these unique farmers who adapt to constantly changing, agri-ecological, socio-cultural and economic conditions, and do so with such knowledge, innovation and creativity.

3.4.4.1 Main Aims

The aim of collecting heritage material was fundamentally one of making connections within the agricultural community, gathering local traditions and placenames as well as creating a platform for lesser heard voices. It was in part an honouring of traditional practices by capturing the memories of those who kept them alive.

3.4.4.2 Methodology

Heritage officer, Laney Mannion and FORUM employee, Lisa Kane, were tasked with undertaking the Connemara Rural Heritage side of the NCLLAES project in Oct 2022.
While there was a ready-made source of participants from scheme members, our final sources were wide and varied.
The process of finding people to talk to was somewhat informal, participants would volunteer, or suggest people to interview.
Others would be key figures in the Connemara farming community. House calls and phone calls would then be made. There were conversations had while leaning on the bars of cattle pens at the local marts in Clifden and Maam Cross, as well as agricultural shows in Recess and Oughterard.
And, of course, there would be those who were keen to share their history and stories and volunteer themselves.

Figure 16Connemara Rural Heritage project Interviews

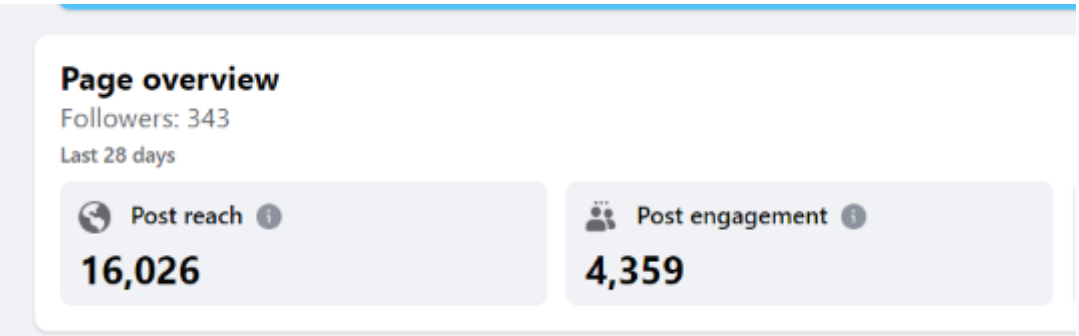
The interviews would be carried out in the participants own homes, these chats were recorded with photographs, video and sound capturing.
The interviews then would be processed, transcribed, edited and uploaded to the Connemara Rural Heritage social media pages. (YouTube, SoundCloud (audio) and Facebook)

Times of coming together through Meitheal were spoken about across several interviews the saving of the hay and turf, calling on neighbours in times of need. The bartering of labour across the community was common practice, as traditional labour practices fade out the sense of loss in community coming together is felt acutely.

3.4.4.3 Results

Since going live in November 2022, there are over 1.600 people following the various social media platforms on which the interviews with the rural heritage participants, have been shared.
The response to social media pages and interaction with the content surpassed expectations, with posts reaching 16,000 individuals. Current listens on Soundcloud as of March 2023 stands at 1,498.

All interviews have been transcribed and copies can be requested.



The full report can be seen below and the Facebook page is still active on https://www.facebook.com/ConnemaraRuralHeritage/

Figure 17 Mrs Harrington explains Wool carding - 1.4 thousand views on this video.

3.4.5 Habitat & Farm Improvements

Based on the comprehensive habitat surveys conducted, a series of strategic actions were prescribed to address and enhance the ecological health of the area. These actions were carefully designed to mitigate various challenges and promote sustainable land management practices.
Farmers were contacted, and an agreement was made as to what actions the farmer could carry out that would benefit both the habitat and the farm. Some farmers were already carrying out positive works and these were included in their plans for payments.
Actions that were carried out included reducing monocultures such as rushes, protecting biodiversity and carrying out maintenance of fencing to control stocking rates.
Farmers were also rewarded for having positive impacts on biodiversity such as farming bees, creating areas for pollinators to thrive, and introducing a replacement breeding programme which would help to control grazing levels in the future.

Actions were created for the individual farmer regardless of the land being private or shared commonage. This allowed the farmer to keep ownership of their farm improvement plan. However, if farmers worked on a specific action together, they would receive a bonus payment.

Actions undertaken by farmers with the intention of improving habitat on the farm were proposed by the Project Team with one or more of the following aims:

1. To increase the biodiversity of the habitat
2. To protect water quality
3. To improve carbon sequestration
4. To create a new habitat
5. To increase the agricultural viability of the plot
6. To control an invasive species
7. To maintain the quality of the habitat at its current level

Through consultation with the project team, the farmer decided which options they would carry out to improve the ecology of their farmed area.
These actions included:

A. Replacement Mapping: Keeping extra replacement ewe lambs from certain grazing areas and less or none from others for ecological/vegetation improvement reasons.
B. Repairing/replacing existing fences or gates.
C. Scrub control using cattle/equines.
D. Supplementary shepherding of sheep. Using lick/feed buckets to entice sheep to graze areas where under grazing is observed.
E. Maintaining stone walls.
F. Physical control of scrub (bracken, heather, Gorse)

Actions that were thought to be beneficial to the ecology of the farm could also be brought forward for consideration by the farmer or the project team.
Farmers had an input into the creation of their own bespoke farm plans.

One significant action involved the installation of fencing. Fencing served a dual purpose: it protected the land from potential damage and helped control the movement of livestock. By strategically placing fences, the project aimed to minimise the impact of grazing on sensitive habitats, thereby fostering ecosystem recovery and protection.

Another vital component of the project was stock breeding control. Through thoughtful stock placement and management, the project sought to achieve a more harmonious balance between livestock and the environment. This control not only safeguarded the delicate ecological balance but also ensured that the land could sustainably support livestock without degrading its natural resources.

Furthermore, the initiative tackled the issue of monoculture control. Recognising the potential harm of monoculture practices to biodiversity, the project implemented measures to diversify and enhance the ecological composition of the area. These efforts aimed to reduce the dominance of single species and promote a healthier, more resilient ecosystem. In essence, these actions represented a multifaceted approach to habitat improvement, emphasising the importance of strategic planning and management to achieve sustainable environmental outcomes.

3.4.5.1 Main Aims

The habitat improvement initiative was based on the results-based habitat assessment which discovered what was on the ground using the score card. It determined what the ecological score of the land was on the day of the survey. The score card was also able to identify what could be improved

on the land or what could be improved on the farm. Using previous and current schemes a list of measures was given to the farmer and a discussion also took place with the project team to see what would best suit the farm based on the habitat surveys and the farmers opinion.

Actions
Many of the actions the farmer could choose from improved the infrastructure of the farm in the form of fixing fencing, gates, gateways, water troughs, sheep pens and more. The farmer saw the benefit of these as it made farming easier and the project team saw the benefit as the farmer had easier control of his stock and could reduce or increase numbers, and know the animals were safe and easy to handle with improved facilities to hand.
Over 75% of the farmers in the NCLLAES farm commonage lands. It can be a challenge to achieve actions on commonage due to the number of shareholders involved, some of whom may not be participants of the scheme. The NCLLAES treated each farmer as an individual whether it was commonage or private land where they were carrying out an action. There was also an incentive to work together built into the incentives, the farmer would receive 1.5 times the original amount for working together with another commonage shareholder. This added bonus worked well in a number of different occasions where farmers came together to fix the fences on boundaries.

Over Grazing
Newly introduced sheep on a hill have a tendency to stay lower down near the gate way and do not travel too far from that location, some sheep tend to wander further up the hill and stay in this location for the entirety of the time they are on the hill. To increase the number of animals on a hill without damaging an area through grazing is difficult. This is why the NCLLAES incentivised the farmer to breed replacements from the sheep that were in locations that where a habitat survey showed the vegetation structure to be in excellent condition. This process is slow and more difficult for farmers as they have to travel further to round up the sheep for dosing, lambing or shearing. It does however increase the grazing platform on the hill and spreads the sheep out more evenly.

Biodiversity and self-sustainability
The NCLLAES scheme occurred during a turbulent time for the global economy with the pandemic and the Ukrainian war. Part of what the NCLLAES wanted to accomplish was to ensure farmers were rewarded for improving the level of vegetables and honey they produce as a means of reducing their own food miles, increasing business opportunities and feeling self-satisfaction for producing food they can eat and share with their friends and neighbours. Growing and eating your own food, means that there are no air or road miles associated with it and no plastic waste from packaging. To accomplish this farmer were rewarded for producing a vegetable patch and producing their own honey. Some farmers were also rewarded for fencing off areas to allow the wildflowers to grow undisturbed. All of these actions increased the level of biodiversity on the farm and gave the common insects more opportunities to have a source of food for longer.

3.4.5.2 Methodology

In this section we will go through each of the actions in detail
Pollinator Habitat
Pollinator species are in decline in Ireland as a result of habitat loss, habitat fragmentation and climate change. Pollinators are essential to both the ecological and economic viability of native plants and

crops. Despite the decline in pollinator species in recent years, only one insect is afforded legal protection and that is the marsh fritillary butterfly.
The North Connemara Locally Led Agri Environmental Scheme aims to incentivise farmers in the scheme to provide habitats for pollinators.

Under this action the farmer could choose to have:

Bee Hives

The honeybee is an important pollinator of native plants and crops. The popularity of beekeeping can only be a positive thing for pollinators and plants. The NCLLAES paid €200 for each beehive that a farmer keeps (to a maximum of €800).

Vegetable patch

Many fruit and vegetable plants have flowers which are attractive to pollinators, providing food and they may be important links between habitats. By growing their own vegetables and fruit, farmers negate some of the environmental costs associated with food production such as carbon miles and packaging waste. The NCLLAES paid €200 for a vegetable patch or fruit garden that contains at least two variety of vegetables.

Biodiversity area

To ensure an area will have plants that will reach full growth and help to sustain to sustain pollinators. Allowing for the flowers to pollinate fully will provide a food source to the important pollinators on the farm.

Topping

Monocultures can reduce the level of biodiversity seen in a field. These plants may not be palatable to the grazing animals which can lead to selective grazing of other plant species reducing the level of competition. In these circumstances mechanical removal or control may be needed. Farmers who top or strim their fields to reduce the monocultures hold on an area will receive a payment of €120 per hectare. The process will need to be continued each year to continue the control process.

Herbicide control

Farmers who carry out control of invasives and monocultures will receive a payment relating to the amount of time the process takes to complete. Farmers will receive €15 per hour on privately owned land and €18 on commonage land. This process will need to abide by all other factors relating to buffer zones and correct chemical used for the plant.

Change of stock

Different species of animal's graze at different levels and at different patterns. Ovine and equines graze using their teeth and where low levels of vegetation is available, sheep have a tendency to eat below the growing point of the plant which slows down new growth. Bovines use their tongue to tear the grass and cannot eat as low as the other species. A mixture of grazing animals has a benefit to a hill area. Bovines can rejuvenate an area that has high levels of Molinia and also can break up scrub naturally. Sheep can then graze the newly cleared areas and, once kept at correct stocking rate can have a positive effect on the area. Farmers in the NCLLAES who wished to change introduce a new species of stock, after a consultation process as to the benefit to the biodiversity at farm level, received funding of €300 per life stock unit.

Farmyard Works

Most farmers in the NCLLAES are classified as part time. The works they carry out are outside working hours. Farm accidents are seen to occur at the busier times of the day/week/year when farmers may be rushing to complete tasks. Having a farmyard correctly laid out can reduce the time some animal

husbandry tasks can take. Farmers were compensated for carrying out improvements on their farmyard. Consultation took place before any compensation was paid. Examples of improvements were:

Sheep Hurdles used to help in controlling animals- Payment was based on proof of purchase

Holding Pen used to carry out animal husbandry efficiently- Payment of €400 for completing a holding pen with multiple holding areas.

Fencing and Gates

Much of the land in the project area is open and sheep wander at will. Fences are the most common stock proof boundary used by farmers in North Connemara. Fences, however, require more regular maintenance than other forms of boundary, such as stone walls or hedgerows. Where fences have broken, livestock can cross boundaries to more favourable grazing spots.

Sheep are selective grazers and will favour herb species over grasses and sedges. If sheep can cross boundaries due to defective fencing, habitats will come under pressure where preferential fodder is located. Habitats will likewise suffer under grazing where sheep have wandered away from less favourable fodder.

Gates benefit grazing as they can allow for quick movement of stock from one area to another.

Different levels of payment were made depending on where/what fencing took place:

- Fencing on low land- trafficable by a tractor. Near a road. received a payment of €5 per metre.
- Fencing on mountain/hill area- Not trafficable by a tractor/not recommended to drive on with tractor due to habitat type/mountain habitat. received €8 per metre.
- Repairing existing fence- All areas. Fences that needed repairing either with new stakes or wire received a payment of €3 per metre. Repairing fences rather than replacing will incorporate the principles of the circular economy by reusing materials in order to preserve natural resources and reduce pollution.

Replacement Mapping

Farmers manage their flocks on the hills in accordance with the level of forage available to their animals. These hills have vast open areas that are unfenced and therefore sheep settle in specific locations and will return to those areas year on year. If sheep are removed and not replaced the area can become under grazed. The process of integrating the right number of sheep into an area is very difficult as it can take years to build up the flock. The most viable option in these areas is to breed replacements from the animals that are integrated into the area. Replacements can go up or down year on year depending on the level of grazing available.

Farmers who carried out this process received €800.

GPS shepherding

Using GPS collar trackers on sheep, a farmer can integrate sheep into a grazing area. The farmer can identify animals which continue to wander and remove them from the area. They can also identify when the animals may wander near the edges of the area and push them back in by themselves or with the aid of a sheepdog. This may eventually allow the sheep to settle into an area. Breeding replacements from the settled animals may increase the number of sheep that settle and will allow the farmer the ability to control the level of grazing seen.

Bonus payment for working with other shareholders on a commonage
Commonages are areas of land that are farmed by multiple individuals. In the NCLLAES farmers who work together on a commonage to carry out specific improvements will be rewarded a bonus of 1.5 times the amount of the work carried out.

3.4.5.3 Results

There was an enthusiastic response to the Habitat and Farm improvements scheme.
In the first year 2020, the Farm Improvement initiative was completed by 49 out of the 65 participants who had Habitat Surveys completed on their lands. Of these 49 participants, 28 farmers did fencing. 23 of these got the maximum payment meaning that they fenced over the max payout for the year of €800.
In 2020

- 11,246m fencing was done
    - 4,610m of this was on hills
    - 2,974m of this was on roadside
    - 3,662m of this was fences which were repaired

13 participants took park in the Replacement Mapping incentive.
Shepherding or herding by farmers was rewarded. Hill sheep that are bred into an area are likely to stay and graze in that area. Many farmers, due to scheme restraints, are forced to stock sheep at a minimum of 1 ewe to the hectare. Some hills can be considered large in area but the grazing platform

which these sheep stay on may be considerably less. Due to the previous blanket approach which led to destocking in most hills, many of the sheep that tended to stay in certain areas were removed, reducing the grazing platform on the hill.
GLAS, the previous ECO scheme before Acres, used a minimum stocking rate requirement for all commonage shareholders in the scheme. Although this tried to ensure the commonage was grazed with the correct number for the area, the sheep all congregated near the fence line or in one small area of the commonage not utilising the entire area. The NCLLAES EIP attempted to move the sheep around through a breeding program where ewe lambs were kept from the ewes that would wander further into the commonage and over time this would ensure a more even spread. Many of the farmers who chose this option increased the numbers of sheep from more remote areas. One farmer for example increased his remote flock from single digits to nearly 20 within the 3 years of the scheme. This also allowed the farmer to reduce the stock in the preferential area. This is a slow process and needs buy-in from farmers which the NCLLAES obtained.
One farmer carried out GPS tracking of sheep. He uses a collar tracking system to identify where the sheep are situated when they leave the area of the commonage the farmer shepherds them back in. He is able to identify the ewes that are constantly wandering and has removed them from the area which has led to a more settled flock.

For the other initiatives only 1 participant took advantage if the Change of Stock, 2 of the Beehives, 2 of the farmyard works (Holding pens and water troughs), 5 did topping,
Only 9 participants did not do any works in the year 2020.

Figure 18 Bee Keeping was encouraged.

3.4.6 Community Engagement

3.4.6.1 Main Aims

Integrating the community into the agricultural sector through a knowledge transfer programme was seen as not just as a benefit for the farmers, but the community as a whole. Educating the younger generation about the importance of the local habitats and biodiversity will lead to a greater level of knowledge in the locality in the long term. These students may farm this land, they may be involved in the agricultural sector locally or they may be involved in policy making in the future.

3.4.6.2 Education & Schools Liasion

The educational project started in May 2019 in 8 local primary schools inside the project area.
A presentation was made in relation to the scheme and the important habitats that can be found in the area. A logo competition was created which these students took part in. The children who listened to the presentation were asked to create a logo which they thought would best represent the scheme, farming and nature in Connemara. Local businesses provided spot prizes for the children who took part in the competition. After an internal vote in the FORUM office, a winning logo created by Oisin will be used as the Logo for the entirety of the scheme.

One of the remits of the project was to increase the interaction between the local community and the local farmers. This started in earnest in May 2019 when the project created a primary school's program where the importance of the local environment was explained to the pupils who then completed artistic illustrations of what the local environment meant to them. The result and quality of the drawings and depictions of the project really showed that the pupils in the local area have a great understanding of the area.
Increasing the level of awareness around agriculture, ecology and biodiversity was an important goal of the scheme. The project created programmes for the local primary schools, including a logo competition back in 2019 which resulted in the creation of the logo being used by the project. An

education programme was also created showing local agricultural practices and comparing them to what happens nationally and worldwide.

To cater for Adolescents the team co-developed a Farming for the Future teen camp at Easter 2022. This aspect of the programme linked with FORUM Connemara's Adolescent Support Programme which caters for 1,200 young people in Connemara. We are delighted to say that this programme is currently expanding and is being financed separately by Healthy Ireland.
The heritage aspect of the EIP project did not only concentrate on the elderly in our community. We also engaged the enthusiastic younger population of farmers withing the Connemara district.

In the spring of 2022 a series of creative workshops around ethnobiology through creativity, the workshop was devised by FORUM Adolescent Support Youth worker, Tina Jack, and carried out with assistance from Visual artist Laney Mannion these workshops were conducted with 50 students aged 8-12, across three Connemara primary schools Allibrack, Ballyconnelly and Kingstown.

This cohort of students took part in the designing of their own window boxes in which they sowed native Irish wildflower seeds. The students were all directly or indirectly involved with agricultural processes through immediate family or relations, they were acutely aware of environmental challenges, and challenges facing farmers in the area.
The team worked with the adolescents to develop a booklet.
The booklet contained stories, poems and paintings of the teenagers' experiences with farming and it was a fantastic success. "Scéals and Tales"

Figure 19 The teenage contributors to the "Scéals and Tales" Booklet at the launch.

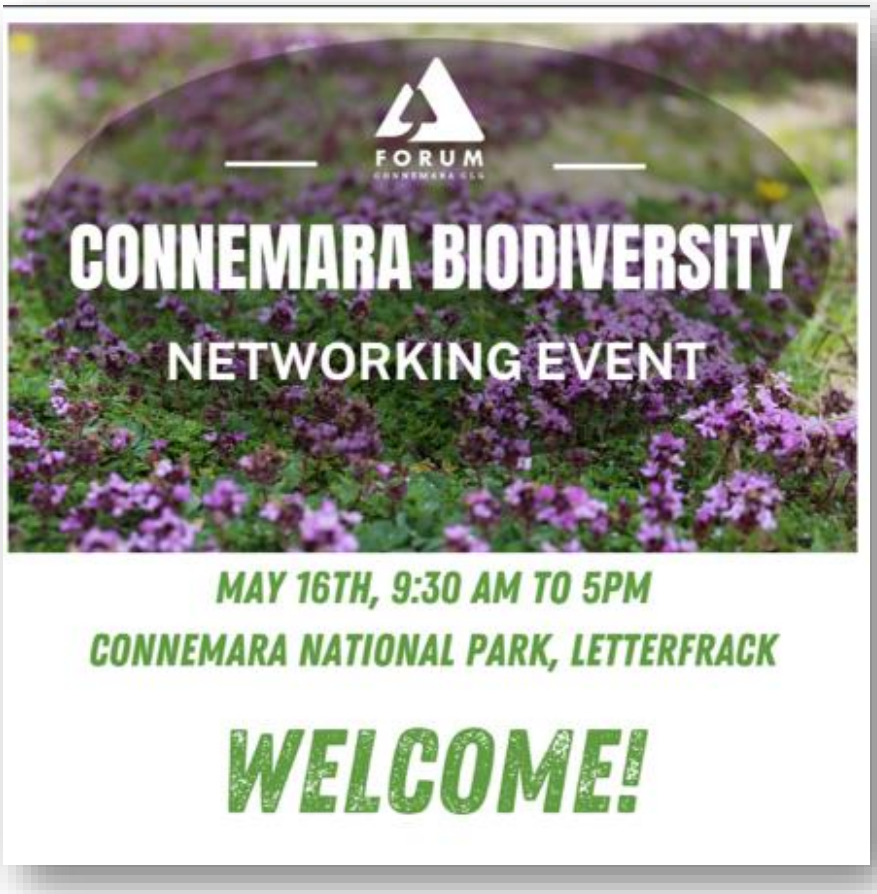
3.4.6.3 Publicity and Networking

The NCLLAES has both hosted and attended events to publicise the project, locally, nationally and internationally.

Figure 20 Irish uplands forum farm walk

Figure 21 Burren Winterage EIP event

3.4.6.3.1 Connemara Biodiversity – Networking Event



This event was organised by FORUM and took place in Connemara National Park on May 16h 2022

This was a full day event open to the public and 50 people attended on the day.

Speakers included:

- The North Connemara Locally Led Agri-Environmental Scheme EIP
- Bundorragha Catchment Rhododendron Control Project
- Joyce Country and Western Lakes Geopark project
- Farming Rathcroghan EIP project
- Dineka Maguire PHD student on trialing ways to reduce chemical usage for weed and invasive species control.
- Guided Walk in National Park - A walk and talk with the rangers in the Connemara National Park. Showing us the rare breeds that are being farmed in the park and also the recent works of Rhododendron Control and removal.
- Freshwater Pearl Mussel EIP Project
- The Caomhnú Árann EIP project
- Dr Derek Mc Loughlin from the Wild Atlantic Nature LIFE IP
- Conor Ruane from LAWPRO
- Galway County Council Biodiversity Officer Rosina Joyce

3.4.6.3.2 Connemara Green Festival

A presentation was given at a local Nature event the Connemara Green Festival along with staff from the Fresh water Pearl Mussel Project. This was well attended by possible participants and others with interest in the local environment.

3.4.6.3.3 The Ploughing Championship 2019

The NCLLAES attended the Ploughing Championship 2019 in September. This was a great opportunity to talk to the staff from the EIP section in the Department of Agriculture and also to other EIPs operating throughout the country, including The Curlew EIP, conserving the Curlew in certain catchments, and the Biorefinery Glas who are working using new techniques to create multiple components form perennial grass.

3.4.6.3.4 Joyce country GEOPARK

Joyce country GEOPARK: The Joyce country Geopark held and event with farmers which Joseph Mannion chaired and Cathy Connelly was also a guest speaker. Farmers discussed what their thoughts were on biodiversity on their farms and also in Ireland as a whole. The event was attended via zoom by numerous international and Irish participants. The Geopark has been set up to try to receive an international recognition which would help to promote the project area to geologists and international tourists interested in Geology.

3.4.6.3.5 Catalonia trip

In late November 2019 the Project team had the opportunity to visit the Catalonia region in Spain to observe other Agricultural projects. Many of the upland EIPs in Ireland were in attendance. It was very beneficial to all to see the way in which farming in remote areas in another country was working. The farms visited were producing produce for their local markets. Local farmers and producers wanted to ensure that they would keep all production at local level, thus giving the product the added value of having a reduced carbon footprint.
A dairy and poultry farm which was visited were using the two operations together. Using a rotational grazing system, the hens' droppings would fertilise the fields where the cattle would be grazing in the future.

3.4.6.4 Methodology

. A nature competition was run by the Project Team which was very successful with numerous entries received from members of the local community who were encouraged to submit pictures of nature while staying within 2km of their home.

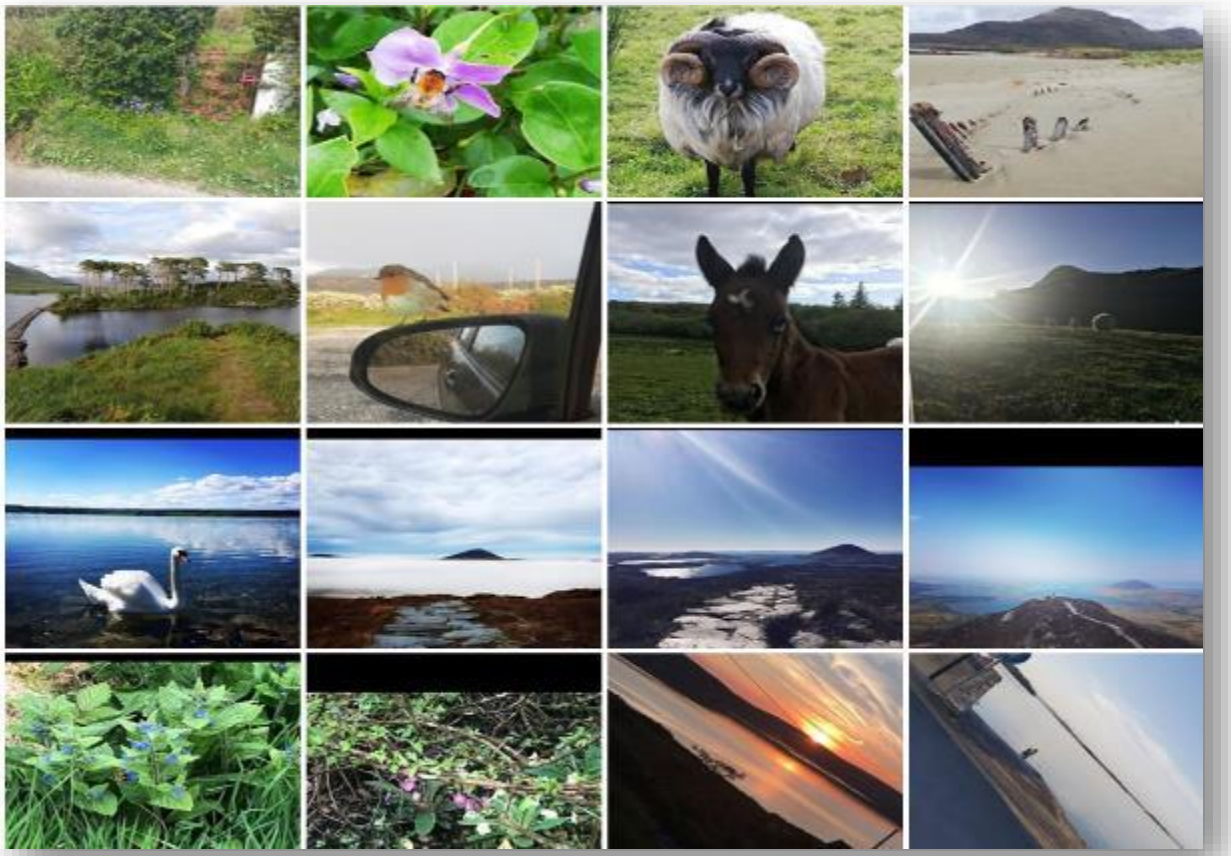


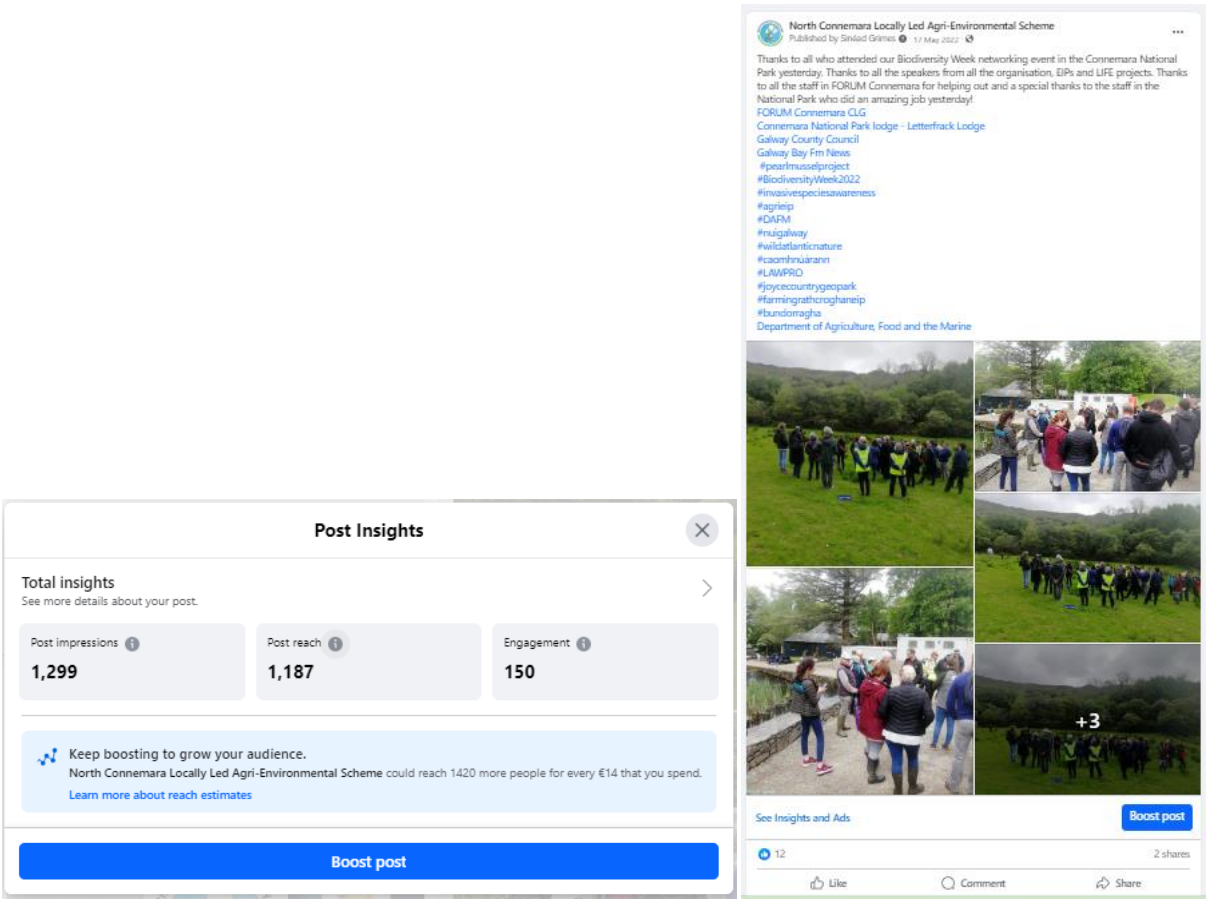
Figure 22 Photo Competition organised during Covid 19

3.4.6.4.1 Radio Shows

The project promoted numerous agricultural ideas and achievements through its radio show on Connemara community radio. Where weekly interviews were held with people from the agricultural, rural development and other ecological projects nationwide.

3.4.6.4.2 Social Media

Based on our initial farmer survey we decided against use of Snapchat / Tic Toc / Instagram/ Twitter and saw that Facebook was the most used social Media tool for our target market.
Our Facebook page had a good reach- as per the statistics below



3.4.6.4.3 Public Talks and media coverage

The scheme had a public presence at the local agricultural shows in Recess, Lenanne and Oughterard. The heritage project was invited to give a talk on farming practices in rural Connemara in the Connemara National Park as part of culture night September 2022, and hold an exhibition of photographs from the scheme.
Scheme participants were invited to share their experiences of farming in Connemara, and local farmer, Mickey Folan, gave a demonstration of using a scythe to cut hay.

A press release was written and sent to the Connacht Tribune, to highlight the activities of the heritage project and an interview was carried out on Connemara Community radio to talk about the collection of heritage and share the details of the social media pages.

3.4.7 Black Faced Sheep Initiative

3.4.7.1 Main Aims

Being the most farmed animal in the project area, the Blackface Connemara/Mayo Mountain sheep is a vital ecological tool. These animals graze at higher altitudes than any other farm animal in the region. When grazed at the correct stocking rate, they can increase and protect the levels of biodiversity in the area. This breed of sheep is generally easy care and can survive on the hills all year round with no

supplementation. They are usually only taken off the hills for breeding and lambing and returned after. Lambs are sold as light lambs which will be fattened for butchering typically on a low land farm in a different area of the country. In general, these lambs sell for less money than low land breeds of sheep but there can be a higher percentage profit as the input costs are lower.

Protecting the viability of the sheep flock is very important to the ecology in the area. Hill sheep farmers and advisors were consulted on the best way to improve the Blackface sheep breed and increase the productivity of an individual flock. Hill farming practices have remained relatively unchanged for generations. This is because many of the traditional practices are still considered to be the best way to do things. As such, many of the more positive traditional practices along with some new techniques have been included in the scheme. Other new practices based on marketing and health have also been included.

Meetings were held as part of the project with farmers from the area. At the meetings discussions were had on the influence sheep production can have on the habitats and actions were created which farmers would be incentivised to carry out. These Actions included:

- Improving the productivity of the flock by increasing the amount of recording of animal husbandry information. Ewes which tend to be a problem or are known not to produce offspring will be removed from the flock.
- Increasing the amount of faecal sampling of the sheep flock to determine if dosing is required. This will reduce unnecessary dosing. They will also weigh the animal to ensure the right volume of dosing is administered.
- Increasing the marketability of the Blackface flock through pure breed creation and signing up to Bord Bia which increased the price of a finished lamb when sent to the factory for slaughter.

For 2021 a new action was implemented where farmers would identify the parentage of the breeding replacement ewe lambs from the hill. This would increase the knowledge the farmers have to make a decision on which ewes in the flock would produce the most suitable offspring to breed from in the future.

Figure 23 Sheep grazing at altitudes of 700metres+

The blackface sheep initiative was initially set up to add extra incentives to carry out positive actions to preserve the important sheep breed that is used most in the Connemara area. Discussing with some farmers it soon came to light that the blackface sheep was not the only breed that farmers were using and, in some cases, they had different breeds entirely. As all grazing animals are seen as being important to ecology and conservation all sheep breeds were considered for the now named "sheep initiative"

All the participant farmers were contacted in relation to the sheep initiative and habitat improvements needed to be carried out in 2021. Booklets were then printed and sent to these farmers. The main options the farmers picked were in relation to improving their sheep flock's productivity, however some farmers took part in a recording program on their flocks which will allow for more detailed improvements in relation to picking the best breeding ewes and their off spring and also which ewes are under performing and need to be removed.

3.4.7.2 Methodology

The actions in this initiative were compiled by numerous conversations with people in the sheep industry, such as sheep Ireland, the local farmers, the local farming groups (IFA and the INFHA) and the vetinary sector. The actions were compiled to be suitable to all farmers nationally be they low land or upland and also be ensuring that new scientific findings were considered. Farmers who have blackface sheep were incentivised to carry out actions to improve their flock through increasing productivity, improving the health of the flock, and increasing the marketability of the flock. Actions included were:

A. Improving flock productivity by culling problem ewes and recording the information: Tag number/reason for culling (broken mouth etc)/age (4+ etc)/area grazed.
B. Marking unproductive ewes who have run with a ram during the mating season but do not bring a lamb to weaning will be marked to see if this is a trend with that individual animal or area. Record Tag number/ identity mark/ grazed area.
C. Supplementation of sheep returning to the hill by forage testing the area to determine what minerals are needed and providing these through a bolus or drench.
D. Faecal egg sampling. Carry out a faecal egg sample once per year to ensure that dosing is needed before it is carried out. Submit sample to lab.
E. Weighing of lambs pre-dosing. Dosing at the correct weight will reduce resistance build up. Weigh the animals before treatment and apply the correct dosage. A dosage which is too low increases the chances of resistance developing in the lamb.
F. Join the Bord Bia Sustainable Beef and Lamb Assurance Scheme Year 1- Farmer will need to be a member of the scheme or receive a Bord Bia inspection from a Bord Bia inspector. If chosen in a subsequent year the farmer needs to pass inspection, as a minimum, to receive payment.
G. Create a Purebred flock though the genotype of an owned Blackface Ram. Run this ram with marked/identified ewes (20) in the breeding season and then remove ram. Ensure

no other ram can mate with ewes for 14 days after ram is removed. Record identity and parentage of lambs, born to these ewes, in the correct lambing dates in booklet.

H. Genotype star ram lambs in flock. Genotype Flock rams and identify parentage of said Star ram lambs and record in booklet.

The first part of the initiative was to ensure the productivity of the flock was increased, improved or conserved. Farmers were incentivised to record the problem ewes on their flocks and to record the exact problem, be that health, poor teeth, breeding or any other problems. This helped the farmer to make a clearer decision on which ewes are needed to be removed from the flock and also what the farmer needs to breed into the new replacements. For example, farmers who may have ewes losing teeth at a young age can buy an older ram with good teeth. This will ensure the longevity of the new replacements in the flock.

The second part was for farmers to increase the health of their flock. The farmers would faecal sample their animals and then dose them if required. This will help with the unnecessary usage of flukicides and wormicides which are becoming less affective through a resistance building up in the parasite. It is also very important when it is necessary to dose based on the weight of the animal and what the dosage is recommended for that weight. Under dosing is a seen as a problem with resistance and over dosing may damage the animal, correct dosing is important.

An important part of the overall scheme was to ensure that there was a possibility to increase the markets for animals and thus increase the amount of income avenues open to the farmers. The farmers were incentivised to join the bord bia scheme which adds a premium payment to any animals that are slaughtered for meat. This is due to the extra quality checks that the farmer carries out on the farm. These checks are also helpful for the farmer as they ensure their paperwork is correct for any inspection carried out by the Department of Agriculture inspectors.

Another part of the initiative was to try to start creating a pure-bred blackface sheep flock. This would be done by matching the parentage of the offspring using genotyping. This action is the start of what is needed to create the pure-bred flock. With known parentage and information recorded about the offspring the breed may be considered to be pure bred if more farmers get involved and start to record the same information. This may lead to an increase in the value of the animal as it is known to be a grazer of higher areas and it also may lead to direct grant aid for the important breed.

Changes

When the scheme started the initial thought was to have an incentive for just the sheep farmers as this was written into the original EIP plan. After year one it was clear that some farmers did not have sheep, they had cattle or equines. The habitat surveys showed there was no increased negative effect on the habitats when they were grazed correctly and as such the initiative was changed to incentivise farmers to carry out actions on their cattle and equine herds.

As some actions were just sheep related, new actions were added to cover the cattle and equines. These new actions were primarily to ensure the enterprise was financially viable, the animals were productive, and they were moved regularly to ensure the ground would have time to recover from the extra weight and grazing pressure.

3.4.7.3 Results

Farmers generally chose the options of increased recording of the flock. They found this beneficial to improving their productivity and output on their farm while also reducing the burden of an underperforming animal.
There was an increase in the uptake of the faecal sampling which we allowed to take place in the local veterinary clinic to ensure the farmer would know the results quickly. In other schemes, the DAFM restricts which clinics a sample can be sent to. This reduces the verbal feedback the local vet can provide which the farmer will take more seriously and understand easier.
The marketing of the flock was seen as a less chosen option for farmers and generally was only chosen by farmers who were fattening lambs for the factory or younger farmers who saw the benefit of their farm being inspected every 18 months by a member of Bord Bia.

The genotyping of the animals was only taken by 2 farmers and they carried this out only once over the 3 years. They saw it as beneficial initially, but when they saw so few farmers taking it up, they did not see the need to continue the process. The genotyping is now part of the new sheep improvement scheme which is been rolled out for the new cap in 2023. It will force farmers to buy rams with known father parentage. Again, it is the start of something which may need incentivisation to continue as farmers, having not used it previously do not see much benefit for it in an upland farm.

The initiative and the actions were seen as been beneficial to the farmer as they gave them a choice of what action would suit their farm. They saw it also as a positive that the actions were planned for a Connemara farm. All the farmers asked have said they would continue with the actions they have chosen as they see them being a benefit to their farm.

3.4.7.4 Cattle & Equine

A payment for making improvements on cattle and equine farms was included for 2021. Of the 96 participants, 11 do not farm sheep. 10 are suckler farmers with the remaining being an equine farmer. The actions these farmers are taking are similar to the sheep farmers, they are also producing a cost control planner and identifying ways in which profits can be increased and losses decreased. Identifying these areas and making changes based on these will increase the viability of the individual farm it may also serve as valuable information to pass onto the other participants.

3.4.8 Innovation

3.4.8.1 Main Aims

Towards the end of the scheme we concentrated on innovative uses for farming by products such as wool and the brash from treated rhododendron as well as topped rushes, furze and gorse. We investigated the use of biochar to deal with the problem of rhododendron brash and built a mobile biochar unit based on a design from America. It was the first of its kind in Ireland. We successfully made biochar from the rhododendron brash and will continue to test the effectiveness of the product. With regards to wool, we pioneered a new product to be used in bog restorations to replace coir logs

– these are currently in use in a bog restoration in Ballycroy, Mayo by the Wild Atlantic Nature LIFE IP project. We hope to be able to secure funding to further explore both of these initiatives.

3.4.8.2 Biochar Methodology

During the treatment of rhododendron on the project we began to recognise that the high quantity of treated rhododendron left standing was going to become an issue for many reasons, for example:

- The dead rhododendron plants could be a fire hazard as the wood is very calorific and cold present a real problem id a blaze broke out in the area.
- We would need to remove the dead plants so that replanting could take place.
- The ground underneath the treated rhododendron was still compacted and possibly toxic and would need to be treated and enriched before the areas could be replanted.

After some initial research we realised that using the rhododendron brash to make biochar could solve these issues. We quickly realised that the commercially available kilns would not suits our needs as we wanted to bring the kiln to make the char where the brash was. So, again we researched and found that the RoCC kiln would be the most appropriate for our needs.
As part of the North Connemara Locally Led Agri Environmental Scheme we built a Rotatable Covered Cavity (RoCC) kiln which can be used for mobile pyrolysis. The idea was that the RoCC could be towed behind an agricultural vehicle into a field and used to make biochar right where the biomass was located. We have successfully made 4 lots of biochar and are continuing to learn and fine-tune the process each time.

Biochar is increasingly being recognised as having a role in the sequestration of carbon as well as having numerous potential agricultural and environmental applications. The Intergovernmental Panel on Climate Change (IPCC, 2018) has identified biochar as one of the most promising NET or Negative Emissions Technology, capable of carbon dioxide removal (CDR).

What is biochar?

Biochar is a stable form of carbon produced by heating organic materials without actually combusting them, a process known as pyrolysis. This differs from combustion, where the aim is to burn materials completely and reduce them to ash. Biochar can be created from various organic sources, with woody biomass being a common choice. In our case the brash from treated rhododendron from the NCLLAES project is ideal as it is very calorific and burns well.

One of biochar's key characteristics is its remarkable longevity in the environment, persisting for decades to even hundreds of years. This longevity makes it a valuable tool for removing carbon dioxide from the atmosphere when produced from biomass. On average, each unit of biochar is roughly equivalent to sequestering three units of carbon dioxide.

Biochar possesses an exceptionally large surface area due to its porous structure, making it an effective adsorbent and a valuable tool for reducing emissions. Its porosity also provides an ideal environment for microorganisms and fungi to thrive when added to soil or mixed with organic matter. Moreover, its surface chemistry and Cation Exchange Capacity (CEC) allow it to retain nutrients and moisture. Certain types of biochar can even effectively capture and immobilise heavy metals and other pollutants.

The production of biochar can be accomplished through low-tech methods like flame cap kilns or sophisticated industrial systems capable of processing large volumes of feedstock. Interestingly, the pyrolysis process itself generates substantial thermal energy, which can be harnessed for various purposes such as process heat or district heating. In some cases, this entire process can yield carbon-negative district heating, where feedstock is transformed into biochar for sale, the biochar is sequestered for environmental or agricultural use, and the heat generated is used to provide heating for local communities.

In recent years, there have been new markets focused on carbon removal. These markets sell certificates to individuals and companies who want to offset their carbon emissions voluntarily. Biochar, when produced in facilities that meet certain environmental standards and capture usable heat, can contribute to these markets. Some of these carbon removal platforms pay around €150 for each ton of biochar produced. Some even sell certificates before removal, which can help startup biochar producers with financing and development.

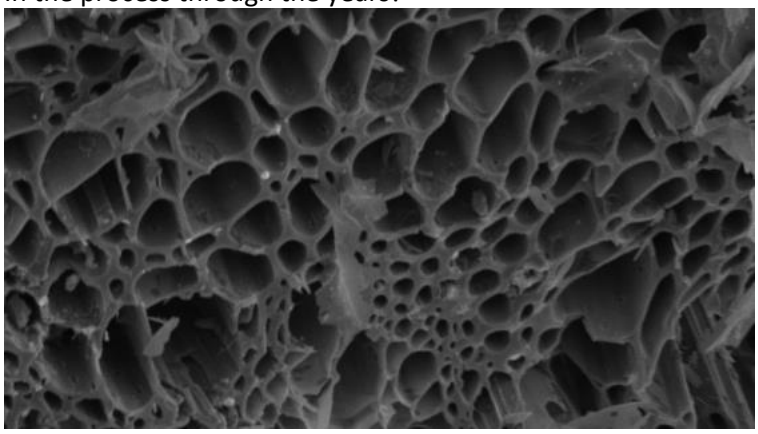
Currently, the facilities participating in carbon removal based on biochar are typically large, industrial operations that run continuously. However, there is growing interest in allowing smaller, farm-scale biochar production units to participate in these carbon markets, especially as part of broader carbon farming initiatives.

It's important to note that using biochar is recommended as an alternative way to use woody biomass, according to certain guidelines and reports, including those from UNESC-ECE and Humboldt County. The National Parks and Wildlife Service (NPWS) has also given feedback on this topic during consultations with Irbea (Irish Bio Energy Assoc)

How to make Biochar?

Biochar is produced through a process called pyrolysis, which involves heating biomass materials, such as agricultural waste, wood chips, or crop residues, in the absence of oxygen.

Biochar has been made for centuries with simple equipment right where it's needed, and it has the potential to help remove a lot of carbon from the environment. But there have been improvements In the process through the years!



Some specific units like Exeter Retort, Kon Tiki Kiln, and the Oregon Kiln use a technique called the flame cap method. This means that any gases produced during the process are burned at the top of the kiln, making the combustion cleaner with less smoke and particles. This also helps turn the biomass at the bottom of the kiln into biochar. To make sure it doesn't reignite, the hot material needs to be cooled down completely with a water or slurry mix.

On-farm pyrolysis

As mentioned above as part of the NCLLAES we built a mobile Rotatable Covered Cavity (RoCC) kiln which could be towed behind an agricultural vehicle into a field and used to make biochar right where the biomass was located.

Figure 24 The RoCC Kiln built by the NCLLAES scheme for making biochar.

(There are a number of other companies looking at developing farm-scale equipment that are likely to be coming online in the near future.)

Top-down fire management

In the absence of commercial biochar production equipment, and in order to minimise any negative air quality impacts arising from the burning of biomass, simple fire management techniques, employing the “top down” burning approach should be employed. Evidence suggests that burning from the top down, rather than the bottom up, reduces the emission of pollutants significantly.

Along with careful arrangement and stacking of the pile so that largest material gets stacked on the bottom, and it graduates upwards, by igniting the smaller material at the top of the pile and allowing it to burn from the top down, it greatly reduces the amount of smoke and particulate that is produced. Farmers should be made aware of this approach compared to setting fire to the base of a pile which

produces far more smoke and particulates. This approach can also yield some biochar at the end, although the yield will be less than biochar produced in a kiln. But importantly, it can effectively be considered cost neutral.

The biochar can then be sold or used on farm in a variety of potential applications.

Biochar Uses

Biochar uses on farm	Biochar uses off farm
• Soil amendment • Biofertiliser component • Compost additive • Slurry/manure additive • Filtration medium • Animal Bedding • Animal Feed additive	• Domestic Animal feed additive • Soil amendment • Peat moss replacement (when mixed with other organics) • Green roof substrates • Additives for construction material such as asphalt/tarmac, mortar and concrete • Filler for thermoplastics and biomaterials • Water filtration media for SUDS, swales, rain gardens, constructed wetlands etc. • Compost additive • Media for land reclamation- e.g. former brownfield or mine sites

Forestry: United States Agriculture Department (USDA) US Forest Service -The US Forest Service has been turning to the conversion of woody biomass through the use of mobile biochar production kilns, which can be brought to site rather than transporting feedstock to a central processing site.

This allows for sustainable management of pest-infected timber as well as woody biomass that represents fire risks. The resultant biochar can then be returned to the forest soil, particularly during reforestation efforts. For further information, the USDA have produced an A-Z of the biochar basics (USDA, 2022).

This may especially be of interest where the replanting of heavily infested areas of rhododendron may take place. The toxic leaf litter and soil compaction that will have resulted from years of rhododendron monocultures could be reversed somewhat by the positive effects of activated and inoculated biochar. Depending on how biochar is used, it is often incorporated back into the soil as part of a sustainable approach.

For example, if you add biochar to winter slurry storage tanks on farms, it can help reduce emissions from these tanks, absorb nutrients from the slurry, and then release those nutrients slowly into the soil when the slurry is spread. This enriches the soil with carbon and nutrients while preventing excess nutrient runoff during heavy rains.

Biochar is also being tested to address problems like surface water runoff, water pollution, and harmful algal blooms caused by too many nutrients in water. It can be used in structures like sediment traps, filtration ponds, or biofilters to improve water quality and reduce nutrient loss from farms. There's even a project called REFORM WATER in Finland that's trying biochar in drainage networks to reduce the amount of dissolved organic matter in water coming from forested peatland areas.

3.4.8.3 Wool use Methodology

As part of our work with farmers we quickly realised there was a need for an innovative use for wool. Sheep must be shorn annually for their welfare. The farmer pays €1.50 to €3.00 per sheep and receives only 5 cent per kg when selling the fleece.
After some research we settled upon the idea of using wool as a tool in bog restorations.

3.4.8.3.1 Wool use in bog restorations

Currently imported coconut husk, manufactured into coir logs, are being placed across eroding gullies on degraded peatlands in Ireland and the UK. The logs stop heavy rain washing away the exposed peat, allowing mosses and other vegetation to grow back. This not only supports biodiversity and helps to reduce downstream flooding but, over time, healthy peatland can pull in and store huge amounts of carbon from the atmosphere.
However, there is a carbon footprint attached to bringing in these coir logs from Sri Lanka and India. We thought why not use our own native wool which is more sustainable and environmentally friendly a solution.
To this end we cooperated with Ulster Wildlife Trust who had trialled the idea in Fermanagh and after a site visit, we took their prototype one step further and make wool logs using jute sandbags.
This is the first of its kind in the Republic of Ireland and they are currently in use in a bog restoration Ballycroy, Mayo in conjunction with the Wild Atlantic Nature LIFE IP project.

Figure 25 The Wool log in Fermanagh Bog Restorations

Figure 26 Our Wool log Prototype in use in Ballycroy, Mayo.

We also investigated the possibility of using wool as a fertiliser, however budget constraints and the time left in the scheme stopped any further research on this initiative. However, we have spoken with some farmers on the possibility of using wool in compost and trials on this are currently underway with two farmers on our scheme.

3.4.8.4 Results

- Created awareness around the composting potential of wool – several farmers are testing this out on their farms.
- Built a mobile pyrolysis unit to make biochar from the treated brash of the rhododendron – there are many potential uses for this biochar for example, fertiliser, a soil improver and a potential for controlling pollutants in water (currently being trialled by Lawpro and Coillte nature)
- We piloted the use of Wool Logs for Bog restoration – the first of its kind in the Republic of Ireland – they are currently in use in Ballycroy, Mayo in conjunction with the Wild Atlantic Nature LIFE IP project. The wool logs have successfully

3.4.9 Farmer Based Payments

3.4.9.1 Main Aims

Efforts to incentivise ecological improvements and the adoption of conservation techniques hold the promise of making hill farming a more viable and sustainable endeavour. By offering incentives that reward farmers for their contributions to ecological stewardship, it becomes economically feasible to integrate practices that benefit both the environment and agriculture. Such incentives can play a pivotal role in ensuring the long-term viability of farming in these challenging terrains.

In early spring 2020 payments were made to farmers. These payments were related to the Blackface sheep initiative as well as the habitat survey and habitat improvement plans. Farmers were contacted in relation to their works which included fencing, flock management and the increase of pollinators on the farm. Inspections were carried out to ensure works were carried out correctly. The payment amounts were then sent to the financial administrator for payments to be made.
Payments for 2021 were made in December to farmers who carried out conservation and improvement actions on their farmland.
Payments for 2022 were made in January 2023. These payments were related to the Blackface sheep initiative as well as the habitat survey and habitat improvement plans, rhododendron control and group meetings. Farmers were contacted in relation to their works which included fencing, flock management and the increase of pollinators on the farm. Inspections were carried out to ensure works were carried out correctly. The payment amounts were then sent to the financial administrator for payments to be made.
In the 3 years the project operated, from 2019 to 2023, €776,674.26 in payments were made to participants.

3.4.9.2 Methodology

Farmer based payments were related to the Blackface sheep initiative as well as the Habitat survey and habitat improvement plans. Farmers were contacted in relation to their works which included fencing, flock management and the increase of pollinators on the farm. Inspections were carried out to ensure works were carried out correctly. The payment amounts were then sent to the financial administrator for payments to be made.

Habitat Improvements 2020

Payment breakdown

Action	Type		Proof of work carried out
Fencing			
Replacing existing Fencing	Mountain rate (not trafficable by a tractor)	€8.00 per metre	Pictures/Maps/Receipts
	standard rate	€5.00 per metre	Pictures/Maps/Receipts
Repairing existing fences	standard rate	€3.00 per metre	Pictures/Maps/Receipts
Gates	4ft	€235	Pictures/Receipts
	8ft	€262	Pictures/Receipts
	10ft	€279	Pictures/Receipts
	12ft	€296	Pictures/Receipts
	14ft	€300	Pictures/Receipts
	15th	€306	Pictures/Receipts
Holding pen (sheep)	Multiple holding areas	€400	Pictures
Other			Pictures/receipts
Pollinator habitat	Keeping Bee hives	€200 per hive	Pictures
	Growing vegetable patch	€200 per Farm	Pictures
	Biodiversity area	€200 per farm	Map
Increasing Biodiversity	Topping/strimming field	€120 per hectare	Map/Pictures
Change of stock	Purchasing of cattle/sheep/other	€300 per livestock unit	Proof of purchase date
Shepherding			
	Replacement Mapping	€800	Booklet
	GPS Mapping	€800	Proof of purchase
Bonus Commonage Collaboration Payment	Works carried out on commonage with other shareholders	1.5 times payment	Pictures/Maps/Receipts

Figure 27 Table showing the Payment Breakdown for Habitat improvements in 2020

3.5 Closing Evaluation

The EIP schemes are a great opportunity to collect information and trial different actions on the ground with farmers. The findings of these actions are very important and need to be disseminated. Sharing this information to others will help them to make more calculated decisions if they are intending on carrying out similar processes in the future.

3.5.1 Programme changes

When the initial plan was drawn up for the NCLLAES program some initial actions were thought to be suitable goals for the uplands and the type of farming carried out in the area.
After the Habitat Surveys were carried out and after discussions with the participants some of these actions were then found to be redundant or not as strategic as initially thought.
All changes in the scheme plans were cleared with the Steering Committee and communicated back to the department and alternative more appropriate measures put in place.
The initial project actions and targets were as follows:

Actions	**Targets**
Rhododendron Removal	200 HA
Scrub Control	100 HA
Track Maintenance	30 KM
Stone Wall Repair	15 KM
Control Burning	100 HA

The following changes were mae:

- The Action specifically stated Rhododendron 'removal' however, removal is not possible without control. The Action was changed to Rhododendron Control 200Ha.
- It was found that scrub, which was included as in the project plan with a target of 100Ha removal, only amounted for 11Ha of land. This measure was not progressed.
- As scrub was not seen as an issue the Action of Controlled Burning was also not seen as an appropriate action for the area.
- Track Maintenance was not something that was seen as an issue by the participant farmers, and as such was not continued.
- Stone walls are being covered by GLAS and was not pursued in the NCLLAES to avoid double payments

3.5.2 Key Performance Indicators: ....

The following tables outlines the strategic goals, key program actions and the Key Performance Indicators for what was achieved:

Strategic goals, key program actions	**Key Performance Indicators Achieved?**
• 200ha of rhododendron controlled.	Over 323ha of rhododendron has been controlled.
• 100ha of scrub under management.	From Habitat surveys it was established that scrub is not a problem in the project area. (Only 11ha affected)

• 1500ha under management through the blackface sheep initiative.	Over 10,000 ha under management in the blackface sheep initiative. Altered to include cattle and horse farmers.
• Group management initiative running efficiently. 1200 person days of management complete.	Group management was heavily affected by public health restrictions. However, training, public and information events have been held and widely attended. The goal was reached through the training events and workshops and group meetings that were held.
• 30km of track repaired and enhanced.	Based on participant feedback track was not an issue on the participants lands. FORUM Connemara operates a Rural Recreation Scheme, and this alleviated any damage caused by Tourists or enthusiasts walking trails. After discussion and agreement from the steering group, this goal was not pursued in the programme.
• 15km of stone walls repaired.	Stone walls are being covered by GLAS and this was not pursued in the NCLLAES to avoid double payments. After discussion and agreement from the steering group, this goal was not pursued in the programme.
• 20 days of training delivered.	Training was affected greatly by COVID-19 and began in earnest in 2022 and amounted to in excess of 30 days by the time the scheme finished. Farmers to date have been trained in: • Pesticide application • Chainsaw usage • Electric sheep shearing • Sheepdog training • Fencing
• 100ha of controlled burning carried out.	Habitat surveys showed that Burning was not needed in the scheme. After discussion and agreement from the steering group, this goal was not pursued in the programme.

• Results of non-chemical methods analysed.	Nonchemical methods were investigated, and a PhD Student was put in touch with our organic farmers for investigation of rush and rhododendron control. We also trialled copper nails, stump cutting and hand removal of regrowth and wool as a weed suppressant – all worked to various degrees. We have 6 farmers continuing the trial with Wool as a suppressant after stump cutting as this was seen to be most effective non-chemical method of control. However, chemical control was the most effective method of control.
• Suitable cattle breeds reintroduced.	Farmers have trialled different breeds of cattle on hill ground
• Annual celebration day for the project well established.	Public event planned in quarter 4 of 2022
• Research and schools project established.	Schools program well established. Young Farmers Easter camp was successful in introducing young people to the multiple farming industries in Connemara
• Outreach programme will have encompassed a wide range of local and national media outlets.	Monthly slot on Connemara community radio plus Regular write up in Connacht tribune. Social media competitions pushing biodiversity
• Publication of project literature on several databases.	Information in relation to invasive species sent to participants and the wider public. Social media promotion also engaged. promotion of EIP in cooperation With Shane Young from RDP in NUIG
• Public meeting	A public meeting was organised by the NCLLAES and held alongside the other EIPS in the Connemara National Park

4 Financial Overview

For detailed project finances please see the quarterly project financial reports submitted to the Department of Agriculture.

4.1.1 Summary

- The project budget was €1,424,284.00
- €901,619.89 of this budget was spent directly on the implementation of the programmes objectives.
    - Of this approx. €776,674.26 was directly paid to farmers as part of the Farmers Payments incentive.
    - €7,508.82 was spent in projects with the local schools as detailed above.
    - €163, 291.13 was spent on the rhododendron control team.
    - €78,160.54 was spent on training and direct implementation costs.
- The overall project personnel and admin cost was €536,858.79
- The total project spend came to €1,438,478.68

For detailed financial breakdowns please see the financial reports given to the Department of Agriculture Food and the marine on a quarterly basis for the duration of the project.

4.1.2 Value For Money

All purchases were done following FORUM Connemara purchasing guidelines with 3 quotes sought for all items.
We sought to do as much of the administration and social media inhouse and kept costs to a minimum.

5 Lessons Learned

The EIPs present a valuable chance to gather data and experiment with various approaches at an individual farm level. The outcomes of these various actions hold significant importance and should be shared widely. Even if the results are not as expected, they might prove effective in a different context or be valuable lessons in their own right. Sharing this information with other farmers, decision makers or government departments, can assist them in making informed decisions if they plan to undertake a similar process in the future. Failure can be a powerful teacher, offering insights into what works and what doesn't in the unique context of hill farming. These lessons, though sometimes challenging, contribute to the collective knowledge base and inform future strategies for sustainable farming practices in upland areas.
Even in cases where the actions undertaken do not yield immediate success, there remains a valuable opportunity to learn.
The information that is being collected by the NCLLAES has been shared at different events both online, via radio and local and national papers and in person. The NCLLAES has also attended events such as the Burren winterage school, The green festival, the local geopark programme and the Irish uplands forum among others.

To summarise in a few paragraphs the main findings of the NCLLAES EIP we would highlight the following areas:

Livestock as Biodiversity tools: Ecology and hill farming share an inseparable connection, with the well-being of these landscapes intricately tied to the practices of those who tend to them. It's increasingly recognised that agriculture, particularly sheep farming, can yield substantial ecological benefits. Sheep, in this context, emerge as valuable ecological tools, aiding in the maintenance and enhancement of biodiversity in upland areas. This growing awareness underscores the potential for farming practices to serve dual roles as both agricultural endeavours and contributors to environmental conservation. Rewards for farmers utlising the best practice in rotation of the grazing pastures will reap rewards for biodiversity in the uplands.

Technology to balance work life balance: The integration of technology into the daily lives of hill farmers can significantly alleviate the inherent challenges of their occupation. Technological advancements can streamline various aspects of farming, from data management to livestock monitoring, ultimately enhancing efficiency and productivity. This technological integration not only eases the burden of farm management but also ensures that farming remains competitive and sustainable in the modern era. More time and money need to be invested in training and grants towards investing in this technology.

Locally Led approach works: Farmers in these regions often express a keen interest in a locally led approach, where their opinions and insights are actively considered in the decision-making process. This participatory approach fosters a sense of ownership and engagement among farmers. They appreciate the opportunity to experiment with different actions and techniques on their farms, reflecting a commitment to learning and adapting to evolving environmental and economic conditions. This enthusiasm should be encouraged and rewarded.

To expand on these learnings we would also add the following:

- Schemes which are administered locally are beneficial to the farmers as any issues can be solved quickly and personally.
- Holding training events has been very successful and there is great interest when these events are organised locally.
- The changes to farmers thinking towards “results based” has been evident in the group meetings and conversations.
- Having low levels of paperwork has helped to administer the scheme.
- Farmers are taking control of removing rhododendron off their lands in the correct manner.
- Those outside of the farming community have taken an interest in the scheme through the social media updates. Interactions have increased between the farming community and the NCLLAES as well as the general public. This has helped others to understand the positive effects of farming on biodiversity.
- Farmers have been upskilled through training.
- Training events are also a tool in combating social isolation, increasing networking opportunities.
- Disseminating ecological and agricultural information to the local educational institutes was a key output of the NCLLAES.
- Farmers were incentivised for carrying out actions which protect the important habitats.
- Data on the habitats were collected and stored.
- Increased public awareness of the invasive species growing in the area.

- Increased network of individuals working towards habitat conservation in the Connemara area.
- More cooperation and networking between agencies and main operators in the area to better plan for future biodiversity control. For example, Coillte, LAWPRO, NPWS, Kylemore, Delphi, Killary, Screebe, Leenanne Development Assoc, Local Tidy Towns groups and schools.
- Increased level of technology being used for habitat surveys in the area.

Conclusions

- Locally led schemes are better able to focus on specific problems in an area.
- Ensuring the local farmers are part of the scheme from the start has ensured their continued support.
- Agriculture and biodiversity are always changing due to environmental factors: Policy changes, climate, socio economic issues etc. EIPs allow for flexibility, and this works very well on the ground.
- Farmers are an important part of ecological conservation and protection on the uplands. The viability of hill farming needs to be protected to ensure the farmers can continue to manage these unique upland areas.

Summary

- ► Ecology and hill farming are intertwined.
- ► Increased awareness of agricultural benefits to the environment –Sheep are an ecological tool.
- ► Incentivising ecological improvements or conservation techniques will make farming in upland areas more viable.
- ► Incorporating technology into daily farm lives will make hill farming easier.
- ► Farmers are interested in the locally led approach where farmers' opinions are considered. They welcome the opportunity to try out actions on their farm.
- ► There is an opportunity to learn valuable lessons even where actions are not successful.

5.1.1 Acknowledgements

The NCLLAES would like to thank the following:

- To the local farmers and the community on the whole for their continued support of the project.
- All EIPS nationwide who have been very helpful and have provided assistance to the NCLLAES team on numerous occasions.
- Local businesses who provided prizes for the Logo Competition.
- The local school's principals and teachers for allowing the NCLLAES to present the scheme to the students.
- To the primary school students who provided amazing drawings for the logo competition.
- The Department of Agriculture, especially all the staff working on the EIP programme.
- The Steering Committee for adding their knowledge and expertise to the project.
- To all the individuals who have participated in the nature competition on our social media page
- To our colleagues in FORUM Connemara for their continued support.

6 Actions to carry forward.

In this section we list any outstanding items which still need to be undertaken even though the project has satisfied the above completion criteria. For each item, we list the actions required to be undertaken and the Owner responsible for undertaking the action.
We are eager to focus any future investigation on:

- Invasive Species control – we would like to expand the knowledge of treating rhododendron to gunnera and knotweeds etc.
- Using Wool as an environmentally sound, low carbon footprint tool for environmental restorations as well as an organic fertiliser.
- Biochar as a soil enhancement and methods of reducing farm waste from brash (rushes / bracken / rhododendron)
- Carbon credits for farmers.

7 Project Closure

Please also see the Project Finalisation Procedures document

7.1 Approval

Name: Karen Mannion
Role: FORUM CEO

Signature: _____

Date: 20 / 10 / 2023
/

Name: Terry Keenan
Role: Chair of FORUM Connemara

Signature: _____

Date: 20 / 10 / 2023

Name: Sinead Grimes
Role: Project Manager

Signature: _____

Date: 20 / 10 / 2023

By signing this document, I grant approval to formally close this project and complete the hand-over activities as described above.

8 APPENDIX

In this section we list all project documentation generated to date which relates to the project closure criteria specified as well as all other relevant information or correspondence.

8.1 Year by Year list of project activities

8.1.1 2019

- 2019 was the start of the scheme with the project manager and administrator being hired in May.
- An educational programme was created and rolled out to the primary schools in the project area. A competition also took place for designing a logo for the scheme. Local businesses donated prizes and spread awareness of the scheme locally.
- Meetings were held with local farmers, agricultural workers and the steering committee. These meetings were used to create specific actions that will work towards the scheme's overall goals.
- The scheme is locally led and getting feedback from the future participants was important to ensure farmers would join and interact with the scheme for the duration. Farmers were interested in the different parts of the scheme and how they would work.
- An invasive species conference was held by the Galway County council in June 2019. AT the event Mayo County council showed the best way to try and tackle any invasive is first to record the extent of the problem.
- The terms and conditions of the scheme were created in September 2019.
- A meeting was held with Evolve technology. This company has created a mapping application which can record the habitat information and the level and location of invasive species in an area. The Primary focus is on Rhododendron, but a plan will be put in place to control all invasive species in the area.
- A steering committee meeting was held in September at which it was agreed an ecologist would be hired directly by the scheme. The post was advertised, and interviews were held in November. An ecologist was appointed to the scheme and the position begun in 2020.
- A group of EIP teams visited EIP's in Barcelona in November. This was hugely beneficial for knowledge sharing by seeing the different problems other countries are going through and their solutions to these problems.
- The year ended with public meetings and a call for farmers to send in expression of interest forms to take part in the scheme. The meetings were held in different locations of the project area, this ensured an even spread of participation. Expressions of interest were sought and 144 were received from individual farmers.

8.1.2 2020

- 2020 started with individual farmers meetings. The farmers were met to gauge their interest in taking part in the scheme. Having received 144 expressions of interest, the project team created a selection criterion of which 117 farmers met and were issued contracts. 96 contracts were returned and these were the participants of the scheme for 2020.
- The farmers with sheep picked actions from the blackface sheep initiative to improve their sheep flocks for 2020.
- The project's ecologist started working in spring.
- Different existing score cards were tested before creating a suitable score card specific for the project area.
- Having received the app from Evolve technology to be trialled, the project team used this app to survey different fields which contained Rhododendron. This app made mapping Rhododendron in the project area more efficient.
- Covid 19 had a large effect on the project; preventing surveys being carried out, meetings being held and training being arranged.
- Bi-weekly meetings were held with other EIP groups.
- Habitat surveys started in May and were finished in September.
- Habitat improvement plans were made with input from the farmers. Participants increased biodiversity on their farm through topping, controlling the grazing levels by repairing and replacing fencing, controlling grazing on the hill through breeding etc.
- Pesticide training took place for participants in September as part of the Group management initiative. This was a great way for social interactions to take place between the participants.
- Farmers received payments for:
    - Habitat survey results
    - Blackface sheep initiative

8.1.3 2021

- 2021 started with Covid restrictions in place which pushed out the farmers meetings again.
- Farmer payments were made:
    - Habitat improvement works from 2020
- Habitat surveys took place in April.
- Rhododendron training took place. Farmers were met one to one and shown the technique which would be incentivized by the scheme.
- Sheep shearing training, one of the group management events, took place in July. 20 participants took part in a very successful event.
- Group management meetings were started in October with the first of these being a training event for the scheme.
- The Irish uplands forum held a meeting in Connemara where a farm walk on a NCLLAES farm was organised.

- The scheme was officially opened by Minister McConalogue in October. This event was delayed several times due to Covid.

Figure 29 Opening of the scheme by the Minister

8.1.4 2022

- Payments for 2021/2022.
- Continuation of works on the Initiatives.
- Increasing the level of Rhododendron clearing.
- Work through the budget ensuring that works that can be incentivised are.
- Continue to disseminate information to the public.
- Carry out habitat survey for year 3.
- Supply information to the participants about the ecology on their lands.
- Hired team of 10 rhododendron operatives to control rhododendron in Connemara.
- Continue to organise training events that will benefit farmers:
    - Shearing
    - Chainsaw training
    - Pesticide
- Hold group management meetings.
- Continue meeting with EIP groups.

8.2 Testimonials from beneficiaries/participants

Testimonials from beneficiaries/participants

John Gerard Keane The NCLLAES scheme, which was set up to support farmers in the area to carry out sustainable, beneficial agricultural and environmental actions on their farms, was a brilliant scheme and a major success. It identified and addressed problems that affected farmers in the catchment area. The scheme definitely helped both financially and structurally with the management of farms and the sustainability of farming. It's unfortunate that the scheme is ending on the 31st of March. The scheme involved the participation and engagement of farmers with Joe Mannion from the outset which enabled them to identify and address the scheme initiatives. (In my opinion, this was a bottom-up approach rather than a Top-down) Thanks to FORUM who initiated this scheme with the Dept. of Agriculture and to Joe, Sinead and team for all for their work and support.
Denis Laffey: I'd like to thank Joe, Sinead and all the team at FORUM Connemara for the professional rollout of the local environmental scheme in which they worked closely with the local farmers. Nothing was a problem and solutions were found for anything that needed fixing. The results-based scheme was great in that you knew exactly what you needed to do and when it was completed, one of the team would drop by to inspect the work. Sorry to see such a well-run project finishing. Thanks again to all the team. Denis.
Patrick Kerrigan Thanks to Joe and the team for all their help. I found the scheme very informative. Great for livestock management, identifying problems in culled ewes, etc and for grants for farm improvements. Hopefully, we'll see schemes like that through Forum in the future. Best of luck to the Forum team.
Patrick O'Toole I would like to thank Joe and all the team for running the NCLLAES scheme, in particular for the system of getting rid of the Rhododendron which I had tried myself previously without success. We now have a way of eliminating it. The payments for farm improvements were also helpful as were the various courses in safety and training.
Michael Conroy I wish to concur with all the previous messages about this scheme and to reiterate again how appropriate it was for this area of rural Ireland. But as we all know a scheme is only as good as those leading the project and as others have stated previously and I concur this is where Joe and all the forum staff, like Sinéad shone brightly. Thanks again to you all for the practical/financial help and guidance. Regards Michael Conroy
Noel Joyce A great scheme and very well suited to Connemara farming. Joe, Sinead and all the Forum staff were very supportive and helpful in all aspects of sustainable farming. The great thing about it was the fact that you had specific work to do and payment was based on that and that added value to our farm. Thanks to Joseph and the forum team and also to Sinead for picking up the pieces at the end. Regards Noel Joyce

Paul Harrington The NCLLAES scheme was extremely helpful to me after I took over the family farm. It provided a lot of training and farm investment funding, I needed to get a good start. The scheme was very relevant to the types of farming used in Connemara. Joe Mannion and his colleagues, Sinead and Cathy are extremely friendly and helpful people to deal with and I wish them well in the future. Paul Harrington Maam.
Josephine Wallace, I want to thank Joseph for all the help he gave us, in particular, the financial support towards the maintenance of fences was of great support, it was a very suitable scheme for the area, Best Regards, Josephine Wallace.
Gerard Heanue I found the NCLLAES EIP and working with the team on it a straightforward task. Simple and easy to operate were the two things that stood out about this scheme. My overall farm benefited a great detail from the scheme with help to upgrade my fencing and gates, overall improving the operations of the farm. Without the financial support the scheme offered I would not have been able to do this work. So a great success in my book! Well done to all involved and thank you! Gerard Heanue

8.3 FORUM Farming - Phone Survey results

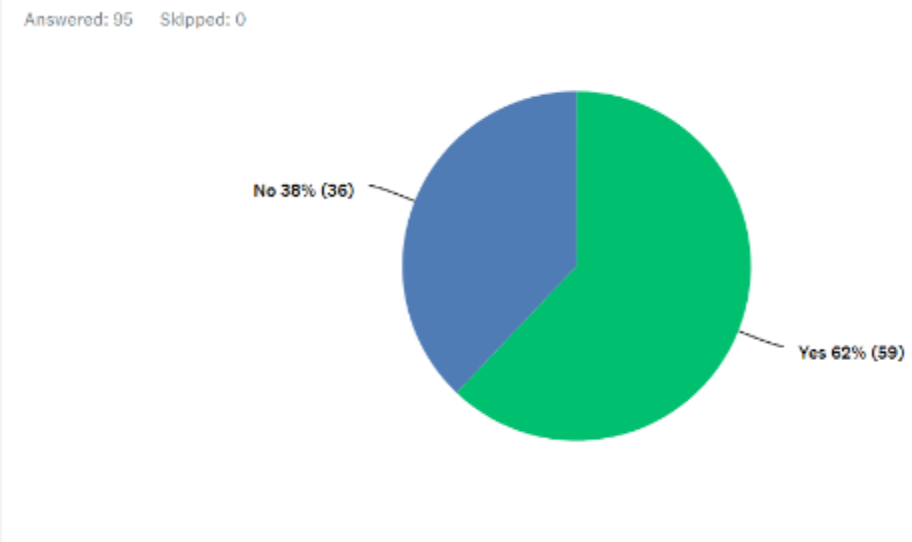
GENERAL SECTION

95 respondents – Carried out January 2022 (phone interview)

How long have you been farming?

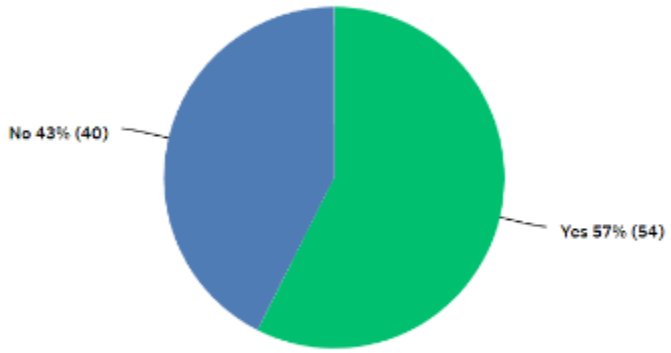
Less than 5 years	7
Between 5 & 10 years	15
Between 10 and 15 years	3
Between 15 and 20 years	8
Between 20 and 25 years	10
Between 25 and 30 years	14
Between 30 and 35 years	3
Between 35 and 40 years	8
Between 40 and 45 years	2
Between 45 and 50 years	2
Over 50 years	23

Do you have an off-farm job?

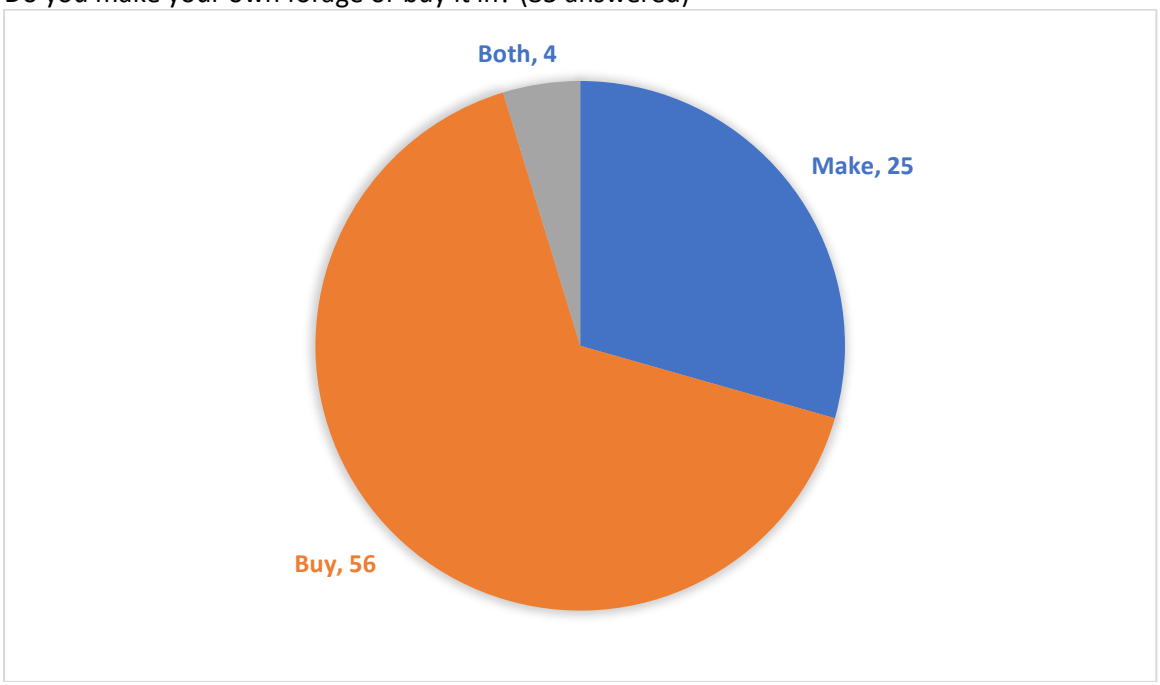


Do you buy feed stuffs in bulk?

Answered: 94 Skipped: 1

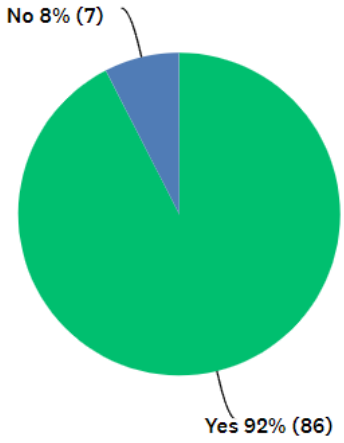


Do you make your own forage or buy it in? (85 answered)



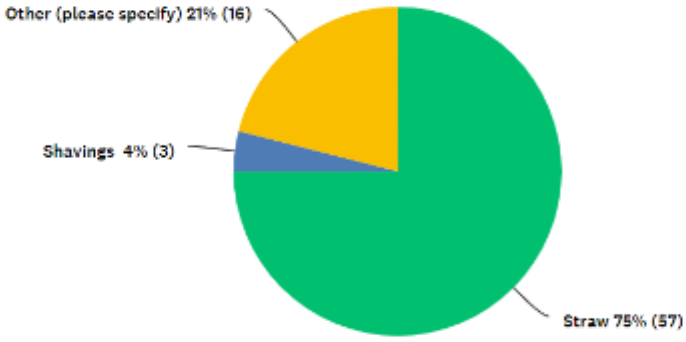
Do you like attending meetings or training events?

Answered: 93 Skipped: 2



What bedding if any is used straw shavings or wood chip?

Answered: 76 Skipped: 19



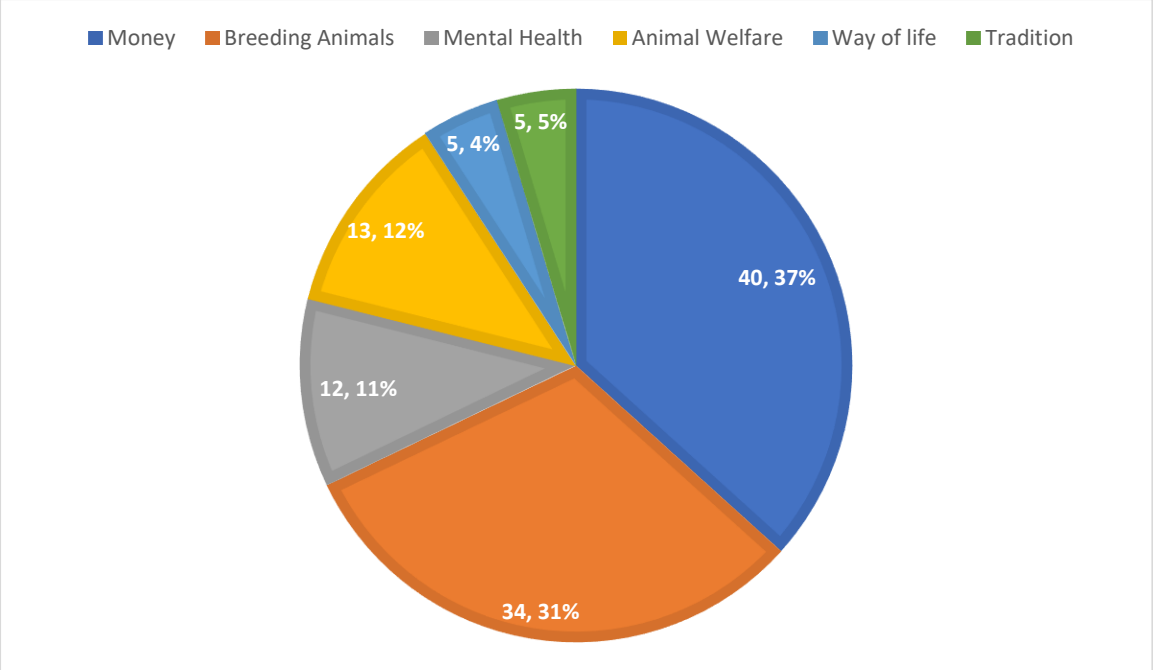
Other was

none		62.50%	10
straw		18.75%	3
sawdust		18.75%	3

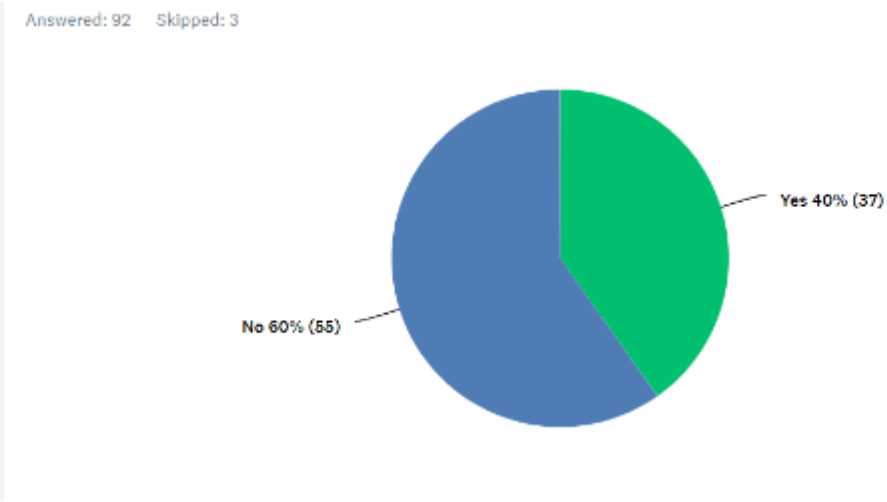
What animals are you farming?

sheep	88.42%	84
cattle	35.79%	34
ponies	4.21%	4
Horse	3.16%	3

What is the most important thing about Farming to you?

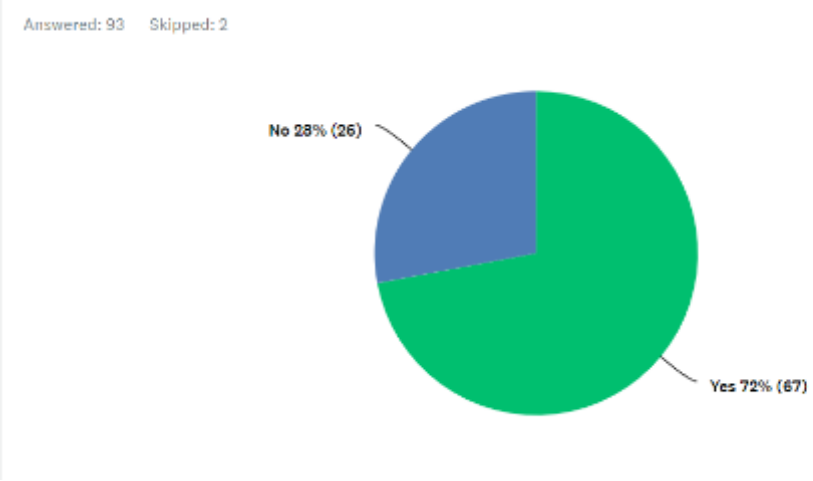


Have you a herd health plan in place on your farm?

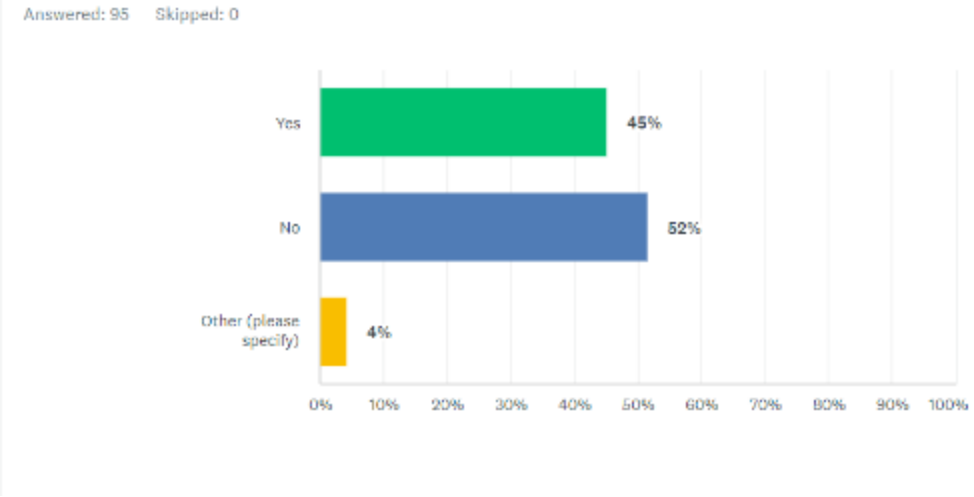


What do you see as the biggest challenge to the viability of farming in the area?

Would you watch short, relevant online videos?



Is there a vermin control plan on your farm?



Is there any area where you would like to receive training in?
49% said yes, they would like training in the following areas:

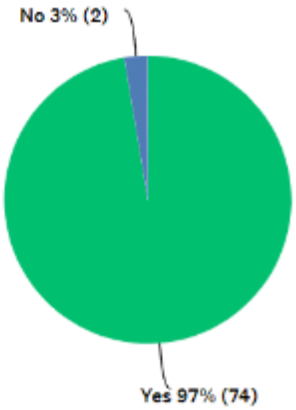
- sheep welfare
- Ag food pilot website
- quad safety
- grassland/Rushes management
- animal husbandry
- information meetings
- dog trails/training
- cows at calving time pros cons and dangers
- sheepdog trials/working them
- Environmental information
- fencing
- Animal Welfare
- Chainsaw
- faecal/feral egg sampling
- Animal breeding
- Farm Safety
- Rhododendron
- Farm Accounts / taxation
- Flock register online

Comments:
Training only on weekend

FARM SURVEY

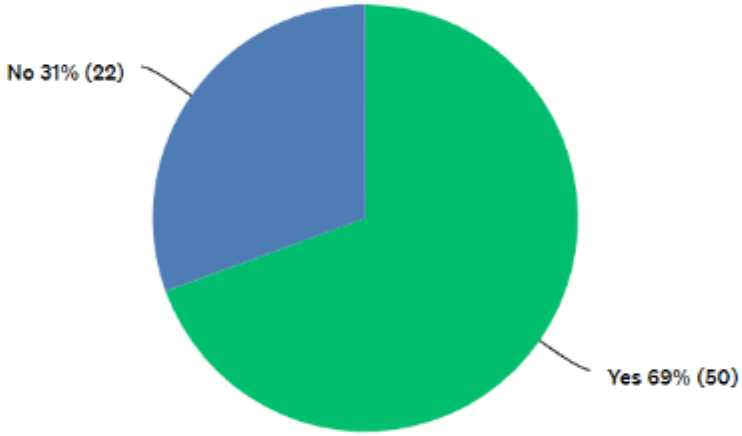
Would you be willing to join another agricultural scheme?

Answered: 76 Skipped: 19



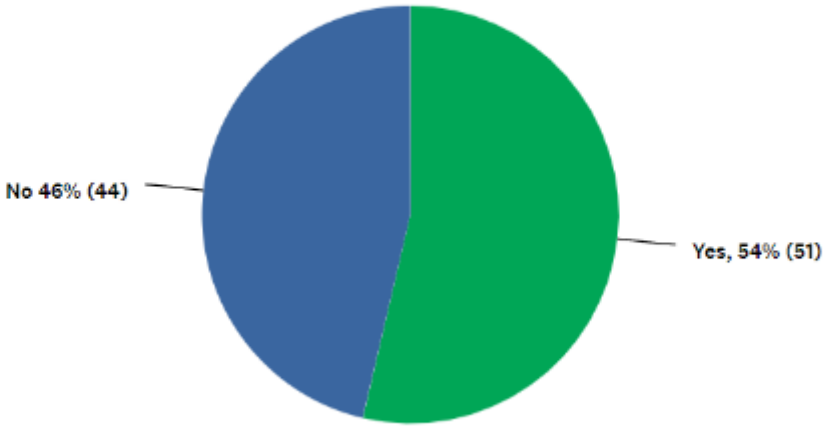
Would you be interested in joining a Farm Health & Safety Scheme?

Answered: 72 Skipped: 23



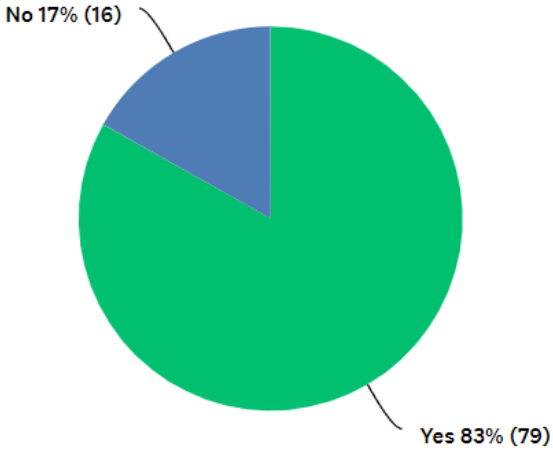
If you are aged 55+ Do you have a successor named for your farm?

Answered: 95 Skipped: 0

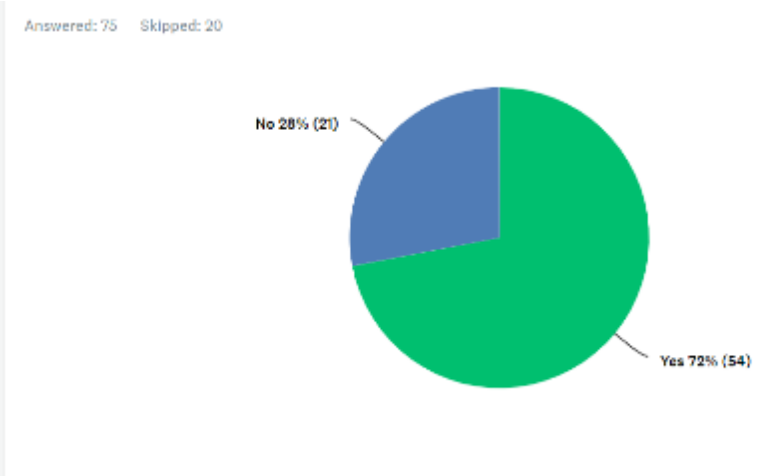


Do you have help on the farm at busy times of the year?

Answered: 95 Skipped: 0

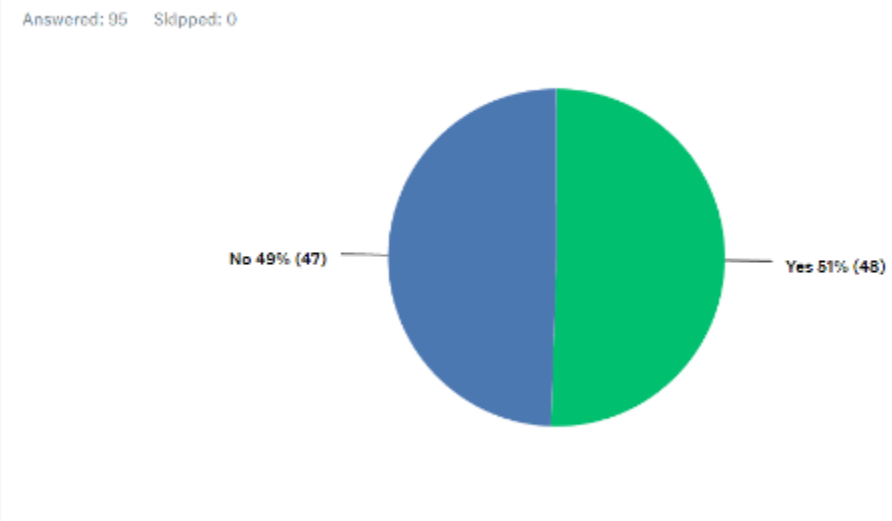


Are you interested in finding out what technology / apps are out there that maybe relevant to you?

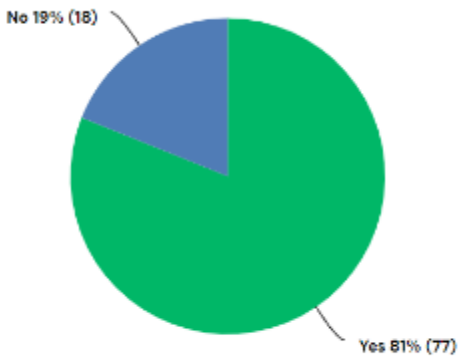


Do you use any farming apps or technology?

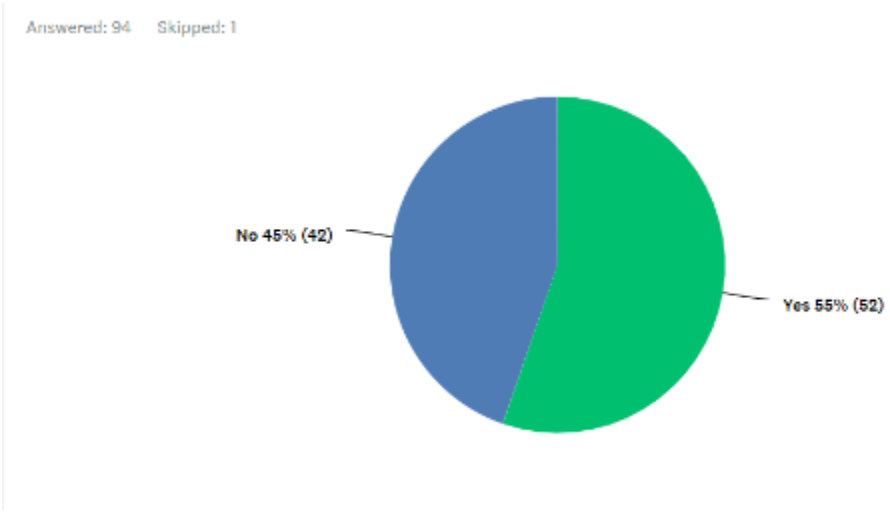
Do you use a Risk Assessment sheet or Safety Plan?



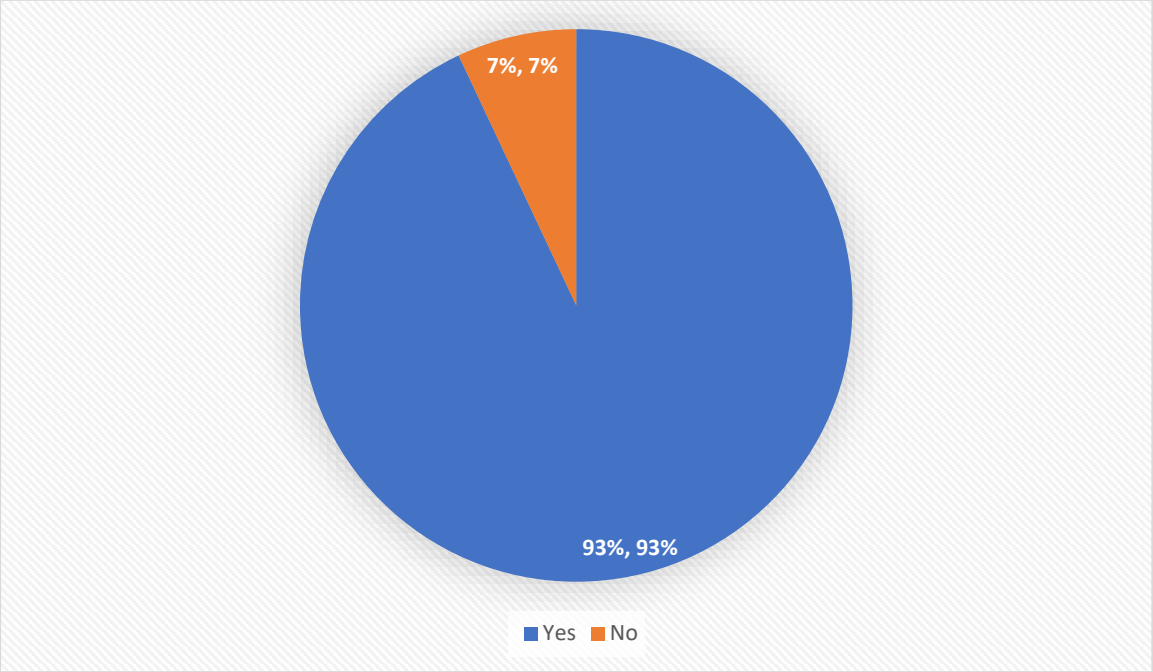
Do you have a secure lockable chemical store?



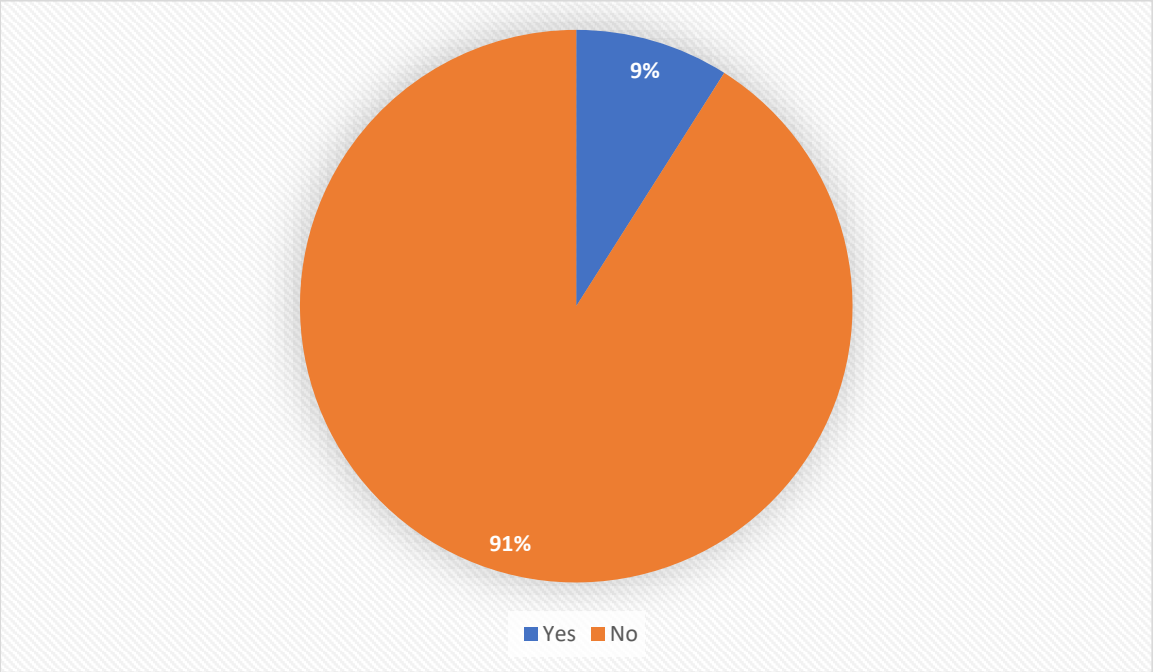
Are there young children living on or visiting the farm?



Does your farm contain hill land?



If Yes, how long does it take to see or round up animals on these areas?
Everything from 10 minutes to a week!
Have you had an accident on your farm?

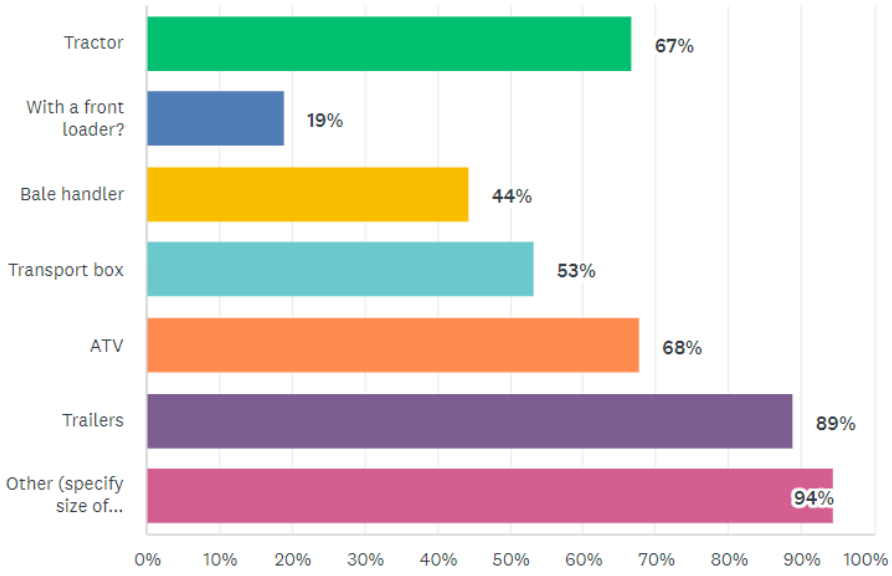


If yes (please specify)

Trips and falls nothing major	7
Broken ribs on quad	1
Lost top of finger with dog	1

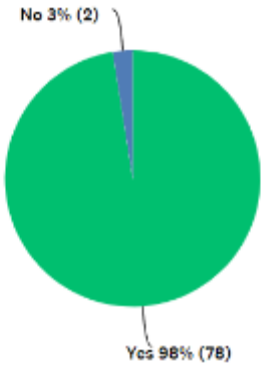
What machinery do you use on the farm?

Answered: 90 Skipped: 5



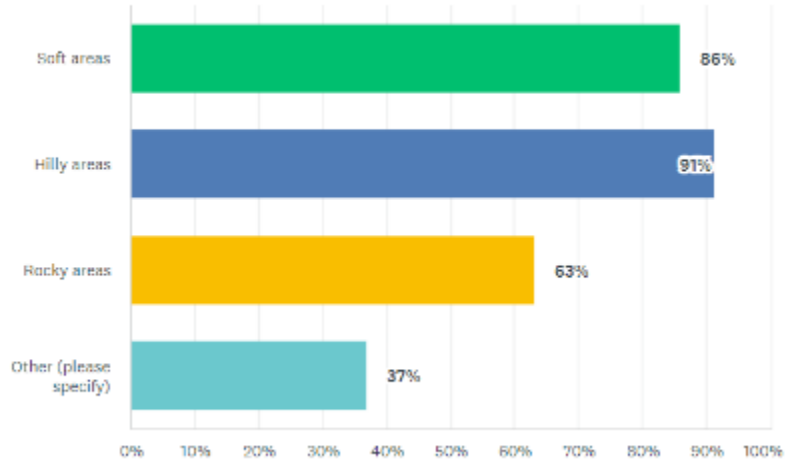
Do you complete a 5-minute check on your machinery to make sure it's safe before use? Like... is the seat in good condition?

Answered: 80 Skipped: 15



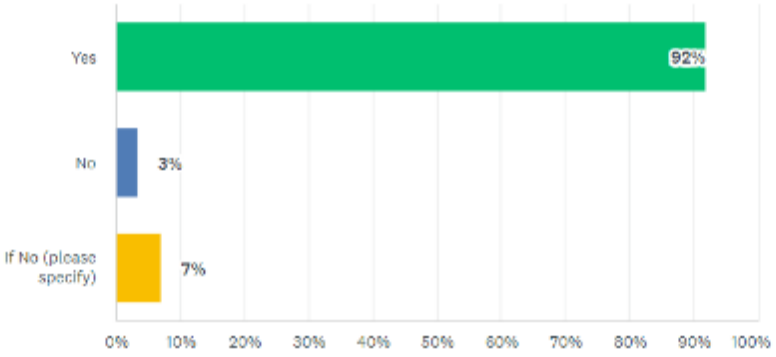
What hazards are in the fields?

Answered: 92 Skipped: 3



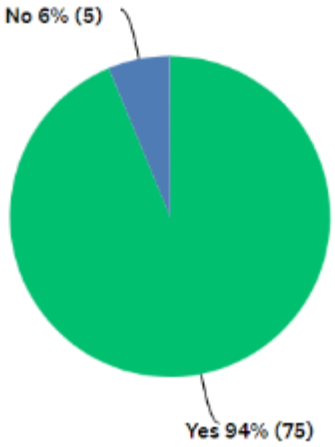
Is there safe access into your farm for ATV's and Tractor?

Answered: 86 Skipped: 9



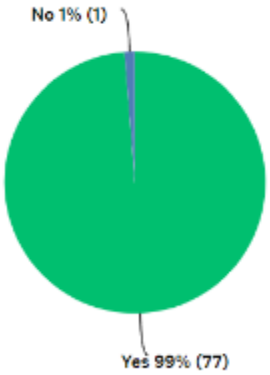
Are lights on machinery clean and in good working order?

Answered: 80 Skipped: 15

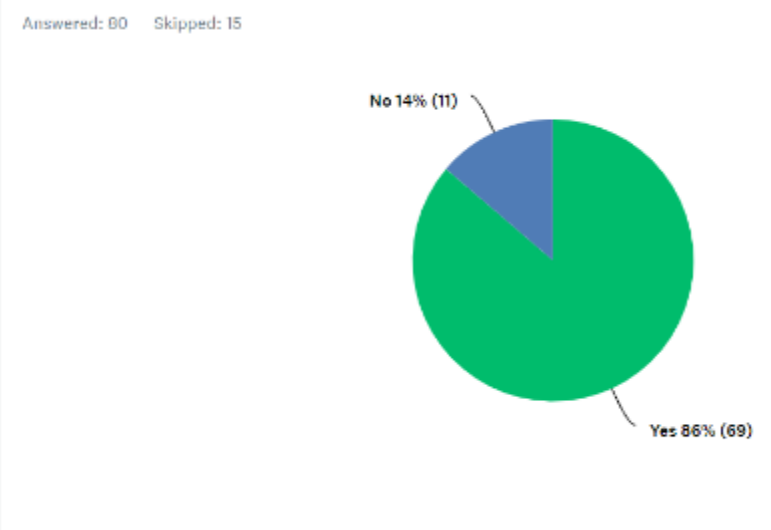


Does handbrake or parking brake work on all propelled machinery?

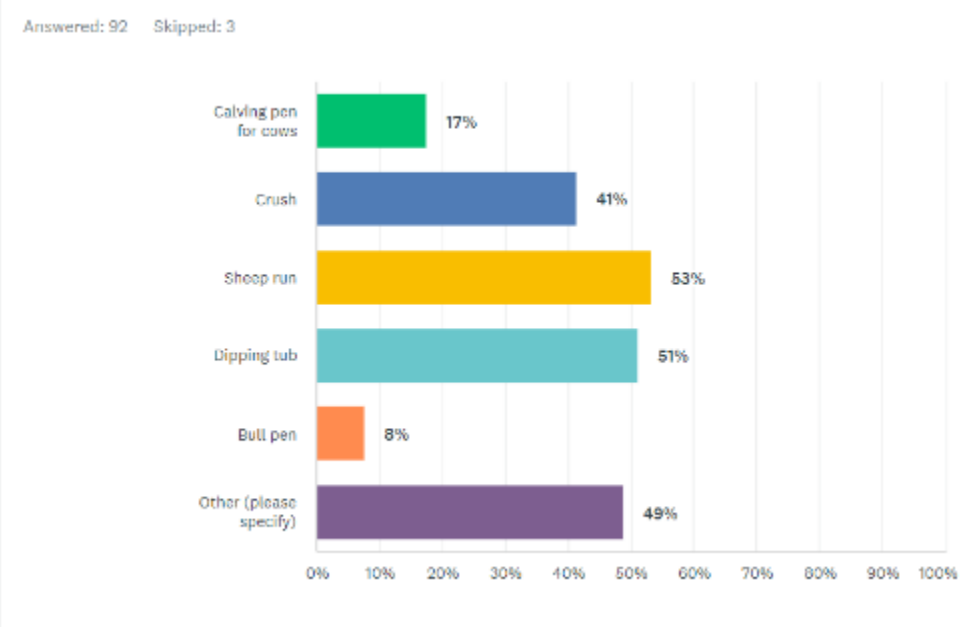
Answered: 78 Skipped: 17



Do you remove the key when finished with your machine?



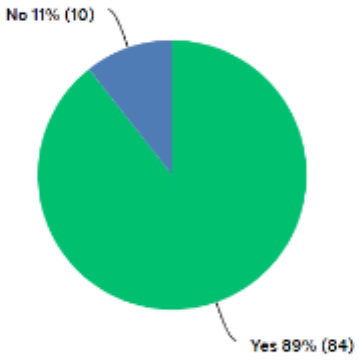
Do you have handling facilities for your animals?



Other:
Pen = 19
Shed = 4
Run with gates = 7
Hurdles = 5

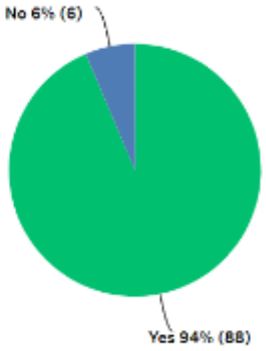
Have you a separate storage for animal health products?

Answered: 94 Skipped: 1



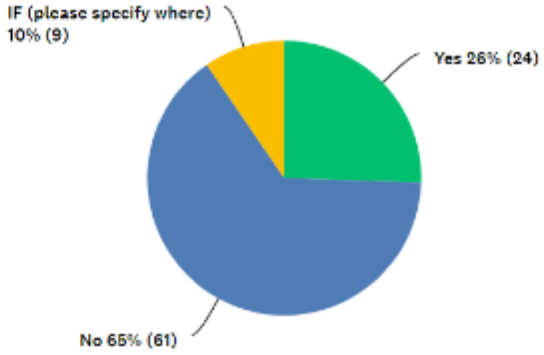
Do you always carry a mobile phone on you while working on the farm?

Answered: 94 Skipped: 1



Are there mobile black spots on your land where there is no coverage?

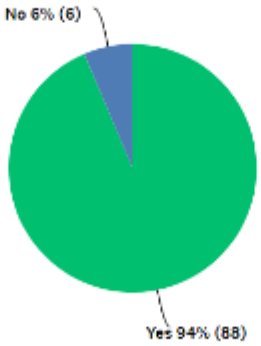
Answered: 94 Skipped: 1



Note: Most blackspots were on the hill / mountain

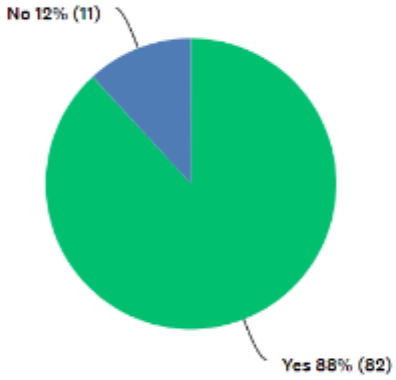
Do you have your vets number stored on your phone?

Answered: 94 Skipped: 1



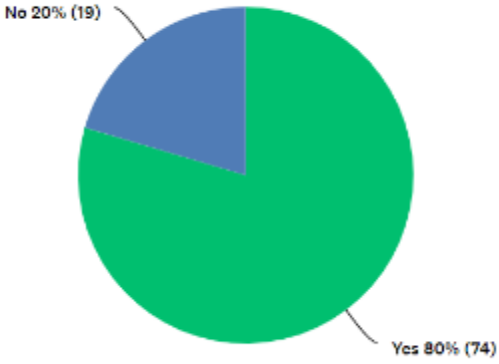
Do you have your doctors number stored on your phone in case of emergencies?

Answered: 93 Skipped: 2

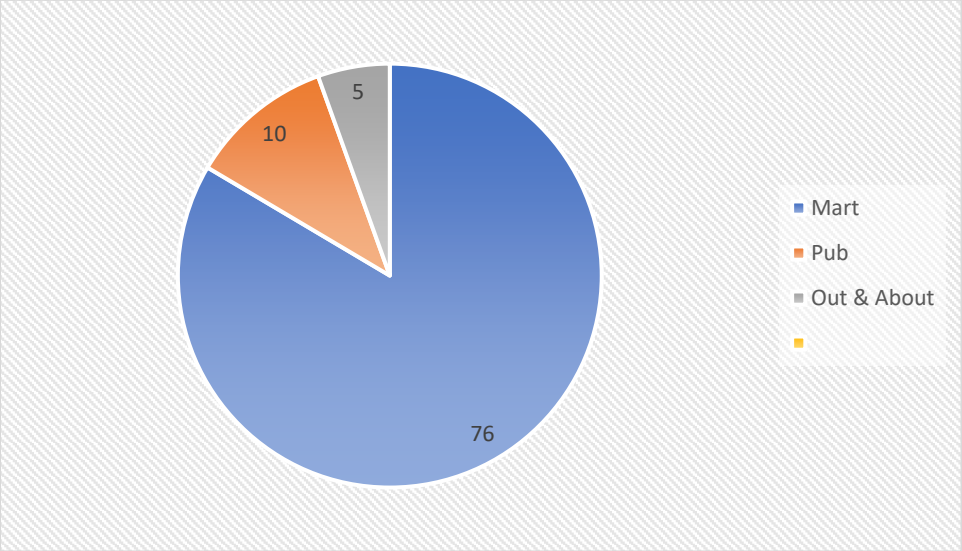


Do you get a health check with your doctor once a year?

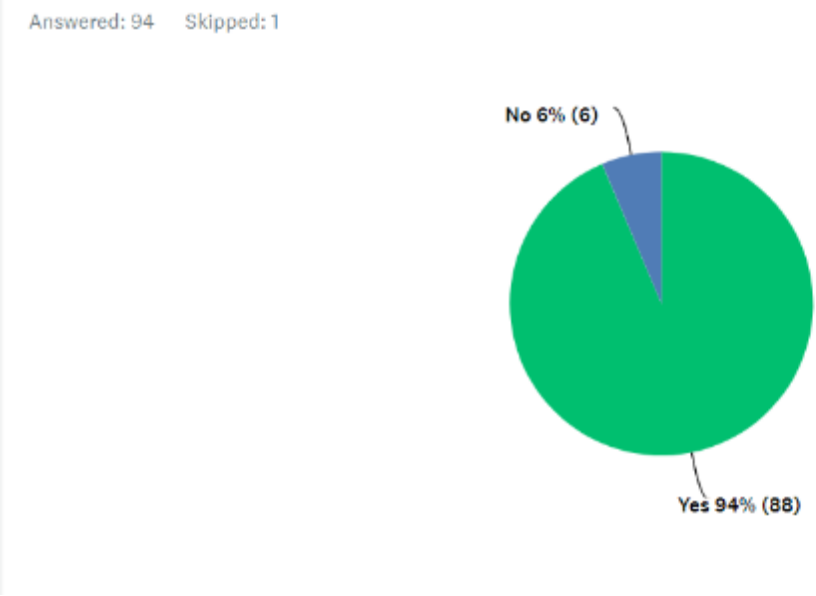
Answered: 93 Skipped: 2



Where do you meet other farmers?

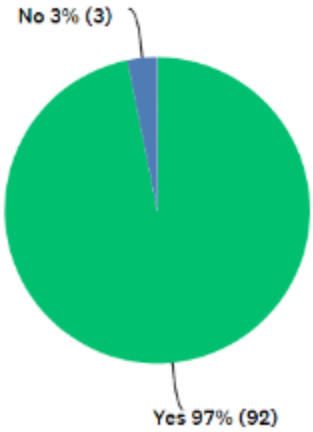


Would you meet other people outside the household more than once a week?



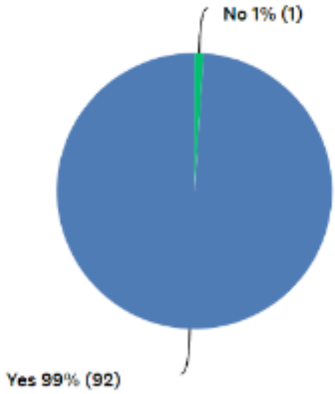
Do you enjoy attending events for farmers?

Answered: 95 Skipped: 0



Do you think that results-based payments where a farmer gets paid for completing tasks is effective?

Answered: 93 Skipped: 2



8.4 Guidance for Habitat Scoring System under NCLLAES.

8.4.1 Methodology

Surveys are carried out by walking through the plot in a "W" shape in order to observe a significant representation of the flora of the plot. All species occurring along the route walked are noted and their abundance recorded according to the DAFOR scale.
The DAFOR scale is used to record the presence and abundance of species:
D – Dominant (A dominant species covers > 2/3 of the plot)
A – Abundant (An abundant species covers between 1/3 and 2/3 of the plot, i.e., everywhere you look you see lots)
F – Frequent (Commonly seen species throughout the plot, i.e., everywhere you look you see some)
O – Occasional (Low frequency throughout the plot but you do not have to search to find)
R – Rare species refer to species that are only recorded a few times throughout the survey. It does not mean that the species is a rare species, it means that within that plot, cover of the species is low.

Height of flora is recorded as an indicator of the condition of the habitat. Percentage cover also indicates the health of the habitat. However, in some cases, it is noted that there is less than 100% cover of plants due to exposed rock rather than damage to the ground flora. Habitats vary throughout the year. The score given is based on the condition of the habitat on the date of the survey.
A score per plot is calculated by awarding an initial 100 points which may be reduced depending on a number of negative factors. The score card is divided into nine sections as follows:

1. Evidence of damage to habitat (25 points)
2. Bare soil (10 points)
3. Turbary (100 points)
4. Artificial drainage (10 points)
5. Invasive species (25 points)
6. Diversity in flora (10 points)
7. Vegetation structure (10 points)
8. Pollinator Potential (10 points)
9. Scrub (10 points)

The lowest score that it is possible to receive is minus 20 (-20). No payment will be awarded for a score of 40 or less.

Evidence of damage to habitat
Damage to habitat can be caused by, but not limited, to heavy grazing, burning, presence of rubbish, supplementary feeding, etc. In both grassland and blanket bog, the presence of hoof prints and dung may indicate the level of grazing. Saturation and bare soil may occur around feeding areas if they are not moved regularly. If plants not normally grazed, such as mat grass, is grazed, it is an indication of dense grazing.
Rubbish should be disposed of appropriately under the Waste Management Acts 1996-2011. Rubbish should never be burned and to do so is an offence under the Waste Management Act (Prohibition of Waste by Burning) Regulations 2009. Further information on waste disposal is available on mywaste.ie

Bare soil

Bare soil can severely impact bog quality and integrity. The absence of the vegetation layer means that the bog is no longer growing and therefore is also no longer storing carbon. Bare soil is susceptible to erosion by wind and water and may impact on the water quality of nearby watercourses. Further erosion should be prevented, and restoration of vegetation should be encouraged.

Bare soil in grassland may result in a loss of species diversity as 'weed' species colonise bare soil quicker than grass species.

Turbary

Turf cutting removes the vegetation layer of bog which is critical for bog formation. Sphagnum mosses are essential for bog formation and are also key to moisture retention. Bog that is missing its vegetation layer is no longer growing and is also no longer storing carbon. Bare soil resulting from turbary may result in further soil erosion and surface water run off which may cause flooding or impact on the water quality of nearby water courses. There are five levels of turbary classification. No turbary loses no points. Old or abandoned turbary which is recovering loses 5 points. Active turbary which does not cover a significant percentage of the plot loses 10 points. 50 points are deducted where there is extensive active turbary in the plot. If turbary is the predominant activity in the plot, it becomes a non-agricultural plot with no biodiversity potential and 100 points are deducted.

Artificial drainage

Blanket bog is a wetland ecosystem to which water supply is essential. Blanket bog is fed by rainwater but if the rainwater is drained away, it can result in drying out of the sphagnum layer and thus alter the ecology of the site. A high-water table is necessary to maintain the integrity of blanket bog and to prevent loss of species. Drains should be blocked in order to maintain the water table of the site unless they are roadside drains necessary for road safety.

Invasive species

Invasive species can impact the integrity of any habitat owing to their dominance of whatever habitat they colonise. Rhododendron blocks out light and eventually prevents the growth of other ground flora species. Invasive species can spread out uncontrollably which can result in the loss of a field for agricultural use. There are six levels of infestation of invasive species in the NCLLAES, specifically rhododendron, but can also be applied to other invasive species, e.g., gunnera or Japanese knotweed.

Level 5 – Severe infestation consisting of a thicket of mature plants. No ground flora is present.

Level 4 – Mature plants growing in a cluster. There is some ground flora present. There are also signs of reseeding of young plants.

Level 3 – Mature plants which are growing individually and therefore easier to tackle than levels 4 and 5 but none the less present a significant problem as they are a major seed source. There may also be younger plants nearby the mature plants. A level 3 could also be an observed significant coverage of a lot of young plants.

Level 2 – Young plants covering a significant portion of the site. They are easy to tackle. They are sparsely located throughout the plot.

Level 1 – Presence of invasive species.

None – No invasive species present in the plot.

If a level 5 infestation is present all 25 points for this section are deducted. Where an invasive species is present, control will be a priority owing to their detrimental effect on biodiversity.

Where more than one invasive species is present, the score will be based on the more severe infestation, i.e. marks will not be lost twice for two different levels of infestation.

Diversity in flora

Biodiversity is the variety of species or variability of organisms in a habitat. The species richness of a habitat influences how that habitat functions as an ecosystem.

Points can be lost in this section if the plot contains a small number of species. The most favourable score in this category is awarded when there is greater than 15 individual species (not including invasive species) found within a plot. However, leniency on this is given when the habitat is identified as blanket bog or heath as both of these habitats contain a smaller number of species.

Vegetation structure

Variety in sward height is important to provide a suitable habitat for birds and insects. Dominance of a single species means that the sward height will contain either all tall or short plants. Dominance of a single species may also indicate that the site is recovering from previous damage. Healthy bog should have heather at different stages of growth and tussocks of moss and lichen species. The presence of lichens indicate that no recent damage has occurred at this site as they are slow growing and sensitive to trampling by livestock. Likewise, diversity in vegetation structure in grassland is indictive of a greater variety of species in the habitat.

Pollinator Potential

Habitats that are tightly grazed, grassland in particular, may have 100% coverage of vegetation but the grasses and flowering plants are so tightly grazed that they do not flower or produce seed. This type of vegetation structure is difficult to survey and is low in species variety. It also impacts on pollinator insect species as there could be a vast area with no coverage and no pollen source.

Scrub

Species that form scrub habitats are not negative themselves but a densely formed scrub prevents light from reaching ground flora. It can spread to cover an entire field, making it unusable for agriculture. In the absence of grazing or mowing, scrub can replace heath and grassland species. In small quantities, scrub is beneficial to insects, nesting birds and small mammals. Where small amounts of scrub occur, no points will be deducted. It is only where scrub is in danger of dominating the plot, that scrub is considered to have a negative impact on biodiversity and points will be deducted.

Score Card

Date	
Farmer ID	
Plot ID	
Location	
Grid Reference	
Habitat type	
Geology	
Soil type	
Altitude	
Land use	
Weather	
Height of flora	
% coverage	
Evidence of damage to habitat	**25**
grazing	-5
burning	-5
rubbish	-5
supplementary feeding	-5
other	-5
Bare soil	**10**
>25%	-10
5-25%	-5
0-5%	0
Turbary	**10**
Turbary is predominate feature of plot. No benefit to ag	-100
Extensive turbary on plot	-50
Active/Recent	-10
Old/Abandoned/Recovering	-5
None	0
Artificial drainage	**10**
Active/Recent	-10
Old/Abandoned	-5
None	0
Invasive species	**25**
Level 5	-25
Level 4	-20
Level 3	-15
Level 2	-10
Level 1	-5
None	0
Diversity in flora	**10**
Dominance of 1-2 species	-10
Some diversity in flowering plants	-5
> 15 species recorded	0
Vegetation structure	**10**
Either short/tall sward dominant	-10
Variance in sward height limited to 1-2 species	-5
Mixed sward height	0
Pollinator potential	**10**
Flowering plants tightly grazed	-10
Flowering plants growing to flowering height	0
Scrub	**10**
Scrub dominated (>50%)	-10
Moderate scattered scrub	-5
No scrub	0

Grassland	
Improved	
Semi-natural	
Marsh	
Peatland	
Natural	
Eroded	
Modified	
Land- use change (forestry, peat cutting)	
Woodland	
Semi-natural	
Commercial forestry	
Scrub	
Non-native	
Watercourse	
River	
Lake	
Other	
% of land parcel	
Fauna	
Other comments	
Total Score	

Flora

Flowering Plants			Invasive species		
Common Name	**Species Name**	**DAFOR**	**Common Name**	**Species Name**	**DAFOR**
Birdsfoot Trefoil	*Lotus Corniculatus*		Giant Hogweed	*Heracleum mantegazzianum*	
Bluebell	*Hyacinthoises non-scripta*		Giant Rhubarb	*Gunnera tinctoria*	
Bog Asphodel	*Narthecium ossifragum*		Himalyan Balsalm	*Impatiens glandulifera*	
Bogbean	*Menycantanthes trifolidate*		Japanese knotweed	*Fallopia japonica*	
Bog Myrtle	*Myrica gale*		Montbretia	*Crocosmia X crocosmiifora*	
Broad-leaved Dock	*Rumex obtusifolius*		Rhododendron	*Rhododendron ponticum*	
Bulbous buttercup	*Ranunculus bulbosus*		**Trees**		
Butterworth	*Pinguicula vulgaris*		**Common Name**	**Species Name**	**DAFOR**
Common Dog Violet	*Viola riviniana*		Alder	*Alnus glutinosa*	
Common Sorrel	*Rumex Acetosa*		Ash	*Fraxinus excelsior*	
Common Speedwell	*Veronica persica*		Aspen	*Populus tremula*	
Common Spotted Orchid	*Dactylorhiza fushii*		Downy Birch	*Betula pubescens*	
Common vetch	*Vicia satica*		Silver Birch	*Betula pendula*	
Cow Parsley	*Anthriscus sylvestris*		Cherry	*Prunus avium*	
Cowslip	*Primula veris*		Blackthorn	*Prunus spinosa*	
Creeping Buttercup	*Ranunculus repens*		Hazel	*Corylus avellana*	
Creeping cinquefoil	*Potentilla reptans*		Hawthorn	*Crataegus monogyna*	
Creeping thistle	*Cirsium arvense*		Holly	*Ilex aquifolium*	
Cuckoo Flower	*Cardamine pratensis*		Juniper	*Juniperus communis*	
Daisy	*Bellis perinnis*		Pedunculate Oak	*Quercus robur*	
Dandelion	*Taraxacum vulgaris*		Sessile Oak	*Quercus petraea*	
Devil's Bit Scabious	*Succisa pratensis*		Rowen	*Sorbus aucuparia*	
Early Dog Violet	*Viola reichenbachiana*		Scots Pine	*Pinus syvestris*	
Flag iris			Willow	*Salix spp.*	
Field Gentian	*Gentianella campestris*		Yew	*Taxus baccata*	
Forget-me-not			**Grasses, reeds, sedges**		
Foxglove			**Common Name**	**Species Name**	**DAFOR**
Germander Speedwell	*Veronica chamaedrys*		Black Bog-rush	Schoenus nigricans	
Golden Saxifrage	*Chrysosplenium oppositifolium*		Carnation sedge	Carex panicea	
Gorse	*Ulex europaeus*		Cock's Foot	Dactylis glomerata	
Greater periwinkle	*Vinca majior*		Common Bent	Agrostis capillaris	
Ground Ivy	*Glechoma hederaea*		Common Club Rush	Schoenoplectus lacustris	
Heath Milkworth	*Polygala serpyllifolis*		Common Reed	Phragmites australis	
Heath Speedwell	*Veronica officinalis*		Cottongrass	Eriophorum angustifolium	
Herb robert	*Geranium robertianum*		Crested Dog's-tail	Cynosurus cristatus	
Horsetail	*Equisetaceae agg.*		Creeping Bent grasses	Agrostis stolonifera	
Kidney vetch	*Anthyllis vulneraria*		Deergrass	Trichophorum cespitosum	
Knotgrass	*Polygonum arenastrum*		Field Wood-rush	Luzula campestris	
Lady's Bedstraw	*Galium verum*		Glacous sedge	Carex flacca	
Lady's Mantle	*Alchemilla vulgaris*		Green ribbed sedge	Carex binervis	
Lesser Celandine	*Ficaria venna*		Heath grass	Danthonia decumbens	
Lesser Hawkbit	*Leontodon taraxacoides*		Heath rush	Juncus squarrosus	
Lords and Ladies	*Arum maculatum*		Mat Grass	Nardus stricta	
Louseworth	*Pedicularis sylvatica*		Marram	Ammophila arenaria	
Marsh cinquefoil	*Comarum palustre*		Meadow Foxtail	Alopecurus pratensis	
Marsh thistle	*Cirsium palustris*		Meadow grasses	Poa spp.	
Marsh Pennywort	*Hydrocotyle vulgaris*		Sweet Vernal Grass	Anthoxanthum odoratum	
Marsh Violet	*Viola palustris*		Perennial Rye-grass	Lolium perenne	
Meadow Buttercup	*Ranunculus acris*		Purple Moor-grass	Molinia caerulea	
Meadowsweet	*Filipendula ulmaria*		Red Fescue	Festuca rubra	
Nettle	*Urtica dioica*		Reed Canary-grass	Phalaris arundinacea	
Oblong Sundew	*Drosera intermedia*		Sheep's Fescue	Festuca ovina	
Ox-eye daisy	*Leucanthemum vulgare*		Sweet grasses	Glyceria spp.	
Pondweed	*Potamogeton*		Wavy Hair-grass	Deschampsia flexuosa	
Primrose	*Primula vulgaris*		White beaked sedge	Rhynchospora alba	
Ragged robin	*Lychnis flos-cucull*		Wood sedge	Carex sylvatica	
Ragwort	*Jacobaea vulgaris*		Yorkshire Fog	Holcus lanatus	
Red clover	*Trifolium pratense*		**Shrub Layer**		
Ribwort Plantain	*Plantago lanceolata*		**Common Name**	**Species Name**	**DAFOR**
Round-leaved Sundew	*Drosea rotundifolia*		Bearberry	Arctosaphylus uva-ursi	
Sanicle	*Sanicula europaea*		Bell Heather	Erica cineria	
Sheep's Sorrel	*Rumex Acetosella*		Bilberry	Vaccinum myrtillus	
Silverweed	*Potentilla anserina*		Bracken	Pteridium aquilinum	
Spring Gentian	*Gentiana verna*		Bramble	Rubus fructicosus	
Spurge	*Euphorbia hyberna*		Crowberry	Emetrum nuigrum	
Tormentil	*Potentilla erecta*		Dwarf willow	Salix herbacea	
Water Milfoil	*Myriophyllum spicotum*		Hard Fern	Blechnum spicant	
Water Mint	*Mentha Aquatica*		Ivy	Hedra helix	
White clover	*Trifolium repens*		Juniper	Juniperus communis	
Wood anemone	*Anemone nemarosa*		Ling Heather	Calluna vulgaris	
Wood avens	*Geum urbanum*		Rose	Rosa spp.	
Wood Dock	*Rumex sanguineus*		Scaly male fern	Dryopteris affinis	
Wood Sage	*Teucrium scorodonia*		St. Daboec's Heath	Daboecia cantabrica	
Yellow Pimpernell	*Lysimachia nemorum*		**Other species**		
Yellow Sorrel	*Oxalis corniculata*				
Yellow Waterlily	*Nuphar lutea*				
Mosses & Lichens					
Common Name	**Species Name**	**DAFOR**			
Reindeer Lichen	*Cladonia spp.*				
Sphagnum	*Sphagnum*				
Brachythecium					
Common hair cap moss	*Polytrichum commune*				
Heath Plait Moss	*Hypnum jutlandicum*				
Heath Star Moss	*Campylopus introflexus*				
Woolly fringe moss	*Racomitrium lanuginosum*				

Habitat Surveys

8.4.2 Introduction

Peatlands provide many important ecosystem services including carbon storage, water regulation, flood attenuation. Peatlands provide a unique habitat for many species of flora and fauna, some of whom are only found in peatland habitats.
Peatlands have the potential to store carbon indefinitely. However, when dried out, degraded, or cut away, peatlands become oxidised and the carbon that they were storing is released back to the atmosphere.
The most recent State of the Environment Report from the Environmental Protection Agency highlights that Ireland's peatlands are in an unfavourable state. The report acknowledges that if restored, bogs could play a vital role in carbon sequestration and provide a space for nature. (EPA, 2020)
Peat is the dominant soil type within the project area, with exception of the coastal areas which have sandy soil. The Irish Peatland Conservation Council estimate that only 28% of Ireland's 774,367ha of blanket bog remains today. (IPPC, 2009)
The NCLLAES aims to improve the conservation status of the habitats of the Maumturk and Twelve Bens Mountain ranges in cooperation with the farming community. In order to achieve this, habitat surveys were carried out on all lands used by participating farmers in the project area. The main objective of the habitat surveys was to identify where there were issues with habitat quality and address those issues through habitat improvement works. The participant farmers received a habitat payment which was linked to the score and therefore to the quality of the habitat. By carrying out these surveys, a snapshot of the types and quality of habitats that existed in North Connemara in 2020 was also recorded.

8.4.3 Habitat Surveys

8.4.3.1 Field surveys

Habitats are the basic building blocks of an ecosystem. They are important in the description of conservation management. A habitat is described as the area in which organisms or groups of organisms live and the biotic and abiotic factors which influence that area.
A Guide to Habitats in Ireland sets out a standard scheme for identifying, describing and classifying wildlife habitats in Ireland. The existence of such a guide allows for consistency among ecologists when undertaking habitat surveying. The guide assigns a code to each habitat, e.g., FW3 Canals. Descriptions of each habitat and examples of species to be found is included in the guide.
The project team found that survey sites frequently have a mosaic of habitats that do not neatly fit into the Guide to Habitats in Ireland classification scheme. Where this occurred, the habitats are recorded as an

Figure 30 Common Centaury (Centaurium erythraea)

amalgamation and are noted by using a dash (-). For example, a survey site where improved grassland species and wet grassland species are intertwined is recorded as “Improved agricultural grassland - Wet grassland”. The habitat codes were combined as “GA1 - GS4”.

There were 26 different habitat type amalgamations assigned to the habitat surveys. These were:

Bog woodland - wet grassland WN7 – GS4	Cutover bog PB4	Dry meadows & grassy verges GS2
Dry-humid acid grassland GS3	Eroding blanket bog PB5	Improved agricultural grassland - Lowland blanket bog GA1 – PB2
Improved agricultural grassland - Machair GA1 – CD6	Improved agricultural grassland - Wet grassland GA1 – GS4	Lowland blanket bog PB2
Machair CD6	Mixed broadleaf woodland - Wet grassland WD1 – GS4	Montane heath - Marsh HH4 – GM1
Oak-Ash-Hazel Woodland WN2	Oak-Ash-Hazel Woodland - wet grassland WN2 – GS4	Oak-birch-holly woodland WN1
Scrub WS1	Upland blanket bog PB1	Upland blanket bog - Montane heath PB1 – HH4
Upland blanket bog - wet heath PB1 – HH3	Wet grassland GS4	Wet grassland - Lowland blanket bog GS4 – PB2
Wet grassland - wet heath GS4 – HH3	wet heath HH3	Wet heath - Bracken HH3 – HD1
Wet heath - montane heath HH3 – HH4	Wet heath - wet grassland HH3 – GS4	

Figure 31 Habitat types in NCLLAES

Habitat surveys were carried out by Joseph Mannion, project manager and Cathy Connelly, project ecologist between May and September 2020. The main objective of the surveys was to assess the quality of the habitats on land used by the participating farmers and to award a payment based on the quality of the habitat. This payment rewards the farmer for the service that they provide to biodiversity through their farming practices. The habitat survey also provided the base for habitat improvement works to be undertaken by the farmers for the duration of the project.

65 participants of the NCLLEAS received a habitat survey and are undertaking habitat improvement works. The total land area farmed by these participants is 10,503ha. There are 262 individual LPIS numbers in this area. In some cases, a parcel may have more than one LPIS number associated with it but is being utilised as one large area without internal fences. In these cases, the whole area was scored on one score card as the habitat and the management is the same throughout. In some cases, there were two or more distinct habitats within a land parcel and they were scored on separate score cards. In total, 232 habitat surveys were carried out. A species list with DAFOR (Dominant, Abundant, frequent, Occasional, Rare) cover values was recorded for each survey. Scores were awarded based on quality of the habitat.

Figure 32. Glencoaghan

The surveys were carried out using the following procedure:

4. Each land parcel was walked in a "w" shape with every species that was observed is recorded. The abundance of each species was recorded using the DAFOR scale. The decision was made to this method rather than relying on indicator species or relevés for two reasons. The project team felt that only recording indicator species would mean that the variety of flora in the project area would not be captured. Due to the mosaic nature of the habitats within land parcels, it was felt that relevés may miss variances in habitat that occur within a land parcel.
5. An assessment was made in the field on the condition of the habitat. Any impact on the quality of the habitat was recorded. A score was then given based on the points awarded during the assessment.
6. The scores for each survey were added together and an average was given to give one overall figure which formed the basis for the payment to the farmer in respect of the habitat payment.

Improved agricultural grassland- wet grassland was by far the most commonly recorded habitat type (73 score cards). This type of habitat is typical of lowland areas that have had some intensification and fertilisation in the past but also have a high presence of wet grassland or bog species. This habitat, however, only covers 634Ha. By area size, the most common habitats in the project area are blanket bog (upland and lowland, 3448.5Ha) and heath (5643Ha). Dry grasslands and woodlands make up 103Ha and 38Ha respectfully. Scrub, which was included as in the project plan with a target of 100Ha removal, only amounted for 11Ha of land.

8.4.4 Habitat Scores

8.4.5 Methodology

100 points is the maximum score that can be awarded per parcel. Points are deducted for activities or impacts to the biodiversity of the area. There are 9 categories where the impact to biodiversity is examined.
These are evidence of damage to habitat, bare soil, turbary, artificial drainage, invasive species, diversity in flora, vegetation structure, pollinator potential and scrub. Points are deducted depending on the type of activity and the impact that it has on biodiversity.
Extensive turbary which results in exposed peat with little or no vegetation cover will receive a zero score. This is because the site contains little or no species of flora at the time of the survey. Extensive cover of an invasive species will mean a loss of 25 points to the score. Maximum points are deducted in this category when growth of an invasive species is so great that no other species can sustain itself in that area.
The majority of land parcels scored over 70. Very few parcels had a score under 50. Three parcels were given zero score. Two of these were commonage and one was privately owned. Both commonage parcels were scored zero because of excessive active turbary. In the case of the private parcel, it was given no score because the damage to the ecology is so great that it was deemed to be the same as the effects of turbary. The private plot is classified as eroding blanket bog. Three parcels were given a score of 40. These were one commonage and two private.
Classified as lowland blanket bog; scrub and improved agricultural grassland – wet grassland. The reason for the score is different in each case but include invasive species, rubbish, scrub, little diversity in species, low sward height.

Score	Number of parcels
100	35
95	31
90	30
85	36
80	30
75	26
70	12
65	12
60	10
55	3
50	0
45	1
40	3
0	3

Table 2. Collated scores

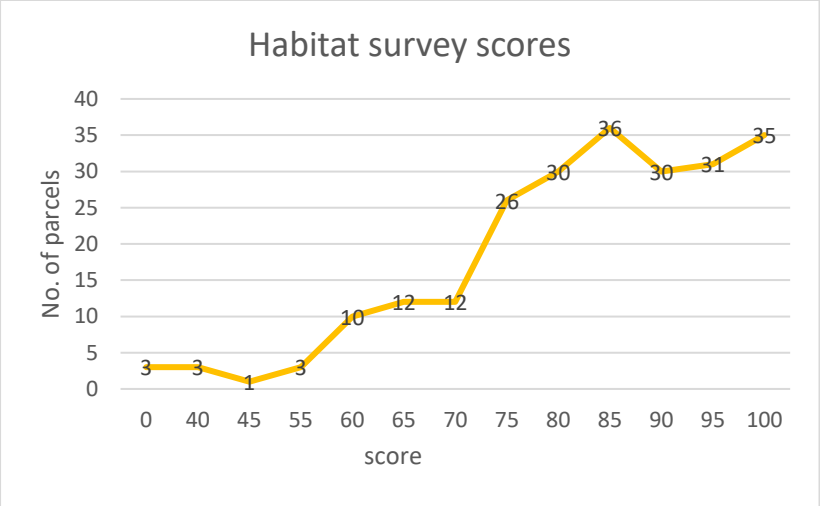


Chart 1. Habitat survey scores

8.4.6 Habitat survey results

196 different flora species were identified during 2020 surveys. 4201 individual records of flora species were made during surveys. Score cards are divided by type: flowering plants, mosses and lichens, trees, shrubs, invasive species and grasses, reeds and sedges.

Flowering Plants

113 species of flowering plant were found in the 2020 surveys. Tormentil was the most encountered plant (145 records). It was found in 55% of surveys. The widespread occurrence of tormentil is due to its preference for multiple habitats, including grassy, heath, boggy, wet, or dry habitats. Therefore, unlike other species of flora which have a more limited range, tormentil was found across the entire project area.

Picture 4. Tormentil (*Potentilla erecta*)

Mosses, Lichens & Fungi

While there is a wealth of mosses and lichens to be found in Ireland, identification to species level in the field is difficult. Therefore, there are only 6 moss species and one lichen on our score card with space to record "other species" where identification is not known. In the 2020 surveys, we found 11 different species of mosses and lichens and also recorded "other" for the species that we could not identify in the field. (11 species + other species of mosses, lichens, liverworts and fungi)

Trees

Trees observed during surveys include alder, ash, downy birch, silver birch, blackthorn, hazel, hawthorn, juniper, oak, rowan, scots pine and willow. The most commonly encountered trees were hawthorn and willow. 15 different species of trees were found during surveys. Most of the habitats within the project area are grassy, heath and bog habitats with few pockets of wooded areas and few hedgerows.

Grasses, Reeds & Sedges

Grasses, reeds and sedges were the most frequently encountered group of flora as they were found in almost all habitat surveys. There were 32 species of grass, reeds and sedges found during surveys. The most numerous species found were black

bog rush (178 records), Yorkshire fog (113 records), purple moor grass (112 records), bog cotton (109 records).

Shrub Layer

19 shrub species were found during surveys with ling heather being the most commonly recorded. Ling heather was found in 109 parcels. Bracken was found in 73 parcels. However, bracken was only dominant in one location and abundant in 9 locations which indicates that bracken is not causing undue pressure to ecology in the project area.

Picture 5. Ling heather (*Calluna vulgaris)*

8.4.7 Invasive species

This project aimed to clear 200ha of Rhododendron during its lifetime in order to enable restoration of upland heaths and peatlands. The surveys carried out in 2020 found that there is far more than 200ha of invasive species in the project area. This figure only refers to the 10,503Ha that were surveyed in the summer of 2020. There are more farmers in the overall scheme who are not involved in the habitat improvements. This land may also have invasive species on it. These areas will be surveyed for invasive species in spring 2021. The project team have noted however, that there is extensive coverage of rhododendron and to a lesser extent other invasive species on land that is not part of the project. Where invasive species occur along roadsides or on public land, the project team will endeavour to record it over the duration of the project.
88 parcels or 37% of parcels surveyed have invasive species in them. This amounts to 1543.40Ha or 14% of the survey area affected by invasive species. Invasive species found are rhododendron, gunnera, Himalayan balsam, Japanese knotweed, montbretia, Himalayan knotweed. (6 species). Rhododendron was by far the most numerously encountered invasive species.

Figure 33 Rhododendron, Gunnera and Japanese knotweed

8.4.8 Land Use

Sheep are the predominately grazed animal in the project area. 175 of the parcels surveyed in 2020 are being grazed by sheep. 43 are grazed by cattle. Five are used as hay meadow, four have sheep and cattle on them, 2 have sheep and donkeys, 2 are exclusively used for turbary and 2 are unused. The average score of the parcels that are grazed by sheep is 82. The average score of the parcels that are grazed by cattle is 83. While there were only five parcels that were being used as hay meadows at the time of the survey, they had an average score of 99 which reflects the species richness that is associated with a hay meadow.
The variances in impact on habitat occurs when like habitats are compared. Dry humid acid grassland when grazed by cattle has an average score of 92.5. the same average score when grazed by sheep on this habitat is 84. While an average of 84 is quite a good score, it is several points lower than the average achieved by using cattle on the same habitat. When lowland blanket bog is grazed by sheep, the average score is 86. When the same habitat is grazed by cattle, the average score is 69. Therefore, the management of land is intrinsically linked with the nature of the habitat.

8.4.9 Land use impacts

Sward height was the most common reason for points deduction. This was noted in 91 of the surveys. Sheep, in particular graze lower than other livestock. This is because they nibble the sward to a uniformly low level, meaning that flowering plants do not reach flowering level. This results in a dominance of grass species in the field. Cattle tear the sward which gives a variance in vegetation height and different levels of grasses and flowering plants.

69 surveys noted a lack of species diversity.

Species diversity is often linked to the grazing pattern. As mentioned above, where flowering plants are grazed to a low level, they do not reach flowering and seeding point. This typically happens on grasslands, and results in a dominance of one or two species of usually grasses or clovers. In peatland habitats, purple moor grass can become dominant to the detriment of other species. Grazing help prevent this from happening, especially in the spring when purple moor grass is most palatable to sheep. In a short-term project such as this one, it would be difficult to address species diversity in any way other than changing grazing patterns where this is the cause for the lack of diversity.

Turbary was noted in 24 surveys. For the most part, this refers to historical turbary rather than active turbary. Old or abandoned turbary sites show signs of recovery with coverage of mosses and grasses. However, as turbary removes a significant depth of peat and dries out the soil points are deducted on a scale from 5 – 100 depending on how much of the site has been affected by turbary. The project team acknowledge that in many cases the turbary occurred in the past and even where it is currently being removed, it may not be the participant farmer who is responsible for the turf cutting. However, as turbary is an activity which causes significant habitat damage and is irreversible, we note every occurrence of turbary that we find. Turbary has a significant impact on blanket bog as the peat depth is shallower than on raised bog. Blanket bog is typically between 1.5m to 5 metres deep, while raised bog can be up to 15m deep. Peat grows at a rate of around 1mm per year. We have noticed places where the peat has been stripped back to the layer of clay soils or even down to bedrock in which case, peat soils and bog habitats are beyond repair.

Other impacts on the quality of the habitat include drains, invasive species, scrub, rubbish, species dominance, bare soil, supplementary feeding, poaching.

8.4.10 Conclusions

Overall, the quality of habitats that were surveyed are in good condition. With many of the sites scoring highly, there is evidence to suggest that the current land management practices are conserving the habitats in the project area. The total land area in the Maumturk and Twelve Bens is approximately 30,000ha. This report only refers to one third of that area. The areas that were surveyed are exclusively livestock farmed areas. An absence of intensive dairying, beef and tillage farming in North Connemara contributes to the quality and variety of habitats in the area.

Figure 34 Devil's Bit Scabious (Succisa pratensis)

Invasive species, particularly Rhododendron, are a significant problem within the project area, and also beyond its boundaries. It is worth noting that the densest thickets of rhododendron occur on land that was not included for survey, particularly in Letterfrack and Kylemore.

Rhododendron can form very dense thickets which prevent access to fields because of its sheer mass. It out-competes native plants resources such as sunlight and space. It is poisonous to livestock. Land has been lost, and more

will continue to be lost to agriculture where Rhododendron takes hold. Treatment and eradication are not a quick solution, but results from Killarney National Park, whose treatment the NCLLAES recommends, suggests that it is possible to control rhododendron.

It is important to note that while this report has indicated that the overall quality of the habitats that we surveyed is in good condition, this is not a reflection on the National Parks and Wildlife Services reports under Article 17 of the Habitats Directive which indicates that many Irish habitats are in unfavourable status. The NPWS report on the countrywide status of habitats.

The NCLLAES is focusing on a very small area in one location. The Article 17 status depends on factors such as long-term maintenance of the habitat and whether the range that the habitat covers is stable or increasing. As the purpose of the habitat surveys carried out by the NCLLAES was to allocate a score based on ecology for every individual land parcel the parameters used to assess conservation status under the Habitats Directive are not applied in this project.

Surveys will be carried out again in the summer of 2021 in the hopes of collecting and recording more species information for the North Connemara area. Habitat improvement works are being undertaken by farmers throughout the lifetime of the scheme. Measures such as repairing fencing and replacement mapping aim to control the movement of stock, and subsequently the impact that they have on the habitats. Other farmers are erecting beehives and planting vegetable gardens to encourage more pollinator species to the area. Others will concentrate on invasive species eradication. While major impacts of these actions may not be seen from year to year, these measures should have lasting impacts on the quality and conservation of the variety of habitats in North Connemara.

8.4.11 SOURCES

Malone, S. and O'Connell, C. (2009) Ireland's Peatland Conservation Action Plan 2020 – halting the loss of peatland biodiversity. Irish Peatland Conservation Council, Kildare.
Fossitt, J.A. (2000) A Guide to Habitats in Ireland. The Heritage Council, Kilkenny.
Environmental Protection Agency (2020) Ireland's Environment – An Integrated Assessment.

8.5 Biochar Production

Biochar is increasingly being recognised as having a role in the sequestration of carbon as well as having numerous potential agricultural and environmental applications. The Intergovernmental Panel on Climate Change (IPCC, 2018) has identified biochar as one of the most promising NET or Negative Emissions Technology, capable of carbon dioxide removal (CDR).

8.5.1 What is biochar?

Biochar is a stable form of carbon produced by heating organic materials without actually combusting them, a process known as pyrolysis. This differs from combustion, where the aim is to burn materials completely and reduce them to ash. Biochar can be created from various organic sources, with woody biomass being a common choice. In our case the brash from treated rhododendron from the NCLLAES project is ideal as it is very calorific and burns well.

One of biochar's key characteristics is its remarkable longevity in the environment, persisting for decades to even hundreds of years. This longevity makes it a valuable tool for removing carbon dioxide from the atmosphere when produced from biomass. On average, each unit of biochar is roughly equivalent to sequestering three units of carbon dioxide.

Biochar possesses an exceptionally large surface area due to its porous structure, making it an effective adsorbent and a valuable tool for reducing emissions. Its porosity also provides an ideal environment for microorganisms and fungi to thrive when added to soil or mixed with organic matter. Moreover, its surface chemistry and Cation Exchange Capacity (CEC) allow it to retain nutrients and moisture. Certain types of biochar can even effectively capture and immobilise heavy metals and other pollutants.

The production of biochar can be accomplished through low-tech methods like flame cap kilns or sophisticated industrial systems capable of processing large volumes of feedstock. Interestingly, the pyrolysis process itself generates substantial thermal energy, which can be harnessed for various purposes such as process heat or district heating. In some cases, this entire process can yield carbon-negative district heating, where feedstock is transformed into biochar for sale, the biochar is sequestered for environmental or agricultural use, and the heat generated is used to provide heating for local communities.

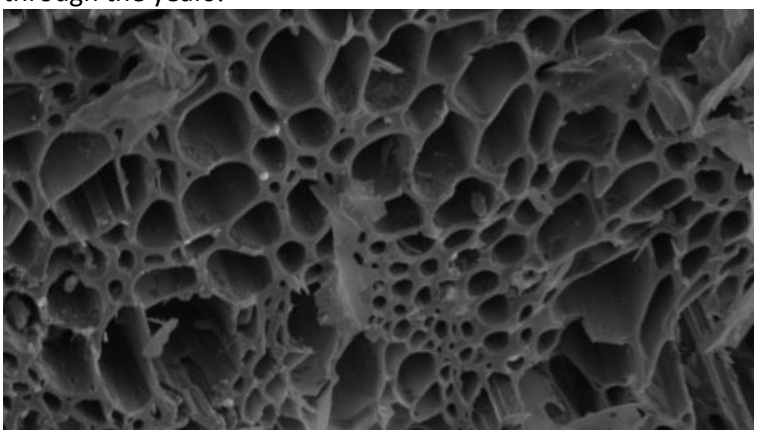
In recent years, there have been new markets focused on carbon removal. These markets sell certificates to individuals and companies who want to offset their carbon emissions voluntarily. Biochar, when produced in facilities that meet certain environmental standards and capture usable heat, can contribute to these markets. Some of these carbon removal platforms pay around €150 for each ton of biochar produced. Some even sell certificates before removal, which can help startup biochar producers with financing and development.

Currently, the facilities participating in carbon removal based on biochar are typically large, industrial operations that run continuously. However, there is growing interest in allowing smaller, farm-scale biochar production units to participate in these carbon markets, especially as part of broader carbon farming initiatives.

It's important to note that using biochar is recommended as an alternative way to use woody biomass, according to certain guidelines and reports, including those from UNESC-ECE and Humboldt County. The National Parks and Wildlife Service (NPWS) has also given feedback on this topic during consultations with Irbea (Irish Bio Energy Assoc)

8.5.2 How to make Biochar?

Biochar is produced through a process called pyrolysis, which involves heating biomass materials, such as agricultural waste, wood chips, or crop residues, in the absence of oxygen.
Biochar has been made for centuries with simple equipment right where it's needed, and it has the potential to help remove a lot of carbon from the environment. But there have been improvements In the process through the years!



Some specific units like Exeter Retort, Kon Tiki Kiln, and the Oregon Kiln use a technique called the flame cap method. This means that any gases produced during the process are burned at the top of the kiln, making the combustion cleaner with less smoke and particles. This also helps turn the biomass at the bottom of the kiln into biochar. To make sure it doesn't reignite, the hot material needs to be cooled down completely with a water or slurry mix.
On-farm pyrolysis
As part of the North Connemara Locally Led Agri Environmental Scheme we built a Rotatable Covered Cavity (RoCC) kiln which can be used for mobile pyrolysis. The idea was that the RoCC could be towed behind an agricultural vehicle into a field and used to make biochar right where the biomass was located. We have successfully made 4 lots of biochar and are continuing to learn and fine-tune the process each time.

(There are a number of other companies looking at developing farm-scale equipment that are likely to be coming online in the near future.)
Top-down fire management
In the absence of commercial biochar production equipment, and in order to minimise any negative air quality impacts arising from the burning of biomass, simple fire management techniques, employing the “top down” burning approach should be employed. Evidence suggests that burning from the top down, rather than the bottom up, reduces the emission of pollutants significantly.
Along with careful arrangement and stacking of the pile so that largest material gets stacked on the bottom, and it graduates upwards, by igniting the smaller material at the top of the pile and allowing it to burn from the top down, it greatly reduces the amount of smoke and particulate that is produced. Farmers should be

made aware of this approach compared to setting fire to the base of a pile which produces far more smoke and particulates. This approach can also yield some biochar at the end, although the yield will be less than biochar produced in a kiln. But importantly, it can effectively be considered cost neutral.
The biochar can then be sold or used on farm in a variety of potential applications.

8.5.3 Biochar Uses

Biochar uses on farm	Biochar uses off farm
• Soil amendment • Biofertiliser component • Compost additive • Slurry/manure additive • Filtration medium • Animal Bedding • Animal Feed additive	• Domestic Animal feed additive • Soil amendment • Peat moss replacement (when mixed with other organics) • Green roof substrates • Additives for construction material such as asphalt/tarmac, mortar and concrete • Filler for thermoplastics and biomaterials • Water filtration media for SUDS, swales, rain gardens, constructed wetlands etc. • Compost additive • Media for land reclamation- e.g. former brownfield or mine sites

Forestry: United States Agriculture Department (USDA) US Forest Service -The US Forest Service has been turning to the conversion of woody biomass through the use of mobile biochar production kilns, which can be brought to site rather than transporting feedstock to a central processing site. This allows for sustainable management of pest-infected timber as well as woody biomass that represents fire risks. The resultant biochar can then be returned to the forest soil, particularly during reforestation efforts. For further information, the USDA have produced an A-Z of the biochar basics (USDA, 2022).
This may especially be of interest where the replanting of heavily infested areas of rhododendron may take place. The toxic leaf litter and soil compaction that will have resulted from years of rhododendron monocultures could be reversed somewhat by the positive effects of activated and inoculated biochar.
Depending on how biochar is used, it is often incorporated back into the soil as part of a sustainable approach. For example, if you add biochar to winter slurry storage tanks on farms, it can help reduce emissions from these tanks, absorb nutrients from the slurry, and then release those nutrients slowly into the soil when the slurry is spread. This enriches the soil with carbon and nutrients while preventing excess nutrient runoff during heavy rains.
Biochar is also being tested to address problems like surface water runoff, water pollution, and harmful algal blooms caused by too many nutrients in water. It can be used in structures like sediment traps, filtration ponds, or biofilters to improve water quality and reduce nutrient loss from farms. There's even a project called REFORM WATER in Finland that's trying biochar in drainage networks to reduce the amount of dissolved organic matter in water coming from forested peatland areas.

8.5.4 A few terms:

Activated biochar is primarily used for adsorbing and removing contaminants from gases or liquids, while inoculated biochar is employed as a soil amendment to improve soil fertility and support beneficial microorganisms for agricultural and environmental purposes.

Inoculated biochar is biochar that has been intentionally mixed or coated with microorganisms, such as beneficial bacteria or fungi. The purpose of inoculating biochar is to introduce specific microorganisms that can enhance its properties and functions. These microorganisms can contribute to soil fertility, nutrient cycling, carbon sequestration, and remediation of contaminated soils. Inoculated biochar is often used as a soil amendment to improve soil health, promote plant growth, and increase the efficiency of nutrient uptake. FORUM hopes to investigate the use of both Activated and Inoculated Biochar in a new EIP programme in the next open call.

8.6 Rhododendron Control Workers Site Visit Reports

Once the NCLLAES hired the 10-man rhododendron control operatives we were better able to track the ground covered and the quality of the work done.

A total of 16 Farmers had the team work on their farms to control rhododendron on their lands.

These are anonymised here for GDPR reasons:

#	Name	Address
1	Farmer A	Moyard, Co. Galway
2	Farmer B	Curr, Maam, Co.Galway
3	Farmer C	Mullagloss, Renvyle, Co Galway
4	Farmer D	Letterfrack, Co.Galway
5	Farmer E	Cahir, Recess, Co.Galway
6	Farmer F	Moyard, Co. Galway
7	Farmer G	Creagha, Leenane, Co.Galway
8	Farmer H	Derrynacleigh, Leenaun, Co. Galway, H91 PY61
9	Farmer I	Bunowen, Leenane, Co Galway.
10	Farmer J	Letterettrin, Renvyle,Co Galway
11	Farmer K	Curr, Maam, Co.Galway
12	Farmer L	Ross, Co.Galway
13	Farmer M	Ross, Co.Galway
14	Farmer N	Letterettein, Co.Galway
15	Farmer O	Gorrom, Recess, Co. Galway
16	Farmer P	Lissoughter, Recess, Co. Galway

During the course of 16 weeks, we successfully covered a total of 123 hectares of land. You can review the specific areas we worked on in the attached maps:

Figure 35 Moyard

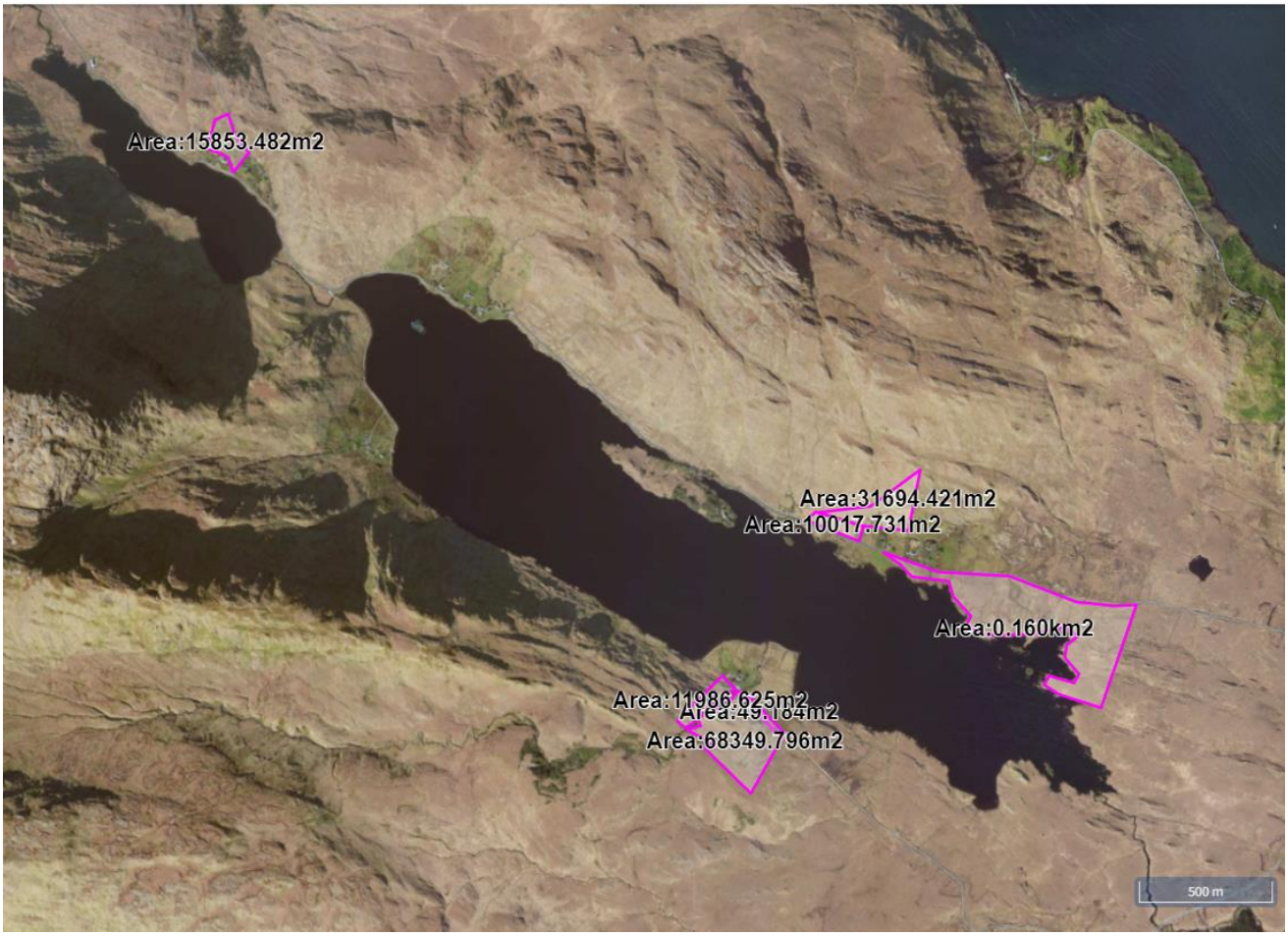
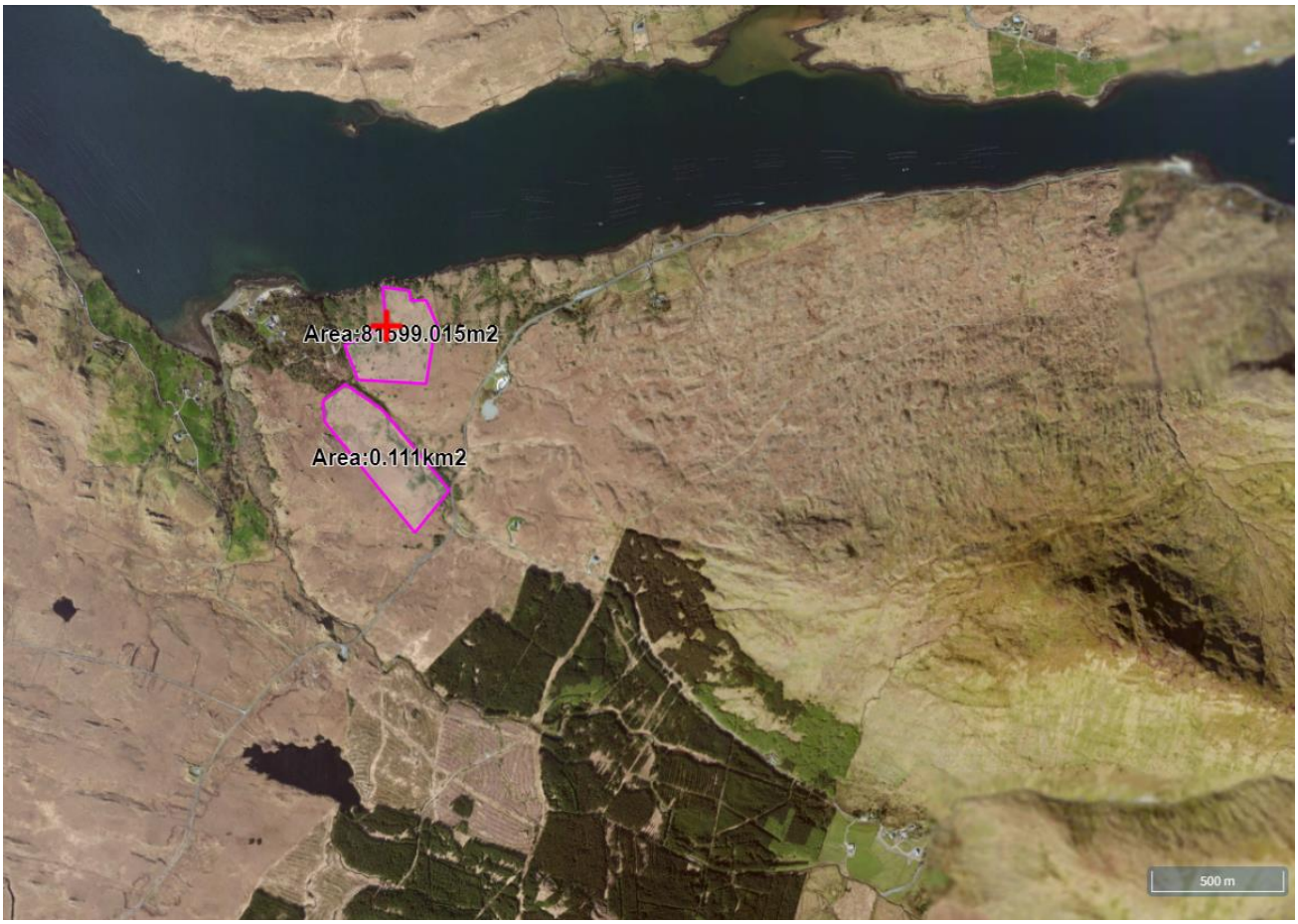
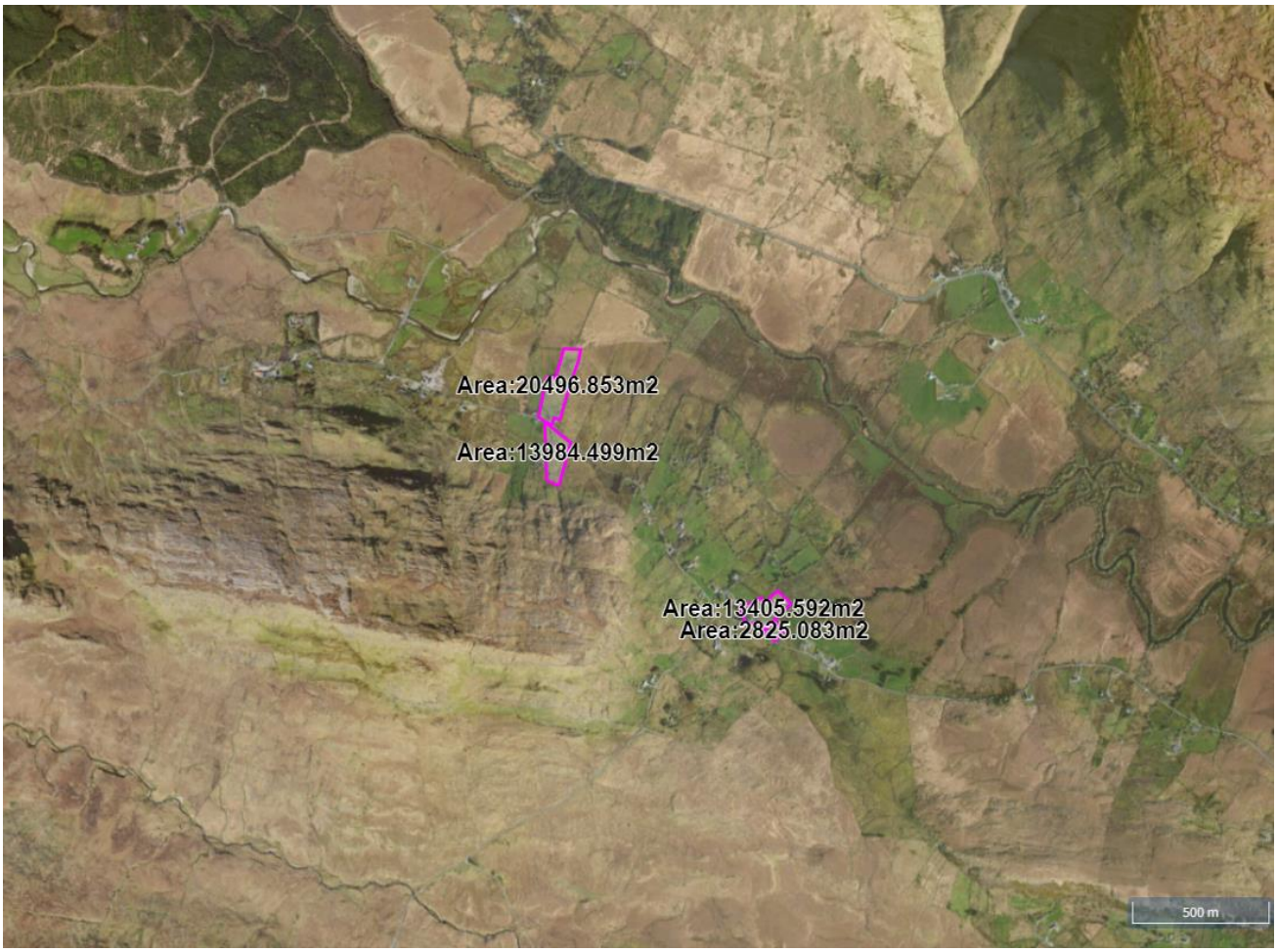
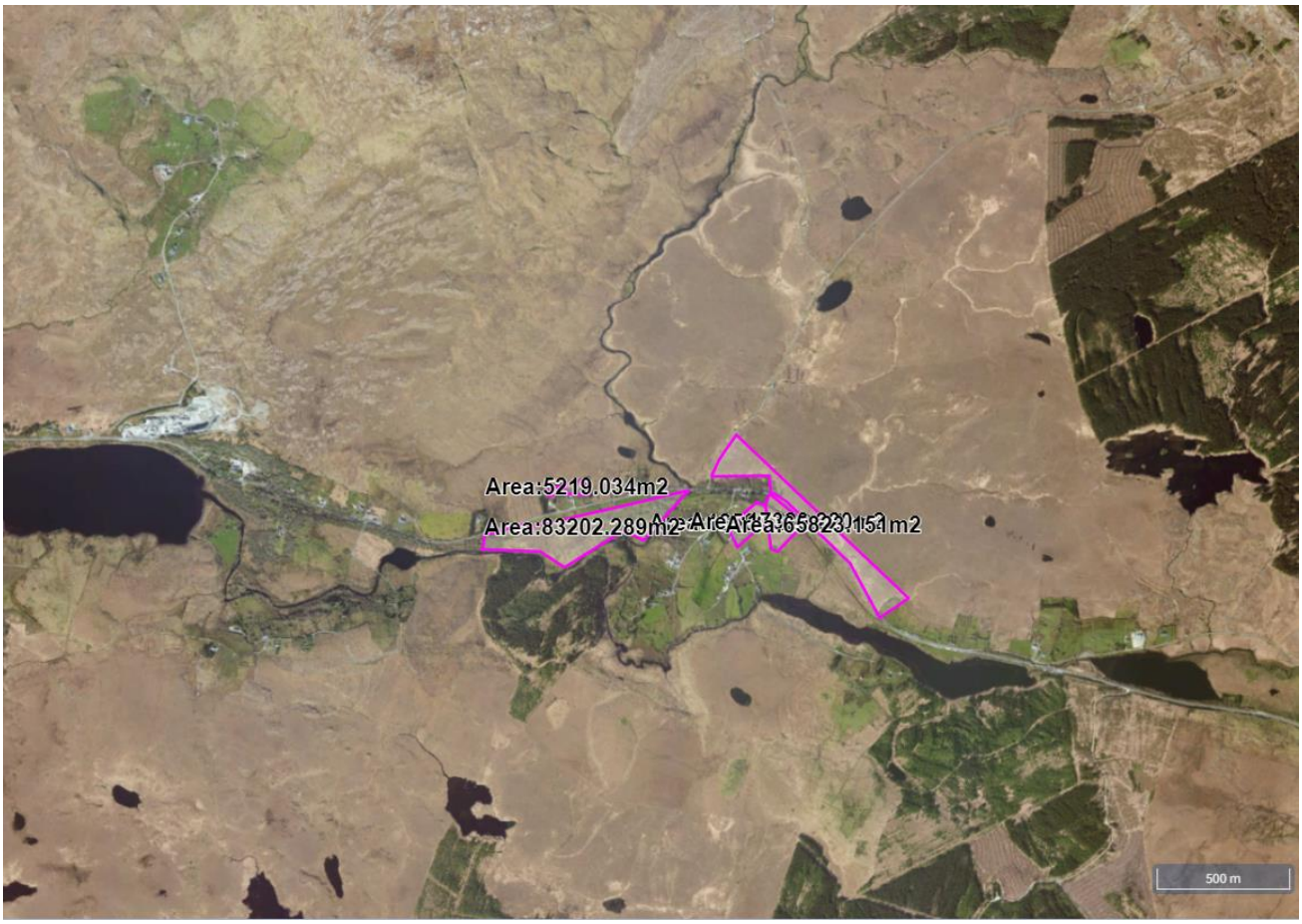


Figure 36 Lough Fee Area


Area:81599.015m2
Area:0.111km2
500 m


Area:20496.853m2
Area:13984.499m2
Area:13405.592m2
Area:2825.083m2
500 m


Area:5219.034m2
Area:83202.289m2
Area:63823.151m2
500 m

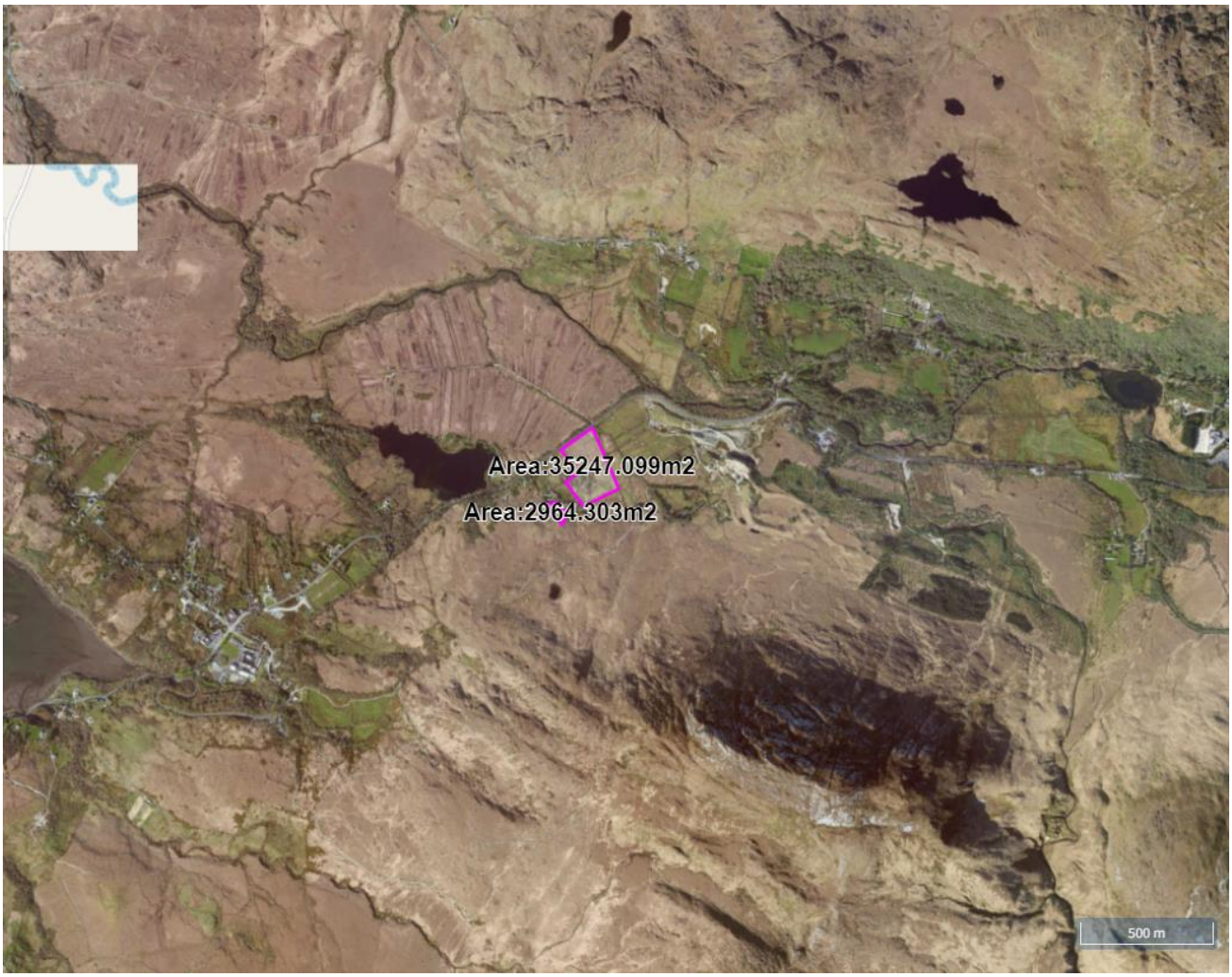

Area:35247.099m2
Area:2964.303m2
500 m

Figure 37 Mullagloss

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: ***REDACTED***
Site Address: Moyard, Co. Galway

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.
Site Visit Detail
Date of in in initial site visit: 17/01/2023
Private or Commonage: Private
Is the site a SAC: No
Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty
Age/Height/Spread: The spread is moderate to severe with the age and height varying from seedings to very mature plants ageing around. The rhododendron was a maximum of 50 years old and reached up to 10 ft in places.
Site specific issues: There is a river running through an area of the site with rhododendrons along the banks. It also is located at the back of a short term rented property. There was also uneven terrain and some areas had no fence marking the boundary.

Summary: The farmer has already begun treating the rhododendron, with some already dead. There is water available, however there is no parking. Parking at a different location must be arranged close to the site. The areas being targeted over the 5 days consist of three different plots. The river will be avoided in the plot as it is too close and too difficult to access. The residents renting the house should be informed when work is underway.

Site visit during treatment:
Date of visit: 3/03/2023
Name of inspectors: EIP Environmental Scientist, Aisling Finnerty
Weather conditions: Mostly dry with some rainfall
Number of days treating on site: 5
Summary:
An arrangement can be made with the craft shop located across the road from the site to use their car park for the welfare unit and staff. Due to the severity and maturity not all the rhododendron on site was treated. Spread may occur in the future.

Photographs and Site Maps:

Fig.1. Map showing no SAC's in proximity to site.

Fig.2. Map showing river with flow direction.

Table 1. Table showing monthly average temperature and rainfall.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
56.9	143.1	39.0	51.6	78.9	79.4	66.0	79.6	114.2	199.3	156.2	114.3
167.3	113.4	102.1	23.9	95.7	29.8	58.5	84.8	91.1	164.0	78.9	114.7
118.7	248.5	108.2	46.8	49.6	67.9	174.3	109.8	90.3	168.0	148.1	151.6
116.7	87.8	94.7	72.0	75.3	79.6	86.5	107.8	100.3	128.9	120.3	123.2

Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	6.0	7.3	6.7									
2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Photos post treatment/during site visit:

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: ***REDACTED***
Site Address: Curr, Maam, Co.Galway

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.
Site Visit Detail
Date of in in initial site visit: 7/12/2022
Private or Commonage: Private
Is the site a SAC: No
Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty
Age/Height/Spread: The rhododendron is mostly mature with it mainly in hedgerows along the perimeter of the plot. The plants are approximately 11 ft and between 50/60 years old.
Site specific issues: There is a fenced area located in the centre of the plot. This poses an issue as it makes it difficult to gain access to the rhododendron stem to treat.
Summary:
There is a lot of fencing in the plot and this can be difficult/ dangerous when using a chainsaw. Also, there is a river in the plot however the rhododendron is located more than 5m from the river so can be safely treated.

Name of inspectors: EIP Environmental Scientist, Aisling Finnerty

Photographs and Site Maps:

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Table 1. Table showing monthly average temperature and rainfall.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
56.9	143.1	39.0	51.6	78.9	79.4	66.0	79.6	114.2	199.3	156.2	114.3
167.3	113.4	102.1	23.9	95.7	29.8	58.5	84.8	91.1	164.0	78.9	114.7
118.7	248.5	108.2	46.8	49.6	67.9	174.3	109.8	90.3	168.0	148.1	151.6
116.7	87.8	94.7	72.0	75.3	79.6	86.5	107.8	100.3	128.9	120.3	123.2

Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	6.0	7.3	6.7									
2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Photos pre-treatment/during site visit:

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: John Thomas Coyne
Site Address:

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.
Site Visit Detail
Date of in in initial site visit: 8/11/2022
Private or Commonage: Private
Is the site a SAC:
Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty
Age/Height/Spread: The age varied from new seedlings to fully mature bushes.
Site specific issues:

Summary
There was plenty available parking at the site and there was an available water source so the herbicide could be mixed on site. The site is small so the full five days won't be needed.
Site visit during treatment:
Date of visit: N/A
Name of inspectors: EIP Environmental Scientist, Aisling Finnerty
Weather conditions: Heavy rain throughout the treatment of the site.
Number of days treating on site: 3
Summary:
When workers arrived to treat the rhododendron the land owner informed them that he had recently sold two of his three plots. It was the least severely infested plot. This is reasoning for the farmer receiving three days of treatment
Site Visit Post-treatment:

Photographs and Site Maps:

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
56.9	143.1	39.0	51.6	78.9	79.4	66.0	79.6	114.2	199.3	156.2	114.3
167.3	113.4	102.1	23.9	95.7	29.8	58.5	84.8	91.1	164.0	78.9	114.7
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116.7	87.8	94.7	72.0	75.3	79.6	86.5	107.8	100.3	128.9	120.3	123.2

Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	6.0	7.3	6.7									
2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Table 1. Table showing monthly average temperature and rainfall.

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: Site Address: *REDACTED*

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.

Site Visit Detail

Date of in in initial site visit: 17/01/2023

Private or Commonage: Private

Is the site a SAC: No

Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty

Age/Height/Spread: The rhododendron is mature, aging between 50 to 60 years and reaching 11 ft. The infestation is severe.

Site specific issues: The rhododendron is dense in areas with gorse growing amongst it.

Summary:

Parking and water are available on site. The rhododendron located adjacent to the house will be tackled first as this is still usable farmland, preventing further encroachment. If there is time the area located above the house will be treated. This is completely infested with rhododendron. Tackling this will give the farmer more usable land and prevent further spread. Due to the level of severity and the multi stemmed plants, the whole site will not be treated within the allotted time.

Site visit during treatment:

Date of visit: 23/01/2023

Name of inspectors: EIP Environmental Scientist, Aisling Finnerty

Weather conditions: Heavy rainfall

Number of days treating on site: 5

Summary:

The area currently used as farmland was treated as well as the area above the house. The gorse and the dense, multi stemmed plants made it difficult to treat.

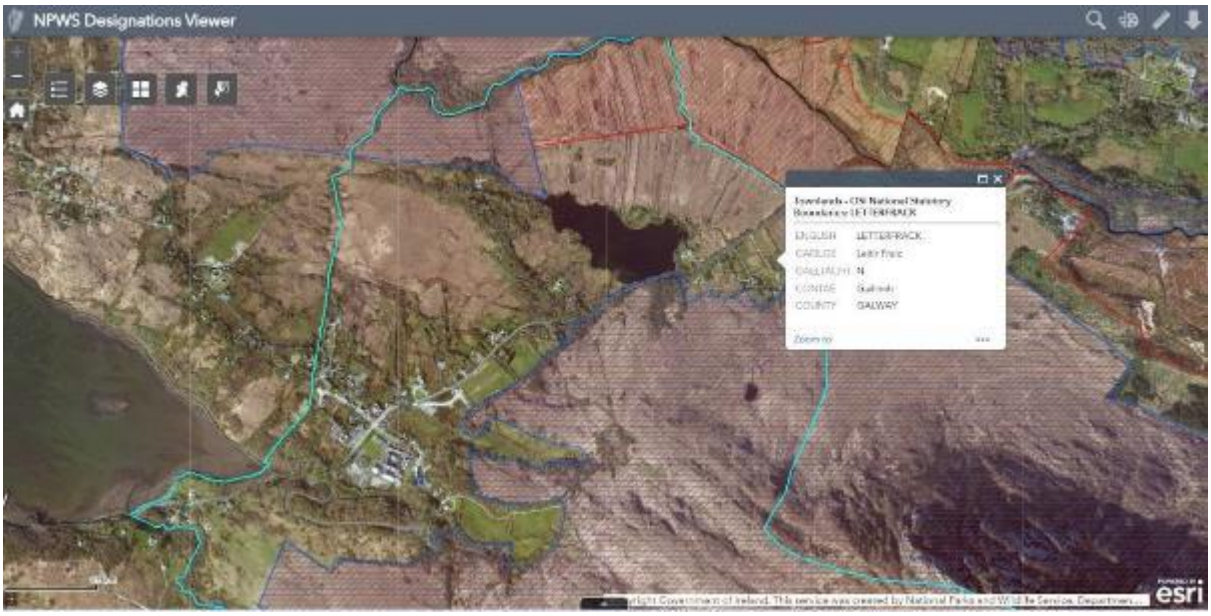

Fig.1. Map showing SAC's in proximity to the site.

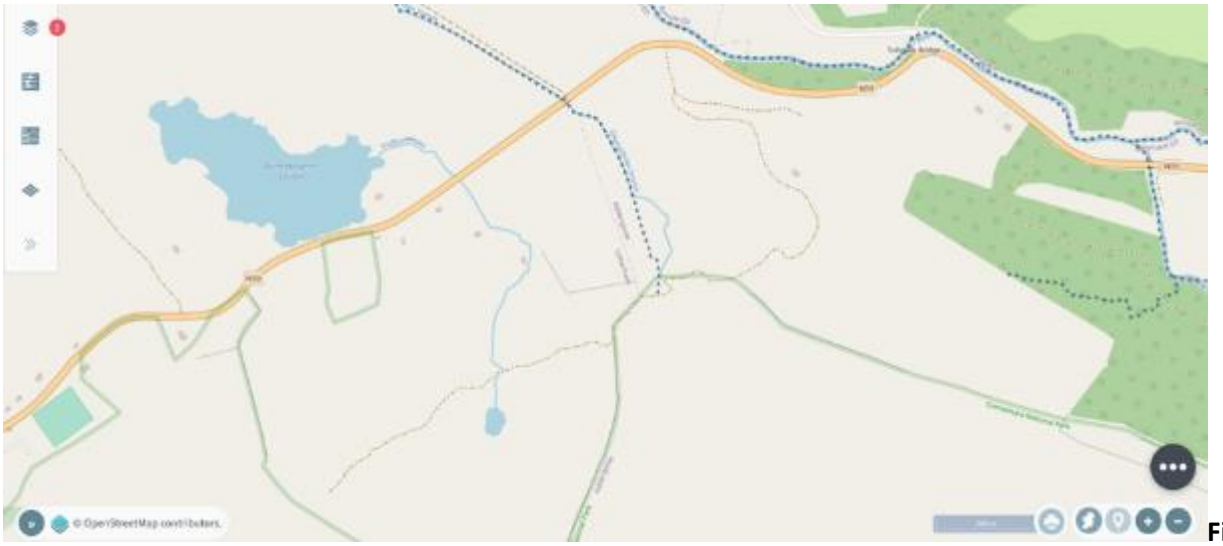

Fig.2. Map showing river with flow direction.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
56.9	143.1	39.0	51.6	78.9	79.4	66.0	79.6	114.2	199.3	156.2	114.3
167.3	113.4	102.1	23.9	95.7	29.8	58.5	84.8	91.1	164.0	78.9	114.7
118.7	248.5	108.2	46.8	49.6	67.9	174.3	109.8	90.3	168.0	148.1	151.6
116.7	87.8	94.7	72.0	75.3	79.6	86.5	107.8	100.3	128.9	120.3	123.2

Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	6.0	7.3	6.7									
2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Table 1. Table showing monthly average temperature and rainfall.

Photos pre treatment/during site visit:

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: Site Address: *REDACTED*

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.

Site Visit Detail

Date of in in initial site visit: 7/12/2022

Private or Commonage: Private/Commonage

Is the site a SAC: No/Yes

Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty

Age/Height/Spread: The rhododendron is mostly immature, less than 10 years old, with some mature bushes at the entrance of the site, lining the fencing, on the private land. The infestation is moderate. These plants are approximately 30-40 years old and 9 ft tall.

Site specific issues: There is a river located on the comanage.

Summary:

Permission must be obtained from other shareholders on the commonage. No treatment will be carried out near the river located on the commonage. There is access to water and parking on site.

Site visit during treatment:

Date of visit: 2/02/2023

Name of inspectors: EIP Environmental Scientist, Aisling Finnerty

Weather conditions:

Number of days treating on site: 3

Summary:

The five days were not needed on site as the level of infestation was moderate and the plants where mostly singled stemmed.

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
56.9	143.1	39.0	51.6	78.9	79.4	66.0	79.6	114.2	199.3	156.2	114.3
167.3	113.4	102.1	23.9	95.7	29.8	58.5	84.8	91.1	164.0	78.9	114.7
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Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	6.0	7.3	6.7									
2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Table 1. Table showing monthly average temperature and rainfall.

Photos pre treatment/during site visit:

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: Site Address: ***REDACTED***

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.

Site Visit Detail
Date of in in initial site visit: 17/01/2023
Private or Commonage: Private
Is the site a SAC: No
Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty
Age/Height/Spread: The rhododendron is a mix of seedlings, immature and mature plants. The infestation is moderate with plants spread throughout the site.
Site specific issues: The ground is uneven making it challenging to work in. There is no water source on site. There is also no parking
Summary:
Water will have to be brought to the site. An arrangement can be made with the craft shop located across the road from the site to use their car park for the welfare unit and staff. There are other plots located in close proximity which also contain rhododendron which may cause the species to return.

Site visit during treatment:
Date of visit: N/A
Name of inspectors: EIP Environmental Scientist, Aisling Finnerty
Weather conditions:
Number of days treating on site: 2
Summary:
The two plots which were treated were small and the infestation was moderate. The five days which were allotted were not needed.

Photographs and Site Maps:

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
56.9	143.1	39.0	51.6	78.9	79.4	66.0	79.6	114.2	199.3	156.2	114.3
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Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Table 1. Table showing monthly average temperature and rainfall.

Photos pre treatment/during site visit:

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: ***REDACTED***
Site Address: Creagha, Leenane, Co.Galway

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.
Site Visit Detail
Date of in in initial site visit: 8/11/2022
Private or Commonage: Private
Is the site a SAC: No
Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty
Age/Height/Spread: The age varied from new seedlings to fully mature bushes
Site specific issues:
There is a river running along the west of the site but it can be avoided.

Summary
There was plenty available parking at the site and there was an available water source so the herbicide could be mixed on site. The works will focus on the younger/smaller rhododendron which is encroaching on the farmland.
Photographs and Site Maps:

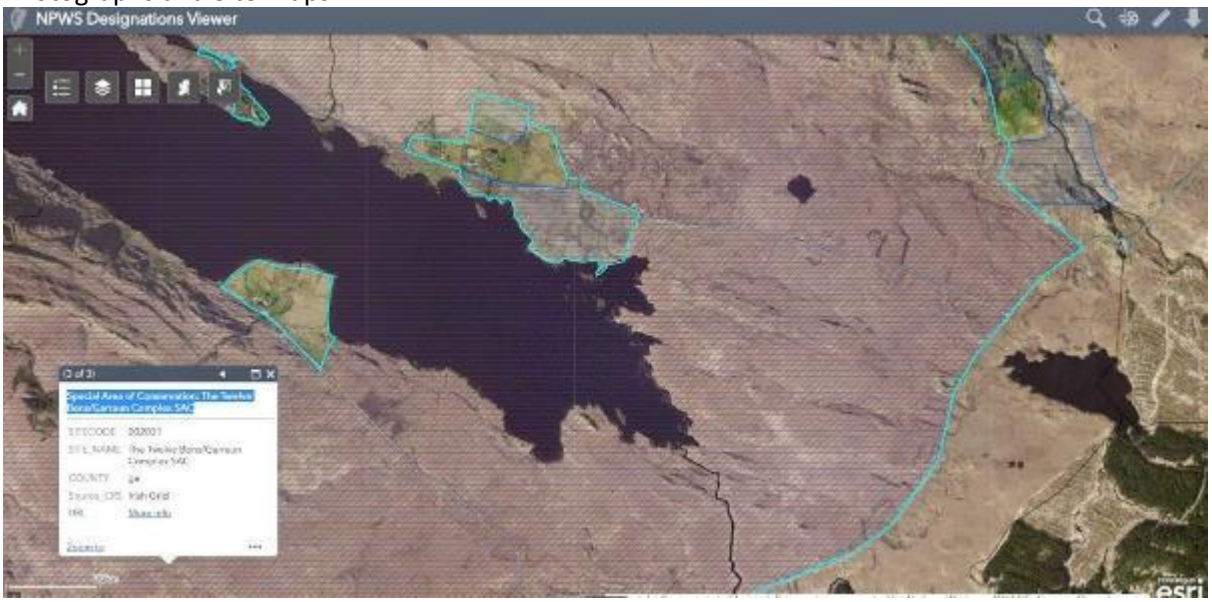

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
56.9	143.1	39.0	51.6	78.9	79.4	66.0	79.6	114.2	199.3	156.2	114.3
167.3	113.4	102.1	23.9	95.7	29.8	58.5	84.8	91.1	164.0	78.9	114.7
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Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	6.0	7.3	6.7									
2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Table 1. Table showing monthly average temperature and rainfall.

Photos pre treatment/during site visit:








Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: ***REDACTED***
Site Address: Killary Adventure Co, Derrynacleigh, Leenaun, Co. Galway, H91 PY61

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.
Site Visit Detail
Date of in in initial site visit: 8/11/2022
Private or Commonage: Private
Is the site a SAC: No
Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty
Age/Height/Spread: The age varied from new seedlings to fully mature bushes ageing between 40/50 years.
The height varied from just a few centimetres to 11ft multi-stem bushes
There is an extensive/ severe spread across the site
Site specific issues:
There were some very dense bushes which would be difficult to access.
Summary
There was plenty available parking at the site and there was an available water source so the herbicide could be mixed on site. There were no water bodies of concern near the area being treated. The site was flat and would be an ideal area for workers in terms of safety and efficiency. The participant has already begun treating the rhododendron on site below. In the area chosen it was decided that it would be most beneficial to the participant for the younger, less mature rhododendron which was encroaching on the land to be prioritised. If left untreated the land would be completely unusable in the future.

Site visit during treatment:
Date of visit: 4/1/2023
Name of inspectors: EIP Environmental Scientist, Aisling Finnerty
Weather conditions: Heavy rain throughout the treatment of the site.
Number of workers: 8
Number of days treating on site: 5
Summary:
The workers didn't encounter any issues on site.

hotographs and Site Maps:

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Table 1. Table showing monthly average temperature and rainfall.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
56.9	143.1	39.0	51.6	78.9	79.4	66.0	79.6	114.2	199.3	156.2	114.3
167.3	113.4	102.1	23.9	95.7	29.8	58.5	84.8	91.1	164.0	78.9	114.7
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Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	6.0	7.3	6.7									
2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Photos pre treatment/during site visit:




Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: ***REDACTED***
Site Address:

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.
Site Visit Detail
Date of in in initial site visit: 8/11/2022
Private or Commonage: Private
Is the site a SAC: No
Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty
Age/Height/Spread: The age varied from new seedlings to fully mature bushes ageing between 40/50 years.
The height varied from just a few centimetres to 11ft multi-stem bushes
There is an extensive/ severe spread across the site

Site specific issues:

Summary
There was plenty available parking at the site and there was an available water source so the herbicide could be mixed on site. There were some drains however they would be easily avoidable. The participant has already began treating the rhododendron on site. The site is approximately 10 ha with rhododendron spread throughout the site.
Site visit during treatment:
Date of visit: 4/12/2022
Name of inspectors: EIP Environmental Scientist, Aisling Finnerty
Weather conditions: Heavy rain throughout the treatment of the site.
Number of workers: 8
Number of days treating on site: 5
Summary:
There was very heavy rainfall during the treatment of the rhododendron on site. The workers found this difficult to work in as the site didn't have much shelter. They focused the work on an area which had some hills rather than working in the open. This slowed progress.

Photographs and Site Maps:

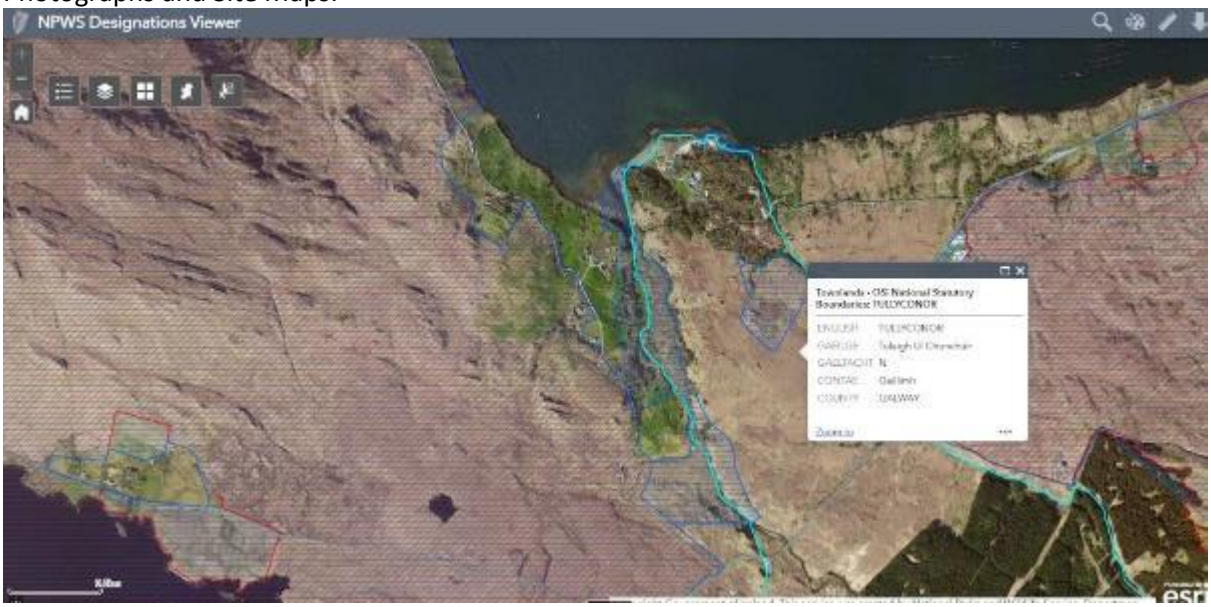

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Total rainfall in millimetres for ATHENRY

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Mean temperature in degrees Celsius for ATHENRY

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2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Table 1. Table showing monthly average temperature and rainfall.

Photos pre treatment/during site visit:






Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: ***REDACTED***
Site Address:

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.
Site Visit Detail
Date of in in initial site visit: 8/11/2022
Private or Commonage: Private and Commonage
Is the site a SAC: No
Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty
Age/Height/Spread: The age varied from new seedlings to fully mature bushes ageing between 40/50 years. The mature bushes were primarily located around an old building. This was likely the source of the spread. The rhododendron located in the grassland areas were smaller and younger.
The infestation was mild.
Site specific issues:
Part of the site is located on a slop which could pose an issue for the workers. The areas that were too steep would be avoided for safety. It was also located up a damaged secondary road and would require a jeep to access.
.
Summary
There was available parking at the site but workers would need to carpool in a jeep up to the site. There was an available water source so the herbicide could be mixed on site.
Site visit during treatment:
Date of visit: N/A
Name of inspectors:
Weather conditions:
Number of workers: 5
Number of days treating on site:
Summary:

Photographs and Site Maps:

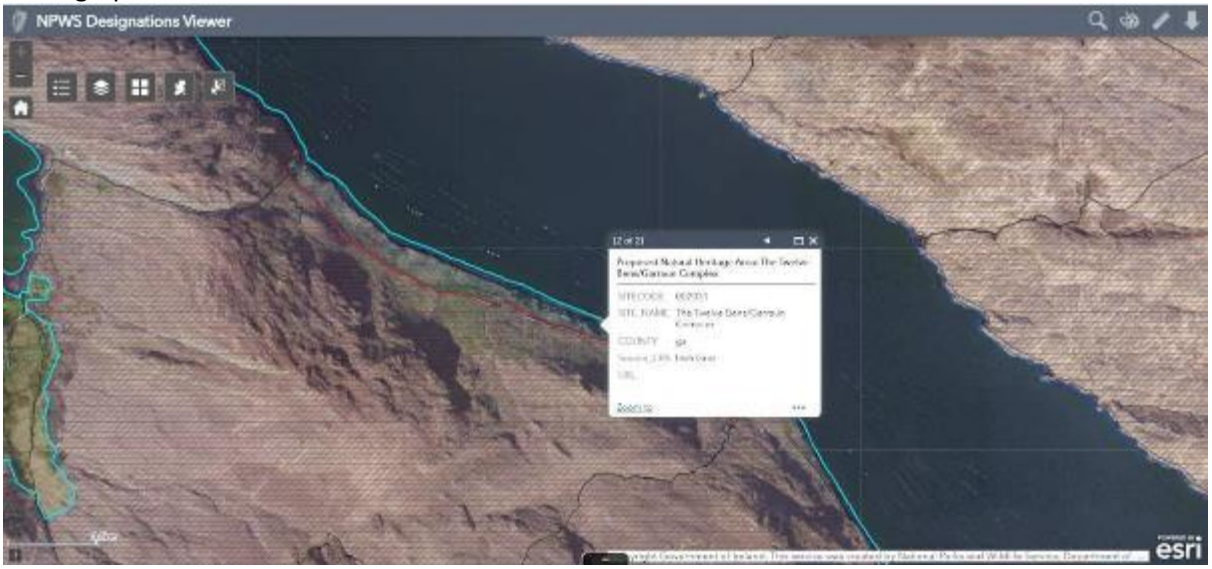

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Table 1. Table showing monthly average temperature and rainfall.

Photos pre treatment/during site visit:







Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: Site Address: ***REDACTED*** : Curr, Maam, Co.Galway

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.

Site Visit Detail

Date of in in initial site visit: 7/12/2022

Private or Commonage: Private

Is the site a SAC: No

Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty

Age/Height/Spread: The rhododendron is approximately 40-50 years old and 10 ft tall. The plants are mainly located along the fenced boundary.

Site specific issues: No issues are apparent upon site inspection.

Summary:

The rhododendron is mostly mature with it mainly in hedgerows along the perimeters of the plot. There did not appear to be any spread into the centre of the site. There is a rhododendron in a second plot on the south side of the road. If there is time within the allotted treatment period this will also be tackled.

Site visit during treatment:
Date of visit: 24/01/2023
Name of inspectors: EIP Environmental Scientist, Aisling Finnerty
Weather conditions: Dry with cool temperatures
Number of days treating on site: 5
Summary:
The south side plot was also treated.

Photographs and Site Maps:

Pre-treatment:

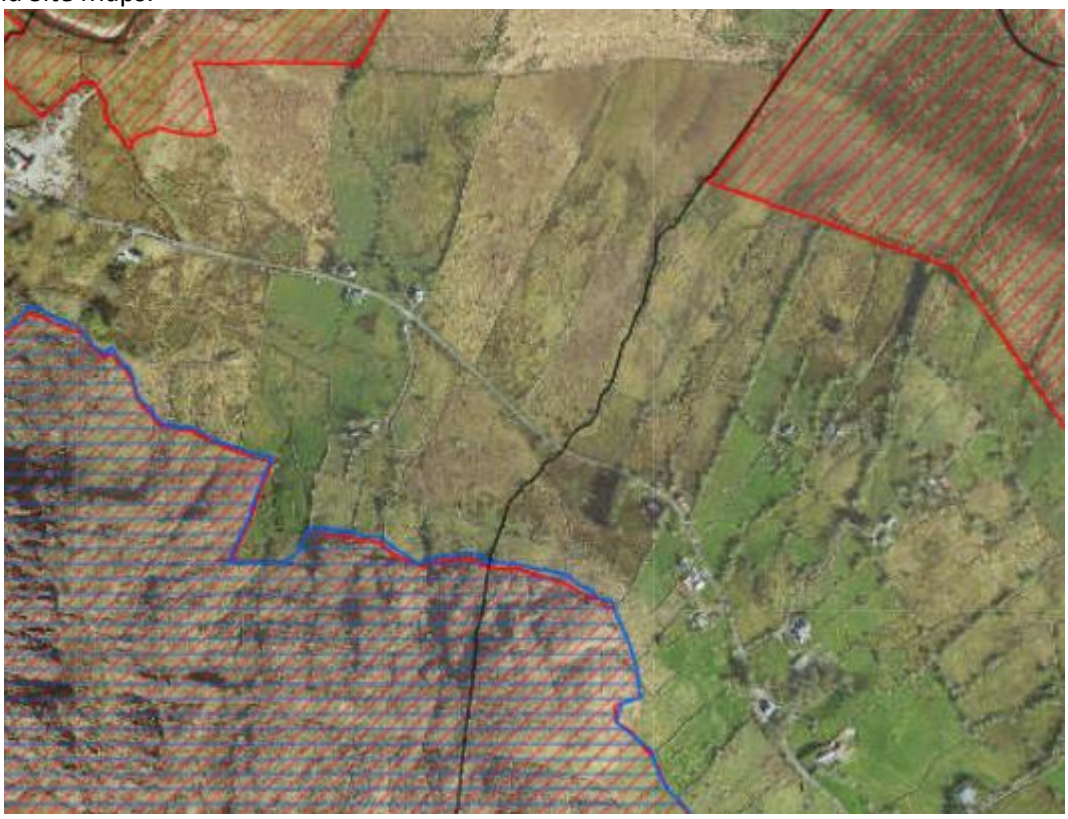

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Table 1. Table showing monthly average temperature and rainfall.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
56.9	143.1	39.0	51.6	78.9	79.4	66.0	79.6	114.2	199.3	156.2	114.3
167.3	113.4	102.1	23.9	95.7	29.8	58.5	84.8	91.1	164.0	78.9	114.7
118.7	248.5	108.2	46.8	49.6	67.9	174.3	109.8	90.3	168.0	148.1	151.6
116.7	87.8	94.7	72.0	75.3	79.6	86.5	107.8	100.3	128.9	120.3	123.2

Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	6.0	7.3	6.7									
2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Photos pre treatment/during site visit:




Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: Site Address: ***REDACTED*** Ross, Co.Galway

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.

Site Visit Detail

Date of in in initial site visit: 9/03/2023

Private or Commonage: Private (Leased)

Is the site a SAC: No

Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty

Age/Height/Spread: The rhododendron is mature, aging up to approximately 80 years old. The height is varied. Some plants are up to 10 ft tall. The infestation is severe.

Site specific issues: The rhododendron is intertwined with gorse in some areas making it difficult to access. The rhododendron is also very dense.

Summary:

The rhododendron is highly mature and the trunks of some of the plants are very thick. Gaining access and treating these plants will be difficult. The rhododendron that is amongst the gorse will be challenging due to the nature of the gorse. There is more than one plot that the farmer would like treated. .

Site visit during treatment:

Date of visit: 9/03/2023

Name of inspectors: EIP Environmental Scientist, Aisling Finnerty

Weather conditions: Heavy rainfall

Number of days treating on site: 5

Summary: Due to the level of infestation complete treatment of rhododendron in each plot will not be possible.

Photographs and Site Maps:

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Table 1. Table showing monthly average temperature and rainfall.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
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2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Photos pre treatment/during site visit:

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: Site Address: ***REDACTED*** : Ross, Co.Galway

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.

Site Visit Detail

Date of in in initial site visit: 17/01/2023

Private or Commonage: Private

Is the site a SAC: No

Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty

Age/Height/Spread: The rhododendron is mostly mature with it mainly in hedgerows along the perimeter of the plot. The bushes are approximately 40/50 years old and 11 ft tall.

Site specific issues: The bushes are very dense so gaining access may be difficult. They are located near a fence. The area being treated is located at a height with a steep edge. The road leading up to the site has been damaged due to heavy rainfall and frost.

Summary:

A jeep will be needed to gain access to the site. The welfare unit will not be able to be placed in close proximity to the site. The area in which the rhododendron is located has a steep edge therefore the plants located will not be treated due to safety concerns.

Site visit during treatment:

A site visit was not done due to the road access issues.

Date of visit: N/A

Name of inspectors: EIP Environmental Scientist, Aisling Finnerty

Weather conditions:

Number of days treating on site: 4

Summary: N/A

Photographs and Site Maps:

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Table 1. Table showing monthly average temperature and rainfall.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
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2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Photos pre treatment/during site visit:

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: Site Address: ***REDACTED*** : Letterettein, Co.Galway

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.
Site Visit Detail
Date of in in initial site visit:
Private or Commonage: Private
Is the site a SAC: Yes
Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty
Age/Height/Spread: The spread is severe throughout the site. With plants ranging from seedling to 8 ft in height.
Site specific issues: Due to the size and severity of the infestation on site it is unlikely that the entire site can be treated.
Summary:
There are no areas of concern other than the size and severity which might prove difficult to tackle.

Site visit during treatment:
Date of visit: 24/03/23
Name of inspectors: EIP Environmental Scientist, Aisling Finnerty
Weather conditions: Heavy rainfall throughout treatment.
Number of days treating on site: 5
Summary:
Heavy rainfall is creating difficult conditions to work in.

Photographs and Site Maps:

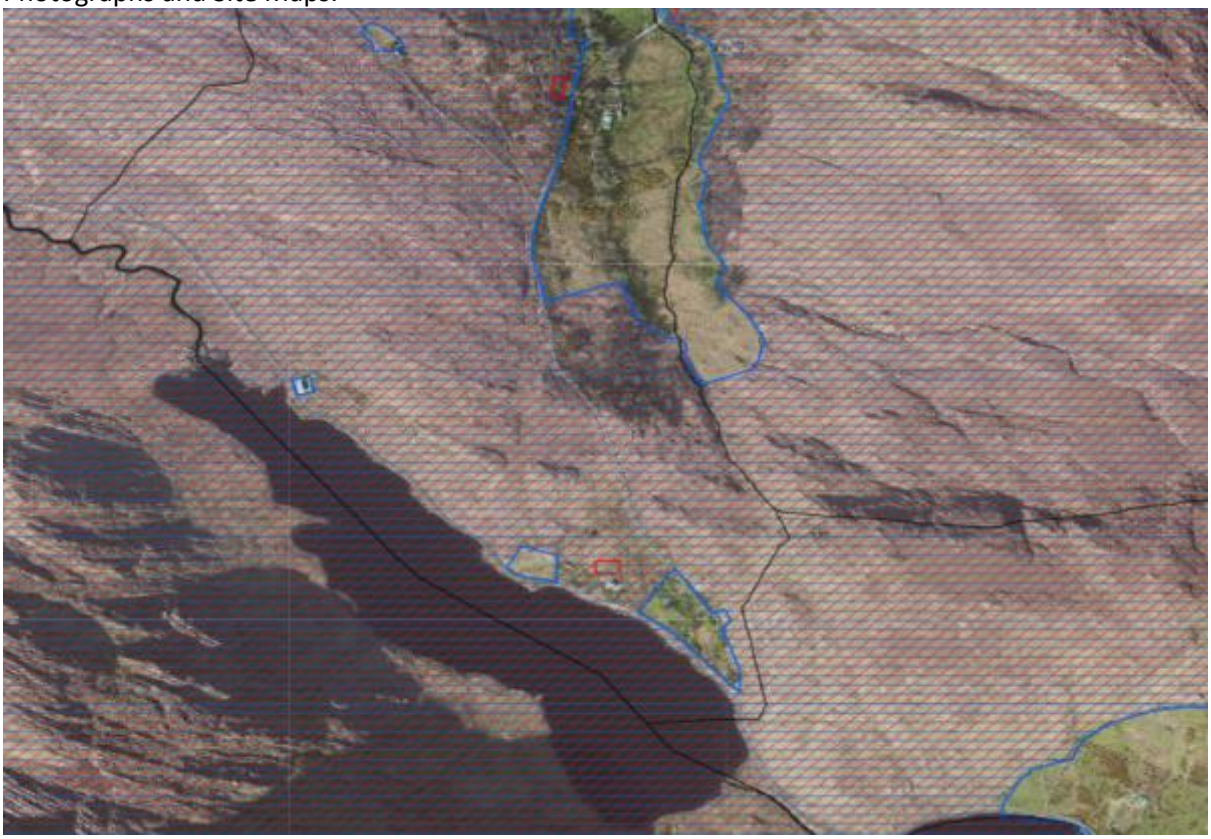

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Table 1. Table showing monthly average temperature and rainfall.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Mean temperature in degrees Celsius for ATHENRY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	6.0	7.3	6.7									
2022	6.1	7.0	6.9	8.7	12.2	13.6	16.2	15.5	13.1	11.7	8.8	3.4
2021	3.9	6.2	7.4	7.9	9.5	13.2	17.3	15.6	14.8	11.5	8.3	7.1
2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Photos pre treatment/during site visit

:

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: Site Address: *REDACTED* : Gorrom, Recess, Co. Galway

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.

Site Visit Detail

Date of in in initial site visit: 17/01/2023

Private or Commonage: Private

Is the site a SAC: No

Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty

Age/Height/Spread: The age and spread ranged from seedlings to highly mature plants. Some areas are severely infested and other areas of the plot are just slightly infested.

Site specific issues: The site is a large area. The team will only not be able to treat the entire plot. There is also a forestry neighbouring the site which contains rhododendron which could cause further spread in the future.

Summary:

There is a wide variety of rhododendron bushes throughout a large area. The farmer has begun work on rhododendron treatment. Some bushes will not be able to be treated. The larger, more dense bushes will be left due to time. The focus will be on preventing the agricultural land from being taken over by rhododendrons by tackling the areas with severe infestation of the plants less than 10 years of age.

Site visit during treatment:

Date of visit: 18/02/2023

Name of inspectors: EIP Environmental Scientist, Aisling Finnerty

Weather conditions:

Number of days treating on site:

Summary:

The team are focusing on the areas where the less mature rhododendrons are encroaching on usable farm land. They are unable to treat the highly mature bushes which are grouped together.

Photographs and Site Maps:

Fig.1. Map showing SAC's in proximity to the site.

Fig.2. Map showing river with flow direction.

Table 1. Table showing monthly average temperature and rainfall.

Total rainfall in millimetres for ATHENRY

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
113.9	42.0	175.2									
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Mean temperature in degrees Celsius for ATHENRY

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2023	6.0	7.3	6.7									
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2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Photos pre treatment/during site visit:

Rhododendron Site Visit Report

The site visit report contains site information before, during (if applicable) and after the treatment of rhododendron on a given site.

Name of farmer participant: Site Address: ***REDACTED*** : Lissoughter, Recess, Co.Galway

Pre-treatment site visit: the aim of the initial site visit is to assess if the site is suitable for the treatment of rhododendron. The site must be safe for the workers. It must have access to water and have parking available. The visit also aids in determining the extent of the invasive infestation and also where to tackle the rhododendron giving to optimise the benefit to the participating farmer.

Site Visit Detail

Date of in in initial site visit: 7/12/2022

Private or Commonage: Private

Is the site a SAC: Yes

Names of site inspectors: EIP Environmental Scientist, Aisling Finnerty
Rhododendron Control Team Supervisor, Dermot Flaherty

Age/Height/Spread: The rhododendron is a mixture of mature and immature plants reaching a maximum of 10 ft. The infestation is severe and is spread throughout the entire site.

Site specific issues: There is a fenced area located in the centre of the plot. This poses an issue as it makes it difficult to gain access to the rhododendron stem to treat. There is a river adjacent to the site which is SAC.

Summary:

Parking and water are available. Rhododendron in proximity to the river will not be treated. The fenced area will also not be treated. There is a drain located beneath the fence.

Site visit during treatment:

Date of visit: 14/02/2023

Name of inspectors: EIP Environmental Scientist, Aisling Finnerty

Weather conditions: Heavy rainfall throughout treatment

Number of days treating on site: 5

Summary:

The majority of the site was treated within the 5 days. No treatment was done in proximity to the river. There was heavy rainfall throughout the 5 days.

Photographs and Site Maps:

Fig.1. Map showing SAC's in proximity to the site.

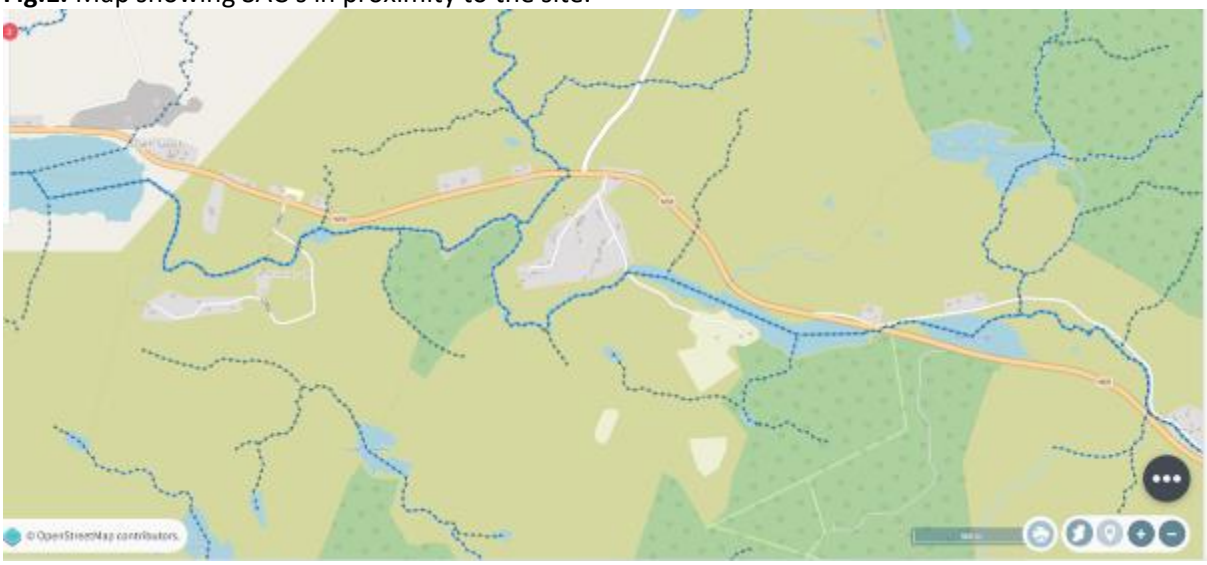

Fig.2. Map showing river with flow direction.

Total rainfall in millimetres for ATHENRY

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2020	6.1	5.8	6.3	9.8	12.0	13.7	13.8	15.6	13.0	9.7	8.1	5.0
LTA	5.5	5.6	7.1	8.6	11.3	13.7	15.5	15.2	13.2	10.2	7.5	5.6

Table 1. Table showing monthly average temperature and rainfall.

Photos pre treatment/during site visit:




8.7 Blackface Sheep Initiative Booklet 2022

North Connemara Locally Led Agri-Environmental Scheme

Blackface Sheep Initiative Booklet 2022

Name_____

Herd number_____

Viability of Enterprise

Financial information

Outgoing

Cost Item	Amount 2021
Feed	
Fertiliser	
Forage	
Veterinary	
Stock purchases	
AI	
Other	

Income

Animal sales	
Department scheme income	
Other	

Area where costs may be reduced_____

Area where income may be increased_____

CULLING UNPRODUCTIVE EWES

The farmer will carry out a health check on their flock at important stages of the year to identify problem or underperforming ewes which will be sold. Removing these from the flock will reduce the time farmers need to spend on ewes that are causing problems. Farmers will record the reasoning for selling these ewes from the flock. A trend in the reasoning for sale may help with management or breeding decisions in the future.

			CULL REASONING			
Tag number	Date of Sale	Dispatch Docket Number	Mastitis	Teeth	Breeding	Other

RECORDING UNPRODUCTIVE EWES IN FLOCK

The farmer will identify all ewes that have lambed down and returned to the hill with a lamb at foot. During the weaning process, ewes that have not brought a lamb to weaning will be recorded with an identity mark of the farmers choosing. The tag number and the identity mark will be recorded. It will then be easier to determine if an ewe needs to be removed from the flock.

Tag Number	Identity Mark	Area grazing