Great Yellow Bumblebee - EIP PROJECT

Final Project Report

April 2023

Table of Contents

Executive Summary

The Great Yellow Bumblebee (*Bombus distinguendus*) is classified as 'Endangered' on the Irish Red List, and 'Vulnerable' at European level. This European Innovation Partnership (EIP) Project was designed to work with farmers to implement management actions that would protect floral resources for the Great Yellow Bumblebee on the Mullet Peninsula and Erris coastal mainland, Co. Mayo.

Twenty-seven farmers chose options including delayed grazing options, delayed mow options, creation of linear features, and management of off-field habitat for pollinators. This resulted in 75.4ha of *Delayed Grazing* fields, 16.15ha of *Delayed Mowing* fields, 1655m of linear features, and 1ha of off-field habitat.

The fieldwork season occurred between the beginning of May and the end of September. Each farm received at least two visits from an ecologist during this period. All bumblebees were recorded using standard bumblebee transect monitoring techniques.

Farmer and community workshops were held throughout the year promoting the Great Yellow Bumblebee. Farm meetings as well as one-to-one meetings with farmers were an important element in farmer engagement and learning throughout the lifetime of the project.

Over 1800 bumblebee records were logged during the fieldwork season, from 12 different species. There were 78 records of Great Yellow Bumblebee. The target species was found in 17 of the 46 fields in the EIP. All farms recorded at least 4 different species of bumblebees.

The Great Yellow Bumblebee was found foraging on 13 different flowering plants on the project farms. The most important forage plants were Red Clover (37%) and Common Knapweed (33%). Ragwort, *Hypochaeris* species (mainly Cats-Ear) and Kidney Vetch were also important.

An MSc project entitled "Evaluating the Effectiveness of Agri-Environmental Measures for Rare and Common Bumblebees" was conducted by Alex Hayden, a UCD Master's student. This study investigated the effects of delayed mowing and grazing (treatment sites) in comparison to conventional mowing and grazing practices (control sites) on rare and common bumblebees. All treatment sites were fields participating in the Great Yellow Bumblebee Project.

The Great Yellow Bumblebee Project designed the first revision of a scorecard for the target species. The project ecologist looked at criteria for inclusion in the scorecards and tested the scorecard during the fieldwork season. From work carried out during the fieldwork season it was possible to draw up a list of indicator species. By the end of the fieldwork season it was determined that the following flowers were of particular importance: Red Clover, Common Knapweed. Ragwort, Yellow Composites especially Cat's Ears, and Yellow Rattle. This could be used to increase the quality of agri-environmental measures and to refine measures for use in future years with larger projects.

The project has built up a very good relationship with the remaining 27 farmers in the project. Farmers feedback on the project was very positive. The key feedback was that the farmers

now have a better understanding of how their farm management can impact bumblebees and other pollinators.

The project has delivered valuable conservation measures for pollinators while at the same time rewarding farmers for high value nature farming. The project has made a significant contribution to the baseline knowledge of the Great Yellow Bumblebee in the project area.

The project cost a total of €95,951with 38% of the project budget being farm payments or an equivalent of €36,415.

The Great Yellow Bumblebee Project are working with the LIFE on Machair team to continue to work with the Great Yellow Bumblebee Project farmers for 2023.
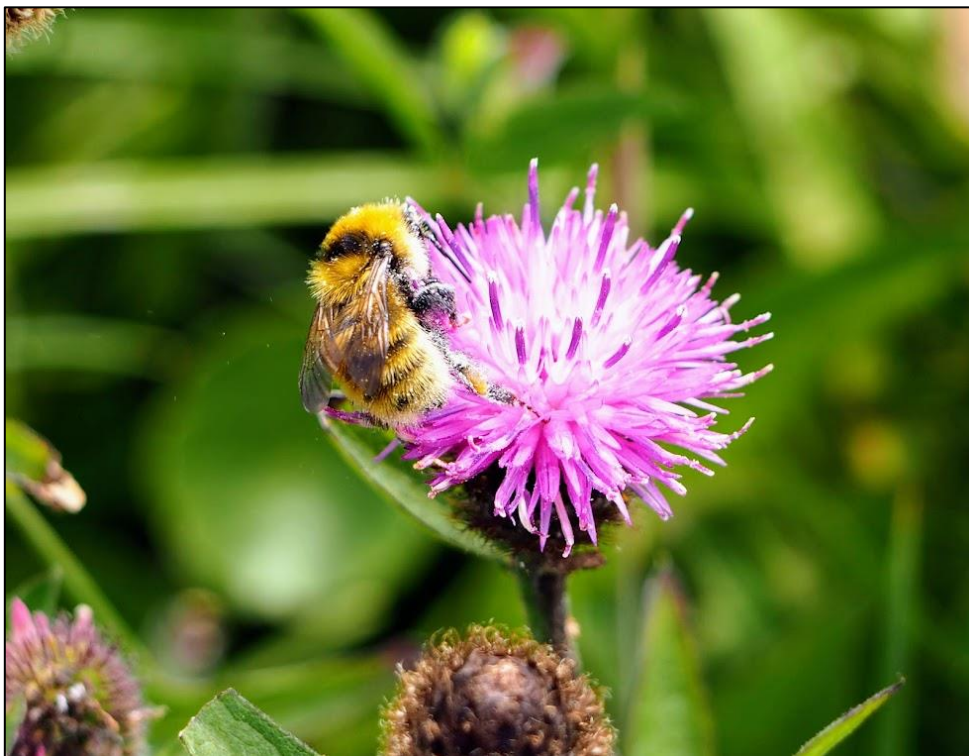
Photograph 1: Great Yellow Bumblebee worker on knapweed

What do you feel was the most valuable part of the Great Yellow Bumblebee project?

"Becoming aware of the importance if pollinators and the threat to them." - Project Farmer

1.0   Brief Description of Project

In Ireland, where once the Great Yellow Bumblebee had a national distribution, it is now only found along the western coast mainly on machair and flora-rich coastal farmland habitats. Today, the Mullet Peninsula and Erris coastal mainland are the only places in Ireland that support a healthy population of these endangered bumblebees. Adoption of land management practices that protect the flora-rich habitats used by farmers and other landowners as well as creating connections between flora-rich habitats are vital steps in supporting the bumblebee population on the Mullet Peninsula and Erris coastal mainland.

During the project, a results-based agri-environmental project was piloted with 27 farms on the Mullet Peninsula (19 farms) and the Erris coastal mainland (8 farms). Farmers have adapted the management of fields with specific actions known to help bumblebee conservation.

Our operational group included farmers, local representatives of Belmullet Tidy Towns, agri-advisors, an ecologist, BirdWatch Ireland, Mayo County Council, National Parks and Wildlife Services (NPWS), Teagasc, and School of Agriculture and Food Science, University College Dublin (UCD). The group have worked hard and very well throughout the project. They offered valuable support to the two part-time project staff, the Project Ecologist and the Project Administrator whose roles were funded by the EIP.

A pilot results-based EIP was developed, which was implemented across participant farms on the Mullet Peninsula and Erris coastal mainland, Co. Mayo (see Map 1 below). There were over 45 expressions of interest from farmers to join the project. The project ecologist visited and spoke to each of these farmers and produced a farm recommendations document in consultation with the farmer. From these, 27 farmers agreed to sign up to a detailed management plan. Each plan identified various actions to be undertaken by the farmer, including delayed summer grazing, delayed mowing, protection of linear features for pollinators, and management of off-field habitats for pollinators.

Photograph 2: Machair species rich grassland on one of our project farms
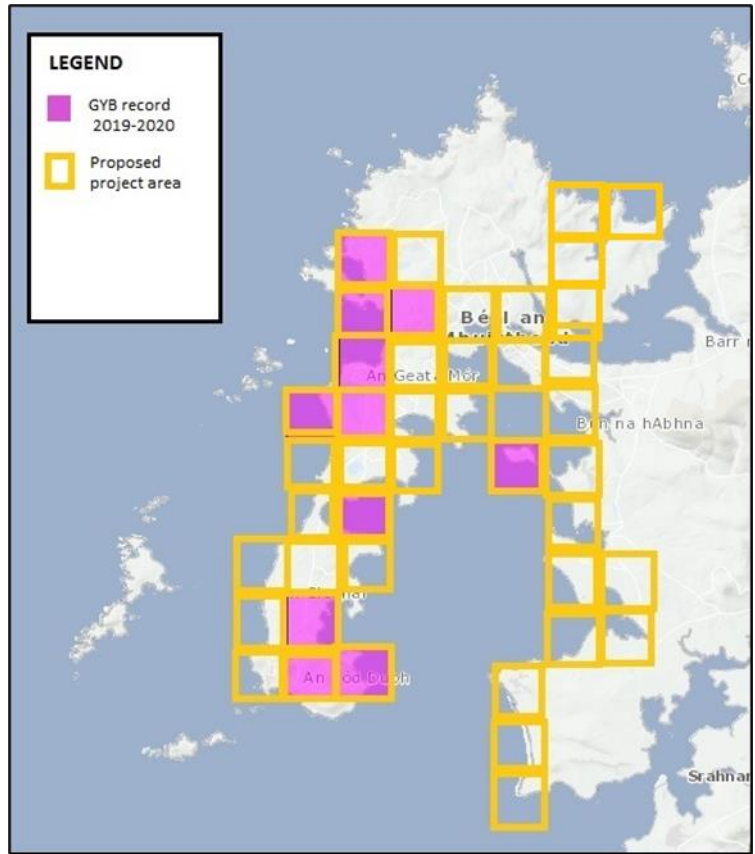
Map 1: Project area

Photograph 3: Common Carder Bee feeding on willow

2.0   Methods of Project

2.1   Operational group and staff

The Great Yellow Bumblebee working group had been formed prior to the EIP getting funding. The Operational Group have been working towards a conservation programme for the Great Yellow Bumblebee since Belmullet Tidy Towns was awarded a Pollinator Plan Award in 2019. Prior to the EIP funding, the group has been successful in obtaining €10,000 of Leader funding to raise awareness about the bee and its ecology on the Mullet through a series of school and farmer workshops and has facilitated an MSc student from UCD School of Agriculture and Food Science to conduct research into the ecology of the species on the peninsula.

The table below lists the operation groups members and their roles.

Team member	Role
Peter Gill, Mayo County Council	Project leader. Mayo County Council are key stakeholder.
Dr. Margaret Tallott, Management Research and Training Consultant –	Belmullet Tidy Town representative and community engagement lead. Belmullet Tidy Towns are key stakeholder.
Noel Walsh, Agri-consultant	Agri-advisor for project. Agri-advisors are key stakeholder.
Dr. Karina Dingerkus, Ecologist	Ecologist and ecological advisor to project.
Dr Dara Stanley, School of Agriculture and Food Science, University College Dublin	Great Yellow Bumblebee expert and lead entomological advisor and research lead for project.
Dr. John Finn, Teagasc, Researcher in Biodiversity and Agri-Ecology	Agri-Ecology advisor for project.
Eva Reilly (Belmullet Tidy Towns)	Belmullet Tidy Town Representative and community champion.
Dave Suddaby, BirdWatch Ireland	BirdWatch Ireland representative on group. BirdWatch Ireland are key stakeholder as they manage reserves successfully on Peninsula for biodiversity.
Irene O'Brien (NPWS)	NPWS representative on group. NPWS are key stakeholder.
Margaret Gaughan	Farmer representative and key stakeholder.
Angela Healy	Farmer representative and key stakeholder.

On being successful in the getting the EIP funding, a competitive tender process was completed to engage an ecologist/s to deliver the project. Dr. Karina Dingerkus stepped down from the working group during the tendering process as she was interested in applying.

Giorria Environmental Services were successful in the tender process. A Service Contract was agreed and signed between The Great Yellow Bumblebee Conservation Group and Giorria Environmental Services. They provided a part-time ecologist and part-time administrator to deliver the project on behalf of the working group.

Karina Dingerkus, Project ecologist, reported directly to Margaret Tallott and Peter Gill on a regular basis and all decisions were agreed between them. Regular meetings were held with the full operational group every two months to up-date all on progress.

Dr Dara Stanley was successful in getting an MSc student (Alex Hayden) to complete a project on some of the Project farms. See section 4.4 below for further details.

2.2   Farmer Engagement

To get farmer engagement with the Great Yellow Bumblebee EIP, contact was made with all the local farm advisors. Due to COVID-19 restrictions at the time, a meeting was held online with them to promote the project. The advisors were very supportive of the project and recommended the project to many of the farmers.

2.3   Expressions of Interest

The project received 45 expression of interest forms from farmers who were interested in joining the scheme. From these 4 were deemed not to be suitable due to location outside project area or because they had no suitable flora rich habitats within their farm. Farm visits were made to the remaining 41 farms by the project ecologist.

2.4   Initial Farm Visits

The project ecologist assessed each farm for suitability for inclusion in the Great Yellow Bumblebee EIP scheme. Suitability was determined by presence of appropriate species rich grassland based on Fossitt habitat classification (Fossitt, 2000). The majority of the farms had coastal machair grasslands. Some had species rich meadows that would have been traditionally used as hay meadows and where not machair (Fossitt, 2022). Options for farm plans were discussed with farmers during these visits. After the visits, farm maps (see Figure 1) and farm recommendation documents were compiled for each farmer. These were then discussed with the farmer and project ecologist. Farmers who decided not to go ahead with scheme at this stage were deterred by the stocking density constraints. These farmers' stocking densities were too high for successful execution of the low graze or late mow options proposed in their recommendations farm plans.

In the end, the project compiled finalised farm plans for 29 farmers. One farmer withdrew very early in the scheme as the relative that owned the land he farmed had decided to sell. Another farm was lost in July, when the farmer was unable to rectify non-compliance issues.

The final numbers of farmers who signed up to and completed the EIP were 27 farmers, with 19 on the Mullet Peninsula and 8 on the Erris coastal mainland.
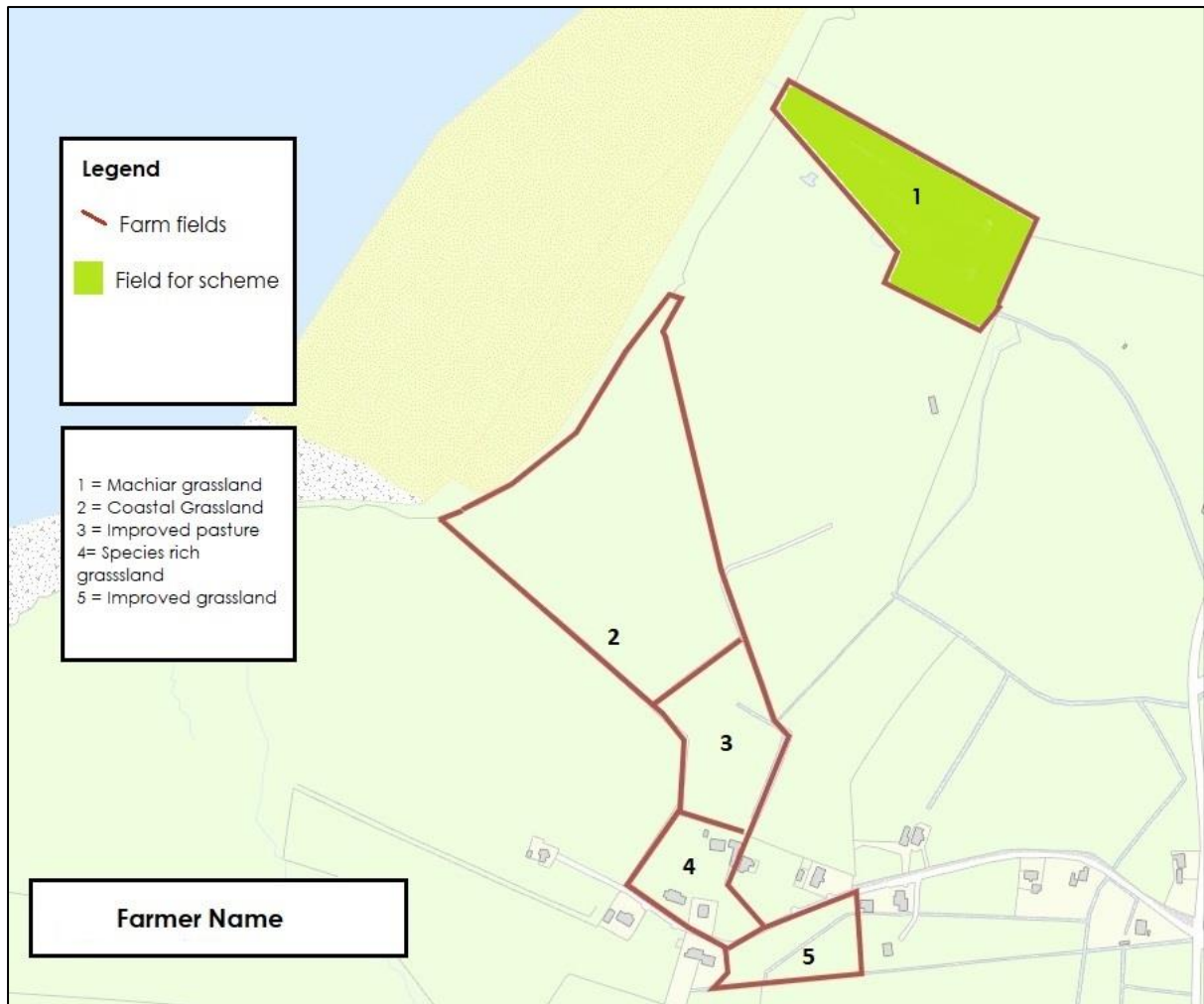
Figure 1: Example of farm map from the Great Yellow Bumblebee Project Scheme

Photograph 4: Machair grassland on one of the project farms

2.5   Proposed Options for Farmers

Farmers could include up to 5ha within the Great Yellow Bumblebee scheme. They choose from the following options, with payments related to the length option adopted. Payment rates were calculated by comparing options with existing farm payment schemes.

A. GRAZING OPTIONS

Options:	€ per ha
1) Remove stock for 26 weeks during summer 3rd April to 30th September	€340
2) Remove stock for 24 weeks 17th April to 30th September	€300

3) Remove stock for 22 weeks of summer (*circle a or b*)
   a. 3rd April to 4th September
   b. 17th April to 17th September
	€250

4) Remove stock for 18 weeks of summer 1st May to 3rd September	€200
5) Summer (April – September) grazing at reducing stocking density of 0.4 LSU / ha	€175

B. DELAYED MOW OPTION

Options:	€ per ha
A. Delay mowing until 20th August	€225
B. Delayed mowing until 1st September	€300
C. Delayed mowing until 30th September	€375
	€ per linear m
Create / restore species rich linear corridor	€0.80

C. FIELD MARGINS AND OTHER AREA OPTIONS

Options:	€
Create / restore species rich linear corridor (minimum 2m wide x 250 m long)	€0.80 /per linear m
Part of field	€340/ per ha

D. MANAGING OFF-FIELD HABITATS FOR POLLINATORS OPTIONS

Option:	€
Off-field habitat for pollinators. This area should remain uncut from April until late September, and no herbicides or pesticides should be used here (e.g. yard surrounded by natural vegetation, farm track etc).	€340 per ha
	€0.80 per linear m

E. CREATE OR RESTORE SPECIES RICH GRASSLAND

Option:	€ per ha
Create / restore species rich grassland	€340 per ha
	€ per m
Create / restore species rich linear corridor (how wide)	€0.80 per linear m

Farmers had also to sign up to the Great Yellow Bumblebee Project EIP Terms and Conditions.

Photograph 5: Kidney Vetch in flower on machair grassland

Photograph 6: Species rich meadow with abundant red clover

3.0   Results of Project

3.1   Options Chosen by Farmers

A total of 75.4ha were included by farmers in the *Delayed Grazing* option. The majority of delayed grazed fields removed stock for 26 weeks during summer (total of 50.8ha), with 16ha in the 24-week option, 2.8ha in the 22-week option and 5.8ha in the 18-week option.

A total of 16.15ha were included in the *Delayed Mow* option. Most farmers opted for the delayed mowing until the 30th of September option (13.05ha), while the remaining 3.1ha was included in the delay mowing until 20th of August.

A total of 1655m of linear features were included in the project (this represents options from C and D above). Four farmyards were included in the off-field habitat for pollinators (encompassing a total area of 1ha). These yards were surrounded by natural vegetation making them suitable for inclusion. Farmers agreed these areas would remain uncut from April until late September, and no herbicides or pesticides would be used.

While the project had initially hoped to create or restore some species rich-grassland this proved not to be a practical option for a one-year project. It would be something suited to a longer-term project.

An average of 3.6ha was included by each farmer, with 8 farmers including the maximum of 5ha in the scheme. The main reason farmers did not include the full 5ha allowed was because they did not have enough suitable land to include in the scheme.

3.2   Practical Work

The fieldwork season began in early May and was completed by the end of September. Each farm received at least 2 visits from an ecologist during this period.

During the initial farm visits farm habitat surveys had been completed by the project ecologist. During the fieldwork the ecologist recorded all plants species presents within the project fields, (i.e. fields for which a late graze or late mow option had been selected).

In addition, using standard bumblebee transect monitoring techniques (as per https://biodiversityireland.ie/surveys/bumblebee-monitoring-scheme/), all bumblebee sightings were recorded in each of the project fields during each visit. Butterfly species were also recorded. The number of hoverflies and solitary bees seen was also documented, but no attempt was made to classify these to species level.

3.3   Community Engagement

Throughout the project, we engaged with farmers and members of the public both within the project area and beyond.

Farmer workshops were held, the most popular being farm visits to other farms within the project. These were great learning opportunities for both farmers and members of the working group. It allowed farmers to share their experiences and discuss issues and concerns. These workshops were also attended by some smaller landowners who were not farmers but who were keen to manage their small areas of land for the benefit of pollinators.

Through LEADER funding several other biodiversity workshops were held in the project area. The purpose of these workshops was to extend the community engagement so that a wider general audience would learn about the Great Yellow Bumblebee Project, and pollinators in general.

A wildlife walk was held in Belmullet for Heritage week and the project ecologist also had the opportunity to speak about the project on the Mooney Goes Wild Radio Programme on RTE Radio One. The project also attended the Erris Show to further promote the project with the wider farming community.

The project team made connections with Corncrake LIFE and LIFE on Machair projects. This included delivering pollinator training to the LIFE on Machair teams and wildlife rangers that were interested in monitoring bumblebees. The project ecologist also met with David Fallon from Irish Water, to discuss how Irish Water sites in the project area could be managed to support the Great Yellow Bumblebee and other pollinators.

The project also partly sponsored a large nature mural together with Belmullet Tidy Towns, LIFE on Machair and Corncrake LIFE. The mural, which occupies two walls of a large handball alley in the centre of Belmullet, depicts large images of the Great Yellow Bumblebee, Corncrake and Lapwing. The images were created by artist James Kirwan who had also held concept work-shops with the local community. The mural was launched by Senator Pippa Hackett on the 19th April 2023.

Photograph 7: Some of the working group in front of the Mural depicting Great Yellow Bumblebee

3.4 Key Performance Indicators

By May 2022, all the following key performance indicators had been met, a little behind schedule due to some COVID-19 restrictions.

Initial Planning Phase and Initial Engagement Indicators

- Operational group had set the refined targets.
- Project had engaged a cohort of farmers.
- Project had engaged and liaised with agri-advisors/consultants.
- Project had identified links with other projects, specifically Corncrake LIFE, LIFE on Machair and Irish Water.
- Initial farm visits had been completed by project ecologist to encourage engagement and do a preliminary assessment of farm suitability for the scheme.
- Workshop had been held for farm advisors and an initial farmer workshop had been held.

- It had not been possible to identify "Stepping-stone" farms due to the spread of farms that had engaged with the project. It was determined that this would be something for a much larger project that could engage two or three times the amount of farmers.

By the end of 2022, all the following key performance indicators had been met.

Practical Work Indicators

- Initial farm visits had been completed by April and the monitoring visits continued from May till the end of September.
- Habitat maps for each participating farm had been completed and formed part of each farm plan which had been sent to each participating farm.
- Farmers chose a range of actions including delayed mowing, reduced grazing and uncut margins/other linear feature options.
- Community engagement workshops were held through the project. Two farmer workshops were held (one introductory workshop and another in the field on one of the project farms) and a Wildflower seed collection workshop which was held in September. A walk was held as part of National Heritage Week. A series of LEADER funded workshops were held from May till August. These five workshops promoted the work of the great Yellow Bumblebee Project and were used as a further means of disseminating information about the project and the Great Yellow Bumblebee.
- All on farm evaluations were completed by the end of September 2022. In July, one farmer was lost due to incompliance with the actions specified in the farm plan.
- A review workshop was held for all participating farmers on the 1st of December 2022. The project was able to provide feedback to the farmers including what had been achieved during the lifetime of the project and also offer them advice from other schemes working in the area.

There were a couple of key performance indicators which were incomplete by the end of the project. These included:
- Green hay mix trail. On reflection the project needed more than a one-year pilot project to complete this trial. There was not enough time to facilitate the trail. It would have required at least 2 summers, and ideally a longer timeframe to assess its success.
- Links/corridors to be mapped. The farms within the project were scattered throughout the Peninsula and Erris coastal mainland and there were too many gaps to be able to map these links and corridors effectively.

4.0 Results of Monitoring

4.1 Bumblebees

Over 1800 bumblebee records were logged during the fieldwork season, from 12 different species. There were 78 records of Great Yellow Bumblebee (see Figure 1). The target species was found in 17 of the 46 fields in the EIP. The greatest number of Great Yellow Bumblebees recorded on any farm was 9. All farms recorded at least 4 different species of bumblebees. The highest number of species recorded on a farm was 10. The average number of bumblebees recorded was just over 66 bees. The maximum number of bumblebees recorded on any one farm was 208, and the lowest was 16.

The most recorded bumblebee was the Common Carder Bee (see Figure 1). The Large (Moss) Carder Bee was the second most common species recorded. This species is classed as *Near Threatened* in the Irish Red List of Bees (2006) and as *Vulnerable* in the European Red List of Bees (2014). Recent data from the All-Ireland Bumblebee Monitoring Scheme shows ongoing declines for this species, so it is good to see that the species is doing well within the project area. Red-Shanked Carder Bees are also classed as a *Vulnerable* bumblebee species and 31 were recorded on project farms.
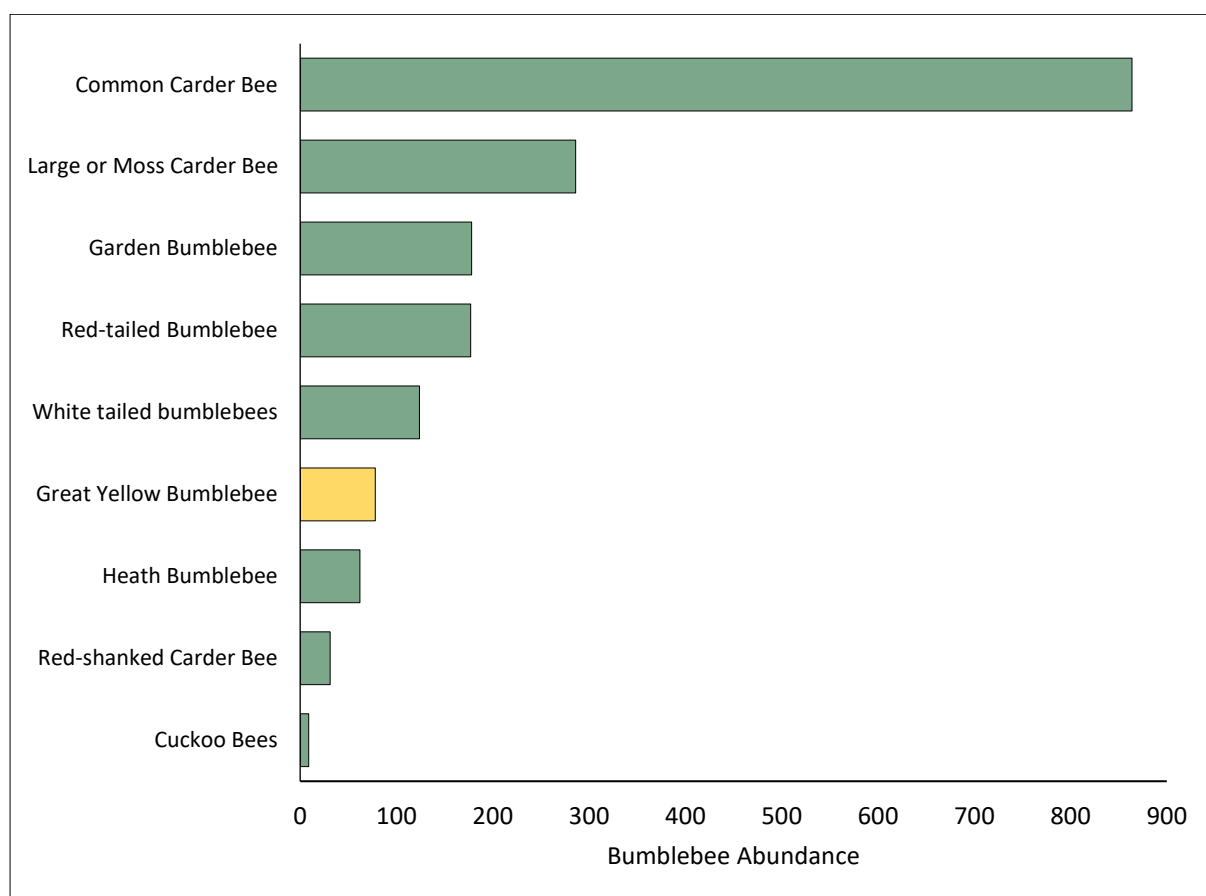

Figure 2: Abundance of different bumblebee species recorded on project farms

Figure 3 shows the distribution of Great Yellow Bumblebee records on the farms throughout the project area. It is important to note that the farms were not evenly distributed throughout the project area with a greater concentration of farms along the western seaboard. There was only one farm in the north-west of the project area and no farms in the north-east within the EIP.

While a good number of farms on the Erris coastal mainland expressed interest in joining the EIP initially, fewer were willing to sign up to farm plans. Generally, it was found that the condition of species rich habitats on the Erris coastal mainland was in much poorer condition than similar land on the Mullet peninsula. This may be due to several factors. Firstly, there have been more agri-environmental scheme on the Mullet due to the prevalence of designated sites and also the Corncrake. Secondly, farms on the mainland may have had higher stocking densities which had negative impacts on habitat quality.

Figure 3: Distribution of Great Yellow Bumblebees recorded on project farms

Photograph 8: Large carder bee on kidney vetch

4.2   Other Pollinators

Other pollinators were also recorded during monitoring of farm fields. The most recorded butterfly species were Meadow Browns, with large numbers (117) recorded in one particular field. The same field also recorded over 100 Six-Spot Burnet, a day flying moth. Two other project farm fields also recorded over 50 Meadow brown butterflies.
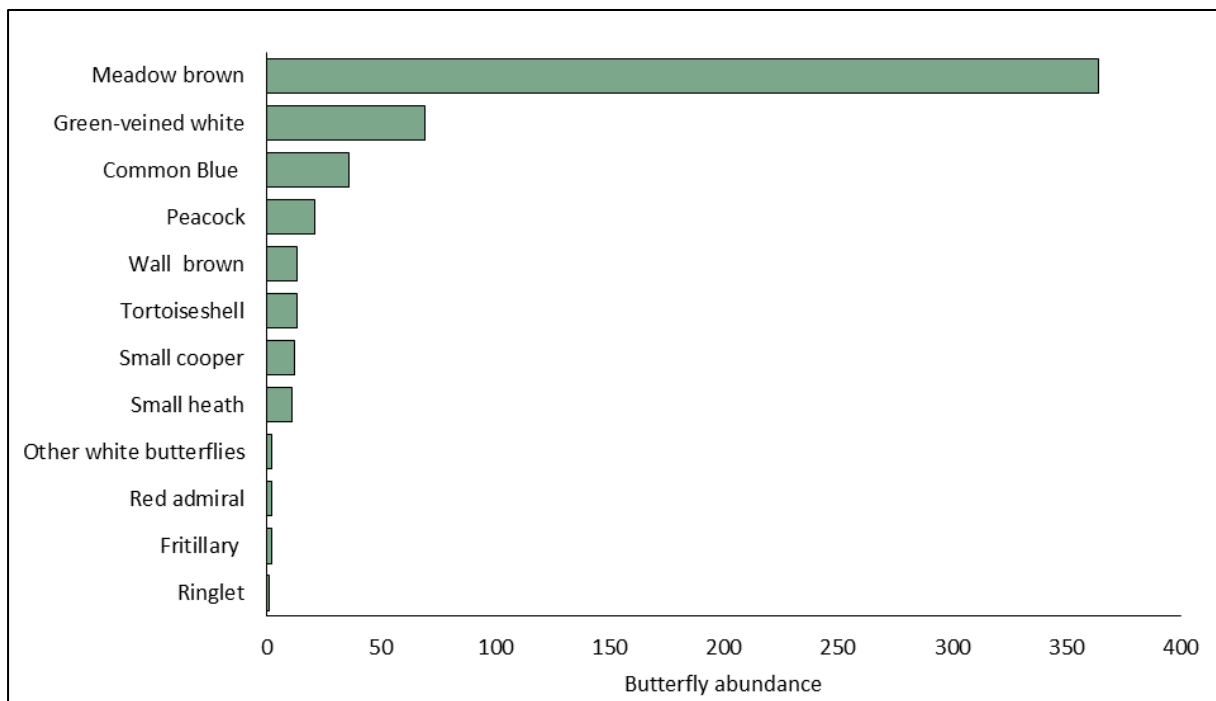

Figure 4: Abundance of different butterfly species recorded on project farms

Other pollinators were also recorded but numbers were lower than expected. Only 24 solitary bees were recorded and a total of 152 hoverflies.

Photograph 9: Machair grassland and dunes

4.3   Flora and Bee Forage

The Great Yellow Bumblebee was found foraging on 13 different flowering plants on the project farms (Figure 4). The most important forage plants were Red Clover (37%) and Common Knapweed (33%). Ragwort, *Hypochaeris* species (mainly Cats-Ear) and Kidney Vetch were also important. The other forage plants (for which only one record was recorded) included Common Birds-Foot Trefoil, Devils-Bit Scabious, Marsh Woundwort, Red Bartsia, Sea Holly, Selfheal, White Clover and Yellow-Rattle. It is likely that some spring plants are under-recorded as poor weather in May meant there were fewer field visits when spring flowering plants were in bloom. However, the forage information is still very important when it comes to developing a scorecard for pollinators in this area.

Interestingly, the most common bumblebee species recorded during the project, the Common Carder Bee, had a much wider choice of forage plants. It was recorded on 39 different plant species. Similar to the Great Yellow Bumblebee, Red Clover and Common Knapweed were the most important forage sources for this species as 21.4 % and 32.8 % of records were found on these floral species respectively. The Large (Moss) Carder Bee was most commonly recorded on Ragwort (27.3%), but Common Knapweed (18.2%) and Red Clover (10.7%) were still important food plants.

See Table 1 below for a breakdown of the range of forage plants used by pollinators in the project area.

Part way through the fieldwork season, it was noted that bumblebees appeared to favour the coastal subspecies of Ragwort (*Jacobaea vulgaris* subsp. *dunensis*) which grows in abundance in the project area. This is something that could be further investigated in the future.
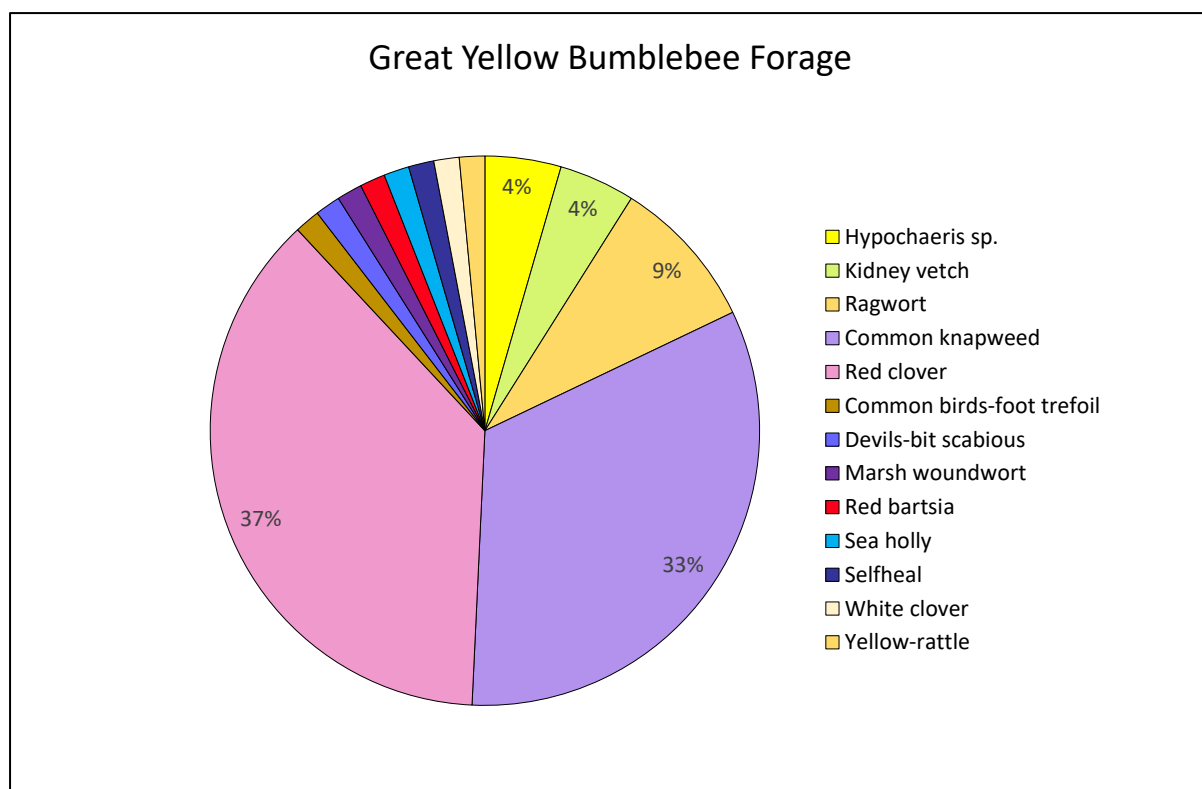

Figure 5: Forage plants Great Yellow Bumblebees were recorded visiting

Table 1: Showing the top three most visited plants for each of the more commonly recorded bumblebee species within the project area

		Bumblebee Species (% of individuals recorded on Floral Species):							
		Great Yellow	Large Carder	Red-Tailed	Garden	Common Carder	Heath	Red-Shanked Carder	White/Buff-Tailed
Floral Species	Common Knapweed	32.8		14.6	21.4	32.8	12.9	51.6	
	Ragwort	9.0		37.2	8.1		29	9.7	35
	Red Clover	37.3	19.6		24.3	21.4	12.9		
	White Clover		12.3				12.9		13.6
	Hypochaeris sp.		13.8	13.1					
	Devils-Bit Scabious					10.7		9.7	
	Red Bartsia		12.3						
	Yellow-Rattle								9.7
Total No of Plant Species Visited		16	16	19	25	39	11	10	20

Photograph 10: Some of the top forage plants for bumblebees within project area

4.4   MSc Project

Alex Hayden, a UCD Master's student, carried out her research project entitled "*Evaluating the Effectiveness of Agri-Environmental Measures for Rare and Common Bumblebees*" under the supervision of Dr Dara Stanley with support and advice from Dr Karina Dingerkus from the Great Yellow Bumblebee Project over the summer months of 2022. This study investigated the effects of delayed mowing and grazing (treatment sites) in comparison to conventional mowing and grazing practices (control sites) on rare and common bumblebees. All treatment sites were fields participating in the Great Yellow Bumblebee Project.

This comparison was achieved using generalised linear mixed models and metrics such as abundance, species richness, and Shannon Diversity Index for bumblebees and flowering plants. The relationship between bumblebees and floral metrics was also evaluated. After the submission of the affiliated thesis for the project, the research was continued and additional data was collected. Analysis on the complete dataset found that not only did the measures influence the floral availability, but also the bumblebee abundance. This showed that the increased mean abundance on the treatment sites was due to the management practices employed under the Great Yellow Bumblebee Project. The intention is to submit these results in the form of an academic paper to relevant journals by the end of 2023.

Summary of Results:

- In mow sites, management significantly influenced bumblebee abundance (ANOVA: n = 24; Chi-sq = 4.14; p-value = 0.042) and floral abundance (ANOVA: n = 24; Chi-sq = 4.76; p-value = 0.029).
- In graze sites, management significantly influenced bumblebee abundance (ANOVA: n = 30; Chi-sq = 30.77; p-value = < 0.001), floral abundance (ANOVA: n = 30; Chi-sq = 47.25; p-value = < 0.001), and floral species richness (ANOVA: n = 30; Chi-sq = 4; p-value = 0.046).
- Given that management practices influenced both floral and bumblebee abundance, it was concluded that the delayed mowing and grazing measures under the Great Yellow Bumblebee Project were effective in protecting rare and common bumblebees.
- No relationship was found between floral abundance and bumblebee abundance. This may have been due to the high diversity in the project area.
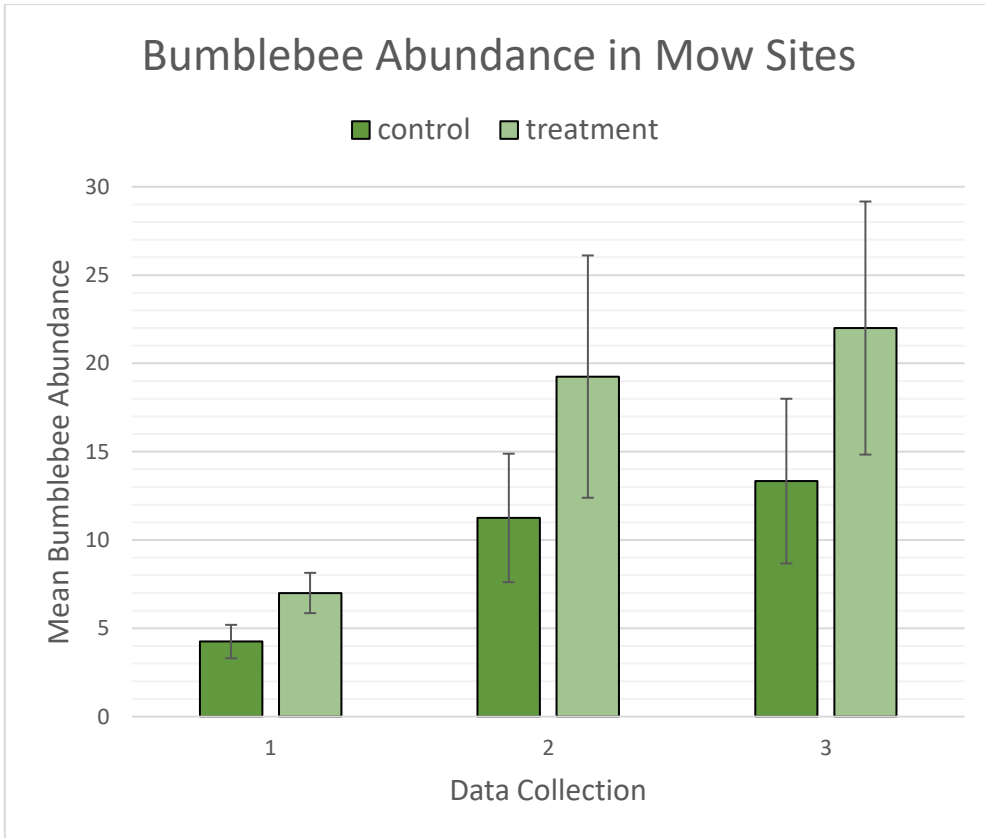
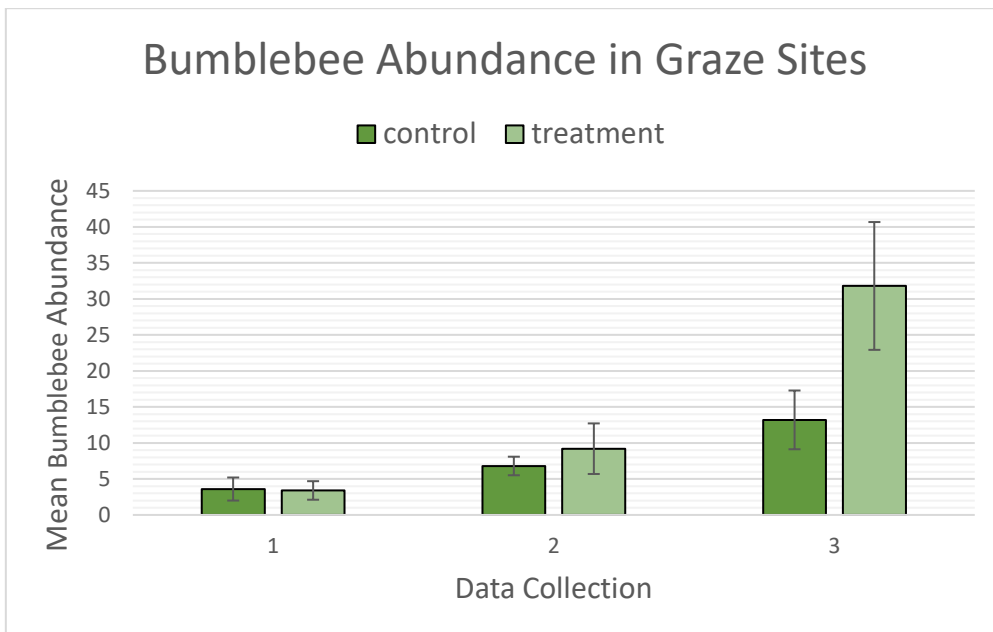*Figure 6: Bumblebee abundance on sites with delayed mowing versus control sites*

Figure 7: Bumblebee abundance on sites with reduced grazing versus control sites

4.5   Scorecards

The Great Yellow Bumblebee Project looked at criteria for inclusion in scorecards to score agri-environmental measures on coastal grasslands. The aim of the scorecard was to provide a framework for measuring the effectiveness of agri-environmental measures in place for the Great Yellow Bumblebee and other pollinators. It was designed to increase the quality of measures and as a tool for refining measure in the future. This was achieved by compiling information obtained during the fieldwork. This resulted in a species indicator list which was drafted and tested in the field. As many of the fields were already species rich, it was important to try and determine which plant species were of most value to pollinators.

By the end of the field-season it was determined that the following species (see Table 2) were most important in terms of future scorecards and the presence of these species was important for pollinators. In future years it will be important to test this scorecard to ensure that it works. A draft pollinator/Great Yellow Bumblebee scorecard is shown in Appendix 1.

Table 2: Showing pollinator plants that would be considered in scorecard for pollinators

Flower species / group	Percentage of Great Yellow bumblebee visits	Percentage of bumblebee visits
Red Clover	37.3	17.81
Knapweeds - Common (& Greater)	32.8	25.75
Ragwort	8.9	13.72
Yellow Composites – (especially Cat's Ears, but also Hawkweed's, Hawkbit's & Goat's-Beard (not Dandelion))	4.5	5.60
Yellow-Rattle	4.5	2.29
White Clover		6.44
Birds-Foot-Trefoils (Common & Greater)		3.13
Red Bartisia		3.07
Kidney Vetch*		1.68

*Kidney Vetch records are thought to be under recorded due to the poor weather in May when Kidney Vetch was in flower.

4.6   Farmer Workshops and Meetings

The project ecologist met most farmers on a one-to-one basis while doing the initial first farm visits. A couple of farmers worked aboard and conversations with these famers were via email. In total, 88.9 % of our farmers attended at least one farm meeting or farmer workshop.

Seventeen farmers attended our first farmer meeting on the 4th April, which introduced farmers to the project. During the summer we had five biodiversity workshops funded by North East LEADER and farmers were invited to these events. Ten farmers attended our workshop on the 14th of July. Project farmer fields were used as workshop locations. Farmers had the opportunity to observe many pollinators including the Great Yellow Bumblebee and

to hear a Corncrake. A good discussion was facilitated regarding how farmers could manage fields in a way that helped local biodiversity.

On the 24th of August, 12 project farmers and an additional 4 landowners/farmers interested in the project, attended our second farmer workshop. This workshop was again held on one of the project farmers' fields. We were able to look at how good land management positively influenced wildflower abundance and pollinator numbers.

On the 11th of September the project held a wildflower seed collecting and growing workshop. This was attended by 14 people. The workshop aimed to share skills on collecting wildflower seeds, and how best to store and grow them. The focus was on wildflower species local to the project area and used by pollinators. There was particular emphasis on the importance of using local wildflower seed.

The penultimate farmers' workshop was held on the 1st of December. The project presented the results of the project to the farmers and provided feedback on how their on-farm actions benefited pollinators, particularly the Great Yellow Bumblebee. There were several guest speakers on the evening, including Dr Catherine Farrell from the LIFE on Machair project, Liam Loftus from Corncrake LIFE, and Mary McAndrew from ACRES. In addition, Dr Brendan Dunford from the Burren Beo, gave a talk about Burren projects in County Clare. Farmers gave feedback on their thoughts of the project and their comments were very positive (see Table 3 below and Appendix 2).

Table 3: Results of farmer questionnaire from farmers meetings on the 1st December

Question:	Excellent:		Very Good:	
How would you rate GYB project overall	83.33 %		16.67%	
Question:	**Yes:**	**No:**	**Don't Know:**	**No Answer:**
Would you participate in the Great Yellow Bumblebee Project if it ran in 2023?	100%			
Do you feel you have a better understanding of how your farming practices may affect pollinators in general?	100%			
Do you feel you know more about the Great Yellow Bumblebee?	75%		8.3%	16.7%
Having taken part in this project, will your experience this year influence your farming practices in the future?	91.7%			8.3%
Would you recommend the Great Yellow Bumblebee Project to your friends / neighbours?	100%			

Our final two workshops were held on the 4th March 2023. At the "Native Wildflowers" (hosted by Sean Keane, horticulturist) farmers learned about Ireland's native wildflowers and why they are important for our pollinators. Sean focused particularly at the species used by the Great Yellow

bumblebee. There was also a practical demonstration on sowing wildflower seeds, and how these can be incorporated into meadows and fields.

The other workshop on the 4th March 2023 was an "Introduction to Ireland wild bumblebees" with Dr. Karina Dingerkus (Project ecologist). The workshop gave an introduction to Ireland's native bumblebees and learning how to identify bumblebees. There was a brief explanation about the bumblebee monitoring scheme and participants were told how to record casual sightings of bumblebees on the National Biodiversity Data Centre website, and why it this was important.

Photograph 11: Attendees at our final workshops on the 4th March 2023

What part of the Great Yellow Bumblebee Project did you enjoy most?
"Viewing and listening to all the different species of bees."
- Project Farmer

4.7   Other Talks/Presentations

As well as workshops funded through the EIP, the Great Yellow Bumblebee project also engaged with a wider audience through various workshops, interviews, field meetings, and presentations. All these actions aimed to raise the profile of the project.

- Two school and 5 community workshops funded by LEADER which prompted the Great Yellow Bumblebee Project.
- Interview on Mooney Goes Wild by project ecologist.
- Interview on Raidió na Gaeltachta by one of the farmers.
- Presentation to Mayo County Council Agriculture Committee by project ecologist.
- Presentation to the NPWS Regional Conference, Co Clare by project ecologist.
- Project ecologist held pollinator training workshop for Life on Machair (LOM) team and LOM volunteers.
- Site meeting with Irish Water's ecologist to talk about management of Irish Water sites within the project area for the benefit of the Great Yellow Bumblebee.
- Field meetings with individual members of the Life on Machair team where project manager and project ecologists joined project ecologist for monitoring visits of project farms.
- Homeland/Aviro held an event at their local Belmullet store where they sponsored fruit trees for local school and plants for Belmullet Tidy Towns as part of their support for the Great Yellow Bumblebee Project (www.homeland.ie/tips-advice/aurivo-supports-the-great-yellow-bumblebee-eip-project).

Photograph 12: Sponsorship of fruit trees and pollinator plants to local schools and Tidy Towns in their support of the Great Yellow Bumblebee Project

4.8   Details of Dissemination of Project Findings

The project used various means to disseminate the project findings.

Final Farmers Seminar

All farmers were invited to attend the seminar during which a presentation was give showing the results and project findings. In addition, members of Corncrake LIFE, LIFE on machair and ACRES to attended and gave presentations at the seminar.

Final Farmer Reports

A final farmer report was produced for each farmer (see Appendix 6 for example). This report gives a general summary of the project and in addition gave each farmer a summary of the results for their own farm. This includes the number of bumblebees recorded, the number of other pollinators, and the number of floral species recorded. The report also gives farmer recommendations on how to manage project fields in the future. It was hoped that the reports would encourage farmers to continue to implement positive actions for pollinators.

Project Flyers

Two project flyers were produced which summarised the project findings. The first flyer (See Appendix 3) was distributed at the EIP-AGRI National Conference 2022 on the 28th of November 2022 and also at the West and Mid-West Divisions (NPWS) Annual Conference on the 8th of December 2022. The second flyer (see Appendix 4) was produced for the farmers and distributed to all the farmers involved in the project.

Scientific Journals

The project will work with researchers from UCD to publish papers in peer reviewed scientific journals on project results.

Social Media

The project has also used social media to continue to disseminate information about the project including project findings. The project has an active Twitter, Facebook and Instagram account. All these accounts will continue to be used to promote the project after the EIP funding is finish.

Presentations

A presentation was given to West and Mid-West Divisions (NPWS) Annual Conference on the 8th December on the project findings. A presentation was also given halfway through the project to the Mayo County Council Agricultural committee with a shorter follow-up in December.

Articles

Article about the project appeared in the BirdWatch Ireland Wings Spring edition (Number 107), 2023.

Website

General information on the project is found on the website:
www.belmullettidytowns.com/great-yellow-bumblebee
An ARC story-map has been created at:
storymaps.arcgis.com/stories/d9298dc42aa140a3a069282e12c560d5

Working with other groups

The project farm actions for 2022 have also been shared with the local ACRES team. The project team has worked closely with the LIFE On Machair Team and Corncrake LIFE team throughout the lifespan of the project and will continue to work with them in 2023.
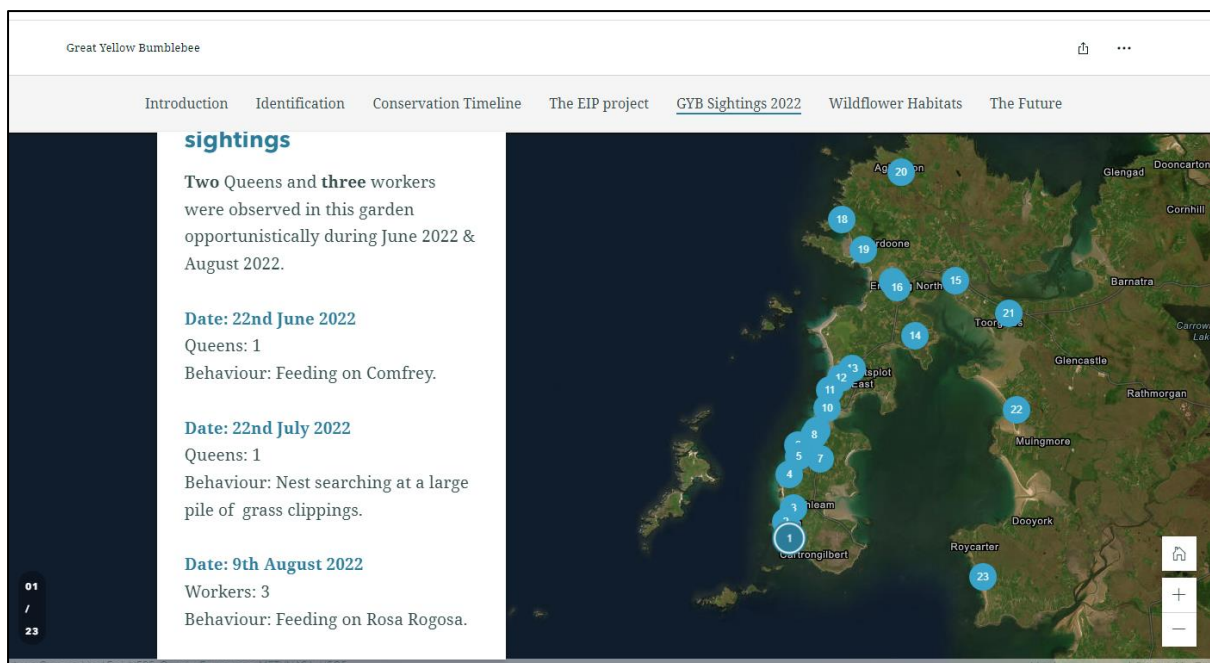

Figure 8: Screenshot from the Great Yellow Bumblebee ARC story map

What part of the workshop did you enjoy most?
"Got to see all the different species"
- Project Farmer

5.0   Evaluation of Project

There has been a lot of favourable feedback from both the farmers and wider community about the Great Yellow Bumblebee Project. The farmers are now much more aware of the importance of how their farm management impacts the conservation of pollinators in general and in particular, the Great Yellow Bumblebee.

5.1   Highlights of the Project

- ✓ The project has built up a very good relationship with the 27 farmers in the project.

- ✓ Farmers' feedback on the project was very positive. They have told us that they now have a better understanding of how their farm management can impact bumblebees and other pollinators.

- ✓ Other farmers in the area have approached the project team seeking to join, showing that word about the project was being spread.

- ✓ There are many farmers with valuable habitat and floral resources in the area that fall between the cracks of different project areas. This can hinder connectivity which is key to conservation of the Great Yellow Bumblebee. From the start the Great Yellow Bumblebee EIP project focused on farms that are not involved in any other agri-environment schemes which turned out to be a positive for both the project and farmers.

- ✓ Based on the results on data collected throughout the project, actions implemented had a statistical influence on the bumblebee and floral abundance in participating delayed graze and delayed mowing fields.

- ✓ The project has made a significant contribution to the baseline knowledge of the Great Yellow Bumblebee (and other bumblebees) in the project area due to the important scientific baseline data collected.

- ✓ The project has raised the level of awareness about the Great Yellow Bumblebee and other bumblebees, both within the farming community and beyond (e.g. being interviewed for the Mooney Goes Wild Radio programme on RTE1, though workshops, talks etc.).

- ✓ The project has shared and will continue to share, knowledge and data with projects such as LIFE on Machair, Corncrake LIFE and ACRES to ensure conservation efforts are cost-effective by reducing the possibility of duplicated work.

- ✓ A considerable amount of collaboration has taken place during the short period of this project, with over 130 participants attending workshops held in collaboration with Belmullet Tidy Towns including pollinator workshops, Irish wildflower seed-saving workshops and farm walks looking for pollinators.

✓ The collaboration with Belmullet Tidy Towns, Corncrake LIFE and Life on Machair which resulted in the nature mural in Belmullet which was launched by Senator Pippa Hackett.

Photograph 13: Mural created by artist James Kirwan

5.2   Value for Money

- The project operational group brought together experts from many fields. The group included Dr Dara Stanley, an assistant Professor in Applied Entomology from University College Dublin, and Dave Suddaby, BirdWatch Ireland reserves manager and local expert on the Great Yellow Bumblebee, both of whom made huge contribution to the project. Noel Walsh, a local farm advisor, was instrumental in promoting the project locally, and getting support from a large number of farmers. Margaret Tallott and Eva Reily, representatives from Belmullet Tidy towns made a huge contribution toward raising awareness of the project.
- The project has delivered valuable conservation measures for pollinators while at the same time rewarding farmers for high value nature farming.
- The project delivered additional scientific information in the form of a MSc study (see Section 3.4 above).
- Our budget, outlined in Table 4 below, shows that the project offers value for money with over 39% of budget being allocated for farm actions (equivalent to €34,169). See Section 5 below for more detailed information.
- The project has delivered valuable scientific pollinator baseline data which will also be used by other projects particularly the LIFE on Machair project.
- The project has recorded over 1800 bumblebee records which will be shared with the National Biodiversity Data Centre.

Photograph 14: Farmers feedback seminar

6.0   Financial Report

There was an under-spend in both the administration budget and farm payments budget. The project had originally budgeted for 30 farmers but only had 27 farmers that received payments for farm actions. In addition, some farmers put less than the 5ha budgeted within the scheme. The total payments for on-farm actions are given in Table 4 below. Most of the payment was given for the farm action *delayed grazing for 26 weeks* for which nearly 50ha were left un-grazed.

Table 4: Breakdown of farm payments for on-farm actions

On-Farm Action	Total Area/Length	Payments to Farmers
Delayed Graze (26 wks)	1.00ha	€175.00
Delayed Graze (18 wks)	5.80ha	€1,160.00
Delayed Graze (22 wks)	2.80ha	€700.00
Delayed Graze (24 wks)	16.00ha	€4,800.00
Delayed Graze (26 wks)	49.80ha	€16,932.00
Delayed Mow (Aug End)	3.10ha	€883.00
Delayed Mow (Sept End)	13.05ha	€4,876.25
Off-Field Habitat for Pollinators	1.60ha	€540.00
Linear Feature for Pollinators	1655.00m	€1,324.00
Attending Farmer Meetings/Workshops	-	€5,025.00
TOTAL FARM PAYMENTS		**€36,415.25**

By the end of the project the farm payments only represented 38.2% of budget, with an underspend of €14,584. The project would have liked to have seen the full farmer budget utilized. However, it is difficult to plan this budget given the unpredictability around the number of farmers who will sign up, their circumstances, and their preference towards difference management measures.

> **What part of the Great Yellow Bumblebee Project did you enjoy most?**
> "Finding significant species on the site and of course the payment!"
> - Project Farmer

Table 5: Project costs breakdown

Administration Budget:	Spend €	Subtotals
Salary - Project Ecologist	€24,613.00	
Salary - Project Administrator	€20,947.50	
Workshop costs	€1,060.03	
Mileage	€6,946.02	
Administration Expenses	€2,248.15	
Fieldwork Expenses	€610.02	
Donation to BTT Mural	€600.00	
PR material	172.44	
Office rent	1040.00	
Equipment	€1224.87	
Bank Fees for both accounts	€142.15	
SUBTOTAL:		**€59,604.18**
Farmers Budget:		
Farm action payments	€31,394.25	
Farmer workshop payment	€5,025.00	
SUBTOTAL:		**€36,419.25**
TOTAL PROJECT SPEND:		**€96,023.43**

In total, the salaries cost the project just over €45,500. Farm payments represent 38% of total project costs. The workshop costs were mainly for just two of the four workshops held, namely the seed saving workshop and the final farmers seminar where food was provided for the participants. For the seed-saving workshop the project brought in expertise from outside the team. The farm visit workshops were led by the project ecologist and Dave Suddaby from Birdwatch Ireland who is on the project Operational Group.

Photograph 15: Farmer workshops on one of project farms

A future goal for the project is to work with farmers and local schools by bringing local school children onto their closest project farm to carry out pollinator and flora surveys. This will encourage future land custodians to continue the work started with the project farmers. The project will continue to encourage community efforts to maintain the progress of the project. Steps to attain this goal include working with farmers and the local community by holding pollinator workshops/field days on project farms. It will also be important for the project to continue to engage with farmers so ensure knowledge transfer continues.

The project hopes to continue to facilitate research on the Great Yellow Bumblebee Project through our links with UCD and Teasgasc.
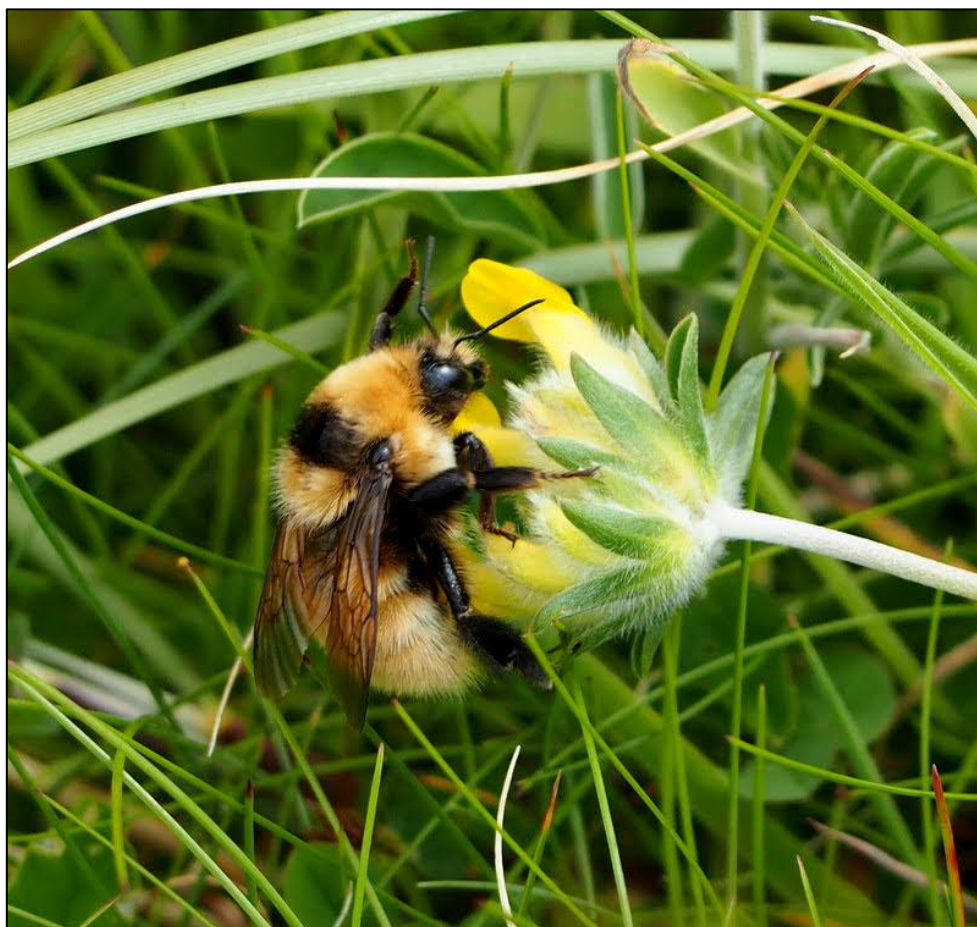
Photograph 16: Great yellow bumblebee queen on kidney vetch

7.0   The Future

7.1   Lessons Learned

- The project was fortunate to have a wide ranging operational group, as each individual offered their own expertise.
- Getting bank account up and running takes a long time.
- Farmers prefer on-farm workshops.
- Everything takes longer than expected.
- Project ecologist needed more time allocation.
- Project staff need to be familiar and comfortable with budgeting and accounting.
- Project team underestimated the amount of administration work required after the finish date of the project (e.g. final financial statement, returns required by department, end of year report etc.).
- It is felt by staff and the operational group that the one year pilot was really too short a time period for this project and that the project would have benefited from being a two year project as a minimum.

7.2   Actions to Carry Forward

The project has been successful by working and engaging with the farmers and the wider community. This success was aided by the provision of payments for achievement of a wide variety of conservation management goals for farmers to work towards with expert help from the project ecologist. Without these farmers are likely to be discouraged through loss of income, lack of flexibility, and lack of access to ecological expertise. Monitoring has also been vital to the project, as has been seen in previous ecological studies. Without it there is no way to know whether the measures implemented are achieving the expected results or how effectively they do so. Development and refinement of measures becomes increasingly difficult without measuring their effectiveness.

The project has had discussions with LIFE on Machair about how LIFE on Machair could work with many of the Great Yellow Bumblebee Project farmers that fall within the LIFE on Machair area. During 2023, the Great Yellow Bumblebee Project will continue to a large extent under the LIFE on Machair umbrella. The project will continue to engage with the original project farmers along with a small number of additional farmers. The project will also engage with the local ARCES team and information from the Great Yellow Bumblebee Project is being used to inform the local ACRES action plan.

The Great Yellow Bumblebee Operation group is very keen that the project continues. The involvement of farmers is key for the long-term conservation of the Great Yellow Bumblebee and other pollinators. At the same time, it is important to continue the awareness raising elements of the project. The operation group will continue to look for funding from other sources.

7.3   Improving a future project

Starting the project with three months to work the design phase allowed time to build a good foundation for the project, build knowledge of staff members and sort administration aspects such as service contract. Setting up bank accounts was found to be challenging and took longer than expected. It was felt that the one-year pilot of the project was too short and at a minimum these projects benefit from at least two years working on the ground with farmers though 3 or 4 years is probably a lot more valuable. The project built a great relationship with the farmers, and it is good for this to be cemented by several years work.

It would have been good to see the farmers get higher payments, so that payments accounted for at least 50% of project spend. In this case it worked out that the final budget allocation to farmers was 38%, though we had originally envisaged that this would be greater.

The workload for the ecologist was also higher than expected and any future project would need to take this into consideration. The project benefited from having a MSc student researching aspects of the farmer actions and benefited further by having a then trained fieldworker to pick up some of the ecology surveying later in the summer months, after her research project was completed.
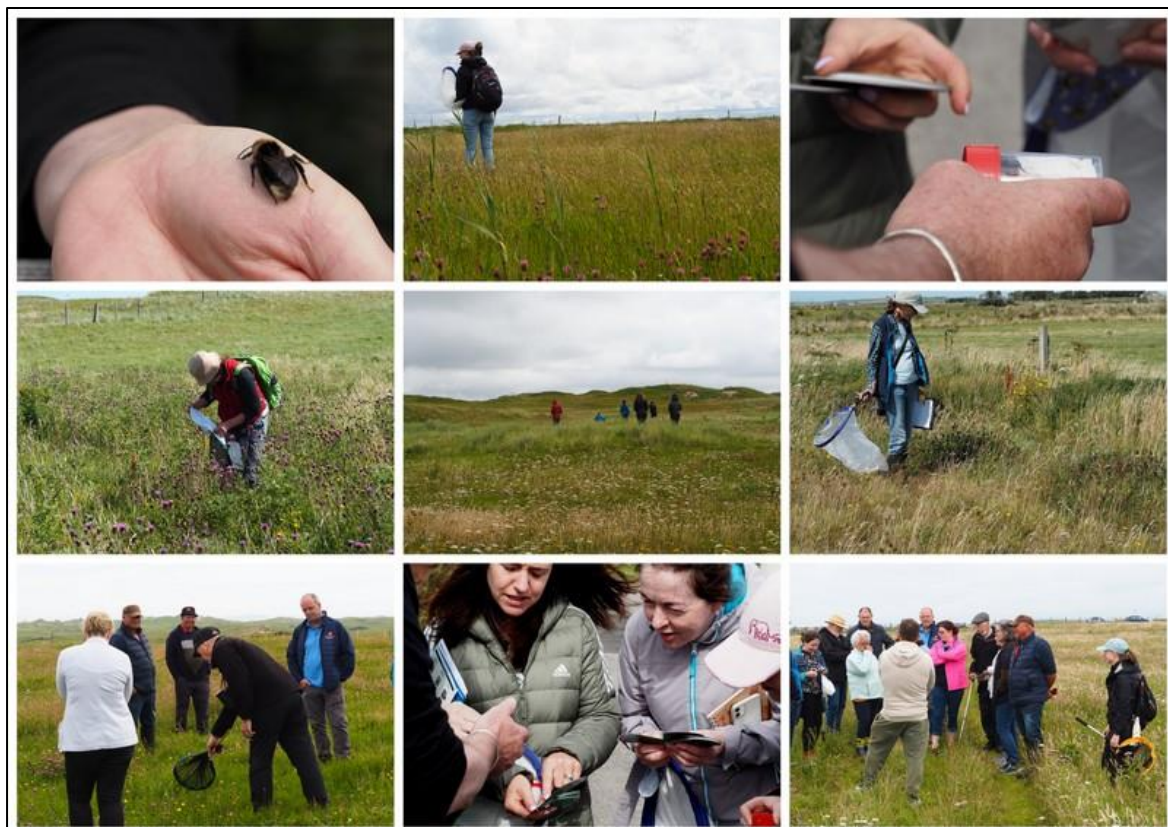
Photograph 17: Various workshops and field visits held throughout the project

Appendices

Appendix 1 – Draft Scorecard

Appendix 2 – Farmers' Feedback

Appendix 3 – Farmer Information Flyer

Appendix 4 – General Information Flyer

Appendix 5– Workshops Additional Photographs

Appendix 6 – Example Summary End of Project Farm Report

Great Yellow Bumble Bee Pollinator Assessment scorecard *DRAFT*

Landowner: Date of Survey: Surveyor/s:

Townland: Field Number:

A. Ecological Integrity	SCORE A & B:

A.1 How many positive indicators are present in the field/unit? Circle and count all positive indicators present in Box 1 overleaf. Note all positive indicators present as you walk through a 'W' transect through the		Low 6	5
		Medium 6 - 10	10
		Med-high 11-14	15
		High >14	20

A.2 What is the cover of positive indicators (listed below) through the field/unit? Cover is the proportion of the field or management unit taken up by all positive indicators present.		Negligible <5%	0
		Low 5 – 10 %	10
		Medium 11 – 25%	20
		Med High 26- 50%	25
		High >50%	30

A3. Which of the top 8 pollinator plants occurs? Cover is the proportion of the field or management unit taken up by top 8 positive indicators present (yellow in in Box 1 overleaf).		Low 6	5
		Medium 6 - 10	10
		Med-high 11-14	15
		High >14	20

A4. What is the cover of negative indicator species &/or agricultural 'weeds' throughout the field/unit. Negative indicators/weeds around current feeding sites should be scored under MF-B.6; all other negative indicators/weeds under this indicator.		High >50%	-30
		Medium High 26-50%	-20
		Medium Low 11-25%	-10
		Low 6 – 10 %	0
		Negligible <5%	10

Circle: Docks   Perennial Rye Grass   Chickweed   Nettles   Thistles (Creeping)

                    Fathen   Other species (identify):

B. Future Prospects and Threats

B.1 What is the suitability of current habitat for the Pollinators? Assess this indicator only over main area of field/unit considered to be suitable	**Suboptimal** Mown, abandoned, intensely grazed, regularly flooded	-20
	Moderate Small patches or one area which has patchwork of sward height between 5-60cm with low to moderate (1-20%) cover of pollinator plants	10
	Good Numerous patches or larger area(s) which have patchwork of sward height between 5-60cm, with >20% cover of pollinator plants	20

B.2 What is the cover of dense, dead plant litter ?	High >75%	-15
	Medium-high 51 – 75%	-5
	Medium-low 21 – 50%	5
	Low <20 %	15

B.3 Are there any damaging activities to vegetation, soil or water? E.g. dumping including organic, pollution, or damage to soil, inappropriate use of herbicide, track due to tractor If yes, list all activities in comment box over-leaf.	High	-40
	Medium-High	-20
	Medium - Low	-10
	Low - None	0

B.5 Is there damage due to supplementary feeding? Identify type (silage, ring feeder, poaching, erosion etc) Other please list_____	High	-40
	Medium	-20
	Low	0

BOX 1: Circle or tick the positive indicators which occur within a 'W' walk of the grassland. Each individual indicator, whether a single species or group of species, counts as one indicator for Questions MF-A.1 & MF-A.2.

Refer to Positive and Negative Plant Identification Booklet to assist with correct identification.

Code	Positive pollinator and habitat indicator	Code	Positive habitat indicator
1	Knapweeds - Common & Greater	18	Meadow Thistle
2	Red Clover	19	Marsh Thistle
3	Ragwort	20	Purple loosestrife
4	Yellow Composites - Cat's Ears, Hawk-weed's, Hawkbit's & Goat's-beard (not dandelion)	21	Primrose
5	Birds-foot-trefoils (Common & Greater)	22	Small Umbels - Yarrow, Sneezewort, Wild Carrot
6	Red Bartisia	23	Orchids - all species
7	Yellow rattle	24	Ragged Robin
8	Kidney vetch	25	Small Bedstraws (all species) Stitchwort (Field & Marsh);
9	White clover	26	Tormentil - Common & English, silverweed
10	Self-heal & Bugle	27	Meadowsweet
11	Woundwort, marsh and hedge	28	Eyebright
12	Mints - all species	29	Marsh Cinquefoil
13	Willow, ground and other willow species	30	Yellow Iris
14	Scabious - Devils'-bit (not on machair)	31	Violets - all species
15	Vetches - Meadow Vetchling, Bush Vetch etc	32	Sea Holly
16	Dandelion	33	Milkwort
17	Bramble	34	Sheep sorrel

Comments or any recommended actions:
Any issues to be brought to farmers attention for immediate action or to rectify in short/medium term:

Appendix 2 – Farmers' Feedback

Feedback from Famers (meeting 01/12/2022)

What part of the Great Yellow Bumblebee project did you enjoy most?

What was the most valuable part of the Great Yellow Bumblebee Project for you?
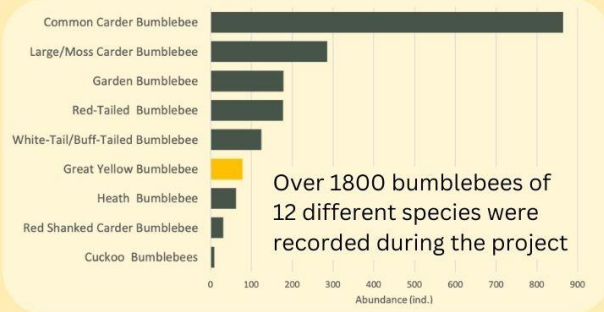
Flyers sent to farmers on results of first year of the project.

The Great Yellow Bumblebee Project

63% of participating farms recorded Great Yellow Bumblebees

Bumblebee Abundance

Species	
Common Carder Bumblebee	
Large/Moss Carder Bumblebee	
Garden Bumblebee	
Red-Tailed Bumblebee	
White-Tail/Buff-Tailed Bumblebee	
Great Yellow Bumblebee	
Heath Bumblebee	
Red Shanked Carder Bumblebee	
Cuckoo Bumblebees	

Abundance (ind.)   0 100 200 300 400 500 600 700 800 900

Over 1800 bumblebees of 12 different species were recorded during the project

Bumblebees

Data analysis showed that delaying mowing or delaying grazing has positively affected bumblebee abundance.

The rare Large/Moss Carder Bumblebee was recorded nearly 300 times.

The unusual weather in June may have influenced the size of some recorded worker bumblebees.

Great Yellow Bumblebee Abundance & Distribution

The Great Yellow Bumblebee was found in 17 of the 46 fields in the EIP.

Participating fields were not evenly distributed throughout the project area.

- Project Site
- Project Area

0   5   10 km

Great Yellow Bumblebees were recorded feeding on...

Red clover 37.9%	Knapweed 34.5%	Ragwort 9.1%	Catsear 4.5%	Kidney vetch 4.5%

Other flowers visited
- Birds-foot trefoil
- Devils-bit scabious
- Marsh woundwort
- Red bartsia
- Sea holly
- Selfheal
- White clover
- Yellow-rattle

Red Clover was recorded in over 93% of delayed graze fields and 78% of delayed mow fields

Knapweed was only recorded in 65% of delayed graze fields and 42% of delayed mow fields

www.belmullettidytowns.com/great-yellow-bumblebee

Appendix 4 – General Information Flyer

The Great Yellow Bumblebee Project

The Great Yellow Bumblebee European Innovation Partnership (EIP) is a one-year pilot project. The project aims to protect and raise awareness of the endangered Great Yellow Bumblebee (*Bombus distinguendus*). The EIP has worked with 27 farmers on the Mullet Peninsula (19) and Erris coastal mainland (8) in County Mayo.

Great Yellow Bumblebee on knapweed.

While once widespread the Great Yellow Bumblebee was never a common species. Today the only known viable population is on the Mullet Peninsula and Erris coastal mainland. The decline of the Great Yellow Bumblebee is thought to be connected to the loss of flower-rich habitats.

Great Yellow Bumblebee on red clover.

Flora-rich machair grassland used by pollinators including the Great Yellow Bumblebee

Farm plans were produced in consultation with each farmer. Farmers protected flora-rich farmland habitats by reducing summer grazing or by delaying mowing. Other actions included having uncut field margins and managing off-field habitats (e.g. farm tracks and farm yards) in a pollinator-friendly way. Farmers will receive a payment for all actions undertaken.

Farmers workshop conducted on one of the EIP farms

Farmers attended workshops learning about pollinators and how farm management actions can be important tools for supporting pollinators. In addition, there was a workshop on saving and growing wildflower seed, another important action for creating suitable flora-rich habitats for pollinators.
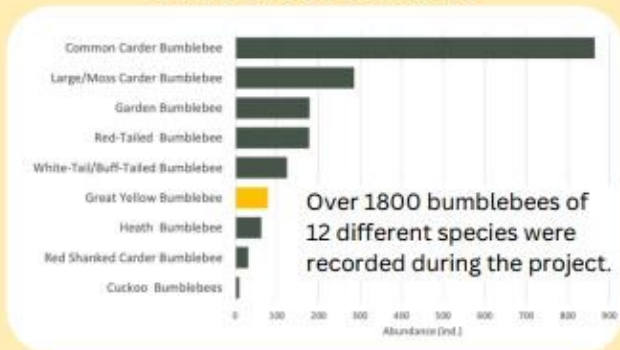
www.belmullettidytowns.com/great-yellow-bumblebee

The Great Yellow Bumblebee Project

63% of participating farms recorded great yellow bumblebees

Bumblebee Abundance

Over 1800 bumblebees of 12 different species were recorded during the project.

Pollinator Actions

Delayed Grazing = 75.4 ha
Delayed Mow = 16 ha
Linear Feature = 1655 m

Farm Payments

€ €34,130 total budget for farmers with the average payment to each farmer being €1,265

Great Yellow Bumblebee Abundance & Distribution

The Great Yellow Bumblebee was found in 17 of the 46 fields in the EIP.

Participating fields were not evenly distributed throughout the project area.

Total of 2776 pollinators recorded

77% of Great Yellow Bumblebees were recorded after 12 PM

89% of farmers attended project meetings

Great Yellow Bumblebees were recorded feeding on...

Red clover
37.9%

Knapweed
34.5%

Ragwort
9.1%

Catsear
4.5%

Kidney vetch
4.5%

Other flowers visited
- Birds-foot trefoil
- Devils-bit scabious
- Marsh woundwort
- Red bartsia
- Sea holly
- Selfheal
- White clover
- Yellow-rattle

Appendix 5 – Workshops Additional Photographs

Photograph 18: Attendees at the one of our farmers workshops

Photograph 19: Attendees at the Irish wildflower seed-saving workshop

Great Yellow Bumblebee
Summary Report
2022

EXAMPLE FARMER

General Project Summary

The Great Yellow Bumblebee European Innovation Partnership (EIP) was a one-year pilot project. The project aims to protect and raise awareness of the endangered Great Yellow Bumblebee (*Bombus distinguendus*). The EIP has worked with 27 farmers on the Mullet Peninsula (19) and Erris coastal mainland (8) in County Mayo. While once widespread the Great Yellow Bumblebee was never a common species. Today the only known viable population is on the Mullet Peninsula and Erris coastal mainland. The decline of the Great Yellow Bumblebee is thought to be connected to the loss of flower-rich habitats. The flora-rich machair grassland (sandy banks) and hay meadows on the Mullet and coastal Erris mainland support a great variety of bumblebees and other pollinators.

Over 1800 bumblebees were recorded during fieldwork consisting of 12 different species (Figure 2). A total of 78 Great Yellow Bumblebees were recorded. The most common bee (over 800 records) recorded was the Common Carder bee.

Great Yellow Bumblebees were recorded in 63% of participating farms. The majority of these were found feeding on Red Clover (37.9%) and Common Knapweed (34.5%).

Figure 9: Map showing number of Great Yellow Bumblebee sightings
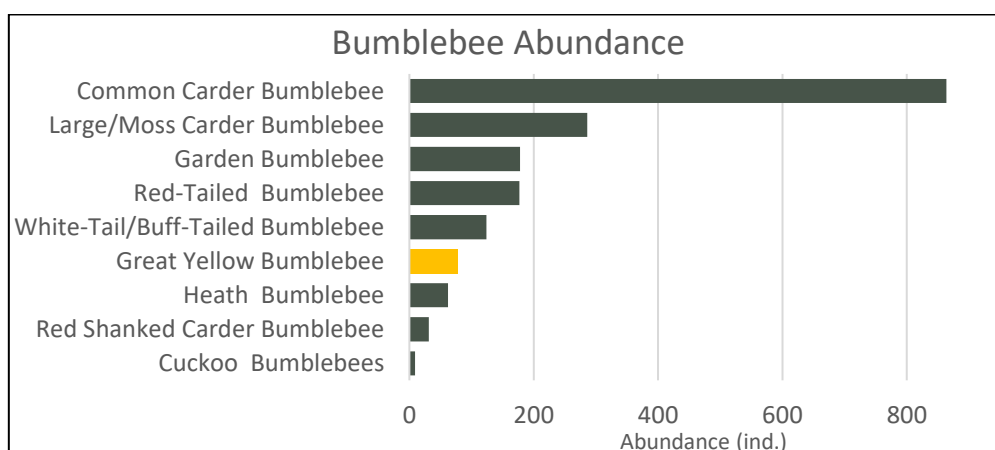
Figure 10 Total number of each bumblebee species recorded throughout the Great Yellow Bumblebee Project. Due to the small numbers, cuckoo bumblebee species were grouped together.

Your Farm Summary

Your machair field / sandy bank is an excellent example of the type of sandy bank that supports a wealth of wildlife. Your field was very diverse in terms of the number of flowering plants recorded. Keep up the good work. As well as bees, we also heard a corncrake on your field and saw a hare.

Flora

Over 37 flowering plants were recorded on your sandy bank. This is one of the highest diversities found on farms in the project.

Pollinators

Two Great Yellow Bumblebees were recorded on your sandy bank. In addition, seven other bumblebee species were seen. The most abundant bumblebee bee recorded (10) was the large carder bee. This is also a rare bee and is listed as "near threatened" in Ireland. Recent data from the All-Ireland Bumblebee Monitoring Scheme shows an ongoing decline in this species.
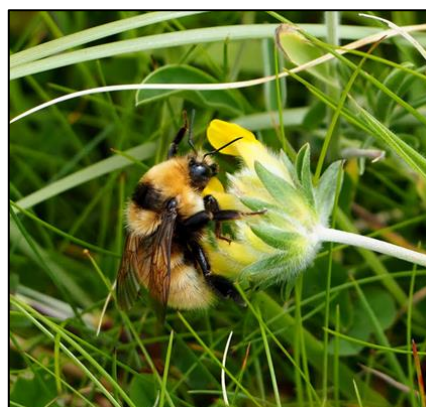

Figure 11: Great Yellow Bumblebee on Kidney vetch

Your Farm Recommendation

Figure 12: Red Clover

Continue to winter graze your field. Aim to remove stock by the end of April and try not to return stock till the start of October. Take care when supplementary feeding with silage, keep to a minimum by having a low stocky density. If using a ring feeder try and move feeder around so that erosion doesn't occur. Do not over-use track especially during wet weather conditions. Keep up the good work.

On behalf of the whole project team at the Great Yellow Bumblebee EIP we would like to thank you for taking part in the project. We hope you have gained valuable knowledge, skills, and ideas that you will bring forward to your future farming practices.

Great Yellow Bumblebee - EIP PROJECT

Final Project Report, 2023

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