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National Biodiversity Data Centre
A Heritage Council Programme

Biodiversity IRELAND

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Great Spotted Woodpecker
Dramatic range expansion in Ireland

Common Scoter:
a sea-duck breeding at Ireland's freshwater lakes

Marine Citizen Science
Drafting a Marine Biodiversity Citizen Science Strategy 2023–2028

National Biodiversity Data Centre

A Heritage Council Programme

Biodiversity Ireland Issue 22 Spring/Summer 2022
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The National Biodiversity Data Centre is a programme of the Heritage Council and is operated under a service level agreement by Compass Informatics. The Biodiversity Data Centre is funded by the Department of Housing, Local Government and Heritage.

Cover: Great spotted woodpecker © Brendan Hartley

The National Biodiversity Data Centre

Ireland's biodiversity is under threat. Like elsewhere in the world, biodiversity loss is depriving future generations of its intrinsic and monetary value. International conventions, nature protection legislation and national initiatives have been supported by the Irish government to address biodiversity loss and improve the quality of life of its citizens. The National Biodiversity Data Centre is one such initiative.

In order to conserve Ireland's biodiversity, we need to document what biodiversity we have, understand how it is distributed across the island of Ireland and its marine waters, track how it is changing over time, and communicate the importance of conserving biodiversity.

Addressing these knowledge gaps and building the scientific evidence base to help its conservation is central to the work of the National Biodiversity Data Centre. Find out more about what we do from the publication: *Introducing the National Biodiversity Data Centre*

https://biodiversityireland.ie/aboutthecentre_pdf

The Staff of the National Biodiversity Data Centre

Owen Beckett, *Research Officer,* has responsibility for the identification of insects as part of the Protecting Farmland Pollinators EIP Project. He is also using his specialist expertise to assist with the validation of wasp records submitted to the Data Centre.

Kate Chandler, *Pollinator Plan Communities and Engagement Officer,* has responsibility for engagement with local communities to support and coordinate community actions for pollinators. This post is funded by The National Parks and Wildlife Service.

Oisín Duffy, *Surveys and Records Officer,* has responsibility for the management of Ireland's Citizen Science Portal and the data validation processes with partners. He provides active support to the recording network to improve the quality and quantity of data submitted.

Dr. Úna Fitzpatrick, *Senior Ecologist,* is responsible for the development of, and oversees delivery of, the All-Ireland Pollinator Plan, and is responsible for the plant and vegetation work programmes of the Data Centre. This includes management of the National Vegetation Database and contributing to development of the Irish Vegetation Classification System.

Dr. Michelle Judge, *Data Manager and GBIF Node Manager,* has responsibility for maintaining the National Biodiversity Database and publishing biodiversity data through Biodiversity Maps. In addition, she looks after the National Biodiversity Indicators and the data analysis for the Irish Butterfly Monitoring Scheme.

Dr Saorla Kavanagh is the Project Manager of the Protecting Farmland Pollinators project which seeks to test evidence-based actions to make farmland more pollinator-friendly. This is a five-year project funded under the European Innovative Partnership programme.

Sarah Kelly, *Agri-business Officer,* is working on supporting Origin Green Companies to deliver biodiversity measures to support implementation of the All-Ireland Pollinator Plan. This post is supported by Bord Bia.

Dr. Michelle Larkin Is responsible for managing the National Pollinator Monitoring Scheme. This pilot project aims to develop a robust national monitoring framework that will collect data on the distribution, conservation status and trends of insect pollinators across Ireland. This project is funded by the NPWS, and the Department of Agriculture, Food and the Marine.

Dr Liam Lysaght, *Centre Director,* is responsible for setting the strategic direction of the Data Centre, overall management of the operations and work programme, and building of partnerships with other organisations. He is an active recorder and helps with the delivery of the Data Centre's work programme on butterflies, birds and mammals. He also serves as Head of Delegation for Ireland to the Global Biodiversity Information Facility (GBIF).

Martina O'Brien, *Invasive Species Engagement Officer,* has responsibility for engaging with different sectors to coordinate actions that address the threat posed by Invasive Alien Species. The role is to support NPWS in implementing and reporting on delivery of the EU Regulations on Invasive Alien Species in Ireland. This post is funded by The National Parks and Wildlife Service.

Colette O'Flynn, *Invasive Species Officer,* is responsible for the Invasive Species work programmes of the Data Centre. She manages the National Invasive Species Database, provides coordination of invasive species data and information, and contributes advice and policy support at the national and European level.

Niamh Phelan, *Administrative and Engagement Officer,* is responsible for day-to-day office management at the Centre and spearheading the Centre's engagement and outreach programme.

Dave Wall, *Citizen Science Officer,* is responsible for the Explore Your Shore! and Dragonfly Ireland 2019-2024 citizen science projects. He also takes the lead on developing the Data Centre's work programme on citizen science and all marine biodiversity activities.

Ruth Wilson *Farmland Pollinator Officer,* is responsible for implementing actions in the All-Ireland Pollinator Plan that relate to making farmland more pollinator friendly. The post is supported by the Department of Agriculture, Food and the Marine.

Director's Comment

Spring is now well and truly underway, with the natural world once again bursting into life. This spring, as the Covid restrictions become a memory, the signs of life and vitality are particularly pleasing and appreciated. The last two years has been a very difficult time, challenging much of what we have heretofore taken for granted. One of the consequences of the lockdowns was that it caused us all to slow down and become more in touch with our surroundings. For many, it brought into sharp focus the benefits of biodiversity and of a healthy local environment. For others an interest in biodiversity definitely helped to better cope with the challenges faced by the Covid lockdowns. Yet, despite the importance of biodiversity, Ireland is in the midst of a biodiversity emergency.

We know this is the case because of what the evidence is telling us about species declines and a reduction in the quality of ecosystems. This evidence is generated by a large number of individuals and organisations who are working to survey, collate and analyze data to better understanding what is happening with different aspects of Ireland's biodiversity.

The Spring 2022 issue of *Biodiversity Ireland* presents just a snapshot of some of the important work that the Data Centre and some of its partners are doing on biodiversity in Ireland. It shows the value of conservation NGOs and conservation charities who have such expertise in specialised aspects of biodiversity. It showcases the huge engagement that already exists with a large network of individuals who record biodiversity and see it as a lifelong learning pursuit. It highlights the importance of regular systematic surveys to help monitor biodiversity populations so that any changes that are happening can be detected, quantified and reported upon, in order to stimulate conservation action. It also shows the importance of scientific research to better understand why some of these changes are happening and how the impacts can be mitigated, which again should help to better inform policy to take more targeted conservation action.

The Department of Housing, Local Government and Heritage is currently in the consultation stage of production of Ireland's fourth National Biodiversity Action Plan as the framework for public policy and action to improve the conservation of Ireland's biodiversity. With the renewed political support that biodiversity has received from the current Government, there is a corresponding expectation that this new Plan will provide the impetus to change the outlook for biodiversity conservation in Ireland, in a real way. The National Biodiversity Data Centre looks forward to playing its part to help deliver on the ambitions of the Plan.

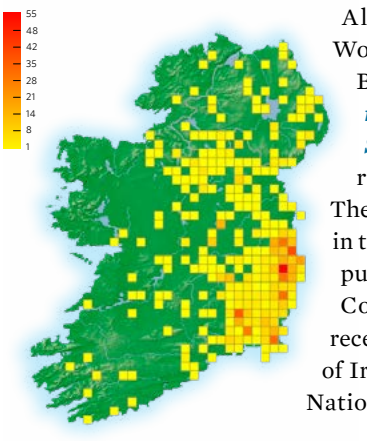
Outstanding Achievement Awards 2021

The National Biodiversity Data Centre recently issued Outstanding Achievement Award certificates to recorders who had achieved significant milestones in recording activity during 2021. Thirty-four recorders where awarded Gold certificates for submitting in excess of 1,000 records during the year. A further 37 recorders received a Silver certificate for submitting in excess of 500 records.

During 2021, a remarkable 9,345 individuals submitted at least one record to Ireland's Citizen Science Portal. All of these records are valuable as they all help to build the knowledge base on what species occur where in Ireland. For this reason, all records are greatly appreciated and we thank all the recorders who took time to submit details of their sightings.

Great Spotted Woodpecker continues its remarkable spread in Ireland

The Great Spotted Woodpecker has continued its dramatic range expansion in Ireland and now occurs in all counties. Records submitted to the National Biodiversity Data Centre show it is extremely widespread in Leinster, has colonised much of the border counties, and continues to extend its range westward, though it is still relatively scarce west of the Shannon.



All records of Great Spotted Woodpecker can be viewed on Biodiversity Maps: ***https://maps.biodiversityireland.ie/Species/11298***. The majority of records are from two datasets. The historic records are contained in the Rare Birds of Ireland dataset, published by the Irish Rare Bird Committee, whereas the more recent sightings come from the Birds of Ireland dataset, published by the National Biodiversity Data Centre.

Great Spotted Woodpecker seen at the National Biodiversity Data Centre offices, Carriganore, Co. Waterford on 9th March 2020 by Oisin Duffy

The maps showing the distribution of sightings are generated from casual sightings by observers and are not based on any systematic, structured survey. Yet it shows the value of submitting casual sightings of birds where all the sightings can be collated together and mapped on Biodiversity Maps. All these data are freely available for research and other purposes and provide a valuable record of the spread of this species across the island of Ireland.

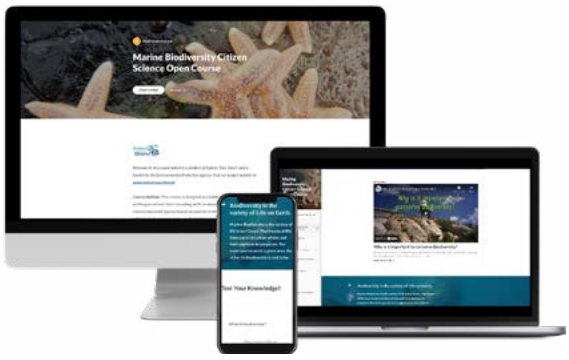
New online course on Marine Biodiversity Citizen Science

Explore Your Shore!

Do you want to learn how to tell periwinkles from topshells and sort bladderwrack from furbelows? Do you want to discover how to survey biodiversity on rocky shores and beaches? Well now you can, with our new Marine Biodiversity Citizen Science online course designed for the beginner or improver. From the comfort of your own armchair, using a laptop, tablet or smartphone, you can now learn how to become a Marine Biodiversity Citizen Scientist through our six-part online course, covering:

- Biodiversity and Citizen Science
- Life on the Seashore and Seaweeds
- Rocky Shore Molluscs
- Other Rocky Shore Invertebrates
- A Tale of Two Halves - the Bivalves
- Coastal Fish and Explore Your Shore! Surveys

Complete the course at your own pace and test your growing knowledge with the end of module quizzes. Then put what you have learned into action by completing our six end-of-module Missions! Successfully complete the course and missions to receive a course



completion certificate and be well placed to continue developing your skills in Marine Biodiversity recording. Access the course at: ***https://exploreyourshore.ie/marine-biodiversity-open-course***

Need additional support? Why not purchase one of our identification swatches which will help you to identify common intertidal seaweeds and marine bivalve shells? Visit our online shop at: ***biodiversityireland.ie/shop/*** You can also ask for help with identifications by posting your images to our Facebook page @ExploreYourShore

National Parks & Wildlife Service

We're delighted to include this new regular column with news from our partners at the National Parks and Wildlife Service, profiling some of the research they're doing.

Common Scoter: a sea-duck breeding at Ireland's freshwater lakes

'Common Scoter' – a bird few have heard of and even fewer have seen. The Common Scoter, *Melanitta nigra*, is, in fact, a member of the sea-duck tribe, which includes more familiar species such as Eider, Goldeneye and Mergansers.

As one might guess, they are known as sea-ducks as they spend the majority, if not all, of their time at sea. To survive in the challenging marine environment, sea-ducks typically have short, robust bodies and all are expert divers, diving down to feed on fish, molluscs, crustaceans and other prey sources.

In Ireland, Common Scoter vary in abundance through the year. In autumn and winter, they are rather abundant in coastal marine areas right around the island of Ireland. During the winter period, they can occur in rafts of thousands, concentrating over rich feeding areas where they dive to feed upon molluscs such as mussels and clams, as well as crustaceans and fish larvae. Nationally important areas for Common Scoter include Dundalk Bay, Castlemaine Harbour, the north Wexford coast and Donegal Bay, with Special Protection Areas (SPAs) designated for the species in each of these areas.

In spring and summer, the distribution and abundance of Common Scoter is rather different. The majority of Common Scoter that occur in winter migrate back to breeding grounds in Iceland, Scandinavia and even Russia. However, some birds are resident in Ireland and remain here to breed on freshwater lakes, such as Loughs Ree and Corrib, where they nest on scrubby islands.

The species was first recorded breeding in Ireland as recently as the 1940s, and the population seemed to increase as the population in Northern Ireland decreased. The Irish population reached a peak of 100 pairs in 1995, distributed across Loughs Ree, Corrib, Conn and Cullin. Sadly, by 2012, a survey of all known breeding lakes determined that the population had declined to just 39 pairs.

In 2020, the National Parks and Wildlife Service (NPWS) sought to get an update on the population status and distribution of breeding Common Scoter in Ireland. The national survey was delivered by NPWS staff and Aniar Ecology, with Loughs Corrib, Ree, Arrow, Conn, Cullin and Gara surveyed in ideal conditions.

The breeding census recorded a total of 50 potential breeding pairs of Common Scoter, an increase of 28% in the national population since 2012. However, this total is significantly lower than the peak of 100 pairs in 1995. The noted short-term increase in the national population is a result of an increase in the Lough Corrib population from 28 pairs in 2012 to 38 pairs in 2020. At other sites the population remained stable but low since 2012. Breeding success in 2020 (28%) was similar to 2012 (26%), however, successful breeding was only recorded on Loughs Corrib and Ree. The full report will be published as an Irish Wildlife Manual at the link below.

Common Scoter
L Ree Owen
Murphy 2021

A lot remains unknown about breeding Common Scoter in Ireland and further monitoring and research is needed to gain greater insight into its breeding ecology and preferences, pressures impacting upon it, and how site management and policy can be improved for the benefit of this rare breeding bird. The future of Common Scoter will require all relevant lake stakeholders to work together to build healthy, functioning ecosystems that can be sustainably enjoyed by all.

- Common Scoter records - ***https://maps.biodiversityireland.ie/Dataset/21/Species/10100***
- Irish Wildlife Manuals: ***https://www.npws.ie/publications/irish-wildlife-manuals***

Seán Kelly is an ecologist with the Science & Biodiversity Unit of the National Parks and Wildlife Service, specialising in monitoring, research and advice for the conservation of waterbirds in Ireland.

Small Tortoiseshell, one of our most recorded species in 2021. © Liam Lysaght

Ireland's Citizen Science Portal

The Citizen Science Portal is Ireland's national portal for the collection of biological records. Species that you see casually, or actively search for, can be submitted through a host of online recording forms. The purpose of collecting this data is that it helps to inform and update our knowledge on Ireland's biodiversity. This can include where species occur; if the geographic range of a species is growing or receding, appearing earlier or later in the season; and potential threats they may face in the future.

At the National Biodiversity Data Centre, we have seen a huge increase in biological recording since 2020. This is likely due to the restrictions that were put in place during the beginning of the COVID-19 pandemic, however the trend continued to increase even after restrictions were lifted. Perhaps the extra time or ability to work from home allowed people to explore more of their own localities leading to an increased interest in the natural environment.

Biological Recording Activity in 2021

Biological recording activity reached a higher level in 2021 than any previous year. Over 181,000 records were submitted through Ireland's Citizen Science Portal. Records were submitted for all counties within Ireland for over 6,100 different species by 9,345 individual recorders. As expected, recording activity was highest during the summer months, however, over 13,000 records were submitted in January of 2021, a noticeable increase on previous years. This could potentially be explained by Level 5 restrictions, which stayed in place for the entirety of January 2021, coupled with an already increased interest in biological recording which was noticed through 2020.

> ***Biological recording activity reached a higher level in 2021 than any previous year. Over 181,000 records were submitted***

The 10 most heavily recorded species throughout 2021 were: Hedgehog (*Erinaceus europaeus*), Small Tortoiseshell (*Aglais urticae*), Speckled Wood (*Pararge aegeria*), Robin (*Erithacus rubecula*), Common Buzzard (*Buteo buteo*), Red Admiral (*Vanessa atalanta*), Peacock (*Inachis io*), Swallow (*Hirundo rustica*), Blackbird (*Turdus merula*) and Hooded Crow (*Corvus cornix*). The Hedgehog was the most recorded species, which can likely be explained by the call for records by the Irish Hedgehog Survey (***https://biodiversityireland.ie/surveys/irish-hedgehog-survey/***). All other species within the top 10 were from just two taxonomic groups, butterflies and birds.

One of the other interesting aspects of biological recording is observing recorder effort. Some locations are heavily recorded by multiple recorders, while other areas are under-recorded and may have no regular recording taking place. This also adds another layer to interpreting species distribution and mapping. When there are gaps in a species distribution, it could be due to unsuitable habitat, rarity of the species or potentially it is just in an area where there is a low-level of recording. When reviewing data from previous years, we have noticed a number of recurring trends, which give us an insight into the workings of recorder effort.

One of the most interesting trends is that on average more than half of all recorders who submit a record in a given year will only submit one record. This is a stark contrast to a small handful of recorders who actually submit more than 1,000 records in a given year.

The Spring Flowers Project

There are a number of dedicated recording forms on the Citizen Science Portal. This is mainly related to taxonomic groups, such as Vascular Plants, Birds and Bumblebees. However, there are also a number of recording forms related to specific surveys or recording initiatives, which are either run by the National Biodiversity Data Centre or hosted by ourselves for partner organisations.

Our Spring Flowers Project, which was originally set up in 2017 as a pilot project between the National Biodiversity Data Centre and the Botanical Society of Britain and Ireland, has seen an increased level of recording and benefits from having its own dedicated recording form. The Spring Flowers Project is an ideal recording initiative for all levels. There is a list of 20 species to record, the majority of which are distinctive and easy to identify. For more information on the Spring Flowers Project, please visit our project website: ***https://biodiversityireland.ie/surveys/spring-flowers-project-2022/***

Bluebells, one of our most charismatic spring flowers © Oisín Duffy

Ladybird Atlas 2025

Records coming through our Ladybird recording form will be used in our Ladybird Atlas 2025 project, which aims to produce an Atlas on Ireland's ladybird species. Having a dedicated recording form for these conspicuous ladybirds is also useful as it not only allows for direct linking to the form, but also helps to reduce inputting errors during the record submission process. For more information on the Ladybird Atlas 2025, please visit our project website: ***https://biodiversityireland.ie/surveys/ladybird-atlas-2025/***

There are many other recording forms which are dedicated to specific surveys and recording initiatives, so please visit Ireland's Citizen Science Portal to view the full selection: ***https://records.biodiversityireland.ie/***

7-Spot Ladybird, our most commonly recorded species of Ladybird © Oisín Duffy

Oisín Duffy

SURVEYS AND RECORDS OFFICER
National Biodiversity Data Centre

Biodiversity Maps approaches 5 million records!

Biodiversity Maps

A very significant milestone will be passed very shortly, when Biodiversity Maps will map more than 5 million records, making it by far the largest resource of data on Ireland's biological diversity. As of the end of April 2022, Biodiversity Maps contains 4.97 million records of 17,141 species – from 170 different datasets. Biodiversity Maps is a national platform that partner organisations use to publish their biodiversity datasets, to showcase the work they are doing and to contribute to building the knowledge base on Ireland's biodiversity. By the time this newsletter is published, the 5 million record mark will have been exceeded. Thanks to all our partners who avail of this service to publish their data.

Protecting Farmland Pollinators

Protecting Farmland Pollinators is a European Innovation Partnership (EIP) project that aims to identify actions farmers can take to protect pollinators on their farm.

The National Biodiversity Data Centre is working with a group of 40 farmers to come up with a method that will support all farms across Ireland in becoming more pollinator friendly. By taking action to help pollinators on the farm you will help all biodiversity.

In consultation with farmers, we have created a scorecard that allows each farm to receive pollinator points each year and farmers receive a results-based payment that relates to these points. The scorecard has 18 actions, and farmers can decide what actions work best for their farm. Each action has a weighting associated with it, with the most pollinator-friendly action having the highest weighting.

Table 1 Pollinator-friendly actions for hedgerows and field boundaries.

No.	Action	Units of measurement	Approx. amount
1	Flowering hedgerow max. cut once every 3-5 years with a 1.5-2m margin or understory fenced from grazing part of the year or untilled	metres	
2	Flowering hedgerow cut once every 2-5 years with at least 0.5m margin fenced from grazing part of the year or untilled	metres	
3	Flowering hedgerow cut once every two years (no margin)	metres	
4	Other pollinator-friendly field boundary	metres	

Table 2 Pollinator-friendly action for trees.

No.	Action	Units of measurement	Approx. amount
5	Pollinator-friendly flowering trees (up to max 500)	number of trees	

Pollinator friendly trees on farmland can be located within a hedge, garden or can be stand alone trees in a field.

Farmers fill in the 'approximate amount' section for each of the 18 actions on the scorecard (Tables 1 & 2) and their points are calculated. There are pollinator-friendly actions for hedgerows, trees, and fields and flowers. There are also pollinator-friendly pesticide options (points are received for not using pesticides).

This year, the highest scoring farm received a score of 340,498 pollinator points, which has the equivalent value of €17,000. Unfortunately, the maximum a farmer can be rewarded in the scheme each year is €4,000. What these figures show is that some Irish farms remain incredibly biodiversity friendly. The new actions that some farmers are taking to protect biodiversity on their farm through this project are incredible. Within one farming year, four of the participant farmers have more than tripled their pollinator score. Twenty-five farmers have increased their score between this year and last (9 tillage, 7 dairy, 5 beef and 4 mixed) (Figure 1).

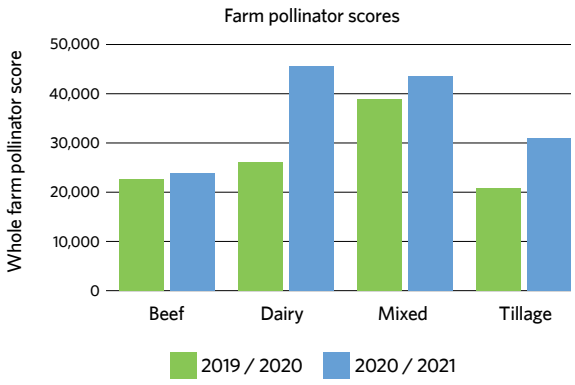


Figure 1 Calculated Pollinator Points across four farm types (beef, dairy, mixed and tillage) comparing this year (2020/2021) and last year (2019/2020).

Active nests created by the farmers.

Hedgerows cut on a minimum 3-year rotation with the margins clearly visible.

Farmers have been given the knowledge on how they can take action to help pollinators and they have acted based on that knowledge. Within the last farming year, some of the additional pollinator-friendly management practices that farmers have taken include:

- 11,849 meters of flowering hedgerow with a 1.5-2-meter margin cut on a 3-5-year rotation
- 19,671 meters of flowering hedgerow with a 0.5-meter margin cut on a 2-5-year rotation
- 6,696 meters of flowering hedgerow cut on a 2-year rotation
- 4 hectares of native meadow
- 28 hectares of clover pasture and/or mixed species sward allowed to flower
- 8 farmers have reduced pesticide inputs

One particularly interesting action is the natural rejuvenation of a field on a tillage farm. One farmer is experimenting to see if it is possible to create a native meadow on his farm without sowing seed. This is potentially more beneficial for biodiversity than sowing a field of native wildflower seed. The site will be monitored closely this year. The All-Ireland Pollinator Plan have published many blogs highlighting the horrors associated with sowing flower seed mixes. When it comes to long-term biodiversity actions on the farm, the focus needs to be on retaining habitats (however small) and on natural regeneration after that.

As part of the project, farmers were required to create solitary bee nesting sites for our cavity-nesting and mining bees. Some of these sites were checked for occupancy in 2020. Twenty-seven sites had active aggregations of mining bees on 19 farms, and 11 bee boxes from eight farms were occupied. The data generated from the survey in 2020 will be used to create action sheets, with tailored evidence-based information on what farmers can do to help pollinators on their farm. To date, we have collected and identified 2,051 specimens (42 hoverflies and 37 bees) on the 40 farms. We also have data on farmland plants and hedgerows.

The success of this project to date is due to the farmers. We are also very fortunate to have a fantastic operational group. The pollinator score helps farmers to understand how pollinator friendly their farm is, and to identify what simple, low-cost actions they can take to work towards improving their score in a way that does not negatively affect productivity. What's important to note here is that it is up to the farmer to choose what actions to take. Because of this project farmers have created, maintained, and restored small wildlife habitats on their farms for biodiversity, they have taken action to help pollinators. If you try to help pollinators on your farm you will help all biodiversity.

> *When it comes to long-term biodiversity actions on the farm, the focus needs to be on retaining habitats (however small) and on natural regeneration after that.*

Dr Saorla Kavanagh

PROJECT MANAGER

Protecting Farmland Pollinators EIP.

Protecting Farmland Pollinators

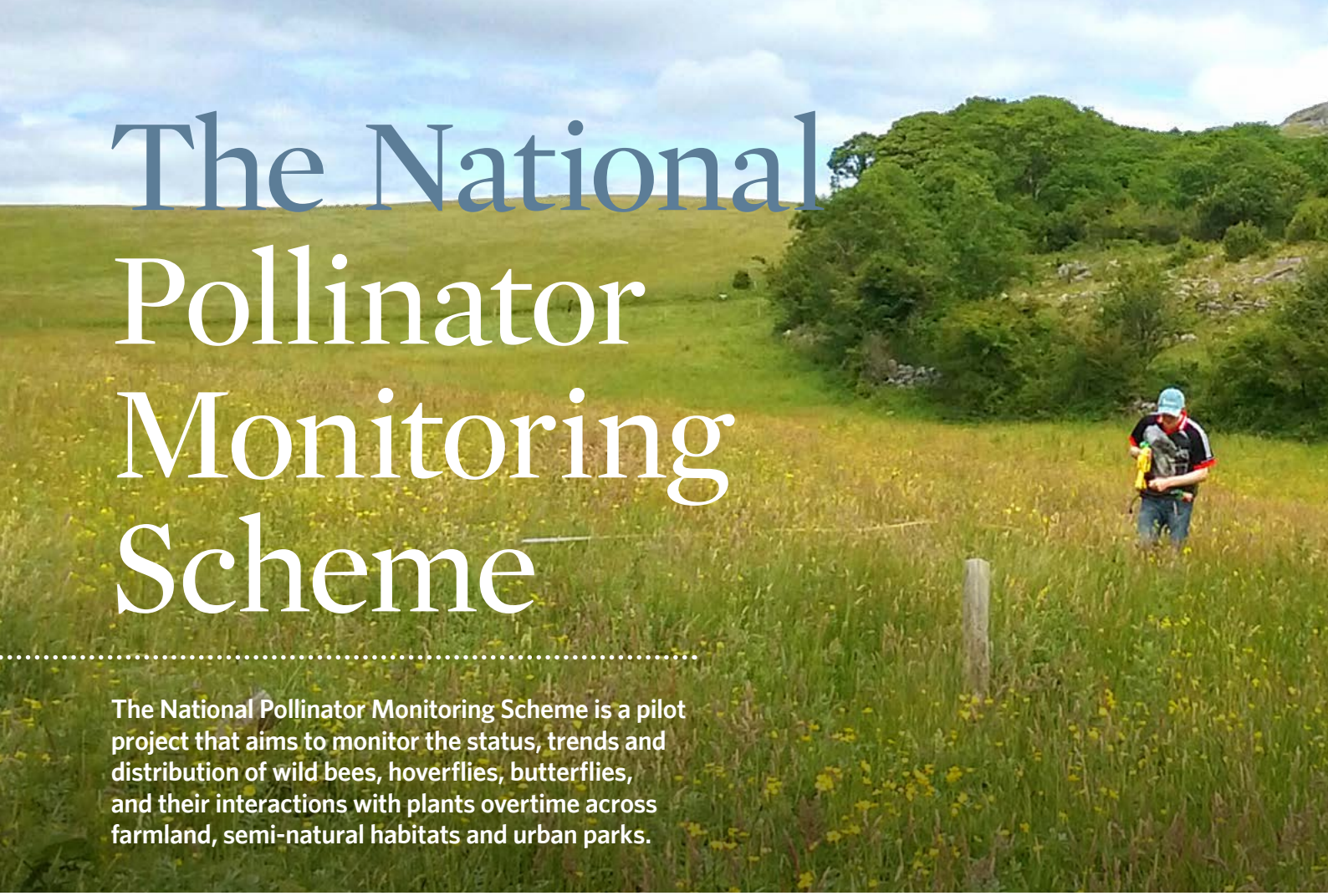
eip-agri AGRICULTURE & INNOVATION

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

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

Protecting Farmland Pollinators is a European Innovation Partnership (EIP) funded by the Department of Agriculture, Food, and the Marine (DAFM) under the Rural Development Programme 2014-2020. Aspects of the Project are subject to change in response to participant feedback and project monitoring. More information is available at: www.biodiversityireland.ie/farmland.

The National Pollinator Monitoring Scheme



The National Pollinator Monitoring Scheme is a pilot project that aims to monitor the status, trends and distribution of wild bees, hoverflies, butterflies, and their interactions with plants overtime across farmland, semi-natural habitats and urban parks.

Why do we need a Pollinator Monitoring Scheme?

There is a diverse suite of insects in Ireland that contribute to the pollination of both wild and crop plant species, including well known groups such as bumblebees and honeybees, as well as lesser-known groups such as hoverflies. Insect pollinators are experiencing population declines across the world, with negative consequences for pollination services and ecosystem stability. In Ireland, 30 of our 100 wild bee species are at risk of extinction. As a result, it is vital that we track where they are, how their populations are changing, and what habitats they are using, so that we can develop and inform effective pollinator conservation strategies to protect and enhance pollinator communities.

Where and how will we be collecting the data?

Fifty 1km^2 monitoring sites have been set up across the Republic of Ireland, incorporating farmland (beef, dairy, mixed [beef and sheep] and tillage [Oilseed Rape and Barley]), semi-natural habitats (calcareous grassland, old sessile oak woodland, dry heaths and fixed coastal dunes) and public land (urban gardens and amenity areas). Sites were selected to ensure they are representative of the overall landscape.
Each site will be visited once a month, from April to August 2022-2025, with bumblebees, solitary bees, honeybees, hoverflies, and butterflies sampled using pan trapping, transects and Flower-Insect Timed Counts. Flowering plants will also be recorded to monitor what plants are available as pollen and nectar sources for foraging pollinators throughout the sampling season.

How will the data be used?

The information collected will be used to:

- Monitor the status, trends, and distribution of wild pollinators across a variety of habitats
- Collect information on visitation by insect pollinators to wild and crop flowers
- Inform pollinator monitoring and conservation strategies at the local, national and EU level
- Assess the impacts of the All-Ireland Pollinator Plan on wild pollinator populations
- Aid in the development and/or updating of national conservation assessments for pollinators (Red Lists of Bees and Hoverflies)
- Contribute to upskilling and knowledge transfer

Some insect pollinators found in Ireland; a) hoverfly, b) solitary bee, c) bumblebee

Plans for 2022

There was a large response to our call for surveyors to adopt a pollinator monitoring site. Many thanks to all who showed interest in the monitoring scheme, it was great to see such a positive response! Each site has now been allocated a surveyor, with workshops to train surveyors on how to monitor pollinators and their floral resources.

Dr Michelle Larkin

PROJECT MANAGER
National Pollinator Monitoring Scheme

A mix of habitats will be monitored for pollinators incorporating a) farmland; b) semi-natural habitats and c) public parks

National Parks & Wildlife Service

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

The pilot National Pollinator Monitoring Scheme is managed by the National Biodiversity Data Centre and is funded by the National Parks and Wildlife Service and the Department of Agriculture, Food and the Marine.

Invasives.ie
Invasive Alien Species in Ireland

Invasive Alien Species in Ireland's aquatic environment:

how to help prevent their arrival and spread

Chinese Mitten Crab © Jan Robert Baars

From infamous invaders like the zebra mussel to more recent arrivals such as the Chinese mitten crab, Ireland has, (unfortunately) been amassing a diverse collection of unwanted invasive aquatic species for decades. These species have infiltrated our rivers, lakes, ponds, canals and marine waters with few aquatic environments spared from their presence. While globalisation has enriched our societies greatly, it brings with it parallel and inextricably linked movement of non-native plants and animals beyond their natural range. Key pathways that facilitate the spread of these species include boating and shipping, angling, aquaculture and the pet and horticulture trade.

Zebra mussel on Lagarosiphon Photo: Jan-Robert Baars

A proportion of non-native species that arrive become invasive with the capacity to cause substantial harm to our native biodiversity and natural environments. Once invasive species have established, our movement between waterways can facilitate their spread within Ireland.

Some of the most recent and significant invaders of our aquatic systems in Ireland include species like the Quagga mussel, the Crayfish plague disease, and the slipper limpet. These and other aquatic invasive species dole out an assortment of damaging impacts in their invaded range - they can cause mass mortality of native species, destabilise riverbanks, outcompete native species and bring about changes to habitats and ecosystems. Their impacts extend to negatively impacting on the services nature provides, on our economy, and the way we live.

So, what's the solution?

Preventing the introduction and establishment of invasive alien species is a crucial first step in our response to the threat that they pose. It is at this point where we have the greatest capacity to protect our native wildlife and ecosystems.

Contaminated boats and gear (e.g. equipment, footwear, and clothing) is one of the most common causes of the spread of invasive species to new waterways. Invasive plants and animals can be small, and hard to spot, so they are easily spread on damp equipment and clothing. Some can survive for many days or weeks in damp conditions. However, all water users can protect our wildlife and environment by following the 'Check Clean Dry' code. In January, the National Biodiversity Data Centre officially launched a range of 'Check, Clean, Dry' guidance and awareness raising materials for anglers, boaters, canal users, paddle sport enthusiasts and other water users! The materials were launched with Leave No Trace, Waterways Ireland and the National Parks & Wildlife Service. All are freely available from *https://invasives.ie/biosecurity/*.

> *Contaminated boats and gear is one of the most common causes of the spread of invasive species to new waterways.*

Invasive Alien Species 'Pathway Action Plans' for recreational boating and angling are also currently being developed with key stakeholders throughout Ireland so that we can all work together to take action and reduce the risk of spreading invasive alien species. They will look at how we can strategically manage high risk pathways for some of the most harmful invasive alien species.

The Check Clean Dry awareness campaign is supported by a range of organisations and is funded by the National Parks and Wildlife Service of the Department of Housing, Local Government and Heritage.

Juvenile quagga mussel (left) adult quagga mussel (below) Photos: Dr Jan-Robert Baars

Top 5

Invasive Species Impacts

Report suspected sightings, with a photo if possible at: *https://records.biodiversityireland.ie/record/invasives*

1. Extensive fouling of boats and floating structures

2. Carry disease, causing mass fish kills

3. Damage boats and propellers

4. Clog whole waterbodies

5. Kill wildlife and reduce biodiversity

Colette O'Flynn
INVASIVE SPECIES OFFICER
National Biodiversity Data Centre

Martina O'Brien
INVASIVE SPECIES ENGAGEMENT OFFICER
National Biodiversity Data Centre

Drafting a Marine Biodiversity Citizen Science Strategy

2023–2028

Marine Biodiversity Citizen Science is being increasingly recognised at national, European Union and international level as a valuable contributor of robust data to support marine policy reporting requirements, develop marine environmental policy, help fill biodiversity data gaps, and engage citizens in ocean literacy and marine policy.

Our ocean provides us with ecosystem services which support our economy, security, health, and wellbeing, and yet it is under increasing pressure from a range of human impacts. For Ireland to succeed in our marine conservation goals, public buy-in is essential. Lack of public awareness and understanding of the ocean, its ecosystems, and the threats facing them, are the single biggest barrier to progressing sustainable use of our ocean.

> *Ocean Literacy is the understanding of how the ocean affects us and we affect the ocean.*

In Ireland and globally a lack of robust marine biodiversity baseline data has resulted in the problem of shifting baselines, leading to a false perception of what heathy or untouched marine ecosystems should look like. Significant gaps in our knowledge of marine biodiversity have highlighted an urgent need to integrate Marine Biodiversity Citizen Science into marine conservation, monitoring, and reporting. Citizen Science has an important contribution to make in addressing data gaps due to its ability to gather large volumes of robust data over wide geographical areas, but also to learn from citizens and their shared historical knowledge of local biodiversity.

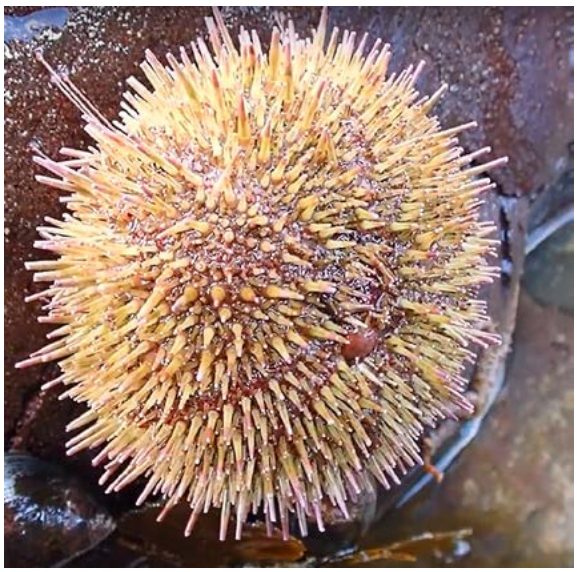
Our EPA-funded Explore Your Shore! project has shown that there is a strong appetite for Marine Biodiversity Citizen Science in Ireland. Since the project's inception in 2019, the Data Centre has witnessed a 298% increase marine species records received via its Citizen Science Portal, with 1,340 volunteer recorders submitting 11,000 marine biodiversity records over the past three years.

In Ireland, some of our longest running marine data sets are Citizen Science data sets. Birdwatch Ireland, the Irish Whale and Dolphin Group, and Coastwatch have been collecting Marine Biodiversity Citizen Science data in Ireland for over 30 years. Citizen Science lends itself to the collection of long-term data sets as it is less expensive to conduct and therefore easier to maintain over long periods.

Long-term and spatially diverse marine biodiversity data sets are crucial to our understanding of natural fluctuations in marine species and habitats, and to enable us to distinguish human-induced impacts from natural fluctuations. To allow Ireland effectively plan climate change adaptation and targeted marine conservation actions, it is essential that we possess sufficient data to evaluate the current rate and extent of ecological impact, accurately predict future change, and have robust baseline data from which we can assess the impacts of our actions.

While the need to integrate Marine Biodiversity Citizen Science into policy, monitoring and research is often discussed and is included in many policy and research strategies, there is usually little detail on how this should be achieved.

Common Starfish and Shore Urchin © Dave Wall



The National Biodiversity Data Centre has drafted a six-year Marine Biodiversity Citizen Science strategy with the goals of:

- Engaging and supporting the Irish public in Marine Biodiversity Citizen Science and Ocean Literacy.
- Addressing data gaps in the national knowledge of marine (and in particular intertidal) biodiversity with robust validated data.
- Better integrating marine biodiversity citizen science into national policy, research and education.
- Continuing to build Explore Your Shore! as a national platform to support and showcase Irish Marine Biodiversity Citizen Science.
- Collaborating with stakeholders including Citizen Scientists, NGOs, state agencies and academics in developing and supporting Marine Biodiversity Citizen Science initiatives in Ireland.
- Working with key state agencies to coordinate national Marine Biodiversity Citizen Science activities in supporting their core objectives.
- Encouraging a culture of Open Access in marine biodiversity data in Ireland.

Explore Your Shore! Training Day at Bull Island

Delivering the Strategy

Delivery of the strategy builds upon the National Biodiversity Data Centre's 15-year track record at the forefront of delivering Biodiversity Citizen Science projects contributing the National Biodiversity Data Resource through a robust infrastructure of information technology systems and experienced personnel.

It also builds on an active network of dedicated and experienced biodiversity recorders who have supported Irish Biodiversity Citizen Science recording over many decades, and the Data Centre's considerable experience in working with the public and private sectors, and with professional marine biodiversity surveyors and researchers.

The draft strategy supports the National Biodiversity Data Centre's role in:

- Promoting Marine Biodiversity Citizen Science data collection and driving local enthusiasm for biodiversity citizen science projects.
- Delivering programmes at a scale that are valuable to communities, local government, government, EU and global partners.
- Managing national biodiversity data sets.
- Responding in an effective and efficient manner to national, EU and global data end users.
- Ensuring support for genuine citizen science generated biodiversity programmes that answer real local needs.

The National Biodiversity Data Centre's Draft Marine Biodiversity Citizen Science Strategy has six overarching goals (outlined in the diagram above), with identified objectives and actions towards achieving those goals.

The Strategy will be put out to consultation with key partners and stakeholders in the coming months and we welcome all comments and suggestions. If you feel that you, or the group or organisation you represent, would like to be included in this consultation, please email dwall@biodiversityireland.ie and we will include you in our consultation call.

Dave Wall
—
CITIZEN SCIENCE OFFICER
National Biodiversity Data Centre

Biodiversity Maps

The data and mapping portal Biodiversity Maps https://maps.biodiversityireland.ie/ provides access to data on Ireland's biodiversity. At the end of April 2022, it maps 4,968,890 records of 17,411 species from 170 separate datasets.

Recently added, our updated datasets include:

Hedgehogs of Ireland
1,506 records

Mayfiles of Ireland
282 records

Earthworms of Ireland
1,025 records

Online Atlas of Vascular Plants
19,145 records

Moths Ireland
105,107 records

Ladybirds of Ireland
351 records

Dragonfly Records
401 records

Explore Your Shore
399 records

Mammals of Ireland 2016-2025
1,509 records

National Macroinvertebrate Biomonitoring (EPA) dataset
185,886 records

Butterflies of Northern Ireland
11,359 records

Purse Shark and Ray Eggcase Sightings Scheme
1,034 records

Ireland's Citizen Science Portal *https://records.biodiversityireland.ie/* saw an exceptional level of biological recording activity in 2021, with over 181,000 records submitted to the portal, by 9,345 different recorders. This was a 7.5% increase in recording activity from the already high 2020 figure. This high rate of recording activity has continued for the first three months of 2022, as 33,811 records were submitted by the end of March.

Butterflies

The end of 2021 marked the end of the fieldwork season for the Atlas of Butterflies in Ireland. This new Atlas, which will be produced in collaboration with Butterfly Conservation Ireland and Butterfly Conservation Northern Ireland, is based on records and surveys completed between 2017 and 2021. Thanks to the huge recording effort by people across the island, there is now a very comprehensive dataset of almost half a million records to map for the Atlas. Species observation records will be supplemented by population trend data generated by the butterfly monitoring programmes, to provide a comprehensive benchmark on the status and distribution of butterflies in Ireland. The Atlas is due to be published in mid-2023 and it will also update Ireland's Red List of Butterflies, which was published in 2010.

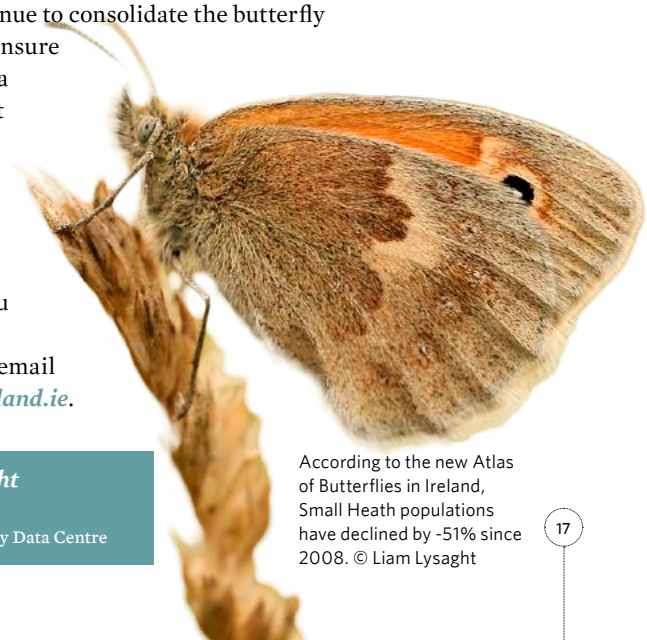
The National Biodiversity Data Centre now operates four different monitoring programmes that provide valuable insights into butterfly populations. The core butterfly monitoring programmes are the two transect-based schemes that involve walking a fixed transect either weekly between April 1st and September 30th each year, or the reduced effort five-visit monitoring scheme. The result of this monitoring shows that the overall butterfly index generated from the 15 commonest species continues to show a strong increase of 7.8% since 2016, but when viewed over the full 12 years since the scheme was established, the index is still showing a decline of 0.9%. Of course, this population index masks the changing fortunes of different species as, for example, Peacock is showing a very strong increase of +185% since 2008, whereas Small Heath populations have declined by -51% over the same period. Brimstone, Holly Blue, Small Tortoiseshell and Dingy Skipper populations have experienced a moderate increase, whereas Green-veined White, Large White, Small Copper and Speckled Wood have experienced a moderate decline. This analysis is possible only because of the large amount of time spent by the volunteer recorders who devote their time and expertise to monitor transects.

The Garden Butterfly Monitoring Scheme was introduced in 2020 and is already showing interesting results. It is based on volunteers completing 15-minute counts of the butterflies seen in their garden. The counts show clearly, for example, that 2021 was a season of two halves. Butterfly numbers were low until the end of June, but the species with late summer or autumn generations, such as Small Tortoiseshell, Speckled Wood and Large White, were counted in very large numbers in August and September.

The fourth monitoring programme for Marsh Fritillary is a very detailed survey of key sites that includes counts of larval webs in addition to a habitat quality assessment.

For 2022, we hope to continue to consolidate the butterfly monitoring programmes to ensure that robust, high-quality data is generated to enable impact of factors like land use and climate change to be tracked, to provide the evidence for policy action to be taken to mitigate these impacts. If you would like to get involved in butterfly monitoring, please email *butterflies@biodiversityireland.ie*.

Dr Liam Lysaght
—
DIRECTOR
National Biodiversity Data Centre



According to the new Atlas of Butterflies in Ireland, Small Heath populations have declined by -51% since 2008. © Liam Lysaght

Dragonfly Ireland


Irish Damselfly, *Coenagrion lunulatum*
© W. Woodrow & Monaghan Co. Council

2021 was another busy year for the Dragonfly Ireland all-Ireland survey, conducted in collaboration with our partners at the Centre for Environmental Data and Recording (CEDaR) in Northern Ireland and funded by the Environmental Protection Agency (EPA). A huge thank you to all who submitted records in 2021, with a total of 3,443 records of 27 dragonfly and damselfly species submitted to the Data Centre. We are asking you to make a special effort to record dragonflies and damselflies this year as we try to fill gaps in our distribution maps, and please remember that all records are valuable, even those of very common species!

Speaking of gaps, the combined all-Ireland data set shows records have now been received from 749 10 km grid squares (75% of squares available for survey). We have prepared a map of 10km squares from which we have so far not received records and this map is available to explore on our survey web page (*https://biodiversityireland.ie/surveys/dragonfly-ireland/*). So, if you are up for a challenge this summer, why not see if there's a blank square near you and help us fill it in with some dragonfly and damselfly records.

We were delighted to see a 78% increase in site surveys conducted by recorders in 2021. These surveys are hugely valuable to us as they give an overall picture of species richness at each site, as well as yielding important information on habitat quality, and forming the backbone of a longer-term monitoring programme for these amazing animals. In 2022, we really do encourage you to give our site surveys (Dragonfly Recorder or Dragonfly Monitor) a go! Details are available on our survey web pages.

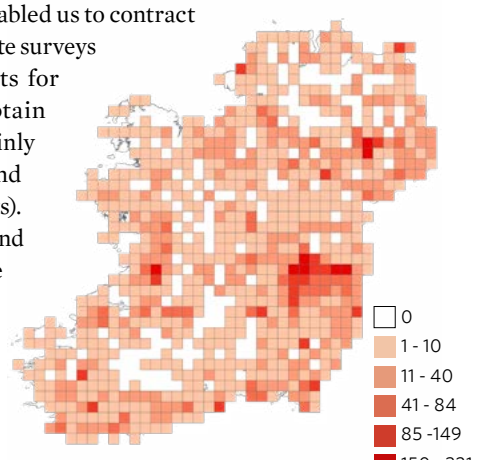
In 2021, we were thrilled to receive funding from our colleagues at CEDaR which enabled us to contract ecologists who conducted 108 site surveys targeting species and habitats for which we may struggle to obtain records via Citizen Science (mainly due to difficulties accessing and surveying some types of habitats). The good news is that CEDaR and the National Parks and Wildlife Service have agreed to fund additional site surveys for specific habitats and species in 2022, helping us fill these gaps in our knowledge.

This year, we are also collaborating with colleagues at Queens University Belfast on a study of the population genetics of the Irish Damselfly, which will hopefully help explain where the Irish population of this species originated, given its complete absence from Britain.

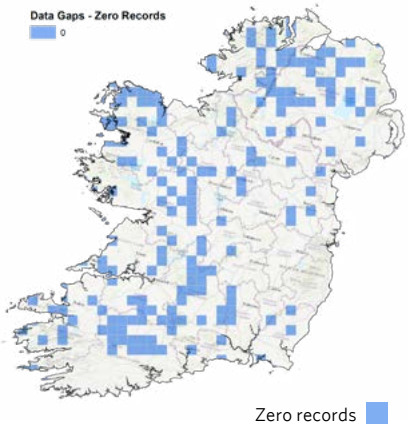
No doubt you will have noticed a lack of recording workshops over the past two years due to Covid restrictions, though many of you have been availing of our online dragonfly and damselfly identification modules. The good news is that we are running a full programme of workshops in 2022, with six workshops scheduled for counties Dublin, Donegal, Mayo, Leitrim, Wexford and Kerry. To book your place, see *https://biodiversityireland.ie/workshops/.*

Finally, a reminder that all validated dragonfly and damselfly records from 2019 - 2021 have been uploaded to the Dragonfly Ireland 2019 - 2024 data set on Biodiversity Maps (*https://maps.biodiversityireland.ie/Dataset/299*) and are available to explore as Open Access data. We are looking forward to another busy recording season in 2022 and we hope to see you at our workshops or visiting Ireland's fantastic wetland habitats.

Dave Wall
CITIZEN SCIENCE OFFICER
National Biodiversity Data Centre



Dragonfly Ireland 2019 - 2021 - Records per km²



Dragonfly Ireland data gaps

Moths

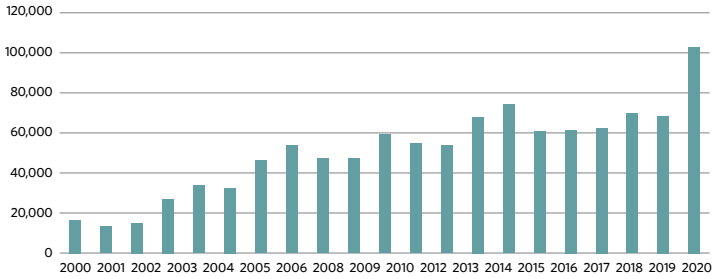
In terms of species new to Ireland, 2021 got off to a slow start as a result of the long, cold spring. The cold weather lasted into June and the first new species didn't make an appearance until June 19th, when Christian Osthoff trapped Ireland's first Sloe Pug, *Pasiphila chloerata*, in Co. Wicklow. This was the start of a good period with no less than three species added to the Irish list in July.

The first of these was the micro-moth *Euzophera pinguis*. Amazingly, two of these were trapped by two different recorders, Cian Merne and Gareth O'Donnell, on July 5th, about 3km apart in north Co. Dublin. Cian then followed that up at the same site on the 21st with another species of micro-moth new to Ireland, *Epiblema foenella*. Hot on its heels was a second specimen trapped on 23rd, about 20km to the north by Don Hodgers.

Meanwhile in Co Wicklow on July 7th, Angus Tyner added Kent Black Arches, *Meganola albula*, to the Irish list. While well distributed in parts of England, this species would not have been on anyone's list as a potential addition to the Irish fauna.

Not a new species but almost as exciting was the discovery by Fionnuala Parnell on July 12th of two larvae of *Mullein Cucullia verbasci*, again in north Co. Dublin. This species was considered regionally extinct in Ireland as it had not been recorded in over 50 years. There were only five previous records, in 1901 and 1952, all in Co. Cork. It will be very interesting to see if more are found this year.

The next new species was the discovery of a mine and pupa of the micro-moth *Phyllonorycter tenerella* in Belfast on October 6th by Dave Allen.



Annual moth record totals

The final addition to the Irish list came on October 15th, when Eamonn O'Donnell, Geoff Oliver and James McNally trapped a Radford's Flame Shoulder on Cape Clear Island in Co. Cork. This long-overdue addition is a migrant species that regularly occurs in GB. In the weeks preceding the one on Cape Clear, there had been quite large numbers recorded in GB, but weather conditions had not been quite right to bring any here. Luckily for the observers present, one did manage to make it.

With the database almost completely up to date to the end of 2020, I thought it would be interesting to look at the annual totals for the last number of years. For the first time ever, 2020 saw the milestone of 100,000 records in any one year broken with a significant increase over previous years. Perhaps a result of more people taking up moth recording during lockdown and existing recorders trapping more often than they normally would. Thanks to everyone who has submitted records. The database currently contains over 1.25 million records. Perhaps the largest dataset in the country?

Michael O'Donnell

MOTHSIRELAND
www.mothsireland.com

Images (clockwise from top left) Kent Black Arches © Angus Tyner, *Epiblema foenella* © Cian Merne, Sloe pug © Christian Osthoff, *Mullein Cucullia verbasci*© Fionnuala Parnell, *Euzophera pinguis* © Gareth O'Donnell, Radford's Flame Shoulder © Eamonn O'Donnell

Mountain Bumblebee © Steven Falk

Bees

2021 was another good year, with 4,152 new validated bee records added to the national database. Seventy-seven of our 99 wild bee species were recorded, including some of the rarer Sphecodes and Coelioxys species. Special thanks to the small group of people who have microscope facilities and are actively recording solitary bees. We greatly appreciate your efforts in improving our knowledge base with new recent records.

The most exciting find of the year was the first appearance of the Ivy Bee (*Colletes hederae*). In the autumn, it migrated from Britain to set up home in Ireland for the first time. The first sighting was made on October 12th at the Raven Nature Reserve in Wexford, by recorder Jim Kenny. It's a solitary bee with an autumn flight period, to match the flowering of its favourite plant, Ivy.

In good news, the Tawny Mining Bee (*Andrena fulva*) had another good year. That's the lovely spring-flying solitary bee that reappeared from extinction in 2012. It was reported from sites in counties Dublin, Wicklow, Kilkenny, Tipperary, and Kildare. In April 2021, we had the first ever sighting from Co Carlow!

The Violet Carpenter Bee is another interesting species. This is a huge black solitary bee, the largest in Europe. It was recorded in Kinsale in June 2021. This is only the second ever Irish sighting. The first was in Waterford in 2007. It was then recorded in Dublin in August 2021. We also had a few other sightings from around the country that have been held back for further investigation. It seems likely that some of these arrived in timber imports or via the horticulture trade.

The Wool Carder Bee (*Anthidium manicatum*) was reported across the Southeast in 2021 (Waterford, Wexford, Kilkenny, and Tipperary), and seems to be expanding its range annually. It was recorded for the first time in Ireland from Wexford in 2015.

The latest bumblebee to arrive in Ireland is also slowly expanding its range. The Tree Bumblebee was first recorded from Dublin in September 2017 and was then reported from Belfast in 2019. In 2021, new sightings were reported from counties Antrim, Down and Dublin. The Tree Bumblebee is a robust bumblebee and an excellent pollinator. It will be interesting to see its range expansion over the coming years. To help us track that, please make sure to submit any sightings or any of the other new arrivals.

We had sightings of our rarest bumblebee (Great Yellow Bumblebee) from the Mullet Peninsula in August, where it seems to be remaining in healthy numbers. We also had sightings of other rare bumblebees - Red Shanked Carder Bee (Mayo), Shrill Carder Bee (Clare) and the Mountain Bumblebee (Wicklow). In excellent news, we had a new sighting of the Mountain Bumblebee from Co Antrim in May 2021. It remains very rare in Northern Ireland, so it is very positive to add new known sites.

In more worrying news, the latest analyses from the All-Ireland Bumblebee Monitoring Scheme (2012-2020) show that both our carder bumblebees remain in trouble. The Common Carder Bee appears to have undergone substantial declines in recent years. It shows how easily a 'new normal' can be created - it remains common in relative terms, but thanks to the efforts of the bumblebee monitoring scheme volunteers, we know that it is actually in decline.

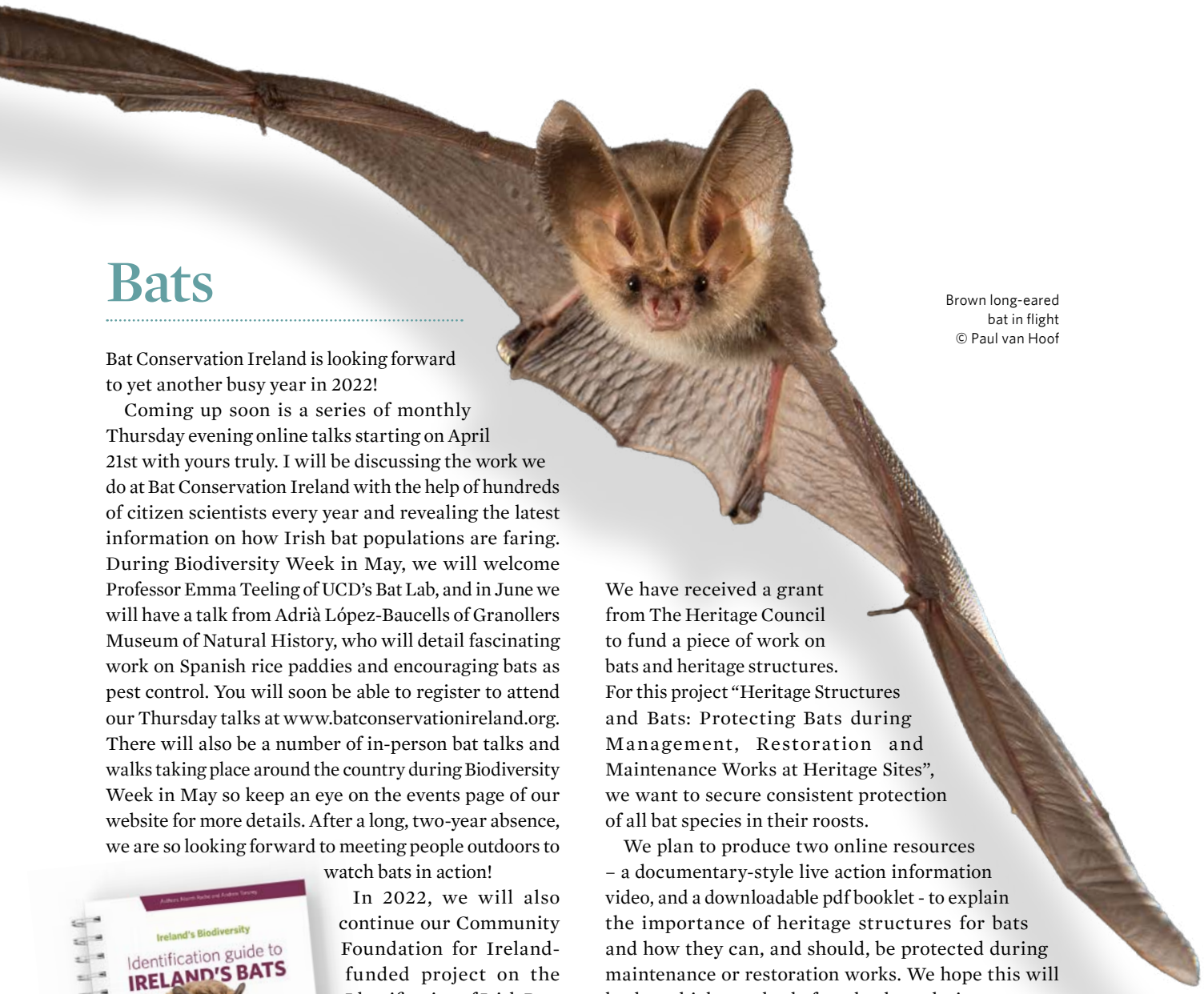
In very positive news, the National Biodiversity Data Centre is launching a National Pollinator Monitoring Scheme in 2022. This is thanks to funding from the Department of Agriculture, Food and the Marine and the National Parks and Wildlife Service. It will complement our existing citizen science initiatives. In future years, we look forward to learning what wild bees turn up across this diverse network of monitoring sites!

Dr Úna FitzPatrick

SENIOR ECOLOGIST,
National Biodiversity Data Centre

*As we go to print, we have just received another amazing bee record! The Hairy-footed Flower Bee (*Anthophora plumipes*) has migrated from Britain to set up home in Ireland for the first time. The first sighting was made by Mary Molloy in her garden in Harold's Cross, Dublin on the 27th March 2022.*

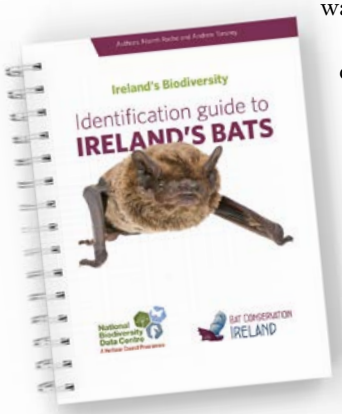
Bats



Brown long-eared bat in flight
© Paul van Hoof

Bat Conservation Ireland is looking forward to yet another busy year in 2022!

Coming up soon is a series of monthly Thursday evening online talks starting on April 21st with yours truly. I will be discussing the work we do at Bat Conservation Ireland with the help of hundreds of citizen scientists every year and revealing the latest information on how Irish bat populations are faring. During Biodiversity Week in May, we will welcome Professor Emma Teeling of UCD's Bat Lab, and in June we will have a talk from Adrià López-Baucells of Granollers Museum of Natural History, who will detail fascinating work on Spanish rice paddies and encouraging bats as pest control. You will soon be able to register to attend our Thursday talks at www.batconservationireland.org. There will also be a number of in-person bat talks and walks taking place around the country during Biodiversity Week in May so keep an eye on the events page of our website for more details. After a long, two-year absence, we are so looking forward to meeting people outdoors to watch bats in action!



In 2022, we will also continue our Community Foundation for Ireland-funded project on the Identification of Irish Bats and their Insect Prey. The first part of this project in 2021 was to help people improve their skills in identifying bats by producing a field guide. We were delighted to launch this, with the help of the National Biodiversity Data Centre, just before Christmas in 2021. This field guide is now available to buy online (*biodiversityireland.ie/shop*). The second part of this project researches the kinds of insects that bats are consuming and what ecosystem services Irish bats provide. We will continue this initiative with UCD this summer, asking bat roost owners to volunteer to collect bat droppings to send for analysis at the Bat Lab. You can register your interest at the project website *www.batsandbugs.ie*.

We have received a grant from The Heritage Council to fund a piece of work on bats and heritage structures. For this project "Heritage Structures and Bats: Protecting Bats during Management, Restoration and Maintenance Works at Heritage Sites", we want to secure consistent protection of all bat species in their roosts.

We plan to produce two online resources – a documentary-style live action information video, and a downloadable pdf booklet - to explain the importance of heritage structures for bats and how they can, and should, be protected during maintenance or restoration works. We hope this will lead to a high standard of works that take into account both built and natural heritage.

The current contract for managing the Irish Bat Monitoring Programme (2018-2021) has now come to an end. Bat Conservation Ireland hopes to renew it within the next couple of months and continue this important work with the help of members of the public. If you are interested in getting involved please contact us (*www.batconservationireland.org/contact-us*). We always need volunteers with the all-island Daubenton's survey which takes place in August. We provide training and can lend bat detectors to those new to bat recording. The NPWS funds these bat surveys and additional grant assistance is provided by the Northern Ireland Environment Agency.

Dr Niamh Roche
—
BAT CONSERVATION IRELAND
niamhr@batconservationireland.org

Birds

Barnacle Goose © Richard T Mills

It is that time of year when we are saying goodbye to the winter visitors, such as Whooper Swans, geese, waders and thrushes, and at the same time listen out for the first spring migrants returning to our shores to breed following their sojourn in the Mediterranean region or Africa. In the last few days of March, I have heard song tentative song from Blackcaps and Chiffchaffs and today (March 30th), the first Swallow was seen in Kilcoole close to BirdWatch Ireland HQ. Many of our resident birds are already busy nest-building (rookeries are very noisy at the moment) and without doubt 'love' is definitely in the air for Woodpigeons and Collared Doves.

As well as the avifaunal turn-round, it is time to switch national monitoring programmes. So, last weekend I did my final monthly count of winter waterfowl on my local reservoirs (March, no. 7) for the Irish Wetland Bird Survey. My Little Grebes are 'whinnying' to one another, while Great Crested Grebes have returned from their wintering areas and look majestic, though have not started their incredible 'display-dance'. April 1st saw the commencement of the Countryside Bird Survey, which monitors our common breeding birds. The Project Coordinator, Dick Coombes, is always looking for new volunteers to take up 1-km squares. The method requires two 1-km transects to be walked in the early morning, mapping the various species detected. A first survey is undertaken before mid-May, and the second between then and the end of June. Contact Dick (*rcoombes@birdwatchireland.ie*) and he will guide you to an interactive map where you can see if there are uncovered squares in your vicinity.

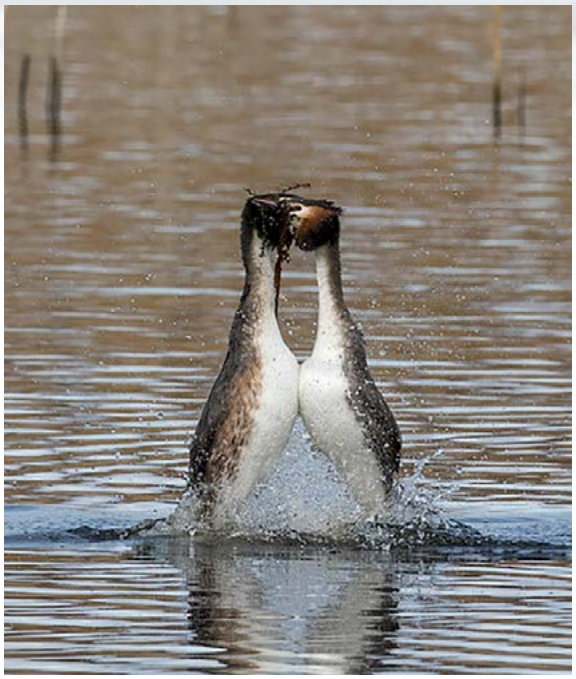
While we are on the subject of breeding birds, I will say goodbye to a dear colleague and friend, Paul (J.P.) Hillis, who passed away in February. Paul was the founder of the Irish Rare Breeding Birds Panel in 2002 and worked tirelessly as the Honorary Secretary (and report compiler) for 10 years up to 2011 before passing the baton on to Ken Perry and myself in 2012. Paul remained on the Committee for a further five years or so, and continued recording in the field, assiduously monitoring the rare breeding ducks of Ireland at 'challenging wetlands', especially Lough Neagh. In the 'rare' category are the likes of Pochard, Garganey and Gadwall. There is very definitely a vacancy for someone who delights in patient observation of reedy lake fringes for rare glimpses of mother ducks with broods in tow. For those interested in helping monitor our rarer avifauna (rare = less than 100 pairs on the island of Ireland), please contact myself (e-mail below or via the panel website). On a similar theme, the Irish Raptor Study Group, Golden Eagle Trust and BirdWatch Ireland are looking for volunteers to contribute to a new national survey of breeding Hen Harriers in the uplands. Please contact Ryan Wilson-Parr at *secretary@irsg.ie*.

Pochard
© Richard T Mills

Great Crested Grebe © Richard T Mills

IRBBP

All our monitoring schemes record ups and downs in population sizes, variations in breeding success, responses to climate change and so on. One factor that is less frequently mentioned is the role of disease. At this very moment, just as we are hoping we have seen off the worst of the COVID-19 pandemic, some of our waterfowl are in the midst of a deadly outbreak of bird flu (H5N1). The large wintering flocks of Barnacle Geese in County Sligo (Lissadell area) are particularly affected, and also to a lesser extent those in Donegal. At least 100 have perished in Sligo and, given that the authorities have not been trained or equipped to dispose of carcasses, bodies are being scavenged in the fields and the virus is being picked up by the likes of Herring Gulls and corvids. This is very worrying, as the geese will very soon migrate to Iceland and Greenland and encounter other concentrations of migratory waterbirds at common staging sites. A similar outbreak, earlier in the winter, in southwest Scotland, occurred in amongst the Svalbard-breeding population of Barnacle Geese and that killed at least 4,000 birds, about 10% of the population. Elsewhere, bird flu outbreaks are threatening Dalmatian Pelicans in Greece and Common Cranes in Israel.



Great Crested Grebe pair performing courtship display © Shay Connolly

Dr Steve Newton

SENIOR CONSERVATION OFFICER
Birdwatch Ireland
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Vascular Plants

Members of the Botanical Society of Britain and Ireland (BSBI) have this year been trying to identify the three Erophila (Whitlowgrasses) that occur in Ireland: *E. majuscula* (Hairy Whitlowgrass), *E. verna* (Common Whitlowgrass) and *E. glabrescens* (Glabrous Whitlowgrass). As the names suggest, one is very hairy, another has very few hairs, and the other is somewhere in between, which can make it very difficult to be sure of identity. Other features used are: how deeply notched are the petals, and how long the seeds are. As Whitlowgrasses are tiny plants, it isn't easy to make these measurements without the help of a microscope.

Mount Leinster, © Paul Green

An unusual site for Glabrous Whitlowgrass is from the summit of Mount Leinster, Co. Carlow, where it grows at an altitude of 794m.

It also doesn't help that all three will grow in the same habitats, and often two species will grow in mixed populations. Hairy Whitlowgrass is very rare and has only been found in 16 sites. The only new site for this in 2022 was from the golf course at Rosslare, Co. Wexford, where it was abundant. An unusual site for Glabrous Whitlowgrass is from the summit of Mount Leinster, Co. Carlow, where it grows at an altitude of 794m. This is possibly the only mountaintop site for it in Ireland. Here it is likely to have been brought in with the material used to build the road in the 1950s, when the TV mast was put on the summit. Here the Glabrous Whitlowgrass grows with some very unlikely companions: *Carex bigelowii* (Stiff Sedge), *Huperzia selago* (Fir Clubmoss), and *Hymenophyllum wilsonii* (Wilson's Filmy-fern).

Hairy Whitlowgrass © Zoe Devlin

As part of the BSBI Rare Plant Project Ireland, Ciarán Flynn, Cliona Byrne, Enda Flynn and Kate Harrington went in search of *Lycopodium clavatum* (Stag's-horn Clubmoss) on Clermont Cairn, Co. Louth. First of all, Cliona took a look at the specimen in the National Botanic Gardens herbarium, collected from the site by Dónal Synnott in 1968 for information that might help locate the exact spot. They first took a look on a very windy day in December, and after a long search found five plants on a steep, open, damp spot. In January, Ciarán and Enda returned and searched an adjoining valley, and found more Stag's-horn Clubmoss, again on damp ground, this time growing up through Sphagnum moss. It goes to show that if you look hard enough, it can be possible to re-find a plant at a site where it hasn't been seen for a long time.

Phoebe O'Brien found *Myosotis ramosissima* (Early Forget-me-not) just coming into flower in mid-March, on the dunes at Maharees, Kerry. This is a species that is very rare on the west side of Ireland, otherwise only known from one other dune system in Kerry. As it is another tiny plant, it might have been overlooked in the past.

At Rosslare, Co. Wexford, along the base of a wall, a new small annual *Cotula australis* (Annual Buttonweed) was found. It has yellow button-like flowers without any petals. It is a native of Australia and New Zealand.

Stag's-horn Clubmoss © Cliona Byrne

Hoary Stock © Paul Green

Annual Buttonweed © Paul Green

Fir Clubmoss © Paul Green

On the sea-cliffs at Ballybrack, Co. Dublin, a large population of *Matthiola incana* (Hoary Stock) is now well established, here it is a garden escape.

Back in 2019, *Matthiola sinuata* (Sea Stock) was re-found for Ireland at Morriscastle, Co. Wexford, where it grew on the sandy low sea-cliff, below Sea-buckthorn at the top of the beach. Sea Stock had been extinct in Ireland since 1926, when it was last seen on the sand dunes at Ballyvaughan, Co. Clare. Unfortunately, the storms over winter did so much destruction to this stretch of coast, the Sea Stock was washed away, and may once again be extinct here.

The BSBI are running their Aquatic Plants Project again this year. There will be live online training sessions, and there will also be field training days. If you would like to join us, you can contact me at the address below.

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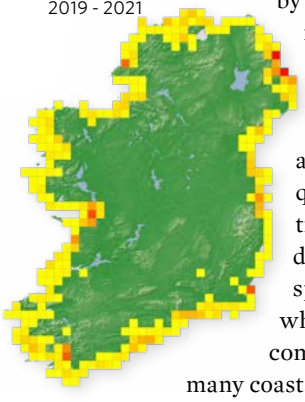
Clean Coasts Observer Shore Session Ring Co. Cork 2021

Explore Your Shore!

Marine species records submitted 2019 - 2021



2021 saw a 52% increase in marine records submitted to the National Biodiversity Data Centre compared to 2020, with 5,625 records of 406 marine species recorded by you, our volunteer recorder network. This is fantastic progress and is contributing towards building a robust baseline data set for our coastal species, from which we can monitor future change due to human activities including climate change and water quality. A huge Thank You to all who took time to contribute records in 2021 and please do keep those records coming in! All marine species records are immensely valuable, whether the species are rare or extremely common as we lack robust baseline data for many coastal species.

Since 2019, we have validated 7,649 marine species records from 263 coastal 10km squares. All validated records have been added to the Explore Your Shore! data set on Biodiversity maps and are available to view, explore and download under our Open Access Data policy. We have also shared these data to the Global Biodiversity Information Facility (GBIF) and the European Ocean Biodiversity Information System (EurOBIS).

While the top hitters on our species scoreboard for many years were jellyfish and seals, it has been good to see a mix of intertidal species in our top 20 marine species recorded in 2021. This reflects growing participation in Explore Your Shore! and growing capacity among our volunteer recorders in identifying and recording marine species.

But please don't forget that if you are struggling to identify any marine species you can post it on our Facebook page (*@ExploreYourShore*) or via Facebook Messenger and we will do our utmost to identify them, and there are a range of Facebook groups specialising in pretty much every marine species group. You can also upload photos of unidentified species using our Seashore Spotter web form and we will identify and validate them.

2021 saw a 71% increase in participation in our effort-related surveys. However, we want more! Have YOU tried our Rocky Shore Safari or Big Beach Biodiversity surveys yet? If not, then why not give it a go in 2022? All the information you need to get involved is available at *www.exploreyourshore.ie*

We continue to work with and promote a fantastic array of Irish Marine Biodiversity Citizen Science partner projects, some of which have been going for 30 years or more! We were delighted to add over 1,000 records of shark, skate and ray egg cases from the Purse Search Ireland recording scheme to Biodiversity Maps in March. We have also been working with our colleagues at Coastwatch on a plan for mapping the extent of seagrass beds monitored by Coastwatch volunteers. And in 2021 the Irish Whale and Dolphin Group updated their Citizen Science datasets on Biodiversity Maps, adding thousands of new records of whales, dolphins and basking sharks to help improve our understanding of these species in Irish waters.

In March, we completed our second year of training for the Clean Coasts Observer programme and we are looking forward to meeting local Clean Coasts groups during the year. This year we have linked up with Leave No Trace Ireland to deliver an Explore Your Shore! course to outdoor activity trainers from around Ireland.

2021 saw the launch of a new online course on Marine Biodiversity Citizen Science, developed in collaboration with the Waterford and Wexford Education and Training Board (WWETB). See p4.

2022 also sees the welcome return of our workshop programme and we are currently busy planning Explore Your Shore! workshops, so please keep an eye on *exploreyourshore.ie* for upcoming events.

There has never been a better time to get involved in Marine Biodiversity Citizen Science recording. Why not start by seeing how many species you can find on your local shore or beach, and if you get stuck, visit our online course or our Facebook page for support.

Dave Wall
—
CITIZEN SCIENCE OFFICER
National Biodiversity Data Centre

Cetaceans

During the period October 1st 2021 to 30 March 2022, IWDG validated 520 sighting records, which include nine species of cetacea. The most frequently recorded species are ranked as follows: harbour porpoise 28%; bottlenose dolphin 18%; common dolphin 17%; minke whale 9%; fin whale 7%; humpback whale 4%; basking shark 2%; with Risso's dolphin, killer and pilot whale each at a single sighting. Yet again, what was almost certainly the most unusual sighting during this period wasn't a cetacean.

There is a natural order as to how species of marine megafauna appear each year. Whilst always allowing for occasional outliers, the season generally starts slowly, building to a peak and then sightings taper off, until they've largely all left, presumably for pastures anew. The basking shark, *Cetorhinus maximus*, is no different. 2021 was a good year for basking shark sightings records, with 161 sightings validated by IWDG. It was in fact the fourth best year since IWDG started handling records of the planet's second largest fish; but still some way off the 2009-2011 peak when we validated 240, 204 and 176 records respectively. Our 2022 basking shark season has, it seems, began with our first record, and to say it started with a bang would be something of an understatement!

So what was so unusual about Charlie O' Malley's observation on March 24th, some 6-8 miles southwest of Hook Head, Co. Wexford, was neither the time nor the location, but the sheer numbers. Charlie described there being so many sharks in the area, that he had to slow down to avoid hitting them. His best estimate was a minimum of 100 animals, but likely to be much closer to 150 individuals, making this quite likely to be the largest aggregation documented to date by either the IWDG or the Irish Basking Shark Group. This is an incredible start to the basking shark season and, given the recent Irish Government decision to bring them under the Irish Wildlife Act, it is good to know that this iconic species will now have a level of protection from interference and wilful harassment, which they've previously not been afforded under Irish law.

At time of writing (late March) there is a sense that our field season is going to be a busy one as commercial whale watching boats in places like west Cork are already starting to run trips, making the most of some very settled weather. One four-hour whale watch trip from Reen Pier near Union Hall on March 28th has already produced 15-20 minke whales and 200+ common dolphins, feeding on lesser sand eels, so it only seems like a matter of time before humpbacks make an appearance, after their long northbound migration from tropical breeding grounds.

During this same period, the IWDG Cetacean Stranding Scheme has validated a total of 140 records of stranded cetaceans on the island of Ireland. These include ten species: bottlenose dolphin (n=2), common dolphin (n=84), Cuvier's beaked whale (n=4), fin whale (n=1), harbour porpoise (n=18), minke whale (n=1), pilot whale (n=3), sperm whale (n=3), striped dolphin (n=1) and white-beaked dolphin (n=1). As expected, numbers were highest for common dolphins, followed by harbour porpoise. Of these, five were known live strandings of four commons and one striped dolphin. IWDG also received six records of sea turtles: loggerhead (n=1), Kemp's Ridley (n=1) and leatherback (n=4). Animals were reported from a total of 14 counties, the top counties being Kerry (n=30), Donegal (n=21), Cork and Mayo (n=19 from each). Although Kerry has historically had the highest number of reports, Donegal and especially Cork were higher than expected.

Current figures are way down compared to this time last year, when IWDG received 267 records. In March 2021 alone, over 90 animals were reported. This has declined to only 18 in March 2022. One factor which most likely contributed to this drastic peak in 2021 was the COVID-19 lockdowns during the peak stranding period. We do expect numbers to be higher from now on due to the success of the IWDG Reporting App.

Two adult female sperm whales were reported stranded in Co. Donegal on the same day. This animal was reported from Malin Head. © Sean O'Callaghan

Please report all cetacean sightings and strandings (alive or dead) to IWDG. With support from NPWS and the National Biodiversity Data Centre, the IWDG maintains the official database of stranded cetaceans in Ireland, one of the longest running stranding schemes in Europe which allows us to monitor trends.

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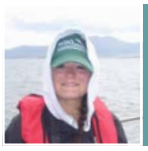

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We manage Ireland's citizen science portal, supporting a network of more than 9,000 recorders who help to record Ireland's biodiversity

We manage Ireland's largest national biodiversity database, containing more than 4.9 million records of over 17,141 species

We manage a national bioinformatic infrastructure to underpin many of Ireland's biodiversity data and information needs

The National Biodiversity Data Centre serves as a repository and secure backup for data and information on Ireland's biodiversity collected by partner organisations

National Biodiversity Data Centre
A Heritage Council Programme

We coordinate the implementation of the All-Ireland Pollinator Plan

We manage the online mapping system, Biodiversity Maps, to enable the publishing of national biodiversity datasets

Our achievements to date

We operate the All-Ireland Bumblebee Monitoring Scheme

We facilitate reporting on the Invasive Alien Species Regulations (No 1143/2014) to the European Commission

Since its establishment in 2007, the National Biodiversity Data Centre has become an essential component of the national heritage infrastructure, making information on Ireland's biodiversity more accessible for decision-making; assisting engagement with biodiversity by both the public and private sectors; and supporting the conservation of biodiversity in Ireland.

We report on the National Biodiversity Indicators

The National Biodiversity Data Centre is Ireland's node to the Global Biodiversity Information Facility (GBIF)

We coordinate the Irish Butterfly Monitoring Scheme

We manage national surveys on various taxonomic groups, and citizen science projects on freshwater and coastal biodiversity

We have provided training to almost 4,000 participants through recorder training and capacity-building programmes

We are delivering a five-year research project 'Protecting Farmland Pollinators' funded under the European Innovation Partnership (EIP) Programme

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An Chomhairle Oidhreachta
The Heritage Council

The National Biodiversity Data Centre is a programme of the Heritage Council and is operated under a service level agreement by Compass Informatics. The Biodiversity Data Centre is funded by the Department of Housing, Local Government and Heritage.

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage