

# ANNUAL REPORT



2019

Bat Conservation Ireland

Summary of Activities of Bat Conservation Ireland  
in 2019

# Annual Report

## BAT CONSERVATION IRELAND

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## Message from the Chair

On behalf of the Council of Bat Conservation Ireland, I am delighted to present the Annual Report for 2019.

We had a busy year in 2019 and I am delighted to share with you a summary of the work carried out by our dedicated volunteers, council and staff.

In January, a bat and tree survey training course was proposed utilising fibrescopes and the course was given by John Curtin, Chris Peppiatt and Tina Aughney in March. This course was scouted out by many of the Council members at Birr Castle and Charleville Demesne, County Offaly in February and bats were noted in both locations.

Donna Mullen represented Bat Conservation Ireland's interests at the Environmental Pillar ELIG (Env Law Implementation Group) in January also. At this time, moves towards taking on two staff members Tina Aughney and Niamh Roche as employees was finally put into operation.

Bat Conservation Ireland put itself forward as a partner on the multi-national COST Action project being spearheaded by Professor Danilo Russo in 2018. This project will look at how to research into Climate Change, ecosystem services of bats and to carry out modelling work on climate change impacts, to develop a monitoring network and develop an economic assessment on the role of European bats. For CLIMBAT, Niamh Roche was asked to participate on behalf of Ireland, along with Professor Emma Teeling of UCD.

In February, Bat Conservation Ireland's representative on the council of BatLife Europe, Donna Mullen, submitted an observation on the Europe-wide anxiety among bat conservation groups to the derogation applications, reports and compilation on a national basis in Member states with whom the BatLife Europe Council were most familiar. In February, Sligo IT student Ciara McHugh from the Cavan / Meath area requested as part of her placement for 4th year to assist Bat Conservation Ireland with our work and was engaged by Tina Aughney in various surveys and report compilation and analysis.

In February we began the recruitment process for a dedicated Administrator for the organisation and we were very pleased to welcome Dawn Quinn as Administrative Manager in May.

Walks for groups throughout Ireland were undertaken from May onwards when bat activity was more guaranteed. In May, a shortfall in the number of squares required to complete the project BATLAS 2020 was highlighted and efforts to tackle these squares began. Bat Conservation Ireland is hugely indebted to those who gave up their nights in summer to help us meet our commitments.

At the end of May, Niamh Roche was asked to input into climate change modelling for Irish bats.

Dawn Quinn has assisted in updating and preparing policies and governance codes. These are a necessary part of the greater level of scrutiny that all charities face and we are grateful to Dawn for her guidance on this.

August is a period of intensive monitoring of brown long-eared bats, Car transect species while lesser horseshoe bat monitoring is undertaken both in summer and winter. The volunteers prove



their absolute golden value to us and to bat conservation in this month as they make their way to a river or canal, an old church, a very slow-moving car and record what the year has in store for our bats.

In September Michael Ewing of the Irish Environmental Network invited Bat Conservation Ireland to join him to celebrate his retirement at Blas Café in Dublin, which I was delighted to attend on behalf of the organisation.

In September, Council members John Curtin and Anna Collins met with NHBS to see how we could assist each other to further bat conservation in Ireland. Discussions are ongoing and we look forward to their support in 2020. Anna and Dawn represented Bat Conservation Ireland, as part of Culture Night in the Natural History Museum, to help engage our younger supporters with the world of bats.

In October Chairperson Brian Keeley represented Bat Conservation Ireland in Brussels for IEN organised meetings with European Commission staff and Members of the European Parliament and their support staff. This provided a wonderful way to learn of the best way to avail of these extraordinary resources to further conservation in Ireland and throughout the European Union.

The issue of bat fatalities across Europe were brought to the attention of a representative who was of the misconception that one bat per year was killed in Europe by turbines. Donna Mullen represented BatLife Europe in addition to being the Chair of another IEN member group: Green Foundation Ireland.

From 1-3 November Bat Conservation Ireland were represented at the Dark Skies Festival in Mayo. This festival has been a very welcome addition to the environmental calendar and was praised by a Swedish environmentalist with which the Chair met on a Polish survey.

In November, Bat Conservation Ireland provided a poster on the BATLAS 2020 results and Niamh Roche spoke on bats and climate change at the All-Ireland Mammal Symposium in DCU Dublin.

In December, I met with the Irish Wind Energy Association to discuss bat surveys and risks for bats on wind farms and how to work together to reduce any negative consequences while trying to move away from fossil fuels.

There have been many survey training dates, bat walks throughout the island, consultations and responses to householders and interested parties, discussions with NPWS, county councils, other NGOs and charities.

I would like to thank all those who contributed their time and energy to help us in the important work of conserving our bat populations in 2019.



Brian Keeley

**Chair Bat Conservation Ireland**

## 1. About Bat Conservation Ireland

Bat Conservation Ireland is a Non-Governmental Organisation dedicated to the conservation of bats throughout the island of Ireland. We provide information on the conservation of bats and assist the general public in their needs in relation to bats. The organisation is also involved in raising awareness of the importance of conserving Ireland's bat populations through providing training in the use of bat detectors, erection and management of bat box schemes, biometrics and bat handling, through organising workshops. Ongoing projects include, the erection of bat boxes, field surveys and the collection of data on bat distribution throughout the country which is carried out in conjunction with other local county bat groups and tidy town groups.

Bat Conservation Ireland was launched in 2004 and now acts as the national umbrella group for all county bat groups. Bat Conservation Ireland is affiliated with BATLIFE Europe and works closely with many other environmental NGOs in Ireland and Europe, The Heritage Council, Local Authorities, NIEA (Northern Ireland Environment Agency), and NPWS (National Parks and Wildlife Service) Conservation Rangers. Bat Conservation Ireland manages the Irish Bat Monitoring Programme with funding and assistance of NPWS (Department of Culture, Heritage and the Gaeltacht) and NIEA (UK Department of Agriculture, Environment and Rural Affairs).

The main reason Bat Conservation Ireland was established is '*the advancement of education and the promotion of the conservation and study of bats on the island of Ireland and elsewhere in the world*'. Bat Conservation Ireland fulfils this mandate through the following 5 objectives:

1. Disseminating education materials
2. giving talks and leading bat walks;
3. carrying out nationwide surveys and monitoring of bats;
4. acting as an umbrella group for local bat groups;
5. providing a central repository for bat records.

In 2019, these subsidiary objectives were achieved through the following (greater detail on all of these activities is provided in the main body of the report).

### **a. Disseminating education materials**

*Publishing scientific papers as part of our conservation policy and education:*

One scientific paper was accepted by *Acta Chiropterologica* on 16 August 2019, which shows the results of an analysis of climate in relation to data collected by the Car-based Bat Monitoring Scheme:

Roche N., Langton S., Aughney, Lynn D. and Marnell F. Elucidating the consequences of a warming climate for common bat species in north-western Europe.

Bat Conservation Ireland contributed Irish bat trend data to the recent publication 'UK State of Nature 2019' which was published by the RSPB (Hayhow et al. 2019, The State of Nature 2019. Royal Society for the Protection of Birds).

*Producing newsletters to provide up to date information on Bat Conservation Ireland news and news from bat groups and other bat organisations around the world.*

In 2019, two newsletters were distributed to members and volunteers – January and October editions. The newsletter keeps members up to date of all Bat Conservation Ireland-related activities and any information or developments that give a greater understanding of bats and bat monitoring or conservation projects happening in the bat world.

*Training Courses are a vital and extremely important educational tool. Bat Conservation Ireland provides training for members, volunteers and on request for particular topics by bat groups.*

Training was provided through the Irish Bat Monitoring Scheme and to county bat groups in 2019. In addition, Bat Conservation Ireland organised the following training courses:

- Bat Tree Roost Identification and Endoscope Workshop; and
- An Introduction to Recording Bats, in conjunction with the National Biodiversity Data Centre.

*A total of 29 training courses were provided in 2019.*

*Bat Talks & Walks are other vital components to Bat Conservation Ireland's education policy and are great tools to reduce the negative image of bats as nocturnal mammals.*

Annually, all Bat Conservation Ireland committee members and local county bat groups undertake an array of bat walks and bat talks across the island of Ireland as part of our Education Programme. Bat walks and talks are very popular and provide a great source of introduction to the wonderful world of bats. *Approximately 29 bat walks and/or talks were hosted in 2019.*

*Tidy Town Surveys provide Bat Conservation Ireland an opportunity to encourage members of the public to join our monitoring schemes and to address bat conservation in their wildlife section of the Tidy Towns application form.*

Our guidelines for Tidy Town groups were made available on our website and through email on request. A number of Tidy Town groups participated in the All-Ireland Daubenton's Bat Waterways Survey. Bat Box schemes set up by Tidy Town groups were registered on the Bat Conservation Ireland database and Bat Conservation Ireland checked a number of bat box schemes. Additional surveys were undertaken by Kildare Bat Group to facilitate bat conservation at a local level. Bat Conservation Ireland also provided training courses to Tidy Towns Groups based in Cavan.

*Providing bat talks on specific topics.*

In February 2019, Dr. Tina Aughney, Project Manager of 2 programmes in the Irish Bat Monitoring Scheme, gave a presentation at the National Biodiversity Conference in Dublin Castle titled 'Irish Bat Monitoring Programme: 16 years of citizen science participation', based on a paper co-authored with Dr. Niamh Roche. Dr. Niamh Roche also manages 2 programmes in the Irish Bat Monitoring Scheme.

Tina also gave a presentation at the 14<sup>th</sup> Symposium for Protection of the Night Sky, as part of the Mayo Dark Skies Festival in November 2019 – ‘*Artificial Light at Night and Minimising Impacts of Lighting Schemes*’, based on research carried out by her, Dr. Niamh Roche and Dr. Ferdia Marnell of the National Parks and Wildlife Service (NPWS).

*Social Media is an important source of education and a tool to disseminate information on Irish bat populations. Currently Bat Conservation Ireland has three Facebook pages and one Twitter account.*

Bat Conservation Ireland has maintained a continued online presence through two websites ([www.batconservationireland.org](http://www.batconservationireland.org), and [www.learnaboutbats.com](http://www.learnaboutbats.com)), Facebook pages and a Twitter account. Engagement statistics for these mediums are discussed further in the report.

*Media is another important source of education and a tool to disseminate information on Irish bat populations.*

Bat Conservation Ireland undertook one radio interview and one magazine article in 2019 principally to advertise the training courses provided by the organization and to chat about bats, in general. Tina Aughney gave a radio interview on ‘Mooney Goes Wild’ on a show he hosted on ‘Wildlife Rehab’ on 23 September 2019 to discuss a talk that she was giving on ‘Bats in Ireland: Identification and Handling’ at ‘WILD’ – Wildlife Information and Learning Day in Sonairte, Co. Meath. Tina also wrote an article for ‘Biodiversity Tales’, published in 2019.

In October 2019, Ger O’Donohoe, Chair of Galway Bat Group, gave an interview to the Galway Advertiser, titled ‘Bats Won’t Fly into your Hair’, which was published on 31 October 2019 in time for Hallowe’en. The purpose of this article was to help dispel some of the myths people may have around bats. Bat Conservation Ireland produced *1 article for publication (NBDC Biodiversity Newsletter)* and submitted two scientific papers.

Additionally, Albert Nolan, Community Outreach Officer with Limerick Bat Group writes a column for the Limerick Leader newspaper, called ‘Wild About Wildlife’, where bats feature regularly. Many of these columns are based around the community outreach activities he organizes to help educate young and old further about wildlife and more specifically bats, which is a great way to educate the public at community level and more widely through the media.

*Information Stands provide Bat Conservation Ireland an opportunity to engage with members of the public and to encourage members and volunteers to assist Bat Conservation Ireland with such information stands.*

In February 2019, Bat Conservation had a stand at the National Biodiversity Conference in Dublin Castle, and we also participated in the 14<sup>th</sup> Symposium on the Protection of the Night Sky, as part of the Mayo Dark Skies Festival in November 2019, with an information stand, as part of this 2-day conference. In September 2019, Bat Conservation Ireland, along with Kildare Bat Group were part of an educational exhibition at the Natural History Museum for Culture Night, which was organized to engage the general public about bats. These events presented the opportunity to educate children and adults alike about bats, Bat Conservation Ireland and all the work that is being done to help conserve bats in Ireland.

*Bat Group Surveys provides Bat Conservation Ireland an opportunity to work closely with bat groups to complete surveys in their local areas and to increase their skill level in relation to detecting and identifying bat usage in bat boxes.*

As part of our support for bat groups, Bat Conservation Ireland provided guidance, equipment and fieldwork support for Kildare Bat Group, Galway Bat Group, Clare Bat Group, Cavan Bat Group, Dublin Bat Group, Waterford Bat Group, Meath Bat Group, Limerick Bat Group, Mayo Bat Group and Midland Bat Group in 2019. Northern Ireland Bat Group provided guidance in the relation to setting up the Donegal Bat Group, which was set up in 2018 and got up and running in 2019.

**b. Giving talks and leading bat walks**

*In 2019 Bat Conservation Ireland provided or facilitated a large number of bat walks and talks across the island while additional bat walks were provided by the individual bat groups (a list is given in the appendices).*

- a) Belvedere House & Gardens  
Annually, Bat Conservation Ireland provided 1 bat walk & talk for Belvedere House & Gardens in Mullingar, Co. Westmeath.
- b) Biodiversity Week  
A series of bat walks were organised for Biodiversity Week May 2019.
- c) Heritage Week  
A series of bat walks were organised for Heritage Week August 2019.
- d) Working with Local Authorities  
Bat Conservation Ireland provided bat walks as part of wildlife educational plans for county councils.
- e) Working with local groups  
Bat Conservation Ireland provided bat walks as part of wildlife educational plans for Tidy Towns, Scout and Cub groups, other NGOs, community events, festivals to name but a few.
- f) Bat Group walks and talks  
All bat groups undertake additional bat talks and walks.

These bat walks and talks are events geared towards members of the public and are fun, interactive, family-orientated events to introduce people to the wonderful acoustic and visual world of bats. They are evening/dusk events and offer a chance for people to use a bat detector and watch bats in flight in their natural habitats.

**c. Carry out nationwide surveys and monitoring of bats**

- a) All Ireland Daubenton's Bat Waterways Survey;
- b) Car-based Bat Monitoring Scheme;
- c) Brown long-eared Roost Monitoring Scheme;
- d) Lesser horseshoe Roost Monitoring Scheme;
- e) BATLAS 2020 – systematic survey of 10km squares across the island;
- f) Bat Box Monitoring Scheme – maintains, checks and registration of bat box scheme across the island;
- g) Training Courses – these events are held in areas where new bat distribution data is required;
- h) Tidy Town Surveys – support for Kildare Bat Group in their Tidy Town Surveys;



- i) Supporting research through the Bat Conservation Ireland Grant Scheme 2018 – some of these projects spilled over into 2019.

Bat Conservation Ireland resurveyed the entire island in 2010-2019 to establish the distribution of our nine resident bat species. Under the six projects above, this data is annually collected and logged onto the Bat Conservation Ireland Database in order to review the status of Irish bat populations every 10 years. These six schemes also provide a tiered system of training for those volunteers interested in working in bat conservation.

*BATLAS 2020 is an all-island bat distributional survey. Bat Conservation Ireland believes that in order to provide sound policy on the conservation of Irish bat populations we need to know their status and national distributions. Bat Conservation Ireland undertook the first BATLAS in 2008 and 2009 (named BATLAS 2010) and combined with all of the data collated in 2000-2009 produced the book 'Irish Bats in the 21<sup>st</sup> Century', to disseminate this important information. Provided appropriate funding and resources are available Bat Conservation Ireland would open to repeating this process in 2030.*

In 2019, Bat Conservation Ireland undertook the final year of BATLAS 2020. In 2019, the focus was on filling in gaps with an aim of surveying an additional 80 squares. Our volunteers stepped up to the challenge and by the end of the 2019 survey season, a total of ninety-one 10km squares were surveyed.

#### **d. Acting as an umbrella group for local bat groups**

As part of Bat Conservation Ireland's Strategic Plan (2017-2020), the aim was to increase the number of county bat groups by two in that time period and support all bat groups with training, equipment, educational materials and funding. In 2019 there were 13 Bat Groups throughout the country. In July and August 2019, Bat Conservation Ireland conducted a survey of all the county Bat Groups to see where the organization could offer greater support to them in their work. A gap identified by the groups in the survey was administrative support around funding and finances for the groups. As Bat Conservation Ireland hired a new Administrative Manager in mid-2019, this will go some way to addressing this issue and providing more administrative support to the groups where needed.

*Bat Conservation Ireland provides Public Liability Insurance for all bat groups affiliated with the organisation. This is undertaken to reduce bat group costs and with the purpose of providing the facility for wider volunteer engagement. Through funding available for Biodiversity week, Bat Groups were able to undertake bat-related events. Bat groups are offered support in relation to event organisation, advertisement and profiling of their work in the Bat Conservation Ireland Newsletter, The Natterer and on the Bat Conservation Ireland website and Facebook Page.*

#### **e. Providing a Central Repository for Bat Records**

The Bat Conservation Ireland online database is the largest repository of bat data on the island. This database holds in excess of 50,000 bat records and provides baseline data to inform policies on bat conservation. Bat Conservation Ireland works with the National Biodiversity Data Centre (NBDC, Waterford) in order to display the data and allow public querying of the data. Alternatively, people can query the data directly through Bat Conservation Ireland.

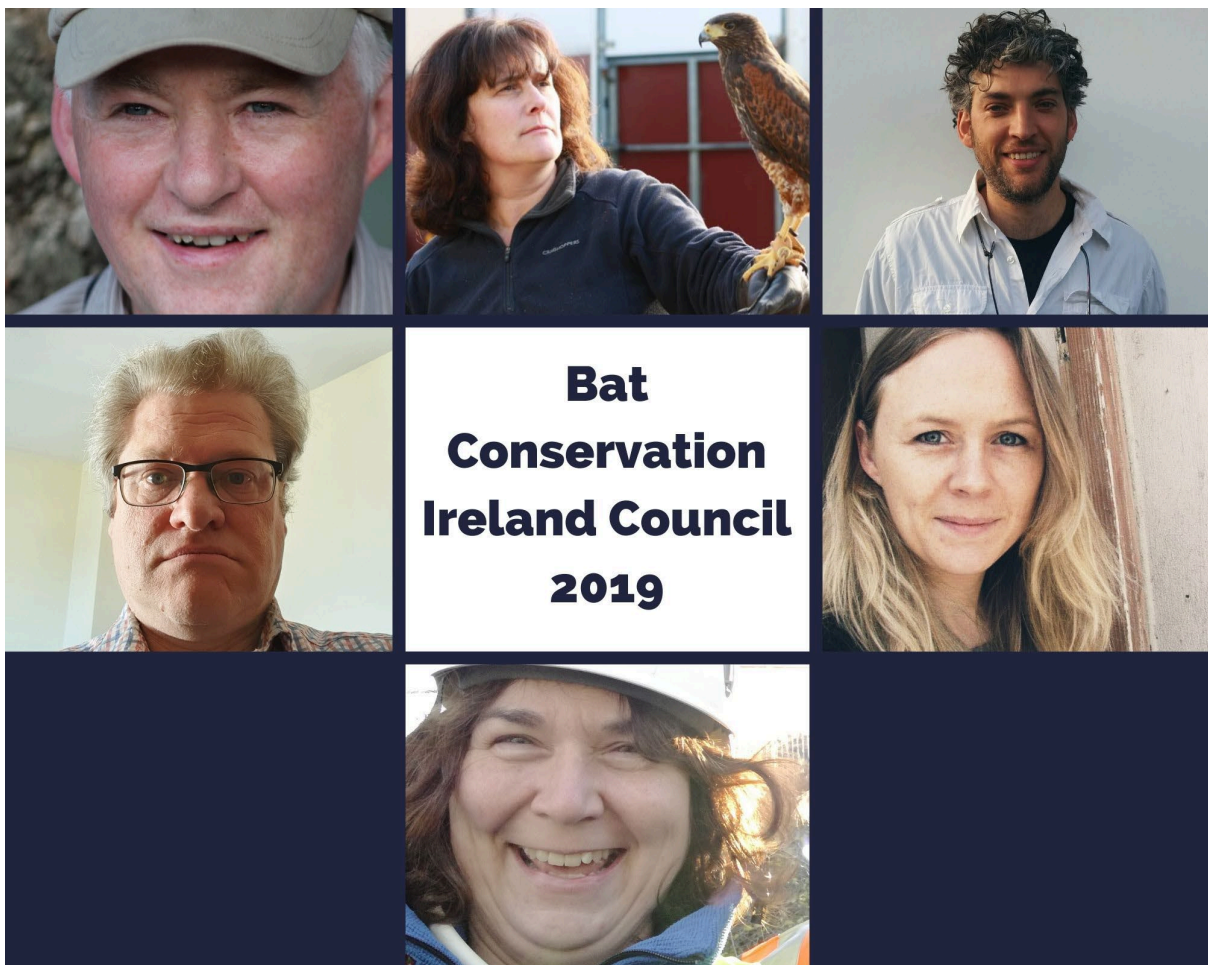
This data also provided the foundation for the book “Irish Bats in the 21<sup>st</sup> Century” (on-sale in 2019) and the 2000-2009 dataset acts as a foundation for BATLAS 2020.

These data were shared in 2016 with NBDC in preparation for the Atlas of Mammals in Ireland 2010-2015 which was launched in 2017. In 2019, Bat Conservation Ireland continued to collate data and provide access to such data for public and consultancy queries.

## Who We Are

### 2019 Management Council

Bat Conservation Ireland is managed by a Council which in 2019 consisted of 8 members. The Council of Bat Conservation Ireland works to ensure that the organisation complies with its legal obligations and requirements, as well as setting policy and guiding the direction of the organisation. Council members are voted in and appointed at the Annual General Meeting of Bat Conservation Ireland and contribute their time to the organisation voluntarily.



Bat Conservation Ireland Management Council from Top Left: Brian Keeley, Chair & Company Director; Caroline Shiel, Company Director; John Curtin, Company Secretary; Chris Peppiatt, Treasurer & Company Director; Emma Boston, N. Ireland Bat Group Chair, Anna Collins, Kildare Bat Group Chair.

Additionally, Paul Scott, Chair Dublin Bat Group & Andrew Fenner, Midlands Bat Group, were also members of the Bat Conservation Ireland Council in 2019.

## Staff

### Dr. Tina Aughney

Tina has managed the All-Ireland Daubenton's Waterways Survey since 2006 and the Brown Long-eared Bat Monitoring Scheme since 2007. She works for Bat Conservation Ireland on a part time basis.

Under Tina's management, the All-Ireland Daubenton's Waterways Survey has developed into a monitoring scheme with a large and committed volunteer base. By liaising on a county level with local authorities and community groups, promoting the project with local press and radio stations, and presenting training courses throughout the island, Tina has trained in excess of 2,000 volunteers since 2006. This scheme continues to thrive with over 400 waterway sites surveyed across the island providing extensive information on the distribution of this species.

Tina has an honours degree in Environmental Science from NUI Galway and completed a Ph.D. thesis on the impact of the Rural Environmental Protection Scheme (REPS) on lowland farm habitats in the west of Ireland. For her extensive work in relation to bats and facilitating members of the public to become actively involved in the conservation of Irish bat species, Tina was awarded Distinguished Recorder of the Year 2011 by the National Biodiversity Data Centre.

She is an active active collector of biodiversity data that is regularly submitted to National Biodiversity Data Centre (NBDC).



### Dawn Quinn

Dawn joined Bat Conversation Ireland in 2019 as its part-time Administration Manager.

She has over 20 years' administrative and financial experience, working in both the private and NGO sectors.

Dawn has worked in variety of different roles including managing and implementing administrative systems, volunteer management, project and network coordination and event management in the human rights, social justice and international development sectors.

She holds an honours degree in Audio Visual Communications from the Institute of Technology Tallaght and a master's degree in Comparative Ethnic Conflict from Queen's University Belfast.



**Dr. Niamh Roche**

Niamh has managed the Car-based Bat Monitoring Scheme since 2004 and the Lesser Horseshoe Bat Roost Monitoring Scheme since 2012. She works for Bat Conservation Ireland on a part time basis.

Under her direction, the car-based scheme has grown from a pilot project covering fewer than 10 survey squares, to an island-wide survey with a committed surveyor base. She has also presented Bat Conservation Ireland's work at national and international conferences. She was lead author of the book *Irish Bats in the 21st Century*. Niamh has also been the main organiser of several national bat conferences. More recently Niamh has been involved in analysing long-term bat trend datasets collected by Bat Conservation Ireland monitoring schemes to see if predictions can be made about how they are likely to change with future climate change.

Niamh represents Bat Conservation Ireland on the Management Committee of the EU Cost Network Project on Bats and Climate Change and is Vice-Chair of the Action's Working group on Bat Monitoring.

She has a degree in Environmental Biology from UCD and a Ph.D. from the University of Warwick, which examined bat activity in broadleaved woodlands.



## 2. Governance

Bat Conservation Ireland is a company limited by guarantee and with charitable tax exemption status. We are governed by a Revenue-approved Memorandum and Articles of Association. Having signed up to the Governance Code, Bat Conservation Ireland signaled its commitment to Good Governance and ensuring that its policies and procedures are compliant with the Charities Regulator Guidelines.

Bat Conservation Ireland is a member of The Wheel, Ireland's National Association of Charities, Community and Voluntary Organisations and Social Enterprises. Bat Conservation Ireland views Good Governance as an ongoing undertaking within the organisation and is committed to implementing any changes in governance as required.

Good Governance Actions Completed in 2019:

### Governance of Organisation

- 6 Council Meetings Held in 2019;
- AGM held in 2019;
- Conflict of Interest Policy Drafted;
- Staff Handbook Drafted;
- Production of Annual Report to outline the work the organization has completed.

### Finance

- Assessment of the Control Environment & Overall Risks of Misstatements Completed;
- Internal Financial Controls Policy and Procedures Drafted;
- Donor Charter Drafted and Adopted by Council;
- Audit carried out of 2019 Annual Accounts and lodged with Companies Registration Office;
- Preparation of Annual Budget and monitoring of actual spend of organization.

### Legal

- Retention of a firm of solicitors as legal advisors to ensure the Company Secretary role is completed and that the MOU meets requirements under the 2014 Companies Act;
- Liaising with Boardmatch to seek a Company Secretary for the organization;
- Registration of Beneficial Ownership Details Submitted and Accepted;
- Compliant with Companies Registration Office;
- Compliant with Charities Regulation Authority;
- Review of insurance annually to ensure organization is adequately covered for all activities.

### 3. Funding

Bat Conservation Ireland would like to acknowledge with thanks the following bodies for funding/grants/contracts received in 2019. Table 1 below provides further details on these funding / grants / contracts.

1. National Parks and Wildlife Service (NPWS), Department of Culture, Heritage and the Gaeltacht
  - a. Car-based Bat Monitoring Scheme
  - b. All Ireland Daubenton's Bat Monitoring Scheme
  - c. Brown Long-eared Roost Monitoring Scheme
  - d. Lesser Horseshoe Bat Monitoring Scheme
  - e. BATLAS 2020
  - f. Training Courses
  - g. IEN Biodiversity Week
  - h. Lesser Horseshoe Bat SAC Conservation Objectives
  
2. Department of Communications, Climate Action and Environment & the Irish Environmental Network (IEN)
  - a. Irish Environmental Network (IEN) Core Funding
  - b. Irish Environmental Network (IEN) Biodiversity Week Projects
  - c. Irish Environmental Network (IEN) Consultations
  
3. Northern Ireland Environment Fund (NIEA)
  - a. Car-based Bat Monitoring Scheme
  - b. All Ireland Daubenton's Bat Monitoring Scheme
  
4. Republic of Ireland County Councils & Voluntary Groups
  - a. Bat Walks & Talks
  - b. Biodiversity Week
  - c. All Ireland Daubenton's Training Courses
  - d. Heritage Week events
  - e. BATLAS 2020
  
5. Northern Ireland County Councils & Voluntary Groups
  - a. All Ireland Daubenton's Training Courses
  - b. BATLAS 2020

Donations received in 2019 by Bat Conservation Ireland members and members of the public (through bat walks)

## Principal Income sources for 2019

Table 1

Funding Body	Name of Programme	Details	Duration
NPWS, Department of Culture, Heritage and the Gaeltacht  CONTRACT won by public tender process	Irish Bat Monitoring Programme  Reference Code: Contract SPU-CO10-2018  Elements operated in the Republic of Ireland are funded by this contract.	The IBM entails four survey schemes managed by Bat Conservation Ireland: a) Car-based Bat Monitoring Scheme b) All Ireland Daubenton's Bat Waterways Survey c) Brown Long-eared Roost Monitoring Scheme d) Lesser Horseshoe Bat Roost Monitoring Scheme	2018-2022 monitoring years  Contract runs from May 2018 to April 2022
Northern Ireland Environment Fund awarded by NIEA, Department of Agriculture  GRANT awarded by application	Irish Bat Monitoring Programme  File Reference: ENF 22  Elements operated in the Northern Ireland are funded by this grant.	The IBM entails four survey schemes managed by Bat Conservation Ireland: a) Car-based Bat Monitoring Scheme b) All Ireland Daubenton's Bat Waterways Survey	2019  Annual application for grant
NPWS, Department of Culture, Heritage and the Gaeltacht  CONTRACT won by public tender process	National Bat Distribution Project (aka BATLAS 2020)  Reference code: SPU-C005-2016	BATLAS 2020 – survey of 10km squares across the Republic of Ireland.	2016-2018 survey years  Contract runs from May 2016 to March 2019
Irish Environmental Network (IEN)  Funding through activities from NPWS, Department of Culture, Heritage and the Gaeltacht and Department of Communications, Climate Action and Environment.	- Core Funding  - Biodiversity Week  - Expense Refund for specific activities	Core Funding Application for 2019  Biodiversity Week Funding for bat events  Expense refund for the work completed by Donna Mullen, on behalf of Bat Conservation Ireland	Bat Conservation Ireland is a member of the IEN and applied for funding for projects in 2019.  Annual funding
NPWS, Department of Culture, Heritage and the Gaeltacht  CONTRACT won by public tender process	Lesser Horseshoe Bat Project  Reference No. SPU C017-2017	Preparation of Conservation Objectives for Lesser Horseshoe Bat SACs	Once-off project, completed spring 2019



## 4. Member and Volunteer Engagement

Bat Conservation Ireland is a membership organisation that greatly values its members and volunteers, both of whom are vital to the work of conserving Ireland's bat populations. We would like to sincerely thank all of our members and volunteers for their kind and generous support in 2019. Volunteers with Bat Conservation Ireland play a key role in supporting the work of the bat monitoring projects carried out on an annual basis.

In 2019, there were 266 paid members of Bat Conservation Ireland, with membership of the organisation remaining steady. The online recurring membership payments system was set up to allow members' annual membership fees to be automatically renewed, thereby decreasing the amount of administrative time spent on following up on payments.

The remainder of Section 2 will summarise all of the activities of Bat Conservation Ireland in 2019. These activities will be further discussed, where necessary, under the remaining sections of the report.

### Training Courses in 2019

There is a lot to learn about bats and we have lots of knowledge to share. Training courses are an essential element to achieving the five key objectives of the organisation. In 2019, 29 training courses were organised by Bat Conservation Ireland and these are presented in Table 2.

**Table 2:** Training Courses organised by Bat Conservation Ireland and Bat Groups in 2019

No.	Type	Location	Date	Trainer
1.	Bat Tree Roost Identification & Endoscope Training Workshop	Birr Castle, Co. Offaly	28 March 2019	Tina Aughney
2.	Training with Tidy Towns Groups	Virginia, Co. Cavan	1 May 2019	Tina Aughney
3.	Training with Tidy Towns Groups	Killenkere, Co. Cavan	2 May 2019	Tina Aughney
4.	An Introduction to Recording Bats	Craft Granary, Cahir, Co. Tipperary	25 May 2019	Niamh Roche
5.	Daubenton's Training Course	Angling Club House, Swan Park, Bunrana, Co. Donegal	5 June 2019	Tina Aughney
6.	Introduction to Bat Ecology and identifying bat roost features	Blackrock, Dublin	21 June 2019	Dublin Bat Group
7.	Car Based Monitoring Training	Enniskillen, Co. Fermanagh	July 2019	Niamh Roche
8.	Car Based Monitoring Training	Ballintoy, Co. Antrim	July 2019	Niamh Roche
9.	Car Based Monitoring Training	Downpatrick, Co. Down	July 2019	Niamh Roche
10.	Car Based Monitoring Training	Meath	July 2019	Niamh Roche
11.	Car Based Monitoring Training	Dublin City	July 2019	Niamh Roche
12.	Car Based Monitoring Training	Killarney, Co. Kerry	July 2019	Niamh Roche
13.	Car Based Monitoring Training	Cork City, Co. Cork	July 2019	Niamh Roche
14.	Daubenton's Training Course	The Dropping Well, Milltown Road, Rathmines, Dublin	2 July 2019	Tina Aughney
15.	Daubenton's Training Course	Shannon Dolphin & Wildlife Centre, Merchant's Quay, Kilrush, Co. Clare.	3 July 2019	Tina Aughney
16.	Daubenton's Training Course	Birr Castle, Co. Offaly	12 July 2019	Tina Aughney

17.	Daubenton's Training Course	Manch, Ballineen, Cork	16 July 2019	Tina Aughney
18.	Daubenton's Training Course	Castle Oaks House Hotel, Stradbally, Limerick	17 July 2019	Tina Aughney
19.	Daubenton's Training Course	St. Thomas Church of Ireland, Slieve Mor Road, Doogort, Mayo	18 July 2019	Tina Aughney
20.	Daubenton's Training Course	Forum Connemara CLG, Ellis Hall, Letterfrack, Galway	19 July 2019	Tina Aughney
21.	Daubenton's Training Course	Jennings O'Donovan & Partners, Finisklin Business Park, Sligo	22 July 2019	Tina Aughney
22.	Daubenton's Training Course	River Island Hotel, Main Street, Castle Island, Kerry	23 July 2019	Tina Aughney
23.	Daubenton's Training Course	The Cloughmore Centre, Kilbroney Park, 60 Shore Road, Tostrevor, Down	24 July 2019	Tina Aughney
24.	Daubenton's Training Course	Lakeland Forum, Broadmeadow, Enniskillen, Co. Fermanagh	25 July 2019	Tina Aughney
25.	Daubenton's Training Course	Sion Stables, 120, Melmount Road, Sion Mills, Tyrone	29 July 2019	Tina Aughney
26.	Daubenton's Training Course	Hospital Road Community Centre, Omagh, Tyrone	30 July 2019	Tina Aughney
27.	Bat Workshop for NCBI, organized in association with the Heritage Council	NCBI, Dublin	23 October 2019	Tina Aughney
28.	Training with Tidy Towns Groups	Killeshandra, Co. Cavan	6 November 2019	Tina Aughney
29.	Training with Tidy Towns Groups	Maudabawn, Co. Cavan	7 November 2019	Tina Aughney

Training was provided in 17 counties across the island of Ireland. The majority of the courses organised were to train citizen scientists for the Irish Bat Monitoring Programme. These will be discussed further in Section 3. In 2019, Bat Conservation Ireland ran a 'Bat Tree Roost Identification & Endoscope' Training Workshop 28 March, which was a new course in order to train members and those working in the area of bat conservation, in new skills. This course was held in the beautiful grounds of Birr Castle, Co. Offaly. We would like to thank all core organisers and hosts for their wonderful hospitality and support in the running of this workshop.

The course objectives were:

- To introduce the use of endoscopes in the identification of bat roosts in trees;
- Provide tips on how to identify bat roosts in trees;
- Provide practical field-work experience.

This was an intensive field-based course and comprised of a day of talks and was aimed at ecology professionals, arborists and experienced amateur bat workers. 13 participants attended this course.

In April 2019, Bat Conservation Ireland, in conjunction with the National Biodiversity Data Centre, organised an evening workshop on 'An Introduction to Recording Bats'. This Workshop was aimed at individuals who had some bat detection experience and was designed to build on that by

improving nocturnal recording skills and learning about the biology, life cycle and conservation of bats in Ireland. Participants were taught how to identify Ireland's bats using in-classroom specimens and keys and observed bats in flight outdoors using bat detectors. This course was fully booked, with a total of 25 people in attendance.

All of our monitoring training courses were free to attend. The number of free courses was due to funding provided through the Irish Bat Monitoring Programme.

### **Volunteer Participation in 2019**

Over 600 volunteers participated in Bat Conservation Ireland's activities in 2019. These volunteers surveyed 10km squares for BATLAS 2020; surveyed rivers and canals for Daubenton's bats; drove around logging bats as part of the Car-based bat monitoring scheme; counted brown long-eared bats emerging from roosts; organised bat walks and talks in their local area; inspected bat boxes; liaised with local Men's Sheds on their bat box construction scheme; assisted tidy town groups with bat surveys and manned information stands at biodiversity events. Our volunteers are located in every county on the island and, as a result of their dedication, Bat Conservation Ireland can map the distribution of Ireland's bats, monitor the island's bat populations and continue to spread the message of conservation for Ireland's bats.

In 2019, 69 individuals signed up for Temporary Volunteer Membership in order to ensure they are covered for their activities under Bat Conservation Ireland's insurance policy.

### **Volunteer Support in 2019**

In addition to training courses, Bat Conservation Ireland also loans bat detectors to surveyors. In 2019 Bat Conservation Ireland purchased 6 bat loggers for use by Citizen Science Volunteers on the Irish Bat Monitoring Programmes.

Volunteers setting up bat groups or acting as county representatives are also provided with a "Starter Pack" which consists of heterodyne bat detectors, which is a basic type of bat detector to introduce novices to the world of bat sounds, literature, hi-vis vest and a power point presentation of "Bats in Ireland" talk.

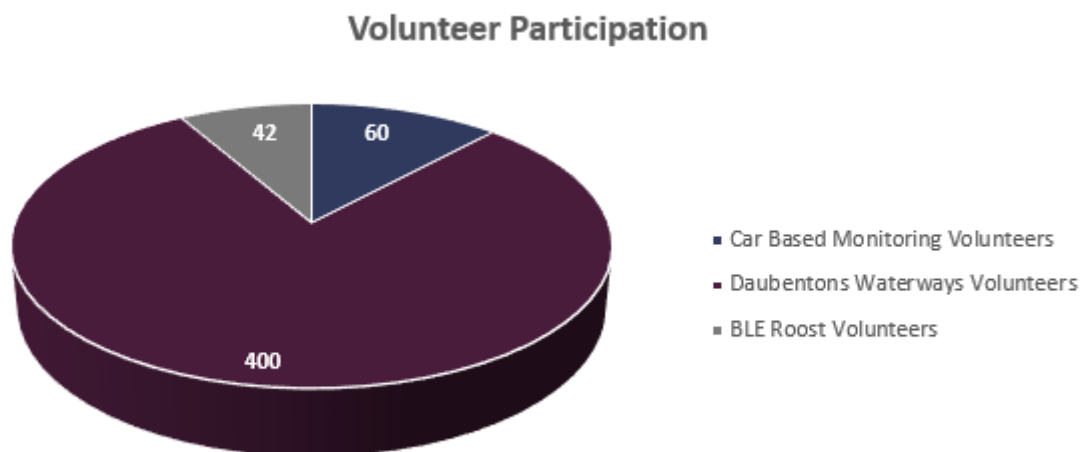


Figure 1. Number of volunteers that participated in the Irish Bat Monitoring Programme in 2020.

Note: many volunteers participate in more than one scheme.

### Bat Events in 2019

In 2019 Bat Conservation Ireland organised, funded and hosted an array of bat related events across the island. A total of 41 events were undertaken and these comprised of bat walks & talks, bat box inspections, media interviews, research projects, bat surveys for tidy town groups, house visits, conferences and exhibitions to name but a few. These are in addition to all of the training courses listed in Table 2. A list of all of our events is presented in Appendix 1.

### Additional Bat Conservation Activities in 2019

In 2019, Bat Conservation Ireland Council Members and staff undertook additional activities to those listed in Table 2 and Appendix 1. These comprised of attending meetings, workshops organised by other environmental NGOs, IEN meetings, conferences, training events, information days and council meetings to name but a few. These are important for the running of the organisation, upskilling, furthering the conservation needs of bats in Ireland and abroad, and networking.

### Batline - Websites

In 2019 Bat Conservation Ireland continued to provide a BATLINE service through email, telephone and social media with Approx. 350 queries dealt with, along with a number of house visits. In addition, the two websites administered by Bat Conservation Ireland, provide extensive information for members of the public on bats:

- [www.batconservationireland.org](http://www.batconservationireland.org)
- [www.learnaboutbats.com](http://www.learnaboutbats.com)

There is also a facility for members of the public to log their “Bat Sightings” through the main website. In 2019 over 109 sightings were recorded through this means.

## 5. Bat Groups in Ireland

Bat Groups offer essential local support both for Bat Conservation Ireland monitoring schemes, educational programmes and to people interested in increasing their bat survey experience. There are a number of very active bat groups that undertake a phenomenal amount of bat work. In 2019 the bat groups participated in all of the monitoring schemes and BATLAS 2020, along with additional roost counts. They manage their own bat box schemes, liaise with local wildlife organisations; host bat talks, walks and training events for Heritage Week, Biodiversity Week and monitoring schemes and rescue and rehabilitate grounded bats. Additionally, Bat Groups carry out their own conservation work, such as tree roost surveys, carried out by Dublin Bat Group and harp trapping (under licence) as part of the All-Ireland Nathusius' Pipistrelle Bat Project. The location of bat groups across the island (as of December 2019) is illustrated in Figure 2.

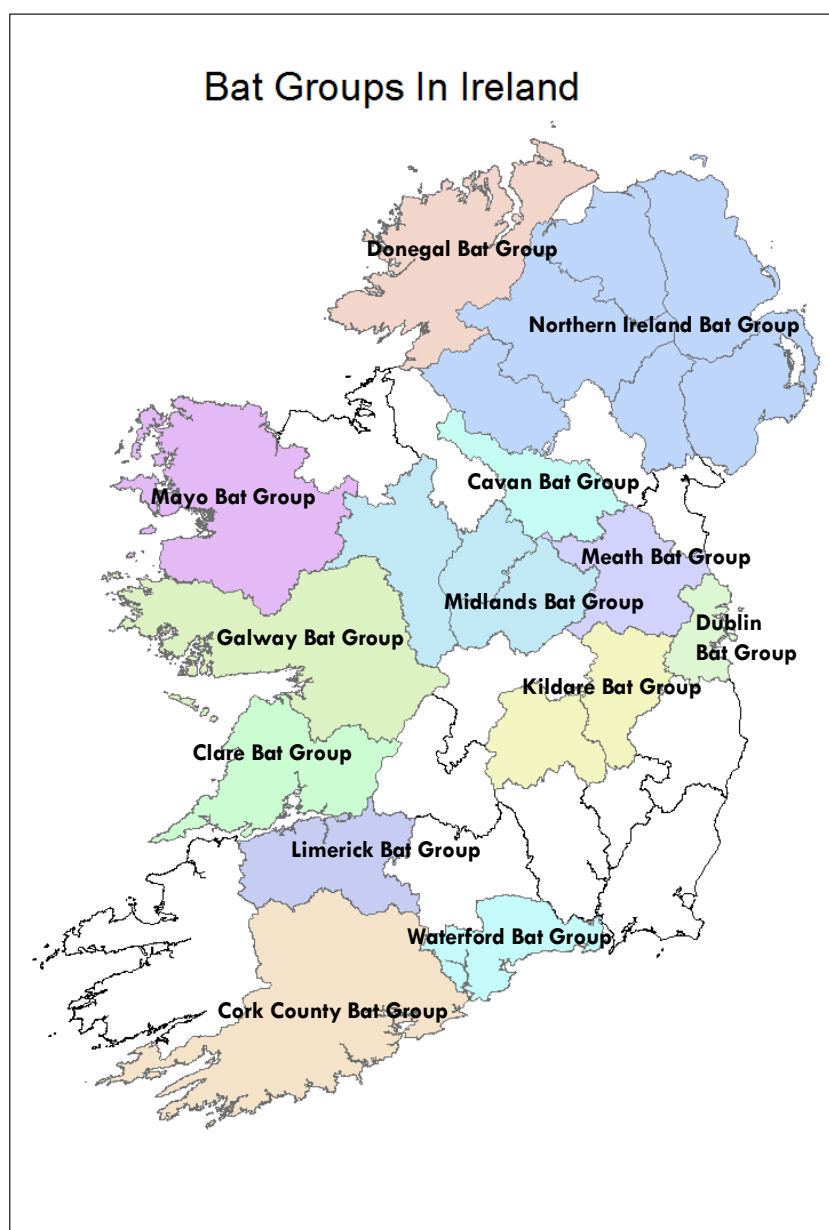


Figure 2. Location of Bat Groups on the Island of Ireland.

Table 3.

Activities undertaken by the Bat Groups on the Island of Ireland in 2019.

Bat Group	Bat Walks & Talks	Car-based Surveys	Waterways Survey	BLE Roost Counts	BATLAS 2020
Kildare	√		√	√	√
Cavan	√		√	√	√
Meath	√		√		
Midlands	√	√	√	√	√
Galway	√	√	√	√	√
Waterford	√		√	√	√
Cork			√	√	
Dublin	√		√	√	√
Clare	√	√	√	√	√
NIBG *	√	√			√
Limerick	√	√	√		√
Mayo	√		√	√	√
Donegal	√				

\* NIBG events are reported separately by the group in a separate Annual Report.

## 6. Bat Conservation Ireland's Work in 2019

### a. Irish Bat Monitoring

#### Introduction

The main aim of Bat Conservation Ireland is to help conserve Irish bats. In order to ensure Irish bats are being conserved, it is important to know to find out how their populations are doing, in other words, whether they are increasing, decreasing or stable. Regular monitoring is the key to picking up any declining (or increasing) trends, which are in turn, important in forming conservation policy and management on a nationwide and EU level. Bat Conservation Ireland manages four monitoring schemes to track trends in bat populations as follows:

1. Car-Based Monitoring;
2. The All-Ireland Daubenton's Bat Waterways Survey;
3. Brown Long-Eared Bat Roost Monitoring;
4. Lesser Horseshoe Bat Roost Monitoring

#### Car-Based Monitoring

Despite high levels of legal protection for all species, until 2003 there was no systematic monitoring of any species apart from the lesser horseshoe bat in Ireland. To redress this imbalance, The Car-based Bat Monitoring Scheme was first piloted in 2003 and targets the two most abundant pipistrelle species (common and soprano pipistrelles) and Leisler's bat. These species are relatively easy to detect and distinguish from each other on the basis of echolocation calls. The car-based survey makes use of a broadband bat detector, which picks up a range of ultrasound that can be recorded in the field and analysed post-survey. This method allows survey work to be carried out by individuals with little or no experience in bat identification since identification is completed post survey work. Nonetheless, all surveyors are fully trained in carrying out the survey method, which can be tricky to implement initially, and are provided with a full set of equipment in order to complete the survey. In this way, results are standardised across the island. We are currently undergoing an equipment upgrade to a new detector. This means that many surveyors in the past couple of years have been using two sets of equipment simultaneously so that we can ensure the datasets from the old and new equipment are fully compatible.

#### The All-Ireland Daubenton's Bat Waterways Survey

The Car-based Bat Monitoring Scheme (managed by Dr. Niamh Roche) was followed in 2006 by the All-Ireland Daubenton's Bat Waterways Monitoring Scheme (managed by Dr. Tina Aughney). This scheme follows a survey methodology devised by the Bat Conservation Trust (BCT UK). Narrow band, heterodyne detectors are used so volunteers who conduct the survey are trained in the identification of Daubenton's bat prior to field work. Surveyors count the number 'bat passes' of this bat species for 4 minutes at each of the ten fixed points on linear waterways. The onset of this

scheme was a very significant development in bat monitoring here, since it represented the first large-scale recruitment of members of the Irish public to bat conservation-related work.

### **Brown Long-eared Bat Roost Monitoring Scheme**

More recently, in 2007, the Brown Long-eared Bat Roost Monitoring Scheme (Managed by Dr. Tina Aughney) was piloted and established. This project concentrates on counts of brown long-eared bats at their roosts and is conducted by individuals with a greater level of experience in bat identification than is necessary for the waterway surveys or car-based surveys. The roost survey protocol involves at least two counts per annum (mid-May to August) using three potential survey methods depending on the structure, access and location of bats within, and emerging from, the roost.

### **Lesser Horseshoe Bat Monitoring Programme**

In 2013 Bat Conservation Ireland won a contract with NPWS to manage and administer the Lesser Horseshoe Bat Monitoring database (managed by Dr. Niamh Roche). This involves liaising with local National Parks and Wildlife Service (NPWS) and Vincent Wildlife Trust (VWT) staff who conduct counts at lesser horseshoe bat sites in the west of Ireland in summer and in winter. Bat Conservation Ireland gathers the data, ensures it is entered into the database and carries out trend and other analysis on it. This monitoring scheme was originally established (by the NPWS) in the late 1980s for some winter sites while counts at summer sites started in the early 1990s.

The Car-Based Bat Monitoring Scheme and All Ireland Daubenton's Bat Waterway surveys are all-Ireland schemes. The Brown Long-eared Bat Roost Monitoring has, so far, been based in the Republic of Ireland only and lesser horseshoe bat only occurs in the Republic of Ireland. Regular monitoring under Bat Conservation Ireland's management is, therefore, in process for six of the Annex IV bat species for the Republic of Ireland, and for four species in Northern Ireland.

In 2018 Bat Conservation Ireland was successful in their tender bid for the operation of the Irish Bat Monitoring Scheme 2018-2022. As a consequence, the organisation currently manages all four monitoring schemes (Car-Based Bat Monitoring Scheme, All Ireland Daubenton's Bat Waterways Scheme, Brown Long-eared Roost Monitoring Scheme and Lesser Horseshoe Bat Database) in the Republic of Ireland, and the first two schemes in Northern Ireland.

### **BATLAS**

In 2016 Bat Conservation Ireland was successful in its tender for BATLAS 2020 (2016-2018) in the Republic of Ireland (managed by Dr. Simon Pickett).

The methodology for BATLAS 2020 was piloted and fine-tuned in 2015. The new methodology was introduced for the 2016 survey season along with the development of the survey as an online survey where volunteers register their interest, choose their 10km squares and report their results all through the Bat Conservation Ireland website. This was developed by Dr. Simon Pickett and continued to be in operation in 2019.



## b. Conservation Work

### Monitoring and Mapping Ireland's Bat Populations in 2019



#### Introduction

The Irish Bat Monitoring Programme entails four monitoring schemes. In 2019 BATLAS 2020 was into its final year of the programme to map the distribution of the target species across the island.

Despite high levels of legal protection for all species, until 2003 there was no systematic monitoring of any species apart from the lesser horseshoe bat in Ireland. To redress this imbalance, the Car-based Bat Monitoring Scheme was first piloted in 2003 and targets the two most abundant pipistrelle species (common and soprano pipistrelles) and Leisler's bat. These species are relatively easy to detect and distinguish from each other on the basis of echolocation calls. The car-based survey makes use of a broadband bat detector which picks up a range of ultrasound which can be recorded in the field and analysed post-survey. This method therefore allows survey work to be carried out by individuals with little or no experience in bat identification since identification is completed post survey work. Nonetheless, all surveyors are fully trained in carrying out the survey method, which can be tricky to implement initially, and are provided with a full set of equipment in order to complete the survey. In this way, results are standardised across the island. We are currently undergoing an equipment upgrade to a new detector. This means that many surveyors in the past couple of years have been using two sets of equipment simultaneously so that we can ensure the datasets from the old and new equipment are fully compatible.

The Car-based Bat Monitoring Scheme (managed by Dr Niamh Roche) was followed in 2006 by the All-Ireland Daubenton's Bat Waterways Monitoring Scheme (managed by Dr Tina Aughney). This scheme follows a survey methodology devised by the Bat Conservation Trust (BCT UK). Narrow band, heterodyne detectors are used so volunteers who conduct the survey are trained in the identification of Daubenton's bat prior to field work. Surveyors count the number 'bat passes' of this bat species for 4 minutes at each of the ten fixed points on linear waterways. The onset of this scheme was a very significant development in bat monitoring here since it represented the first large-scale recruitment of members of the Irish public to bat conservation-related work.

More recently, in 2007, the Brown Long-eared Bat Roost Monitoring Scheme (Managed by Dr Tina Aughney) was piloted and established. This project concentrates on counts of brown long-eared bats at their roosts and is conducted by individuals with a greater level of experience in bat identification than is necessary for the waterway surveys or car-based surveys. The roost survey protocol involves at least two counts per annum (mid-May to August) using three potential survey methods depending on the structure, access and location of bats within, and emerging from, the roost.

In 2013 Bat Conservation Ireland won a contract with NPWS to manage and administer the Lesser Horseshoe Bat Monitoring database (managed by Dr. Niamh Roche). This involves liaising with local NPWS and Vincent Wildlife Trust (VWT) staff who conduct counts at lesser horseshoe bat sites in the west of Ireland in summer and in winter. Bat Conservation Ireland gathers the data, ensures it is entered into the database and carries out trend and other analysis on it. This monitoring scheme was originally established (by the NPWS) in the late 1980s for some winter sites while counts at summer sites started in the early 1990s.

The Car-Based Bat Monitoring Scheme and All Ireland Daubenton's Bat Waterway surveys are all-Ireland schemes. The Brown Long-eared Bat Roost Monitoring has, so far, been based in the Republic of Ireland only and lesser horseshoe bat only occurs in the Republic of Ireland. Regular monitoring under Bat Conservation Ireland management is, therefore, in process for six of the Annex IV bat species for the Republic of Ireland, and for four species in Northern Ireland.

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In 2016 Bat Conservation Ireland was successful in its tender for BATLAS 2020 (2016-2018) in the Republic of Ireland (managed by Dr Simon Pickett). An additional survey year was undertaken in 2019 to mop up extra squares in order to meet survey commitments.

The methodology for BATLAS 2020 was piloted and fine-tuned in 2015. The new methodology was introduced for the 2016 survey season along with the development of the survey as an online survey where volunteers register their interest, choose their 10km squares and report their results all through the Bat Conservation Ireland website. This was developed by Dr Simon Pickett and continued to be in operation in 2018. This is a link to the BATLAS 2020 section on the website:

<https://www.batconservationireland.org/what-we-do/monitoring-distribution-projects/batlas>

### **Citizen Scientist Bat Surveyors 2019**

The schemes described above primarily rely on volunteers to complete surveys, thus providing Bat Conservation Ireland with the opportunity to train over 400 volunteers annually. Without volunteers, Bat Conservation Ireland could not monitor Ireland's bat populations or map their distribution. Therefore, Bat Conservation Ireland is greatly in debt to Irish citizen scientists who gladly give up their time to complete surveys. In any given summer season, there are over 600 volunteers participating in the numerous schemes managed by Bat Conservation Ireland.

Training is provided for volunteers in a tiered manner, allowing volunteers to participate in schemes according to their level of expertise. Participation in the All-Ireland Daubenton's Bat Waterways Survey is the first step for novice volunteers whereby, once completed, each surveyor can identify one species of bat, Daubenton's bat, in flight over waterways. Training consists of an evening lecture followed by field work after dusk.

Once surveyors have expressed an interest in further developing their skills they can participate in training and workshops for other monitoring schemes and BATLAS 2020. Volunteers are also encouraged to join their local bat group to gain further experience. In 2019, a total of 29 training courses were organised across the island, the majority of these were for Irish Bat Monitoring Programme surveys (n=27).

### Training Courses & Support Material for Volunteers in 2019

A total of 21 courses were organised for volunteers participating in the Irish Bat Monitoring Programme in 2019: Car-based Bat Monitoring Scheme (n=7 courses); All Ireland Daubenton's Bat Waterways Survey (n=14 courses) – See Table 2. Training for the All-Ireland Daubenton's Bat Waterways Survey was organised in locations to attract new volunteers. These courses were advertised on the Bat Conservation Ireland website, Facebook pages and emails to members and volunteers. Where possible, advertisements were also run in local newspapers. Local communities or groups that co-hosted the training events also advertised events in their local area. Posters were produced for each training courses (an example of which is shown below: Figure 3). All other training courses for monitoring were organised for specific volunteer teams.

**We need you to survey your local waterway this summer**

**Join us at a your local training course**

An Roinn Cultúir, Oidhreacht agus Gaeltachta  
Department of Culture, Heritage and the Gaeltacht

NIEA Northern Ireland Environment Agency  
www.niea-environment.gov.uk

**BAT CONSERVATION IRELAND**

**County Offaly**

**VENUE:** Pavillion, Birr Castle, Birr, Co. Offaly

*Organised in conjunction with Birr Castle Education*

**DATE & Time:** Friday 12<sup>th</sup> July 2019 @ 8.30 pm

**DETAILS:** 1 hour presentation, 1 hour discussion of sites followed by a visit to a local waterway to demonstrate the survey methodology.

**ALL ARE WELCOME**

**All Ireland Daubenton's Bat Waterways Survey**

Figure 3. Poster advertising Daubenton's Bat Waterways Survey Training

**Support Material**

As part of on-going support for volunteers, a bat call library was set up on the Bat Conservation Ireland website:

<https://www.batconservationireland.org/what-we-do/monitoring-distribution-projects/batlas/batlas-training-materials>

The Bat Conservation Ireland YouTube Channel (name BatConservation Ireland – please note that there is no space between Bat and Conservation) which was set up five years ago, continues to host training videos for volunteers.

### c. Irish Bat Monitoring Programme in 2019



An Roinn Cultúir,  
Oidhreacht agus Gaeltachta  
Department of Culture,  
Heritage and the Gaeltacht



Department of  
**Agriculture, Environment  
and Rural Affairs**  
[www.daera-ni.gov.uk](http://www.daera-ni.gov.uk)

#### i. Car-based Bat Monitoring Scheme 2019

This scheme has been running 15 years and the 28x 30km squares are fixed and surveyed annually by volunteer teams. Each 30km square has 15 x 1.6km transects which are shown in Figure 4.1

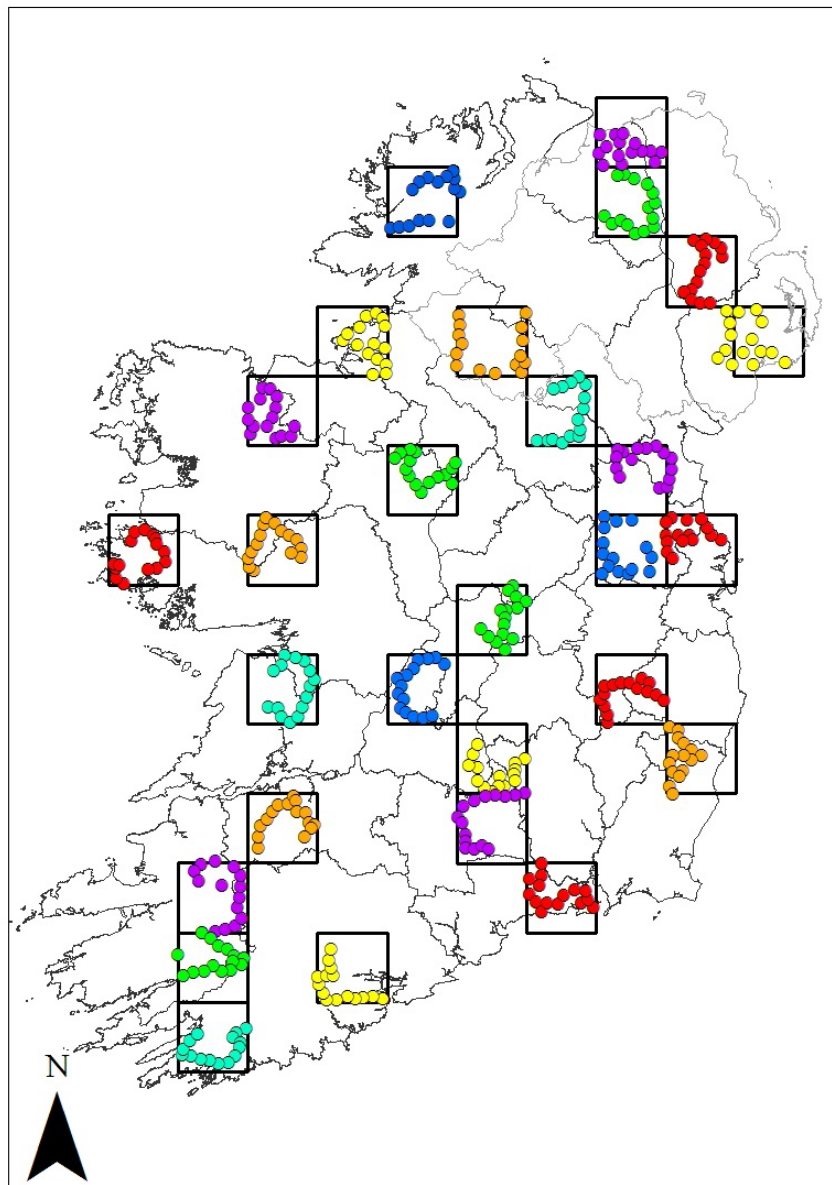


Figure 4.1: Location of 30km Survey Squares across the island.

For the Car-Based Bat Monitoring Scheme 60 individuals participated in surveys of 28 squares around the island (Figure 3.6). Training for new team members or new teams was provided in five locations. Training for existing teams taking on new bat detector systems for the survey – Batlogger M – was provided 2019 for six teams an additional three localities of the island, as well as remote training for two teams. This extended the trial of this detector to 27 teams in conjunction with the traditional detector and smart phone system, however both detectors were not successfully used in both in all cases. Data from 54 surveys was available to contribute to bat species trend modelling.

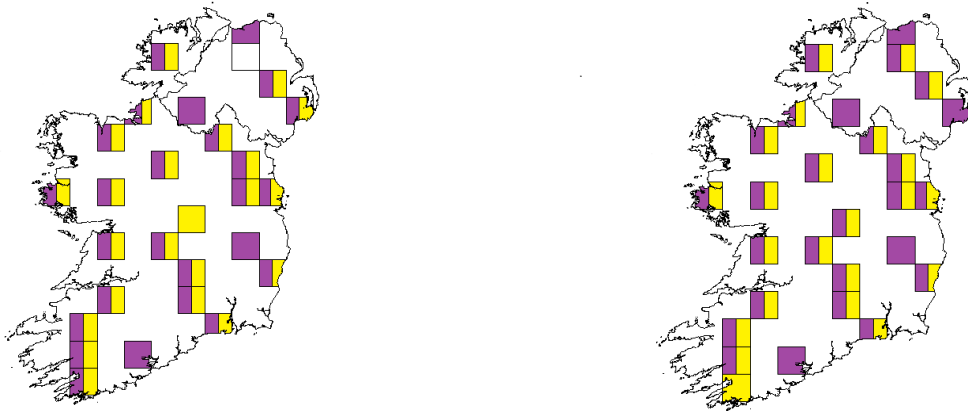


Figure 4.2 a & b: Location of 30km Survey Squares, Survey 1 – left, Survey 2 - right. Purple indicates a Tranquility detector and yellow indicates a Batlogger. Dual colours indicate both detectors were used simultaneously, single colour indicates that just one detector was used for the survey.

Over 3,600 bats were recorded, of which 42% were common pipistrelles. The soprano pipistrelle was second most frequently recorded and Leisler's the third most common. Leisler's bats and soprano pipistrelles accounted for 20% and 25% of the total bat encounters, respectively, in 2019. Twelve percent of all encounters were 'Pipistrelles unknown' that could be either soprano or common. Nathusius' pipistrelles, *Myotis* species and brown long-eared bats were encountered, as in previous years, in very low numbers.

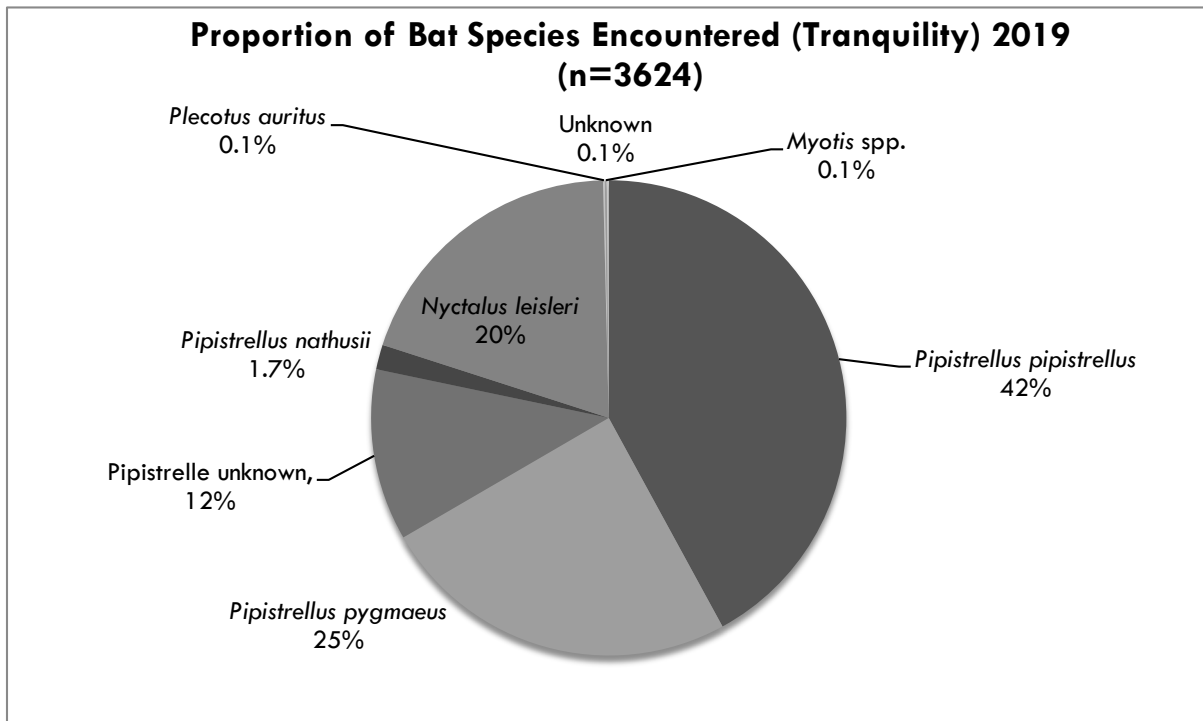


Figure 4.3: Species encountered during the car-based bat monitoring scheme in 2019 using Tranquility detectors.

Common and soprano pipistrelles declined a little in 2019. Leisler’s bat showed a slight increase from 2018. Nathusius’ pipistrelle trends are still unclear but seem to show signs of stability or slight increases, whilst the brown long-eared roadside trend in 2019 was reasonably stable. For Nathusius’ pipistrelle and brown long-eared bats, numbers of observations are extremely low using the car-based method, leading to wide error bars.

Additional data for roadside vertebrates other than bats is also collected by surveyors during the scheme. In 2019, as in other years’ cats were the most prevalent roadside vertebrate accounting for over 50% of the records.

Trials using Batlogger M detectors were carried out from 2017-2019. Detailed analysis of the two detector systems was carried out. The results are somewhat mixed. There is reasonably good correlation, overall, between numbers of bats recorded by the two systems. However, there is quite a lot of variability between surveys and between squares. It seems unlikely that an additional year of dual detector use would improve precision, so we intend to roll out the Batloggers fully in 2020. We anticipate that the confidence intervals around the trend will widen for the coming few years as a result of the changeover. We intend to archive the Tranquility detectors for up to five years in case further investigations are warranted at a later date.



Photo of an 'other vertebrate' taken by the Killarney Car-based Bat Monitoring Team in July 2019.



Volunteers Ferdia Marnell and Gemma Weir at the start of a car survey in Tipperary.



## ii. All Ireland Daubenton's Bat Waterways Survey 2019

In 2019, over 200 people attended 14 training across the island. A total of 48 new teams signed up during training courses and received survey packs prior to August, then completed surveys in 2019. A total of 238 waterway sites were surveyed by 180 survey teams in 2019; this included 49 new survey teams who surveyed 24 new waterway sites and 31 previously surveyed waterway sites. Overall, 26 teams surveyed two or more waterway sites.

A total of 238 waterway sites were surveyed in 2019. Thirty-six waterways sites were located in Northern Ireland and 202 waterway sites in the Republic of Ireland. Twenty-four waterways sites surveyed in 2019 were new waterway sites, four located in Northern Ireland. In 2019 a total of 12 canals (41 waterway sites), 2 channels and 127 rivers (194 waterway sites) were surveyed. In 2019 the Royal Canal had 15 waterway sites surveyed along its length while the Grand Canal had 11 waterway sites surveyed in 2019. River Boyne and River Shannon had eight waterway sites located along its length (Figure 1). Overall, for the 2006-2019 dataset there are 544 waterways sites located on rivers (n=289 rivers), 91 waterway sites on canals (n=22 canals) and the remaining four waterway sites are channels, such as the North Slobs in Co. Wexford (n=4 channels).

Of the four provinces, the highest number of waterway sites surveyed in 2019 were surveyed in Leinster (n=97, Figure 2) and County Dublin had the highest number of waterway sites surveyed per county (n=19, Figure 3).

A total of 434 completed surveys from 238 waterway sites were returned to Bat Conservation Ireland in 2019. Two hundred and eighteen surveys were completed in the first survey period in 2019 (Survey 1: 1<sup>st</sup> – 15<sup>th</sup> August) while 216 surveys were completed in the second survey period (Survey 2: 16<sup>th</sup> – 30<sup>th</sup> August). Waterway sites with repeated surveys (i.e., surveys completed in both sampling periods S1 and S2) provide more robust data for monitoring. In 2019, a total of 196 repeated surveys (82% of waterway sites) were completed while 42 single surveys were completed (see Figure 4). This was a lower number of repeat surveys than in previous years. The years 2007 and 2010 had the highest rates of repeat surveys of all thirteen years to-date (95% and 93% respectively).

In 2019, 'Sure' Daubenton's bat passes were recorded on 209 waterway sites (88%) (see Figure 5). At each of the 10 survey spots of each completed survey, volunteers recorded Daubenton's bat activity for four minutes generating 40 minutes of data per completed survey. In total, 16,440 'Sure' Daubenton's bat passes and 3,019 'Unsure' Daubenton's bat passes were recorded during 289 hours and twenty minutes of surveying. The number of Daubenton's bat passes is less than previous years (e.g., in 2019 during less hours of surveying over 19,000 Daubenton's bat passes were recorded).

The mean number of 'Sure' Daubenton's bats passes per survey was 38.1 passes, which is the second lowest mean for the fourteen years of monitoring. In addition, bats were only recorded on 52.16 of survey spots in 2019, which is the lowest percentage recorded in the fourteen years of the monitoring scheme. In 2018 Connaught, had the highest mean (Mean no. = 73.6 'Sure' bat passes). Indeed, this was the highest mean recorded in the previous 13 years of monitoring. However, in 2019, this dropped to a mean of 36.4 'Sure' bat passes in 2019. In 2019, both Leinster and Munster had a mean number of 41 'Sure' bat passes while the lowest mean number was recorded in Ulster (31 mean number of 'Sure' bat passes). For a full break down of descriptive results for 2006-2019 see the Annual Monitoring Report.

Assessing the population trends is an important part of the monitoring scheme and the data used for this is any site where there is at least two years of surveying (this is why it is so important that we keep surveying our waterway sites from year to year). Statistical population trend modelling using the percentage of survey spots with bats present was assessed. The response variable in the analysis is, for example, 0.7, if Daubenton's bat passes were observed at seven of the ten survey spots.

A smoothed GAM trend was also applied to the results. Results suggest a decline to 2008 with numbers stabilising in 2009, 2010 and 2011 and declining again in 2012, 2013 and 2014 (Figure 5.5). There was a slight upward trend in 2015 but this stabilised till 2018. However, we are seeing a small dip in the curve for 2019. Overall the smoothed index is currently 1.319% above the 2007 base year value which is equivalent to an average 0.11% annual increase. Therefore, the Daubenton's bat population is considered to be stable.

Bat Conservation Ireland encourages new survey teams to take on an "old" waterway sites in order to strengthen the data to ensure that we have a robust dataset in order to complete as accurate as possible population trend models. In the 2006-2019 dataset, 157 (24.6%) waterway sites out of 638 have been surveyed in one year only. On a county-by-county basis, the five counties with the highest percentage of single year survey sites are Counties Tyrone (54%, n=13), Mayo (50%, n=12), Clare (42%, n=8), Monaghan (40%, n=4), and Westmeath (39%, n=11). County Fermanagh is the only county where all waterway sites have been surveyed for at least two years of the scheme's operation (n=10 waterway sites) while four counties (Armagh, Cavan, Kerry and Laois) have only one waterway site surveyed once during the entire duration of the monitoring scheme. We need to survey these single sites, so if you know of any volunteers that might like to take on an old waterway site, please do encourage them.

This is the 14<sup>th</sup> year of the All-Ireland Daubenton's Bat Waterways Survey, and the success of the scheme is down to our wonderful volunteers that consistently survey from year to year. Thank you.

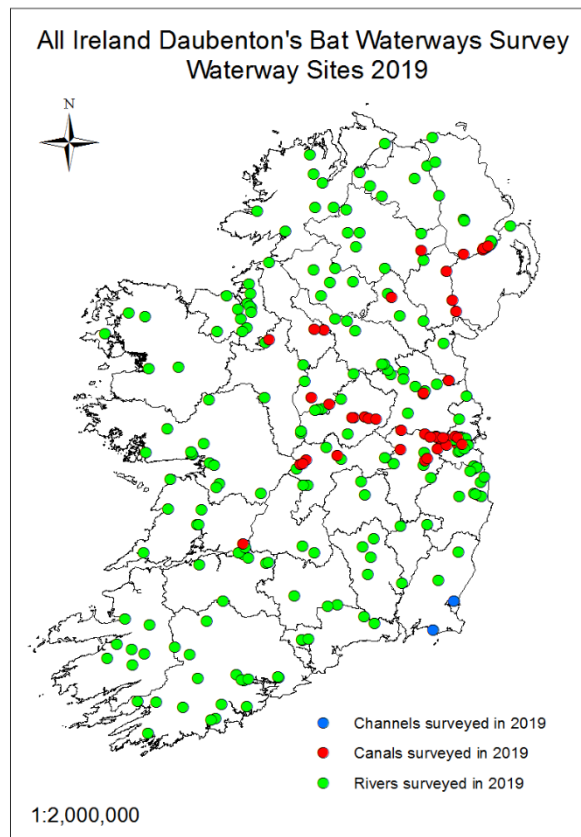


Figure 5: Different type of waterways surveyed in 2019 as part of the All-Ireland Daubenton's Bat Monitoring Scheme. Green circles = Rivers surveyed; Red circles= Canals surveyed; Blue circles = Channels surveyed.

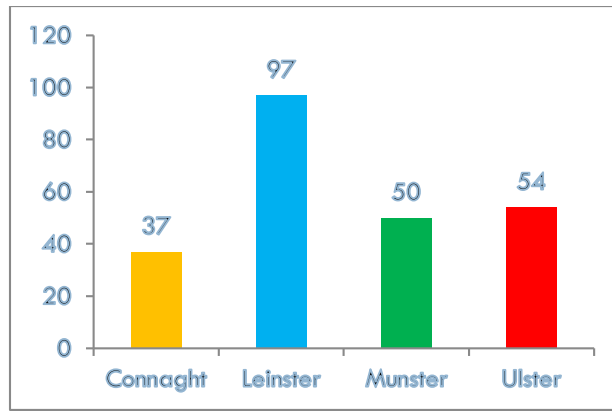


Figure 5.1: Number of waterway sites surveyed in each province in 2019 as part of the All-Ireland Daubenton's Bat Monitoring Scheme.

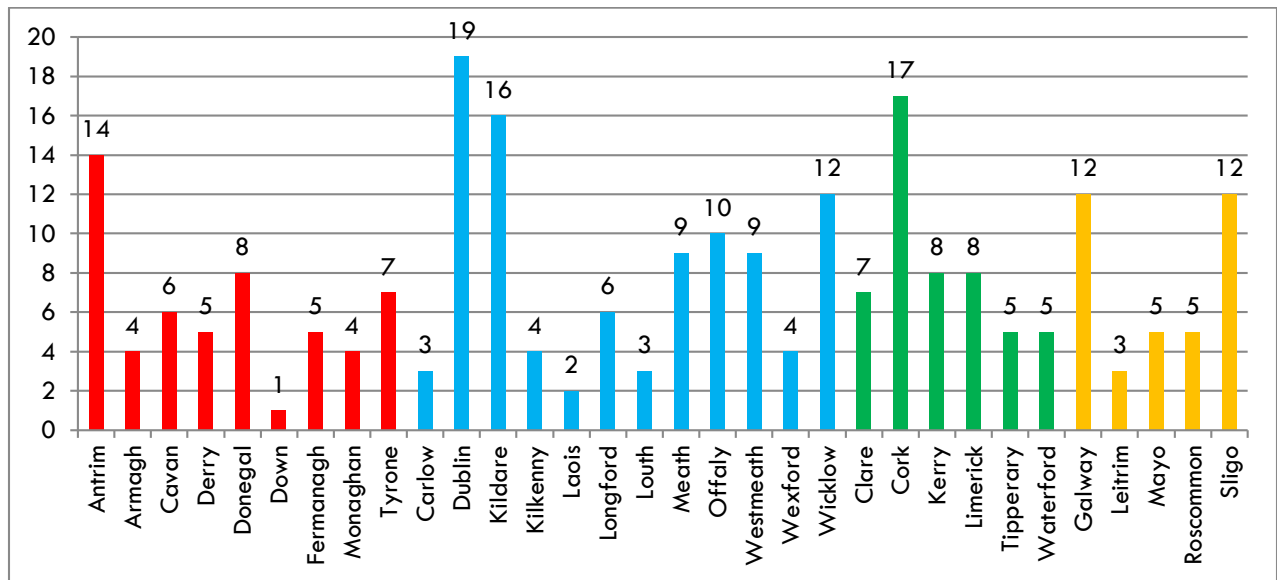


Figure 5.2: Number of waterway sites surveyed in each county in 2019.

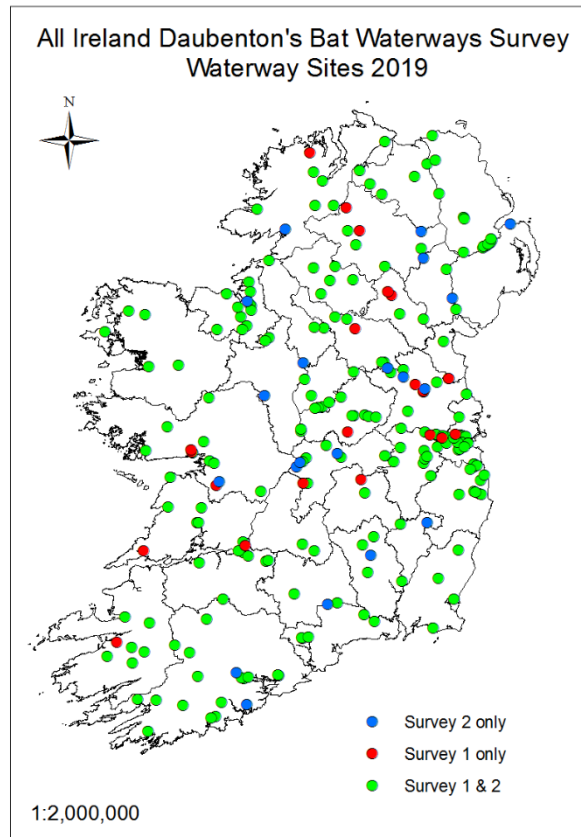


Figure 5.3: Waterways surveyed either twice (Survey 1 & Survey 2) or only once (Survey 1 only or Survey 2 only) in 2018 as part of the All-Ireland Daubenton's Bat Monitoring Scheme. Green circles = Survey 1 & Survey 2; Red circles = Survey 1 only; Blue Circles = Survey 2 only.

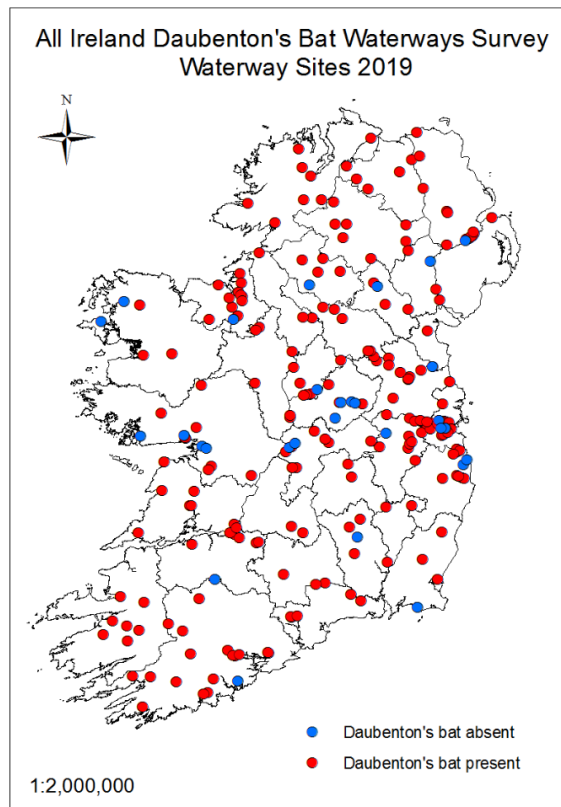


Figure 5.4: Location of waterways sites with Daubenton's bat recorded in 2019 as part of the All-Ireland Daubenton's Bat Monitoring Scheme. Blue circles: Daubenton's bat not recorded; Red circles: Daubenton's bats recorded.



Tina Aughney of Bat Conservation Ireland conducting Daubenton's Bat Waterway Survey Training for Dublin Bat Group

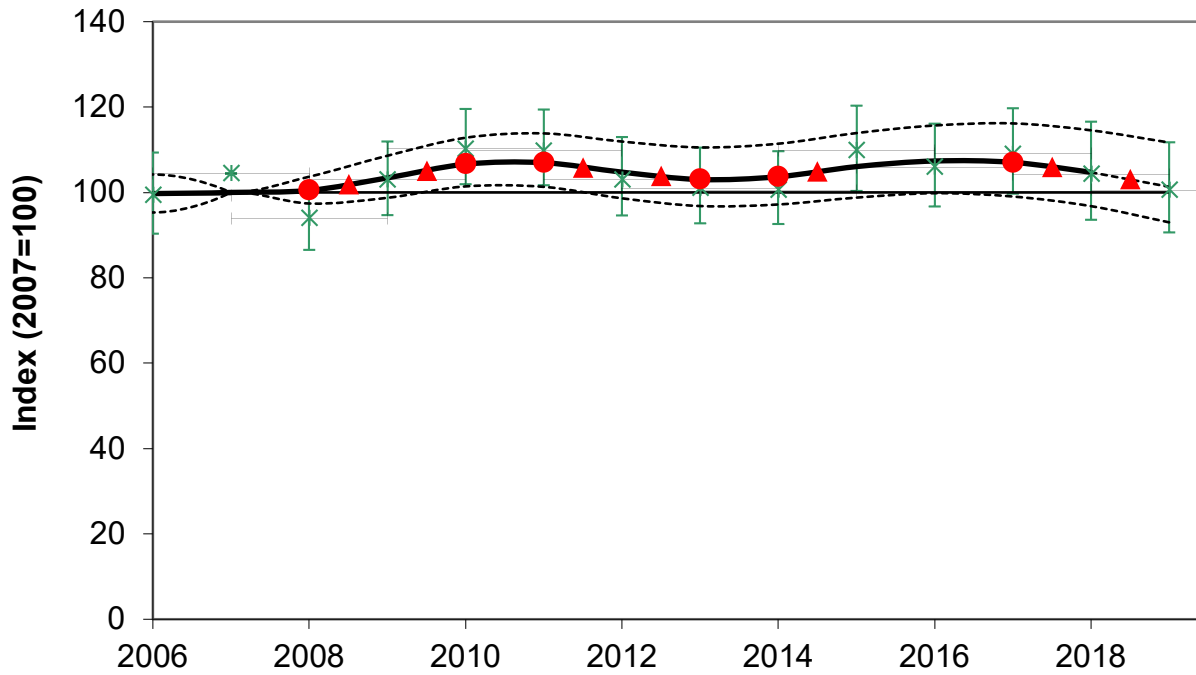


Figure 5.5: Results of Daubenton's bat Binomial GAM/GLM trend with covariates, for All-Ireland data. Green points are estimated annual proportions derived from the Generalised Linear Model (GLM) and the bars are bootstrapped 95% confidence limits. The black line is the fitted GAM curve with 95% confidence limits shown by the dotted lines.

### iii. Brown Long-Eared Bat Roost Monitoring Scheme 2019

Forty-three building roosts were surveyed in 2019, 31 of which were monitored solely by volunteer teams and/or roost owners. One new team participated in 2019. The coordinator also assisted surveying of four additional roosts and surveyed the remainder herself. In total, 42 volunteers, including three roost owners, participated in the monitoring scheme in 2019.

Kildare Bat Group, Dublin Bat Group, Wicklow Bat Group, Clare Bat Group, Cork County Bat Group and Galway Bat Group surveyed one roost each, while County Waterford group monitored three roosts. Brown long-eared roosts monitored in 2019 were distributed in 18 counties, with the highest number of roosts located in Counties Cavan (n=6), Cork (n=6), Galway (n=5) and Wicklow (n=5 each). One roost, verified as suitable for inclusion in 2018, was monitored again in 2019 (County Monaghan). A new roost was recorded in 2019 (County Limerick) and it will be assessed in 2020.

In 2019, the majority of roosts were surveyed by external Dusk Emergence Counts (n=36, 83.7%) while 7 roosts were surveyed by Internal Counts (Figure 6). A total of 95 external surveys and 15 internal counts were undertaken in 2019.

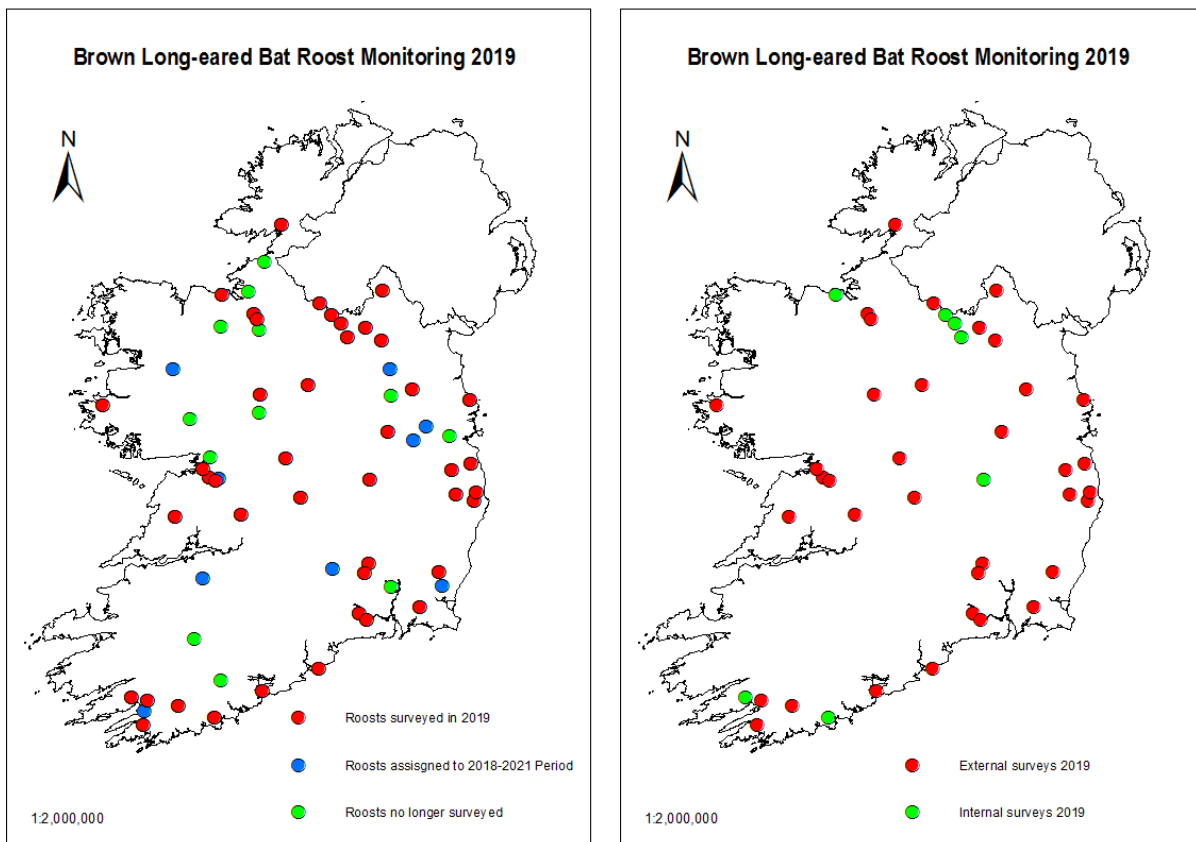


Figure 6. Brown long-eared roosts surveyed in 2019 as part of the Brown Long-eared Bat Roost Monitoring Scheme.

The buildings surveyed included churches, houses, agricultural barns, large buildings/houses and a category named “other” to represent two medieval towers and 12<sup>th</sup> century stone structure. The majority of the buildings surveyed were churches.

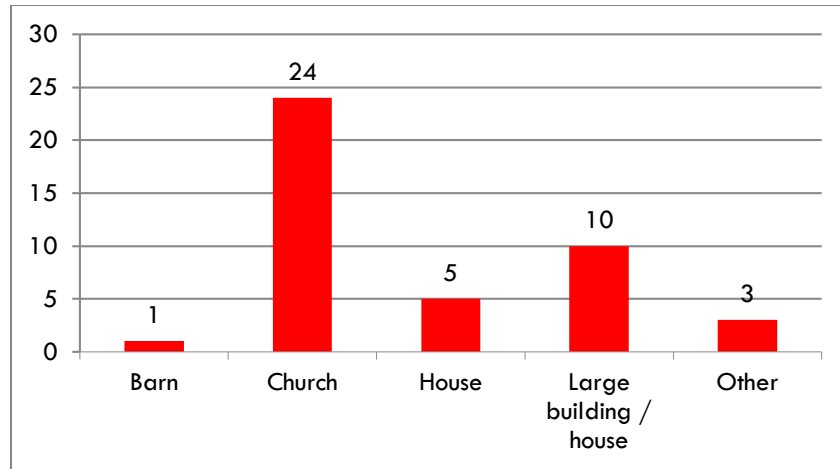


Figure 6.1. Type of buildings monitored in 2019.

In 2019, a total of 1,621 individual bats were counted in the 43 roosts monitored. The highest total over the thirteen years of the scheme was in 2017 (Highest = 1,823, n=47 roosts, 2017). The mean number of bats per roost in 2019 was 32.53 individuals and the median count was 29 individuals.

Citation: Aughney, T., Roche, N., & Langton, S. (2020) Irish Bat Monitoring Schemes: Annual Report for 2019. [www.batconservationireland.org](http://www.batconservationireland.org).

Citation: Aughney, T., Roche, N. & Langton, S. (2020) Irish Bat Monitoring Schemes: Daubenton’s Bat Waterway Survey & Car-based Bat Monitoring in Northern Ireland. Annual Report for 2019. [www.batconservationireland.org](http://www.batconservationireland.org).



#### iv. Lesser Horseshoe Bat Roost Monitoring Scheme in 2019

The lesser horseshoe bat monitoring scheme is also managed by Bat Conservation Ireland. As part of this, we coordinate roost and hibernacula counts, carried out in the west of Ireland, where the species is found. These are mainly done by National Parks and Wildlife Service (NPWS) Conservation Rangers with additional counts submitted by the Vincent Wildlife Trust. Each year surveyors complete counts of specific sites within their district. Surveys take place in summer from dusk and are carried out using bat detectors. Some sites are counted internally during daylight hours. The dates for surveying in summer are May 23<sup>rd</sup> to July 7<sup>th</sup>, although counts outside these dates are included in the overall trend series. Winter surveys are carried out in January and February each year. Records are sent to Bat Conservation Ireland for processing and the data is inputted to a MS Access database that was supplied by the National Parks and Wildlife Service (NPWS).

Bat Conservation Ireland carries out analysis of yearly trends. Although this species has increased considerably since the onset of monitoring in the late 1980s there are serious issues associated with roost deterioration across its range. This issue, combined with low genetic diversity and mixing between areas of the Irish population, means that the species is threatened by population isolation within its current range.

Additional work carried out as part of this scheme included a day seminar in February 2019 in Kenmare to meet the surveyors and discuss lesser horseshoe conservation and the monitoring scheme. Querying of the database was carried out in spring 2019 to provide the NPWS regions with a list of historical sites for resurvey. This was done in order to reassess the species' current distribution as many sites on the periphery of its range have not been surveyed in over a decade. The number of sites checked by the rangers increased considerably in 2019.



Bouchier's Castle, Co. Limerick in which a new lesser horseshoe bat roost was discovered in 2019 by Bat Conservation Ireland staff with the local wildlife ranger Ciara Powell.

#### **d. BATLAS 2020 in 2019**

BATLAS 2010 was undertaken in 2008-2009 to survey as many 10km squares across the island to determine the distribution of the four most common bat species: Leisler's bat, Common Pipistrelle, Soprano Pipistrelle and Daubenton's bat. Additional data on other Irish bat species were accepted from experienced bat surveyors. This was the first field-based study that used a standardised survey protocol developed by Bat Conservation Ireland. Surveying of the target species was conducted in each 10x10 km square using bat detectors. A species identification card was designed for the survey. BATLAS 2010 resulted in 71.6% of the island land mass being surveyed for bats and greatly added to the knowledge of bat distribution on the island.

This survey has now been repeated with BATLAS 2020 (2016-2018). We carried out over 35 training courses for BATLAS volunteers from 2016 to 2018. This level of citizen scientist participation was almost double that of BATLAS 2010. However, by early 2018 it was clear that we were falling short of target coverage, so for 2018, it was decided that more emphasis needed to be placed on ensuring the necessary number of squares would be covered. Therefore, just two training courses were carried out in early 2018 and for the remainder of the season available funds were instead diverted into surveying of areas with gaps in coverage with the help of paid surveyors. By the end of 2018, a total of 778 10km<sup>2</sup> squares (representing 77% of the island) were visited with a total of 3,373 survey sites were surveyed, which is almost double the number of sites surveyed for BATLAS 2010.

Additional surveying was undertaken in 2019 to seek data for 80 more 10km<sup>2</sup> squares to ensure that a minimum of 80% of the island was surveyed. Bat Conservation Ireland volunteers stepped up to the challenge and an additional 91 10km<sup>2</sup> squares were surveyed.



BATLAS 2020 volunteers from Kildare Bat Group.

The BATLAS Coordinator for the island, Dr Simon Pickett, was appointed in 2016 and he finished working on the project in early 2019.

### **BATLAS 2020 Results**

Thirty volunteers participated in the BATLAS 2020 survey in 2019 and data for a total of 248 discrete survey points were returned to Bat Conservation Ireland. This additional survey work resulted in Bat Conservation Ireland meeting their survey aims for BATLAS 2020, so a very big thank you to all of our surveyors.

Figure 7 depicts the total number of records gathered in 2019 for the four target bat species. Soprano pipistrelle was the most frequently recorded bat species in 2019 with 70% of the sites surveyed recording this species (n=173 sites). An additional 157 (63% of surveyed sites) records were submitted for common pipistrelle, 86 (35% of surveyed sites) additional Leisler's bat records and 68 (27% of surveyed sites) new Daubenton's bat records.

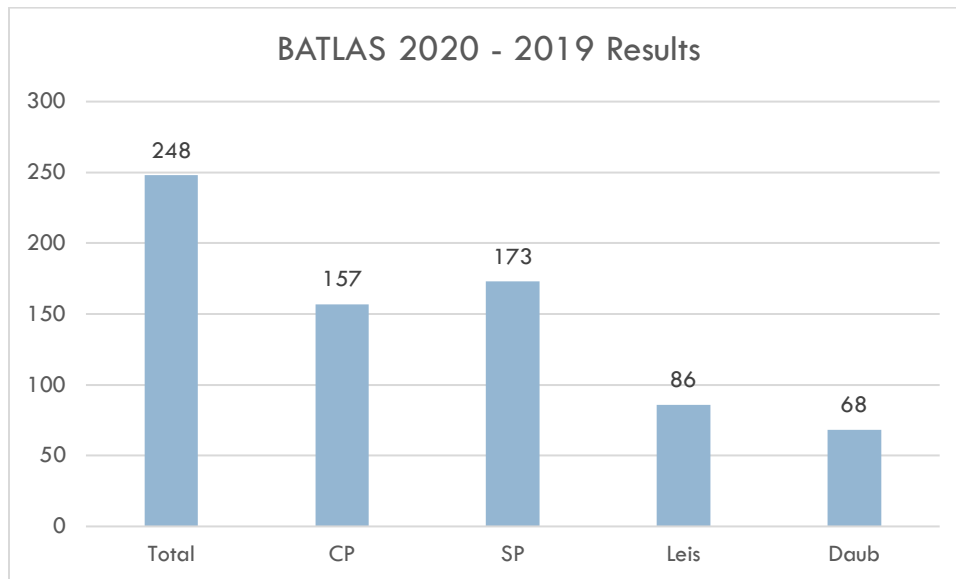


Figure 7. Total number of records for the four target bat species returned in 2019 (Total survey sites = 248).

Additional bat records were submitted for the following bats species: brown long-eared bat (n=13 records); Natterer's bat (n=3 records), whiskered bat (n=5 records), lesser horseshoe bat (n=1 record) and 25 records of *Myotis* species.

BATLAS 2020 has been running since 2015 when it was piloted and then this was followed by three years of intensive surveying. 2019 was a chance to fill in gaps in the survey map. As a consequence of BATLAS 2020, Bat Conservation Ireland received data for 3,621 discrete survey sites across the island of Ireland. The following maps depict the location of all of these survey sites with the 2019 survey sites shown in Red.

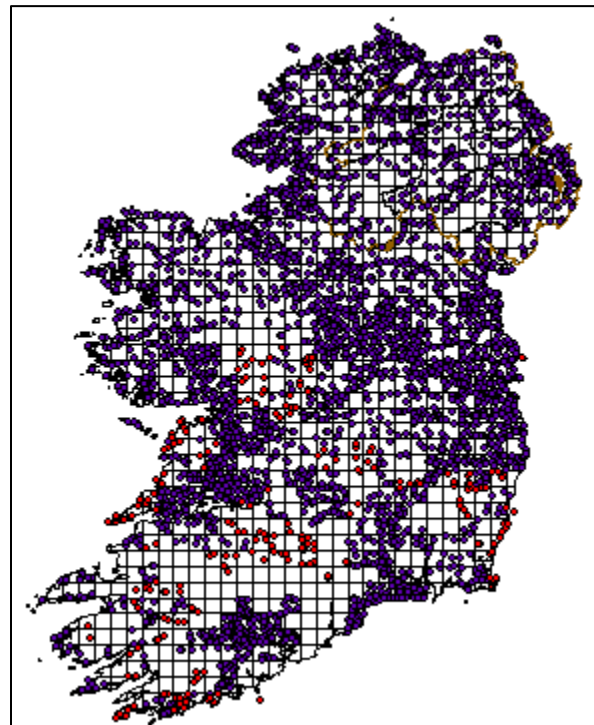


Figure 7.1: BATLAS 2020 survey sites (2015-2019 dataset). Red points indicated 2019 survey sites.

Table 4: Total number of records for BATLAS 2020 Target Bat Species and Non-Target Bat Species (2015-2019 dataset).

Target Bat Species	No. of Records (% of total survey sites)	Non-Target Bat Species	No. of Records
Common pipistrelle	1977 (55%)	Brown long-eared bat	134
Soprano pipistrelle	2465 (68%)	Natterer's bat	78
Leisler's bat	1304 (36%)	Whiskered bat	34
Daubenton's bat	1105 (31%)	Nathusius' pipistrelle	55
		Lesser horseshoe bat	14

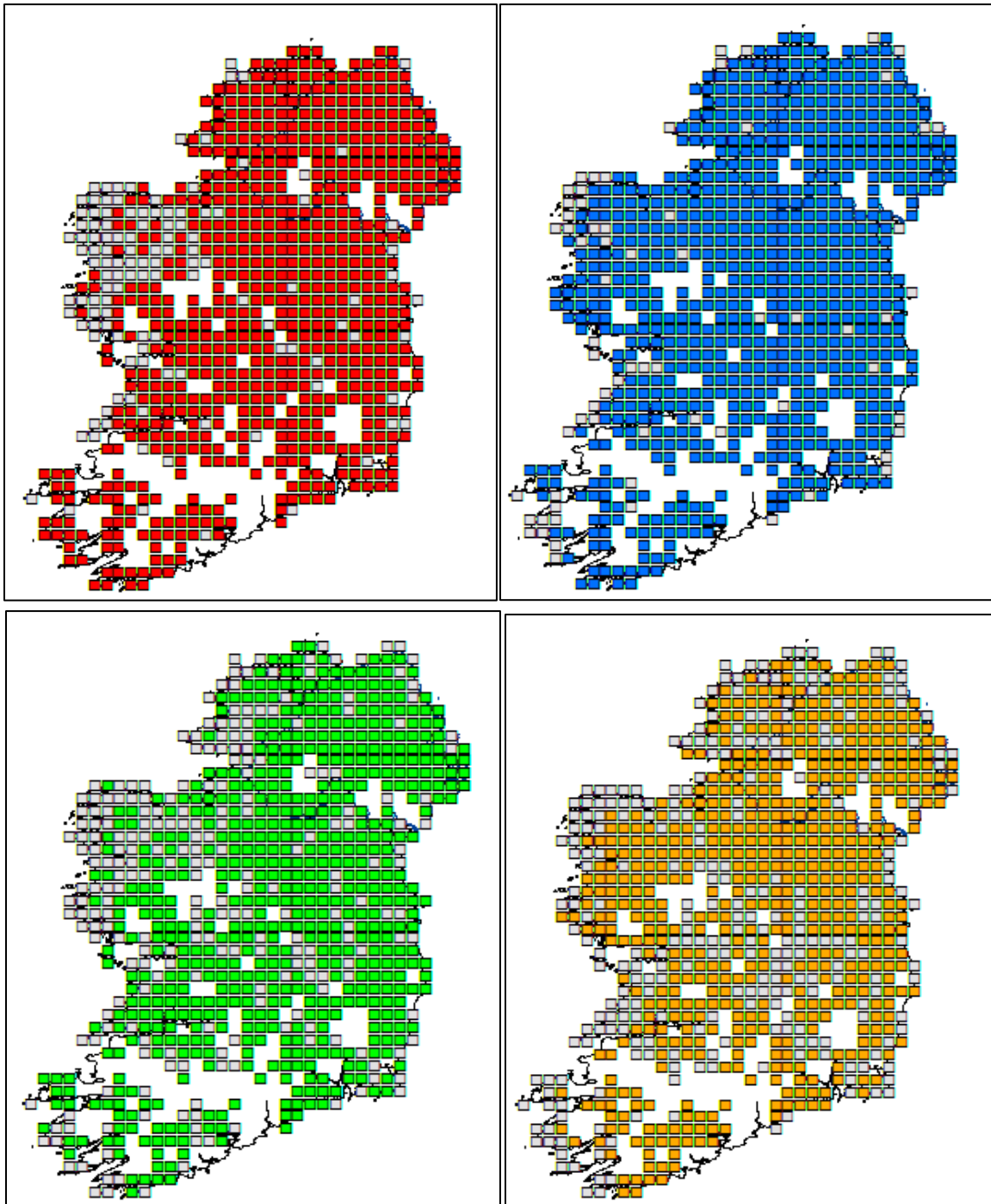


Figure 7.2: BATLAS 2020 10km distribution maps for the four target bat species: Red = Common pipistrelle; Blue = Soprano pipistrelle; Green = Leisler's bat & Orange = Daubenton's bat. Grey Squares indicate the 10km squares surveyed but no bat record for the specific bat species described was recorded.

Again, thank you to all of our BATLAS 2020 surveyors for making this a successful bat distribution survey scheme. See you in 2025 for the start of BATLAS 2030!

## 7. Key Events in 2019 for Bat Conservation Ireland

The first report for the Irish Bat Monitoring Programme (2018 - 2022) was compiled in spring 2019 and was submitted to the National Parks and Wildlife Service (NPWS) as part of the required reporting process for this contract in May 2020.

### Creation of Staff Roles in Bat Conservation Ireland

Considerable Bat Conservation Ireland Council time was spent in the early months of 2019 on the proposal to change working arrangements in the organisation to PAYE and to recruit and employ an administrator. PAYE was implemented in January 2019 and interviews for an administrator was undertaken in March 2019. The new administrator was appointed in May 2019. This allows Bat Conservation Ireland to put more resources against ensuring the organisation is compliant with the Charities Acts and associated increase in administration reporting requires.

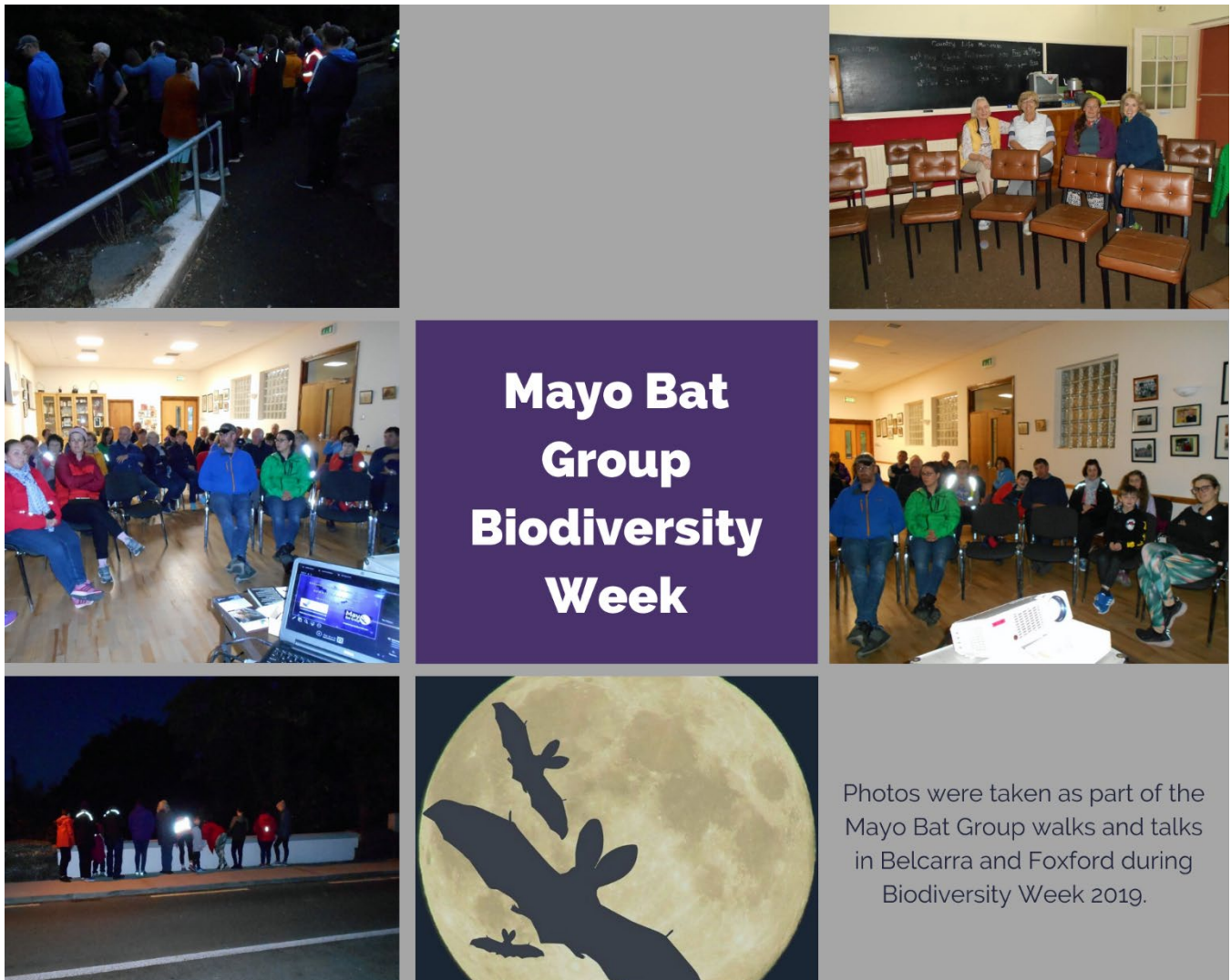
It also provides the opportunity for the Irish Bat Monitoring Programme Managers to devote their time solely to the important work of bat conservation in Ireland.

### Biodiversity and Heritage Week 2019

Bat walks and talks have become cornerstone events of Biodiversity Week and Heritage Week. It is great opportunity for members of the public to experience the nocturnal and auditory world of bats. A large number of events were organised across the country for Biodiversity Week. Bat Conservation Ireland would like to thank all of the bat groups and leaders that organised and hosted such events. We would also like to thank the Irish Environmental Network (IEN) through which we received funding for these events. In addition, numerous events were also hosted during Heritage Week with thanks to local county councils for funding. Of the 29 bat walks and talks hosted in 2019, most were organised for Biodiversity Week and Heritage Week.



Participants at the Bat Walk, Rossmore Park, Co. Monaghan as part of Biodiversity Week in May 2019



Photos were taken as part of the Mayo Bat Group walks and talks in Belcarra and Foxford during Biodiversity Week 2019.

Participants at the bat talks organized in Belcarra and Foxford by Mayo Bat Group where the Common and Soprano Pipistrelles and Daubenton's bats were detected. *'I couldn't believe how many Pipistrelle bats we detected and saw this evening. We were bitten to pieces by the midges, but what a fantastic display the bats gave us'* – Mary Roberts, Mayo Bat Group

### **Bat Group Bat Walks, Talks and Other Events**

Limerick Bat Group held a number of Education and Outreach Events in 2019, which included bat walks and talks held in the grounds of Curragh Chase Forest Park in conjunction with An Taisce Living Limerick and one very well attended event held in conjunction with Coillte, which was attended by approximately 400 children. They also carried out a bat walk for Heritage Week to explore the 'Bat Life of Curragh Chase. They carried out workshops with Youth Reach groups on building bat boxes and linked in with local Men's Sheds, who made up bat boxes and kits, which were then assembled in schools and by community groups. They held workshops and training for Tidy Towns groups across Tipperary and worked with community and Tidy Towns groups and provided advice on plans for enhancing habitats for bats in communities. This input was included in the Tidy Towns 3-year plans. They also carried out a number of school visits, giving talks about bats.

### Culture Night at the Museum, Museum of Natural History

Kildare Bat Group and Bat Conservation Ireland showcased all the best learning about bats at a Culture Night Event in the Museum of Natural History in Dublin. Bat specimens, bat poop, bat detectors, recordings of bats, posters, presentations and a colouring station were set up to engage people and children in the wonderful world of bats. The night was a great success with approximately 300 people coming through the museum in 2.5 hours.



**Kildare Bat Group**



**Culture Night at the Museum of Natural History**



Photos were taken on Culture Night, 20 September 2019 in the Museum of Natural History - Top Left are members of Kildare Bat Group

A collage of photos of Kildare Bat Group at Culture Night at the Museum in September 2019



## Conferences and Symposia

### National Biodiversity Conference

Ireland's first National Biodiversity Conference was held in Dublin Castle 21 and 22 February 2019. Tina Aughney was an invited speaker at the conference, and she presented a talk about Bat Conservation Ireland's work with citizen scientists. Tina Aughney and Niamh Roche also (wo)manned a stand in the exhibition centre during the two-day conference, raising awareness of the work of Bat Conservation Ireland.



National Biodiversity Conference delegates 2019

### All Ireland Mammal Symposium

The All-Ireland Mammal Symposium, held at All Hallows College, Drumcondra, Dublin ran over three days from 22 to 24 of November 2019. Niamh Roche presented a talk on '*What are the consequences of a warming climate for common bat species in Ireland?*', the results of several years of research using data collected from the Car-based Bat Monitoring Scheme and weather data provided by Met Eireann.

## Seminars

A one-day seminar on Lesser Horseshoe Bats was held in Kenmare on 28 February 2019. Delegates were mainly National Parks and Wildlife Service (NPWS) and Vincent Wildlife Trust (VWT) staff who carry out the lesser horseshoe bat monitoring counts in summer and winter. Niamh Roche presented results of the Lesser Horseshoe Bat Monitoring Scheme which is managed by Bat Conservation Ireland.



Delegates at the lesser horseshoe bat seminar in Kenmare February 2019

### Symposium on the Protection of the Night Sky

In November 2019, Dr. Tina Aughney made a presentation at the 14<sup>th</sup> Symposium on the Protection of the Night Sky, as part of the May Dark Skies Festival titled– ‘Artificial Light at Night and Minimising Impacts of Lighting Schemes’, based on research carried out by her, Dr. Niamh Roche and Dr. Ferdia Marnell.

Bat Conservation Ireland also had an information stand at the symposium, which ran over 2 days, an important audience to engage with and raise awareness about how artificial light affects bats.



Bat Conservation Ireland Stand at the Symposium on the Protection of the Night Sky, November 2019

## Conservation Projects

Dublin Bat Group were delighted to be able to undertake some surveys of the Fernhill Park in Stepaside, Co. Dublin before it was fully open to the public in 2019. The site has a number of old outbuildings (the main house is illustrated below) as well as numerous veteran trees. The initial surveys identified at least three species of bat using the site including Leisler's bat, Common pipistrelle bat and Soprano pipistrelle bat. One of the buildings was found to support a small Soprano pipistrelle roost. As part of the survey of Fernhill, the group also scoped out a number of mature trees to be surveyed in 2020 as part of a new project the group has started. Tree roosts are notoriously hard to find given the transient nature of bats (Leisler's bats can move between trees roosts every couple of nights!) and usually require a tremendous amount of survey effort to find. Radio tracking is one of the best methods for finding tree roosts but this requires the use of very expensive equipment and a lot of man hours! Inspired by Henry Andrew's work on tree roosts in the UK (<http://battreehabitatkey.co.uk/>) the DBG decided that one of the groups aims going forward would be to try and find more tree roosts in the Dublin area, starting with some of the trees at Fernhill. In late 2019 the group scoped out a number of trees in Fernhill Park that they planned to survey on a monthly basis in 2020 and beyond. Surveys are undertaken using an endoscope and under licence from the NPWS (tree survey method illustrated in Plate 3, below). The overall aim is to build up a database of tree roosts in the Dublin area. This is only the very beginning of a project that will hopefully grow year on year. Dublin Bat Group are looking forward to undertaking many more surveys at Fernhill in the coming years, this site is very likely to throw up some nice surprises in the future.



Fernhill House and grounds being surveyed by Aoibheann Gaughran and Kevin Delahunty using an endoscope to potentially identify tree roosts

### Dublin Zoo and the All-Ireland Nathusius' Pipistrelle Bat Project

As part of the All-Ireland Nathusius' Pipistrelle Bat project, members of Dublin Bat Group participated in harp trapping of bats (under licence from the National Parks and Wildlife Service) in Dublin Zoo on 12th September 2019. The Nathusius' Pipistrelle bat is a relatively poorly understood species in Ireland, with relatively little knowledge on the status of the Irish population or its ecology. It has often shown an affinity to habitats in the vicinity of large water-bodies, and Dublin Zoo was selected as a trapping location due to the presence of two large artificial ponds in a sylvan setting. This elusive species has been recorded in the Zoo and around Phoenix Park on bat detectors on several occasions. Although no Nathusius' Pipistrelle Bats were caught by Dublin Bat Group on this occasion, members gained valuable trapping and handling experience under the guidance and expertise of Paul Scott.



Corey Cannon & Paul Scott of Dublin Bat Group with harp trap, Dublin Zoo

## Research Projects

### **COST Action Network: Climbats**

Niamh Roche of Bat Conservation Ireland was invited to participate on a European COST Action Network Bats and Climate Change (CA 18107 Climate Change and Bats: From Science to Conservation).

Niamh attended the first meeting of the Action in Brussels on 26<sup>th</sup> February 2019. At the meeting Niamh was elected as Vice Chair of the Working Group on Bat Monitoring (Working Group 2).

This Action aims to bring together bat researchers, academics, NGOs and others to examine how climate change affects bat distribution in Europe and how this is likely to impact on the ecosystem services that they provide.

<https://climbats.eu/>

As part of the action, Bat Conservation Ireland has already contributed over 50,000 Irish bat records and these data, along with thousands of other bat records from across Europe, will enable modelling of bat occurrence and climate. WG2 is assessing possible methods for monitoring changes in bat phenology (timing of life events) at a Europe-wide scale.

The second meeting of the Action took place in Granollers in Catalonia in November 2019.

- **Climate Change and Bats and Toads**

Queens University Belfast (Dr. Neil Reid) with Bat Conservation Ireland as a partner, were awarded a tender for a project on '*An Assessment of the Impact of Climate Change on Natterjack Toad and Bat populations*'. This project is ongoing.

- **Bats and Ecosystem Services**

University College Dublin (Prof. Emma Teeling) with Bat Conservation Ireland as a partner, submitted a proposal for Environmental Protection Agency (EPA) Research funding on '*Irish Bats and Ecosystem Services*'. The proposal has been approved in principle, subject to funding availability. This project will include research by a PhD and Masters student and a citizen science element that will be coordinated by Bat Conservation Ireland.

## Consultations

Bat Conservation Ireland contributed to the recent update of Northern Ireland's '*Priority Species for Conservation*' in December 2019. Niamh Roche was among the mammal specialists asked to contribute to the process. All bats have now been reinstated on the Priority Species list.

### **BATLIFE Europe**

Ms. Donna Mullen, representing Bat Conservation Ireland is a Trustee on the BATLIFE Europe committee. In 2019, Donna attended 5 meetings of BATLIFE Europe and she worked on the campaign around Derogation Licences in Europe and advocating for a centralised portal which informs the public about derogation licenses issued, species affected and monitoring results. This campaign is ongoing.

## 8. Communications

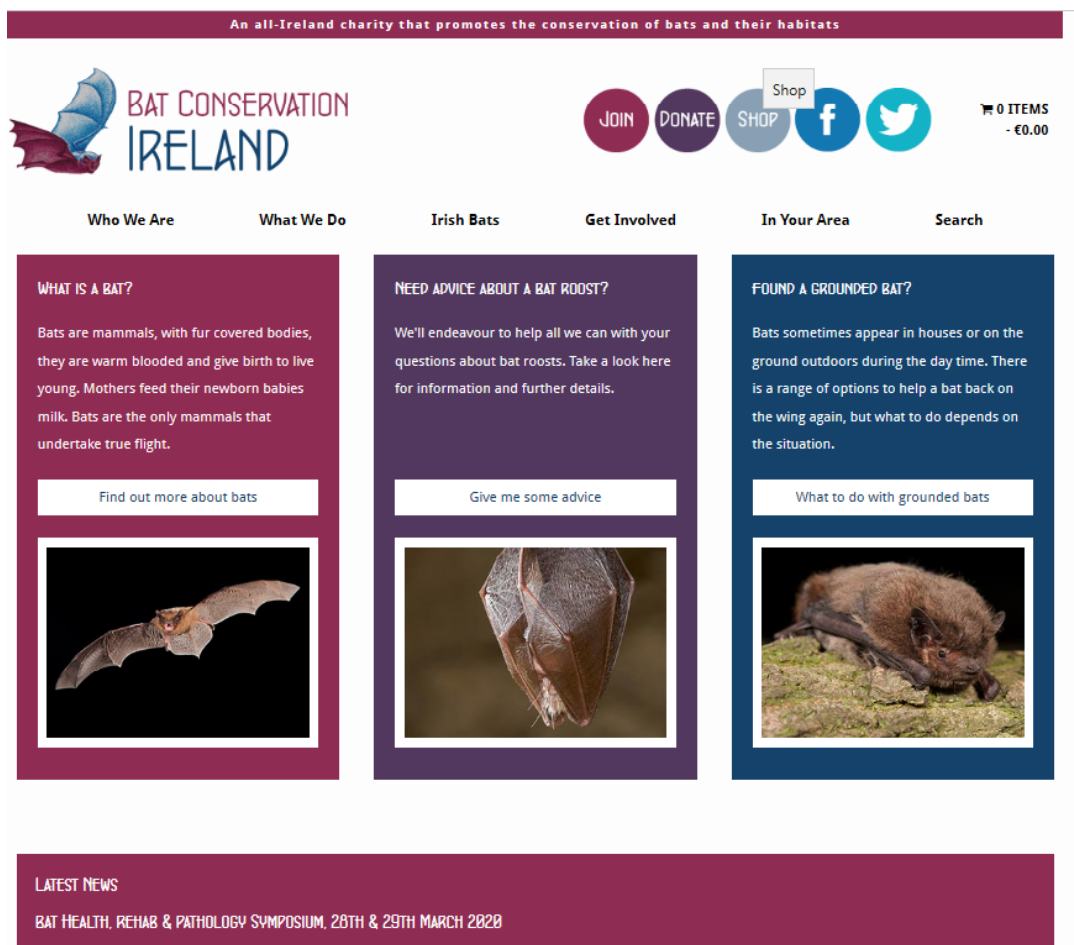
### Website

Bat Conservation Ireland current runs two websites:

[www.batconservationireland.org](http://www.batconservationireland.org); and

[www.learnaboutbats.com](http://www.learnaboutbats.com)

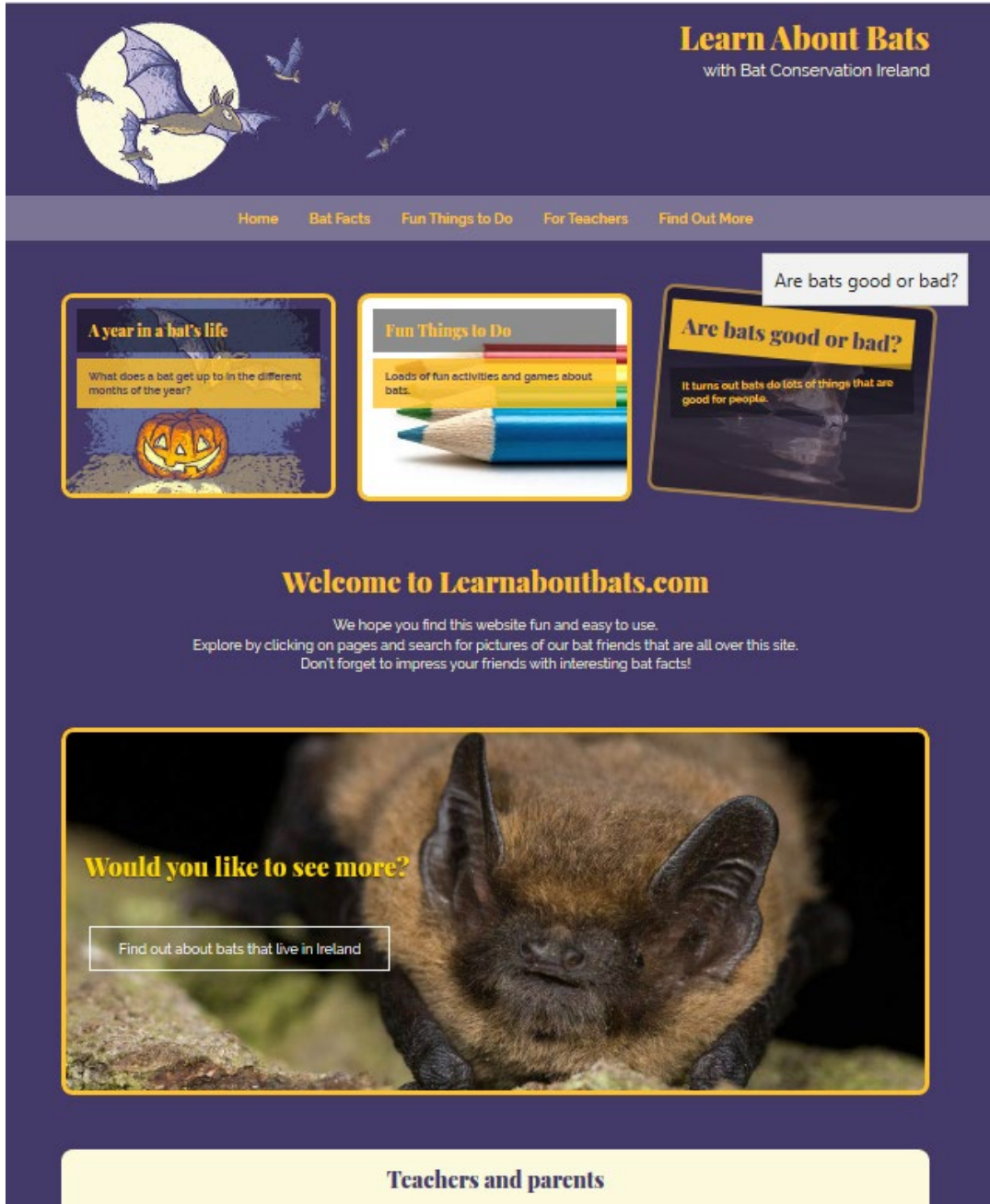
The Bat Conservation Ireland website is a leading resource for the public looking for information on bats in Ireland. In 2019 the website had approx. 115,000 visits during the year, 89,378 of these visits are unique page views. This works out at approximately 244 visits per day. Website visits peaked during the months of July, August and September, which is when bats are most active and shows us that the Bat Conservation Ireland website is a very useful resource for the public, looking for information on bats, what to do if they have found a grounded bat and researching further information on bat species.



Screenshot of the homepage of Bat Conservation Ireland's website



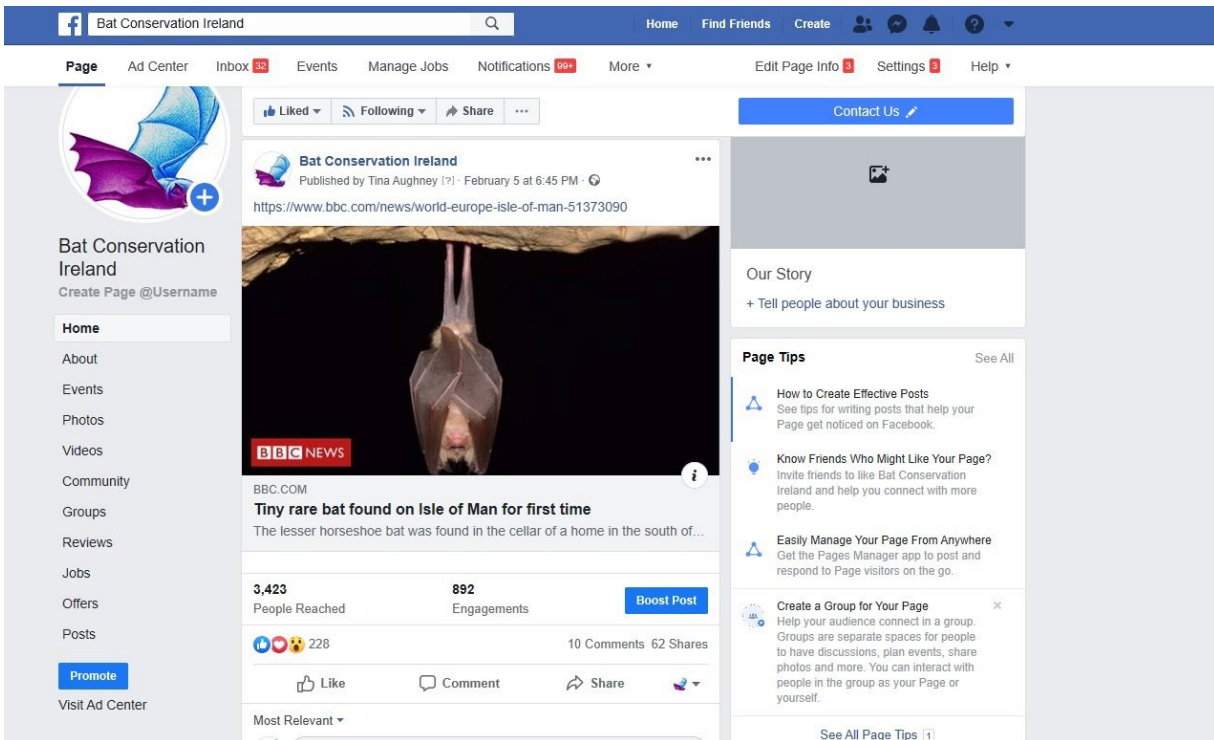
The Learn about Bats website was developed as a resource for children to help them learn more about bats and why they are so important for our environment. This site had approx. 16,000 visits in 2019, 13,244 where unique page views, which works out at an average of 36 visits per day. Visits to the site peaked during October and November, which links in with the Hallowe'en holiday and when children may be learning more about bats in school and generally around this time of year.



Screenshot of the homepage of Learn About Bats website.

## Social Media

Bat Conservation Ireland has a very popular Facebook page with 6,499 likes and 6,530 followers at the 31 December 2019, an increase of 875 likes and 906 followers throughout the year. This worked out at an average of 2.4 extra likes and 2.5 followers per day over the past year. An important point to note is that these likes and followers are all organic and come directly from the volunteer opportunities and work of Bat Conservation Ireland. Our Facebook Page is used to post bat related news both Irish and International, to promote training courses and events, advertise Bat Conservation Ireland reports and guidelines, answer bat related questions (through our private messaging service) and lobby for policy support.



Screen grab from the Bat Conservation Ireland Facebook page sharing information about the first Lesser Horseshoe Bat to be found on the Isle of Man.

The BATLAS 2020 Facebook page had 739 likes and 747 followers at the end of 2019, which is a growth of 24 and 526 followers respectively. This social media outlet is used to post BATLAS 2020 news, to promote training courses and events, advertise reports and guidelines.

Irish Car Bat Monitoring Facebook page had 211 likes and followers at the end of 2019, an increase from 46 respectively from 2018. This page is used to primarily promote this scheme and keep volunteer surveyors in touch with its progress.

Bat Conservation Ireland also has a Twitter account which is used regularly. It proved to be a very suitable medium to prompt discussion during the year. @BatConservIre. It currently has 2,545 followers.

Between all of our social media accounts, we have an audience of approximately 10,000. This is a very powerful way of getting batty messages out there.

## Bat Conservation Ireland Newsletters, Publications and Guidelines

### Newsletter

In 2019, Bat Conservation Ireland produced two editions of ‘The Natterer’ Newsletter. The newsletter is sent out to all the members of Bat Conservation Ireland and updates the members on what we have been doing as an organisation, what the Bat Conservation Ireland volunteers and Bat Groups have been doing, general interest articles, such as ‘Gardening for Bats’ and keeping the members informed of important upcoming events.



Copy of the Front Page of ‘The Natterer Newsletter’ Autumn Edition 2019.

### **Monitoring Reporting**

Bat Conservation Ireland submits annual reports to funding bodies in relation to monitoring schemes. These reports are available on the website for downloading or contact [info@batconservationireland.org](mailto:info@batconservationireland.org). The first report from the 2018-2022 contract period was submitted to the National Parks and Wildlife Service in Spring 2019. This report covered the first year of the Irish Bat Monitoring Programme.

### **Publications**

Bat Conservation Ireland contributed Irish bat trend data to the recent publication 'UK State of Nature 2019' which was published by the RSPB (Hayhow et al. 2019, The State of Nature 2019. Royal Society for the Protection of Birds).

## 9. Working with other Groups

Donna Mullen, Bat Conservation Ireland member, represents Bat Conservation Ireland on the Environmental Pillar. Tina Aughney occasionally attends meetings on behalf of Bat Conservation Ireland.

### Working with IEN Groups

Donna Mullen, Bat Conservation Ireland's IEN representative, former Council member and member of the Meath Bat Group undertook an array of work with the IEN in 2019:

- Attended 4 IEN Pillar Steering Committee Meeting
- Voted on behalf of Bat Conservation Ireland
- Provided input into agricultural policies; work which is ongoing
- Input into Symposium for Farming and Biodiversity, organized by the Environmental Pillar and Birdwatch Ireland
- Was Part of an IEN Delegation to the Headquarters of the European Parliament

Brian Keeley, Chair of Bat Conservation Ireland, was also part of the IEN delegation to Brussels in October 2019. Issues raised during the visit by both Bat Conservation Ireland representatives were of the concerns around wind energy and bat fatalities and that the number of fatalities were actually greater than our European colleagues were led to believe. The group presented their concerns about ongoing pollution and environmental threats in Ireland and the range of problems that environmental groups face in tackling environmental concerns. Bat Conservation Ireland also raised this issue of information on derogation licences for both species and habitats.

Additionally, Donna wrote a handbook for bat groups for taking cases to Europe under the Habitats Directive.

Bat Conservation Ireland works with a number of IEN members. In 2019, we carried out training and bat-related events with numerous groups e.g., participating in the WILD event, held at the Sonairte Visitor Eco-Centre, Co. Meath. Bat Conservation Ireland and the local bat groups team up with local group to host training courses, bat walks and bat talks regularly (Please see appendices for list of events held).

Bat Conservation Ireland has a close working relationship with the Vincent Wildlife Trust (VWT). We have promoted their work on our social media and in our newsletters and Kate McAney of the Vincent Wildlife Trust gave a keynote presentation at the Bat Conservation Ireland AGM on 'Farm Plans for Lesser Horseshoe Bats' in December 2019.

### Working with Non-IEN Groups

Bat Conservation Ireland works closely with the National Biodiversity Database Centre (NBDC) based in Waterford in relation to the Bat Database.

All Irish Bat Monitoring Programme records collated by the car-based and the waterways survey were submitted to BCT, UK, CeDAR and NIEA, Northern Ireland.

Records were also submitted to NPWS and CeDAR as part of Article 17 processes.

Bat Conservation Ireland is an affiliated member of BatLife Europe. BatLife Europe is an international non-governmental conservation organisation built from a partnership of national bat conservation organisations that are committed to promoting the conservation of all bat species and their habitats throughout Europe. Ms. Donna Mullen was voted in as a Trustee in August 2017 and in 2019 attended meetings on behalf of Bat Conservation Ireland.

Bat Conservation Ireland worked with the following groups in 2019:

- Abbeyleix Bog Project
- An Taisce
- Bat Conservation Trust, UK
- Bird Watch Ireland
- CEDaR, NI
- County Councils across the island (Cavan, Leitrim, Sligo, Donegal, Galway, Clare, Tipperary, Wicklow, Wexford, Dublin City, Fingal, Kildare, Laois, Offaly, Kilkenny, Ards & North Down Borough Council, Belfast City Council, Antrim & Newtownabbey Borough Council and Lisburn & Castlereagh City Council.
- Dark Skies Ireland & Friends of Mayo Dark Skies
- EUROBATS
- The Green Foundation Ireland
- The Heritage Council
- Irish Wildlife Film Festival, UCC
- Local Men's Sheds
- National Biodiversity Centre
- National Museum of Ireland, Natural History
- National Parks & Wildlife Service (NPWS)
- Northern Ireland Bat Group
- Northern Ireland Environment Agency
- Teagasc
- The Bat Lab, UCD
- Tidy Town Groups
- Scouts & Cub groups across the country
- Wexford Naturalists' Field Club
- Sonairte, as part of its 'WILD' Information Day
- Vincent Wildlife Trust



**Foxford Riverfest  
2019**

Bat walk and talk on 23rd August at 8:30pm  
Meet at St. Mary's Old Music School  
(Opposite Hope House)

Come and learn about these unique,  
elusive and fascinating creatures  
and then see and hear them on the River Moy  
using bat detectors!

 BAT CONSERVATION  
IRELAND

Please wear appropriate footwear and clothing  
All children must be accompanied by an adult

 Mayo  
Bat Group

Working with a local community group, Mayo Bat Group

## 10. Sustainable Development Goals

### Sustainable Development Goals

While the primary goals of Bat Conservation Ireland relate to bat conservation, the organisation is committed to achieving Sustainable Development Goals as defined by the document “Transforming Our World – The 2030 Agenda for Sustainable Development”. The following Sustainable Development Goals are the goals that Bat Conservation Ireland, through our day-to-day running, can target. However, there are elements of the individual targets that Bat Conservation Ireland are unable to realistically achieve.

#### **SDG 2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture.**

Bat Conservation Ireland promotes bats as a natural predator of agricultural pests and have partner with a number of Irish universities in relation to defining bats “Ecosystem Services”. Dr Niamh Roche is on a European working group working towards this.

Bat Conservation Ireland has worked with the Department of Agricultural in order to have bat box schemes as part of agri-environmental programmes and has provided training with Teagasc on such schemes.

#### **SDG 3 Ensure healthy lives and promote well-being for all ages.**

Bat Conservation Ireland, through volunteer activities, promotes well-being and encourages all age groups to become involved in bat conservation. Volunteering and participating in volunteer programmes, particularly, those that provide access to nature, is a promoter of well-being.

#### **SDG 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.**

Bat Conservation Ireland, through volunteer activities, promotes inclusiveness and aims to provide skills in order to undertaken wildlife monitoring. Participation in our monitoring programmes is often seen as a steppingstone to a career in wildlife and ecological professions and it is our aim to provide as many free training courses as possible to aid such career development.

#### **SDG 5 Achieve gender equality and empower all women and girls.**

Bat Conservation Ireland is an equal opportunities organisation.

#### **SDG 6 Ensure availability and sustainable management of water and sanitation for all.**

Bat Conservation Ireland promotes the use of bats as an environmental indicator of water quality, specially the Daubenton’s bat through the All-Ireland Daubenton’s Bat Waterways Survey.

#### **SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.**

Bat Conservation Ireland promotes and educates in the use of technology in relation to bat monitoring and surveying. We are keen to keep our members and volunteers astride with advances in bat surveying technology.



**SDG 10 Reduce inequality within and among countries.**

Bat Conservation Ireland encourages all members of the public to join bat events and monitoring programmes.

**SDG 11 Make cities and human settlements inclusive, safe, resilient and sustainable.**

Bat Conservation Ireland promotes the protection and safeguarding of cultural and natural heritage and works with groups across the island in relation to bats roosts in historic buildings. One of the organisations primary goals is the protection and conservation of bats, an important mammal group that represents ¼ of Ireland's terrestrial mammal species.

**SDG 12 Ensure sustainable consumption and production patterns.**

Bat Conservation Ireland aims for zero waste in its operation. For example, reduce, reuse and recycle is operated in the Bat Conservation Ireland office and minimum printing is undertaken for training courses etc. As much digital resources are provided and promoted to reduce paper usage.

**SDG 13 Take urgent action to combat climate change and its impacts.**

Bat Conservation Ireland recognises that bat monitoring requires volunteers to drive to survey sites. However, we encourage volunteers survey close to their home address in order to reduce travel and thereby fossil fuel consumption.

Bat Conservation Ireland are involved in a research project with Queens University Belfast '*An Assessment of the Impact of Climate Change on Natterjack Toad and Bat populations*'.

**SDG 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development.**

Bat Conservation Ireland recognises that all life is intertwined, and the protection / conservation is required of both terrestrial and marine life forms.

**SDG 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.**

One of the organisations primary goals is the protection and conservation of bats, an important mammal group that represents ¼ of Ireland's terrestrial mammal species. A healthy and varied ecosystem is required for the protection and conservation of Ireland's bat populations. Bats are a suitable environmental indicator of the state of our environment as it relies on many connected habitats within a diverse landscape.

Bat Conservation Ireland promotes the sustainable management of structures and buildings in order to protect known bats roosts and to provide bat roosts in the future.

Across Europe, the decline of bat species has been well documented. Bat Conservation Ireland is dedicated to protecting and conserving Ireland bat populations and undertakes extensive monitoring and conservation work in order to achieve this. The organisation works closely with government and non-government bodies to promote bat biodiversity loss and engages members of the public to be aware of bat conservation.

**SDG 16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.**

Bat Conservation Ireland is an effective, accountable and transparent organisation.

**SDG 17 Strengthen the means of implementation and revitalise the global partnership for sustainable development.**

Bat Conservation Ireland works with many partners for sustainable development.

## 11. Funding Acknowledgements

Bat Conservation Ireland would like to thank the following organisations for their financial assistance:

National Parks and Wildlife Service (NPWS)

Northern Ireland Environment Agency (NIEA)

Irish Environmental Network (IEN)

The following County Councils:

- Cavan
- Dun Laoghaire Rathdown
- Fingal
- Roscommon
- Tipperary
- Wicklow

Additionally, Bat Conservation Ireland would like to thank all of our members for their support in 2019 and to all those who generously donated to the organisation

## 12. Appendix 1.

No	Type	Person(s) Representing Bat Conservation Ireland	Date	Topic	Location	Wider Event
1.	Bat Box Scheme	Kildare Bat Group	12.01.19	Conservation	Newbridge Linear Park, Newbridge	Extension to existing scheme
2.	Bat Box Scheme	Kildare Bat Group	12.01.20	Conservation	College Farms Estate, Newbridge	
3.	Bat Box Scheme	Kildare Bat Group	January 2019	Conservation	Portlaoise Men's Shed, Portlaoise	
4.	Constructing Flat Pack Bat Boxes	Kildare Bat Group	January 2019	Education/Conservation	Abbeyleix Bog, Abbeyleix, Co. Kildare	
5.	Bat Talk	Dr. Caroline Shiel, in association with the Wexford Naturalists' Field Club	07.03.19	Education	Wexford Wildfowl Reserve, Pumphouse, Wexford	N/A
6.	Engagement Session - <i>How can we engage the public through citizen science Workshop</i>	Dr. Tina Aughney, Bat Conservation Ireland	21.02.19	Education	Dublin Castle, Dame Street, Dublin 2.	National Biodiversity Conference – New Horizons for Nature
	Bat Talk & Walk	Dr. Tina Aughney, Bat Conservation Ireland	20.04.19	Education	Belvedere House & Gardens, Mullingar, Co. Westmeath	N/A
7.	Bats and Caves Talk	Dr. Tina Aughney, Bat Conservation Ireland	21.04.20	Education	Leitrim	DCU Caving Club
8.	Presentation & Talk	Kildare Bat Group	29.04.19	Education	Kildare	AGM
9.	Bat Walk	Dublin Bat Group	April 2019	Education	Cabinteely Park, Cabinteely, Dublin 18.	Beavers Group
10.	Bat Box Scheme	Kildare Bat Group	April 2019	Conservation	Donadea Forest Park, Co. Kildare	
11.	'Tune Your Ears Back In' – Session on Listening to Bats	Kildare Bat Group	May 2019	Education	Carton House, Maynooth, Co. Kildare	
12.	'Tune Your Ears Back In' – Session on Listening to Bats	Kildare Bat Group	May 2019	Education	Carton House, Maynooth, Co. Kildare	
13.	Bat Talk & Walk	Mary Roberts, Mayo Bat Group	20.05.19	Education	Belcarra Community Centre, Belcarra, Co. Mayo	Biodiversity Week
14.	Bat Walk	Anna Collins, Kildare Bat Group	20.05.19	Education	Naas Community Library, Naas, Co. Kildare	Biodiversity Week
15.	Bat Walk & Talk	Brian Keeley, Meath Bat Group	21.05.19	Education	Trim Library, High St. Trim, Co. Meath	Biodiversity Week
16.	Bat Walk & Talk	Anna Collins, Kildare Bat Group	23.05.19	Education	Maynooth University Walled Gardens, Maynooth	Biodiversity Week
17.	Bat Walk & Talk	Mary Roberts, Mayo Bat Group	24.05.19	Education	Foxford Social Services, Church Street, Foxford, Co. Mayo.	Biodiversity Week
18.	Bat Walk & Exhibition of local Men's Shed Boxes	Anna Collins, Kildare Bat Group	25.05.19	Education	Abbeyleix Manor Hotel, Cork Road, Abbeyleix, Co. Laois.	Biodiversity Week
19.	Bat Walk	Anna Collins, Kildare Bat Group	26.05.19	Education	Confey College, River Forest, Newtown, Leixlip, Co. Kildare	Biodiversity Week
20.	Bat Walk	Dr. Tina Aughney, Bat Conservation Ireland	27.05.19	Education	Rossmore Park, Tullyard, Co. Monaghan	Biodiversity Week
21.	Bat Walk	Dublin Bat Group	27.05.19	Education	The Dropping Well, Milltown, Dublin 6.	Biodiversity Week

22.	Roost Count	Kildare Bat Group	21.06.19	Conservation	Bog of Allen Nature Centre, Lullymore West, Rathangan, Co. Kildare.	
23.	Bat Walk	Anna Collins, Kildare Bat Group	17.08.19	Education	Norebridge, Castletown, Churchfield, Co. Laois.	Heritage Week
24.	Bat Walk	Dr. Tina Aughney, Bat Conservation Ireland	19.08.19	Education	Mucknoo, Castleblaney, Co. Monaghan	Heritage Week
25.	Bat Walk & Talk	Mary Roberts, Mayo Bat Group	23.08.19	Education	St. Mary's Old Music School, Foxford, Co. Mayo.	Heritage Week
26.	Bat Walk & Talk	Anna Collins, Kildare Bat Group	24.08.19	Education	Water Gates, Linear Park, Newbridge, Co. Kildare.	Heritage Week
27.	Bat Walk & Talk	Karen Healy, Donegal Bat Group	24.08.19	Education	Swan Park, Buncrana, Co. Donegal	Heritage Week
28.	Bat Talk	Dr. Tina Aughney, Bat Conservation Ireland	07.09.19	Education	Sonairte, Laytown, Co. Meath.	WILD – Wildlife Information & Learning Day
29.	Bat Walk	Dr. Tina Aughney, Bat Conservation Ireland	13.09.19	Education	Athboy, Co. Meath	Heritage Week
30.	Showcase	Kildare Bat Group & Bat Conservation Ireland	21.09.19	Education	Museum of Natural History, Merrion Square, Dublin 2.	Culture Night
31.	Bat Walk	Dublin Bat Group	Sept 2019	Education	Fitzsimons Woods, Sandyford, Dublin	N/A
32.	Bat Walk	Dublin Bat Group	Oct 2019	Education	Cabinteely Park, Cabinteely, Dublin 18.	Beavers Group
33.	Sensory Experience Workshop for those with Sigh Impairment	Dr. Tina Aughney, Bat Conservation Ireland	23.10.19	Education	Drumcondra, Dublin 9.	Creative Ireland Pilot Programme
34.	Bat Walk - Halloween	Anna Collins, Kildare Bat Group	26.10.19	Education	K Club, Straffan, Co. Kildare	Halloween Events in K Club
35.	Bat Walk – Halloween	Anna Collins, Kildare Bat Group	31.10.19	Education	K Club, Straffan, Co. Kildare	Halloween Events in K Club
36.	Bat Walk - Halloween	Anna Collins, Kildare Bat Group	04.11.19	Education	K Club, Straffan, Co. Kildare	Halloween Events in K Club
37.	Presentation – <i>Artificial Light at Night: Minimising Impacts of Lighting Schemes</i>	Dr. Tina Aughney, Bat Conservation Ireland	04.11.19	Education	Mulranny House Hotel, Mulranny, Co. Mayo	European Symposium for the protection of the Night Sky
38.	Information Stand	Dawn Quinn, Bat Conservation Ireland	03.11.19-05.11.19	Education	Mulranny House Hotel, Mulranny, Co. Mayo	European Symposium for the protection of the Night Sky
39.	Presentation – <i>What are the consequences of a warming climate for common bat species in Ireland?</i>	Dr. Niamh Roche, Bat Conservation Ireland	23.11.19	Education	All Hallows College, Drumcondra, Dublin 9.	All Ireland Mammal Symposium
40.	Talk – Farm Plans for Lesser Horseshoe Bats	Dr. Kate McAney, Vincent Wildlife Trust	07.12.19	Education	Ardilaun Hotel, Taylor's Hill, Galway	Bat Conservation Ireland AGM