Vincent Wildlife Trust

Newsletter #13
December 2020

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Welcome

from Vincent Wildlife Trust's CEO, Lucy Rogers

Welcome to the 13th issue of our newsletter – and what an eventful year it's been!

Despite the gravity of the pandemic and its repercussions unfolding around us, VWT has weathered the storm well and finished the year in good shape. After the initial readjustment to work programmes, meetings and travel, we have made great progress this year in what is the first year of our Ten-Year Strategy.

With many of our plans on hold, very early on we decided to use the time normally spent out in the field as an opportunity to catch up with desk work, including developing some exciting new projects. I hope to share these developments with you in the future as new projects come on board.

One of our most successful projects, The Pine Marten Recovery Project, is in its final year and while end of project celebrations will have to wait until 2021, we have still made progress with a National Pine Marten Recovery Plan for Britain. Working in partnership with Scottish Natural Heritage, Natural England and Forestry England, this outlines a recovery plan for pine martens in Britain. The strategy will emphasise the importance of conserving the recovering pine marten populations in Scotland and suggest a road map of staged releases to a series of the most optimal regions in England and Wales in priority order, and in such a way that reintroduced populations have the highest probability of establishing, spreading and ultimately linking up. Look out for that in 2021.

Our volunteers too, were asked to engage with desk top activity, including analysing over 80,000 camera trap images from the Trust's European mink camera trap analysis project. The project was based in Spain and undertaken in October 2019 alongside partner organisation MITECO-Tragsatec from Spain. By June, with the help of 29 volunteers from England, Wales and Ireland who shared over 200 hours of their time between them, all 81,655 camera trap images had been analysed!

Then in July, as restrictions eased, staff were at last able to get out in the field and catch up in a number of areas, including catching up on our summer bat counts. Our bat reserves were also highlighted in an excellent programme transmitted this autumn — Inside the Bat Cave.

We recruited three new staff this year — Jane Abel took up the post of part-time 'Business and Administration Officer' in March 2020 after our Head of Finance, Angie Powell-Stevens, moved on to another role. Thankfully, Angie remains engaged with VWT to mentor the current Finance Team.

We appointed Dr Patrick Wright to work in the Conservation Team as a Senior Science and Research Officer to support the whole Conservation Team with experimental design, modelling, and feasibility studies. We also appointed a new

Volunteering and Community Engagement Officer, Laura Lawrance-Owen, in October after Gemma Fisher left us to pursue a new career direction.

We also sadly said goodbye to two long-standing Trustees, Sally Ford-Hutchinson and Matt Norman, who have both written about their time with VWT. While it is always sad to say goodbye to any of our team, we were very lucky to recruit two excellent new Trustees this year, Shelly Moledina joining with expertise in investments and Sarah Binstead with expertise in risk management and finance.

Finally, an enormous thank-you to all our staff, volunteers and Trustees who have worked so brilliantly this year to keep the show on the road.

Stop Press... Stop Press... Stop Press...

Bats at risk from climate change receive a helping hand

The site of western Europe's largest colony of greater horseshoe bats is just one of a number of bat roosts in England to benefit from vital new funding aimed at reducing the impact of climate change.

Vincent Wildlife Trust (VWT) has just been awarded £180,000 from the Green Recovery Challenge Fund to future-proof its greater and lesser horseshoe bat reserves. The roosts cared for by the Trust are used by around 50% of Britain's greater horseshoe bats and a significant proportion of our lesser horseshoe bats, so the potential impact of this funding on the future of our horseshoe bat populations is significant.

Bats play a vital role in a healthy ecosystem as they are natural pest controllers. They are also useful indicator species: eg, a drop in our bat numbers may indicate that all is not well in the insect world. Unfortunately, bats are also vulnerable to the extremes of weather associated with climate change. This comes on top of catastrophic declines in all of Britain's bat populations in the last century.

Rather than sitting back and watching the 20th century decline in our bat species unfold, Vincent Wildlife Trust set about acquiring, managing and protecting roost sites of the rare horseshoe bats and has continued to do so for more than 30 years. Helped by the Trust's expertise and its innovative roost management techniques, both horseshoe bat species have started to show good signs of recovery, but this could be reversed by the current climate crisis and the likely increase in frequency of extreme weather events.

During the milder and wetter winters more commonly experienced in recent years, bats will often remain in the cool areas of their summer roosts rather than heading for their winter hibernation sites. Unfortunately, summer roosts are often less well-insulated and offer less protection. As a result, the bats that remain are vulnerable to sudden cold snaps. More frequent cold and wet weather in the spring affects roosting and foraging conditions, reducing the birth rate and the survival rates of young bats. In addition, many roof spaces become uninhabitable for bats during hotter and drier summers.


Photo: ©Andrew McCarthy

By enhancing roosts using proven techniques such as the installation of hot and cool boxes to provide a range of stable microclimates, we can significantly reduce the negative impacts of climate change and so this funding could not have come at a better time to help us ensure the current recovery of our horseshoe bats is sustained.

In this issue

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A warm welcome to new VWT

Dr Patrick Wright
Senior Science and Research Officer

During my PhD interview, Henry Schofield, Vincent Wildlife Trust's Head of Conservation and PhD supervisor to be, asked me where I saw myself in ten years. I remember specifically saying that I wasn't driven by academia, but more by the conservation of threatened species through research. Who would have thought that six years down the line, I would be doing exactly that for Vincent Widlife Trust.
Indeed, I joined the Trust as the Senior Science and Research Officer amidst the lockdown frenzy in April 2020. My work with VWT, however, goes right back to the start of my PhD on the Bechstein's bat which was funded by the Trust. During my PhD at the University of Exeter, I tried to disentangle some aspects of this species' biology through the use of genetics and landscape modelling. After this, in 2018, I joined Fiona Mathews at the University of Sussex as a postdoc and worked on more bat projects, hedgehogs and even water voles! My role with VWT is mainly to assist the carnivore and bat programmes on different aspects of their research. Despite spending all my time working from home, I've been lucky enough to somewhat immerse myself into the life of pine martens, European minks, barbastelles, horseshoe bats and Bechstein's bats through my research. I look forward to contribute towards many more exciting projects with VWT.

Jane Able
Business and Finance Administration Officer

I joined the Trust in March 2020 as Business and Administration Officer just as the first lockdown started. Instead of a first day at the office, I had the office delivered to me in the form of a laptop and various necessary items of stationery. Despite this unusual start to my new role with Vincent WIldlife Trust, I was soon getting to know staff via email and virtual meetings, if not in person, as I dealt with various aspects of financial administration. I have worked for a variety of organisations within both the charity and retail sectors, including the NHS, but it is good to be working with an organisation focused on the conservation of threatened species and to make a contribution through my role. I am also looking forward to meeting every member of the organisation in person... one day!

Laura Lawrance-Owen
Volunteering and Community Engagement Officer

I joined Vincent Wildlife Trust (VWT) as Volunteering and Community Engagement Officer (VCEO) in September. Working as a volunteer and with volunteers has been a core part of my own experience and so I am excited to be working on a great volunteer programme, enabling people to get involved in mammal research and conservation.
I have a love of wildlife and the natural world and studied Zoology at the University of Liverpool. Since graduating, I have spent the last ten years volunteering and working in the wildlife conservation sector. I joined the RSPB as a warden intern to gain experience of conservation work in the UK. This led to other roles in the sector, including a year with Chester Zoo, Cheshire Wildlife Trust and rECOrd as a biodiversity trainee. I joined VWT after working as a Ranger for six years with the National Trust.

Staff and Trustees

Day-to-day, as VCEO, I have been co-ordinating our volunteering and community engagement behind the scenes, planning how we return to volunteering safely with COVID-19 and learning about volunteering with VWT.
I have been inspired when reading about different volunteer roles and projects, past and present, and visiting some of the project areas and VWT sites and getting involved with fieldwork has shown me how essential volunteers are to the success of VWT work. I am looking forward to working with a great team of staff and volunteers to deliver future projects for VWT.

Sarah Binstead
Trustee

I was very pleased to have been accepted onto the Board of Trustees last December and am not sure where the year has gone.

I was introduced to Vincent Wildlife Trust by my former boss who had worked with Lucy in the past and having had some conversations with David and Lucy, it was clear that there was real passion and commitment to the goals and aims of the Trust — and I wanted to be a part of that.

This is my first Trustee role so I am on a steep learning curve but, with help from the other Trustees, Lucy and Tim, I am finding my way.
My background is in finance, risk and control and, having qualified as a chartered accountant, I have spent my working life to date in the accountancy and financial services areas.
Looking back over my first year, I have heard about some wonderful work that is being done as well as future plans, all in support of the Ten Year Strategy. I know we all keep saying it, but it has been a strange year and the situation has had some impact on what the Trust wanted to do. Despite all this, people remain committed and keen to do what they can. I had been really looking forward to the site visit that had been planned for September and am keeping things crossed for next year so I can get out there and see what is being done firsthand.

Wishing you all a safe and well Christmas and here's to 2021.

Shelly Moledina
Trustee

I am thrilled to have been asked to join the Trustee team at VWT. I love being able to contribute to the wider community away from my day job of managing pension funds. I also have a keen interest in environmental conservation and in restoring the balance in nature, as well as wildlife photography.

VWT is in the first year of its Ten Year Strategy and I am very much looking forward to working with Lucy Rogers, the VWT team and the other Trustees to help it deliver on its strategy to support mammal conservation. I find VWT's aims to be ambitious but balanced, and I hope the impact we will be able to have in the coming years will be meaningful and very long lasting.
This is also my first Trustee role and I am on an extremely steep learning curve as I try and understand the work of and the possibilities for VWT, alongside finding the best way to use my voice and contribute effectively.
I have only been a Trustee for a few weeks and with the Coronavirus restrictions in place, my contact with the team and its work has been extremely limited. That said, the professionalism and passion of those I have encountered has been impressive and their willingness to answer questions and to share insight and experience has made my early days in this role really enjoyable.
I am looking forward to getting to know the team better and spending time in the field visiting bat reserves and pine marten habitats. I hope to grow my knowledge in mammal conservation alongside being able to contribute to the stewardship of the Trust in what promises to be an exciting and eventful time for VWT.

The 2019 All-Ireland Squirrel and Pine Marten Survey

Ruth Hanniffy, Species Conservation Officer – Ireland

Photo: ©Lizzie Croose

Citizen science was fundamental to the 2019 All-Ireland Squirrel and Pine Marten Survey, which was published this year, thanks to members of the public who submitted their sightings of red and grey squirrels and pine martens during 2019.

The 2019 All-Ireland Squirrel and Pine Marten Survey was published in June of this year and was made possible by members of the public who submitted their sightings of red and grey squirrels and pine martens across the island of Ireland during 2019. The project was led by NUI Galway in partnership with VWT, Ulster Wildlife, the National Biodiversity Data Centre and the Centre for Environmental Data and Recording in Northern Ireland. It was funded by the National Parks and Wildlife Service.

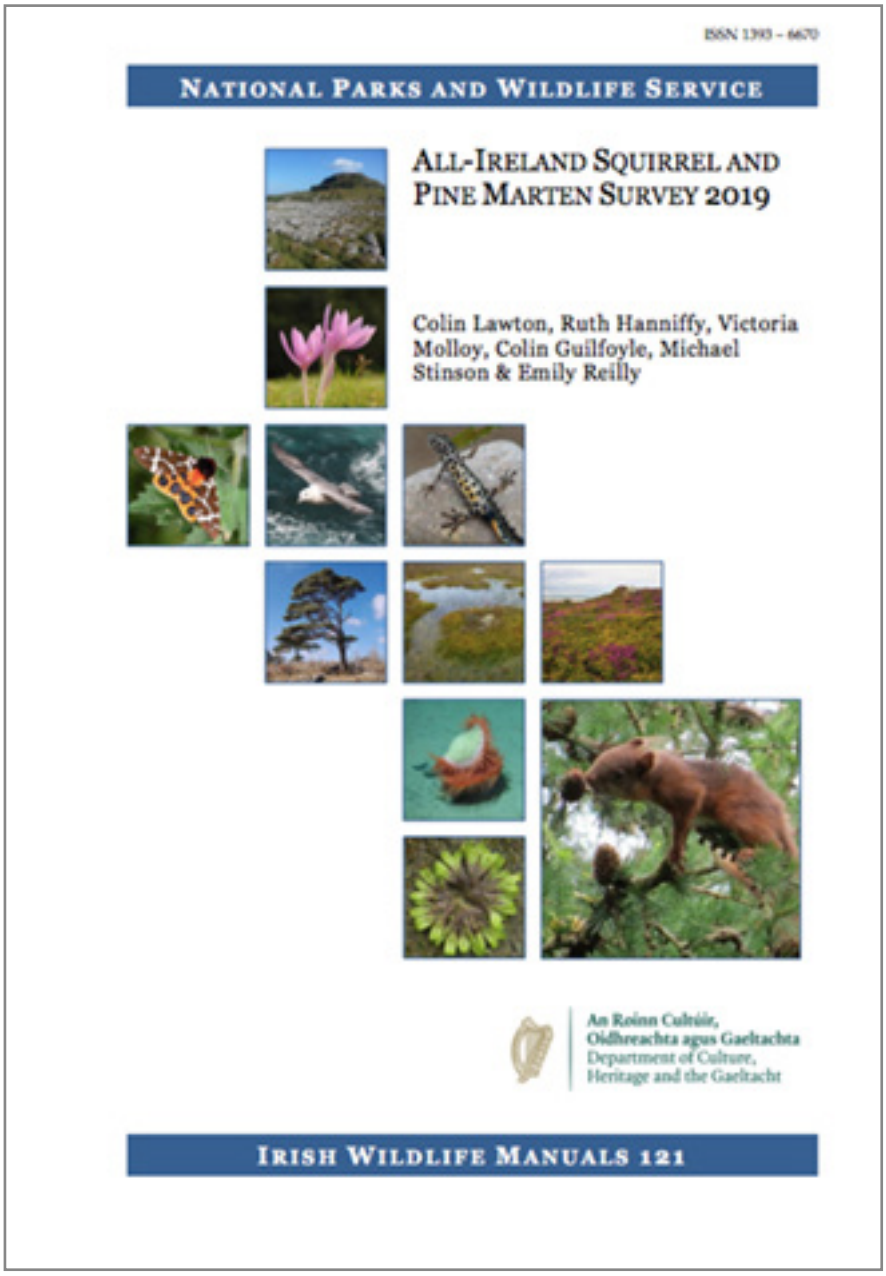
During 2019, promotional flyers and posters, newspaper ads, radio and television were used to encourage the public to submit sightings of these species. As with previous surveys, dedicated social media pages were set up and proved invaluable in communicating the ongoing results of the survey on a county by county basis. Updating participants as a survey progresses follows the Citizen Science principles and was a key component of the project. In areas of particular interest, for example the Midlands, grey squirrel sightings were likely, yet the species appeared to be absent. In these instances the team undertook dedicated searches, interviewed residents and used camera traps to confirm these absences. This was also the case for unusual outlier records and those at the frontiers of grey squirrel distribution. In other areas, non-invasive monitoring using hair tubes helped to provide records. In Northern Ireland, Red Squirrel Community Groups systematically monitored forests using trail cameras and squirrel feeders.

Red and grey squirrel distribution in Ireland has been the subject of a series of surveys since the middle of the 20th century. It was during the 2007 survey that the disappearance of grey squirrels from parts of the Midlands was first highlighted, and

Photo: ©Ruth Hanniffy

research over the past decade has proven its strong association with the pine marten presence. Recent studies have revealed that the grey squirrel does not show the same caution as the red squirrel in the presence of pine marten, termed a 'predator naïve reaction'. The 2012 survey showed a gap in grey squirrel distribution across the Midlands covering an area of approximately six counties, whilst in 2019 this gap has expanded to nine counties in the Midlands. The pine marten was granted legal protection in 1976, and this, in addition to afforestation, has led to its return to woodlands from which it had long vanished.
We are not out of the woods yet however, because sightings have shown that the grey squirrel has continued to spread, including being recorded in Co. Kerry, a first for the county. The silver lining this time is that such invasions are not accompanied by a second wave of the species to bolster new populations. Currently the east coast cities of Dublin and Belfast have the highest densities and are likely to remain the species strongholds. Increasing our understanding of suitable habitat types and landscape characteristics for the species is essential. Recent research by Flaherty & Lawton found that the presence of pine marten, waterbodies, peatland and coniferous forests represented significant differences between a region with high grey squirrel occurrence records and one where they are now rare.

What does the picture look like for the native red squirrel? They are largely absent from areas along the Atlantic coast with little connectivity to join the sparse blocks of woodland. Most recordings came from counties Cork and Wicklow — good news for the latter where they were previously considered under threat. The survey also demonstrated the lag period between the disappearance of grey squirrel populations and the arrival of red squirrels. Counties Westmeath, Offaly and Laois — areas from which the grey squirrel has disappeared for the longest time, recorded the highest increases in red squirrel sightings.



Results of the 2012 and 2019 All-Ireland Squirrel and Pine Marten Surveys led to the Irish population of red squirrel recently being downgraded from Near Threatened in 2009, to Least Concern, a significant step for a species listed as 'decreasing' on the IUCN Red List and classed as Endangered in Britain. From a citizen science perspective, the 2019 survey received 19.5% more records than its predecessor, emphasising the role of citizen science as a cost-effective survey method for certain species. This approach was made possible by the National Biodiversity Data Centre in Waterford and the Centre for Environmental Data and Recording in Belfast, whose online recording platforms and expertise in data collection and robust validation are the backbone of citizen science in Ireland. Dr Colin Lawton from NUI Galway who coordinated the 2019 survey, as well as the previous surveys, said 'The survey was very successful and underlined the benefits of citizen science and using the collective knowledge of an informed and enthusiastic public.' He also felt that the 'collaborative nature of the study, bringing together colleagues from institutions across both parts of the island, was very productive.'

The full report is available at: http://bit.ly/All-IrelandSquirrelSurvey

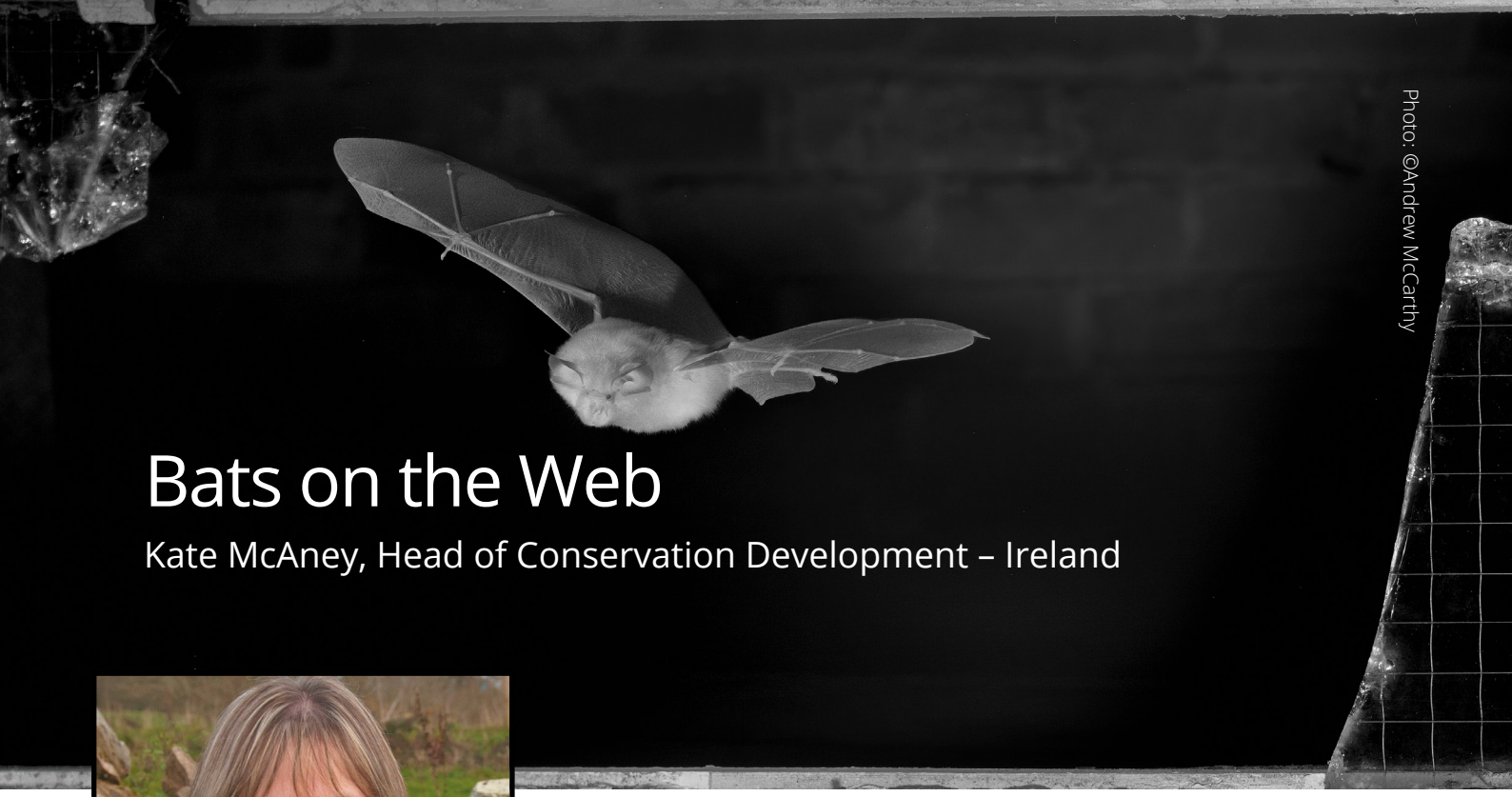


Photo: ©Andrew McCarthy

Bats on the Web

Kate McAney, Head of Conservation Development – Ireland

Although COVID-19 put a stop to engaging with volunteers and the public, it encouraged new ways of thinking and engaging.

Although the restrictions on movement during 2020 due to COVID-19 prevented us engaging with volunteers on projects and running events attended by the public, it encouraged us to explore alternative ways of keeping our work to the fore. The first of these was accepting an invitation from Limerick City and County Council to create a virtual bat walk for them as part of their programme to celebrate Limerick's European Green Leaf City 2020 designation. http://bit.ly/EuropeanGreenLeaf

We devised a 30-minute walk based at Curragh Chase Forest Park, a location where we had previously held 'actual' bat walks. In the video we featured the habitats normally encountered on a bat walk and interspersed these with echolocation calls from the bats we would expect to find, eg, Daubenton's bat at a lake edge and a lesser horseshoe bat flying along a hedgerow. We were also able to include excellent footage of bats in flight, thanks to *Crossing The Line Productions*, the award-winning documentary production company. While watching and listening to a virtual bat walk will never compensate for participating in a walk, there is the advantage that the midges do not bite! The video is still available to view at https://bit.ly/virtualbatwalk and we are thrilled that over 800 people have viewed it since it was first broadcast on 5 June. Find out what was involved in creating this video on page 34.

Limerick City and County Council also provided us with the opportunity to create our first Webinar, which was broadcast on 24 September and focused on the lesser horseshoe bat. This species is found in just six counties in Ireland, and Limerick occupies a strategic position between what is now considered to be a northern subpopulation in Mayo, Galway and Clare and a southern subpopulation in Kerry and Cork.

Our final digital presentation in 2020 was at the Mayo Dark Sky Festival in October, with a talk on the lesser horseshoe bat, a wholly appropriate setting for one of Ireland's most photophobic species. The Dark Sky Festival is an annual event that normally brings together a range of speakers to the towns of County Mayo to highlight that the region is internationally recognised as one of the best places in the world to view the night sky.

The Dark Sky Park http://www.mayodarkskypark.ie is located between the Nephin Mountain Range and the Atlantic coastline, borders Ballycroy National Park and is 150km^2 in extent. It is Ireland's first International Dark Sky Park. In previous years, the festival has featured talks on physics, culture and the environment, family-friendly science workshops, as well as walks and stargazing sessions. Although the workshops and outdoor events were not possible this year, a varied programme was organised and included our talk; *'Woodlands and ruins under dark skies — why County Mayo is so important for the lesser horseshoe bat'*.

The impact of traffic noise on bat activity

Domhnall Finch, former VWT PhD student

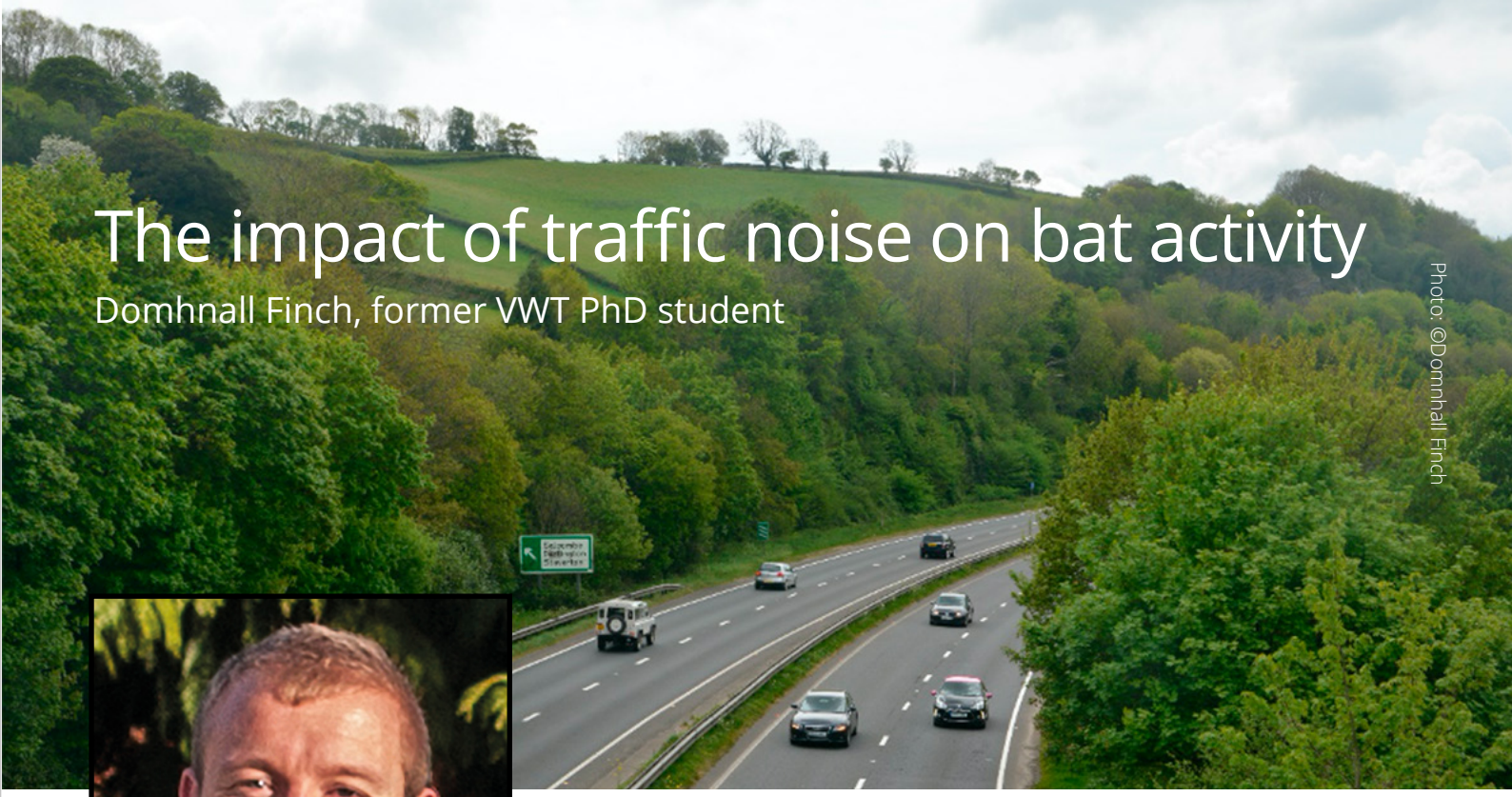


Photo: ©Domnhall Finch

We are well aware that driving our cars around, perhaps in pre COVID-19 times, can have negative effects on the environment by increasing the amount of carbon dioxide in the atmosphere, reducing air quality, and increasing the likelihood of pollution in waterways; all of which can have significant effects on human health. But what about impacts on biodiversity? As part of my recent PhD research at the University of Sussex, jointly funded by VWT, I carried out investigations into the effect of traffic noise on the activity of bats.

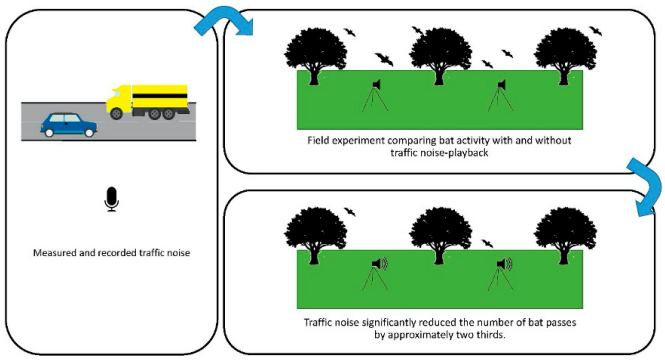
In areas previously undisturbed by heavy traffic noise, we used a phantom road playback experiment to replay traffic noise through speakers along hedgerows and treelines to mimic the effect of passing cars on bat species, and monitored potential changes in their activity levels. This two-year study initially examined the effects of both the sonic and ultrasonic spectrums of traffic noise together.

Our results demonstrated that traffic noise can cause a reduction in total bat activity by approx. two thirds. This negative impact was also recorded 20m away from the source of the traffic noise. These effects were seen across a broad spectrum of bat species that have varied foraging strategies and frequencies at which they echolocate, including the greater horseshoe bat, common and soprano pipistrelles, noctule and the genus Myotis, which includes Bechstein's bat and Daubenton's bat. These effects were not just limited to the number of bat passes; we also saw a reduction in the number of feeding buzzes – calls that are emitted by bats just before they capture their prey – for both common and soprano pipistrelles during the experiment.

When the sonic and ultrasonic spectrums were played on separate nights, we demonstrated that it is the sonic spectrum that has the highest impact on bat activity. These results suggest that traffic noise isn't jamming or masking bat echolocation calls but rather it is causing an avoidance behaviour in bats.

Further research is required to identify effective mitigation strategies, to delineate the zone of influence of road noise, and to assess whether there is any habituation over time. However, as many bats are of high conservation concern, Environmental Impact Assessments need to consider the potential effects of road noise on habitat quality, landscape connectivity, and population viability. These effects need to be considered in combination with those of street lighting, collision and direct habitat loss and prioritised accordingly.

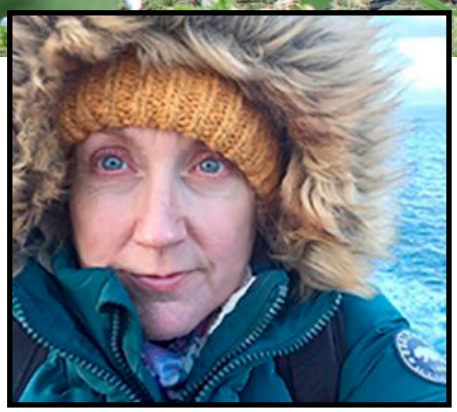
These assessments are not just important when new roads are due to be built but also need to be considered if there is to be an increase in the volume of vehicles using a road, eg, through road widening schemes.



The rise and rise of the pine marten in Wales – reflections on the Pine Marten Recovery Project

Jenny MacPherson, Science and Research Programme Manager

Photo: ©Robert Cruickshanks/Ootmahoosewindae.com



The pine marten, Bele'r coed (marten of the wood), was once on the verge of extinction in Wales but is now back in healthy numbers.

Between autumn 2015 and 2017, a total of 51 pine martens were translocated from the Highlands of Scotland to the forests of the Cambrian Mountains in Mid Wales to save the species from going extinct. This was all part of Vincent Wildlife Trust's (VWT) Pine Marten Recovery Project (PMRP).

Pine martens were once common and widespread throughout Britain. However, during the 19th century the species suffered one of the most dramatic declines of any British mammal. This was largely due to increases in predator control to protect game birds, compounding the effects of habitat loss, with woodland cover in Britain having declined to a low of around 5% by the beginning of the 20th century. By this time, pine martens had disappeared from almost all of southern Britain. The majority of the remnant population was restricted to North West Scotland, with only a few isolated animals remaining in the remote uplands of northern England and Wales.

Since the latter half of the 20th century, the pine marten population in Scotland has made a significant recovery, with an expansion south and eastwards from the core areas in the North West Highlands. However, the species is still rare in Britain with the most recent population estimate of around 3,700 martens, most of which are in Scotland. In England and Wales, there was no discernible natural recovery of pine martens by 2014, and the species remained very rare or absent altogether. Because pine martens do not usually breed until their third year and only have one annual litter of two to four kits, it takes a long time for populations to recover once diminished. Records, mainly in the form of sightings, were still reported from parts of England and Wales, but it was thought unlikely these represented viable populations. As the population in Scotland continued to expand southwards, it was highly likely that pine martens would naturally recolonise parts of northern England, but the road and rail networks criss-crossing urbanised areas, as well as the large distances involved would probably have made natural recolonisation further south well nigh impossible.

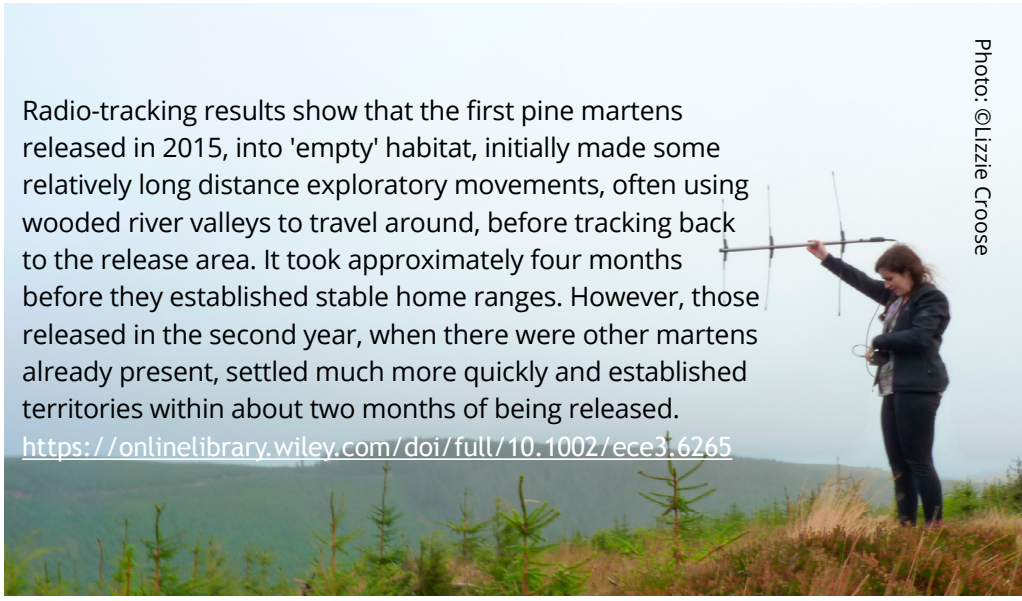
So, VWT's Pine Marten Recovery Project began in 2014 to address some of these issues and help restore the species to suitable areas throughout England and Wales. Initially, a detailed study was carried out to look at the feasibility of using translocations as part of the conservation strategy for this species (MacPherson, 2014). IUCN guidelines for conservation translocations were followed throughout the process and habitat suitability and population viability models were used to classify regions according to their potential to support a viable breeding population. Central Wales was identified as having high biological suitability because of the large amount of well-connected, suitable woodland habitat and relatively low risk to pine martens of road mortality. There was also recent DNA evidence (in 2007 and 2012) that there could still have been extremely small numbers of pine martens still present.

The social acceptability of translocating pine martens to Wales was as important as the biological feasibility. The results of a wide-scale public opinion survey suggested that the majority of people would be in favour of action

Camera traps and volunteers are vital in help to monitor the pine marten population grow

to prevent the pine marten from becoming extinct in Wales. However, crucially, more detailed consultations with stakeholders and communities in the prospective release areas were carried out so that we could answer any questions, discuss specific issues and ensure that there was local input to, and support for, the project (https://besjournals.onlinelibrary.wiley.com/doi/full/10.1002/pan3.10139). All the feedback gathered in these early stages was taken into account when making the final decision to proceed, and in deciding where releases should take place. We were very fortunate that the local communities in and around north Ceredigion were very keen to get involved in the project and have been absolutely crucial to its ongoing success. We also had help and support from key landowners and forest managers, including Natural Resources Wales, as well as several local businesses in Mid Wales.

Following the preparation work, translocations began in autumn 2015. Twenty healthy, adult pine martens were released into a large area of well-connected woodlands, with a further 20 animals in autumn 2016 and another 12 the following year. These were all taken from robust populations on Forestry and Land Scotland sites spread across the northern Highlands. All the pine martens were radio collared and were studied intensively for a long period following release. The data collected has provided a huge amount of information, which will inform subsequent reintroductions elsewhere. Some of the research, which has now been published, focused on the martens' ranging behaviour and habitat use in the days and months following release. All translocations are essentially exercises in forced dispersal, but dispersing animals in many, even relatively anti-social, species rely on the presence of others of the same species (conspecifics) to assess habitat suitability. Translocated individuals invariably face an environment with no, or very few, conspecifics, therefore they may not settle in suitable habitat at the release site, choosing instead to disperse to another area in search of conspecifics.



Radio-tracking results show that the first pine martens released in 2015, into 'empty' habitat, initially made some relatively long distance exploratory movements, often using wooded river valleys to travel around, before tracking back to the release area. It took approximately four months before they established stable home ranges. However, those released in the second year, when there were other martens already present, settled much more quickly and established territories within about two months of being released. https://onlinelibrary.wiley.com/doi/full/10.1002/ece3.6265

Photo: ©Lizzie Croose

Extensive mature conifer woodland, like much of the plantation forestry in the release area, provides martens with plenty of cover; it has been shown in previous radio-tracking studies that they spend much of their time in these sorts of areas. However, while they may be used by pine martens as habitat and for feeding, even-aged plantations often do not provide good denning opportunities, generally due to the lack of deadwood habitat and cavity trees. Pine martens prefer tree holes for breeding dens so they can safely rear their kits above ground for the first weeks after birth. Woods with 'old growth' attributes, such as large old trees grown to maturity, deadwood habitat, cavity trees and natural areas, generally offer more suitable sites for denning. These are likely to be semi-natural woods, riparian zones, or natural reserves where old-growth characteristics have had time to develop. To ensure that there were enough suitable dens available, a network of artificial den boxes was put up throughout the release area and some of these have certainly been used by martens. However, we also tracked animals to the many natural den sites that they found, including tree holes, squirrel dreys, rocky ledges and derelict buildings. By early April, following the first release, some of the radio-tracked females began staying very close to a chosen den site, which suggested that they might have had kits, but we had to wait until the middle of May to find out for certain. By this time the kits are quite well developed and the females start to leave the den for longer periods of time so we were able, under licence, to check the dens. It was certainly one of the high points of the project when we confirmed that at least four of our females had successfully bred in the first year of release and we counted five healthy looking, Welsh-born pine marten kits in 2016. From March onwards every year, monitoring of the females was intensified to see if any of them were showing signs of breeding. Camera traps were also used at den sites, along with a combination of other evidence. All this detective work confirmed that at least five females bred in spring 2017, resulting in at least ten Welsh-born pine marten kits, four of which were born to PM16 who was released in autumn 2015. This meant that hers were the first known pine marten kits conceived and born in Wales for decades and was another big project milestone.

People and pine martens... benefits beyond biodiversity

Jenny MacPherson, Science and Research Programme Manager

Photo: ©Rachel Alexander

The return of a healthy pine marten population has potential to provide benefits beyond biodiversity.

The interaction between pine martens and grey squirrels has been a subject of great interest since a study in Ireland showed declines in grey squirrel numbers as the pine marten recovered in some areas. It is still not known if a similar effect will be observed in Britain but some research carried out by Catherine McNicol, looking into the behaviour of grey squirrels in pine marten release sites in Wales did suggest that the martens had an effect on how the squirrels behaved https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/1365-2664.13598

There is also the prospect of pine martens benefiting local businesses through ecotourism, as is the case in some parts of Scotland. The Rheidol Railway has actively supported the project and there is now a Pine Marten Information Den at the station in Devil's Bridge, which (prior to COVID restrictions) was very well used by visitors to the area.

Collaboration with and involvement by local communities were crucial to the success of the Pine Marten Recovery Project.

Engagement with people and communities continues to be key to the project. Many local volunteers were directly involved with radio-tracking the martens, and continue to monitor the health of the population using more non-invasive monitoring methods such as camera, scat and hair tube surveys. These have all together provided up to date information on how far the martens have spread out and given us valuable insights into how the population is faring.

Ultimately, this local involvement and support is as important to the long-term integration of pine martens back into the natural landscape as all the science and preparation that led up to the return of the pine marten to Wales.

Volunteers helped to cover huge areas of Wales in last year's Pine Marten Expansion Zone survey.

VWT leaving thoughts

Sally Ford-Hutchinson shares her thoughts on her role as a Trustee

Over my career in advertising and market research, I have always been involved in voluntary work for the professional organisations; it was always about giving back. I arrived at a point in my life when I thought I would really like to give back in a different way, in an area that would reflect my personal interests and passions — and that was wildlife. I started doing some work with Herefordshire Wildlife Trust where I met the then Chief Executive of Vincent Wildlife Trust (VWT). I had never heard of VWT but I really liked the sound of the organisation's work. I was encouraged to apply to be a Trustee. I did and there I was, part of this wonderful organisation with the hope that my strategic and marketing experience could prove useful.

I did indeed find that the way I approached issues was perhaps different and in many ways more commercial. While I would never want VWT to be a commercial organisation, I do hope that I have had an influence on the steady move towards an approach which always ensures that VWT is as professional in finance and in marketing as it has always been in everything it does in the world of conservation and wildlife.

The challenge for me was balancing my attitudes from the commercial world with the world of a charity, but I always felt that made for more interesting debates about strategy: back again to my slightly different way of looking at issues. Since the time when I started on the Board of Trustees I think there has been a change in the make-up of the board. For a start I was the first female Trustee, now I think it is 50/50. Also, there is now a very good balance between the conservation world and the commercial world. This means that the board can contribute in a really wide range of areas and that makes for good governance.

In many ways there was a time when VWT perhaps 'hid its light under a bushel'. It was doing fantastic work, always based on absolutely sound and innovative scientific research. If this could be communicated to a wider, relevant audience then there would be more overall impact. This was definitely an area in which I did have some relevant experience.

Hopefully some of that experience helped the Communications Team develop the brand, develop the communications and develop VWT's position in the world of conservation. Very much their work not mine, but I still look on it proudly.

Joining VWT was always about the conservation of wildlife and so some of the most enjoyable times were visiting the bat roosts and watching all the wonderful videos of the pine marten translocations. Just being a distant part of that success story was very rewarding and I am thankful for the opportunity I was given by VWT.

All I can say as a parting thought is just keep on doing the great work. Share it proudly with as many organisations as possible so that you can positively influence the work they are doing. As VWT goes forward this means you will have more and more impact and the world will be a better place.

Tracking Pathways for Bats

Kate McAney, Head of Conservation Development — Ireland

Photo: ©www.andrewmccarthyphotography.co.uk

Our lesser horseshoe bat work this year in Ireland has been a healthy mixture of monitoring our reserves, researching bat activity in the vicinity of one of them and desktop modelling for the entire Irish population.

Despite travel restrictions due to COVID-19, which meant we were unable to provide our helpers in Kerry with the necessary equipment to enable them to conduct emergence counts, we were still able to monitor the number of adult bats emerging from nine of our twelve reserves. This was possible due to help from the Conservation Rangers of National Parks and Wildlife Service (NPWS), for which we are very grateful. The 3,059 bats counted at the nine sites either reflected an increase or were similar to the numbers recorded in 2019. As there was no evidence of disturbance at the other three roosts and bats were present, we estimate the Trust's Irish reserves may have held approximately 4,000 bats this year in the weeks leading up to the first births.

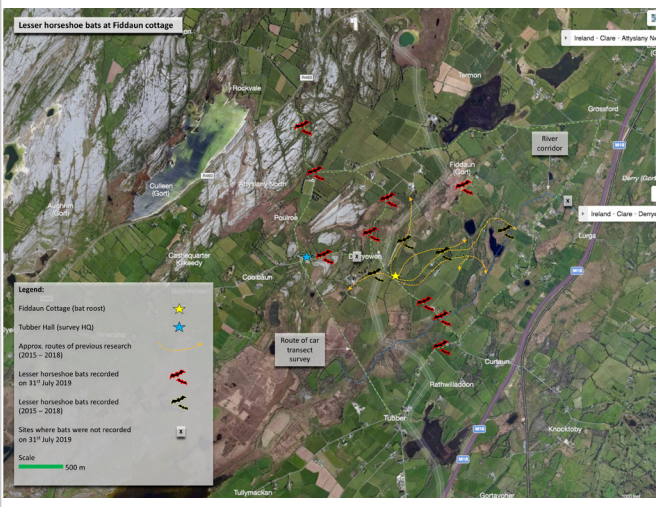
Tracking the movement of bats from Fiddaun Cottage

Our Galway reserve, Fiddaun Cottage, straddles the boundary with neighbouring County Clare, which has many large and important lesser horseshoe bat roosts. This small cottage was on the brink of collapse when the Trust acquired it in 1998, yet 30 bats were using it, probably because they had no alternative roost. Although the colony has increased since then — this summer 150 adult bats emerged one evening in June — we always wondered where the colony went at night because the habitat surrounding the cottage is quite poor. So, over the years, we have followed the bats at dusk for short distances using hand-held detectors. This research was greatly helped by 24 volunteers in 2019 who on one night walked transects within 2km of the roost listening for the bats.

This year we adopted a different approach. Rather than walking at night along minor roads and tracks, we placed six SM4 static bat detectors at a variety of locations by day, all within 2km of the reserve. In total we have 76 randomly generated spots to visit over two summers and these include a range of habitat types and quality at varying distances from roads and artificial lighting. While this leaves our nights free, the days are spent contacting landowners to ask permission to enter their land to place a detector along a hedgerow, or sometimes on a post in the middle of a field

The detectors are well hidden when placed along public areas and only positioned in a field when we

know that cattle will not be grazing there during our study week. Cattle are very curious animals and, although the detectors are robust and waterproof, they are not bovine proof! The requirement to contact every landowner is time consuming but a very rewarding part of the project because it gives us an opportunity to talk to the farmers and to learn about their farming practices. A key to our success to date in tracking down the names and contact details for farmers has been our neighbour at Fiddaun, Killian Forde, who farms close to the cottage, and also to local volunteers, so we extend a big thank you to them for all the help they have given us.



Map showing records of lesser horseshoe bat activity around Fiddaun Cottage between 2015 and 2018 using volunteers walking with bat detectors and records of activity in 2019 using static recorders..

It will be interesting to see how our study of lesser horseshoe bat activity on farms around Fiddaun compares to the results obtained by Dr Domhnall Finch during his research on greater horseshoes bats. Domhnall found that 29% of calls were recorded in the centre of fields, an unexpected result for a species which, like the lesser horseshoe bat, prefers to fly along linear landscape features (Finch *et al*. Animals 2020, 10, 1856; doi:0.3390/ani10101856).

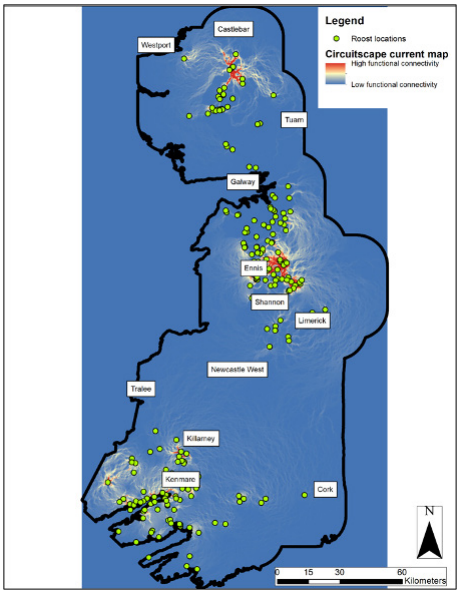
Desktop modelling and the Irish lesser horseshoe bat

We received a grant from NPWS this summer to conduct a modelling study for the lesser horseshoe bat and who better to undertake this than Dr Domhnall Finch, who had just completed his PhD on the greater horseshoe bat in Britain. The aim of our study was to identify potential pathways and barriers to movement of lesser horseshoe bats across their known range in Ireland. Previous research has shown that the Irish population, approximately 13,000 bats, is now fragmented into three regions or subpopulations, probably due to landscape changes and urbanisation.

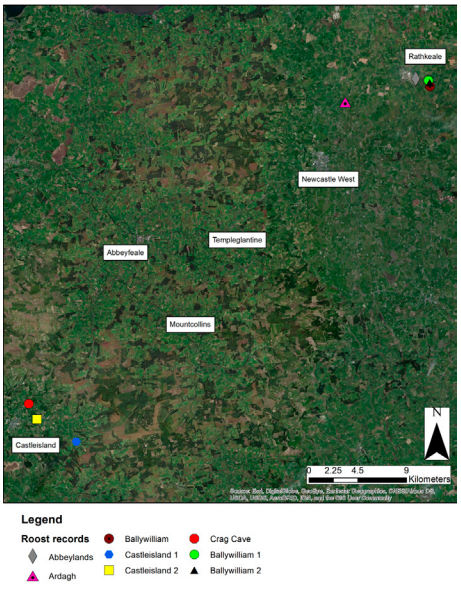
Knowledge of potential pathways and barriers is the first step in developing a targeted approach to conserving the species at a landscape scale, which could be achieved by landowners under future funding streams, such as a LIFE project or the next Common Agricultural Policy. Although we have carried out desktop studies before on this topic, this is the first time we have incorporated data on roads and artificial lighting. We are grateful to all the local authorities for providing us with data on the level of artificial lighting in their regions.

The report is available to download from www.vincentwildlife.ie but in summary, we found that while there are areas of relatively high functional connectivity between roosts in each of the three regions, there is limited connectivity between these regions at a landscape scale. This may be due to the level of urbanisation associated with the cities of Galway and Limerick. These two cities are responsible for the highest streetlight density across the study area, which could be acting as a barrier to this photophobic bat species.

Modelling was conducted at a more detailed level for Limerick and north Kerry and predicted that there are corridors of connectivity the bats could use, specifically to bridge the gap of over 55km which is between roosts in Rathkeale (Limerick) and Castleisland (Kerry). Before any practical work is undertaken in this area, however, fieldwork is needed to verify the predictions of the model and we are now looking to see how we can fund and achieve this.



Map showing areas of high and low functional connectivity for the lesser horseshoe bat across its entire range in the Republic of Ireland.



Map showing The locations of the eight additional roosts in the counties of Kerry and Limerick.

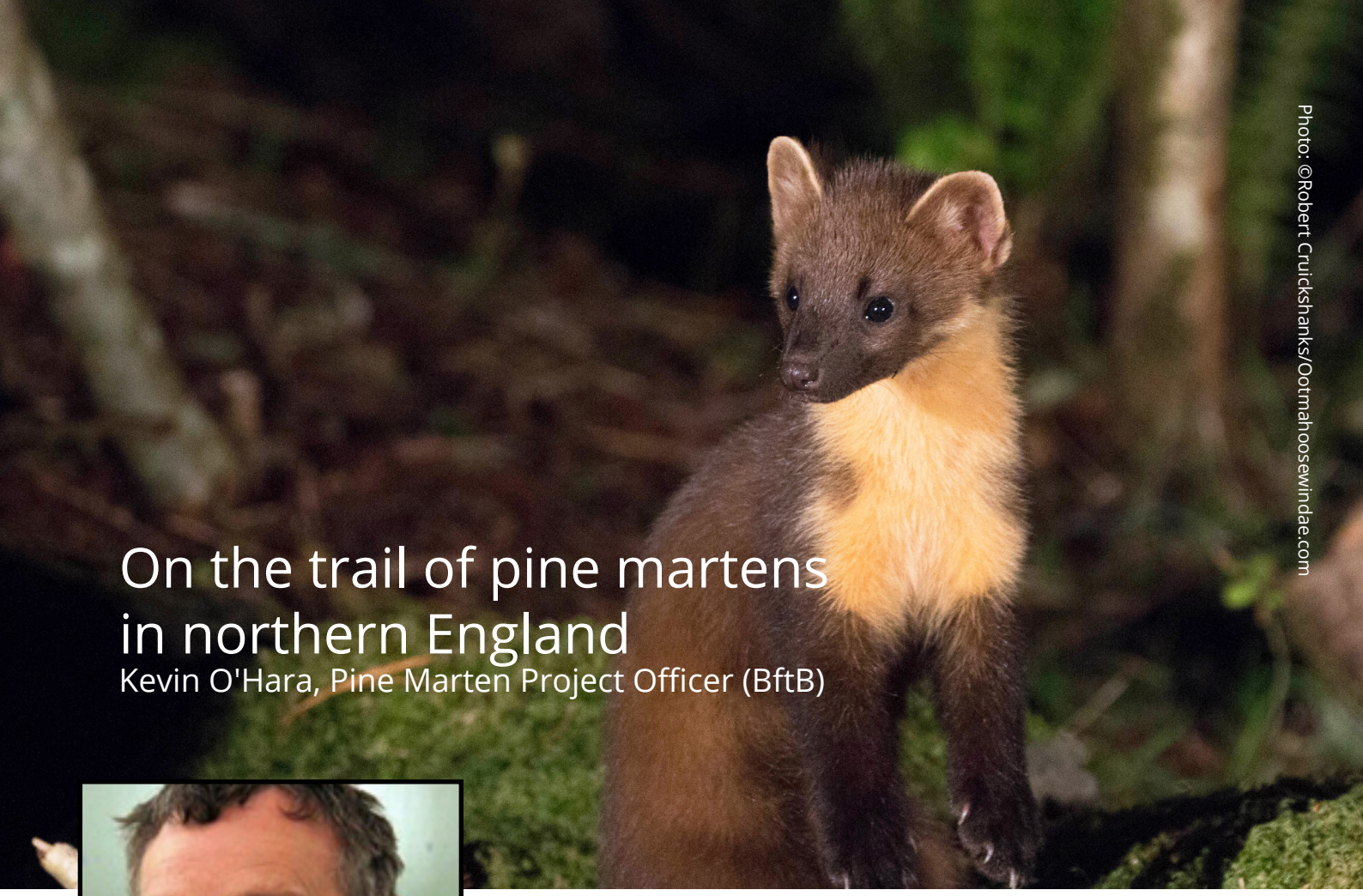


Photo: ©Robert Cruickshanks/Ootmahoosewindae.com

On the trail of pine martens in northern England

Kevin O'Hara, Pine Marten Project Officer (BftB)

The occurrence of occasional records of pine martens in Northumberland suggested that martens might be re-colonising parts of northern England by spreading south over the Scottish border. However, prior to this Back from the Brink Pine Marten Project, very little was known about the presence, distribution and conservation status of pine martens in northern England.

The aim of the Back from the Brink project was to facilitate and monitor the natural recovery of pine martens in northern England, in order to develop a better understanding of their status and distribution in this region. This work will inform future conservation and management plans and feed into the overall recovery of the pine marten nationally.

The long-term aim is to see the establishment of a viable self-sustaining population of pine martens in northern England. Working with volunteers, landowners and land managers, we surveyed woodlands in Northumberland and Cumbria to collect information on the presence and distribution of these elusive mammals. We also enhanced woodland habitat for martens by installing artificial den boxes to provide resting and breeding sites.

As the Back from the Brink Pine Marten project comes to an end after 3.5 years, Kevin O'Hara, VWT's Pine Marten Project Officer (BftB), reflects on what has been achieved.

As we eased out of the first lockdown, we looked forward to getting out and about once again and continuing to monitor the presence of pine martens as they make their own way from Scotland into northern England. We also spent time pursuing a legacy project to help maintain the momentum we have gained through the BftB project, thanks to the dedication and commitment of volunteers and local communities who have done so much and have helped to put the region and the species on the map.

As a quick recap, it's worth considering what everyone has achieved during the BftB project. We captured, using trail cameras, the very first pictures and videos of naturally colonised and wild living pine martens in England. Since then, we have identified the presence of pine marten in northern England (in Northumberland and Cumbria) with over 80 records so far. We have also been able to identify several individual martens from camera trap images, that appear to be resident across the region, and we have shared these findings with many people through social media and through the press. Through these findings, we have ultimately brought the presence of pine marten into the public eye and have been able to open the discussion on their presence in the environment.

So, it is a big Thank You to everyone for their patience and for their

efforts prior to lockdown, and we optimistically look forward to a continued pine marten presence in the north of England.

Whilst the pine marten population is in early stages of re-establishment in northern England, ongoing monitoring is recommended to keep track of changing distribution and range expansion.

Although funding for the Back from the Brink project has come to an end, we hope that some monitoring efforts will continue, thanks to partnerships established with volunteers, landowners and other organisations during the project. Additionally, plans are being developed for a wider legacy project to secure the future of pine martens in northern England and further facilitate the species' recovery nationally.

Thanks to the collaboration of local communities and landowners, facilitated by the Back from the Brink programme, the pine marten now has a stronger chance of recovery in northern England.

Photo: ©Robert Cruickshanks/Oormahoosewindae.com

My time as a Trustee for Vincent Wildlife Trust

Matt Norman reflects on his time as a trustee with VWT.

In 2010 I spotted an advert online placed by a charity seeking a new Trustee with investment experience. There soon followed a cup of coffee with the CEO and Chairman, a meeting with the remaining Trustees to see if there was a fit… and before you know it, ten years serving as a Trustee flashed by! In spite of joining the Trust in the aftermath of the 2008 financial crisis and at a time when some difficult board decisions had to be made for the longevity of the VWT, the quality and togetherness of everyone involved from Trustees and management through to staff and volunteers, was (and indeed remains) something quite special to behold. VWT's family-like culture and science-led approach still continues and enables it to continue to punch well above its weight.

Visiting Bronsil each year to hear in person how the various projects have advanced and seeing how the staff develop has been an absolute pleasure and become a part of my annual year end routine, alongside the Trust Christmas parties. My favourite memory however is clear — the Board's decision to 'go for it' with regards to the ambitious and indeed costly pine marten recovery plan. That decision well and truly put Vincent Wildlife Trust on the map and is something we should be so proud of.

But the highlights of being a Trustee have been many and it has been a wonderful experience helping the Trust to develop over these years — and it has been such an honour. Hopefully I am safely passing the baton on and leaving VWT a little bit better than I found it. The great thing is that the Board continues to attract fantastic experienced people willing to volunteer their time.

The next ten years will be bright for the Trust as it works with more and more partners, leading by example and spreading the very special VWT way of doing things. I'll be looking forward to reading about those next adventures — long may they continue.

VWT and the Irish Environmental Network

Kate McAney, Head of Conservation Development – Ireland

Vincent Wildlife Trust in Ireland undertakes what you might call a soul-searching exercise in the first quarter of every year.

This has nothing to do with setting New Year's resolutions but relates to our completing an annual application form to join the Irish Environmental Network (IEN). The IEN is an umbrella network that supports Irish environmental NGOs by providing funding to cover core costs, grants for projects and training. The groups that make up the network represent a broad range of environmental issues, everything from wildlife conservation to climate change, and they undertake practical conservation work, education, research, campaigns, lobbying and raising public awareness. Thirty-two organisations comprised the network in 2019, representing over 35,000 members and supporters and annually contribute over six million unpaid hours on environmental work (www.ien.ie). The importance and value of this network was recognised by our President, Michael D. Higgins in 2015 when he invited the network to a special celebration of civil society in June.

Financial support for the network is provided by the Department of Environment, Climate and Communications, and represents one of the few sources of funding available to environmental NGOs in Ireland. Unfortunately, lottery funding is not available to the environmental sector in Ireland, as it is in the UK. An important responsibility of each member is that a representative of their organisation serves on the network's Board of Directors for a three-year period, which ensures that a range of talents and experiences govern the operation of the network. Having recently stepped down as a Director, I very much valued this experience.

VWT first applied to join the network in January 2014 and we were delighted to have our application accepted. The membership process is a detailed one and each application is reviewed by independent assessors. Funding is then allocated based on this assessment. There is quite a long list of eligibility criteria,

IEN funding enabled us to create our first artificial hibernation site for lesser horseshoe bats.

which includes the requirements that the organisation's primary objectives and activities are environmental protection and/or environmental sustainability, is not for profit, has a demonstrable national remit and has an up-to-date website and social media presence.

Apart from access to funding and a sense of solidarity with other NGOs, I believe a major benefit of being part of the IEN is being forced to take time out to reflect on the previous year's work, because it is so easy to become absorbed with issues on a day-to-day or week-to-week basis. We undertake quarterly reporting as an organisation within the Trust, but it is good to have an opportunity to reflect just on our work in Ireland and to ensure we are meeting our objectives. When we first applied in 2014, our only source of funding was that provided directly by the Trust. In the intervening years, the core funding provided through the IEN has become significant, both as core funding and in direct grants for specific projects, such as our first artificial hibernation site. We have also used IEN grants to secure additional funding from other sources for projects.

One of the Trust's major concerns in Ireland is the ability of the lesser horseshoe bat to freely move between its roosts that are dotted along the west coast because this ensures gene flow between colonies to sustain a healthy population. Habitat fragmentation, however, has created gaps in this distribution and already we can detect slight genetic differences in bats between counties. We believe the best way to counteract this is to identify the optimum routes along which connectivity could be reinstated using modelling techniques. An IEN grant in our first year as a member enabled us to undertake our first piece of research, which was conducted by Fionnuala Lyons. This then led to a second study in 2017 carried out by Patrick Lenihan while he was an Intern with Kerry

County Council and, thanks to funding from National Parks and Wildlife Service this year, Domhnall Finch is continuing this.

Financial assistance from the IEN was also an important catalyst for our work here on the pine marten, because this funded field trials into how to keep this species out of pheasant pens. This predation was becoming a problem for small gun clubs and so, in partnership with the Kilcormac Game and Conservation Club, we designed a release pen that is both mammalian and avian predator proof. Instructional notes and a video about this are available on www.pinemarten.ie

Our membership of the IEN coincided with Ruth Hanniffy joining the Trust so we then had the capacity to work with other organisations within the network. Ruth worked with The Native Woodland Trust to erect pine marten den boxes, including one at its reserve in Westmeath. On a trip there in 2017, they discovered through examining trail camera footage that a pine marten had been using the boxes. This was the first time we had filmed martens using a den box in Ireland. Ruth has since teamed up with BirdWatch Ireland, Irish Wildlife Trust, Irish Whale and Dolphin Group and Bat Conservation Ireland, all IEN members, on many occasions to run public events. The largest of these is the now annual Go Wild in Galway event during National Biodiversity Week in May, when the network works hard to create awareness about all aspects of biodiversity. The IEN provided us with additional funding for a special event in May 2015 that enabled a small group of local people to witness lesser horseshoe bats emerge from their summer roost at Coillte's Curragh Chase House, County Limerick. We ran this event with help from volunteers and the NPWS.

It has been easy to write about the IEN in this blog, not least because I didn't have to restrict myself to 5,000 characters as is the case in many sections of the multi-paged membership application form! But this demand for brevity is a small price to pay for the many benefits of membership, and I hope we will continue to be part of this important network for many years to come.

Photo: ©Julia Bracewell

A privileged peek into the hidden world of greater horseshoe bats

Julia Bracewell, Senior Design and Communications Officer

It's 3am on a Monday morning in June 2019 and I'm perched on a box in the cold dark of a small room, grateful for the many items of branded clothing I'd been issued with when I joined Vincent Wildlife Trust (VWT). I'm wearing them all now… and still I'm cold. I'm also struggling to keep my eyes open. With their heads together and hunched over the only light in the room, which is coming from a tiny screen, I'm certain the two other people here wouldn't notice if I close my eyes and sleep. But there's nowhere to sleep.

Suddenly, there's excitement as a small, rotund figure flies across the screen and comes to rest, hanging upside down and slowly swaying with ever-diminishing momentum until it stops. I'm wide awake now.

We are in a small room at Bryanston Old Kitchens, one of VWT's largest greater horseshoe bat roosts, watching and waiting for the bats to return from their nocturnal feeding trips and to settle into their roost. I assume that they will sleep off a night of feasting on insects. Their favourites include the cockchafer, a large crunchy beetle, and the equally chunky yellow underwing moth… but most insects unfortunate enough to miss the swift and silent wing beats of these bats will be taken.

Sadly, during the last century, the abundance and variety of insects along with suitable habitats declined drastically with changes in agricultural practices and with the increased use of pesticides. And with these losses came the inevitable decline in greater horseshoe bats. Some estimates put it at over a 90% loss by the 1980s, leaving a sparse population of only 5,000 individuals in Britain.

With such catastrophic figures, the founder of Vincent Wildlife Trust, Vincent Weir, took the costly steps of acquiring buildings where the greater horseshoe bat was clinging on and funding research into how buildings and the surrounding habitats could be enhanced to provide maximum protection and the most appropriate conditions for the different stages of a year in the life of a bat. These sites are now managed by VWT as bat reserves to provide safe and suitable havens.

Unlike other species, horseshoe bats can't crawl into crevices and need to have roosts with openings large enough to fly into and surfaces that they can suspend from. As with most bats, they have different habitat needs during the year: a warm, safe space for pups in a maternity roost and a cooler space for winter hibernation. And of course, a surrounding habitat that can provide them with a good supply of insects. The Old Kitchens fulfils these needs. It is an old sandstone building in the grounds of Bryanston School and was once the catering quarters for a large country house. The house has long since gone, but this building remains and now belongs to the bats.

With me in this small space are Anita Glover, VWT's Bat Programme Manager, and Andrew Thompson, Film Director with BBC Scotland. We are here to capture footage of the normally hidden world of a greater horseshoe bat roost for Andrew's latest project: *Inside the Bat Cave*. The aim of this and a further four visits to this reserve is to spend weekly eight-hour shifts staring into the monitor and to record life inside the roost. Andrew is hoping to capture footage of a live birth during these sessions. I'm just hoping I can survive the next few weeks of nocturnal living.

But for now, I'm captivated by the sight of this round ball — a heavily pregnant bat. We are able to peek into this unseen world of bat roosts thanks to an infra-red camera, which was installed in

the roof space earlier in the year, long before the breeding season began in order to avoid disturbing the bats. The camera is linked to a small monitor on the ground floor, which we are now glued to as the bats are starting to return. Our fingers are poised to hit record and soon this single bat is joined by others as they fly in and hang in ones and twos. But sleep seems to be the last thing on their minds.

We watch these ethereal creatures of the night start the mundane task of grooming. Although I've seen countless animals cleaning themselves, this seems different, almost choreographed. Suspended from the ceiling mesh by the tiniest toes, they stretch out long elegant and almost translucent wings. Ballet dancers of the bat world, they sway and spin as their cleaning creates momentum. Having licked every millimetre and maybe more, this fastidious bat suddenly envelops herself in her wings and transforms into an origami kite that hangs. We move on and scan the area for other bats. While we've been engrossed by the cleaning, more bats have flown into this roof space, known as a hot box. Designed specially for maternity roosts, it is a thermostatically heated and insulated box where mothers can leave young pups at optimal temperatures for growth and survival while they go out to feed.

We carry on slowly scanning, when Anita spots something. She takes the control and zooms in on an odd-shaped bat. It's a mother with a young pup and we can just see the tip of it clinging on, tucked beneath its mother's folded wing cocoon. This is the first sighting this summer of a young greater horseshoe bat and is something to celebrate. Vincent's strategy of taking on buildings and enhancing them as safe roosts seems to be paying off as the number of this species has been slowly rising — the latest estimate in 2018 is a British population of around 13,000. I'm sure he would be delighted to know that the reserves he established are now host to around 50% of this total population, with one of the roosts being home to the largest known greater horseshoe bat maternity colony in western Europe. While the majority of the British population is still found in the southwest of England and in south Wales, there are early signs that they are expanding their range into the southeast of England and north Wales. All of this is good news, but there is still much more to do in order to bring greater horseshoe bats back up to their previous population levels.

Suddenly the mother unfolds her wings and starts to clean her young pup… it is the equivalent of spit and rub as the pup is thoroughly cleaned all over, including behind the ears. Maybe in a bid to escape this attention, the pup suddenly drops down, hanging by its feet to the mother. At this stage it seems all angles and skin, and somewhat baby dragon-like as it is yet to fill out and fluff up. It starts to stretch and flap its wings, rest and then repeat. Although this youngster probably won't start flying until August, it is already flexing muscles and preparing for independence. This vigorous movement causes the young pup to swing right round on its feet in both directions and I wonder out loud how these bats are able to cling on for so long. Anita explains that bats, like birds, have a specialised tendon locking mechanism that locks the feet into a grip with very little muscular effort. This means that the muscles are in a 'relaxed' state while they are hanging on.

We realise that the hotbox is getting quite crowded now with huddles of bats dotted across the ceiling. In between these huddles are individuals grooming and stretching or occasionally sidling up to each other to 'converse'. As we zoom in on one huddle of around 15 bats, we can see that they are tightly packed together and seem to be finally resting until the next evening's feeding flight… or so I thought. The whole group suddenly jolts, as if a pulse started by one travels through the whole. As we watch, it happens again and again. A regular beat. Our trance at this pulsing collective is suddenly broken as a bat flies in from the right and barges its way into the bundle. There are the inevitable moments of disgruntled fidgeting to accommodate this incomer and then the group settles once again into its rhythmic heartbeat… until one of the bats decides to leave and sets off another round of fidgeting and settling and pulsing. I realise now that my view of a bat roost as a still place of sleep has been hugely altered as we continue to scan and watch the pulsing huddles, the grooming individuals and those just stretching or flapping or fidgeting.

And then it is time to switch off the camera and monitor. The last hours have disappeared in minutes and, although there wasn't a live birth to capture on camera, as I stumble out into the daylight, I feel so privileged to have had this peek into the hidden world of the greater horseshoe bat.


Photo: ©Julia Bracewell

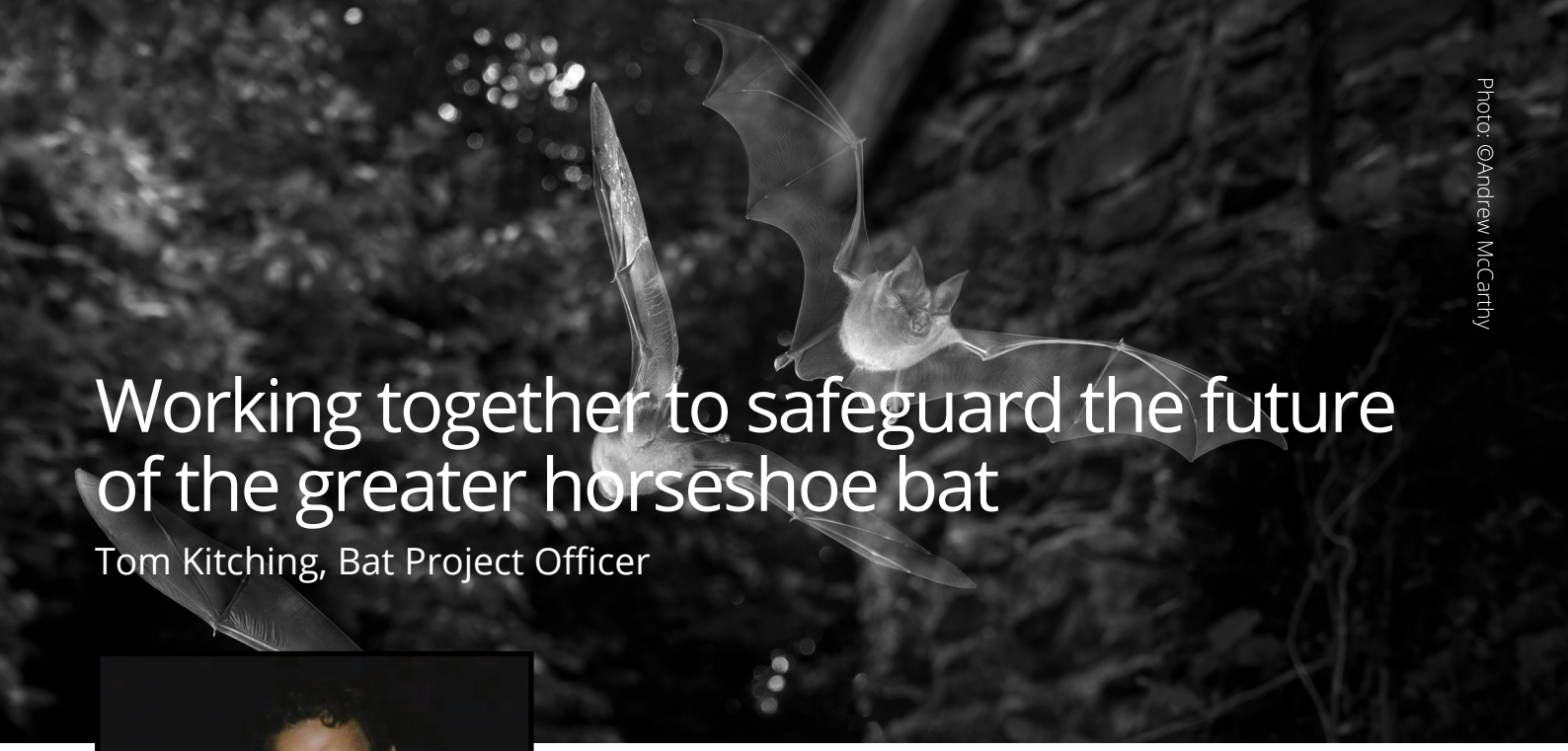
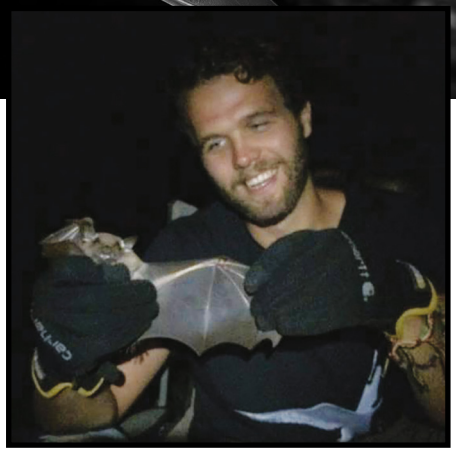


Photo: ©Andrew McCarthy

Working together to safeguard the future of the greater horseshoe bat

Tom Kitching, Bat Project Officer



It's been another exciting year working on greater horseshoe bats, despite the unexpected challenges this year has brought us.

Whilst we've all had to adapt our working lives, it's good to see that these cave-dwelling mammals are still showing encouraging signs of population recovery; this year we documented record bat numbers at four of our six nature reserves for this species.

We've been busy on a number of projects for the horseshoe bats, including some exciting prospects for enhancing our nature reserves, researching the impact greater horseshoes have on lesser horseshoes in roosts and developing new monitoring methods using infrared equipment for our volunteers. We were also contributors to the documentary ***Inside The Bat Cave***, filmed in 2019, which aired on BBC2 in October 2020. The programme, which is available on iPlayeruntil September 2021, featured bats from our greater horseshoe bat reserve in Dorset.

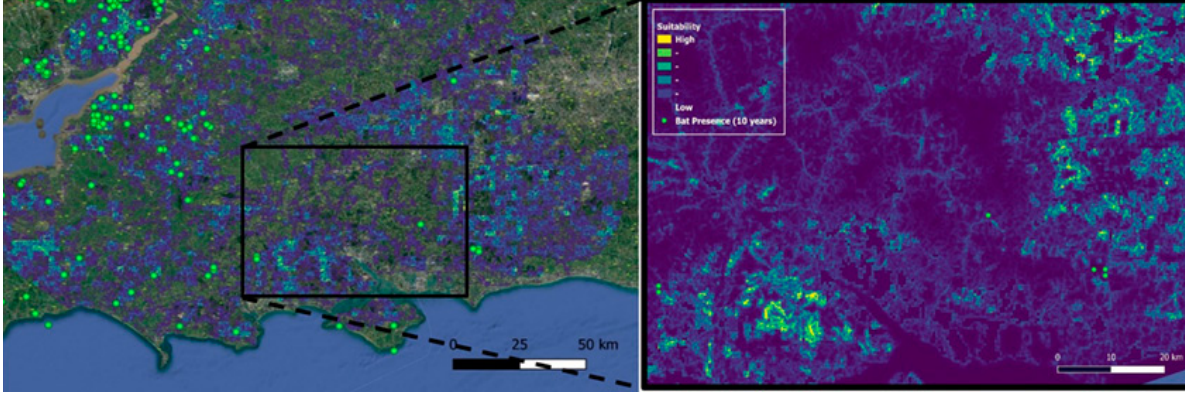
So what's next for greater horseshoes? It's been quite clear for some time now that their numbers are increasing across the UK. We've seen an average annual increase of around 7% in the number of adults at our bat reserves since 2000, and across the UK this figure is around 4-5%. This is brilliant news, and you might be forgiven for thinking this species is largely out of the woods. But species recovery is a long road and it's important that we don't become complacent.

Despite the marked population increase, greater horseshoe bats have not recovered in some parts of their historical range across southern Britain. The longstanding national strongholds of this species are in South Wales, the West Midlands, and South West England, whilst there are relatively few

We are seeing increasing numbers of adult and juvenile bats at our nature reserves.

We are seeing increasing numbers of adult and juvenile bats at our nature reserves.

records in the southern counties beyond the long-established roosting sites in East Dorset. Historical records show that greater horseshoes were once found across Hampshire, West Sussex, Surrey and even as far as Kent. There are, however, promising signs that greater horseshoe bats are not completely absent from these counties, with low numbers regularly recorded in West Sussex at hibernation sites, indicating that there is still potential for them to re-establish in this part of the UK.



Our initial modelling work shows there is suitable habitat in eastern counties, but large gaps in contiguity.

More recently, greater horseshoe bats were recorded via acoustic detectors in coastal Kent, although there is some debate as to whether these are from a British bat or a French bat that somehow made it across the English Channel. Greater horseshoe bats haven't been recorded in Surrey since 1996 and numbers on the Isle of Wight are greatly diminished.
It is well documented that both horseshoe bat species in Britain underwent massive declines in the mid-20th century; by some estimates, 300,000 greater horseshoe bats are thought to have inhabited Britain in 1900, which makes todays figure of 13,000 look much less favourable than it does in the context of the last 30 years. So what else can we do to aid this recovery? It's evident that protecting and enhancing roost sites has played a vital role thus far, but we are increasingly interested in what is happening in the wider landscape at much larger scales. Much of the information we have on the population trends of greater horseshoe bats relies on roost monitoring data, but these sites are lacking in the eastern parts of their range. In order to figure out whether this species might be able to recover in the southeast, we need to know whether the habitat is suitable to support them since the landscape has surely changed dramatically since the species were present in any great numbers.


The current distribution of greater horseshoe bats indicates there is potential for range expansion into South East England.
Map ©Mammal Society, 2018

As well as suitable summer and winter roosts, horseshoe bats require a network of suitable foraging habitats, primarily broadleaf woodland and cattle-grazed pasture, connected by corridors of linear woody vegetation that are unpolluted by artificial light. More recently, it has been shown that noise pollution from road traffic can also inhibit foraging activity. By using maps of landscape features and land-use types, we are able to quantify these factors to generate spatial models that predict the extent and location of suitable habitat, based on the location of existing records of greater horseshoe bats.

These kinds of predictions show different parts of the landscape with the potential to support greater horseshoe bats alongside areas of unsuitable habitat, which may impede dispersal. Large swathes of arable land with poorly developed field boundaries and few trees are more difficult for greater horseshoes to navigate and, therefore, these areas show up as low suitability, as do urban areas with lots of lighting. Conversely, well vegetated riparian corridors, broadleaf/mixed woodland and cattle pasture show up as areas of high suitability where they cover a high combined proportion of the land.

These tools allow us to focus our groundwork to look for new records of these bats in areas where the habitat is better. They can also help us to work with local landowners to improve landscape features at the edge of the current range and potentially to develop or improve roosting sites. With so few roosting sites known in the eastern counties, it is important that we do what we can to protect any remaining roosting sites, however small. Without safe roosting sites, it is impossible for greater horseshoes to recolonise this part of the country.

Over the next few years, we hope to work closely with other conservation organisations, volunteers and landowners in South East England, so that we can facilitate the return of greater horseshoe bats and safeguard the future of this recovering, but ultimately still rare species.

PhD Research Round Up

Kieran O'Malley

How did the bat cross the road?

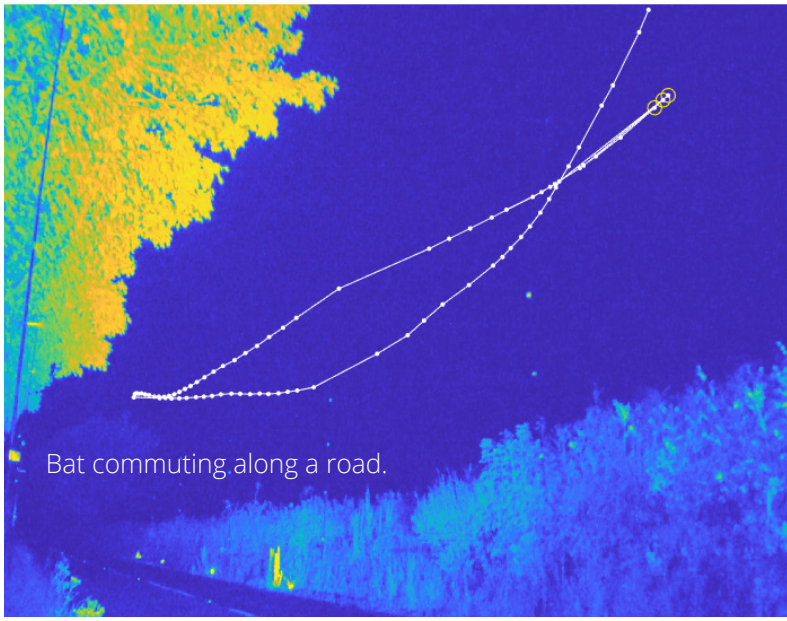
Roads can act as a barrier for many species, either through avoidance behavior or by means of direct collisions with traffic. It is not uncommon to see mammal or bird carcasses on the side of the road, a grisly reminder of how our everyday lifestyle has an impact on our environment. Whilst the profound effects of roads on other wildlife are now well documented, bats are often an overlooked casualty. Previous attempts to provide safe passage for bats across roads using 'bat gantries' have been costly and ineffective, and a better understanding of how bats interact with roads is now needed to improve road management for bats.

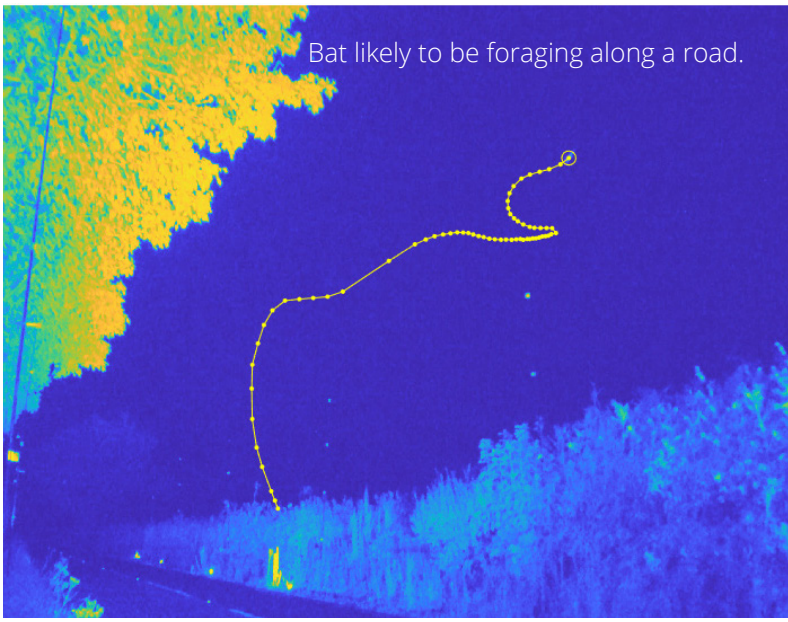
Many people presume bats are similar to rats or mice, short lived but also with the ability to produce many offspring. Yet bats are one of the longest-lived mammals for their size. At 41 years, the Brandt's bat, a common species in Britain, holds the record for the longest lived bat. On the other hand, bats reproduce slowly, giving birth to just a single pup a year. This unusual life history strategy (normally associated with much larger species) makes bat colonies vulnerable to any process that will lead to a population decline, given the limited ability they have to rapidly recover.

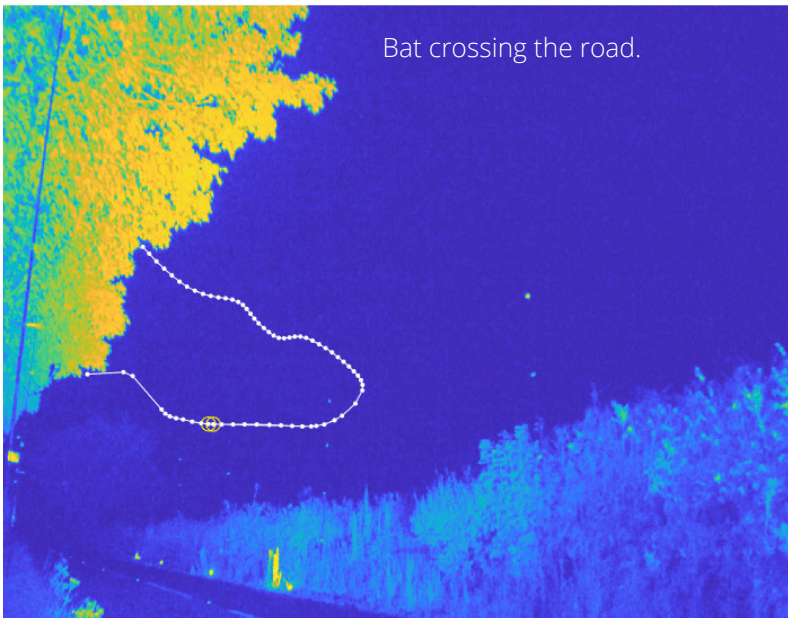
As roads may act as a significant source of mortality for bats it is important to understand how the two interact. For the most part we can discern why a bat may have crossed a road (to reach foraging sites or during migration) but determining exactly how they cross the road is a bit more of a challenge. Studies relying on observers can be useful but will inevitably lead to a loss of information, as well as being subject to human error. A more direct approach is therefore needed if we are to get a more in-depth look of bat movements during these vulnerable moments.

Therefore, as part of my PhD research, I spent the summer along the roads of West Sussex in order to establish exactly how at risk bats may be based on their flight patterns. To circumnavigate the issue of human-observer bias, I used multiple infrared cameras in combination with a network of bat detectors to record bats crossing roads. It is the use of a complementary pair of infrared cameras, one on either side of the road, that will allow me to obtain unprecedented detail of bat movements such as height, speed, and flight paths in 3D space. Using a software developed specifically for reconstructing bat flight paths, I am working on getting this data for a species that is of particular interest to me, the barbastelle.

The barbastelle is one of our rarest species of bat in Britain and is the main focus of my PhD research. By directing my efforts on road sections that intersected known commuting routes of two well-established colonies of barbastelles, I hope to obtain enough data to establish just how much of a risk roads pose to the persistence of these colonies. Through a better understanding of how bats cross or utilise roads, we can in turn help manage our roads to better protect not only the barbastelle, but all bat species.







A combination of infra red cameras and bat detectors placed on either side of a road helps to capture the movements and journeys of bats along and across roads *(left)*. These are plotted to show how bats interact with roads. *(above right)*..

PhD Research Round Up

Tom Dando and Keziah Hobson

Finding positives in a pandemic

It's been a year of disruption and having to adapt some of even the best-laid plans. As I enter the second year of my PhD study into the social and ecological feasibility of reintroducing wildcats into England and Wales, I certainly haven't been immune to it all. But the show must go on, and over the past 12 months, the PhD and project certainly feel like they're moving forward at quite a pace.

Fieldwork permissions may have been a challenge this year, but thankfully desk-based work is just as fun (maybe not). The piece of work within my PhD at the most advanced stage is my literature review, which aims to evaluate the application and guidance of social feasibility in reintroduction projects. While not directly linked to wildcats, this work has enabled me to collate hundreds of case studies from around the world and understand what best practice looks like in terms of the social side of reintroductions.

While reintroduction might seek an ecological outcome, social aspects of these projects are vitally important to achieving any success. The review highlights the importance of constructive and

Photo: ©Helen Haden

committed stakeholder relationships, multi-disciplinary approaches and local involvement in achieving reintroduction success and the pitfalls of under-resourcing social actions, and unaddressed public concerns.

It hasn't all been tapping away at a keyboard... I have also begun the process of interviewing individuals from some of the key stakeholder groups concerning wildcat reintroductions. These interviews provide the first opportunity to understand some of the common concerns of different stakeholders and can inform any future stakeholder engagement work.

Specifically, the research is examining the perceptions these groups have of conservation and by extension, conservationists, and to understand what, if any, barriers exist that might influence their involvement in the reintroduction process.

There will hopefully be fieldwork on the horizon in the New Year as well, with applications submitted to conduct an intensive camera trapping survey of some of the candidate landscapes, to understand the presence, behaviour and breeding status of feral/wild-living and domestic cats. Hybridisation with domestic cats is one of the main threats posed to wildcats and these surveys can help to build a picture of how much of a factor this is likely to be.

Knowledge of the catscape of Wales and England is something that is poorly understood and of significant conservation concern for many species. It's going to be another busy 12 months as this work continues, and there is still space to develop another chapter or two.

As part of my personal development, it's also been fascinating to observe and partake in the development of the wider project and see its progress. Working with VWT, Durrell and Wildwood is a great learning opportunity for me and, if anything, just as valuable as the technical skills learnt through the research itself. It feels like it's going to be a busy winter of work and, hopefully, there will be more exciting progress to report soon.

Analysing attitudes around recovering predators

Following maternity leave, I returned to studying for my PhD at Aberdeen at the beginning of April this year, investigating the ecological and social aspects of pine marten recovery. And then lockdown happened. I will continue on a part-time basis with the new submission date set for late 2022. Since returning, I have been analysing the data collected through an online questionnaire survey which was running whilst I was on leave. This aims to identify drivers of tolerance towards recovering predators in the UK. The protected predators included in the survey were pine marten, polecat, otter, buzzard, red kite and golden eagle, which were chosen due to the differences in their level of recovery and distribution across the UK. The potential drivers included in the study are experience, impacts, wildlife orientations values, and interests. The questionnaire was shared with members and volunteers of organisations with interests in shooting, forestry and wildlife conservation, and over 800 responses were received.

Another chapter of my PhD is looking at the effect of land use on pine marten population density, connectivity, and survival over time. The genotyping of the remaining pine marten hair samples from my 2nd and 3rd spatial capture-recapture surveys for this study had to be put on hold, as the NERC Biomolecular Analysis Lab (NBAF) at the University of Sheffield was closed for several months due to lockdown. The lab has just recently opened and so the genotyping has started up again.

Photo: ©RObert Cruickshanks

A team effort: searching for the elusive barbastelle

Kieran O'Malley, VWT PhD Student

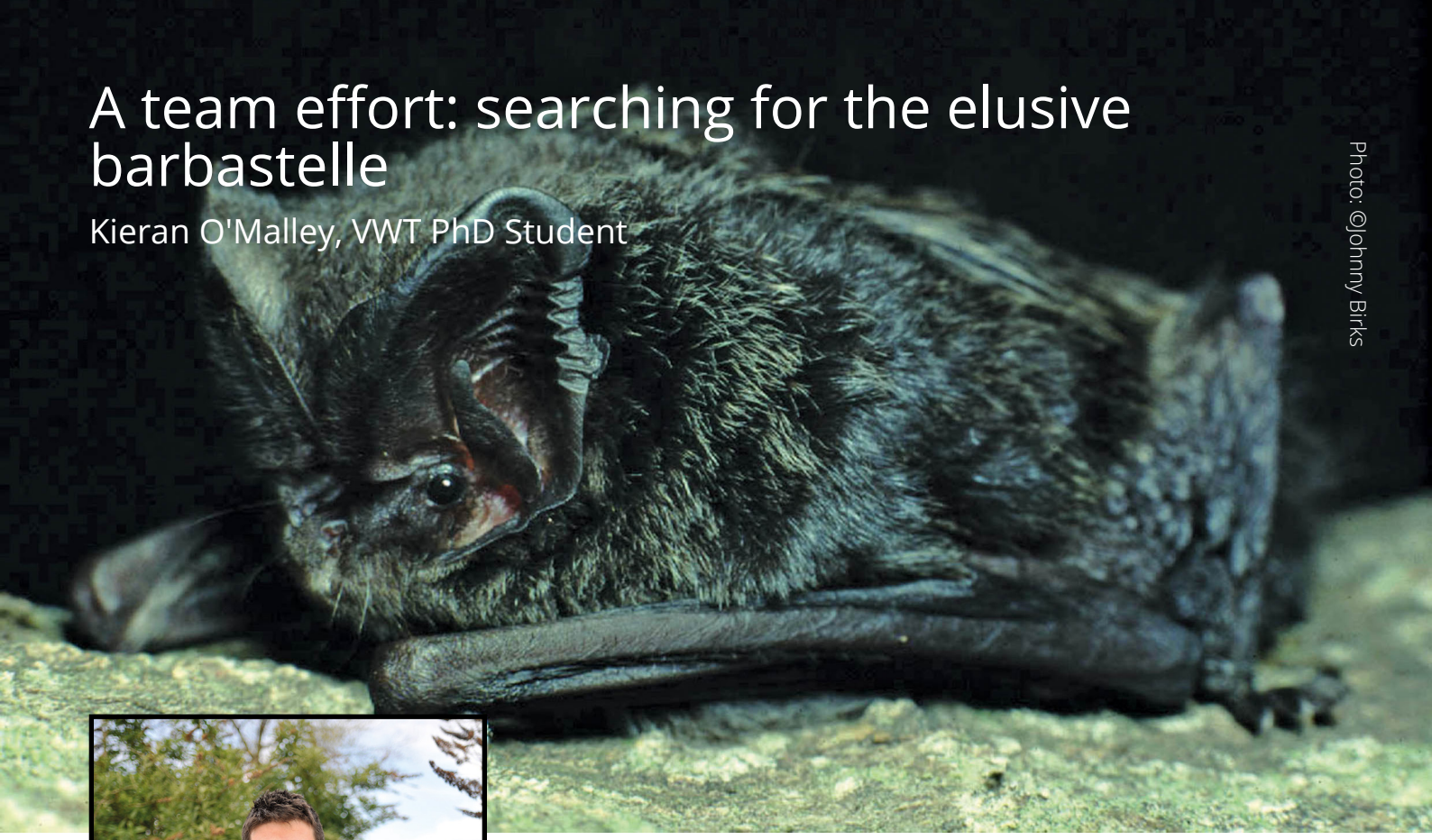


Photo: ©Johnny Birks

Last year I started my PhD at Sussex University, in collaboration with Vincent Wildlife Trust, to study one of Britain's rarest mammals, the barbastelle. Considered to be 'Near Threatened' by the International Union for the Conservation of Nature, as well as being an Annex II species (meaning it has special areas of conservation designated to it), the barbastelle has become one of our most beloved bats. Until recently, however, barbastelles have received a surprising lack of attention in the literature, despite being a species of conservation concern. This PhD is therefore focused on gaining a better understanding of the distribution of barbastelle maternity colonies and how this relates to the wider landscape. The research not only aims to improve our understanding of the elusive barbastelle but also hopes to provide landscape-scale conservation advice for this species here in the UK, which is in line with VWT's conservation-led research and landscape-scale delivery of conservation actions.

The main challenge for this PhD, whilst theoretically simple, is somewhat difficult to address in practice… How do we determine if a woodland is occupied by a barbastelle colony? Identifying woodlands that provide important roosting habitat can be a time-consuming process and has traditionally been reliant on the capture and/or radio-tracking of individual bats. The limited opportunities for conducting barbastelle radio-tracking studies, along with the rarity of this species, has consequently meant only a handful of colonies are known across England and Wales. This presents a problem, not only because it is likely to be an unfair representation of their current distribution and density,

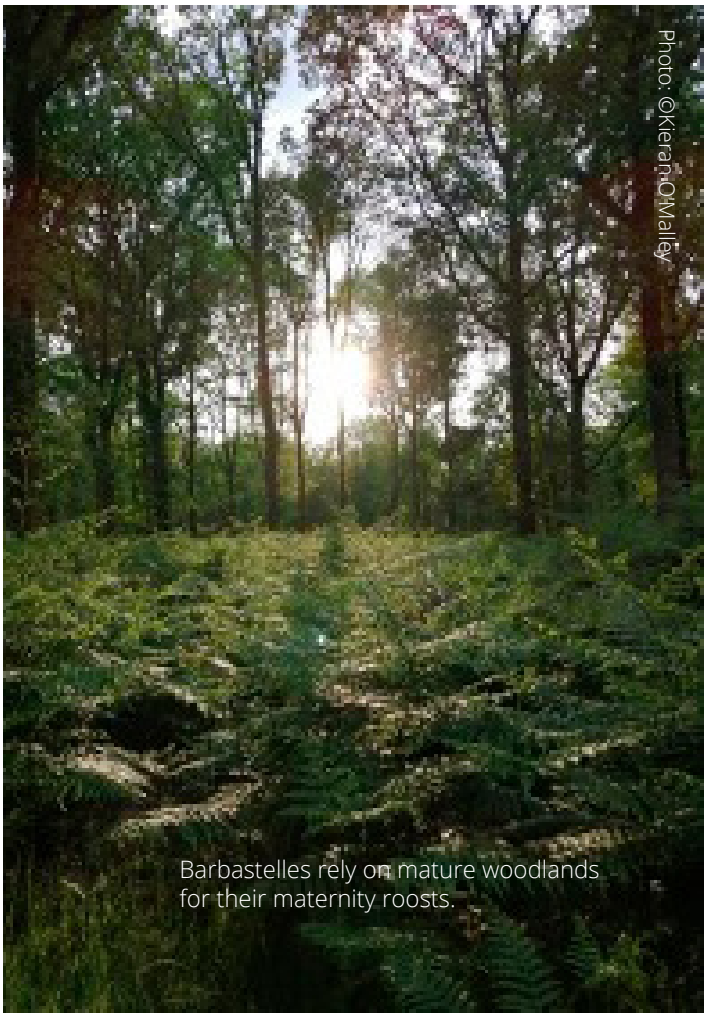


Photo: ©KieranOMalley

Barbastelles rely on mature woodlands for their maternity roosts.

Photo: ©Kieran O'Malley

Static detectors captured more than 5,500 barbastelle recordings.

but because the sparsity of data on colony sites will make any landscape-scale analysis of habitat preference more challenging.

Therefore, last summer I spent my time exploring how acoustics may be utilised to help identify woodlands containing maternity colonies. The basic principle is something already widely recognised amongst bat workers but an aspect which has not been formally investigated is that if you record a high number of echolocation calls near sunset then a roost is likely nearby. To determine the relationship between colony presence and pass rate, I deployed static detectors at a number of ancient woodland sites across Wiltshire, Herefordshire, and West Sussex. The work culminated in more than 5,500 barbastelle recordings spread over 40 nights. By comparing activity levels across different woodlands, I started to better understand the role that acoustic data can have in determining woodland occupancy. Importantly, I was able to establish the minimum survey effort, in terms of number of static detectors, needed to ensure a high level of confidence in any conclusions drawn about woodland occupancy by barbastelle colonies. This research has now led to the establishment of a protocol for the monitoring of woodlands for the presence of barbastelle maternity colonies. With the assistance of dedicated bat groups and volunteers, the hope now is to implement this protocol to survey woodlands on a large-scale. Volunteer contributions will form an essential aspect of the research but also provide opportunities to expand and utilise survey skills.

Unfortunately, this is where we hit our problem. With the initial uncertainty surrounding the reopening of universities in the first half of the year due to the current pandemic, I had no choice but to suspend the roll out of this scheme for 2020. Whilst this was a huge disappointment, my aim now is to continue this work in the coming spring. Therefore, I hope I will be able to work with many of you in the not-too-distant future.

Photo: ©Kieran O'Malley

The barbastelle is thought to be one of Britain's rarest mammals.

Get involved

Although this project will continue in spring 2021, the exact survey period may be subject to change in order to adhere with both local/national government and university guidelines. If you wish to express an interest in the project or volunteer, please contact me directly.

Surveys will be limited to the counties of Wiltshire, Herefordshire, West Sussex, and Norfolk; so please only contact to volunteer if you are able to reach these locations. Surveys will involve the deployment and collection of detectors at specified locations in woodlands. We may be able to loan equipment if needed.

Contact me if you are interested in taking part in this aspect of the research project.

Email: ko255@sussex.ac.uk

Photo: ©Henry Schofield

Can genetics help us uncover the secret life of Bechstein's bats?

Patrick Wright, Senior Science and Research Officer

It is well known that bats are unique amongst mammals. Their ability to fly has allowed them to establish themselves in most continents and habitats, with the exception of Antarctica. Bats have also evolved a distinctive ability among land mammals to use echolocation as a tool for orientation. Both adaptations have allowed them to take advantage of an aerial nocturnal lifestyle and utilise a vast diversity of ecological niches. This diversity is reflected by a wide variety of roosting, feeding, and social behaviours, as well as a range of reproductive strategies. Due to their lifestyle, they are extremely hard to study and monitor — indeed, a review published in 2019 indicated that 57% of bat species have unknown population trends and almost a quarter of species are Data Deficient by the IUCN Red List (Frick *et al.*, 2019). Conservationists, therefore, are continuously challenged to develop new techniques to better understand and protect bats.

While the first human genome took over 13 years to be fully sequenced and cost 3 billion US dollars, rapid advances in the field mean that these technologies are now a lot faster and cheaper. The Bat1K genome project intends to sequence the full genome of all bat species in order to uncover the secret of longer health-spans, flight, echolocation and disease resistance hidden in the bat genome. These molecular tools are also useful in the field of conservation genetics to better understand and protect wildlife, and can be used to detect hybridisation, resolve taxonomic uncertainties and, most importantly, to assess the genetic health of rare species. Recent access to latest genetic techniques has also led to new opportunities to answer some of the issues we come across when studying and monitoring bat populations.

My association with Vincent Wildlife Trust began in 2015 when I started a PhD, co-funded by VWT, at Exeter University. The focus of my research was the Bechstein's bat (*Myotis bechsteinii*), a species recognised as one of Europe's most elusive bats. It is found primarily in ancient woodlands and colonies tend to roost in woodpecker-made cavities. The species was first recorded in Britain in 1837. This, however, was not followed by a deluge of records as they had only been recorded from 14 sites before 1989 (Stebbings, 1989). It was only when the Bat Conservation Trust's Bechstein's Bat Survey started in 2007 that we began to understand the habitat requirements of the species and its distribution in Britain.

The high level of legal protection for the species makes it essential to quantify population size and structure, detect changes and protect key habitats. In the case of

elusive species like the Bechstein's bat, conventional approaches for monitoring cannot be applied. Indeed, the species' echolocation calls are hard to differentiate from other Myotis species and roost count, along with trapping, are both particularly time consuming. The use of molecular techniques, however, can help elucidate some of these mysteries!

With the help of several bat groups, I managed to collect hundreds of DNA samples from all over southern Britain and western Europe. Then, I headed straight to the lab to do some genetic analysis on these samples. I found that the British population showed signs of isolation from the continental populations, meaning that there is probably very little movement occurring between Britain and the continent. This discovery could have led us to believe that British populations would be inbred, but this was not the case. In fact, inbreeding levels remained low throughout their range with the exception of a small isolated population found in Buckinghamshire (Wright *et al.*, 2018a).


Photo: ©Patrick Wright

Members of Dorset Bat Group were among those who helped to collect hundreds of DNA samples

For the case of Bechstein's bats, population genetics alone can provide insight on major barriers, such as mountain ranges and seas. However, the structure and composition of most landscapes affect populations in a more complex way. The field of landscape genetics was introduced to fill in these gaps by providing a robust way to measure the relationship between gene flow and the species habitat. For Bechstein's bats, we found, unsurprisingly, that woodland fragmentation was an important factor influencing connectivity between different populations. This helped us understand why we found some separation between the northern and southern part of the species range in Britain. In this case, Salisbury Plain seems to be a major reason behind the break!

New opportunities for bat conservation may also arise from unexpected avenues. For example, forensic scientists often come up with new ways to study crime scenes. The link between bat conservation and crime scenes may not be obvious at first, but this all changed when I found out that age estimates of victims or suspects could be made from a bit of DNA. Imagine applying these methods to age bats — it could be ground breaking! Indeed, bats live substantially longer than other mammals of similar size and metabolic rate (Wilkinson & South, 2002) with certain species, such as Brandt's bat (*Myotis brandtii*), recorded as surviving in the wild for over 40 years (Gaisler *et al.*, 2003).

Any additional information on the age structure of a colony can provide insight on the health of the population. For example, a bat colony comprised of a majority of very old bats and few young bats may suggest that the colony is on the edge of collapse, while the opposite would suggest a growing population.

However, up until recently, any trustworthy estimate on the age of bats depended solely on long-term ringing studies. Using methods very similar to those deployed by forensic scientists, which involved identifying areas in the genome where levels of DNA methylation would increase or decrease with age, I published a novel method in 2018 to age Bechstein's bats (Wright *et al.* 2018b). By providing information on the age structure of an entire colony from a single sampling session, our methods could facilitate prompt conservation action when required as we would not be dependent on any long-term ringing information.


Photo: ©Patrick Wright

Bechstein's bat

One could argue that developing an ageing assay for such an elusive species, like the Bechstein's bat, was very ambitious and that it may have been easier to develop this assay on a more common species. However, woodland species are in greater need of novel monitoring techniques. Still today, we have no information on the population trends of woodland bats in Britain and the few species trends available from the IUCN red list are solely inferred from the state of their habitat. With the use of molecular ageing techniques alongside other genetic measures, such as effective population size estimates, we have, for the first time, the tools to fill this data gap.

There is still much to be discovered about the Bechstein's bat. For example, we still know very little about their swarming behaviour and where they all go in winter. While the use of genetic techniques will not answer all our questions, it can however provide new insight on populations in order to better monitor and protect the species.

Article based on one originally produced for the Bat Conservation Trust.

References

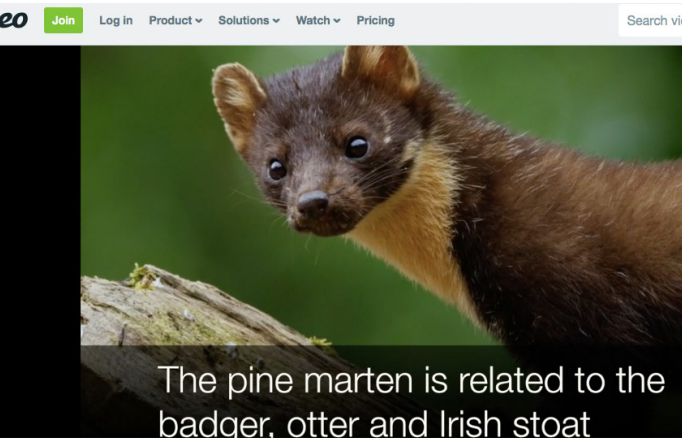
National Heritage Week 2020 and an award-winning film

Ruth Hanniffy, Species Conservation Officer – Ireland

National Heritage Week took place from 15-23 August. This week, which is the biggest celebration of natural, cultural and built heritage in the Irish calendar, has long been a highlight for sharing our work and engaging with communities. This year the theme was 'Heritage and Education: Learning from our Heritage' and we decided to create a short film highlighting 12 native mammals from dawn to dusk, packed full of facts on their ecology and habits.

We narrowed down our selection to Irish hare, Irish stoat, red squirrel, pygmy shrew, otter, fox, bank vole, pine marten, lesser horseshoe bat, hedgehog, badger and wood mouse. The film is illustrated with photographs and also with stunning footage from *Crossing the Line Productions*, and is a helpful Who's Who of native Irish mammals! https://vimeo.com/vincentwildlife/irishmammals

VWT partnered with the Friends of Merlin Woods in a film titled 'Exploring the Mammals of Merlin Woods'. We were thrilled when it recently won the award for Galway City at the National Heritage Week Awards 2020! We are hopeful this will help to promote the importance of Merlin Woods and other natural habitats, particularly those on the outskirts of urban areas like Galway City. Despite their proximity to built-up environments, they can still provide key habitats for protected species like red squirrel, pine marten and Irish stoat.



Colin and Caroline Stanley from Friends of Merlin Woods wished to create a film replicating the type of mammal event we have often run during Heritage week. On these occasions, I have set Longworth Live Capture Traps, looked for mammal tracks, trails and signs and highlighted elusive native Irish mammals using our specimens, whilst discussing the importance of providing cover and fruit and seed-bearing plants for wildlife.

Instead of being joined by members of the public as with previous years, Colin and Caroline filmed my work whilst interviewing me about the techniques I used, how the different habitats might be used by mammal species, and how to recognise them. I used the Longworth traps to study small mammals like bank voles and wood mice, outlining the interesting backgrounds of these underrated small mammals. During filming, we spotted a passing fox and set up a trail camera on its path. It captured footage later that night, demonstrating how useful a tool trail cameras have become in non-invasive monitoring. Using insights from Rob Strachan's book, *Mammal Detective*, the film explores how to become skilled at knowing where and how to look for mammals, and that by learning their habits, we can get a glimpse into their world. It also provided an ideal opportunity to promote mammal research projects that are currently underway across the country, particularly those suitable for citizen scientists.

This award-winning film can be viewed at: https://bit.ly/MerlinWoods.

Photo: ©Julia Bracewell

New ways to volunteer in the New Year

Anita Glover, Bat Programme Manager

In recent years, volunteers have played a vital and ever-increasing role in Vincent Wildlife Trust's mammal conservation efforts.

When it comes to our pine marten projects, volunteers have contributed thousands of hours of their time: walking forest tracks looking for evidence of marten presence in the form of scats; maintaining camera traps and trawling through collected footage; putting up den boxes to provide females with safe places to give birth and raise their young; and even spending long nights tracking the radio-collared individuals that had been translocated from Scotland to Wales.

Volunteers who prefer mammals of the winged variety spend their summer evenings sat outside churches, barns, cottages and stables, batting away the midges and waiting patiently for the sound of faint warbles on an ultrasonic detector. This is a sign that the horseshoe bats that roost inside are stirring, making looping flights and edging closer to the exit points as they determine whether it is dark enough to emerge. Once emergence starts, the bats come thick and fast. Tally counters enable volunteers to keep track of the number exiting and as light levels fall, infra-red cameras become invaluable in completing the count. The roosts in question are some of VWT's bat reserves and the annual summer counts provide data essential for monitoring long-term population trends.

Monitoring the colonies is not the only way in which volunteers can help look after these rare bats. The reserves themselves require building maintenance and habitat management to keep them in good condition and every year there is plenty of practical conservation work that needs to be undertaken. This requires donning some old clothes and work gloves, grabbing some tools and getting stuck in, but many hands make light work. There is also something very rewarding about spending a day working outdoors amongst nature with a bunch of like-minded people and achieving a physical task.

In 2020, COVID-19 restrictions have severely limited the amount of volunteer activities that have been able to go ahead — a disappointment to VWT and its volunteers alike. However, in 2021, as COVID-19 measures allow, we are aiming to expand the network of volunteers involved in taking care of the bat reserves and their horseshoe bats.

We are keen to involve volunteers from all walks of life, especially from local communities around our reserves and people who may not already be engaged in wildlife conservation. We also welcome the skills of professional ecologists looking to contribute to the charity sector, as well as students and graduates seeking early career conservation experience. In addition, we will be offering a number of corporate volunteering days. All training, equipment and PPE will be provided.

Whilst the current situation presents challenges for running volunteer activities, we will make every effort to reinstate them when and where safe to do so. The health and wellbeing benefits of conservation volunteering are well documented, and I would urge anyone who has experienced isolation as a result of lockdown to give it a go.

If you would like to get involved, or for more information on volunteering, please email VWT's Volunteer and Community Engagement Officer, Laura Lawrance-Owen at lauralawrance-owen@vwt.org.uk

©Crossing the Lnes Productions

A 'virtual' walk on the wild side

Ruth Hanniffy, Species Conservation Officer – Ireland

A passing couple shot me an amused glance as I stood in the middle of an area of dense undergrowth talking to myself — well, talking to the Dictaphone app on my phone to be precise. I was on a mission to gather forest sounds like branches crunching underfoot and the wind rustling the leaves. This soundscape would create one layer of our virtual bat walk, and I was in full director's mode.

The year 2020 has been the 'Year of Film' for VWT Ireland as we moved many aspects of our work online in response to COVID-19.

In April, Limerick City and County Council approached us with the first opportunity to channel our inner 'Spielberg'. They had been awarded the European Green Leaf for 2020, but needed to replace their planned celebratory events with online versions, and we were invited to collaborate. During a brainstorming phone call with Sinead McDonnell, Environment Awareness Officer with Limerick City and County Council, memories of my favourite audiobooks floated past, where I'd escaped reality in stories set to music or nature sounds, lost in a world inside those tiny headphones.
Could we achieve the same with a bat walk... and transport the listener to a forest at dusk, perhaps even experiencing their first ever bat walk!

A traditional bat walk is rich in atmosphere. People gather before dusk whilst birds are still singing as they settle for the night, passing the baton to nocturnal mammals before regrouping for the dawn chorus. People murmur in anticipation as sky darkens and they walk in shadowy procession, eyes skyward towards the glow of their bat detectors. Could a virtual bat walk recreate this, woven through with the sounds of the woods and streams, and overlaid with a Daubenton's feeding buzz and the melodic warble of a lesser horseshoe bat? It was worth a try. The idea took flight and Kate set to work on the script that would not only delight newcomers, but satisfy the serious enthusiast. It detailed the power of a bat wing on its downbeat, supported by tiny wing bones. It described the marvel of echolocation, outlining how we can learn to recognise the tonal quality and repetition rate of a bat call; the subtle difference between the pipistrelle call which sounds like a wet slap, compared to the dry click of a Daubenton's bat. And it explored how bats feed — which species catch insects mid-flight using aerial hawking and which glean insects from the surface of the water.

The film was made possible by the generosity of contributors and we are indebted to them. Award-winning *Crossing the Line Productions* sent us footage of lesser horseshoe, brown long-eared and Daubenton's bats in

mesmerising slow motion flight. These frames let us see into their world, one which is off-limits even to those of us who study them. Frank Greenaway, Daniel Hargreaves and Daniel Whitby's photographs capture bats in flight with awesome precision. And Bat Conservation Ireland and Philip Briggs from London Bat Group were on hand with more rare images and echolocation calls.

All this coincided with government restrictions confining me to within 2km and then 5km of where I lived. On the plus side, I had a beautiful woodland next door. On the minus, my WiFi connection was frustratingly poor and, as I couldn't travel to the office, dealing with large video files was a struggle. But I won't forget the morning I awoke to an email from Michel Barataud, a French research scientist and author of books, including the Acoustic Ecology of European Bats, allowing us to use his beautiful echolocation calls on our film. I can't remember a happier lockdown moment!

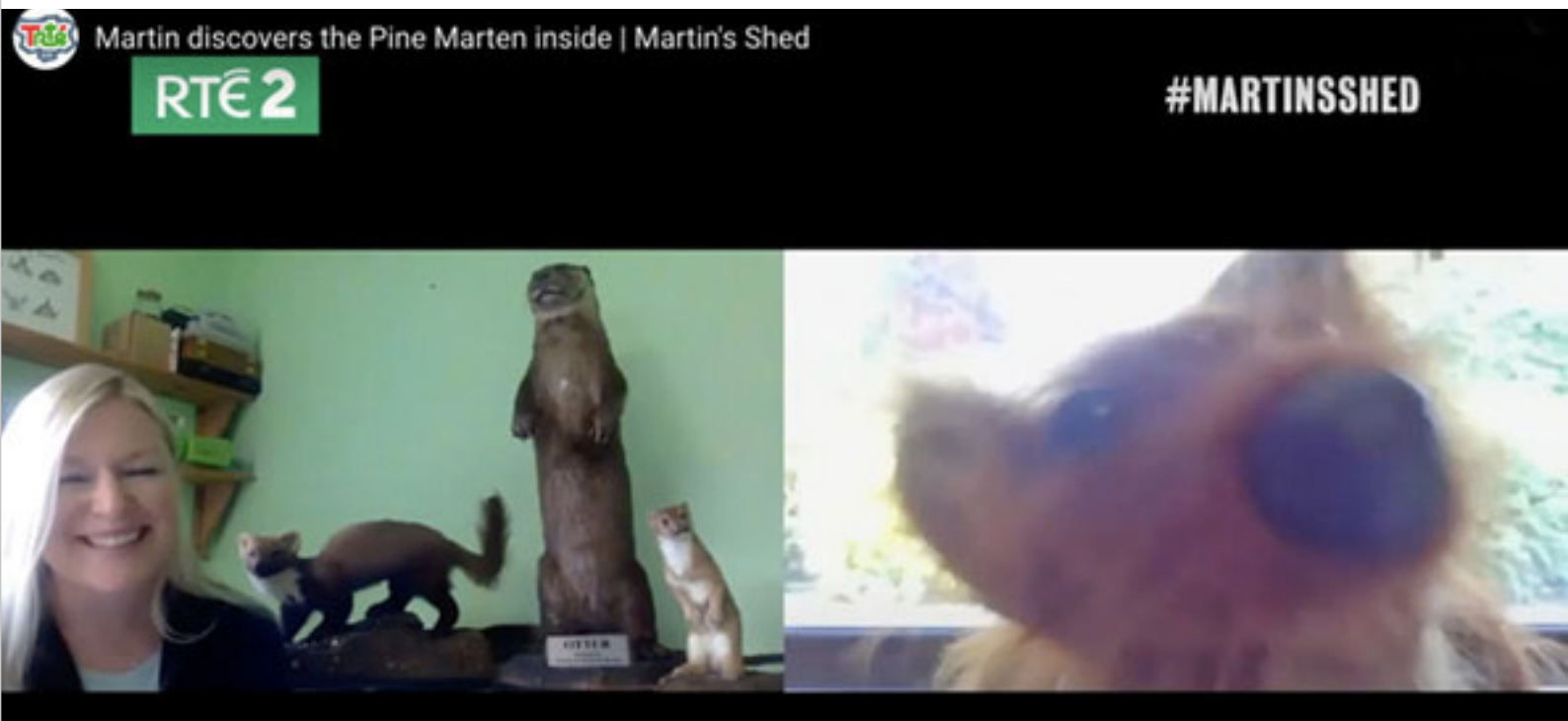
The Virtual Bat Walk is set in Curragh Chase Forest Park, undoubtably the most important place in Limerick for bats. It is a Coillte-owned jewel in the west Limerick countryside with over 300 hectares of rolling parkland, mixed woodland, lakes and an arboretum. Its literary past is impressive — the poet and author Sir Aubrey de Vere and his family lived in Curragh Chase House where visitors included the poet Tennyson. It is now a Special Area of Conservation and the most important site in Co. Limerick for the lesser horseshoe bat. The colony inhabits a slated stone-built outbuilding to the rear of the house in summer, using the abundant woodland and aquatic habitats to feed, and retreating to the ruins of the basement in winter to hibernate. While those on our virtual bat walk may never get to Curragh Chase, they will be transported there through photographs, particularly the aerial photography from Arc Images .

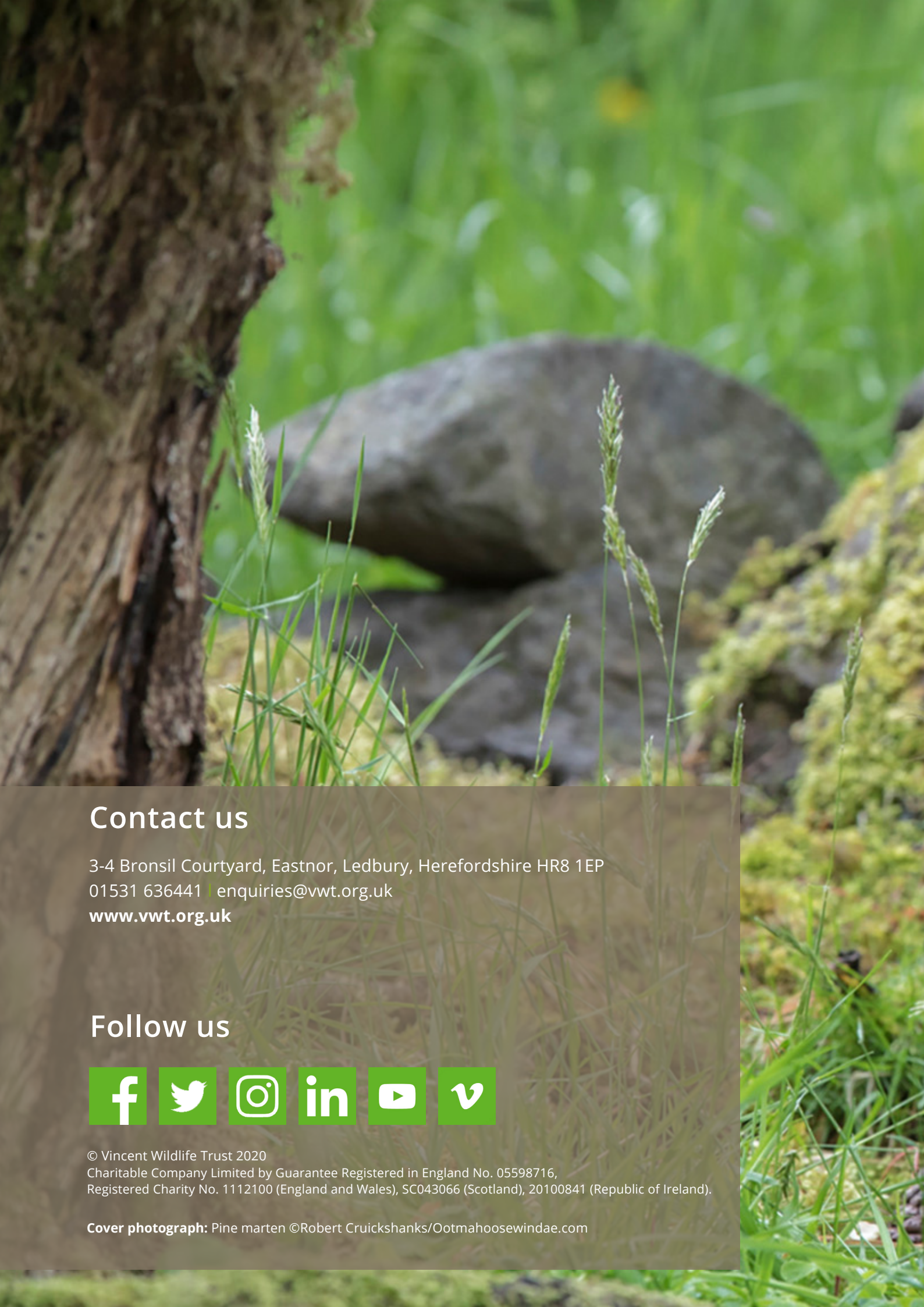
Creating a film must feel a little like writing a symphony. The photographs and diagrams are clearly the main melody, with stunning slow motion footage like a soaring soprano; recordings of woodland and river soundscapes form the steady bass; the narration is the accompanying pianist, leaving the echolocation calls as a violin virtuoso stealing the show. Our virtual bat walk, the first of its kind in Ireland, launched on Friday 5 June and has since had almost 900 views! We look forward to hearing the bird song and feeling the late evening breeze in real life, but in the meantime, our hope is that the virtual version may bring a whole new experience to newcomers, and bat enthusiasts can enjoy these exceptional creatures from a new perspective! Watch it at: https://bit.ly/virtualbatwalk

Martin Pine's journey of self-discovery

Things took an delightful turn when we were approached by the National broadcaster, RTÉ, to feature on their children's channel RTÉ Junior. Their show 'Martin's Shed' is hosted by none other than Martin Pine, a pine marten with a difference, whose weekly show airs from the garden shed he calls home. For his first ever Zoom call he went on a journey of self-discovery with me to learn more about his favourite foods, habitats, and why he likes to spend so much time alone (I reminded him that he is solitary!). Being interviewed by this witty puppet was a new and very enjoyable experience, and I look forward to hopefully speaking to the lively Martin Pine in the future! http://bit.ly/RTE_MartinPine

During this time, RTÉ Junior ran 'Wild Week' where the website profiled Ireland's wildlife in partnership with the organisations who work to protect it. We were delighted to shine the spotlight on Irish mammals and each day the website featured a new species covering pygmy shrew, Irish hare, hedgehog, Irish stoat, fox, pine marten and of course, the lesser horseshoe bat. https://www.rte.ie/learn/vincent-wildlife-trust/





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