

Newsletter 14 December 2021

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Welcome

from Vincent Wildlife Trust's CEO, Lucy Rogers



Welcome to the 14th issue of our newsletter — and what a good year 2021 has been for VWT!

There has been some excellent work delivered by VWT staff, students and partners, along with several new projects in the pipeline.

We published our national pine marten recovery plan for Britain. Working in partnership with NatureScot (formerly Scottish Natural Heritage), Natural England and Forestry England, this outlines a recovery plan for pine martens in Britain. Our Science and Research Programme Manager talks about this, along with VWT's role in the further translocation of pine martens to the Forest of Dean (p8).

Our Bat Team has been fully occupied with delivering the Green Recovery Challenge Fund project, future proofing our bat reserves against climate change, including a raised bat loft at High Marks Barn, a cool room at Iford and a new bat tower for lesser horseshoe bats near Canada Farm where greater horseshoe bats have displaced the breeding colony of lesser horseshoe bats (p14). As usual, our volunteers have made a tremendous contribution to our work, not least helping with wardening and general maintenance at our bat reserves, as well as carrying out emergence counts to contribute to the important National Bat Monitoring Programme (p6).

We also launched a new campaign, the Sussex Bat Appeal, to raise funding for the purchase and repair of a newly discovered greater horseshoe bat colony in Sussex (p5).

We were also kept busy monitoring stoats and weasels — find out more about the work of the team as they find ways to monitor these elusive mammals (p15) and how it links with Mammal Mapper, a Citizen Science project.

We welcomed Amy Coyte, our newest Trustee, Katie Allan, our newest PhD student, and Maria Teresa (Mabli) Agozzino, our Communications Assistant (p4). Sadly, we are saying goodbye to David Bullock, long-standing Trustee and Chair since 2018 (p19).

Finally, an enormous and heartfelt **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...

Papers, reports and articles published this year

Each year, VWT staff and students publish a range of academic papers, scientific reports and articles to share the research, the first-hand experiences and the learning. This year's publications cover pine martens, greater horseshoe bats, Irish stoats and woodland bats.

Papers and Reports

January 2021

P. G. R. Wright, H. Schofield, F. Mathews (2021) Can effective population size estimates be used to monitor population trends of woodland bats? A case study of *Myotis bechsteinii*. DOI: 10.1002/ece3.7143

February 2021

Catherine O'Reilly, Peter Turner, Declan T. O'Mahony, Joshua P. Twining, David G. Tosh, Christopher Smal, Kate McAney, Ciara Powell, John Power, Denise B. O'Meara (2021) Not out of the woods yet: genetic insights related to the recovery of the pine marten (*Martes martes*) in Ireland. https://doi.org/10.1093/biolinnean/blaa214

June 2021

Jenny MacPherson and Patrick Wright (2021) Long-term strategic recovery plan for pine martens in Britain. <u>https://www.vwt.org.uk/wp-content/</u> <u>uploads/2021/07/Pine-Marten-Recovery-Plan-VWT-10June2021.pdf</u>

August 2021

P. G. R. Wright, C. Bellamy, P. B. Hamilton, H. Schofield, D. Finch, F. Mathews (2021) Characterising the relationship between suitable habitat and gene flow for *Myotis bechsteinii* and *Eptesicus serotinus* in Britain. <u>Landscape Ecol https://doi.org/10.1007/s10980-021-01317-4</u>

September 2021

Elizabeth Croose, Ruth Hanniffy, Brian Hughes, Kate McAney, Jenny MacPherson, Stephen P. Carter (2021) Assessing the detectability of the Irish stoat *Mustela erminea hibernica* using two camera trap-based survey methods. <u>Mammal Research https://doi.org/10.1007/s13364-021-00598-z</u>

Articles

January 2021 Pine martens by Hilary Macmillan BBC Wildlife Magazine

August 2021 Spotlight on stoats and weasels in Wales by Jenny MacPherson Natur Cymru Magazine

September 2021

Pine martens – flying the flag for woodlands by Jenny MacPherson and Hilary Macmillan Resurgence and Ecologist Magazine

September 2021

Greater horseshoe bats and the Sussex Bat Appeal by Hilary Macmillan *My Geen Pod* supplement in The Guardian Newspaper

Videos

February 2021 Celebration of the Back from the Brink Pine Marten Project https://vimeo.com/manage/videos/516304095

September 2021 A good news story – The Sussex Bat Appeal https://vimeo.com/manage/videos/592344150

October 2021 Evidence Champions: VWT — The return of the pine marten to mid-Wales https://www.youtube.com/watch?v=zN8o7WHtY6s

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Welcome to new staff, students and Trustees

Dr Amy Coyte — VWT Trustee and Chair Elect

Amy has spent her career in wildlife conservation and her roles have included Chief Executive of the Bat



Conservation Trust, Director of the BBC Wildlife Fund, Director of Communications for the Wildfowl and Wetlands Trust and Chair of Wildlife and Countryside Link. Amy is currently an Independent

Member of the Parole Board and a Trustee of the Gloucestershire Wildlife Trust. She joined the Board of Trustees in 2021 and will step into the role of the Chair of the Board of Trustees at the beginning of the new year.

Katie Allan — PhD Student Following a degree in Zoology and



MRes in Ecology and Environmental Biology at the University of Glasgow, Katie is now doing a PhD at the University of Sussex, co-funded by Vincent Wildlife Trust. Her PhD aims to assess the

permeability of landscapes to rare species of bats using novel telemetry techniques and to identify the locations of key swarming and roosting sites.

Dr Maria Teresa Agozzino — Communications Assistant Mabli has volunteered with the Trust since 2016, working with the



Communications Team. She brings considerable organisational skills and programmatic experience from her former roles as professor, editor, archivist, ethnographer, office manager and author. Mabli is a life-long

advocate for animal welfare, nature and conservation, with a particular passion for all things *Mustelidae*.



Change of Date!

14-16 September 2022 Tbilisi, Georgia

www.european-mustelid-colloquium.org



The European Mustelid Colloquium is an opportunity to bring together people from across Europe and further afield to discuss and share research and issues on all aspects of mustelid ecology and conservation. The Colloquium is usually held once every two years.

The 34th European Mustelid Colloquium will be held on 14th-16th September 2022 at Ilia State University in Tbilisi, Georgia. The Colloquium will be subject to COVID-19 and associated travel restrictions easing in time for the event.

Registration will be available from early 2022 and we will announce further details in due course.

www.european-mustelid-colloquium.org

Sussex Bat Appeal

Lucy Rogers, CEO, and Henry Schofield, Head of Conservation



In 2019, a member of Sussex Bat Group had perhaps one of the most exciting finds of his life. For 20 years or more, the group had been recording small numbers of greater horseshoe bats in hibernation sites and individuals in summer roosts, but in the roof space of a derelict Victorian stable block in West Sussex, Scotty Dodd discovered a small colony with pups. Although home to just a handful of residents, it was an immensely important find and right now is possibly the most important greater horseshoe bat maternity roost in Britain.

It is 100 years since the greater horseshoe bat has bred anywhere in southeast England — its stronghold is in the southwest. To find this outlier breeding colony is evidence that this bat species is outgrowing its main base in the southwest.

The fall and rise...

Greater horseshoe bats suffered a devastating population crash in the 20th century -a loss of 90% of the population by some estimates. Although still very low, the population is now on the rise and in fact the species is increasing faster in percentage terms than any other British bat currently monitored by the Bat Conservation Trust's National Bat Monitoring Programme. Estimates put the population size today at 13,000 tripling its all-time low of some 4,000 individuals in the latter part of the last century.

Legal protection of greater horseshoe bats predates the Wildlife and Countryside Act and started in the 1970s, helping to trigger a recovery in the species. Alongside their legal protection, greater horseshoe bat population increase has been assisted by a series of mild winters experienced in the latter 20th and early 21st centuries, which allowed high juvenile survival over winter and adult females were able to come out of hibernation in good condition. In addition, VWT's efforts in the acquisition of bat reserves since the 1980s has enabled the greater horseshoe bat population to thrive at a much faster pace than anticipated.

Today, as well as carrying out species research, VWT also manages 37 bat roost sites with the aim to protect and enhance the roosts of rare bats. Six of these sites in the southwest are exclusively focused on the protection of greater horseshoe bats. By acquiring reserves dedicated entirely to the conservation of the greater horseshoe bat, VWT has been able to improve the roosting conditions in buildings that were sub-optimal and exclude human and predatory disturbance. These measures have resulted in a spectacular increase in populations. Today, around half of the national population of greater horseshoe bats resides within VWT's reserves.

Back to Sussex

The location of the pioneering colony discovered within the South Downs National Park has the potential to act as a crucial stepping stone for this species, with a chance that it will lead to the recolonising of further areas of the southeast. The bats will, however, need a helping hand. Sussex Bat Group and VWT have joined forces to raise the funds needed through the 'Sussex Bat Appeal' to buy and refurbish the stables. If successful, VWT will own the stables in perpetuity for the bats and, using the expertise it has built up over several decades, will transform the building into one that will accommodate a sizeable population of greater horseshoe bats. Sussex Bat Group will help manage the site and monitor the bats.

Find out more at www.vwt.org.uk/sussex-bat-appeal

Sussex Bat Appeal, Vincent Wildlife Trust, 3-4 Bronsil Courtyard, Eastnor, Ledbury, Herefordshire HR8 1EP

Volunteering success in the field and at home

Laura Lawrance-Owen, Volunteering and Community Engagement Officer



In 2021, volunteering with VWT has taken many forms with registered volunteers, corporate volunteers, local group volunteers and also citizen scientists. Whichever form it comes in, this volunteer support is essential for us to reach our ambitions for the monitoring and conservation of mammals in Britain and Ireland.

Our biggest project this year has been to recruit and train volunteers to help monitor and maintain 23 of VWT's bat reserves in England and Wales. In May, June, July and August, we were joined by 79 Bat Reserve Roost Monitor volunteers and corporate volunteers who helped us count the emergence of lesser and greater horseshoe bats for the National Bat Monitoring Programme and VWT records. Not only did they contribute over 430 hours of their time, they also helped us to gather important information on the population trends of these rare bats.

As the autumn months began, we turned our attention to maintaining VWT's bat reserves and the volunteer Bat Reserve Rangers have been central to our progress. So far, more than 40 volunteers, along with a few corporate groups, have contributed more than 220 hours of their time helping us to keep the reserves in good condition for the bats and other wildlife. Tasks have included cutting back vegetation for access and wildlife, clearing bat droppings, building bespoke features for the bat roosts and other maintenance tasks as required.

The bat reserve volunteer opportunities have been possible thanks to funding from the Garfield Weston Foundation, the Postcode Local Trust (supported by players of the People's Postcode Lottery) and the Government's Green Recovery Challenge Fund (developed by Defra and its Arm's-Length Bodies, and delivered by The National Lottery Heritage Fund in partnership with Natural England, the Environment Agency and Forestry Commission). This funding has enabled us to purchase equipment and materials to improve how we monitor and manage our bat reserves, and engage with an additional 106 volunteers, plus corporate groups and students within VWT's Bat Programme.

In Ireland, we trialled the use of 'Mostelas' — a modified camera trapping device designed to capture footage of small mustelids, in this case the Irish stoat. Thanks to funding from the National Parks and Wildlife Service, and to help from a few key volunteers, we installed and monitored 12 Mostelas with cameras and 12 external camera traps. Furthermore, a team of home-based volunteers has been busy going through and cataloguing the large number of videos captured during the project.

Our other volunteer highlights for the year include: deploying static bat detectors for a PhD research project on how to monitor for barbastelle colonies and understand more about the woodlands and landscapes they use; continued monitoring of pine martens with camera traps; recording of bat emergence in Ireland; and citizen scientists cataloguing 'Mostela' and camera trap footage from England via MammalWeb.

This year we have welcomed volunteers in the field and also in their own homes and it is wonderful to see our volunteer community grow and change in support of the work carried out in our bat and carnivore programmes. Thank you to everyone who has helped us this year.

Habitat Suitability Modelling

Patrick Wright, Senior Science and Research Officer



I spend a lot of time working on models that will produce 'pretty' maps, but very little time explaining them in laypersons' terms. So, I will try to give a concise and comprehensive description of the work that goes into making these 'pretty' habitat suitability maps using a software called Maxent.

In ecology, we often want to understand where a species may be found but often, especially with mammals, we have very little information to work with. Habitat Suitability Modelling (HSM), also known as Species Distribution Modelling or Ecological Niche Modelling, is a widely-used technique that uses a limited set of information on a species to understand and infer where it is distributed.

The recipe for these models is relatively simple. First of all, it is essential to choose a study species, but also to decide on the scale, extent and resolution of the study. Then comes the part of gathering data from the different sources available. For HSMs, the records of the species of interest and a suite of relevant landscape variables need to be collected. Assuming this information was easily collected (this does not happen very often), we can now do some modelling!

The Maxent software uses presence-only data of a species as opposed to presence-absence. This is very handy as absence data is rarely available for wildlife! The process is very similar to machine learning as it uses a set of points to develop a model (training dataset) which is then tested against our test dataset. Now it is possible to just throw all the data in the software and trust the results, but that is not very good practice. To get the most out of the models, it is important to 'tune' them to maximise their predicitve abilities. Once this is done, we can then create the long-awaited map predicting the species' distribution and extract the response curves that describe the relationship between the species and the different

landscape variables used. It is important to bear in mind that these models make a number of assumptions, for example, that there has been random sampling of the species throughout the landscape. However, this is rarely the case as the data tends to be messy with some bias in the way records were collected and this will in turn be reflected in the models. For example, if we only look for a species in the woodlands of East Anglia, then the models will be biased towards woodlands and the climatic conditions of that county. That's why it is important to think carefully of the data that is being used in these models.

It is a very exciting time to use technology in conservation as new tools, softwares and modelling techniques are published every day, making it very difficult to stay up to date! I hope this short piece helped to demystify the work that goes into these habitat suitability models as they can be a great tool for conservation and to help us uncover many mysteries of the species that we study at VWT.



VWT and pine martens reintroductions and recovery

Jenny MacPherson, Science and Research Programme Manager

The pine marten is one of Vincent Wildlife Trust's focal species and we have been carrying out research and monitoring of this charismatic little mustelid for more than 30 years. 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 intensive predator control and loss of its preferred woodland habitat. Increases in forest planting and legal protection since the 1980s have led to pine martens making a good recovery across Scotland. However, repeated surveys by VWT during the 1980s and 1990s found little evidence, beyond occasional sightings, to suggest that viable pine marten populations persisted elsewhere.

In Wales, despite there being large areas of suitable habitat, the species was thought to be on the verge of extinction and so, between 2015 and 2017, a total of 51 pine martens were translocated from the Scottish Highlands and released into woodlands in north Ceredigion. The animals were monitored, with the help of local volunteers, using a range of methods including radio tracking, camera traps and scat surveys. Successful breeding has been recorded every year since spring 2016 and martens have now spread beyond the release region.

With our experience of translocating pine martens to Wales, VWT was happy to help when a similar project began in Gloucestershire. In autumn 2019, we began trapping and radio collaring pine martens in Scotland (under licence from NatureScot), for translocation and release into the Forest of Dean. A small core population has settled and begun breeding in the Dean and Wye Valley but a planned second tranche of translocations had to be postponed during the height of the pandemic in 2020. However, we were able to resume trapping in Scotland in late summer of this year and a further batch of pine martens was released bringing the total number up to a healthy 35.



Earlier this year, VWT produced a long-term strategic recovery plan for pine martens in Britain, with support from Natural England and NatureScot. With limited resources and suitable donor populations for actions such as reintroductions, it is important to identify how to achieve the maximum conservation benefit for pine martens. We used modelling methods based on data and knowledge of pine marten ecology and distribution to develop a framework for optimising spatial targeting of conservation measures for this species. The results were used to inform a series of recommendations for long-term pine marten conservation in Britain.

While reintroductions can be very valuable, they should always be a last resort rather than a first resort. If reintroduction is the only option, then it is an acknowledgement that we have failed to protect and preserve a species. Ultimately, we should be aiming to prevent local extinctions in the first place. Looking forward, our focus is on facilitating natural recolonisation and recovery while developing and implementing effective monitoring schemes for existing and expanding pine marten populations.

Forging links for greater impact

Kate McAney, Head of Conservation Development — Ireland



Significant birthdays are an occasion for taking time to look back over the decades, to reminisce on what has been and to remove or add a few things to the 'bucket list'. July 2021 was a significant occasion for me, not as a birthday, but the fact that it marked 30 years since I joined Vincent Wildlife Trust.

For most of this time my work has been 'hands-on activity' to conserve the lesser horseshoe bat in the six western counties in which it occurs in Ireland. I've surveyed hibernation sites and summer roosts, assisted with radio telemetry to determine habitat use and set up reserves. Over the decades, I have been privileged to observe thousands of these amazing creatures as they went about their seasonal activities. This year, I have seen just a few hundred horseshoe bats. The reason is because now my work centres on forging links with a range of organisations and individuals to roll out projects to conserve the species at a scale that would be impossible for the Trust on its own. The need for this is even greater than it was 30 years ago, because we now know habitat loss and fragmentation have

given rise to three and possibly four sub-populations, which must be reconnected. Just as this fragmentation didn't take place overnight, its reversal will take time, but important steps have and are being taken.

In December 2020, I received a photograph of a hot box (thermostatically controlled artificially heated roost space) that had been carefully installed in an outbuilding by a private individual in east Clare. We funded this with a grant from the Hen Harrier Programme (www. henharrierporject.ie). Since then, a second hot box has been installed and two night roosts located in woodlands. We are now monitoring the night roosts and our two 'hot-box hosts' are providing us with regular updates.

In March 2021, we approached Mulkear River Catchment Project (<u>www.mulkeareip.com/</u>) in County Limerick to ask it to join with us in applying for funding for a farm-based conservation project under the EU Rural Development Programme 2014-2022. They agreed, and in May we were one of 24 projects granted funding for a

one-year project, to work with farmers to provide new summer roosts for this species (<u>https://www.</u> <u>mulkeareip.com/</u> <u>horseshoe-bat-</u> <u>project/</u>). Our 1997 survey of Limerick (<u>https://</u> bit.ly/318c8sp) indicated there was a lack of roost sites for the species in the county, yet our 2020 Circuitscape Study (www.vwt.org. uk/wp-content/uploads/2021/02/ VWTIrelandLHBCircuitscapeReportN ovember2020Compressed.pdf) indicated there is suitable habitat in Limerick, including along the Mulkear River. We believe the Mulkear Project will be a successful model that could be undertaken with future agri-environmental funding in the other five counties.

In May this year, we began developing a Species Action Plan with National Parks and Wildlife Service for the lesser horseshoe bat, a significant step in planning its long-term conservation. We have identified 20 actions encompassing Roosts, Foraging, Monitoring, Connectivity, Artificial Lighting and Roads and are receiving feedback on these from a range of government departments and other key organisations.

Although I miss encountering these small plum-sized bats, it is still a privilege to be involved in their conservation in this 'hands off' sense and... there is always next summer.



Wild writing — a personal reflection

Hilary Macmillan, Head of Communications



The role of VWT's Communications Team is to share the work and achievements of our Conservation Team with as wide an audience as possible and in as many ways as we can find. 'Popular science writing' is one such means. It is designed to be accessible, informative and, hopefully, a good read. Some of our writing also happily fits with the term 'new nature writing' - a 'new' genre that embraces what the author Richard Smyth describes as 'a chorus of many voices' and combines scientific observation and discovery with creative narrative. 'Nature writing' is of course not 'new'. There were authors who wrote about the natural world as far back as antiquity: Aristotle's History of Animals was published in the fourth century BC.

Fast forward to the 19th century and we see a growing proliferation of nature writers. Their works incorporated a range of styles and approaches, as it does today; from the Romantics such as Wordsworth and Clare to the recorders and observers, the great travellers of the time: Charles Darwin, Alfred Russell Wallace and from the US, John James Audubon and Henry David Thoreau. This blending of different approaches, as with new nature writing today, can be described as a 'hybrid form'. Darwin's writing is a perfect example of this hybridisation and there is no doubt that he was a 'nature writer'. In his *Reminiscences* of my Father's Life, Francis Darwin describes how he 'used to hear him admire the beauty of a flower; it was a kind of gratitude towards the flower itself, and a personal love for its form and colour.'

As the 19th century progressed, the effects of people on the natural environment were becoming increasingly apparent Environmental concerns appeared in literature and gained a growing political significance. Many writers, and indeed Wordsworth was one of them, carried environmental messages in their work. John Ruskin's 1884 publication Storm-Cloud of the Nineteenth Century was written in response to the growing problem of smog caused by the industrial revolution. Ruskin's work could easily have been a contemporary piece of nature writing as he describes the white cumulus clouds seen briefly. 'through the sulphurous chimney pot vomit of blackguardly cloud beneath'. In 1840, Ruskin divided his diary into two sections: one for 'feeling' and one for 'intellect'. He was not alone in seeing nature

as something that impacted on his feelings as well as somewhere to escape the city pollution and life's stresses. The impact on one's wellbeing, so highly promoted today, was known centuries before.

Nature writing in the 19th century foreshadowed in style; content and purpose what was to follow. 'New' nature writing', it can be argued, has its seeds in the 19th century. Those seeds may have lain dormant for periods in the 1900s, but they stirred in the latter part of that century with the arrival on the stage of authors such as Richard Mabey. A rich harvest has followed. That 'chorus of many voices' today ranges from academics such as Dr Samantha Walton, whose research into environment crisis blends critical and creative approaches into accessible writing, to the likes of Dara McNulty and his passionate award winning Diary of Young Naturalist, to the more radical Feral by George Monbiot and to the authoritative, yet easily digestible reads of the naturalist Stephen Moss.

Nature writing, in all its forms, plays a huge part in bringing the natural world into people's lives and for many, may lead to an enthusiasm for environmental action – and as David Attenborough said: "No one will protect what they don't care about; and no one will care about what they have never experienced."

'No one will protect what they don't care about; and no one will care about what they have never experienced."

Carnivore Conservation, Covid and Collaborations

Steve Carter, Carnivore Programme Manager



Conserving small carnivores is challenging as they typically live at low densities and are often nocturnal and cryptic. Lizzie's piece in this newsletter on the difficulties of studying stoats and weasels exemplifies some of the challenges. COVID has not made this work any easier and although it continued to cast its shadow into 2021 curtailing fieldwork, travel and face-to-face meetings, some semblance of normality did return.

The start of 2021 heralded the conclusion of our flagship Pine Marten Recovery Project in Wales and our Pine Marten Species Recovery Project in North England, part of the ambitious Back from the Brink lotteryfunded project to save some of our most endangered species. However, we are continuing to monitor populations in both areas with the help of local volunteers and partner organisations such as Forestry England. The extra desktime provided by COVID this year was used to develop and plan for new projects. We are currently seeking funding for an exciting new project to capitalise on the success of the above projects and the recent reintroduction

of pine martens to the Forest of Dean, working with a diverse range of partners to facilitate the recovery of pine martens into their former range across Britain. This project will address many of the recommendations in the long-term national recovery plan for pine martens in Britain that we produced earlier this year.

Away from pine martens, we have secured a strong partnership with **Durrell Wildlife Conservation Trust** and Wildwood Trust in an endeavour to secure the recovery of the wildcat, which is on the brink of extinction in Britain. The gravity of the situation was highlighted at a recent visit to the headquarters of the Royal Zoological Society of Scotland's (RZSS) Saving Wildcats project, but we are committed to reversing the plight of the wildcat working with project partners and sharing expertise and experiences with RZSS and others who are trying to save this species from extinction. You can read more about our work on wildcats from our PhD student Tom Dando based at the University of Exeter.

Another critically endangered species that we are trying to conserve is the European mink, which many fear will be the next mammalian extinction. Following a visit to the LIFE LUTREOLA SPAIN project and a subsequent pioneering study in 2019 with local Spanish partners MITECO-Tragsatec, WildCRU, and the University of Salford to detect the presence of European mink, we are expanding our work on this species further east. We have produced an initial feasibility assessment for the reintroduction of European mink to the Southern Carpathians in Romania using modelling methods demystified by Patrick Wright in this newsletter, and we are in early discussion with Fauna & Flora International, the Romanian Wilderness Society and others to identify how we can work collaboratively to save this species from extinction.

We are also working with other smaller NGOs in Europe such as Wildlife Montenegro, which includes loaning camera traps to help survey the rare and elusive and, quite frankly bizarre looking, marbled polecat, a distant relative of the pine marten. Despite the practical challenges of funding and travel posed by Brexit and COVID, not to mention the Climate Crisis, we are determined to find increasingly innovative ways to increase our impact on threatened carnivores at home and beyond our shores.

One of the casualties of COVID this year was the postponement of the biennial European Mustelid Colloquium that we co-organise with different host organisations in Europe. This will now be held in 2022, either in-person in Georgia or online. We hope to see some of you there and, as with previous colloquiums, we hope this will prove to be a catalyst for wider collaboration to help conserve some of our most threatened carnivores.

Securing horseshoe bat roosts against predators

Marina Bollo Palacios, Bat Conservation Officer



VWT bat reserves are home to more than 8,000 horseshoe bats in England and Wales,

and 30% of the lesser horseshoe population in Ireland. These reserves are safe buildings; sanctuaries where the horseshoe bats can give birth and raise their young every summer. As these bat species are faithful to their roost, maintaining these buildings free of disturbance by people, but also predators, is key to guarantee successful breeding. This is crucial for their conservation as horseshoe populations are only starting to recover from the major population decline over the last century.

Unlike other bat species that can use very tight crevices to gain access, horseshoe bats need big openings to fly in and out of the buildings where they roost. These large entrances make it easy for other sizeable species to explore the buildings and, in some cases, target the bats as their prey or cause disturbance that may lead the bats to abandon the building. Direct predation and roost desertion have negative impacts on the horseshoe populations through the loss of individuals and the colony having to find elsewhere to breed. Over the years, VWT has come up with designs to keep predators away from the bat reserves. Some of these modifications have been reactive

after a predator has been found to target a bat roost. However, as the saying goes 'Better safe than sorry', and VWT has spent the past two years implementing modifications as a preventative measure.

Innovative but simple solutions have been successful at deterring non-bat species from using the buildings, while allowing the bats to use their roosts safely. The first predatorproofing solutions were implemented at Pencelli Mill, near Brecon, in 1998, after a cat was found to be targeting lesser horseshoe bats as they emerged. The cat was able to jump to the ledge on the entrance and trap bats with its claws as they flew past at dusk. A simple, yet effective, metal tray was attached to the ledge with hinges. The tray flipped down with the cat's weight, making sitting on the ledge impossible. Not long after this, there were further issues with cats at one of the lesser horseshoe roosts near Monmouth. In this case, metal sheeting was attached to the walls on either side of the entrance. This provided a slippery surface with no gripping opportunities for the cat to climb up.

More recently, in 2018, a pair of barn owls took up residency at a greater horseshoe roost in Devon. Their presence caused more than 800 bats to abandon the roost where they had been breeding for nearly 30 years. In 2019, we successfully excluded the owls with a suite of modifications to the two entrances and doorways inside the barn, including timber baffles to create obstacles that the bats can readily negotiate but that deter the owls. In exchange, we provided the owls with a nest box in a field nearby.

During the past two years, VWT has also focused on securing horseshoe roosts from disturbance by pine martens in the Forest of Dean. A much-improved tip tray has been manufactured, based on the one from Pencelli Mill. This consists of a metal frame with a tray on both sides attached with hinges. The metal frame provides a slippery surface that pine martens can't grip and the tray tilts and closes the entrance temporarily. These tip trays have been fitted directly on the bat entrances or mounted on a box to cover the hatch into a roof void accessible by a staircase.

Designing modifications to bat roosts, particularly around entrance points, requires a good understanding of the species' ecology and permission from the relevant SNCOs. These modifications have been monitored to ensure they have no negative impacts on the bats and to assess effectiveness on excluding the predatory species.

A bat's-eye view

Ruth Hanniffy, Species Conservation Officer — Ireland



Imagine if we could see a landscape from a species' point of view? Circuitscape modelling software aims to do just this by mapping the actual connectivity from a species' perspective, known as the functional connectivity. It uses electrical circuit theory to map the flow, in this case of a lesser horseshoe bat, through a landscape. Good conductors like copper offer little resistance to electricity just as hedgerows and stone walls guide commuting and foraging bats. In an electrical circuit, poor conductors like glass can resist flow. For the bat, flow is disrupted by large areas of open agricultural land, towns and high levels of light spillage.

The Fiddaun Circuitscape Project is researching how the 150 lesser horseshoe bats at Fiddaun Cottage interact with the landscape within 2km of the roost. We will use Circuitscape to produce maps of species flow through areas of good and poor connectivity, by assigning resistance scores to each habitat type. To support this we studied the colony's actual movements by deploying static bat detectors at 76 randomly selected points within the same radius of the cottage. These detectors (Song Meter 4s) record the echolocation call of every bat that flies past, enabling us to determine species' presence or absence at a point. Units were deployed for seven nights, surveying activity at stone walls, hedgerows, conifer plantations, reedbeds, wet grassland, limestone pavement and improved agricultural grassland before being relocated to a new site.

Fieldwork was completed between July and early September 2020 and 2021, totalling 532 survey nights, and was greatly helped by a funding award from the Heritage Council in 2021 to purchase additional equipment. Crucial to this project was the generosity of the 33 local landowners, most of whom are dairy farmers, who permitted us to survey their land. Each point required a treasure hunt of sorts to establish who owned the land before meeting the landowner to discuss the project, examine maps and establish any timing constraints due to cattle, large bulls and sileage cutting!

Lesser horseshoe bats were recorded at 54 out of 76 sites, exceeding our expectations. Fiddaun Cottage is adjacent to the Burren, which provides an abundance of caves for winter hibernation but it is lacking many of the species' summer requirements like vegetated river corridors and mixed woodland. A motorway passes within 2km of the roost and there are large expanses of open marsh. Whilst the quality of a linear feature is undoubtedly important for the bats, we found individuals using less ideal routes, for example, a single strand of electric fence, where there was no alternative. Our research supported the understanding that lesser horseshoe bats avoid flying across open fields. They were, however, recorded over large open wetlands, which likely provide significant quantities of insect biomass.

The next steps are to map and model our results and publish these findings, building knowledge of how the species overcomes the challenges posed by fragmented habitat. We hope that Circuitscape's bat's eye view will ensure we target future measures where they will most benefit the species. Watch this space!



This map illustrates areas of high and low functional connectivity for the lesser horseshoe bat across its entire range in Ireland (taken from Finch & McAney 2020, https://bit.ly/Circuitscapelreland2020).

Resilient bat roosts future-proofing our Englis nature reserve

Tom Kitching, Bat Conservation Officer



VWT's horseshoe bat reserves are a central part of

our historic and current work in bat conservation. In Britain, our reserves now house around 10,000 adult animals in the maternity season; a huge proportion of the national populations of both our native horseshoe bat species. We can also be proud that the bat populations in our reserves are growing faster than the national average, which shows that our work is positively contributing to species recovery. But... this means we have a huge responsibility to ensure that these sites continue to provide secure, optimal conditions for roosting bats throughout the year, particularly in the face of changing seasonality and weather patterns as a consequence of climate change.

In light of this, we set about a programme of work to safeguard our bat reserves in England and to enhance them where there were opportunities to do so. This was no small undertaking as our 12 English reserves span six counties between Devon and Shropshire, and include a number of complex buildings, some of which have Grade II listed status. To start with, we carried out a Roost Resilience Audit, which covers five areas important to the long-term success of a horseshoe bat roost. These include site security; accessibility; microclimates/lighting; internal structure/materials; and landscape factors. The audit allowed us to assess all our roosts via the same process and to target our resources to the sites that imminently needed structural work. It also highlighted the sites with potential to introduce new enhancement features for the bats. Support from the Green Recovery Challenge Fund has enabled us to carry out a variety of building maintenance, including roof repairs, structural timber work and specialist stone masonry. This will ensure each building's structural integrity and ability to shield roosting bats from inclement weather for the forseeable future.

The more exciting work involves constructing new features within our nature reserves. These enhancements are designed to provide a range of roosting areas, allowing the bats to choose their prefered microclimatic conditions throughout the year. This can be done by constructing insulated areas in either the upper or lower parts of a building, and installing materials that bats are able to perch on. We have even built an entirely new lesser horseshoe bat roost, constructed to an innovative cost-effective design, which we have been calling The Bat Tower.

Importantly, we are able to monitor the impact of this work. Passive temperature and humidity loggers have been installed across the reserves to monitor the variation in conditions at different places within different buildings. The data generated will demonstrate the effect of features installed for the bats, so we can see why they may or may not be using them. We have already seen evidence of some success - only a few months after its construction, hundreds of droppings were found inside the newly insulated bat loft at our greater horseshoe reserve near the South Devon coast. It is incredibly rewarding to have your work appreciated so quickly!

I will be watching with bated breath to see how the bats continue to use the changes we have made for them.



A picture of stoats and weasels

Lizzie Croose, Senior Carnivore Conservation Officer

Despite their undeniably charismatic appeal, small mustelids like weasels and stoats are some of our least studied mammals. In part, this is because they are notoriously challenging to study and populations have historically not been of conservation concern. However, while both species are considered to be widespread and common in Britain, there is very little data on their population trends at a national scale and both species are currently listed as Data Deficient.

Thinking inside the box

For the last couple of years, VWT has been interested in methods that can be used to reliably monitor weasels and stoats and better understand their population status. This summer, we built on previous work by VWT and also work pioneered in the Netherlands, and we carried out a field study in Herefordshire aimed at detecting weasels and stoats. Some of you who have been following the small mustelid work carried out by VWT and others in recent years will be familiar with the modified camera trap design known as the 'Mostela'. Designed in the Netherlands by the Small Mustelid Research Network, the Mostela consists of a wooden box with a plastic tunnel running through it and a camera trap facing the

tunnel to record what enters. Small mustelids will investigate tunnels and holes out of natural curiosity and this method has been used successfully to detect weasels and sometimes stoats in previous studies. However, there is evidence that some animals will avoid entering confined spaces like Mostelas and we might be missing out on detecting these 'trap-shy' individuals. To address this, we also set up an additional camera trap outside the Mostela, facing the box entrance, to see how many occasions animals are passing by the boxes and not entering them. All of this will allow us to see which camera method is most effective at detecting weasels and stoats and therefore how to increase the detectability of small mustelids.

Caught on camera

The Mostelas proved to be a big hit with the local weasel population, with hours of entertaining weasel footage recorded, and weasels detected at almost three-quarters of the sites where the Mostelas were placed. We even had one Mostela where two weasels visited together, and spent a while playfighting in the box! We also had a nice surprise with polecats readily entering the Mostelas and even one site where two polecats together frequently came to visit the box. This is the first time we have recorded polecats in the Mostela and it is encouraging that this could potentially be used as a monitoring tool for them. Interestingly, as far as we have seen, no stoats have been recorded either inside the Mostelas or on the cameras outside the boxes. This is puzzling, as stoats are known to be present in the study area.

As well as our small mustelid targets, the Mostelas are always very popular with small mammals (mice, voles and shrews), and we also had visits from rabbits, grey squirrels, grass snakes, the occasional bird and even a mole!

How can I get involved?

With 40 cameras running throughout the summer, we have accumulated a large number of videos from this study and would love your help to identify what is in them. We are working with MammalWeb, a citizen science platform for collating and validating a range of camera trap data. You can simply sign up with MammalWeb (<u>www.mammalweb.org</u>) to start reviewing the footage. It's a great way to see rarely recorded and interesting footage of species like weasels and polecats, as well as contributing to our knowledge of how to better study small mustelids.

PhD research round up

Music to our ears acoustics and barbastelles

Bats can be found pretty much everywhere you look for them. However, where some species have adapted well to urban environments, others are still heavily dependent on woodland habitat. One such species, the barbastelle bat, is a woodland



specialist that relies on loose bark and crevices in trees for roosting. The lack of barbastelle colony records is however impeding our ability to understand the larger-scale influences on roost

site selection. Therefore, as part of my recent PhD research at the University of Sussex, jointly funded by Vincent Wildlife Trust (VWT), I carried out a citizen-science led project to investigate the distribution of barbastelle colonies. During the summer, more than 30 volunteers undertook acoustic surveys across a range of woodlands in search of this rare bat. By employing a survey protocol developed in the first year of my PhD, which helps identify potential colonies within woodlands using acoustics, we would be able to discover new sites important to this species. VWT volunteers helped place more than 500 bat detectors out in 76 woodlands, resulting in more than 1,800 nights of data. This was a huge effort that involved bat groups,

students and wildlife enthusiasts. Our surveys identified 25 woodlands with barbastelle activity levels suggestive of nearby colonies. Some of our most active sites were recording close to 60 barbastelle passes within an hour after sunset, higher than what has been recorded at some well-known colony sites. In preparation for future radio-tracking work, we carried out a trial at one of the lower-level activity sites that was identified as potentially containing a colony and successfully caught three female barbastelles. Whilst the presence of colonies within the woodlands is yet to be validated through radio-tracking, our work already highlights that barbastelles may be more widespread than previously believed. This work will contribute to my current research that aims to establish the factors important in the selection of woodlands by colonies. In particular, I am interested in determining the influence of the surrounding landscape features that may play a significant role given the large distances (up to 20km) that barbastelles can travel to forage each night. Determining the role of the landscape is not just important for woodlands with colonies but also for those without. It is by gaining an understanding of why certain woodlands do not support colonies that we can hope to improve them, and the surrounding landscape, in the future.

Wildcat challenges, progress and plans

It has been a year of progress, challenges and finally escaping the desk to collect data on the wildcat research front. The first part of the year was spent adjusting plans as another lockdown arrived. Fieldwork was moved and, instead,

I began a series of online stakeholder interviews. These aimed to understand some of the key issues and themes to consider as part of restoring the wildcat. It was enlightening,



engaging and very useful to make headway on the social side of the project. By summer, lockdown was over and tentatively fieldwork was allowed to begin again. For me, this meant spending the best of this year's weather hiking through the Welsh hills setting up a network of camera traps. These tools provide an important insight into the numbers of free-roaming cats present in prospective sites and therefore the potential for hybridisation. They also allow us to learn more about the wider ecosystem. Through these data, we can explore mesocarnivore communities and interactions, get an overall view of the prey that exists, ground-truth areas of interest, and learn how the habitat is being used by a variety of species.

By autumn, the fieldwork was drawing to a close, and it was time to get back to the desk, working through a review article looking at the assessment of social feasibility in reintroduction projects across the world, as well as starting to make sense of all the data collected during the past nine months. Throughout all this, I've also been working with the wider project team to develop a release strategy for wildcats. Some of this has included trawling through literature but there has also been time for face-to-face meetings and workshops, including visiting Wildwood in Kent to see the progress they have been making, and a recent trip to the Highland Wildlife Park to hear about the planned Scottish reintroductions and share the wealth of knowledge that exists. As the year ends, I'm excited to be virtually attending the EuroWildcat conference, which is a meeting of individuals and institutions working on the European wildcat. All in all, it's been a year of progress, learning, adapting plans, and data collection ready for 2022, when all of this work and learning should start to come together.

Analysing tolerance to recovering predators

Thanks to a number of delays caused by COVID-19, my research, which focuses on the social and ecological dimensions of pine marten recovery in the UK, is now due to be submitted in February 2023. Since last year, I have mainly been working on my social chapter, which aims to better



understand the factors shaping stakeholders' tolerance to the impacts of recovering predators. I collected the data using an online questionnaire

survey shared with members of organisations with interests likely affected by the recovery of six predator species in Britain. By creating a tolerance score and using numerous predictor variables, including respondent's interests, frequency and types of experience, and perceptions about the species, I identified the factors that best described our tolerance proxy. The findings have highlighted an interesting gradient in tolerance across interest groups clustered using multiple interests, with overlap between groups with interests in shooting, wildlife conservation, fishing, and farming. Experience and perceived benefits of a species played a strong role in shaping tolerance, in particular negative experience of a species. However, a respondent having negative experience of other recovering predators reduced tolerance for the least tolerated species, but not for the more tolerated species. I am aiming to submit this work to a journal soon, so hopefully you'll be able to read the full paper in the not-too-distant future! I've also been scoring the pine marten genotype data, which will hopefully be completed in the next four to six months, and then I'll be able to start analysing the data to investigate the influence of habitat and land use on the population density and individual survival of pine marten. In the time being, I am cracking on with my chapter that is investigating the influence of land use and habitat on pine marten range expansion.

A flying start

I am just over a month into my PhD at the University of Sussex, co-funded by VWT, and things have got off to a flying start. I have already attended many statistical training courses; had a couple of days out in the field meeting my study species, the greater horseshoe bat, face-to-face with my supervisor, Fiona Mathews; and met everyone in our lovely research team at the university. I have further field days planned with former VWT student Cat McNicol, to learn about conventional radiotracking techniques - fingers crossed we see a pine marten! I am also excited to be

going to Portugal for the EU Erasmus+ FIELD Workshop, to learn how to plan, manage and run field courses for students. For my PhD project, which aims to assess the permeability of landscapes to the greater horseshoe bat using novel telemetry techniques, I have been reading literature to come up with new ideas for my project. My main goal is to establish a network of

static radiotracking receivers which can automatically log the passage of bats and to develop a machinelearning approach to triangulate the animal's positions on a fine-scale resolution. Further to the development of this novel



radiotracking technique, I hope to be able to validate previous movement and connectivity models of the greater horseshoe bat (created by former VWT student Domhnall Finch); develop our understanding of Roost Sustenance Zones; and explore the winter foraging habits of this species of bat. On the technical side of my project, we have started testing how the stations work as numerous factors can alter the strength of radio signals, including the landscape features and the station height. There are also many types of radio antenna, each of which have their own advantages regarding the directionality and strength of signal detection. Although it will be a challenge, the aim is to have all 16 masts set up and to collect preliminary trial data by the end of winter. Once I am happy that the system is in full working order, I will begin to capture and tag individual bats in my study area. I am really excited for the field season ahead and look forward to tackling the technical challenges that will inevitably occur. Developing this new methodology is extremely important to help us understand current knowledge gaps of the landscape-scale ecology of the greater horseshoe bat, which is a current barrier in effective conservation of the species.

Pine marten personalities

David Bavin, Senior Carnivore Project Officer

Over the last

few decades,

an increasing

evidence has demonstrated

distinct and

measurable

personality variation

body of



populations of species - from sea anemones to mice, and toucans to barbary macaques. Should this surprise us? We probably wouldn't think twice in identifying personality traits in our pets and variance between them, often noting marked differences between closely related individuals. Increasing biodiversity contributes robustness to ecosystems, and diversity of personality within populations is an aspect of biodiversity – it confers evolutionary resilience to a population, where different individuals adopt different strategies to survive and, in doing so, the genetic heritage of a species does not all end up in one basket.

As part of my MPhil research I investigated personality differences between our translocated pine martens, with support from our team at VWT and University of Exeter. I sought to explore whether we could identify variation in the personality of the pine martens using remote camera traps at the source sites in Scotland and, if we could, whether these differences translated into variable dispersal and settlement strategies after the martens' release in Wales. Specifically, we were interested in whether there were differences in behavioural traits associated with vigilance and exploration, as these traits have been shown in other species to be key in affecting survival during the critical initial phase of dispersal and settlement following release in a new environment.

We found that there was indeed behavioural variation within the translocated martens and that vigilance at the source sites provided some predictive capability in anticipating the movements of individual following their release. We found that individuals that were more vigilant around the traps in Scotland initiated dispersal more rapidly and they travelled further from the release sites over a shorter period of time compared to less vigilant animals. This reflected the findings of Catherine McNicol during her PhD research on the project, when she identified two distinct dispersal strategies amongst the martens – dispersers and settlers. The more vigilant individuals also experienced less stress during translocation and captivity than less vigilant individuals (ascertained by sampling glucocorticoids from the martens' faeces, collected during captivity).

The findings could help future projects to identify individuals who are more likely to disperse rapidly over long distances following release after translocation, enabling project staff to prioritise the monitoring of these individuals and reduce the chance of losing animals. In doing so, projects can increase the quality of information gleaned from studying the martens' movements, whilst reassuring stakeholders. It also enables practitioners to better satisfy their responsibility towards the welfare of the translocated animals, by being better able to monitor them during the most hazardous phase of their release and establishment.

Future research might investigate whether personality differences translate into variable breeding success for translocated individuals, survival rates in the longer term, habitat selection, and the potential for particular individuals to be more conflict-prone in their interactions with the interests of people and with other wildlife.



... and a very fond farewell to David Bullock

How and when did you first become involved with VWT?

I have known about the work of VWT since its inception but about 20 years ago, the charity started to 'open up', showing a few people how it managed bat sites. Working in nature conservation for National Trust, which cares for several lesser and greater horseshoe bat roosts, visits to VWT Bat Reserves opened our eyes to the detail needed to help these species recover their populations. And, yes, I peeled a few polecats from tarmac to contribute to VWT's early surveys of this species as it expanded out of Wales. I recall bringing a huge road-killed male into our NT office in Cirencester. It caused quite a stir (and stink) but thankfully Johnny Birks, who was on the VWT staff at the time, called to collect...

What have been the highlights of your time with VWT?

- Being invited to join the Board and then becoming Chair were big highlights for me!
- Successful reinforcement of the pine marten in Wales and the increasing recognition that VWT has a place at the top table of carnivore translocation programmes.
- Increasing opportunities for early career academics fostered by VWT to do research on what we can do to halt and reverse declines in threatened mammals.
- Impacts of the work to halt and reverse declines in horseshoe bats in our Bat Reserves, and with VWT as an Influencer.

What has been the greatest challenge?

COVID-19 had a big impact on our field work. Having said this, being 'grounded' has allowed some staff to spend more time preparing projects and apply for external funding, ably supported by a wonderful office-based team.

The greatest challenge has been our evolution from a rather inward looking and secretive organisation to being recognised for what we are: a highly respected conservation charity that gets results. More than any of the other wildlife charities that the late Hon Vincent Weir generously supported, our external grant funding activity has been questioned because we hold substantial financial reserves. The interest from this capital allows us to retain permanent, highly skilled staff and to be 'fleet of foot': two attributes you really need if you have to act quickly to halt a decline in a mammal species.

Where would you like to see VWT in ten years' time?

- VWT making a major contribution to proposals for reintroductions of mammals to places where they have been eradicated or new places where, in a climate-changed world, they could thrive.
- VWT recognised as an 'International' organisation.
- A diverse Board that is a good reflection of society.
- 'Better, bigger, more and joined up' applied to the lesser horseshoe bat roosts in the west of Ireland. These tiny bats are at the northwestern edge of their world range in the Republic of Ireland and one of a handful of its native mammals. VWT, the Irish Government and farmers will have set out what needs to be done to reduce fragmentation and isolation of their colonies and done it, hopefully by 2030.

What message would you like to leave as you step down after more than ten years on the Board of Trustees?

- Embrace change. Human demographic, climate, geo-political changes will all have a profound impact on the conservation of wild mammals. Where and how can VWT make the biggest difference?
- Be unafraid to let go. For example, withdraw subject to agreed and good legacy plans investment in species where decline has been successfully halted and reversed.
- In terms of our conservation management interventions, let the world know what does and does not work.



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