



NFBR

NATIONAL FORUM
FOR BIOLOGICAL
RECORDING



Newsletter 58 – November 2019

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Welcome to Issue 58 of the National Forum for Biological Recording Newsletter.

This issue brings news of myriad ways in which technology is helping to expand the possibilities of biological recording, from new tools for identification (pg 6) to hugely ambitious DNA projects (pg 26).

But we will always need to keep up the great gritty task of field recording and identification (pg 15, pg 29) in order to push the boundaries of knowledge and contribute to science (pg 24).

Many thanks to everyone who has contributed to the newsletter, I hope you all enjoy reading it and find some inspiration within.

Elaine Wright (Editor) editor@nfbr.org.uk

As always, if you would like to make a contribution to a future newsletter, please get in touch at any time. The next edition will be out in April.





2020 Conference

The 2020 conference committee are currently hard at work organising the details and programme of our next conference, which will take place 30th April - 2nd May 2020. We are very pleased to announce that we will be partnering with the [Tanyptera Project](#) at the World Museum in Liverpool.



NATIONAL FORUM
FOR
BIOLOGICAL RECORDING



Conference 2020

Outside the Honeypot: biological recording in the urban world

Thursday 30th April - Saturday 2nd May 2020
World Museum, Liverpool

Current NFBR Governance

NFBR has a board of seven trustees who form the Executive Committee, plus an Advisory Council. You can learn more about the individual Trustees and Council Members on [the NFBR website](#).

Current members and positions held are as follows:

Trustees

Sarah Whild (Chair)
Jodey Peyton (Vice Chair)
Graham Walley
Clare Langrick
Paula Lightfoot
Simon Pickles
Elaine Wright

Advisory Council

Teresa Frost	Chris Raper
Martin Harvey	David Slade
Martin Hicks	Craig Slawson
Maria Longley	Alan Stewart
Damian McFerran	John van Breda
Steve Prentice	Zoe Randle





Conference attendees at BTO headquarters, Thetford © BTO



NATIONAL FORUM
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2019 NFBR conference

Elaine Wright

We held our annual conference at the British Trust for Ornithology (BTO) headquarters in Thetford in May 2019, with the theme *Recording outside the honey-pot*. 58 attendees joined us for two days of talks and workshops. We learnt about overlooked habitats (such as caves), under recorded taxa (such as soil fauna) and discussed the barriers to biological recording and how to remove them.

Attendees got the chance to visit some nearby botanical sites of interest on Thursday evening, but the real fieldwork fans stayed on for the third day of the conference, a field trip to [Breckland](#) SSSIs Cranwich Camp and Foulde Common. The Saturday started off extremely wet, making collecting and recording at the first site ([Foulde Common](#)) rather challenging, but we persevered and some interesting species were found in a range of habitats including pingos, a wetland speciality of [the Brecks](#).

After drying off in a local cafe, the brave remaining few headed to [Cranwich Camp](#) just as the sun appeared. This proved to be another interesting site, at which Matthew Shepherd discovered the mite *Podoribates longipes*, which is not



only a new species to the British Isles but also a new family (*Mochlozetidae*)!

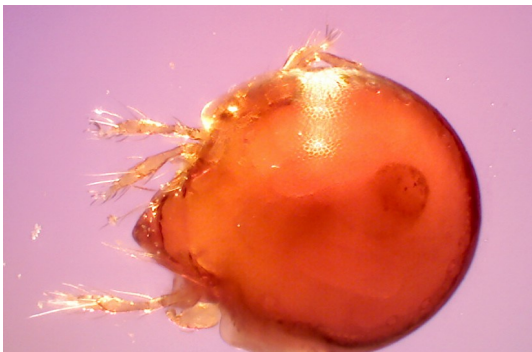
Richard Burkmar was very excited by spider finds from the day (quote taken from his [post](#) in the [NFBR Facebook group](#)):

My enjoyment on the day has almost been eclipsed by my excitement at the microscope over the last few evenings as I've identified the spiders. The two sites - Foulden Common and Cranwich Camp yielded 70 species of spiders including an astonishing 8 Nationally Scarce and 3 Nationally Rare species. All but one of those 11 species were new for me. I've never recorded 70 species in a day before.

Richard's species included *Neon valentulus*, which was last recorded in Britain 20 years ago.

All in all, Saturday was an excellent addendum to an excellent conference.

Many thanks to all our attendees, and particularly our excellent speakers. You can find most of the talks and workshop notes from the event on the [NFBR website](#).



Podoribates longipes © **Matthew Shepherd**



Neon valentulus © **Richard Burkmar**



Thursday botanising © **Teresa Frost**



Rain soaked fieldwork © **Teresa Frost**





Hygrocybe psittacina © Clare Blencowe

A new online grassland waxcap identification support tool

Clare Blencowe

After attending 'an introduction to grassland fungi' with Natural England's waxcap specialist, Andy McLay, and a day's training on FSC Identikit with Rich Burkmar (then of the FSC BioLinks project) within a month of each other last autumn, it felt like the stars had aligned and I could not rest until I'd had a go at creating 'a waxcap thing'.

Over eight months later, and too many evenings and rainy Saturdays to count, my 'waxcap thing' turned into a 'grassland waxcap identification support tool', designed to assist with interpreting the list of grassland waxcap species in the recently published [JNCC Guidelines for the Selection of Biological SSSIs: Chapter 14, Non-lichenised Fungi](#).

You can find the tool here: <https://sxbrc.org.uk/recording/keys/waxcaps/> - available now for field testing. (It should work on any modern browser; it



won't work in Internet Explorer.)

I haven't called it a key, because it's not always going to get you to a species identification. But I hope the tool will help with interpreting waxcaps' sometimes subtle, sometimes striking, and often variable characteristics — and knowing when you can feel confident putting a name to a specimen, and when you might need to start looking at microscopic characteristics or be content with thinking "it's probably one of those ones".

The species concepts in the tool are based on descriptions in David Boertmann's book, 'The genus *Hygrocybe*, 2nd revised edition'. I wasn't sure at first what he'd think of me 'borrowing' his work for an online tool. Once I'd made contact I realised I needn't have worried, as he has been very generous with advice and constructive comments on early versions. My hope is that availability of the online tool will encourage people to get Boertmann's book, as the best source for detailed species descriptions. So these things can work together, rather than in competition with each other.

I am an amateur mycologist myself with limited field experience recording waxcaps, so this has been something I've pursued as a hobby project, to help me learn. I've had advice and input from several expert mycologists while developing this tool, including a lot of patient advice and encouragement from mycologists working on [The Lost and Found Fungi \(LAFF\) Project](#) at RBG Kew. I'm very grateful to them and the generous people who've allowed me to use their photographs — I couldn't have made this on my own. And I couldn't have got it onto the internet without the super skills of my colleague Bob Foreman at [Sussex Biodiversity Record Centre](#).

I thought the NFBR newsletter would be a good place to say thanks to Rich Burkmar and the FSC BioLinks project for getting me started. And also highlight the added value that funded biological recording projects can eek out of the biological recording community – it was Esmée Fairbairn that funded initial development of the FSC Identikit technology through the Tomorrow's Biodiversity project (later National Lottery Heritage Fund & FSC BioLinks) and it's Esmée Fairbairn funding the LAFF project. Without those projects, it would never have occurred to me to attempt something like this.

Whether you're a beginner with waxcaps or an expert mycologist, please have a play with this tool and let me know what you think. I'm particularly keen to find out if it works on real live waxcaps? You can leave comments and feedback on this blog: <http://misidentifyingfungi.blogspot.com/2019/09/a-grassland-waxcap-identification-tool.html>.





Brown Long-eared Bat © Dale Sutton / www.bats.org.uk

Bat
Conservation
Trust



Recording Scheme Spotlight

Each issue the NFBR newsletter celebrates one of the many and varied National Recording Schemes in the UK. These schemes help to ensure accurate species identification, help with dataflow and are an essential part of the British wildlife re-cording community.

This time we are featuring the National Bat Monitoring Programme run by Bat Conservation Trust (BCT), with answers provided by Philip Briggs, BCT Monitoring Manager.

Tell us a bit about the scheme

The National Bat Monitoring Programme (NBMP) was set up in 1996 to collect data in order to produce bat species population trends for the UK. At this time statistical information on how bat species were faring across the UK was very limited and fragmented due to historic challenges in monitoring bats on a large scale. However, the formation of bat groups across the UK and the availability of affordable bat detectors meant that it was now feasible to get large numbers of volunteers involved in bat recording. Since 2001 the NBMP has been run in partnership with the Joint Nature Conservation Committee who provide core funding, with additional funding and input from the country Statutory Nature Conservation Bodies.

The NBMP includes four “core” surveys which collect data from which we pro-



duce species population trends: the Roost Count, which involves counting bats as they emerge from their summer roosts at dusk; the Field Survey and Waterway Survey, two bat detector surveys which involve identifying and counting target species along transect routes; and the Hibernation Survey, through which licensed bat workers share data from counts of bats in their winter hibernacula.

In more recent years additional surveys have been established. These include: the Sunset/Sunrise Survey, which is suitable for anyone including complete beginners and aims to collect basic information on the presence of bats and other nocturnal wildlife, and potentially discover bat roosts; the Woodland Survey, which monitors the ongoing presence of Barbastelles at woodland sites designated as SACs due to this species' presence; the National Nathusius' Pipistrelle Project, through which trained and licensed volunteers in bat groups carry out trapping surveys to collect information on this species' breeding status in the UK and migratory movements; and the British Bat Survey (BBatS), a new survey using new remote acoustic monitoring technology and auto-identification algorithms to collect more in-depth information on a range of species across the UK.

How is the scheme run?

A core team of three BCT staff run the NBMP. Since the programme began in 1996, more than 4,820 volunteers have returned data. If you factor in survey buddies the total number of participants will be at least twice this figure. On average around 1,000 volunteers return data each year. There is no charge for taking part but we do rely on volunteers covering their own costs, such as travel and equipment, though we have a limited number of bat detectors to loan out to volunteers each year. The vast majority of volunteers sign up through the online sign-up form (nbmp.bats.org.uk/Surveys.aspx) though they will have heard about the NBMP through a variety of sources, such as through their local bat group, social media, coverage in the media (e.g. BBC's Springwatch), or attending a BCT conference or NBMP bat detector workshops.

Do you run events such as field days or training courses?

We are lucky to have a team of regional bat detector workshop leaders. These are all volunteers with bat expertise who have been trained to deliver one or more of our standard workshop formats, including an introductory bat detector workshop and also workshops focussed on taking part in specific surveys. These are run across the UK from spring through to autumn. There is a small cost to attend these, with discounts available for those already signed up to the NBMP, BCT members and bat group members. Full details can be found at www.bats.org.uk/our-work/national-bat-monitoring-programme/workshops.





Bat Surveyors © Anne Youngman / www.bats.org.uk

Do you publish a newsletter and or journal?

We publish an e-bulletin, *Bat Monitoring Post*, every two months. This is sent to everyone currently signed up to the NBMP but can also be sent on request to people not signed up. Contact nbmp@bats.org.uk to be added to the mailing list (back issues are available at www.bats.org.uk/our-work/national-bat-monitoring-programme/reports/e-bulletin-archive). Each year we publish the latest bat species population trends in the NBMP Annual Report (www.bats.org.uk/our-work/national-bat-monitoring-programme/reports/nbmp-annual-report).

Can you tell us about a particular species that readers can look out for?

There are seventeen breeding bat species in the UK and one or more of these can be found in most localities, so visiting suitable habitat (insect-rich areas such as parks, woodlands and waterbodies) is likely to yield rewards. You may also spot bats flying around in your own garden. Bats in flight are identified through a mixture of audio clues (using bat detectors, see www.bats.org.uk/about-bats/bat-detectors) and visual clues where possible (www.bats.org.uk/about-bats/what-are-bats/uk-bats). Common and soprano pipistrelle are the species most likely to be spotted but the less abundant Nathusius' pipistrelle is also widespread and there is a good chance of find-



ing it at large waterbodies, particularly during its autumn migration period. Broadband bat detectors enable you to record bat sounds for more precise species identification which can be verified by experts. Some models include automated species ID functionality which can be useful for alerting you to the possible presence of rarer species, but incorrect identifications do occur so it is important to have a good understanding of bat call identification in order to assess the likelihood of the auto-ID being correct.

Any highlights or achievements you would like to share from the past year?

Probably the biggest achievement of the past year was piloting the British Bat Survey (BBatS) in South West England and Wales. This new survey uses AudioMoths, low cost static bat detectors which for the first time makes it feasible to develop a UK-wide survey using this type of technology which has previously been limited by the high cost of such devices. It will also use new automated species identification algorithms to analyse the recordings. Following small-scale pilots of aspects of the survey methodology in Scotland in 2017 and 2018, this year's pilot had the following aims: find out how many nights of AudioMoth surveys are required to collect enough data to estimate population trends for our rarer bat species; and test the system we will be using to classify AudioMoth recordings to species or genus level. We will use the data to determine the best survey methods for a larger scale roll-out of BBatS in 2020.

This summer thirty seven volunteers took part, deploying AudioMoths at 28 sites from 1st July to 11th August, and collecting an incredible 152 nights' worth of recordings. We tested a new way of setting up the AudioMoth using a 'chime', a series of four notes played when a button on our website is clicked. The recording settings for BBatS are embedded in the chime, so when the AudioMoth 'hears' the chime it applies the correct settings. This makes it very straightforward to set up the AudioMoth, and ensures that all AudioMoths are using the same settings.

The data we have received are currently being uploaded to our cloud storage, where the recordings will be processed using automated call classification algorithms over the next few months. This will generate some provisional results, which will be sent out to the volunteers who took part. We will then carry out some manual checks of the recordings and aim to finalise the results by the end of the year.

How should readers get in touch if they wish to know more about your scheme?

Go to www.bats.org.uk/our-work/national-bat-monitoring-programme to find out more about NBMP surveys, training and results and to sign up and enter data online. Join our Facebook group (www.facebook.com/groups/nbmpUK/) or contact us at nbmp@bats.org.uk.



Transforming the NBN Atlas into a world-leading source of environmental data

In July, we were delighted to announce that the National Biodiversity Network Trust had received funding from Esmée Fairbairn Foundation to help transform its data sharing website, the NBN Atlas, into a world-leading source of environmental data.

The funding, of £375,000 over three and a half years, will enable the further development of the NBN Atlas to meet the needs of its audiences, both current and new, and to help with global environmental issues.

Correctly resourced, through the help of funding such as this Esmée Fairbairn Foundation Grant, the NBN Atlas aims to be the single source of high-quality wildlife data at the national level.

On a larger scale, and aiming to help address UK and global environmental concerns, the NBN Trust has identified three 'needs', which will be addressed through this grant:

- 1) engaging more people with the natural world,
- 2) making the data needed for evidence-based decisions more accessible,
- 3) developing the NBN Trust's organisational sustainability to be able to deliver on the first two needs.

The unparalleled aggregation of biodiversity data on the NBN Atlas, along with the expertise within the NBN partnership means that the NBN Trust is uniquely placed to provide expert advice and input into the development of government biodiversity policy.

NBN Atlas Species Dictionary update

At the end of April, the Species Dictionary on the NBN Atlas was updated with the latest version of the UK Species Inventory.

The main name changes and additions include:

- Hymenoptera brought up to date with Gavin Broad's checklist (an addition of 3200 extra taxa) and all names with subgenus brackets have reverted to unbracketed standard binomial names
- All Coleoptera also received the subgenus removal treatment
- 1300+ JNCC/MBA Marine updates to the MSBIAS checklist
- Very many changes/updates to the British Mycological Society checklist (thanks to Richard Shotbolt)
- JNCC SOCC (Species of Conservation Concern) list updated



- Bat mites have been included for the first time
- 1000+ synonyms in various families rounded up and synonymised with their correct taxa
- Approximately 260 requests for ad-hoc changes and copies of data completed

As part of the update there were several issues fixed on the NBN Atlas:

- The English common name displayed on the species and occurrence pages is now the primary name
- Any name qualifier is now included in the scientific name.

A further update to the NBN Atlas Species Dictionary is taking place in the next few months, so keep an eye out for more improvements.

Two further updates to the NBN Atlas are:

- We can now accept the taxon version key of common names and not just scientific names in the data files that are uploaded.
- Automatic data harvesting (ADH) is now installed. The ADH makes weekly checks against Scotland's catalogue of spatial datasets ([SpatialData.gov.uk](https://spatialdata.gov.uk)) for updates to 17 of the spatial layers in the NBN Atlas. The files for any updated layer are then automatically downloaded on to a file transfer site for retrieval and onward processing into the NBN Atlas. Once the testing phase has been reviewed, we will look at the potential to increase the number of layers checked, and also to explore opportunities for checking for updates to layers from the other countries of the UK.

Two new NBN Atlas team members

In July, we were delighted to welcome Caroline Van Dierkson and Stephen Page to the team.

Caroline is the NBN Atlas Project Manager and her core work responsibilities are:

- Working with stakeholders, data providers and users to elicit, capture, analyse, refine, communicate and document their requirements
- Providing support to the developers in the definition of technical solutions
- Defining Customer Journeys and producing wireframes and prototypes
- Representing the technical team in communication with stakeholders and users about the project delivery
- Representing the customer in support of the delivery teams throughout the project
- Validating that the functional and non-functional requirements are appropriately implemented within the solution



Stephen is NBN Atlas System Developer and his core work responsibilities are:

- Providing guidance and advice to other members of the NBN Secretariat regarding technical issues
- Building technical relationships with partner organisations and the wider development community
- Technical development of the NBN Atlas software platform

Why not join us at the NBN Conference and meet them in person?!

NBN Conference 2019 – don't forget to book!

This year's NBN Conference is taking place on Wednesday 13 and Thursday 14 November and will once again be held at the Albert Hall in Nottingham.

The theme is "Network, Knowledge and Narrative – sharing and using data across the NBN and beyond". The programme is available on [the NBN website](#). In addition to 20 presentations, including three keynotes, there is a full afternoon of Knowledge Exchange Sessions on Wednesday 13 November. The available sessions are:

- Whose data are they anyway?
- FAIR Data Principles
- Providing multi-regional and national commercial services in collaboration with data providers
- NBN Atlas Spatial Analysis Tool – demonstration of the new spatial portal
- iSpot at 10 years old

The NBN Trust AGM will also be held and the prize-giving ceremony for the NBN Awards 2019 will take place on the evening of 13 November.





Philaenus spumarius © Claire Harkin

Spotted a spittlebug? Located a leafhopper? Found a froghopper? Let us know!

Claire Harkin^(1,4), Alan J.A. Stewart^(1,4), Ana Perez-Sierra^(3,4), Gerard Clover^(2,4),
Chris Pollard^(3,4), Suzanne Sancisi-Frey^(3,4) and Sarah Plummer^(2,4)

University of Sussex⁽¹⁾, Royal Horticultural Society⁽²⁾, Forest Research⁽³⁾ and
BRIGIT research consortium⁽⁴⁾

There are just over 400 species of Auchenorrhyncha (leafhoppers, planthoppers, froghoppers etc.) in Britain. They are found in a wide range of habitats and can be the most numerous insect group in some of them, particularly grasslands. Although they include some of the world's most serious crop pests, mainly because they transmit plant diseases, very few of the species that occur in Britain could be considered problematic. Their benign reputation could change, however, if the plant bacterium *Xylella fastidiosa* ever arrives in this country, because it is transmitted by froghoppers and possibly also some of the larger leafhoppers.

Xylella fastidiosa has become infamous for its role in the destruction of millions of olive trees in southern Italy (Cornara *et al.* 2017) and has recently been discovered in olive trees in France (Willsher 2019). It has been officially



described as “one of the most dangerous plant bacteria worldwide, causing a variety of diseases, with huge economic impact for agriculture, public gardens and the environment” (European Commission 2019). *Xylella* has been reported to infect a very wide range of host plants, some 563 species at the last count (EFSA 2018), from herbaceous perennials to trees, including ornamental and crop plants as well as native flora. Infected plants exhibit scorched or wilted leaves and may eventually die. There is currently no cure.

Xylella is a bacterium that infects the xylem vessels of plants, causing them to become blocked, and consequently is vectored by xylem-feeding insects: froghoppers (also known as spittlebugs in reference to the conspicuous spittle masses or ‘cuckoo spit’ produced by the nymphs in late spring/early summer) and some of the larger leafhoppers. Whilst *Xylella* is not present in the UK, the insects that have been shown to be vectors in Mediterranean countries are also common and widespread here. Principal amongst these is the so-called common froghopper or meadow spittlebug, *Philaenus spumarius*, which is one of our most common insects. Unfortunately, it is also one of the most polyphagous, being known to feed on at least 400 different plant species.

If *Xylella*-infected plants were imported, there is potential for the bacterium to establish and spread across the country, with potentially devastating economic, environmental and social impacts for horticulture, forestry, domestic gardens, woodlands and native ecosystems. Despite this threat, very little is known about how the bacterium might spread in northern Europe as most research on *Xylella* and its insect vectors has been focussed in warmer climates such as the Mediterranean and South America. Amongst other priorities, the BBSRC-funded BRIGIT consortium (<https://www.jic.ac.uk/brigit/>) has been tasked with developing a better understanding of the xylem-feeding insects that may vector *Xylella* in the UK, including their geographical distribution, abundance and host plant preferences. In addition to consortium members’ own systematic sampling, it was quickly decided that this objective would best be achieved by the promotion of a national survey that would appeal to both experienced and first-time recorders, and the implementation of a wider citizen science outreach programme.

Working closely with Martin Harvey at the Biological Records Centre, our first step was to set up a bespoke iRecord form for capturing citizen science data. Whilst leafhopper and froghopper records are already captured via standard iRecord reporting and the LeDRA recording scheme (<http://www.ledra.co.uk>), these routes did not allow recorders to also submit data on the host plant that the insect was found on, information that is crucial for the BRIGIT project. Therefore, Martin helped us to develop a bespoke iRecord *Survey of Xylem-feeding Insects* reporting form, including fields to capture host plant data: <https://www.brc.ac.uk/irecord/xylem-feeding-insects>. We also set up a companion website <https://www.xylemfeedinginsects.co.uk/> which includes



descriptions of each of the insect species, their habitat preferences and currently-known distribution, as well as simple keys for identification of nymphs, instructions on how to report sightings, and a blog detailing our own field-work for the project. So we were ready for the start of the spittle season; or at least we thought we were.....

On the morning of 26th May 2019, while Claire was on her way to the airport for a family holiday in Spain, Alan appeared on BBC Breakfast television, BBC Radio 4 and BBC online (<https://www.bbc.co.uk/news/science-environment-48383730>) to launch the 'Spittlebug Hunt' and to ask members of the public to report any sightings of froghopper spittle via the project's dedicated iRecord survey form. By the time Claire touched down in Spain only a couple of hours later and turned her phone back on, we'd each had over 100 emails in relation to the survey! A similar volume of queries was waiting for Sarah when she accessed the BRIGIT inbox the following morning. And more kept coming; it didn't turn out to be much of a holiday for Claire! We must have caught the public's attention (or perhaps it was a slow news week) as the project remained the top online story on the BBC News Science & Environment pages for a full week, with around 1.25 million views. In total there were 67 media articles, both in print and online, including articles in The Guardian, The Times, the Daily Telegraph and the Daily Mail. This generated a staggering public response, with over 1,000 records submitted on the first day alone! Despite this enormous success, it became apparent that many first-time recorders found iRecord rather too complicated to use, so we set up a complementary reporting tool via Survey Monkey (<https://www.surveymonkey.co.uk/r/spittlebug>) which went live on 4th June. The Survey Monkey form is simpler to use, but the iRecord form allows for a greater level of information to be collected. Links to both recording routes were posted on the project website, giving contributors the option to use whichever suited them best.

So where are we now? Well, whilst we weren't quite expecting the scale of the response, we are absolutely delighted that the 'Spittlebug Hunt' has so far been an enormous success. We have received over 14,000 records, over 80% of which include the crucial host plant information. Around 3,600 records have been submitted through Survey Monkey, the rest via iRecord. Of course, we need to check and verify all of these records, our task for the coming weeks, and this is where the submission of a photograph to support the record is enormously helpful. Around 40% of submissions have associated photographs which will make the verification task for these records much easier. Once we have verified the records, the interesting and important job of analysing the data will begin; data that will feed into the wider BRIGIT research project to help us determine how best to respond and protect our countryside should *Xylella* arrive in the UK. We already know that over 400 species of host plant have been reported, with lavender, rosemary and rose as the top



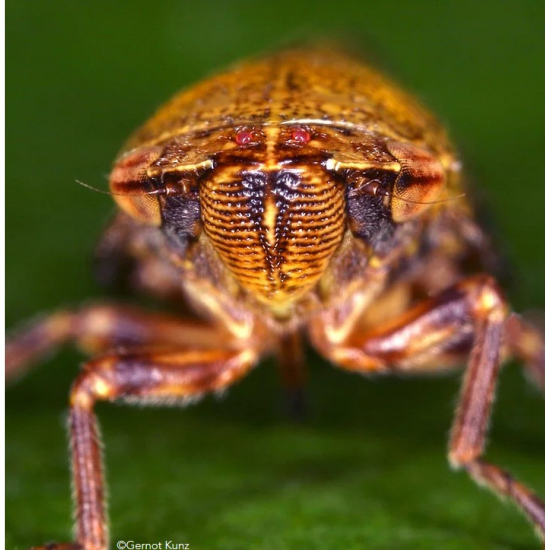
HOW TO REPORT SIGHTINGS OF XYLEM- FEEDING INSECTS

Please let us know when you see either spittle, nymphs (juveniles) or adults of the xylem-feeding insects (froghoppers and some leafhoppers) that have the potential to act as vectors of the *Xylella* bacteria. These records will help us build up a picture of where the bugs are found, what plants they feed on and how much they move around. This information will be essential for deciding how best to respond should the *Xylella* bacterium arrive in the UK.

If you are an experienced iRecord user, please submit your sightings on our [iRecord webpage](#).

If you are not already familiar with iRecord, you may wish to use our [simplified survey form](#).

[Submit a sighting](#)



©Gernot Kunz

Xylem recording website, leafhopper image © Gernot Kunz

three. We also know that around 80% of records have been submitted from private gardens. This is one of the huge benefits of running a citizen science campaign; we simply could not have accessed such data in any other way. We are enormously grateful to everyone, experienced recorders and those just starting out, who have contributed data to this critically important area of research. We have the opportunity to run the survey again next year, so one of our tasks for the winter months will be to decide how best to do this, what information gaps remain to be filled and so on. Either way, none of us will be booking a holiday for the day the survey goes live! In the meantime, please keep an eye on our website for updates on the survey, and if you find a froghopper or locate a (xylem-feeding) leafhopper, please do let us know:

<https://www.xylemfeedinginsects.co.uk/how-to-survey-for-xylem-feeding-ins>

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Willsher, K. (2019) Deadly olive tree disease spreads to France. *The Guardian*. <https://www.theguardian.com/world/2019/sep/09/deadly-olive-tree-disease-spreads-france>.



Earlier in 2019 BRC organised the latest in its series of recording scheme meetings, providing an opportunity for a wide range of recording scheme organisers to meet with representatives of government agencies and research organisations. The presentations and workshop reports are [available to download](#).

A new user guide for iRecord written by Steve Garland is available [to download online](#).

FSC Biolinks project has a [new online forum](#), offering technical support and encouraging feedback on the project's technical developments such as Idenitkit and the FSC QGIS plugin.

The Mammal Society is looking for recorders to help with their new [Walk This Water Way](#) initiative, using their updated Mammal Mapper app to survey for mammal signs along sections of waterway.

The numbers of records being submitted via iRecord and the other sites that share the same data warehouse continues to increase, as does the number of verifications being carried out, records incorporated into recording scheme datasets and shared via the NBN Atlas. A very big thank you to everyone who has contributed records and verifications.



The increasing number of records is welcome and improves our knowledge of changes in species distributions, but also means an increasing workload in terms of verification. Various options exist or are being investigated to support the verification process, many of which were discussed at the BRC recording scheme meeting last March. These include: how to share verification among teams; how 'record-cleaner' rules can be used to automate parts of the process; what role there might be for image recognition.

The verifiers on iRecord are nearly all volunteers associated with the national recording schemes, sometimes working through a network of county recorders. There are still [some gaps](#) in the verification process for particular species or areas, but the total number of records being reviewed is very impressive, and alongside the verification process itself verifiers frequently provide feedback and mentoring to the recorders concerned - thanks again to all who play a verification role.



Local Environmental Records Centre Spotlight

Each edition the NFBR newsletter celebrates one of the Local Environmental Records Centres [LERCs] in the UK. These organisations are centres for the collation, management and dissemination of biodiversity data on a local scale, making biodiversity information available to decision makers throughout the UK, alongside supporting Biological Recorders in a myriad of ways.

Answers provided by Lindsay Bamforth, Information Officer.



Fife Nature Records Centre (Fife Nature) covers the whole of Fife local authority area, which contains most of VC 85 Fifehire as well as small areas of VC 87 West Perth and VC 88 Mid Perth. Coverage extends over the border into the Kinross-shire part of Perth and Kinross to capture the remainder of VC 85.

The area has an extensive and well-visited countryside network with a surprising diversity of natural heritage for its relatively small size, including heather moorland, lochs and burns, woodland, meadows and a rich coastline.

The majority of the coast is of international importance, recognised through Ramsar, SPA and SAC designations. Other internationally important sites lie inland and offshore – the Isle of May is also Scotland's oldest bird observatory. There are over fifty SSSIs as well as NNRs and numerous sites with more local designations.

Tell us a bit about your LERC

A records centre for Fife was suggested by the former NCCS (Nature Conservancy Council for Scotland) in 1990. Included as an Action Point in Fife Regional Council's Charter for the Environment, 'Fife Nature Biological Records Centre' was established in 1992 within the Regional Council.

The motivation was increasing concern over the impact of development on natural heritage and the difficulty accessing suitable information on species and habitats. A records centre was a means of bringing all relevant data together, making it readily accessible and facilitating appropriate responses to development proposals.

There have been changes along the way, including the name, moves within the Council and a period within an independent charity and ALEO (Arms-Length External Organisation) to the Council, but today we are again known as Fife Nature and sit within Fife Council. We hold over 1.6 million species records.

Fife Nature Records Centre is based in Glenrothes, the administrative centre for Fife. We work alongside biodiversity colleagues in an open plan office shared with a range of other teams in the Council. Perhaps unexpectedly, peregrines are a regular sight from the windows!

Alongside the support of Fife Council, we receive funding from SNH (Scottish Natural Heritage), which provides a valuable contribution towards equipment, training and events as well as staff costs.





Fife Nature Staff: Lindsay Bamforth (Information Officer) & Mhairi MacKinnon (Support Assistant)

Tell us about your team

Fife Nature Records Centre is just 2 people. The Information Officer is full-time and manages the day-to-day running of the records centre and all that entails, including responding to data and information requests. The Support Assistant works 3 days per week, with a focus on processing biological records alongside providing support across all aspects of work undertaken. We also have a small core of volunteers who assist in a variety of tasks, from office to surveys and events.

Our Steering Group currently has 6 members (excluding Fife Nature staff), including Fife Nature's first staff member (now retired)! There are also recorders, an ecological consultant and CIEEM Scottish Section Committee member and Council planning and biodiversity colleagues.

Tell us about the local recording scene

The recording community is very active. Groups include Fife Bird Club, Fife Red Squirrel Group, Fife and Kinross Bat Group, Fife Amphibian and Reptile Group and Forth Seabird and Seal Groups as well as those with broader interests, such as the Scottish Wildlife Trust Local Group for Fife and Kinross and the Pitcairn Society, a natural history group. Several people are members of a variety of groups so familiar faces may be spotted regularly! Many very active recorders are not members of local groups but may be affiliated with national schemes and societies.

Recording is also stimulated by regional presence of national organisations, such as Butterfly Conservation East Scotland Branch, and bird recording is very well represented. Some recording is undertaken through land managers, such as regular transects by volunteers for Fife Coast and Countryside Trust. Several experts are brought together in the Fife Recorders Group, administered by Fife Nature, which includes Vice County Recorders as well as other individuals with valuable knowledge, experience and identification skill in various taxa. Many members assist with the verification of species records collated by Fife Nature.





Torry Bay © Lindsay Bamforth

Tell us about how you support local recorders

We support people new to recording as well as experienced recorders and try to help whenever and however we can. This includes answering queries, providing a connection to experts and highlighting resources, tools and websites (and offering support in using them) as well as groups, schemes and societies. Other assistance includes providing mapping and species and habitats information to inform surveys or other projects.

We want to help make recording accessible and try to provide opportunities to give things a go without the barrier of cost, whether for new recorders or existing recorders expanding their interests. Fife Nature hold a number of free workshops each year in partnership with experts, often an introduction to identifying and recording a particular group. Although you can't become an expert in a day, getting a taster at a local event may help people decide whether to pursue the interest, engage with groups, schemes and societies - and perhaps undertake further training. We also have a wide variety of identification guides and recording and survey equipment available to consult, borrow or just try out. We help organise and give technical support at BioBlitzes - guides and equipment are also available for use at similar events or to support other local recording initiatives.

We are planning a get-together in 2020, open to everyone interested in wildlife recording in the area, to celebrate and raise awareness of all that happens, connect people and hopefully inspire even more recording!

What are the top three sites you would recommend to visiting wildlife recorders?

Many wonderful places with their diverse recording interests could be top sites on any given day. These are some staff favourites:

Torry Bay (NT001850). Overlooked by the former Longannet Power Station and in sight of the industry of Grangemouth, the mudflats of the bay are set in an unusual landscape! Part of the Firth of Forth Ramsar site, SPA and SSSI, a great variety of waterfowl and waders may be spotted. Pink-footed geese are a spec-





Lochore Meadows © Fife Nature

tacular sight: heard well before they are seen, they fill the sky before settling in the bay. Torry Bay itself is an LNR and also includes woodland, meadows, wet grassland, reedbed and remnant saltmarsh.

Lochore Meadows Country Park (NT164959) [Weblink](#)

Part of Lomond Hills Regional Park. Has a wide variety of habitats: rich meadows including greater butterfly orchid, semi-improved acid grassland with dry heath and marshy grassland at The Clune Wildlife Site, plus pools, wetlands, woodland and huge old oak trees. Wildlife is diverse, from birds to dragonflies, butterflies, bumblebees and even occasional otter and red squirrel. A scenic walk over Benarty Hill finds you at Loch Leven, Perth and Kinross, an internationally important site, NNR and RSPB reserve.

Tentsmuir (NO510275). [SNH weblink](#) / [Forestry and Land weblink](#)

Comprises a Forestry and Land Scotland forest and an NNR managed by SNH. The coast is part of the Firth of Tay and Eden Estuary Ramsar site, SPA, SAC and a SSSI - the site also includes 2 further SSSIs. A mosaic of habitats: extensive dunes, dune heath and wildflower-rich dune slacks, mudflats, open water and fringing fen - and lots of trees! Wildlife highlights include grey and common seals, red squirrels, crossbills and occasional white-tailed sea eagle.

Any highlights or achievements you would like to share from the past year?

Last year we helped secure funding for a 2-year post to work on a project within Fife Council to review Fife's Wildlife Sites. They were assessed and designated around 20 years ago; surveying since has been very patchy - the project will provide much needed up to date information. Funding was provided through a Workforce Youth Investment fund, so core objectives include the development of that person: this has been an exciting opportunity to employ a recent graduate and offer opportunities to spend time building on habitat survey, wildlife identification and recording skills. The project began in January this year.

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Using biological records to determine trends in thousands of UK species

Charlie Outhwaite

Editor's note: This article was originally [a blog post](#) written as an accompaniment to the paper Annual estimates of occupancy for bryophytes, lichens and invertebrates in the UK, 1970–2015, which you can read in full [online here](#).

I'm not going to lie, organising millions of records of species observations, developing and testing confusing models and running the models (often more than once!) to produce the data described in our [data paper](#) was not an easy task. So, was it worth it? Absolutely!

Let me give you some background. In the UK, we have very good data on certain groups of species which has enabled scientists to determine trends in these species over time. We know, for instance, that farmland birds have undergone strong declines in numbers since 1970, that specialist butterflies have also declined and that populations of bats have increased. Knowing



these trends then enables us to start thinking about what is causing them so that we can prevent declines.

The data we have for these well-studied groups is great because it is collected from across the UK following a strict protocol. This means the data is standardised and it can easily be used to look at how numbers of species have changed over time - trends. Unfortunately, this data is not available for much of the UK's wildlife, in particular for most insect groups. So, in order to determine how other species are doing, as was our aim, we had to find an alternative source of data.

This data was in the form of biological records. A biological record is an observation of a species at a known time and location. These records are collected and collated by volunteers as part of recording schemes. There are over 90 [recording schemes](#) in the UK, each with a focus on a different set of species from ants, bees & wasps, to fungus gnats, soldier beetles, plants and lichens. Many volunteers collect data and, as a result, there are millions of records available over time. The problem is that these data are not collected using a strict protocol, they are opportunistic, and so have issues with biases such as imperfect detection.

Luckily, there are a class of models out there that enable us to account for the biases associated with this kind of data. They are called occupancy-detection models. They are quite tricky and can take a long time to run when you have a lot of data. While models for some species groups took just a few days to run, others needed the use of a super computer called [JASMIN](#) and took months! Needless to say, I was not impressed when I ended up having to rerun some of these models, sometimes more than once (doh!).

But it was worth it! At the end of a lot of work, we have been able to produce annual estimates of species occupancy and associated trends for over 5,000 UK species from 31 taxonomic groups for the time period 1970 to 2015. For many of the species, including many insects, bryophytes and lichens, this is the first time that their trends have been assessed. These estimates have been used to assess change in species distributions to monitor progress towards the [UK Biodiversity Indicators](#) and have contributed to the latest [State of Nature report](#). We have also been able to assess the broad patterns of change in species distribution over time, keep an eye out for that paper soon! Without the information found within the biological records, and the hard work of the volunteers in collecting it, the state of many of these species would be unknown. Now, we can work towards understanding these trends and trying to prevent any further declines from occurring.

You can find and use the dataset of species trend estimates [here](#).





Dr Gavin Broad sweep netting for wasps at Ainsdale © The Trustees of the Natural History Museum, London



Quest begins to sequence genomes of all UK life

Josh Davis, Natural History Museum, London

Editor's note: This article originally appeared on the [Natural History Museum website](#)

Scientists, naturalists and volunteers were out in force collecting invertebrates in the sand dunes of Ainsdale National Nature Reserve in Merseyside.

Located in the north west of England, the reserve and the surrounding environment provided a diversity of habitats - from dunes and beach to freshwater and salt marsh - in which the teams could search for a huge variety of species. After collecting the invertebrates, which included insects, crustaceans, polychaetes, molluscs and arachnids, the researchers brought them back to a pop-up laboratory built on site. There, Museum researchers had set up all the necessary equipment to isolate, amplify and even sequence parts of the animals' DNA.

The Museum's Principal Curator in Charge of Insects, [Dr Gavin Broad](#), says, 'We have been collaborating with Natural England to get many of their experts and surveyors along with our scientists out in the field. Together, we want to do a lot of invertebrate recording and specifically to start building a DNA barcode library.'

This will become a reference library, linked to images of the invertebrates that were sampled and the specimens themselves, which can then be used for the Darwin Tree of Life project. When a species' genome is sampled for this project, it will then be compared to the DNA barcode library to corroborate an identification of what species it belongs to.



Earth BioGenome Project

The Darwin Tree of Life project was [announced late last year](#). It is being led by the Sanger Institute, but involves a whole host of other institutions in addition to the Museum, from the Royal Botanic Gardens (Kew) to the University of Edinburgh. The initial goal is to sample and sequence the genomes of all 66,000 species of plants, fungi, protozoa and animals that are found in the UK. This will then feed into the [Earth BioGenome Project](#), which has an ambitious aim to sequence the genomes of all life on Earth.

It is hoped that this information could help researchers investigate a range of questions, from how and when certain groups or species colonised the British Isles to the evolution of wasp venom or how salamanders are able to regenerate their limbs. This could be of significance to both the biomedical world and the bioengineering sector, as it could allow scientists to better understand how to build entire genomes from the bottom up.

But the project is also part of a longer term initiative.

'Various people have described this as "moonshot" science,' explains Gavin. 'We're not necessarily doing it for a particular purpose.'

'But if you look at how sequencing the human genome unleashed a huge amount of progress in medicine and genetics research, just imagine what sequencing the genomes of a huge slice of life is going to open up in different research fields.'

Tracking species you can't see

Sequencing these DNA 'barcodes' - the short regions of the genome that vary enough between species to be diagnostic - of all the species that live in the UK will also be important in setting a new baseline for biodiversity assessments.

For Andy Nisbet, the Evidence Programme Manager at Natural England, this could be a powerful tool in keeping track of how well they are conserving nature in England.

'We do a lot of biological surveying and monitoring of species and special sites, but that is quite difficult,' explains Andy. 'We tend to monitor groups that are easy to find and species that are easy identify - so typically taxa such as birds, butterflies, dragonflies and flowering plants.'

'Other groups, such as many other invertebrates and fungi, are really difficult to find and there are very few people who can comprehensively identify them. So we're interested in using DNA and eDNA to get around that, to find and identify more species that are difficult to find.'

As species move about their environment, they typically shed bits of their DNA. Known as environmental DNA, or eDNA for short, there has been an increased interest in using these traces to see whether or not a species - particularly rare or elusive ones - has been in an area recently.





Invertebrate samples collected for DNA extraction © The Trustees of the Natural History Museum, London

'We are responsible for protected sites such as Sites of Special Scientific Interest and National Nature Reserves,' says Andy. 'So we need to know if their special features are still there and still doing well, while more generally we want to know what the state of the environment is, and how it is changing.'

The use of eDNA could radically change how scientists can keep track of how these special sites are faring. That's because researchers can simply take a sample of water and test it for different kinds of life.

By conducting this trial in Ainsdale, the team were testing the process of collecting specimens in the field, taking them back to be identified and then sequencing their DNA all in one day, with the aim of replicating it at other sites around the country.

The Museum is building up collections of this DNA, the specimens and their associated data and so will need to target a large variety of habitats, something that will only be possible through collaborations with other groups, institutions and experts.

Editor's Update

Since this piece was written, it has been announced that the Natural History Museum will be one of ten institutes partnering on the [Darwin Tree of Life Project](#). Led by the Wellcome Sanger Institute, the project aims to sequence the genomes of 60,000 species that live in, and around, the British Isles. Find out more from the [Natural History Museum press release](#).



RHS Cellar Slug Survey: have you seen these slugs in your garden?

Imogen Cavadino

At the end of March 2019 the Royal Horticultural Society (RHS) launched an [online survey](#) calling on gardeners to join the search for the yellow cellar slug (*Limacus flavus*). The yellow cellar slug is thought to be being usurped by the green cellar slug (*Limacus maculatus*) which was first recognised in Britain in the 1970s (Evans, 1978). Since its arrival in Britain and Ireland, the green cellar slug has spread rapidly (Rowson et al, 2014), appearing to replace the increasingly rare yellow cellar slug.

The study also seeks to learn more about the two species' interactions with plants, and any commonality in the gardens they inhabit, with a view to understanding what it might mean for their future in our gardens and how they can be encouraged and protected. As both these slugs prefer to feed on decaying rather than live plant material, they are a suitable flagship species for encouraging gardeners to think of slugs in a more nuanced way.

While both slugs have large, green-yellow, patterned bodies the yellow cellar slug has a long, unbroken yellow stripe running along the centre of its tail. As these species of slug are nocturnal, people are being asked to grab torches and step out into their gardens after dark in the hope of recording them. You may also encounter these slugs during the day, huddled in groups under heavy objects or inside compost bins, an unusually sociable behaviour common in these two species of slug.

For more information about how to take part in the study please visit: www.rhs.org.uk/slugsurvey. You can also find the survey on Twitter: [@UKslugsurvey](https://twitter.com/UKslugsurvey).

This survey is part of Imogen Cavadino's PhD project, supervised by the RHS, Newcastle University and the Centre for Ecology and Hydrology, seeking to better understand the diversity of slug species in gardens. Support has also been given by staff at National Museum Cardiff, iRecord, and volunteers from the Conchological Society of Britain and Ireland. Data is being collected via iRecord as the flexibility of their form allows specialist data on garden features to be collected. It also allows data to be fed into the Conchological Society's database via the non-marine recorder and accessed by other organisations.

As of the end of September 2019, over 240 records have been sent in to iRecord using the specialised online survey form. Only 12 of these have been confirmed as being *L. flavus*! Please do get out in your own gardens and see which of the two species you can find. Please also share the survey far and wide throughout the UK. Printed A5 leaflets are available for distribution by request: imogencavadino@rhs.org.uk

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Wanted!

Have you seen

the yellow cellar slug?



What do we want you to do?

- Grab a torch and go on a slug hunt in your garden to see if you can find this nocturnal species
- Take photographs showing the top of each slug
- Match your slug to the ID guide (overleaf)
- Use the online form to let us know what you found and where

Why?

Over the past 30 years, reports of the yellow cellar slug have declined sharply. During this time a second species, the green cellar slug, has started spreading throughout Britain and Ireland. Where is the yellow cellar slug? Has the green species taken over? Are we about to witness a slug go extinct in Britain?

We need your help to find out!

Have you seen these slugs?

There are three large patterned slugs you are likely to find in your garden:

Yellow cellar slug (*Limacus flavus*)

5 cm

Clear yellow
slime

Long yellow stripe running
along centre of tail

Green-yellow bodies

Blue-grey tentacles

Green cellar slug (*Limacus maculatus*)

Clear yellow
slime

Yellow stripe not present
or very short

Leopard slug (*Limax maximus*)

Clear
slime

Tail often heavily striped

Brown-grey body

Red-brown tentacles

Images approximately
to scale.

Both species of cellar slugs are not considered plant pests and may be beneficial to gardeners. After taking your photographs we ask that you return any of these slugs to where you found them.

To take part and find out more visit: rhs.org.uk/slugsurvey





A short round up of some news from the UK biological recording community.

Get Involved

The Agromyzidae Recording Scheme (ARS) is asking for help with their Hogweed Miner Project. Hogweed (*Heracleum sphondylium*) is mined by two Diptera species (*Phytomyza pastinacae* and *Phytomyza spondylii*) which can only be determined by dissecting adult specimens. There are many more records of *Phytomyza spondylii* on NBN, but the majority are based on the leafmine alone. The recording scheme would like to gain a truer reflection of the two species' distribution and are asking for recorders to keep an eye out for mined leafs. You can either rear them through to adult and confirm identification yourself, or to send the mined leaf to ARS via post. [More information is available online.](#)

Dr Grant Brown of University of St Andrews is running the **British Harvestman Barcode Library** project (funded by the British Arachnological Society), which aims to DNA barcode the 31 species of *Opiliones* found in Britain. He is currently seeking material in order to achieve this aim, particularly live specimens, but suitably stored ones up to 15 years old should also be useful. You can find more details on [the project website](#).

If you are hoping to contribute to **Botanical Society of Britain & Ireland's 2020 Atlas**, a reminder to submit your records by the 31st December 2019 deadline..

The **World Museum** in Liverpool are asking for specimen donations to help fill in gaps in [their Diptera collection](#).



Collembola hitchhiker on Tipulid wing
© Elaine Wright

A recent discovery by myself of a Collembola attached to the wing of a crane-fly specimen adds to the theory that Collembola use hitch-hiking as a means of dispersal. [Collembola Recording Scheme](#) organiser Peter Shaw passed my finding to Cyrille D'Haese, who has done work on Collembola specimens attached to termite and ant wings in fossil amber. You can read *Fossil amber reveals springtails' longstanding dispersal by social insects* by N. Robin, C. A. D'Haese & P Barden on [Researchgate](#). If you spot a springtail hitching a ride on a winged specimen, please let [Peter Shaw](#) know, to collect more examples of this interesting phenomenon.

New Tools

David Slade (NFBR webmaster / county moth recorder) has created multi-access keys to [British Pugs](#) and [British Phyllonorycter](#) using the Field Studies Council's [Identikit tool](#).

In other exciting moth news, the *Atlas of Britain & Ireland's Larger Moths* will be published soon, and is available to pre-order on several sites including [NatureBureau](#).

Mark Gurney has updated his excellent free online [Weevil Guide](#) to include *Atte-labidae*, *Anthrribidae*, *Nemonychidae*, and *Rhynchitidae*.

Steven Falk has added more photos to his fabulous [Flickr identification galleries](#), in particular the [Nomad Bees](#), [Mining Bees](#) and [Mini-mining Bees](#) folders.

Recorder 6 has switched to a licence fee arrangement, in order to fund the longevity of the programme. Current versions will continue to work for non-subscribers, but dictionary updates and future developments will only be available to those paying the license fee. More information about the decision and how to pay are available on [the NBN Forum](#).

Reading Materials

As part of the 2019 international Year Of The Fly celebrations, BBC Wildlife Magazine website have been running a Fly of the Month feature. You can read all the articles [online here](#).

BTO recently published a [WeBS Alerts report](#), providing a review of the status of species on sites in the UK which are designated due to their conservation value for waterbirds.

The State of Nature 2019 reports are all available to download on [the NBN web-site](#).

British Ecological Society have created a free virtual issue featuring articles from all their journals: [Why Ecology Matters](#).

The following individual scientific papers, many based on biological data collected by NFBR members, may also be of interest:

[Identification skills in biodiversity professionals and laypeople: A gap in species literacy](#)

[Monitoring insect pollinators and flower visitation: The effectiveness and feasibility of different survey methods](#)

[A validated workflow for rapid taxonomic assignment and monitoring of a national fauna of bees \(Apiformes\) using high throughput DNA barcoding](#)

[Data Integration for Large-Scale Models of Species Distributions](#)

[Robustness of simple avian population trend models for semi-structured citizen science data is species-dependent](#)





NATIONAL FORUM FOR BIOLOGICAL RECORDING

The National Forum for Biological Recording is the premier UK organisation for practitioners engaged with biological recording across the UK. Membership includes individual naturalists, national organisations and recording societies, local records centres and their staff. This gives it a unique perspective and an important role.

Whether you are an experienced naturalist or taking your first steps in biological recording, we want to hear from you.

To offer an article for a newsletter, please contact our Newsletter Editor: Elaine Wright on editor@nfbr.org.uk

To join the NFBR, please contact our Membership Officer and Treasurer: Clare Langrick on membership@nfbr.org.uk

For all other enquiries about NFBR please contact our Chairman: Graham Walley on chairman@nfbr.org.uk

Join the discussion on [Facebook](#) and [Twitter](#).