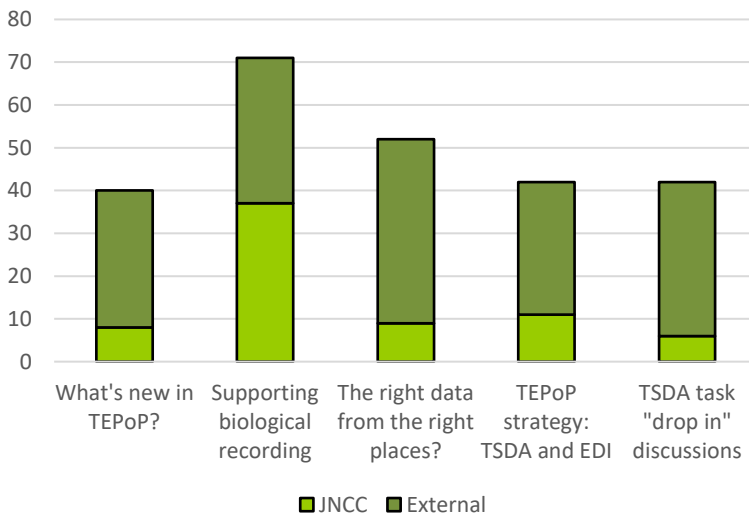


TEPoP Festival 2022 Summary



This year we hosted the sixth annual UK Terrestrial Evidence Partnership of Partnerships (TEPoP) festival. The festival consisted of five events held over a two-month period, with a mix of presentations, workshops, and discussions taking place online. TEPoP consists of 18 organisations involved in terrestrial monitoring engaging volunteer recorders. A total of 135 different individuals participated at one or more of the events, with participants attending per event shown in Figure 1.

Figure 1: Participants per event



Feedback following the festival was positive, with attendees reporting that the events they attended were interesting and relevant to their work. The most common way that attendees heard about the festival was through the TEPoP eBulletin, followed by TEPoP emails. YouTube recordings of events were the most popular output, with the circulation of reports discussed during events also proving useful. Participants indicated that they mainly want future events to be held online, due to accessibility and cost efficiency, with some interest expressed in a face-to-face conference with additional online content.

Participating organisations:

Amphibian and Reptile Conservation; Animal and Plant Health Agency; Bat Conservation Trust; Botanical Society of Britain and Ireland; British Trust for Ornithology; Butterfly Conservation; Centre for Environmental Data and Recording; Chilterns Conservation Board; Department for Environment, Food and Rural Affairs; Department of Agriculture, Environment and Rural Affairs; Forestry Commission; National Biodiversity Network; National Museums Northern Ireland; Natural England; Natural Resources Wales; NatureScot; Northern Ireland Environment Agency; People's Trust for Endangered Species; Plantlife; Royal Society for the Protection of Birds; Royal Society of Wildlife Trusts; Scottish Natural Heritage; UK Centre for Ecology and Hydrology; University of York; Wildfowl and Wetlands Trust

Session 1: What's New in TEPoP?

The first part of this event was a series of eight brief presentations from scheme partners discussing the challenges faced over the last year and the key lessons that have been learned.

The first talk was given by **Rachel Murphy from Plantlife**, who spoke about the National Plant Monitoring Scheme (NPMS). A recent challenge for the scheme has been the disparity between the number of volunteers allocated a square who go on to complete their survey. Questionnaires were conducted to identify barriers to participation, and the results showed a range of factors: perceived complex methodology, lack of confidence, time required, and the process of seeking land access. It also showed that volunteers want more feedback on their data and how it's verified. Following this, NPMS created additional guidance materials such as How-To videos on YouTube and updated how data verification is communicated. An EDI review was also carried out using an anonymous survey to investigate volunteer demographics and scheme diversity. The review found that the volunteers largely fell into a narrow demographic, the majority are already involved in environmental

volunteering, and 1/3 don't feel connected to other volunteers. To improve scheme inclusivity, NPMS has been working on buddying opportunities, making survey squares available in different regions, and are planning to make survey materials available in Welsh.

Martin Harvey from the UK Centre for Ecology and Hydrology (UKCEH) gave an update on the UK Pollinator Monitoring Schemes (PoMS). The team at PoMS have been looking at improving feedback to volunteers, the need for which was confirmed by the responses to the participants' survey carried out in 2022. Participants gave suggestions for things that would motivate greater involvement, the most popular of which was more training and identification resources, something not currently offered by PoMS due to the broad taxon focus of the FIT counts. A key lesson learned during this process is that, while collecting feedback takes time, it is important, as the findings from volunteer surveys help to keep people involved and interest more people in the scheme. As PoMS is a long-term monitoring scheme, they can't yet draw any firm conclusions, but as more data and analysis is accumulated over the coming years that should start to change.

Ian Middlebrook from Butterfly Conservation spoke about difficulties faced by the UK Butterfly Monitoring Scheme (UKBMS) with producing robust population trends for the Purple Hairstreak. Despite being fairly widespread, this species is not best monitored during standard daytime transects due to being most active in the upper tree canopy during the evening. To address this, a workshop was held for several species experts to contribute to designing a new methodology – conducting transects in the early evening, surveying only the upper canopy. This method was trialled with volunteers, who gave feedback which was used to adjust and re-trial the methodology. The key takeaways from this process were recognising that volunteers are unlikely to have a high level of expertise, and may raise basic issues that were not considered by experts. This highlights the importance of thorough testing and taking feedback seriously.

Lia Gilmour from the Bat Conservation Trust discussed the National Bat Monitoring Programme (NBMP), and the issues of underrepresentation in habitats, regions, species, and volunteer engagement. The British Bat Survey (BBatS) is a project built to tackle underrepresented species, habitats, and geographical areas using passive acoustic monitoring surveys. Though the project is still in development, the pilot managed to get data from 100 sites. Outside of NBMP the Trust is also working on NightWatch, a project with a specific focus on engaging volunteers from different backgrounds. Through developing these projects, the key lessons learned have been the value of partnerships and learning from other schemes, and the importance of designing surveys with data integration in mind to produce more robust trends.

Teresa Frost from the British Trust for Ornithology (BTO) discussed a challenge the Wetland Bird Survey (WeBS) has recently encountered: retirement! When a key member of staff retires, there is a risk of losing a great deal of experience and knowledge from the scheme. The key to preventing this loss is building resilience and planning in advance. The transfer of knowledge to other team members takes time, but in the long run will be more efficient and prevent the team being reliant on any one person. Another key lesson learnt through this process is that the best tool for a task may not always be widely used, and it may be necessary to move certain information and functions to programmes that are more widely accessible among staff.

Dawn Balmer from BTO gave presentations on three schemes: the Avian Demographic Scheme (ADS), the Breeding Bird Survey (BBS), and the Seabird Monitoring Programme (SMP). ADS has had a difficult year responding to the outbreak of HPAI in seabird colonies. From the start of the outbreak there were significant concerns about individual and population-level impacts and the potential for exacerbation by monitoring activities; to tackle these, BTO established a forum of CNCBs, Defra, APHA and NGOs to improve data sharing and coordination across Britain and Ireland. BTO developed and disseminated best practice guidance with respect to volunteers and bird welfare and are currently working to assess the impacts of avian flu, predict the species at greatest future risk, and collect more robust mortality data. A key lesson has been the importance of effective communication. Keeping volunteers up to date requires a significant investment in communications,

but prompt and clear guidance is essential for them to have a clear understanding of the risks. Effective management also relies on communication between stakeholders, particularly major landowners, as the current model of volunteer monitoring is very exposed to changes in land manager risk perception. Similarly, the ADS team identified the need for more communication between BTO and CNCBs on the value and usage of volunteer datasets.

In the next presentation, Dawn discussed the impact of Covid-19 on BBS. The restrictions in 2020 impacted volunteer fieldwork, resulting in 49% fewer squares visited compared to 2019. BBS undertook analytical work to assess the impact of restrictions on bird population monitoring and investigated statistical solutions. This assessment found that the reductions were greatest in Wales, Scotland and Northern Ireland, in the early breeding season, when 90% fewer visits were made. Due to the reduction in monitoring, long-term and one-year population trends could only be produced in England for 20 species, and for another 37 species only the long-term or one-year trends could be produced. Field work increased in 2021, which allowed for two-year trends to be produced for 2019-21. BBS also used statistical techniques to produce long-term trends; a smooth spline was fitted to the unsmoothed indices, leaving out 2001 (FMD outbreak) and 2020. BBS reports have been produced explaining the impact of Covid-19 on data usage.

BTO recently discovered the challenges of taking on a new scheme with the Seabird Monitoring Programme. When responsibility for the scheme was transferred to BTO, JNCC emailed all the SMP volunteers to confirm that their personal data can be transferred, but not all the participants were able to be reached this way. To contact those who didn't respond, the log-in system for the SMP website was adapted; when logging in, a pop up will appear linking them to the privacy policy and T&Cs, giving them the option to agree (granting access to the database) or email the organiser. They also set up a Twitter account, @smp_seabirds, to further engage with both current and potential new participants. BTO still don't know all the scheme participants, which remains an ongoing challenge. Moving forward they are looking to improve resources and update the SMP handbook.

Following the presentations were two group sessions. The first addressed effective strategies for improving survey coverage, with participants discussing approaches to improving both geographic coverage and engagement with underrepresented demographics. The second session considered challenges and solutions for national and local biodiversity data join up.

Improving geographic survey coverage

Key challenges: many solutions that increase survey participation result in other challenges: relaxed survey methods can lead to greater bias and wider confidence intervals, and working more directly with volunteers is resource intensive.

Areas partners want to explore: closer collaboration with landowners; increased digitisation of urban wetland sites; greater use of targeted sampling; more buddying up approaches to surveying; working with universities more; training events for under-recorded regions; greater use of bespoke sampling methods.

Improving engagement with underrepresented demographics

Key challenges: lack of continuity with universities; working out realistic boundaries for involvement with youth work; difficult to make the initial connection with underrepresented groups.

Areas partners want to explore: Defra ALPS team; adopting an Urban Indicator; involving the farming sector; improving automated classification software (reduces pressure, increases volunteer confidence).

The application of national scheme data to influence local decision making

Key challenges: different needs of local and national schemes; regional trends and bias; capacity of local schemes.

Key solutions: standard protocols and methodologies; developing resources (communication materials, tools, available datasets).

Influx of local data into schemes

Key challenges: verification; dataflow; merging of datasets.

Key solutions: improved verification and classification tools; common standards.

Session 2: Supporting biological recording through the BReVI (Biological Recording Verification and Interpretation) project

Hannah Hoskins from JNCC opened this session by introducing the Biological Recording Verification and Interpretation (BReVI) project. BReVI is a partnership between JNCC and UKCEH, the objectives of which are to maintain and further develop the Biological Records Centre (BRC) to support volunteer scheme coordination, data management and communication.

David Roy of UKCEH reviewed the achievements of the BReVI project over the last five years, and how the BReVI contract supports the activities of schemes and societies carrying out biological recording. BRC and the BReVI partnership are at the interface of engagement with recording scheme experts, linking to researchers, and providing evidence for policy. BReVI also supports data use by facilitating the flow of data to the NBN Atlas, developing indicators and tools to assess spatial bias and review datasets, evaluating species distribution models, and working on adaptive citizen science tools. The key priorities for BRC going forward are to adopt common standards and help connect systems together, automate data checking, prioritise support for verification, and to support local, national, and international dataflows.

Session 3: The right data from the right places? Tools to support 'precision citizen science' and using the data to support local-to-national biodiversity assessments

Michael Pocock from UKCEH led this talk on tools to support more precise and informative data recording, starting with the Targeting Revisits Maps. The maps visualise how many records are available for certain taxa on iRecord, with 1km survey squares colour-coded to show whether the area is well recorded or targeted for revisits. Being able to see the targeted squares, and the impact of their recording as squares go from pink to green, motivates people to continue collecting data. The next tool introduced was the DECIDE project, the impacts of which are currently being evaluated. Like the Targeting Revisits Map, DECIDE will support existing recording tools by showing places with high priority for recording. Currently focussing on butterflies and moths, this project aims to provide fine-resolution species data and improve distribution modelling in a way that benefits both volunteer recorders and data users. After discussing these tools, Michael introduced some of the values and limitations of using modelled data in decision making, which was followed by an activity in which participants collaboratively noted down strengths and weaknesses of modelled data.

Simon Rolph at UKCEH then gave a brief overview of the DECIDE data interface and how it can be used, including viewing species richness and recording priorities, uploading and viewing shape files, modelling uncertainty, and downloading model outputs for further use.

Lastly, **Alison Dyke from University of York** discussed codesigning use cases for modelled data with recorders, based on the needs of data end users, which led onto breakout group sessions where participants further discussed possible use cases.

Using modelled data in decision making.

Strengths:

- Coverage and scope;
- Able to show distributions across spatial areas;
- Can include inaccessible and unsampled areas;
- Enables predictions.

Weaknesses:

- Uncertainty;
- Need to have confidence in the data;
- Models up to interpretation, need to ensure people understand what is being shown.

Session 4: TEPoP strategy: [TSDA](#) and [EDI](#)

The first half of this event focussed on the Terrestrial Surveillance Development and Analysis (TSDA) project. **Michael Pocock** discussed the 2022-2027 strategy for TSDA. The vision for the project is to support TEPoP schemes in providing evidence to support a nature positive future, through tackling challenges such as adapting to new requirements for evidence, exploiting new data streams, and developing a volunteer-centred approach. This was followed by a series of 5-minute talks about TSDA tasks for the coming year, presented by partners from JNCC, UKCEH, and BTO.

The second half of the event focussed on EDI, starting with three 10-minute talks on surveys conducted by scheme partners. Each survey was conducted with the aims of understanding the demographics of the scheme's volunteers, as well as the motivations and barriers to volunteer sign-up. **Claire Carvell from UKCEH** presented the PoMS participant questionnaire, the results of which represented quite a narrow demographic; 89% of respondents were aged 40 and over, 48% were retired, 75% were educated to at least undergraduate level, 92% described themselves as White English, and 99% were from a household in which the main language is English. As well as carrying out this survey, PoMS worked with a number of projects to widen the focus and impact of the scheme, including the Nature Isn't Neat project in South Wales, and have been discussing social prescribing and the benefits of FIT Counts as a mindful activity. **Rachel Murphy** gave an overview of the NPMS EDI review, as summarised in Session 1. **Megan Lowe from Butterfly Conservation** discussed the UKBMS questionnaire. Similarly to PoMS and NPMS, they found that participants are typically older, White, with a high level of education. Compared to the UK population, younger people, people from minority ethnic backgrounds, disabled people, and people living in urban areas are underrepresented in UKBMS. The scheme was able to learn from feedback given that there is a desire for more training resources and greater accessibility, and that explaining why collecting demographic data is necessary may counter the confusion expressed by some respondents.

Niki Newton from JNCC discussed the importance of EDI within TEPoP. Supporting EDI across TEPoP is important for the sustainability and expansion of schemes, the opportunity to gather more data from under-sampled areas, and to encourage interest in and stewardship of the environment across society. Actions that TEPoP schemes could undertake to break down barriers to inclusion starts with collecting data on volunteer demographics, which allows schemes to identify and prioritise underrepresented demographics, and then develop strategies for enhancing engagement in target audiences. Schemes can then track the impact of actions through shifts in perception and participation, and crucially continue this work to ensure the legacy of these actions and continued engagement.

The talks were followed by breakout group sessions, in which participants discussed the actions they would like to take to improve EDI, both on a scheme-specific level and working together with TEPoP.

Key actions to improve EDI:

- Consider opportunities to increase activity in urban areas;
- Develop partnerships with organisations that work with underrepresented groups;
- Look into new/improved training resources.

Session 5: TSDA tasks “drop in” discussions

A series of 30-minute ‘drop in’ sessions, each of which covered a different upcoming TSDA task that had been introduced during the previous event. In each session, presenters gave an overview of the task, and attendees had the opportunity to give their input, ask questions, and express interest in being involved in the task going forward.

Maddie Harris from JNCC opened this event with a session on using citizen science habitat recording to contribute to the validation of Earth Observation (EO). The aim of this task is to understand volunteer motivations for recording habitat data alongside species surveillance scheme data, as a potential way to validate EO data. This will be carried out using surveying to deduce the most appropriate approaches to working with volunteers to record habitat information, as well as trialling the EarthTrack app. In addition, this task will involve gauging volunteer enthusiasm on forming a “focus group” of individuals interested in trialling potential scheme additions in future TSDA work. Attendees discussed the framing of the task, including how to engage volunteers, and the possibility of building on similar volunteer surveying work done by other organisations.

Michael Pocock and Diana Bowler from UKCEH discussed dealing with uneven spatial coverage. Biodiversity records are used in trend modelling, but records are typically collected more in some areas than others. The aim of this task is to provide tools and recommendations to improve the coverage of biodiversity records to allow for more robust trend modelling. Various statistical and data collection solutions will be tested; the statistical solutions will look at accounting for missing data in trend models, while the data collection solutions will target under-sampled areas. Attendees discussed the shared issue of encouraging surveying in remote areas. A common problem is the time and cost of traveling to these areas, making it less accessible for volunteers. Some schemes tackle this by offering to cover travel expenses, and budget separately for surveyors to visit the most remote squares. Another suggested approach was using the Targeting Revisits Tool to assess the relative importance of under-sampled squares, allowing schemes to fund the surveying costs accordingly. Other issues included obtaining land access permission and inactive volunteers creating a block for further data collection. For statistical solutions the approach of weighting systems was discussed; BBS currently uses regional weighting to balance out the impact of data samples of different sizes.

James Pearce-Higgins from BTO led a talk on improving biodiversity surveillance capacity in Northern Ireland. The aims of this task are mapping current biodiversity surveillance activities, understanding the ambition for carrying out this work in Northern Ireland, describing the barriers and opportunities to increasing surveillance schemes’ coverage, and summarising the evidence needs of stakeholders. This will be followed by co-developing the recommended next steps for TEPoP, and reviewing the approach used and lessons learned. In the discussion, scheme partners talked over the issues faced when trying to get access permission from landowners to conduct surveillance, which proves difficult for both citizen science as well as professionally conducted surveys. For some sites, such as SSSIs, there may be multiple landowners, making the process even harder. One proposed solution was having non-continuous transects, and a solution put forward by PoMS was offering to send landowners the annual report, so that they can see the data collected from their land.

Paul Woodcock from JNCC presented the fourth TSDA task; developing communications to improve stakeholder confidence in TEPoP data and trends. The aims over the coming months are to create a standard template that explains the different potential biases across schemes and how each scheme mitigates them, as well as putting together a more definitive advisory document, and having a cross-scheme TEPoP briefing on ensuring data quality and reliability. Attendees contributed their thoughts on points to be considered throughout this work, such as transparency on the potential shortcomings of any communications, and the types of biases that should be covered in the aforementioned documentation.

Michael Pocock, Diana Bowler, Nick Isaac from UKCEH, and James Pearce-Higgins all led the discussion on the fifth task; bending the curve of UK Biodiversity. This task is closely linked to the main work under TSDA and will be focussing on the ambition for the UK to become Nature Positive by 2030. The main aim is to understand how this target can be reached, taking into account the complex policy landscape and difficulties of predictive modelling, and ways of evaluating progress. The results of this task could help with determining how data can be used to inform policy, evaluating the impact of conservation interventions, and evaluating how current indicators can be used to assess the path to becoming Nature Positive.

The final talk, led by **Michael Pocock**, covered the task of reviewing potential new technologies for TEPoP. Biological recorders have always used new technologies, and while some have been around for several years now, there is still further potential to integrate them into TEPoP schemes. The aims for this task are to address opportunities for new technologies to support and add value to monitoring, ways of incorporating this data, and the acceptability of the technologies. The current framework for this task is to collate new technologies from recent and upcoming horizon scans and create a scoring criteria, which will include potential values and risks, such as the ability to fill temporal gaps and the risk of disengaging current recorders. The technologies will be scored using this criteria, and use cases will be developed to explore funding proposals and piloting in future years. For those interested in being involved in this task, watch out for news to join a series of workshops due in summer 2023.