FSC BioLinks Consultation Report

Analysis of the FSC BioLinks development phase consultation from April 2016 to January 2017.

31st January 2017

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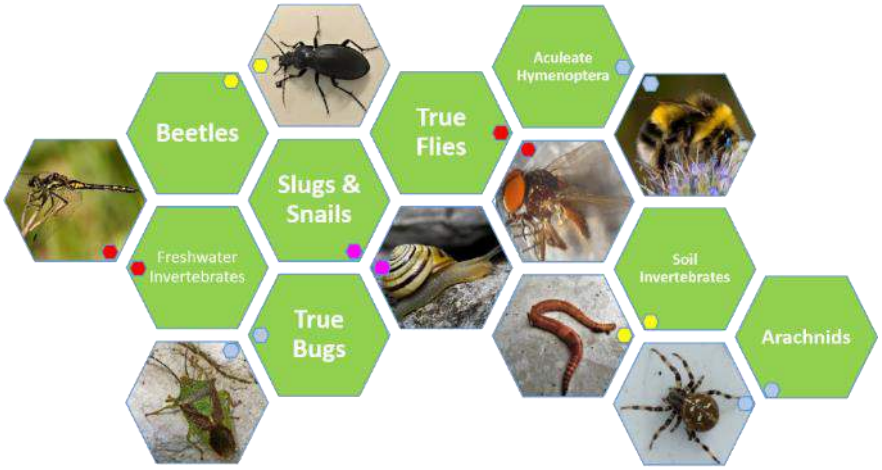
Executive summary - Implications for BioLinks

Natural Heritage

Consultation highlighted a number of species groups that are data deficient and difficult-to-identify. Eight invertebrate groups, consisting of two habitat groups and six taxonomic groups, were selected for inclusion within BioLinks.



To ensure invertebrate species records are used effectively for conservation, usable outputs for site managers will be produced by BioLinks.

People

Young adults are a priority audience for the project to address the generational skills gap that is forming with regards to identification and field skills. BioLinks will consciously ensure that there is gender balance through all of its activities to ensure women are not under-represented, as they are across much of the heritage sector.

The biological recording sector relies heavily on volunteers, yet clear progression pathways for volunteers wishing to learn identification skills are often lacking. BioLinks will ensure it provides these volunteers with clearly outlined progression pathways and ensure gaps in training provision are filled to allow volunteers to progress all the way from an introductory level to an advanced level.

Communities

Both the West Midlands and South East regions of England have well-established biological recording networks, yet many invertebrate groups are still under-recorded. BioLinks will work with existing training hubs and create new training hubs within both regions to strengthen the biological recording community and provide focal community locations for learning about species identification and biological recording.

The impact of the BioLinks project will be improved by working extensively with the large number of existing organisations, societies and groups that are currently involved within the biological recording network. BioLinks volunteers must be integrated within the community so they can continue to be supported by the network through recording schemes and initiatives and therefore provide a lasting legacy to the project.

Consultation legacy This document, alongside the FSC BioLinks Development Plan For Training Provision, will be made publicly available on the FSC Biodiversity website and shared with sector professionals so that the evidence gathered throughout this consultation can be used by other organisations to support other biological recording projects and initiatives.

1 The BioLinks Project

The Field Studies Council (FSC) has a 70-year tradition of training and resource development for taxonomic identification skills. FSC plant, animal and fungi training courses, delivered from our nationwide network of learning centres by leading experts, are highly regarded in the environmental sector. Our dedicated Publications Unit includes in its portfolio the widely used 'fold-out chart' guides and the AIDGAP series (Aids to Identification in Difficult Groups of Animals and Plants) which has established itself as a very strong brand and a mark of excellent quality.

BioLinks is an exciting new FSC project which will bring together existing volunteers, with skills in biological recording and identification, and new volunteers. The aim is to unite them in a community with a shared vision and sense of purpose by providing training and learning opportunities. This in turn will increase the quality of biodiversity data being submitted to our national biodiversity datasets and develop individuals as more highly skilled biodiversity volunteers. Funding was secured from the Heritage Lottery Fund (HLF) for a development phase of one year during 2016 and this report is a summary of the information gathered during consultations carried out during this period.

The project is a continuation of the successful work achieved in the West Midlands region through previous HLF funded projects (Biodiversity Training Project and Invertebrate Challenge), Biodiversity Fellows (a DEFRA-funded project) and Tomorrow's Biodiversity (a project funded by Esme Fairbairn). Furthermore, BioLinks will expand into the South East England region, learning from its success in the West Midlands and building partnerships in the new region. The project will look for opportunities to bring biodiversity training to both regions, filling gaps in current provision and adding value to existing schemes by working as a partner with other biodiversity organisations (such as Local Environmental Records Centres, national and local recording schemes and natural history societies).

The aim of the consultations undertaken during the development phase was to:

- Identify focus species groups
- Identify suitable locations

In addition, the consultation also investigated other topics that would be useful when designing the project activity plan for the delivery phase of the project. This included:

- Regionally specific considerations
- Volunteer motivations, development and satisfaction
- Biological recording event and identification courses
- Digital resources and technology
- Existing provision from other providers and relevant projects/initiatives

2 Consultation process

The BioLinks consultation consisted of 4 consultation methods in order to engage with a wide range of audiences (see Table 1 below). A summary of each survey method is provided below and the evidence gathered in all of the consultation methods will be presented in the subsequent sections of this summary report.

Table 1: Summary of consultation methods

Consultation method	Target audience	Geographic focus
Online survey	Anyone interested in nature	National
Public consultation workshops	Potential volunteers, existing volunteers, professionals/experts	Regional
Stakeholder consultations	Professionals/experts	Regional and National
Site manager survey	Site managers (professionals/experts)	National

2.1 Online survey

The FSC BioLinks Survey is an online survey that was designed to gather evidence from a wide range of audiences, including potential biological recorders (i.e. those interested in nature), existing biological recorders (at any level), sector experts (volunteers) and sector professionals.

The main aim of the survey was to gather evidence regarding the following:

- Biological recording experience with regards to a selection of species groups.
- Demand for biological recording courses with regards to a selection of species groups.
- Sector opinion with regards to which species groups should be prioritised.
- Training course preferences with regards to length days of the week.
- Training course content and support resource preferences.

The online survey allowed the project to engage with a larger number of consultees than would be possible through face-to-face or telecommunication methods within the limited time development phase of the BioLinks project. The survey was launched on 19th April 2016 and remained open until 31st December 2016. In total, 326 individuals responded to the online survey and this data will be included in this report, which will be published and disseminated to the biodiversity sector as a legacy to the development phase of the BioLinks project.

2.2 Public consultation workshops

The public consultation workshops were a series of open discussion workshops that were held across the West Midlands and South East regions. They were designed to gather evidence from the biodiversity sector, including potential volunteers (e.g. volunteers and staff that are involved in environmental education or conservation), existing volunteer biological recorders, sector experts (volunteers) and sector professionals.

The main aim of the consultation workshops was to gather evidence regarding the following:

- Taxonomic priorities for the BioLinks project.
- Potential training locations and tutors for the BioLinks project.
- Existing training provision (with a regional emphasis) and biological recording activities.
- Feedback regarding proposed BioLinks activities.
- Feedback regarding potential volunteer motivations and preferred support methods.

Consultees were assured that any comments or quotes resulting from the workshops would remain anonymous to encourage individuals to freely provide open and honest feedback. All anonymous quotes contained within this report taken from individuals that participated in the public consultation workshops.

In order to ensure that evidence was gathered across both regions, a total of 11 workshops were held In England across the West Midlands (see Figure 1 below) and South East (see Figure 2 on the following page) and 85 individuals participated (see Appendix II: Consultees & affiliations at the end of this document).

Table 2: Summary of public consultation workshops

Date	Location	County	Number of consultees
06/06/16	FSC Preston Montford	Shropshire	10
17/06/16	Martineau Gardens	West Midlands	7
18/06/16	Martineau Gardens	West Midlands	7
15/07/16	Natural History Museum	London	9
16/07/16	Natural History Museum	London	9
21/07/16	FSC Amersham	Buckinghamshire	9
26/07/16	FSC Juniper Hall	Surrey	6
02/08/16	BENHS Dinton Pastures	Berkshire	7
04/08/16	FSC Bushy Park	London	3
09/08/16	Linnean Society	London	7
11/08/16	FSC Bishops Wood	Worcestershire	11

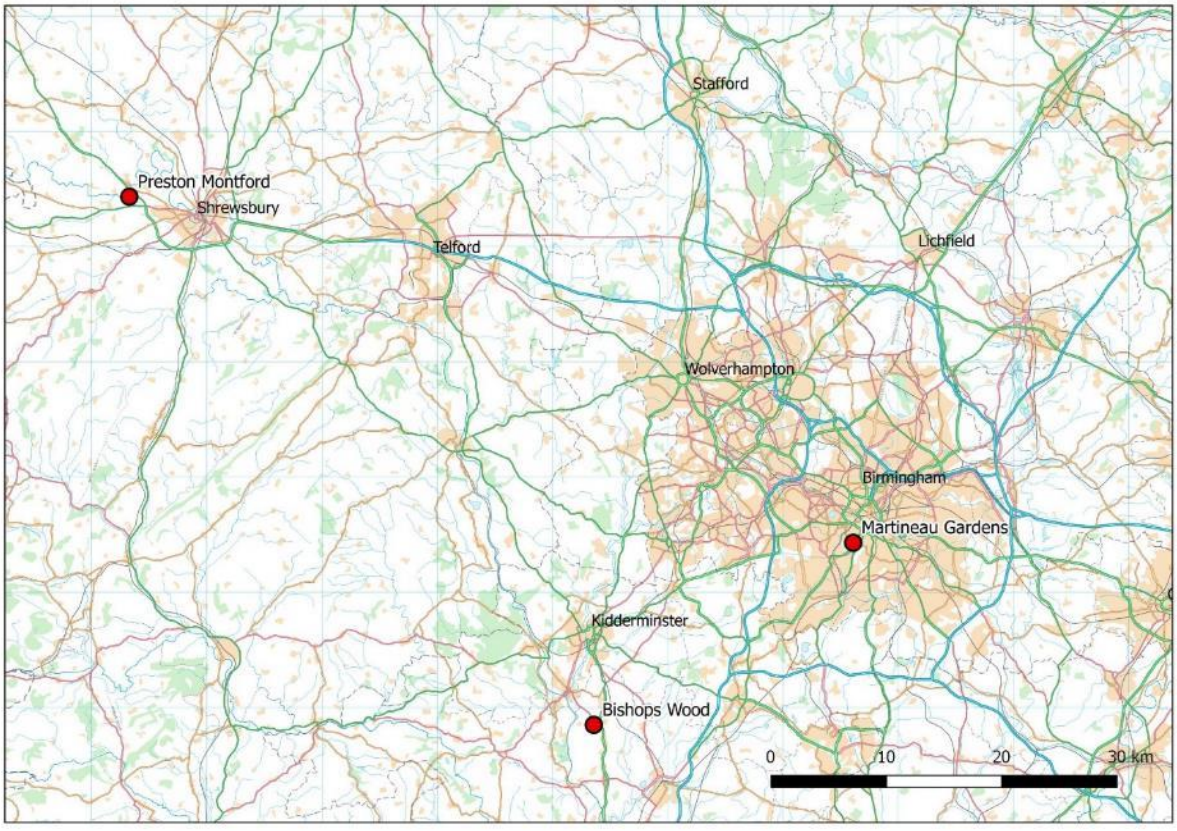


Figure 1: Map demonstrating the locations of the public consultation workshops held in the West Midlands region

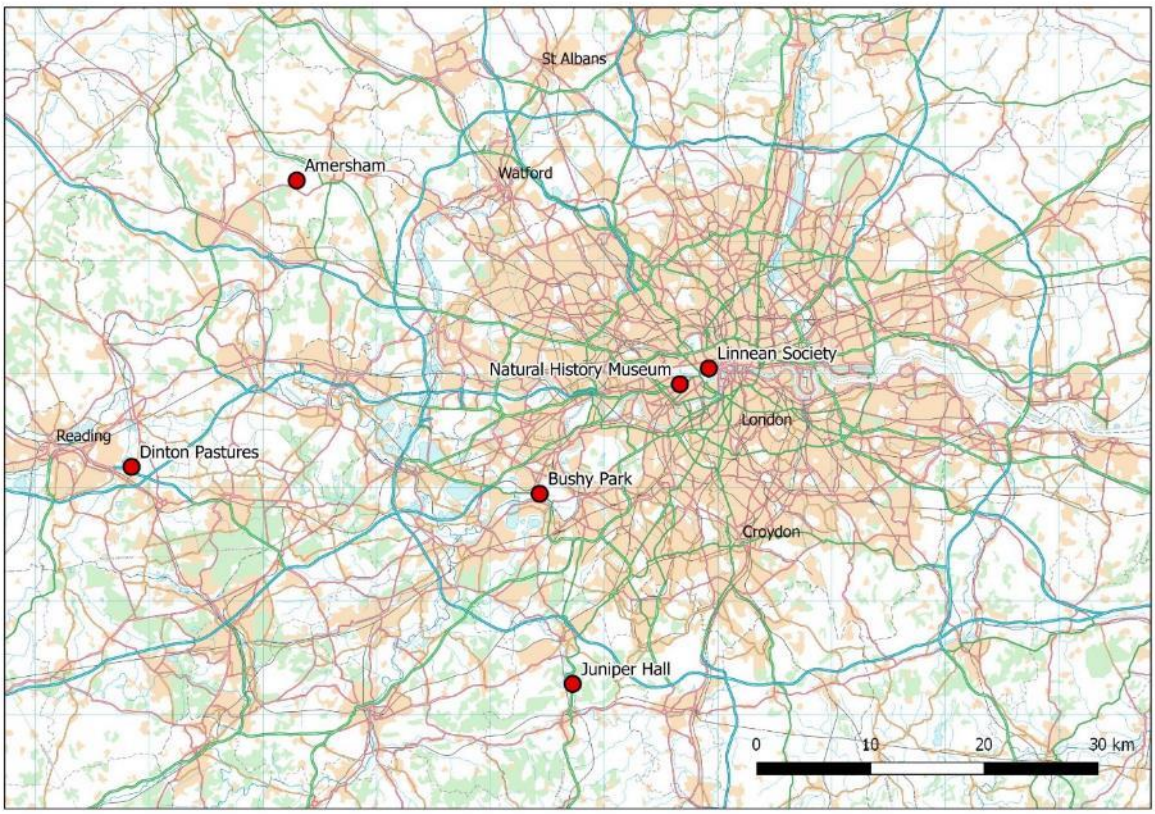


Figure 2: : Map demonstrating the locations of the public consultation workshops held in the South East region

2.3 Stakeholder consultations

The stakeholder consultations were varied in both format and focus. They were designed to gather evidence from the biodiversity sector professionals and volunteer experts, including conservation NGOs, Local Environmental Records Centres (LERCs), National Schemes & Societies (NSSs) and local natural history societies.

The main aim of the stakeholder consultations was to:

- Establish the sector preferences regarding which species groups should be prioritised.
- Confirm the use of identified training locations and services for the project.
- Feedback regarding proposed BioLinks activities.
- Establish the existing training provision, including relevant projects and initiatives.
- Build project awareness and support from biodiversity organisations.

In total 56 stakeholder consultations were conducted and 84 individuals were engaged directly by the project staff (see Appendix I: Stakeholder meeting and Appendix II: Consultees & affiliations and the end of this document). These ranged from project briefings and conference presentations delivered by project staff to face-to-face meetings, email consultations and teleconferences.

2.4 Site manager survey

Following consultation with the HLF mentor, Harriet Carty, it was determined that site managers were an important audience to input into the development of FSC BioLinks. Although a focused effort was made to invite wildlife site managers to the public consultation workshops, this audience was significantly under-represented throughout the main consultation period. Face-to-face stakeholder meetings are not pragmatic as site managers are often based at sites that take considerable time to travel to and from so an online survey was designed that would allow FSC BioLinks to engage with a large number of different site managers. As these professionals are often limited for time it was determined that the survey should be relatively short so that time was not a barrier to participation and key evidence gaps were targeted.

The main aim of the survey was to gather evidence regarding the following:

- Site manager awareness of protected invertebrate species on their site(s).
- Accessibility of invertebrate species records to site managers.
- Potential uses of invertebrate species data by site managers
- Any staff or volunteers that would be interested in identification training opportunities
- The presence/awareness of a local active recording community.

The survey was launched on 1st November 2016 and remained open until 31st December 2016. In total, 49 site managers responded individually or representing an organisation.

The results of this survey are discussed in Section 3.1.1 on page 11.

3 The need for action

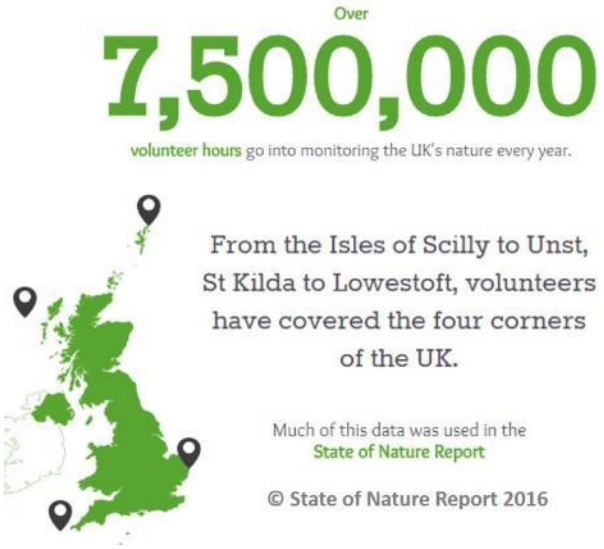
The BioLinks project is being developed by the FSC in order to address the following issues:

Our natural heritage is in danger The loss of British wildlife is continuing at an alarming pace. Over half of our key species are in decline, reducing our local environments resilience to future changes. In 2013, an unprecedented report through the collaboration of 25 non-governmental organisations involved in biodiversity monitoring was published. The State of Nature Report 2013 presented an evidence-based assessment of changes to biodiversity over the past 50 years. In 2016 an updated State of Nature Report 2016 was published, this time as a result of a collaboration between 50 nature conservation and research organisations. This report states:

> *"The **loss of nature in the UK continues**. Although many short-term trends suggest improvement, there was no statistical difference between our long and short-term measures of species' change, and no change in the proportion of species threatened with extinction."*
> **State of Nature Report 2016**

This report also confirms our understanding that the current assessment of UK wildlife is based on a limited number of species and invertebrates are seldom used. This demonstrates that invertebrates, alongside fungi, lichens and mosses are important indicators which are not fully understood and therefore at risk.

Our volunteers lack development opportunities Although there are a number of training providers operating within the sector, there is little in the way of structured development pathways for the skilled volunteers that contribute to the UK's databases of species records through undertaking biological recording. Furthermore, this lack of opportunity for personal development for volunteers is contributing towards a generational skills gap with regards to field and identification skills in young people and threatens the UK's potential to monitor our wildlife.



Our recording community needs strengthening The UK has a well-developed network of organisations involved in biological recording, resulting from its long history of observing and recording natural heritage. However, the sheer size of the network means that relationships between different organisations are often complex and differ from region to region. Many of these organisations are volunteer-led, and even those that can afford to hire staff often have extremely limited resources due to the current economic climate and ever-reducing funding to the biodiversity sector from government.

Sections 4.1 to 4.3 of this report detail the evidence that was gathered from consultees that participated in the BioLinks consultations with regards to the issues highlighted above.

3.1 Recording our natural heritage

Many consultees were passionate about the importance of recording our natural heritage and presented a number of reasons why biological records are useful.

> *"There is a perception from the general public that somebody must know where all of the animals are."*

Understanding ecology Improved distribution maps and more comprehensive databases of species records can improve our understanding of a species ecology. Species records can be used in research by academics to determine a species response to environmental changes, such as change of land use or climate change.

> *"Species distribution information is important to gain a better understanding of organisms and habitats. Gaps in our knowledge need to be filled to learn more about ecology. There are currently lots of gaps in our knowledge of invertebrate distributions."*
> **Professor Simon Leather, Professor of Entomology, Harper Adams University**

Indicator species The presence of some species can be indicators of the health status of habitats. It is important that sufficient recording is undertaken of these indicator species and continual recording of these species allows changes in the health of ecosystems to be monitored. Examples given in the consultation are included in Figure 3 below.

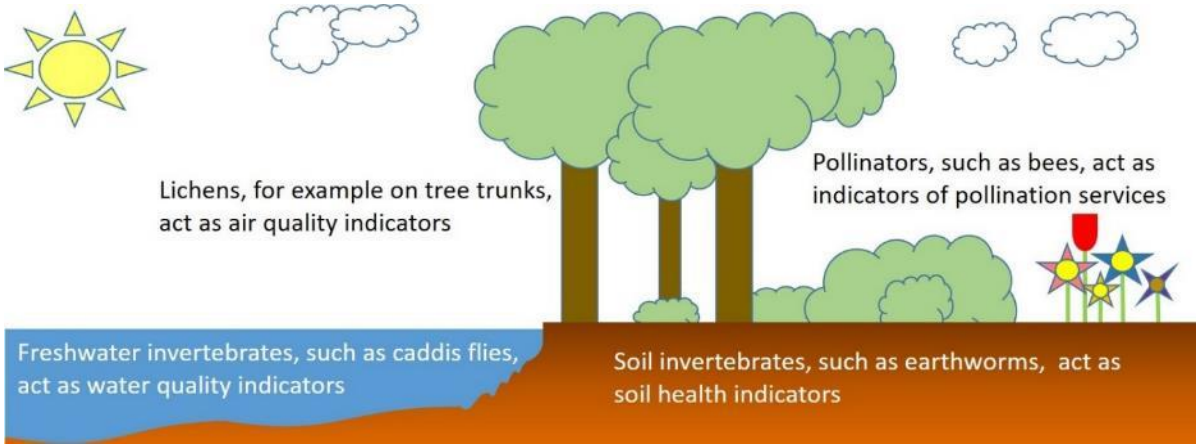


Figure 3: Diagram illustrating examples of indicator species groups mentioned in the BioLinks consultation.

Protection of species We are often unaware of the state of populations for under-recorded species and a lack of data may mean that species that should be protected by legislation are not. Very few non-vertebrates are afforded protection in UK law and we could be close to losing species that we do not even realise are endangered or vulnerable. Anecdotal accounts of dramatic reductions in invertebrate populations were reported by several consultees.

> *"Over past years I have personally observed a dramatic loss in insect abundance."*

> *"We have to understand what's going on over time at a particular site in order to monitor effects on populations: You don't know if you've got a problem if you don't have the records!"*

3.1.1 Site management and conservation

The FSC BioLinks Site Manager Survey investigated how site managers use invertebrate species data when managing their sites for wildlife and undertaking conservation measures.

The majority of site managers (71%) were aware of protected invertebrate species present on their site (see Figure 4 below) and a further 21% were unsure due to a lack of available data. This means that only 8% of site managers stated that protected invertebrate species were not present on their site(s).

However, over half of the site managers surveyed claimed that they find it difficult to access invertebrate records (see Figure 5 below). The most commonly used method of obtaining invertebrate records was from data searches of national, local or in-house own databases (24 site managers), with 3 site managers reporting they liaise with local recorders and 2 mentioning that they commission surveys.

Site manager survey question: Are you aware of any protected invertebrate species that are present on the site you manage?

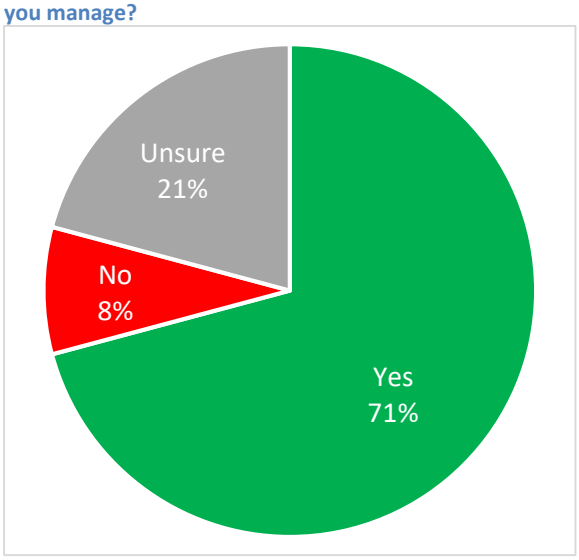


Figure 4: Pie chart displaying the results to the site manager survey question "Are you aware of any protected invertebrate species that are present on the site you manage?". Respondents were given the following options (i) Yes (ii) No (iii) Unsure - not enough surveying completed.

Site manager survey question: How easy do you currently find it to access invertebrate species records?

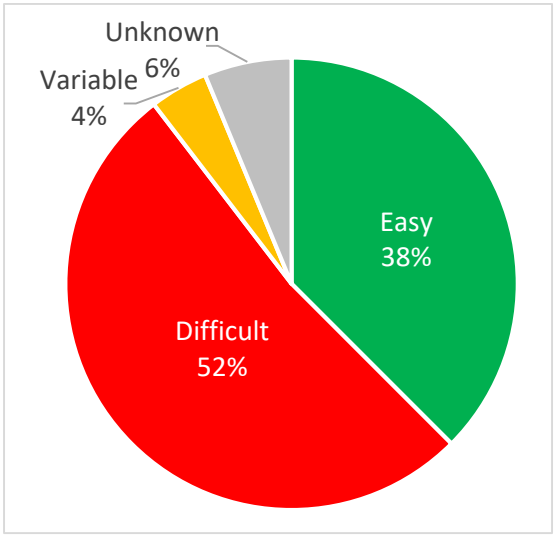


Figure 5: Pie chart displaying the results to the site manager survey question "How easy do you currently find it to access invertebrate species records?. Respondents answers have been categorised by the project officer into 4 categories: (i) Easy (ii) Difficult (ii) Variable (iv) Unknown / No response.

When site managers were asked "How would you use invertebrate species data to manage your site if it was available?" the majority of site managers responded with statements stating that invertebrate data would be useful in informing the site management plans for their site(s). Specific responses varied greatly and included the following suggested benefits site managers

- *Monitoring* of existing invertebrate populations so that changes are detected and appropriate management actions can be taken in response.
- Better understanding of site *species assemblages*, including detection of previously unknown *rare or protected* invertebrate species.
- Provide evidence regarding *the impact of existing conservation initiatives* undertaken on site.
- Assist in *determining which areas or features* of a site require targeted management.
- Inform when the *best time of year and frequency of current practices*, such as mowing, hay-cutting and deadwood removal.
- *Assess connectivity* across sites and surrounding landscape.

The survey also yielded some specific comments relating to the conservation of invertebrate species:

"An example for the red-barbed ant would be the identification (location) of fragmented colonies to aid targeted habitat management to link those colonies in the future. Also to monitor the results of ongoing the habitat management to identify colony expansion, contraction etc."

"I am due to continue working in partnership with York University to record food plant densities and continue surveying Tansy Beetle sightings as I did this year. I would use the data to identify where the population is strongest, possibly to implement 'corridors' between areas of high density/low population to encourage growth in numbers."

In summary, site managers often have access to very few records of under-recorded species groups, such as lower plants and invertebrates. Additional species records of these groups on their sites would allow them to consider a wider range of organisms when designing their site management plan and determining how best to conserve the wildlife they are tasked with looking after.

PANTHEON (www.brc.ac.uk/pantheon) is an analytical tool developed by Natural England and the Centre for Ecology & Hydrology to assist invertebrate nature conservation in England.

Users import lists of invertebrates into Pantheon, which then analyses the species, attaching associated habitats and resources, conservation status and other codings against them. This information can then be used to assign quality to sites, assist in management decisions and augment other ecological study.

Pantheon is expected to be launched in 2017. By generating more invertebrate records for site manager to input into Pantheon for their site, BioLinks will enable more use of this new tool and allow site managers and their volunteers to get a more detailed picture of their site. Furthermore, BioLinks project activities could present site managers with species lists and guidance on using Pantheon to interpret these lists.

A large proportion of the site managers surveyed (88%) stated that training for themselves, their staff or site volunteers would be beneficial, indicating that there would be demand for invertebrate training from the conservation sector. 8% did not answer the question or stated they were unsure if training would be taken up by staff or volunteers. Only 2 site managers (4%) stated there would be no interest in identification training from their sites.

In summary, site managers and their volunteers often have access to very few records of under-recorded species groups, such as lower plants and invertebrates. Additional species records of these groups on their sites would allow them to consider a wider range of organisms when designing their site management plan and determining how best to conserve the wildlife they are tasked with looking after.

3.2 Developing volunteer recorders

The success of the BioLinks project relies on the participation of volunteers to attend project activities and dedicate additional volunteer time to create and submit biological records of wildlife.

3.2.1 Volunteer motivations

Identification skills for difficult-to-identify groups are time consuming to develop so it is important that volunteer motivations are understood and catered for within the project to ensure that volunteers are successfully recruited and their expectations met. The public consultations highlighted a number of motivations that were felt to be relevant to biological recorders:

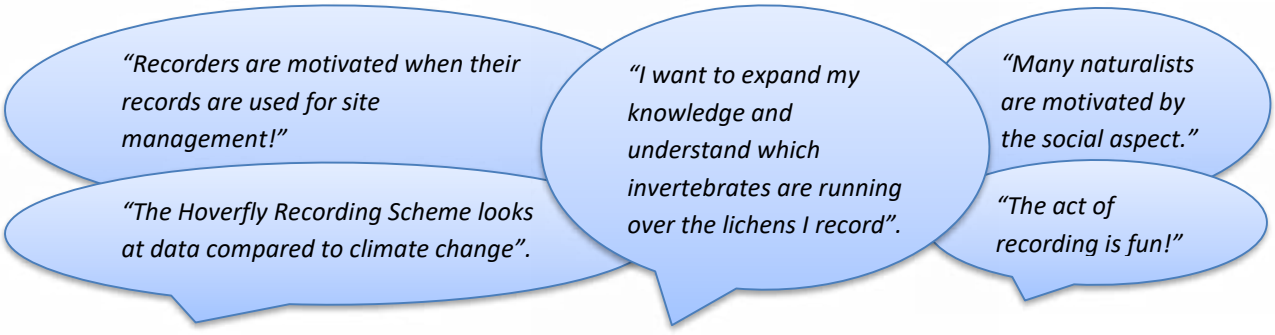
Having fun Some biological recorders simply find the task of observing, identifying and recording wildlife an enjoyable and fun experience in itself. Biological recording has been compared to stamp collecting or trainspotting, as it is an activity that appeals to those that find collecting fun. For these volunteers it is important that the administration involved with biological recording does not outweigh the enjoyment they experience by undertaking the activity.

Building friendships For many individuals biological recordings offers an opportunity to socialise, become part of a local group/community and build friendships. Historically, this involved attending events, as well as forming mentor/mentee relationships. In recent times online groups and forums have also developed that allow those with less confidence or geographically distant from existing groups to socialise via the web. For these volunteers it is important that biological recording involves social aspects and that they feel an important part of a community.

Making a difference Many people understand that biological recording is important to natural heritage and informs policy, species conservation and habitat management. Volunteers are sometimes motivated by the potential uses of the records they create, particularly if they are passionate about a specific site or species group. For these volunteers it is important that they receive feedback regarding the impact of their records on natural heritage.

Lasting legacy The creation of a record creates a piece of data that will remain long after the lifetime of a recorder (a scientific data point that immediately become a historical piece of natural heritage). Leaving this legacy can be the motivation for some volunteers. For these volunteers it is important that their record flows to the relevant data holdings to ensure their legacy is not lost.

Expanding knowledge Volunteers may initially record because of an interest in a specific group (e.g. butterflies or birds) and may notice other groups while out. This can lead to an interest in groups they would not have considered otherwise, such as a butterfly recorder becoming interested in the host plant species associated with the butterflies they are observing. For these volunteers it is important that the relevance of recording a group is linked to their initial interest.



3.2.2 Volunteer retention

In order for volunteers to flourish through BioLinks and maximise the impact their actions have on natural heritage, it is important that volunteers are retained throughout the project and are sufficiently motivated to carry on creating and submitting records as a project legacy. The public consultations emphasised a number of considerations for successful volunteer retention:

Personal development Many consultees, and stakeholders, stated that the key to retaining volunteers is ensuring that volunteer development is at the core of the project activity plan. A major barrier to volunteer development is often the absence of training provision linking courses aimed at different skill levels. The volunteer development plan should be transparent so that volunteers are able to assess and recognise their own personal progression. Project activities should be designed to enable continuous development and are therefore able to continually benefit from the project.

Regular communication It is important to ensure that volunteers receive regular contact with the project. This can be through project activities, emails, social media or newsletters but must be regular enough to prevent volunteers forgetting about the project and help maintain their motivation to participate in project activities and record wildlife.

Feedback loop It should not be underestimated how important it for volunteers to be informed of why their efforts are important. Feedback regarding outputs from project activities (such as site species lists and exciting finds) should be communicated to volunteers. Any such feedback should be distributed as soon as possible and volunteer expectations should be managed where delays are known to occur (such the time taken for record verification and data flow).

Volunteer recognition Project outputs and activities should recognise volunteer input wherever possible. This can be through crediting individuals that have contributed to publications such as regional species atlases, or by providing certificates of attendance when undertaking project training courses. The latter is particularly important to young people and career developers who may wish to use their volunteer experience when applying for biodiversity jobs.

Great value Volunteer time is a competitive resource that many projects and causes are competing for. To retain volunteers BioLinks must provide volunteers with value for their time. The considerations above all help provide value for the volunteer, but this can be increased through added extras that make volunteers feel special. Suggestions included freebies (such as equipment and literature) and providing catering (such as hot drinks and cake) to demonstrate that volunteer participation is appreciated by the Field Studies Council and its funders.

3.3 Supporting the recording community

BioLinks hopes to strengthen the existing biological recording community, rather than complicate the existing network further. Consultees provided insight into how they believe BioLinks can benefit existing organisations, projects and activities and some of the suggestions are outlined below.

Unifying the community Consultees felt it was important that funded projects, such as BioLinks, have a good understanding of the complicated network of organisations involved in biological recording and identification training. It was advised from some consultees that BioLinks should aim to improve the capacity of other organisations where possible by working directly with those organisations that are active within the project areas. It was suggested that through the growth of partnerships with existing organisations and initiatives, BioLinks could act as a catalyst to create a stronger and less fragmented biological recording network.

> *"BioLinks has potential to help unite the constituent parts of the recording community. This ties in with GiGL's communication and engagement strategies.*
> **Mandy Rudd, Chief Executive, Greenspace Information for Greater London (GiGL)**

Local group support It was noted by several consultees that local groups (such as local natural history societies or friends of groups) can benefit greatly from funded projects like BioLinks. Local groups in Shropshire (for example the Shropshire Spider Group and the Shropshire Invertebrate Group) benefited greatly from the FSC Invertebrate Challenge project, with the project manager, Sue Townsend, reporting that the project volunteers remain active members of these groups to this day (3 years since the project ended). It was suggested that that the BioLinks project should seek to develop and broker strong links between biodiversity sector organisations and local groups that operate within the project area (such as London Natural History Society).

> *"Supporting local groups, such as the Joy of Wildlife walks in Shropshire, is important as more can be learned on this type of event than on formal ID courses."*

Synergy with other projects There are a number of projects (past, present and future) that will have synergy with the BioLinks project. It is important for BioLinks to have undertaken research into relevant projects and determine how it can learn from and provide legacy to past projects, benefit from and complement existing projects and lay down foundations for future projects. Many projects were discussed through the consultation workshops and stakeholder consultation and these are summarised in Table 3 on the following page.

> *"Freshwater Habitats Trust believes that the BioLinks project can complement our People, Ponds and Water project by contributing to the project's legacy, particularly in terms of skills progression for our volunteers. In adding to the opportunities for freshwater invertebrate monitoring in the West Midlands and London regions, BioLinks will help volunteers contribute in the longer-term understanding and protection of freshwaters once the People, Ponds and Water project is complete."*
> **Dr Jeremy Biggs, Director, Freshwater Habitats Trust**

Table 3: Summary of relevant sector projects and synergies with BioLinks project

Project	Funder	Start	Finish	Lead organisation	Region	Contact	Areas of synergy with FSC BioLinks
LEMUR Project	HLF	2006	2007	Herefordshire Wildlife Trust	Multi regional	Phil Burton	Recruitment and training for young people and ongoing mentoring.
Bushy Park Restoration Project	HLF	2006	2009	The Royal Parks	London	Toni Assirati	BioLinks will utilise the redeveloped education centre at the Stockyard as a base of operations for the London region and deliver a significant proportion of the project activities from this site.
Biodiversity Training Project	HLF	2006	2010	Field Studies Council	West Midlands	Sue Townsend	BioLinks will provide legacy to this project in the form of skills development opportunities for volunteers that were engaged by this project.
Biodiversity Fellows	DEFRA and NE	2013	2013	Field Studies Council	National (England)	Sue Townsend	BioLinks will provide legacy to this project in the form of skills development opportunities for volunteers that were engaged by this project and will take over management of online Facebook group.
Invertebrate Challenge	HLF and Esmée Fairbairn	2010	2014	Field Studies Council	West Midlands	Sue Townsend	BioLinks will provide legacy to this project in the form of skills development opportunities for volunteers that were engaged by this project and will utilise the 'Invertebrate Challenge Room', equipment and literature library that were created as part of this project.
Wetlands For All	HLF	2013	2016	Wychavon District Council	West Midlands	Liz Etheridge	BioLinks will provide legacy to this project in the form of skills development opportunities for volunteers that were engaged by this project.
Lesnes Abbey Woods Enhancement Project	HLF	2014	2016	London Borough of Bexley	London	Ian Holt	BioLinks will utilise the new visitors centre for delivering project activities to enhance the reach of the project beyond the London base at Bushy Park.
Save Our Magnificent Meadows	HLF	2014	2017	PlantLife	National	Fiona Perez	Volunteer recruitment and retention
The Biodiverse Society	HLF	2014	2017	Lancashire Wildlife Trust	Regional	Joanne Moore	Consultation between the two projects has allowed sharing of evaluation of and barriers to training volunteers in species identification.
Tomorrows Biodiversity	Esmée Fairbairn and FSC	2013	2017	Field Studies Council	National	Rich Burkmar	BioLinks will provide legacy to this project in the form of skills development opportunities for volunteers that were engaged by this project and will utilise the ID Signpost and other digital resources that were created as part of this project, as well as furthering the FSCs work in developing digital resources for biological recording..
West Berkshire Living Landscape	HLF	2013	2018	Berks, Bucks and Oxon Wildlife Trust	Berkshire	Roger Stace	Identification training and tutor recruitment

Project	Funder	Start	Finish	Lead organisation	Region	Contact	Areas of synergy with FSC BioLinks
Identification Trainers For the Future ***Identification Trainers For the Future 2***	HLF *HLF*	2014 *tbc*	2018 *tbc*	Natural History Museum	London	John Tweddle Steph West	BioLinks will provide legacy to this project via skills development opportunities for ID trainnes engaged by this project, including opportunities for project 'graduates' to deliver taught courses in the BioLinks training programme.
People, Ponds & Water	HLF	2015	2018	Freshwater Habitats Trust	National	Jeremy Biggs	BioLinks will provide legacy to this project in the form of skills development opportunities regarding freshwater invertebrate identification for volunteers that were engaged by this project.
Wild Connections	HLF	2015	2018	Wiltshire Wildlife Trust	Wiltshire	Amy Blount	Identification training and tutor recruitment.
Living Wandle Landscape Partnership Scheme	HLF	2015	2019	London Wildlife Trust	London		Identification training and tutor recruitment
Cold Blooded and Spineless	HLF	2015	2019	North Pennines AONB	North Pennines	Samantha Tranter	Identification training and tutor recruitment
Water For Wildlife	Esmée Fairbairn	2016	2019	London Wildlife Trust	London	Petra Davies	Identification training and tutor recruitment
Dearne Valley Landscape Partnership	HLF	2014	2019	Barnsley Council	South Yorkshire	Roseanna Burton	Engagement with the long-term unemployed. Restoration of habitats and engagement though a multi-disciplined approach
Back from the Brink	HLF	2015	2020	Natural England	National	David Hodd	Prioritising species.
Beautiful Burial Grounds	HLF	2016	2020	Caring For God's Acre	National	Harriet Carty	BioLinks will provide skills development opportunities for this engaged with this project and enhance the range of species groups covered by this project.
Growing Confidence	Big Lottery	2016	2021	Shropshire Wildlife Trust	West Midlands	Cathy Preston	Both projects aim to engage with young people regarding natural history and provide learning opportunities at the Preston Montford Field Centre.
AIDGAP Project	Field Studies Council	1976	Ongoing	Field Studies Council	National	Rebecca Farley-Brown	BioLinks will utilise AIDGAP publications when training volunteers to identify difficult-to-identify species groups. Where no suitable identification resources exist for a species group, BioLinks will liaise with the AIDGAP project to regarding the potential to create new AIDGAP resources to fill these gaps.
Restoring the Marches Mosses	HLF	2016	tbc	Shropshire Wildlife Trust	West Midlands	Colin Preston	Support on running HLF project; local experts on meres and mosses
Mission: Invertebrate	The People's Postcode Lottery	2017	2018	Royal Parks Foundation	London	Project staff not yet appointed	BioLinks can provide progression opportunities for those engaged with this project and build upon surveys conducted across these sites within London.

Summary of Section 4: The need for action

Implications for BioLinks

Natural Heritage **Species records are vital to ensuring the conservation of our natural heritage. These records are useful for improving our understanding of ecology, monitoring indicator species and undertaking measures to protect threatened habitats and species. Site managers have access to limited data for species groups such as invertebrates, fungi and lower plants and would benefit from additional data that is accessible to them.**

People **Retention of new and existing volunteers is vital to the success of the BioLinks project. A Development Plan for Training Provision will focus around volunteer development and ensure that volunteers receive regular contact, recognition and feedback from the project. Volunteer motivations in biological recording are varied and a diverse range of project activities are required to cater for the different motivations highlighted in the consultation.**

Communities **BioLinks must integrate into the existing biological recording network in order to have maximum impact. Project activities will aim to complement existing recording efforts and a wide range of biodiversity sector organisations (such as Local Environmental Records Centres, recording schemes and natural history societies will need to be should be engaged throughout the project.**

4 Identifying potential audiences

The original project proposal aimed to target those already engaged with nature and with an interest in learning to identify and record wildlife. Throughout the consultation phase, it was discussed if there should be any targeted effort with regards to specific groups of society to ensure that the project has a positive impact on audiences that are not already well represented within the biological recording communities and what potential barriers may exist.

The 'typical' biological recorder Anecdotal evidence suggests that the common perception of a biological recording volunteer belongs to the white, male middle-aged demographic; a perception that has evolved since the days of Charles Darwin when only those who had private income were accepted in society as people of influence (e.g. the clergy and local businessmen). This perception is strengthened by the number of famous naturalists that fit that stereotype (e.g.; John Rae, Gilbert White, Derek Ratcliffe, Derek Tansley, Arthur Tansley, Eric Hoskins). Even current naturalists are often male (David Attenborough, Chris Packham, Steve Backshall, Nick Baker). However, gathering evidence to support or debunk this perception can be difficult as there may be variation on both a local level (e.g. between local groups) and at a national level (e.g. between different taxa recording schemes).

4.1 Women

During consultation there was no mention of the gender imbalance and BioLinks development phase participation was relatively even across men and women (see Figure 6 and Figure 7 below).

Analysis of proportional representation by gender in the BioLinks project consultation

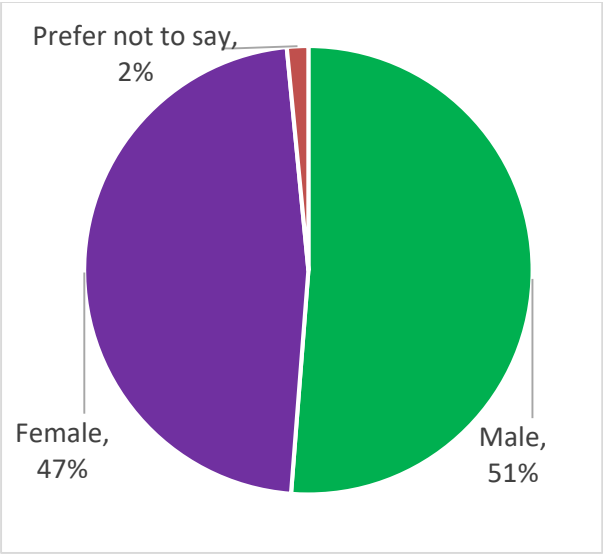


Figure 6: Pie chart of online survey respondent gender (based on 326 responses).

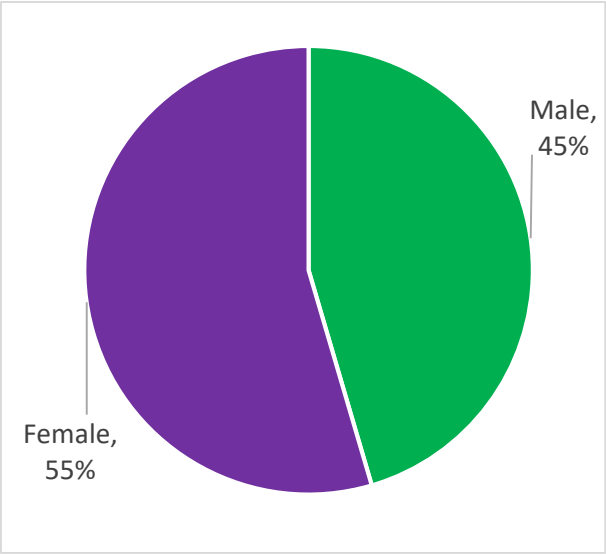
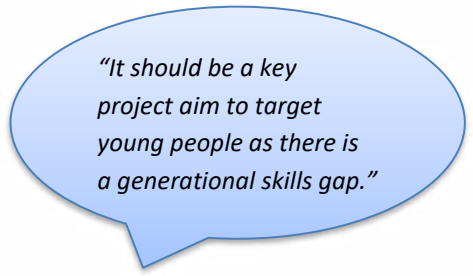


Figure 7: Pie chart of stakeholder meeting / consultation workshop attendee gender (based on 187 attendees).

Although the common perception of a biological recording volunteer is male, the evidence collated regarding gender balance through the BioLinks consultation suggests that proportional gender representation is not biased against women. Therefore, efforts to target advertising towards women regarding BioLinks project activities may only be necessary if proportional female representation is found to have decreased through monitoring gender balance within the project.

4.2 Young adults (18-25 year olds)



The consultees gave much feedback on the concern regarding recruitment of young people into recording groups and societies. It was seen by many as a lack of engagement or appeal with the younger age of the biological recording community. This could be perceived as lack of awareness as there is so little whole organism biology represented in the formal examination system in biology at A Level and even many undergraduate biology degrees where much of the emphasis on biochemistry and medical and human biology. This is of particular concern, as a **generational skills gap** is developing with regards to identification skills and could lead to a reduced capacity to record British wildlife in the future.

A Focus On Nature (AFON) is a forum for young naturalists and their work includes hosting events, facilitating a mentoring scheme and giving young people a voice in the biodiversity sector. The following barriers for recruitment of young people to biological recording groups/societies, and potential solutions, were suggested during the AFON stakeholder meeting and public consultation workshops.

Table 4: Potential barriers and solutions regarding the recruitment of young people to biological recording project activities

Potential barrier	Potential solution
Cost – membership fees for groups/societies can range from free to £60+. Students and recent graduates may be put off by costs as low as £10 per year.	Consider *subsidising young people* to attend courses to ensure that travel expenses and course fees are not a barrier to participation.
Confidence – young people may be intimated by the thought of attending their first event or course, and feel like they have insufficient experience to make a valuable contribution.	• *Clearly label* events with the necessary competency level recommended. • Ensure that clear *volunteer development* is outlined to participants so that young people are attracted to the professional development afforded through project activities.
Awareness – communication is constantly evolving and groups and societies may be using different methods of communication to those currently 'trendy' with young people.	• Advertising project activities through media that is used by young people, such as *social media sites* (such as Facebook and Twitter). • Liaise with *A Focus On Nature* regarding any strategies to target young people. • *Targeting university students* through sympathetic universities by advertising training provision to university natural history societies and on university noticeboards.
Accessibility – if location of meetings/events is not reachable by public transport it can be difficult for those who don't drive to attend.	Ensure project activities are held at locations that are *accessible by public transport*.
Disproportional representation – it can be daunting if the demographic is skewed away from young people and make individuals feel like the "don't fit in".	*Raising the profile of young naturalists* already involved in biological recording to promote inclusivity to the young people demographic.

A Focus On Nature have expressed their support for the BioLinks project and will be an important advisor regarding the recruitment of young people to BioLinks project activities.

4.3 Black and minority ethnic groups

Some consultees reported that they do not believe that black and minority ethnic groups are proportionally represented within the biological recording community and that the majority of volunteer biological recorders are white. These views were based on their own personal experiences of society events being attended by predominantly white audiences. This was supported by the fact that the majority of consultees in the BioLinks public consultation workshops, stakeholder consultations and online survey were white (>98%).

Feedback from consultees that had experience of engaging with black and minority ethnic audiences recommended that any attempts to target black and minority ethnic groups would require external expertise to broker relationships with local groups, and would likely require substantial engagement activities in order to recruit individuals to the wider training project activities. It was pointed out by one experienced consultee that the FSC may not have the experience necessary to successfully engage black and minority ethnic audiences and that any attempt to do so would like require a budget for contracting an external consultant.

4.4 Individuals with learning difficulties

During the consultation it was noted by one further education educator that there is potential to incorporate project activities into BioLinks that could benefit individuals with learning difficulties, such as autism. South Staffordshire College trains apprentices in the land-based sector (including arboriculture, agriculture and horticulture) and a significant proportion of these apprentices have learning difficulties. Due to the nature of the apprenticeships it was suggested that apprentice trainers could incorporate aspects of biological recording into these vocational training programmes if the trainers were provided with relevant information about biological recording and existing surveys.

The consultee felt that introducing biological recording into apprentice training in relevant vocations could both:

- Benefit apprentices by expanding their knowledge and skills using a scientific survey that has real world applications.
- Contribute useful data to biological recording surveys.
- Engage individuals that may otherwise have not been engaged.

Summary of Section 5: Identifying potential audiences

Implications for BioLinks

The stereotype of the 'typical biological recorder' is a white middle-aged male. Although not all aspects of this stereotype may still be true today, some groups are clearly under-represented in this voluntary activity. BioLinks should aim to break down barriers for under-represented demographics where possible and make biological recording inclusive to all.

Young adults will be a priority audience for project activities in order to tackle a generation skills gap that is recognised to be developing in the biological recording sector.

Individuals with learning difficulties may be able to contribute in a meaningful way to biological recording. Potential methods for bringing biological recording to these individuals should be investigated further.

5 Identifying focus species groups

When identifying focus species groups that should be targeted by the BioLinks project, two key criteria were outlined in the initial project application and explained to consultees:

1. *Focus species groups should be data deficient* – many natural heritage activities (such as conservation of species and habitats) rely on the biological records of a relatively small number of species groups.

2. *Focus species groups should be difficult to identify* – many species groups are under-recorded as they are perceived as they require high levels of skill to identify.

An additional consideration for selecting the focus species groups was the demand for training to record specific species groups from potential volunteers, i.e. are certain groups data deficient because volunteers are not interested in learning to record them?

Considerations for determining focus species groups

The BioLinks online survey demonstrated there was a reasonably high demand for training with regards to all species group options, with all species groups indicating interest in training from over 50% of respondents except birds, mammals and herptiles (see Figure 8 below). Bees, wasps and ants had the highest demand with 74% of respondents indicating that they would be interested. Many of the well-recorded groups were found to have lower demand as respondents felt the training was not necessary (likely due to their greater experience in recording these groups).

Online survey question: Would you consider taking part in training to learn how to record the following groups?

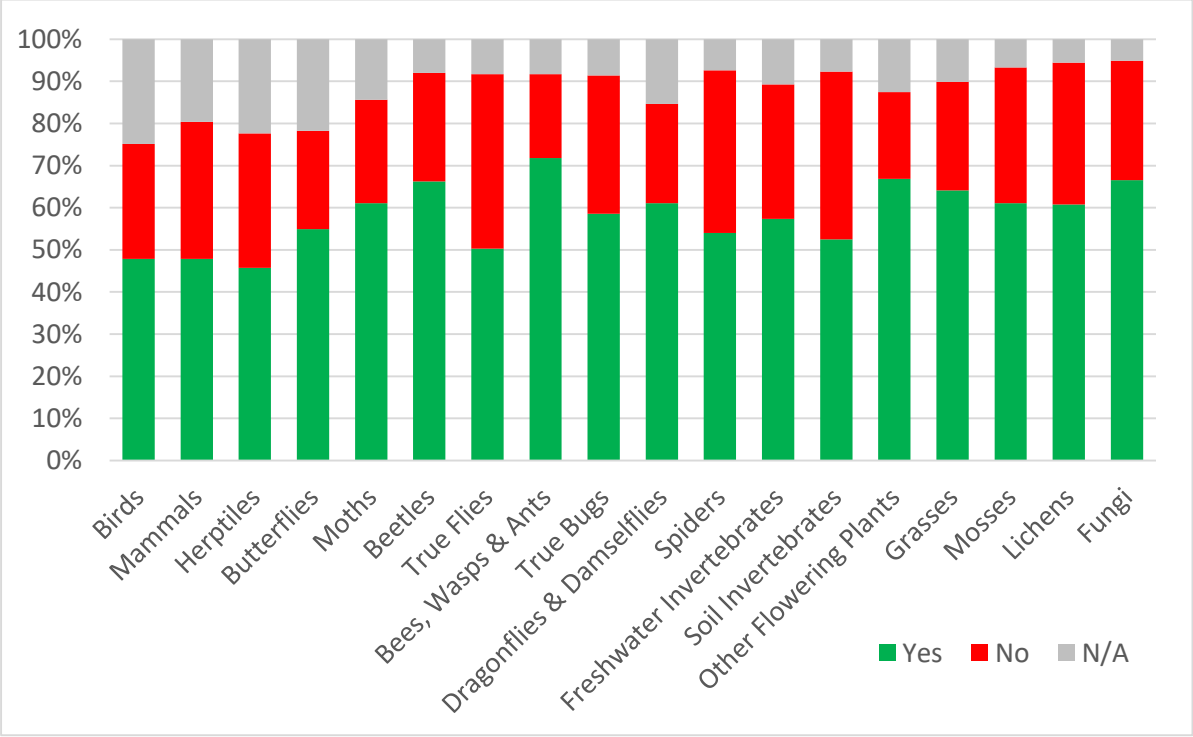


Figure 8: Bar chart representations of the responses to the question 'Would you consider taking part in training to learn how to record the following groups?' for different species groups in the BioLinks online survey from the options: (I) Yes – I'm interested (ii) No – I'm not interested (iii) N/A – not necessary.

Consultees also suggested a number of other factors should be considered when selecting the focus species groups for this project including:

- ecological and 'indicator' value (including links to drivers of biodiversity change)
- seasonality and ease of finding a range of species to record
- accessibility, quality and lack of existing resources
- current training provision
- practical considerations, including cost of resources and equipment needed to study group
- synergistic opportunities with other projects
- region-specific gaps in skills and knowledge

Identified priorities for consideration

A wide range of focus species groups were suggested through the public consultation workshops as current priorities for additional/affordable training provision. However, twelve groups were mentioned repeatedly in the public consultations that match the project criteria:

- fungi
- lichens
- bryophytes
- soil invertebrates
- freshwater invertebrates
- molluscs
- arachnids
- aculeate hymenoptera
- ichneumonids
- true bugs
- true flies
- beetles

This selection was supported through the results of the online survey where respondents were asked a number of questions relating to potential focus species groups. The survey contained options for 18 different species groups (molluscs and ichneumonids were not included in the survey as options, though a mollusc group 'freshwater snails' was mentioned as an example of freshwater invertebrates) and received 326 responses. The ten groups from the list above that were represented in the online survey ranked as the top ten groups that respondents felt should be prioritised by the BioLinks project (see Figure 9 below).

Online survey question: Which of the following groups do you believe should be prioritised by the BioLinks project?

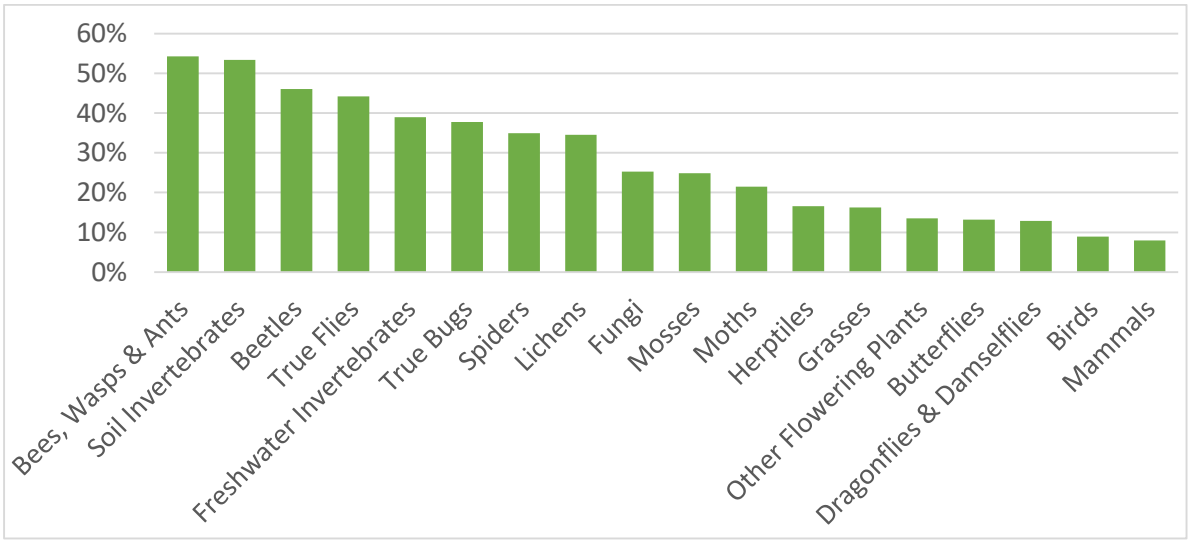


Figure 9: Bar chart representations of the responses to the question 'Which of the following groups do you believe should be prioritised by the BioLinks project?' where respondents were asked to select 5 species groups. Species groups are ordered by perceived decreasing importance for prioritisation from left to right. Based on 326 responses.

This selection was further supported as there was a clear lack of competency in recording these groups among respondents compared to well-recorded groups such as vertebrates, flowering plants (non-grasses) and butterflies. The ten groups highlighted in the public consultation workshops that were available as options in the online survey all ranked within the top 11 groups (grasses ranked at number 9) with regards to the percentage of respondents that felt they had the lowest level of experience in recording these groups (see Figure 10 on the following page).

Selected focus species groups

The suggested focus species groups mentioned previously all fit the criteria for inclusion within the project. However, covering all of these groups is beyond the scope of the project as it would require significantly more funding. There is also a risk that an increase in the proposed number of project activities could saturate the demand, and lead to lower attendance on individual courses.

The Natural History Museum has recently produced a guide to distinctive species of ichneumonids (small parasitic wasps) that can be identified using photos. Hopefully this resource will encourage more recording of ichneumonids, however it was determined that there are currently too few experts to provide the support and training that would be necessary to include this group within the BioLinks Training Plan for Development Provision.

Plantlife have undertaken some work to encourage more recording of lichens, bryophytes and fungi through apprenticeship schemes and working with the national recording schemes (such as the British Lichen Society and British Bryological Society). These initiatives have included the Make the Small Things Count project (funded by the Heritage Lottery Fund). As fungi, bryophytes and lichens are already being tackled through the initiatives above, it was decided that BioLinks will focus on invertebrate species groups. An additional contributing factor in choosing the focus on invertebrates was that the same resource base can support the learning across the focus species, allowing increased value for money for the project.

Therefore, eight focus species groups were identified for inclusion in the project:

- **Aculeate Hymenoptera (**bees, ants and wasps)
- **Arachnids** (spiders, harvestmen and false scorpions)
- **Beetles** (ladybirds, longhorn beetles, carrion beetles, ground beetles and seed & leaf beetles)
- **Freshwater invertebrates** (freshwater snails, insect larva and dragonflies & damselflies)
- **Non-marine Molluscs** (slugs, terrestrial snails, freshwater snails and freshwater bivalves)
- **Soil invertebrates** (earthworms, woodlice, centipedes, millipedes and false scorpions)
- **True bugs** (shield bugs, hoppers, plant bugs, water bugs and psyllids)
- **True flies** (hoverflies, craneflies, soldieflies, blowflies, tachinids and picture-wing flies)

The habitat groupings of ‘freshwater invertebrates’ and ‘soil invertebrates’ include a large number of taxonomic groups within them. The representative taxonomic groups indicated above were selected based on feedback from the public consultations, stakeholders and input from recording schemes/potential tutors.

The following sections (5.1 to **Error! Reference source not found.**) include more detail regarding the feedback provided through the different consultation methods (including quotes), information about the taxonomic groups and a table indicating the number of records per year held within the relevant Local Environmental Records Centre.

Online survey question: How experienced are you as a biological recorder?

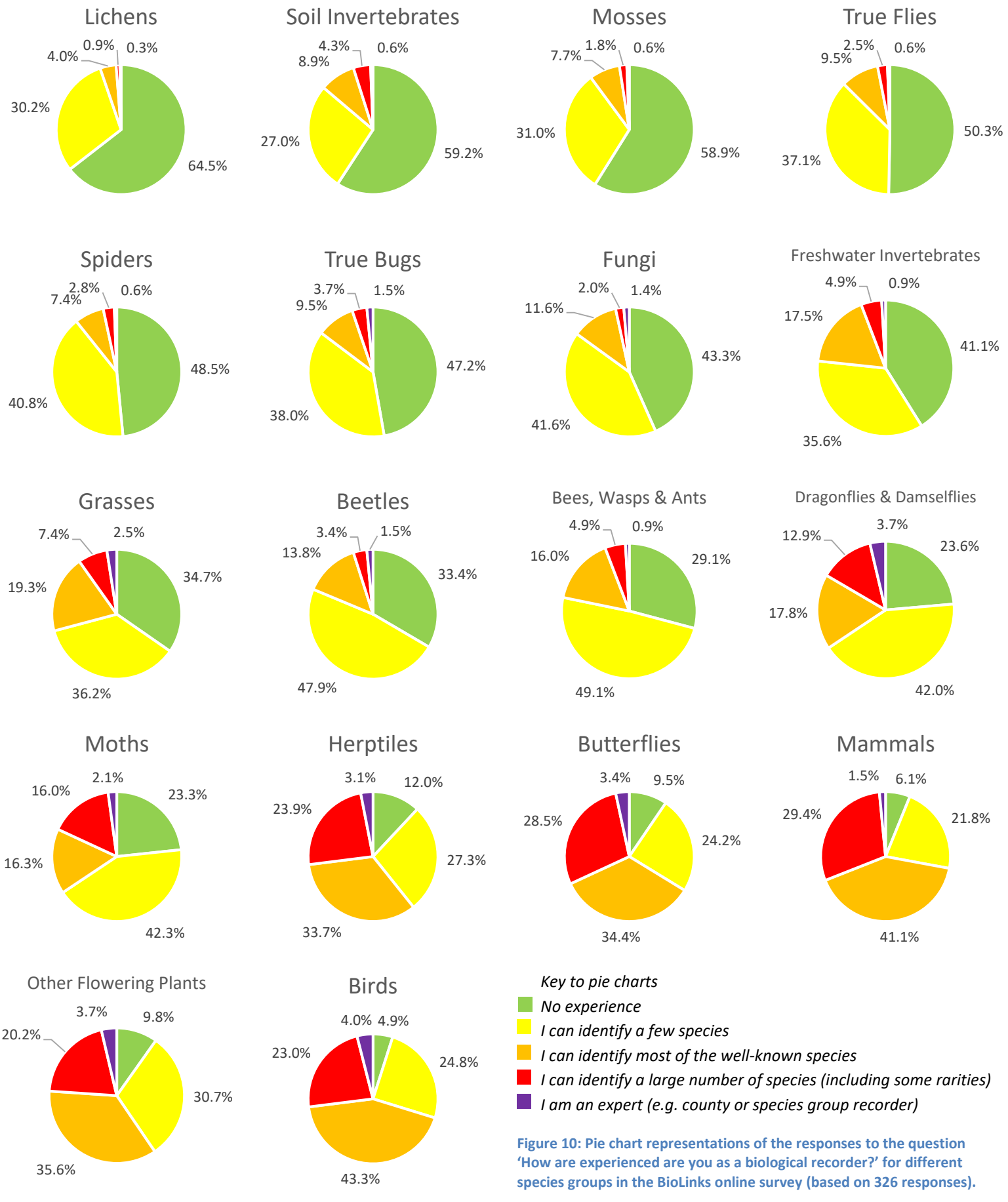


Figure 10: Pie chart representations of the responses to the question 'How are experienced are you as a biological recorder?' for different species groups in the BioLinks online survey (based on 326 responses).

5.1 Aculeate hymenoptera

Aculeates are part of the order Hymenoptera. All aculeates possess a modified egg-laying ovipositor, which forms a sting. The majority of species hide their larva and provide for them with stored food which is collected by the adult or adults. Many aculeates play a vital role in ecosystem services such as pollination and pest control. There are around 590 aculeate species in the UK, including bees, ants and wasps. The Bee, Wasp and Ant Recording Society (BWARS) is a large, active recording society with good links to academia.

Public consultation workshops

Aculeate hymenoptera were frequently suggested as focal species for BioLinks. Many people made reference to their vital role as pollinators and their interesting ecology and behaviour. There was a general feeling that, whilst bees (especially bumblebees) were an engaging and accessible group, wasps were the 'poor relation' in terms of identification training, due to their negative reputation, lack of accessible keys and increased difficulty level. Ants are also under recorded. However, bees, wasps and ants are readily found in parks and gardens so there is a huge opportunity for people to easily find and study these groups.

"Many aculeates are easy to find but hard to ID! There is little support available for people wanting to identify harder groups such as Sphecode bees, which require dissection".

Stakeholder meetings

Again, aculeates were a commonly suggested group. Many things are increasing public awareness of this group, such as discussions of the threat to pollinators, the arrival of charismatic invasive species such as the Asian hornet, honeybee declines, and the publication of new, accessible ID resources (Falk's bee guide). The huge number of people engaging with BWARS on social media suggests there may be a huge, untapped market for aculeate identification training. Wasps were often cited as being neglected in comparison with bees, with ants being even more so. Although bees are a good engagement group to draw people into aculeates, the real gap is in training which allows people to progress on to other bee groups, and onto other aculeate groups such as wasps and ants.

"There are quite a lot of basic entry level courses on bees, especially bumblebees. But there are very few courses aimed at a higher level, so it is hard for people to progress."
Stuart Roberts, Bee, Wasp and Ant Recording Society

Record Analysis

It can be seen from Table 5 below that aculeate records are lacking in both the London region and West Midlands regions). There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 5: Summary of the number of aculeate hymenoptera records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	3221	1558	1404	1384	932	426	381	663	261	271
Shropshire	1281	596	499	370	705	887	1018	399	83	12
Worcestershire	1129	985	994	1059	719	827	657	879	795	1685

5.2 Arachnids

Arachnida is a class of invertebrates including spiders, harvestmen, false Scorpions and scorpions. Spiders (Araneae) are the largest order of arachnids and there around 670 species known to occur in the wild in Britain. Harvestmen (omnivorous arachnids) and false scorpions (predatory soil arachnids) are smaller groups, each with under 30 UK species. The British Arachnological Society host the Harvestmen Recording Scheme and the Spider Recording Scheme.

Public consultation workshops

Spiders were mentioned in public consultations in both the West Midlands and London regions. Although there are county recorders in both London and Shropshire, consultees demonstrated concern that regional recording was too reliant upon individuals, and there is a proven demand for this training in Worcestershire as some recorders have been travelling to Shropshire to take advantage of the training occurring there. It was also noted that spiders are an easy group for recorders to find as they are present in most habitats, including buildings and gardens.

"Spiders provide a dearth of ecological information and there is a current real lack of recorders and knowledge."

Stakeholder Meetings

The FSC Tomorrow's Biodiversity (TomBio) project (funded by Esmé Fairburn) has created a training model that allows volunteers to develop their spider identification skills and enter the learning pathway at a difficulty level that is appropriate to their recording experience and trialled this in Shropshire from 2014 to 2017, with great success. Spiders were also a focus species group for the Invertebrate Challenge project (funded by HLF). Both the former Invertebrate Challenge project officer (P. Boardman) and current TomBio project officer (Dr R. Burkmar) stated that BioLinks should continue the momentum that has been started through these projects by continuing to provide provision for arachnid identification training in the West Midlands and beyond.

"It would be a missed opportunity not to take advantage of the current momentum generated by the Shropshire Spider Group and previous FSC biodiversity projects such as Invertebrate Challenge. There is great potential to expand the current Shropshire provision designed by the Tomorrow's Biodiversity project into other parts of the West Midlands and beyond."
Rich Burkmar, Tomorrow's Biodiversity Project Officer, Field Studies Council

Record Analysis

It can be seen from Table 6 below that arachnid records are particularly lacking in the London region and severely lacking in the West Midlands region. There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 6: Summary of the number of arachnid records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	2755	2808	2509	703	1221	230	159	80	30	839
Shropshire	30	22	33	27	44	17	396	164	4	0
Worcestershire	117	147	83	130	191	217	207	175	259	244

5.3 Beetles

Beetles are insects belonging to the order Coleoptera, and include a diverse range of families. There are over 4,000 species known in the UK. There are 19 separate recording schemes, ranging from well-established schemes (such as the UK Ladybird Survey) to relatively new recording schemes (such as the Carrion Beetles Recording Scheme). The individual schemes vary greatly in their capacity, their methods and the barriers they face to generating interest and records.

Public consultation workshops

The vast number of UK species led to consultees suggesting beetles are included as many families are under-recorded. It was suggested that charismatic familiar groups, such as ladybirds or longhorns, could be used as gateway groups and large groups with many species, such as weevils, could be the focus of advanced level courses.

"There is a shortage of beetle experts in Worcestershire."

Stakeholder Meetings

Beetles are an extremely diverse group and include well known pest species and protected species that are on the verge of extinction in the UK. Beetles are becoming increasingly important for site assessment and provide many different ecosystem services (including decomposition and pest control). The beetle recording schemes tend to operate independently from each other and resources are spread relatively thin. Active recording schemes with good resources include the Ladybird Recording Scheme (including monitoring of the invasive harlequin ladybird) and the Longhorn Beetle Recording Scheme. Both of these groups are relatively colourful, engaging and contain a mixture of easy-to-identify and more difficult species, and would therefore make good gateway groups. Ground beetles are commonly seen and easy to find and were suggested as a good intermediate group to focus on (particularly as some species are large and distinctive). Difficult beetle groups that could be targeted include the weevils and rove beetles, both of which are large groups that are under-recorded and have comprehensive, but complex, identification keys. The Silphidae Recording Scheme is a new initiative focusing on carrion beetles and is managed by young, dynamic and enthusiastic individuals.

"There are increasing numbers of non-native longhorns appearing and becoming established, some of which are classed as pests. This is one reason to increase the recording of this group. As a group in general, they are also good indicators of sites which are good for invertebrates, so could help focus conservation effort on protecting sites for invertebrates in the future."
Wil Heeney, Longhorn Beetle Recording Scheme Organiser

Record Analysis

It can be seen from Table 7 that beetle records are severely lacking in both the London and West Midlands regions (taking into consideration the large number of species contained within this insect order). There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 7: Summary of the number of beetle records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	9206	2369	3249	2917	4736	635	377	309	507	664
Shropshire	248	115	580	400	704	1102	1063	897	702	1293
Worcestershire	2578	2195	1352	1405	1151	1665	971	500	808	1103

5.4 Freshwater insects

For the purpose of this report, freshwater insects refers to caddisflies (199 species), damselflies (20 species), dragonflies (30 species), mayflies (57 species) and stoneflies (34 species). All of the previously mentioned groups have aquatic larval stages that require microscopes to reach an identification. The British Dragonfly Society hosts the recording scheme for dragonflies/damselflies and the Riverfly Monitoring Initiative has individual schemes for caddisflies, mayflies and stoneflies.

Public consultation workshops

Freshwater insects were mentioned on numerous occasions due to the absence of training provision for species identification for freshwater insects. Most existing training provision concentrates on water quality initiatives and monitoring and does not include the taxonomic resolution required for species record creation. There was a perceived demand from volunteers that are involved in water monitoring but are not able to develop their skills further. Dragonflies and damselflies were suggested by as a good gateway group to freshwater insects as the adults can be identified in the field.

"There is a lack of intermediate freshwater insect larva courses linking beginner and professional training provision."

Stakeholder Meetings

Many people will be familiar with freshwater invertebrates due to pond dipping events or volunteer-led water quality monitoring initiatives such as the Riverfly scheme. However, these activities tend to only identify specimens to family or group level. There is a desire among volunteers involved in such activities to take their knowledge further. This has been recognised by the Riverfly Monitoring Initiative who are currently discussing how to allow their volunteers to progress to species level ID. This is a potential opportunity for BioLinks to work with the scheme, which has hundreds of participants across the country. Many freshwater invertebrates can tell a story about water quality and the wider environmental conditions, giving them a value as environmental indicators and helping volunteers feel they are contributing 'worthwhile' data. They are also being used as a trial group for the development of eDNA analysis techniques and many stakeholders raised the importance of BioLinks keeping abreast of technological developments.

"Odonata are a group that respond quickly to rapid change, such as climate change. New species are entering the UK regularly and moving North along the Severn corridor. Shropshire is nearly there in terms of number of records in order to be able to analyse the data in a meaningful way."
Dan Wrench, Biodiversity Officer for Shropshire Ecological Data Network

Record Analysis

It can be seen from Table 8 that freshwater insect records are particularly lacking in both the London and West Midlands regions. There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 8: Summary of the number of dragonfly/damselfly/mayfly/caddisfly/stonefly records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	467	243	501	902	854	730	1111	765	912	777
Shropshire	476	185	202	191	288	586	682	804	925	757
Worcestershire	1584	660	1085	1348	2684	1654	2079	1267	442	1524

5.5 Molluscs

Gastropoda (slugs and snails) are a large class within the phylum Mollusca. There are around 220 species of non-marine gastropods in the UK (i.e. slugs, freshwater and brackish-water snails). The Conchological Society of Great Britain and Ireland, founded in 1876, is the umbrella organisation for UK mollusc recording.

Public consultation workshops

Representatives of three local records centres (Bucks, Herts, GIGL) highlighted that despite being ecologically important, molluscs are extremely under recorded. There were no active mollusc recorders in their areas and no recent data on the presence or absence of scarce or protected species. A number of consultees raised the point that killing specimens is a barrier to biological recording. Many snails can be identified from live specimens/empty shells, so have the advantage that killing is not required. Many people spoke highly of the affordable, accessible identification keys available for terrestrial and aquatic molluscs and slugs in particular. However, training on how to use these keys is essential. There are a few providers of introductory courses (e.g. Worcestershire WT) but a lack of in-depth follow up identification training. The potential link between slugs and snails and urban biodiversity/gardens was also highlighted.

Stakeholder meetings

Freshwater snails are a particularly neglected group, which are good environmental indicators. There hasn't been an updated key for a while and this is a potential opportunity to help update a key. It is also a manageable group size (c. 40 species). Most are identifiable in the field without taking specimens, so they are accessible for beginners and suitable for a one-day course, with some interesting rare species to be found. Some of these already have a monitoring scheme e.g. the mud snail. Slugs were also highlighted as under recorded, despite some good ID resources.

"Molluscs are very poorly recorded in Shropshire, and some key species are present such as the Pond Mud Snail (a Section 41 Conservation Priority Species) and Desmoulin's Whorl Snail (a European Protected Species)."
Dan Wrench, Biodiversity Officer for Shropshire Ecological Data Network

Record Analysis

It can be seen from Table 9 below that gastropod records are particularly lacking in the London region and severely lacking in the West Midlands region. There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 9: Summary of the number of slug/snail records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	670	425	875	648	768	584	558	1085	751	30
Shropshire	39	11	18	1	37	45	13	7	50	0
Worcestershire	803	1104	645	347	306	277	325	311	476	375

5.6 Soil invertebrates

5.6.1 Earthworms

Earthworms are a small taxonomic group of soil invertebrates situated within the order Crassiclitellata. There are 29 species known to occur in Great Britain in natural environments. The National Earthworm Recording Scheme was launched in 2014 by the Earthworm Society of Britain (ESB) and is managed by a volunteer (Keiron Brown). UK earthworms can generally only be reliably identified once preserved and observed under a microscope. There are over 6,500 records in the ESB database as of August 2016 (two thirds coming from Natural History Museum research).

Public consultation workshops

Earthworms were singled out as a priority within soil invertebrates by several individuals in the public consultations due to their ecological importance (such as soil structuring and decomposition) and their potential as biological indicators of soil health.

"Not cute, fluffy and sexy, but are vitally important as ecosystem engineers"

Stakeholder meetings

The ESB is currently the only known provider of publicly available earthworm species identification training and has a limited capacity to deliver courses without the assistance of partner organisations due to limited funds. Currently, the ESB delivers two 2-day identification training courses (in association with the FSC Tomorrow's Biodiversity project) and one 2-day field event per year. These courses can be delivered by any one of four potential tutors. The ESB are different to many other invertebrate recording schemes in that they many committee members that are relatively young (26-35 years old). They also have a strong presence on social media and are sector leaders in sharing their data. As a new recording scheme they have a relatively small dataset.

"The earthworm recording scheme is relatively new and has few records, but is already improving our knowledge of earthworm distribution and habitat preference. For example, Natural England failed to find Dendrobaena pygmaea in a recent targeted project and there was discussion regarding the extinction of this species in the UK until it was discovered by ESB recorders 4 times recently in different locations."

Kerry Calloway, Earthworm Society of Britain

Record analysis

It can be seen from Table 10 below that earthworm records are severely lacking in both the West Midlands and London regions. There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 10: Summary of the number of earthworm records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	7	5	2	2	25	0	2	0	2	0
Shropshire	0	0	0	0	0	0	0	0	11	0
Worcestershire	3	6	16	3	6	8	33	14	9	7

5.6.2 Isopods

Woodlice and Waterlice are detritivorous crustaceans belonging to the order Isopoda. Woodlice are a small group of terrestrial invertebrates consisting of 40 species known to occur in the wild in Britain and can be found readily in soil and deadwood habitats. Waterlice are a very small group of only 4 species known to occur in the wild in Britain that can be found in freshwater habitats. Records for all isopods (and the non-native amphipod *Arcitalitrus dorrieni*) are collated through the Woodlice & Waterlice Recording Scheme hosted by the British Myriapod and Isopod Group (BMIG)

Public consultation workshops

Soil invertebrates were highlighted on numerous occasions as a priority due to their ecological importance and ability to act as soil health indicators in the public consultations. Woodlice were highlighted as a group that are specifically under-recorded in London. One consultee also noted that waterlice are hugely under-recorded.

"Soil invertebrates are so fundamental to good soils and great indicators of soil health."

Stakeholder Meetings

Very few formal training courses on myriapod identification occur, with a 3 day myriapod and isopod course run by the FSC at Preston Montford each year. BMIG hosts an Annual Field Meeting from Thursday to Sunday each year at a different location around the UK. Both the West Midlands and London are poorly recorded, with London currently having only one known active recorder. Surveying techniques for woodlice, such as soil sieving, are labour intensive and can be a barrier to the recruitment of new recorders. BMIG has no county recorder but would welcome 'patch workers' that could cover these geographic gaps in the knowledge base.

"The isopoda (and other soil invert groups) are seriously under-recorded in the London area and I am probably the only active recorder in the area (and I now restrict my activities to the Chipstead Downs SSSI site). The basic problem is that soil invertebrates are not seen as interesting as the 'pretty' wildlife (butterflies/small furry things etc.) and the requirement for microscopes/good hand lenses and the need for more 'expensive' books is certainly a major inhibitor to spreading the study further."
Andy Keay, former Soil Invertebrate Recorder for London Natural History Society

Record Analysis

It can be seen from Table 11 below that woodlice records are severely lacking in both the London region and West Midlands regions. There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 11: Summary of the number of woodlice records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	404	111	56	178	366	18	86	19	26	14
Shropshire	0	0	0	0	0	0	0	1	8	1
Worcestershire	175	136	74	47	94	92	92	91	346	192

5.6.3 Myriapods

Centipedes (Chilopoda) and Millipedes (Diplopoda) are classes of invertebrate belonging to the subclass Myriapoda (along with the classes of Symphyla and Pauropoda). Centipedes are predatory invertebrates and there are more than 50 species known to occur in the wild in Britain. Millipedes are detritivores and there are around 65 species known to occur in the wild in Britain. The British Myriapod and Isopod Group host both the Centipede Recording Scheme and the Millipede Recording Scheme (BMIG). The related Myriapoda classes of Symphyla and Pauropoda currently do not have recording schemes to represent them (likely due to their small size and the difficulty in finding them).

Public consultation workshops

Both centipedes and millipedes were highlighted in the public consultations as potential focus species groups, both specifically and as soil invertebrates. It was stated that they were particularly under-recorded in London and that millipede recording suffers from the lack of an up-to-date accessible key.

> *"There are black holes across the country in terms of centipede records."*

Stakeholder Meetings

Very few formal training courses on myriapod identification occur, with a 3 day myriapod and isopod course run by the FSC at Preston Montford each year. BMIG hosts an Annual Field Meeting from Thursday to Sunday each year at a different location around the UK. Both centipede and millipede atlases have been produced previously, however both the London and West Midlands are poorly represented in terms of recent records as active recorders have been absent from these areas for a considerable time. BMIG has no county recorder but would welcome 'patch workers' that could cover these geographic gaps in the knowledge base.

> *"Records of myriapods and woodlice exist for most parts of Britain but for many areas such as Shropshire there has been little systematic recording and in others, such as Worcestershire and Warwickshire, some of the records may be sixty years old or more. Also, urban areas such as London and Birmingham, where conditions could support unusual species or introductions have been much neglected."*
>
> **Tony Barber, Centipede Recording Scheme Organiser for the British Myriapod & Isopod Group**

Record Analysis

It can be seen from Table 12 below that myriapod records are severely lacking in both the West Midlands and London regions. There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 12: Summary of the number of centipede/millipede records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	35	19	28	13	109	5	33	5	11	1
Shropshire	0	4	8	1	6	8	1	0	3	0
Worcestershire	118	61	29	23	18	10	21	24	141	166

5.7 True bugs

True bugs are insects belonging to the order Hemiptera, and include well-known groups such as aphids and shield bugs. There are nearly 2,000 species known in the UK. There are five recording schemes in the UK: Water Bugs & Allies, Shield Bugs & Allies, Auchenorrhyncha, Plant Bugs & Allies and Psyllids. There is currently no recording scheme for aphids.

Public consultation workshops

True bugs were mentioned regularly throughout the public consultations. It was advised that shield bugs are visually appealing and a great group to engage new biological recorders with, as they are a small group and can mostly be identified in the field. Several participants were keen to stress that both hoppers and plant bugs are numerous but under-recorded. It was also noted that aphids are hugely under-recorded and no current training provision is known outside of academia.

"Can be difficult to find people with expertise to identify bugs."

Stakeholder meetings

Hemiptera were recommended as a focus species group by the Invertebrate Challenge project manager, Pete Boardman, particularly as shield bugs are a relatively easy-to-identify group and can act as a 'gateway group' for those new to insect identification. There is relatively little provision currently for hemiptera identification training. These are mostly general interest courses that include shield bugs, though one course was scheduled on leafhopper identification by the FSC and subsequently cancelled. The recording schemes suffer from a limited capacity to support their recorders and recruit new recorders. Recording scheme managers usually deliver training on the group covered by their respective recording scheme.

"In terms of biological recording, the Hemiptera (true bugs) have been severely neglected compared to many other invertebrate groups. However, in recent years a variety of new identification resources have raised the profile of these insects. The challenge now is to capitalise on this increased awareness by supporting people who want to learn more and become involved in recording."
Tristan Bantock, Shieldbug & Allies Recording Scheme Manager

Record Analysis

It can be seen from Table 13 below that true bug records are severely lacking in both the London region and West Midlands regions (taking into consideration the large number of UK species contained within this insect order). There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 13: Summary of the number of true bug records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	2457	574	896	981	849	372	417	208	140	174
Shropshire	58	89	120	60	560	832	1709	3313	2656	2290
Worcestershire	984	910	608	328	453	492	335	177	410	612

5.8 True flies

True flies are insects belonging to the order Diptera, and include a diverse range of families. There are over 7,000 species known in the UK. There are 22 separate recording schemes, many of which are represented within The Dipterists Forum (the society for the study of flies). The individual schemes vary greatly in their capacity, their methods and the barriers they face to generating interest and records.

Public consultation workshops

Consultees mentioned true flies during many of the public consultation workshops and listed their role as pollinators and emerging identification resources as reasons for their suggestion. Hoverflies were recommended as a gateway group on several occasions, particularly as each species has been assigned an identification difficulty rating that allows recorders to assess which species they are confident recording. Blowflies and Craneflies were recommended for more advanced level training as identification keys are due for publication in the near future, making these groups more accessible to recorders.

Stakeholder Meetings

True Flies were suggested by many stakeholders, including the Natural History Museum and Natural England. Stakeholders suggested that specific diptera families should be focused on due to the very large number of UK species within diptera. Hoverflies are covered by an active recording scheme and many can be identified in the field, and were recommended as a gateway group to other fly families. Courses on identifying flies to family level have been run by The Dipterists Forum and British Entomological & Natural History Society and proven successful in developing the identification skills of biological recorders. Although many fly families are under-recorded, it can be difficult for biological recorders to develop their skills if there is no active recording scheme or current identification literature, and this influenced the specific fly families that were suggested by stakeholders. Some other suggestions included craneflies, blowflies, tachinids, soldierflies, bibionids, snail-killing flies and tephritid flies.

> *"Groups selected for this project need to have a useful purpose. Many flies are important as pollinators. With climate change we need a wider spread of biological recorders looking at a wider range of species*
> **Alan Stubbs, Cranefly Recording Scheme**

Record Analysis

It can be seen from Table 14 that true fly records are severely lacking in both the London and West Midlands regions (taking into consideration the large number of UK species contained within this insect order). There is scope for the project to make a significant difference to the number recording of this group in both BioLinks regions.

Table 14: Summary of the number of true fly records currently held by the Local Environmental Record Centre for counties where a BioLinks training hub is proposed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
London	6693	1652	1873	1548	2238	1276	410	349	192	89
Shropshire	2017	4216	1543	1409	1599	2218	5319	2162	2514	1860
Worcestershire	1369	3128	2273	1943	1133	1070	943	747	828	1297

Summary of Section 6: Identifying focus species groups

Implications for BioLinks

Eight focus species groups have been identified for inclusion within the project:

- **Aculeate Hymenoptera**
- **Arachnids**
- **Beetles**
- **Freshwater invertebrates**
- **Molluscs**
- **Soil invertebrates**
- **True bugs**
- **True flies**

All selected focus species groups were found to be data deficient within both of the project regions. Therefore, there is no need to differentiate between the provision provided within each of the project regions.

Inclusion of two focus species groups based on habitat rather than taxonomy (soil invertebrates and freshwater invertebrates) allows for cross-over between training plans (e.g. freshwater snails can be included in both the mollusc and freshwater invertebrate training plans).

6 Identifying training locations

Throughout the public consultation workshops a large number of different potential training locations were discussed, including well-equipped existing training facilities, potential training facilities and field sites/nature reserves.

The BioLinks project aims to facilitate identification training 'hubs' *that will deliver two services to volunteers:*

(i) Provision of a number of identification courses covering the focal taxa to allow development of identification skills and knowledge.

(ii) Support services for volunteers, such as access to microscopes, literature libraries, natural history collections and mentoring from experts or staff to build confidence and provide motivation.

This model has previously proven to be hugely successful in Shropshire through the FSC Invertebrate Challenge project funded by HLF, and the BioLinks project aims to apply this model on a much larger scale across two regions (South East England and the West Midlands) to create.

It was determined that three types of training centre would be required for regular use within each region:

Existing identification training hubs A number of existing training hubs exist for use by the biological recording community. The use and capacity of these hubs is often limited by finances and resources, and stakeholder meetings were held to determine how BioLinks can support and complement these facilities and what level of project involvement is necessary.

Potential new identification training hubs The consultation highlighted the existence of several potential training hubs, that deliver a limited amount of identification training provision but offer little in the way of support services.

Residential training centres In order to cater for differing lifestyles and work patterns, BioLinks will offer both day and residential courses. In order to deliver residential courses, centres that provide accommodation and catering are required. Where possible, identification training hubs that have these facilities should be used.

It is likely that new training hubs will require more support than existing training hubs so the majority of project activities will operate out of a new training hub within each region. In addition, the current training provision provided at existing training hubs within the regions will be signposted to and complemented where necessary.

Additional training facilities As an alternative to the training hub model, it was suggested in the public consultation workshops that utilising many training venues would improve the reach of the project and engage a wider number of volunteers. In order to improve the reach beyond the areas serviced by the training hubs, a small number of BioLinks training courses and field events will be planned at additional training facilities.

6.1 West Midlands region

Both the FSC Biodiversity Training Project and FSC Invertebrate Challenge project were based in Shropshire, and the FSC continues to support the Shropshire biological recording community through support services and an annual Entomology Day at the Preston Montford Field Centre. The consultation highlighted that Worcestershire also has an active recording community and there is a demand for additional identification training provision and support services.

Preston Montford Field Centre (Shropshire) is an **existing identification training hub** and **residential training centre**. The centre delivers a wide range of well-respected residential training courses, but the costs of these courses can be off-putting to some and unaffordable to others. Low cost courses for biological recorders have also been delivered at the centre by the FSC Tomorrow's Biodiversity project (funded by Esme Fairburn) since 2015 and will continue until 2017. Furthermore, it was the base of the FSC Invertebrate Challenge project and, as a legacy of the project, continues to facilitate the use of a room (equipped with reference collections, identification literature, field equipment and microscopes) to local biological recorders as well as continuing to host the annual Shropshire Ento Day in partnership with the Shropshire Invertebrate Group to support the local recording community. FSC Preston Montford believe that BioLinks can offer training courses that complement their existing provision and provide a comprehensive training plan for select focus species groups.

Bishops Wood Field Centre (Worcestershire) is a **potential new identification training hub**. This large training venue recently acquired by the Field Studies Council with 7 classrooms. The centre will now specialise in environmental education and outdoor learning and began delivering adult biodiversity courses in 2016 and will continue this in 2017 and beyond. Worcestershire has an active biological recording community (the Bishops Wood public consultation was over-subscribed) but suffers from a lack of locally available training provision. FSC Bishops Wood is keen to support the recording community and work with BioLinks to provide a structured training programme for local volunteers. To facilitate BioLinks activities at this site the centre would need to be equipped with microscopes, reference literature and other course resources.

Additional training facilities that were consulted and are keen to facilitate FSC BioLinks project activities include:

RSPB Sandwell Valley has classroom facilities suitable for introductory level courses that do not require the use of microscopes as well as any field-based training courses/events. RSPB Sandwell Valley are particularly keen to encourage identification training activities onsite that will develop the skills of their existing volunteers.

Birmingham Museum Collections Centre can host collections workshops and allow access to its natural history collections.

Figure 11 on the following page illustrates the locations of the proposed training venues within the West Midlands region and the perceived spheres of influence that these will have on the local biological recording community.

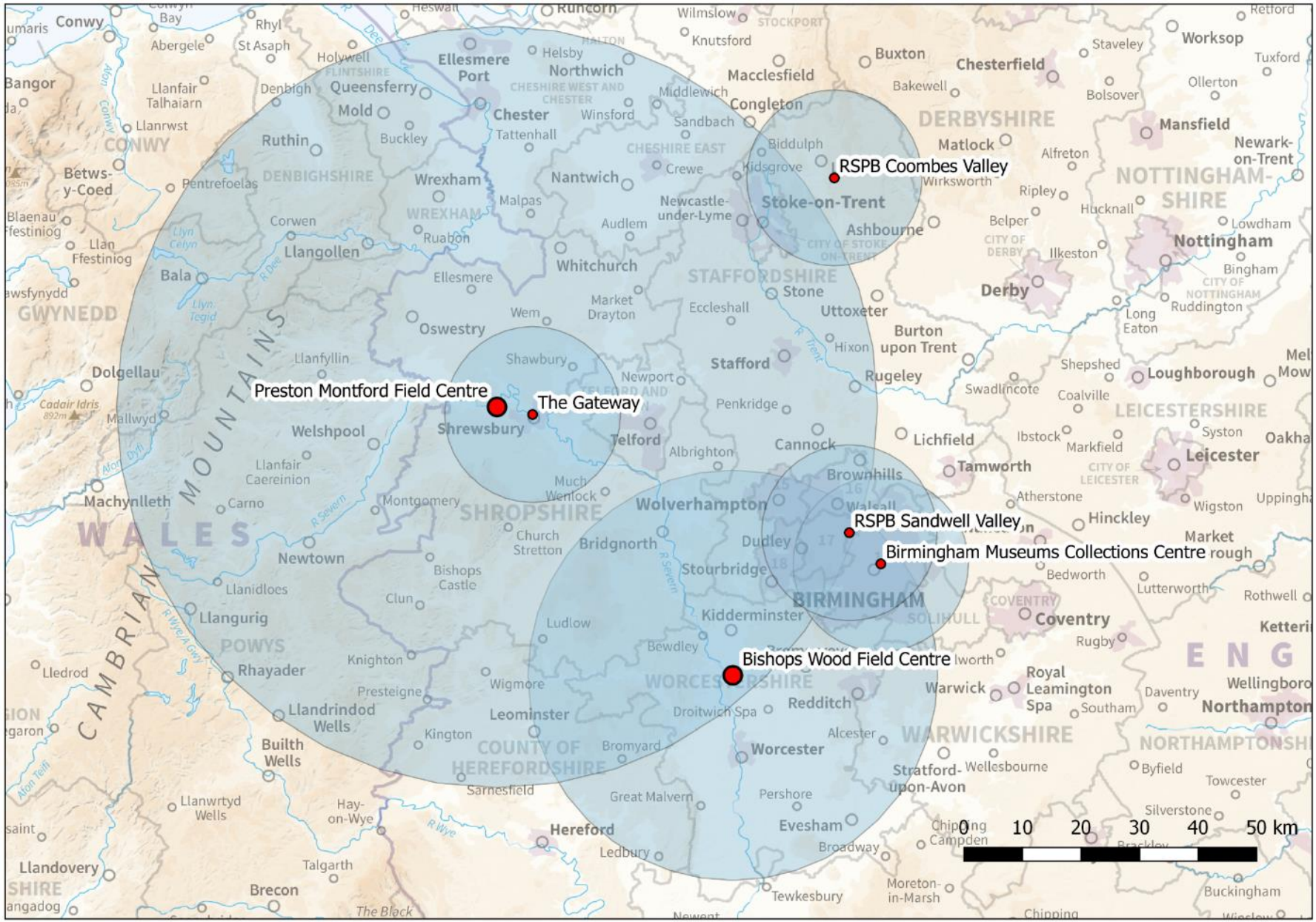


Figure 11: Map of West Midlands region illustrating the predicted influence of FSC BioLinks training locations.

6.2 South East region

The South East region was selected for inclusion within FSC BioLinks due to the perceived presence of a well-established biological recording community. The consultation confirmed that there are a high number of active biological recording organisations, societies and groups operating throughout the region, though all of the selected focus species groups are still relatively under-recorded within the region. London was selected as a priority area due to its dense population and transport links with the rest of the region. Berkshire was also chosen over other potential surrounding counties (such as Buckinghamshire, Essex, Hertfordshire and Surrey) based on the presence of an existing identification training hub.

Angela Marmont Centre for UK Biodiversity (London) is an **existing identification training hub** located within the Natural History Museum and known as the AMC. The centre contains state-of-the-art facilities that are accessible to the general public on weekdays and one Saturday per month through an online booking system, including access to microscopes, photo-stacking equipment, the UK biodiversity synoptic reference collection and support from AMC staff. The AMC also houses the London Natural History Society literature library. These services are currently under-used and the AMC would like for this service to be promoted alongside BioLinks activities to the biological recording community. Furthermore, the AMC has a fully-equipped classroom with 10+ microscopes that can be booked by biological recording organisations, societies and groups to deliver identification training courses.

Dinton Pastures Head Quarters (Berkshire) is an **existing identification training hub** belonging to the British Entomological & Natural History Society and hosts a significant biodiversity literature library and reference collections. The facility also has an identification room equipped with microscopes and regularly delivers free intermediate and advanced level courses that are open to both members and non-members. The BENHS are unable to pay tutors to deliver courses and rely on experts to volunteer their time to the society. In addition, monthly open days are hosted wh ere both members and non-members can use the facilities to identify specimens. BENHS feel that BioLinks could complement their current provision by funding experts to attend their open days and facilitating field events (including the provision of field equipment) on behalf of the society.

Juniper Hall Field Centre (Surrey) is a FSC **residential training centre** and has a large number of different-sized teaching spaces and is set-up to host invertebrate identification courses, though some of its microscope stock would benefit from maintenance or replacement. The centre delivers a wide range of well-respected natural history residential training courses and day courses, though only a small number of these relate to invertebrate identification and residential course costs can be a barrier to some potential attendees. FSC Juniper Hall work closely with FSC Bushy Park to deliver a cohesive training programme for the region, and are the only identified training hub in the projects South East region that can deliver residential courses on behalf of the project.

Bushy Park Field Centre (London) is a **potential new identification training hub**. This small field centre with 3 classrooms and includes a variety of habitats through both publicly accessible and private areas of Bushy Park. The centre is managed by the FSC as part of a contract to deliver environmental education and outdoor learning on behalf of The Royal Parks in Bushy Park. The facility was redeveloped as part of The Bushy Park Restoration Project – Preserving History and Nature (funded by HLF) and has been running adult biodiversity courses over the past few years but has struggled to recruit the minimum number of attendees needed per course, and as a result several courses have been cancelled. Both the centre staff and The Royal Parks support the delivery of BioLinks project activities on site to improve use of the site by local biological recorders and have agreed that one of the classrooms can be allocated for use by the project whenever the regional project officer is on site (with the exception of during days when adult biodiversity courses are running). To facilitate BioLinks activities at this site the centre would need to be equipped with classroom projection equipment, microscopes, reference literature and other course resources.

Additional training facilities (all of which are situated on field sites suitable for activities involving field work) that were consulted and are keen to facilitate FSC BioLinks project activities include:

FSC Amersham is an FSC day centre that specialises in delivering environmental education to school children. They currently run a small number of natural history courses annually and report that these are usually well subscribed due to good connections with local groups. Delivering FSC BioLinks project activities from this centre will expose these local groups to the project and aid recruitment.

Lesnes Lodge is a new training centre that is being constructed as part of the Lesnes Abbey Wood Enhancement Project funded by the Heritage Lottery Fund and are keen to host project activities that will develop the identification skills of site volunteers and other local recorders.

London Wetlands Centre is a Wildfowl and Wetlands Trust reserve that has a new training facility with two classrooms. Most activities that are currently delivered on site are aimed at engaging the general public and regular visitors, with no formal identification courses currently delivered on site.

Tower Hamlets Cemetery Park have current training facilities and are planning to construct additional training facilities on site in the near future. They currently provide very few identification training courses and would like to work with FSC BioLinks to deliver invertebrate identification training opportunities.

Figure 12 on the following page illustrates the locations of the proposed training venues within the London region and the perceived spheres of influence that these will have on the local biological recording community.

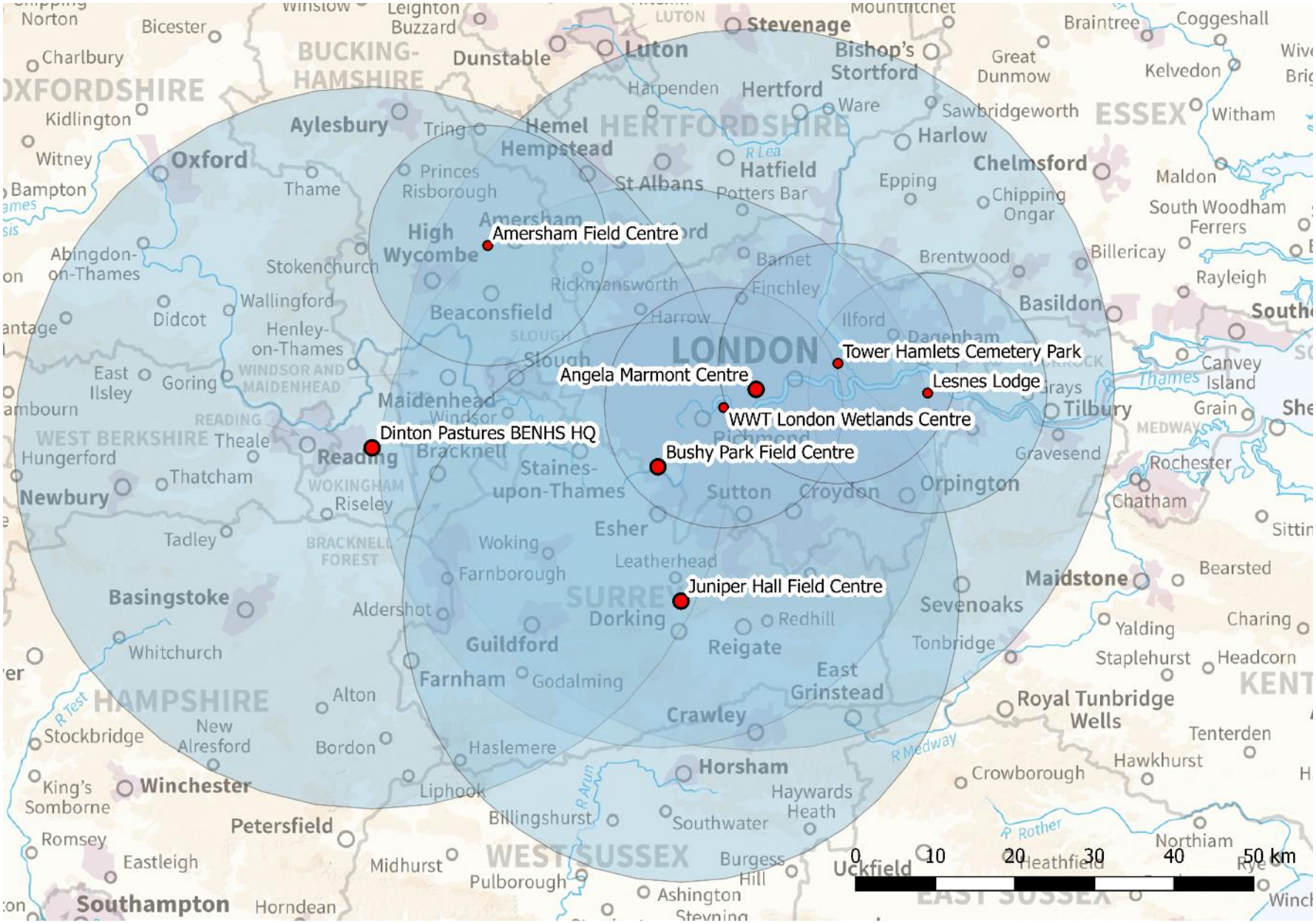


Figure 12: Map of South East England region illustrating the predicted influence of FSC BioLinks training locations.

Summary of Section 7: Identifying training locations

Implications for BioLinks

Two existing training hubs will be supported and complemented by the BioLinks project:

- **Preston Montford Field Centre (Shropshire)**
- **Dinton Pastures Head Quarters (Berkshire)**

Two new training hubs will be created by the project and act as the main base for project activities within their respective region:

- **Bishops Wood Field Centre (Worcestershire)**
- **Bushy Park Field Centre (London)**

Residential courses will be delivered at the suitably equipped training centres:

- **Preston Montford Field Centre (Shropshire)**
- **Juniper Hall Field Centre (Surrey)**

Additional courses and events will be hosted at sympathetic training locations to strengthen the biological recording network and improve the reach of the project.

7 Project activities: Training and events

Training and events will make up a large proportion of the BioLinks project and were discussed throughout the public consultation workshops and investigated through the online survey.

In order to ensure that project training courses and events are well attended, the online survey asked respondents what their preferences are regarding:

Course length Respondents were given a selection of course length options and asked to indicate which they would attend (see Figure 13 below), and give reasons why they wouldn't attend the options they did not select. Very few respondents (only 4%) stated they would not attend training courses. The least popular option was five day courses (28%), with respondents explaining that these courses are often expensive and impractical in terms of annual leave and/or family commitments. One day courses were selected by 53% of respondents, with those not selecting this option often stating that one day courses do not provide enough content to instil confidence in their abilities post-course. The second most popular option was two day courses (56%). Interestingly, the most popular option, with nearly three quarters (71%) selecting it, was a series of one day courses. This suggests that consolidation of learning and skills is very important to attendees, and highlights that BioLinks should aim to deliver the content of a five-day residential course through a series of convenient one day courses.

Online survey question: What is your preferred length of training course?

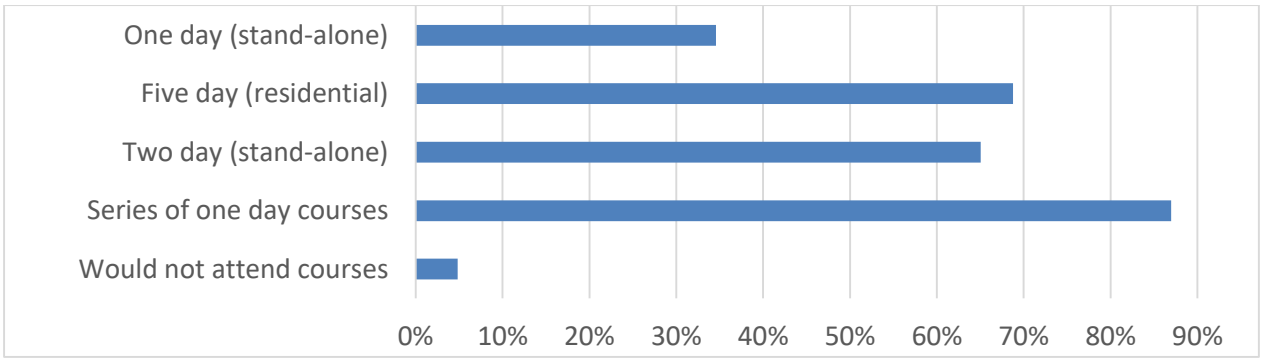


Figure 13: Bar chart representations of the responses to the question 'What is your preferred length of training course?' in the BioLinks online survey. Respondents were asked to select all options that were applicable to them. The chart indicates the percentage of respondents that selected each of the options. Based on 326 responses.

Event scheduling Respondents were asked if their decision to attend courses would be influenced by the day of the week the course is scheduled on (Figure 14 to the left of this paragraph). The majority of respondents (77%) indicated no preference for weekday or weekend courses. Some individuals (15%) could only attend weekend courses, likely due to work/family commitments. Very few individuals could only attend weekday courses (4%) or would not attend training (4%).

Online survey question: When would you attend training courses?

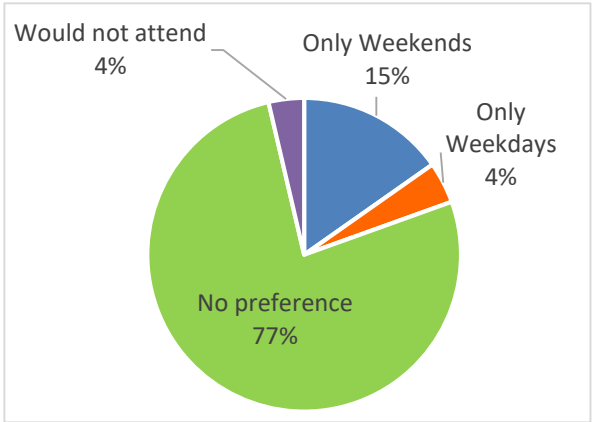


Figure 14: Pie chart representations of the responses to the question 'When would you attend training courses?' in the BioLinks online survey . Respondents were able to select only one option. Based on 326 responses.

7.1 Taught courses

Taught courses covering specific subjects and practical skills are key to ensuring that volunteers have access to experts in order to develop their **knowledge** and **skill** competencies. Taught courses will account for a considerable number of the project activities and will therefore be key to the BioLinks Development Plan for Training Provision and BioLinks Activity Plan.

In the BioLinks Online Survey, respondents were asked which course topics and practical techniques they would like to see included in training courses (from a pre-selected list). They were then asked to select the component they considered most important from the same list. Figure 15 below demonstrates that identifications skills ranked as the most important component, with 98% of respondents believing this should be included and 73% rating it as the most important component of training courses. Field survey skills were ranked as the second most important with 87% of respondents stating they should be covered, though only 12% of respondents ranked it as the most important component. Interestingly, even some of the more specialised practical skills (such as collection curation and dissection techniques) were highlighted by over a third of respondents for inclusion within training.

Online survey question: What topics would you like to see covered within training courses?

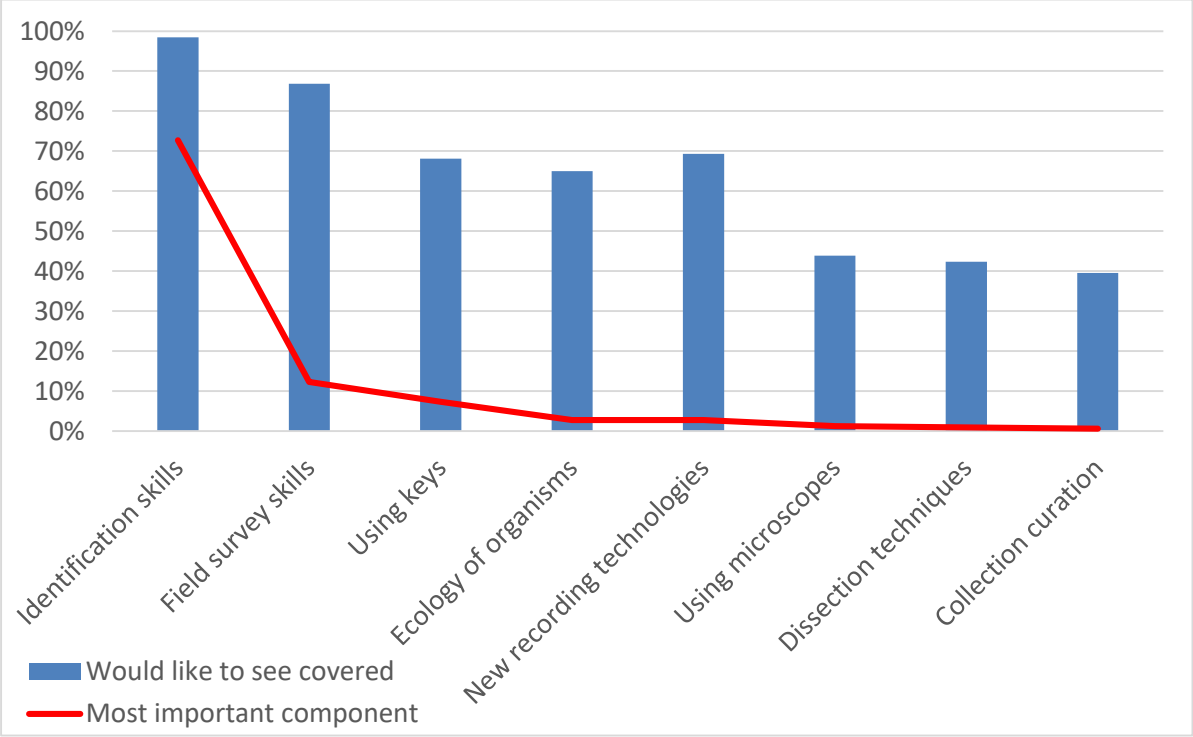


Figure 15: Chart representations of the responses to the question 'What topics would you like to see covered within training courses?' in the BioLinks online survey. Respondents were asked to select all options that were applicable to them. The blue chart indicates the percentage of respondents that selected each of the options. Respondents were then asked to pick one option that they considered the most important. The percentage of respondents that selected each of the options is indicated by the red line. Based on 326 responses.

In the public consultations, some volunteers felt that the branding of course difficulty levels and naming of courses varies greatly both within and between providers. This can be confusing to participants and it was suggested that BioLinks should:

- brand it's course provision with **clear difficulty classifications** for potential attendees.
- use a **standardised system for naming courses** to avoid confusion for potential attendees.

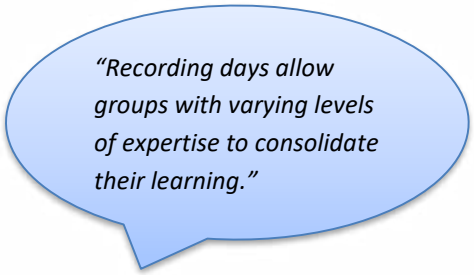
7.2 Field events

Field events improve **knowledge** of wildlife in the field as well as allowing the development of social relationships with mentors and peers, and are therefore key to developing **motivation** and **confidence**.

Field event provision already exists across the two project regions in a range of formats. Three forms of field event were discussed for inclusion within the BioLinks project:

BioBlitz events A BioBlitz event is the recording of all species observed on a site over a relatively short period of time (for example, a 24 or 48-hour period). The format of these events varies greatly and the targets of such an event may be based around public engagement, biological recording or a mixture of both. Consultee opinion regarding the inclusion of such events was divided with regards to the inclusion of such events in a project that focuses on developing volunteer biological recorder competency. Some consultees stated that BioBlitz events should always be open to all audiences and include activities that cater for attendees that have previously not engaged with biological recording. Other consultees stated that public engagement activities can detract from volunteer learning and mentoring at BioBlitz events, and also pointed out that some experts and volunteers are simply not comfortable or even interested in participating with public engagement at this level. However, most consultees agreed that if BioLinks does include BioBlitz events, that they should be planned in a manner that allows volunteer biological recorders to avoid public engagement activities if they choose to and includes provision for volunteers to consolidate their learning from other project activities.

Recorder field days These events are usually one day events that involve the presence of regional experts and the in depth recording of a site and production of a high quality species list for the focus species groups of the event. Most consultees were in favour of such events as it was widely agreed that this type of event builds the confidence of attendees and fosters both peer and mentor relationships. It was suggested that BioLinks could fund the presence of regional or national experts to increase the appeal of such events and ensure that support can be provided with relation to the project focus species groups. It was also suggested that recorder days should be open to the wider biological recording community (including local groups and recorders of species groups that included within the BioLinks project)) to improve the value of any event outputs (such as site species lists) and improve social relations between recorders of different groups.



Field meetings Regular field meetings are held by a number of local groups. The organisations that host these meetings vary from local 'Friends of' groups (such as Wrekin Forest Volunteers) to natural history societies (such as London Natural History Society) and as a result the format of these events is often variable. Consultees noted that these events provide opportunities for socialising and create a community feeling. Some consultees stressed that feeling part of a group in this way often improves volunteer confidence.

7.3 Collections workshops

Collections workshops which engage volunteers with natural history collections are essential for demonstrating how to develop the **skills** needed to use this resource.

Natural history collections are an important piece of our natural heritage and are useful for engaging people and undertaking taxonomic research. They are a useful tool for biological recorders, as they allow biological recorders to compare specimens they have collected and demonstrate regional and local variation in a manner that would be difficult to convey in literature.

Collections awareness Some consultees were not aware that natural history collections may be a useful resource for local biological recording and were unaware of any local collections that were accessible in their area. Some of the consultees that had not previously used natural history collections as an identification resource struggled to understand how they would use this resource to develop their knowledge and skills. Several individuals stated they were intimidated at the thought of using collections in case they caused damage to specimens. The general opinion was that awareness of the availability and importance of local natural history collections within the biological recording community was low and could be improved through the BioLinks project.

Collections importance All of the consultees that mentioned having natural history collections as part of their training or had used them as an aid to the identification of specimens, rated collections as an extremely important resource. Particular emphasis was placed on the way that collections allow recorders to compare real-life examples of a feature (as opposed to photos or diagrams) and appreciate differentiation within and between species. Collections were also noted as being vital for training courses, the production of identification resources and maintaining a DNA record through the preservation of specimens.

Collections use Some consultees felt that collections use is an aspect of advanced training, whereas others believed it should be included at all levels. It was suggested that collections can be brought to training courses rather than attending collections centres, but other consultees that visits to collections centres are necessary to raise awareness and build relationships with collections managers. Several consultees advised that any visits to collections or collections workshops should have a specific biological recording or species identification focus to ensure that any such events are relevant to project participants.

> *"Collections are important as they provide a historical baseline for modern day recording over time and space (as well as for genetics) and the practical value of being able to check identification with life specimen allows verification of voucher specimens. This year the Dipterists' Forum held a meeting at the collections, the county recorder for lichens has recently used the collections to harvest records and some Sandwell Naturalists Club recorders use them to check identifications."*
> **Luanne Meehitiya, Natural Sciences Curator at Birmingham Museums Collections Centre**

7.4 Local recording initiatives

Local recording initiatives are a proven method (e.g. regional atlas projects delivered through the Invertebrate Challenge project funded by Heritage Lottery Fund) for **motivating** volunteers to put their skills into practice and encourage self-learning.

Although providing training is key to developing volunteer knowledge and skills, it is often not sufficient as a stand-alone method to create active biological recorders. Local recording initiatives can be used as a 'call-to-arms' and provide a purpose to biological recording.

Regional atlas projects Regional atlas projects have been used previously by recording schemes/societies and projects to motivate biological recorders to create and submit records for a particular species group within a specified area. This can involve volunteers taking responsibility for a defined area (or 'patch') or publicising grid squares that are data deficient so that areas most in need of attention can be targeted. Many consultees felt that this is motivational as the volunteer can see a clear output resulting from their records through the published atlas. Changes in species distribution can be compared with any previous regional atlas projects from the same species group to provide interpretation of threats to wildlife such as changes in land use and climate change. Looking to the future, regional atlas projects should consider how to use new technology and digital resources to maximise recruitment of volunteers, simplify participation for volunteers and improve engagement with volunteers through effective feedback.

"The dots-on-maps thing is interesting, that's how I got into recording fleas."

"The number of butterfly recorders submitting records had reached very low levels. Launching the Sussex Butterfly Atlas 1010-2014 project, with new tools for capturing records, gave us a platform to engage with a new cohort of recorders. People were eager to get involved with a project which had a clear aim: to improve our understanding of butterfly species' distributions in Sussex. Providing training and regular communications increased the number of butterfly recorders in Sussex by an order of magnitude, and massively increased the quantity of high-quality data being generated. Knowing that this data would feed through to the national recording scheme, where it is used to influence conservation at a local and national level was particularly motivating."
Clare Blencowe, Sussex Biodiversity Record Centre (BRC Manager)

Other local recording initiatives Consultees raised various other potential ideas for local recording initiatives as an alternative to regional atlas projects. Some examples included:

- Working with local collections managers to enhance local collections by encouraging the donation of identified specimens currently absent from regionally significant collections.
- Hosting recorder field days to create site species lists for local land managers.
- Liaising with recording schemes/societies and local environmental records centres to encourage new volunteer county recorders or provide volunteer assistants to current county recorders.
- Producing regional photographic identification resources for suitable groups.
- Working alongside existing monitoring schemes to encourage BioLinks volunteers to participate in schemes that require them to use the biological recording skills and knowledge they have developed through the project.

7.5 Mentoring and support

Mentoring and support is seen by many as the most useful resource for development of **skills** and **knowledge** with regards to species identification and recording, as well as allowing **confidence** to grow through verification of identifications.

Volunteer evaluation from the previous FSC biodiversity training projects (Biodiversity Training Project, Invertebrate Challenge and Biodiversity Fellows) all placed a great deal of emphasis on the importance of mentoring and support. This was further supported by the results from the BioLinks Online Survey (see Figure 16 below), where both access to a mentor and social media support ranked as two of the top four methods of post-course support that would be most likely to benefit volunteer ability to create and submit records.

Online survey question: What post-course support would benefit your ability to create and submit records?

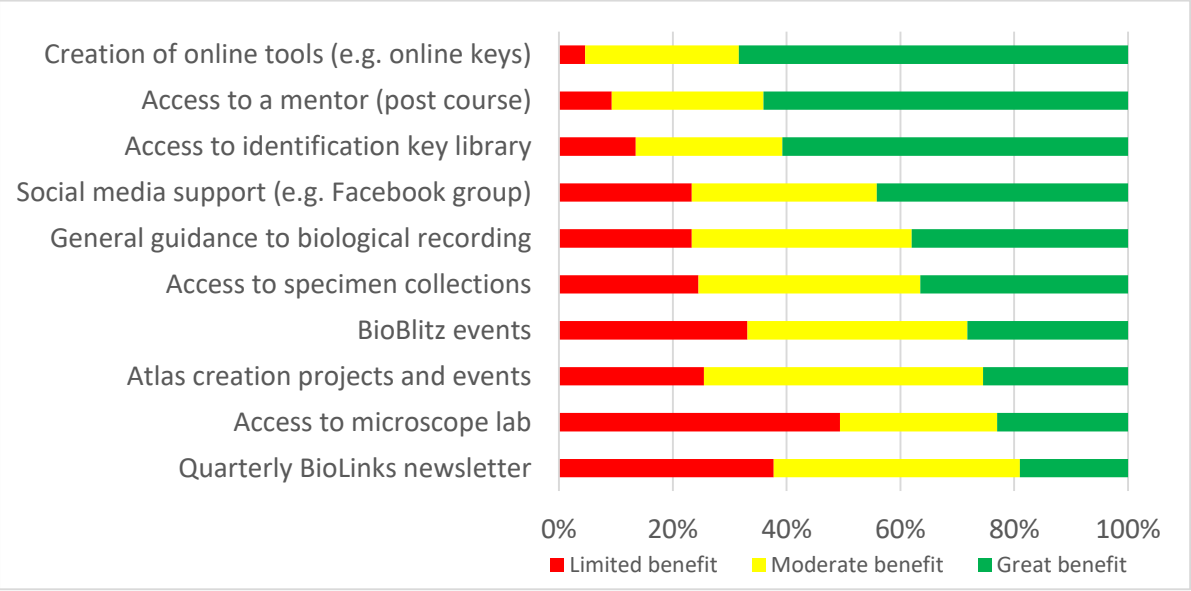


Figure 16: Stacked bar chart representation of the responses to the question 'What post-course support would benefit your ability to create and submit records?' in the BioLinks online survey. Respondents were asked to select an option for each support method from: (I) Limited benefit (ii) Moderate benefit (iii)Great benefit. Responses are ordered in decreasing number of responses for the Great benefit option from top to bottom. Based on 326 responses.

During the public consultation workshops, consultees displayed differing opinions regarding how mentoring should be facilitated and the type of project activities that can deliver successful mentoring and support for volunteers. However, most consultees agreed that mentoring and support are vital to developing volunteer confidence. The following mentoring and support methods were suggested as potential project activities:

- Drop-in verification sessions where volunteers can attend a training hub and access equipment, resources and support from the regional project officer.
- Specialist verification sessions and field recorder days with national experts available to verify voucher specimens and provide advanced identification advice.
- Online support through social media (e.g. a BioLinks Facebook group), providing different levels of support from peers, experts and the regional project officer.
- Development of personal mentor schemes, such as the successful mentor scheme for young naturalists administered by A Focus On Nature.
- Recorder conferences to strengthen the local biological recording community by demonstrating the value of recording at a local level and encouraging social interaction between volunteer biological recorders.

Summary of Section 8: Project activities - Training and events

Implications for BioLinks

The Development Plan for training provision should ensure the development of biological skills and knowledge alongside activities and include events that are specifically designed to engage, motivate, retain and inspire confidence in volunteers.

Training courses should be part of a clear learning pathway that enables both the project and volunteer to assess the volunteer's current competency level and monitor their progression.

A variety of training activity formats will be needed to cater for differing volunteer learning styles.

8 Project activities: Digital resources and technology

The BioLinks project will look to complement the training provision with advances in digital resources to make biological recording easier for volunteers and enhance the volunteer experience through innovative tools. This will be enabled through the recruitment of a Digital Development Officer for the duration of the project that will consult with volunteers and sector professionals to create useful tools during the project and as a legacy once the project is completed.

The Field Studies Council piloted a technology project in the Invertebrate Challenge project and created a shieldbug identification application for mobile phones. Digital resources/technology have been further explored on the Tomorrow's Biodiversity project with great success and creation of online tools was ranked highest as the form of post-course support that would provide volunteers with the greatest benefit in the BioLinks Online Survey (see Figure 16 on page 50).

8.1 Field notes

Field Notes is a proposed crowd-sourced searchable database that allows naturalists to submit observations of behaviour and ecology. The concept was discussed in several of the public consultation workshops and received mixed responses. Many sector professionals were supportive of the concept and believe it has the potential to be a well-received and useful resource for biological recorders and other forms of amateur naturalists. Liaising with the biodiversity sector (such as local environmental records centre, the National Biodiversity Network and the Biological Records Centre) was recommended by sector professionals to ensure it is integrated into existing systems (such as iRecord) and The Field Studies Council's digital team advised that the Digital Development Officer should have experience of rapid prototyping to ensure the success of the Field Notes resource. Some volunteers struggled to understand the concept or its benefits, but this may be due the early state of the concept.

8.2 Signposting tools

Many consultees suggested that volunteer biological recorders would benefit greatly from better signposting of resources, courses/events, natural history collections and mentors. Dr Richard Burkmar stated that he had received the same feedback during his public consultation workshops conducted in 2014 for the Tomorrow's Biodiversity project. As a result of this he created a crowd-sourced tool for signposting identification resources. This tool has been well-received by sector professionals but is still relatively under-used and requires further promotion. Some consultees stated that specialist identification courses can be difficult to find, especially for new biological recorders, as they may only be advertised through individual recording scheme websites. A one-stop shop for biodiversity courses would make these courses more searchable by subject, location, date and skill level. It was recommended on a number of occasions that BioLinks could investigate how to link existing signposting tools (such as the ID signpost and the NatSCA collections signposting tool) and create a new event/course signposting tool.

8.3 Social media

Social media was raised in several of the public consultation workshops. Opinion over the use of specific social media platforms, such as Facebook and Twitter, was divided but many consultees thought it was important that the project actively engages with volunteers through social media to improve recruitment, particularly for young adults, and as a means of providing additional support.

Summary of Section 9: Project activities -Digital resources and technology

Implications for BioLinks

Digital resources and technology development will involve liaising with stakeholders and potential users to ensure a lasting legacy is created and that products are integrated with existing systems where possible.

Signposting tools are in demand from volunteer biological recorders and can strengthen the biological recording community by linking scattered information, resources and training.

An evolving social media strategy is necessary to ensure the project remains relevant to today's audiences.

9 Appendix I: Stakeholder meetings

Date	Organisation	Meeting type
17/03/16	London Natural History Society	Project briefing
11/04/16	Natural History Museum	Project briefing
24/04//16	Natural History Museum (Angela Marmont Centre)	Stakeholder meeting
13/05/16	National Forum for Biological Recording	Conference presentation
01/06/16	FSC Amersham	Stakeholder meeting
02/06/16	Freshwater Habitats Trust (People, Ponds & Water – HLF project)	Telephone consultation
02/06/16	Plantlife (Save Our Magnificent Meadows – HLF project)	Telephone consultation
09/06/16	FSC Bushy Park	Stakeholder meeting
15/06/16	FSC Juniper Hall	Stakeholder meeting
16/06/16	FSC London Projects	Stakeholder meeting
22/06/16	Wildlife Gardening Forum	Conference attendance
20/06/16	Royal Society of Biology	Stakeholder Meeting
05/07/16	Natural History Museum (ID Trainers for the Future – HLF project)	Stakeholder meeting
06/07/16	Biological Records Centre	Stakeholder meeting
08/07/16	Earthworm Society of Britain	Stakeholder meeting
09/07/16	Stephen Falk	Email consultation
11/07/16	Back from the Brink (HLF Project)	Telephone consultation
11/07/16	British Entomological & Natural History Society	Telephone consultation
12/07/16	Thames Valley Environmental Records Centre	Stakeholder meeting
19/07/16	Birmingham Museums Collections Centre	Stakeholder meeting
22/07/16	Natural History Museum (Angela Marmont Centre)	Stakeholder meeting
28/07/16	Natural England Field Unit	Telephone consultation
04/08/16	FSC Bishops Wood	Stakeholder meeting
05/08/16	National Biodiversity Network	Stakeholder meeting
17/08/16	Field Studies Council	Stakeholder meeting
23/08/16	National Biodiversity Network	Stakeholder meeting
24/08/16	British Myriapod & Isopod Group	Stakeholder meeting
25/08/16	Freshwater Habitats Trust	Stakeholder meeting
02/09/16	Shropshire Ecological Data Network	Telephone consultation
02/09/16	Worcestershire Biological Records Centre	Telephone consultation
05/09/16	Cranefly Recording Scheme	Telephone consultation
08/09/16	FSC Preston Montford	Stakeholder meeting
15/09/16	The Riverfly Partnership	Stakeholder meeting
29/09/16	Longhorn Beetle Recording Scheme	Stakeholder meeting
08/10/16	Thames Valley Environmental Records Centre	Conference presentation
09/10/16	Bees, Wasps & Ants Recording Scheme	Stakeholder Meeting
12/08/16	Association of Local Environmental Records Centres	Conference presentation
18/10/16	London Natural History Society	Project briefing
21/10/16	Caring For God's Acre	Stakeholder meeting
27/10/16	Invertebrate Link	Project briefing
28/10/16	British Dragonfly Society	Telephone consultation
28/10/16	London Wetlands Centre (Wildfowl & Wetlands Trust)	Stakeholder meeting
03/11/16	The Woodland Trust	Telephone consultation
03/11/16	Tanyptera Trust	Email consultation
04/11/16	South Staffordshire College	Telephone consultation
07/11/16	A Focus On Nature	Telephone consultation
17/11/16	Silphidae Recording Scheme	Conference consultation
17/11/16	Ladybird Recording Scheme	Conference consultation
24/11/16	The Friends of Tower Hamlets Cemetery Park	Telephone consultation
29/11/16	Lancashire Wildlife Trust (The Biodiverse Society – HLF project)	Telephone consultation
29/11/16	Field Studies Council (Social media meeting)	Telephone consultation
12/12/16	The Conchological Society of Great Britain & Ireland	Telephone consultation
07/01/17	London Natural History Society	Telephone consultation
12/01/17	The Dipterists Forum	Telephone consultation
13/01/17	Wiltshire Wildlife Trust (Wild Connections – HLF project)	Telephone consultation
18/01/17	Natural History Museum (Museum Associate – Beetles)	Stakeholder consultation

10 Appendix II: Consultees & affiliations

People who took part in the public consultation workshops, meetings or telephone conversations are listed below. Please note that affiliations can be any organisation, or entity, that a consultee associated themselves with *in any capacity* (e.g. as an employee, student, volunteer, member, associate, committee member etc.). The affiliations are listed in order to give an idea of the range of experience and expertise that informed this consultation. In the interests of brevity and simplicity, the nature of each affiliation is not given. ***The listing of an organisation as an affiliation for any individual does not infer that the individual represented that organisation in an official capacity*** (although in many cases, they did). Some people listed only their main, or most relevant, affiliation, whilst others listed more.

Name		Affiliations
Martin	**Albertini**	British Entomological & Natural History Society, Buckinghamshire Invertebrate Group, British Arachnological Society
Sian	**Atkinson**	The Woodland Trust
Heather	**Bainbridge**	Worcestershire City Council
Tristan	**Bantock**	Terrestrial Hemiptera (Shieldbugs & Allies) Recording Scheme
Tony	**Barber**	British Myriapod & Isopod Group
Joe	**Beale**	Natural History Museum (ID Trainers for the Future)
Rich	**Beason**	London NERC DTP, Royal Holloway (University of London)
Bjorn	**Beckman**	Biological Records Centre
Charlie	**Bell**	Field Studies Council
Laura	**Bellingham**	Royal Society of Biology
Aaron	**Bhambra**	Royal Society for the Protection of Birds
Jeremy	**Biggs**	Freshwater Habitats Trust
Carole	**Bishop**	Field Studies Council
Clare	**Blencowe**	Sussex Biodiversity Record Centre, Butterfly Conservation – Sussex Branch
Amy	**Blount**	Wiltshire Wildlife Trust (Wild Connections project)
Godfrey	**Blunt**	British Plant Gall Society, British Entomological & Natural History Society, Shropshire Invertebrate Group
Pete	**Boardman**	Natural England Field Unit
Jaswinder	**Boparai**	Natural History Museum (ID Trainers for the Future)
Pam	**Bramwell**	South Staffordshire College
Steve	**Brooks**	Riverfly Partnership
Richard	**Bullock**	Wildlifowl & Wetlands Trust (London Wetlands Centre)
Rich	**Burkmar**	Field Studies Council
Victoria	**Burton**	Natural History Museum (London), Imperial College London, Amateur Entomologist's Society
Kerry	**Calloway**	Earthworm Society of Britain
Julia	**Carey**	Buckinghamshire and Milton Keynes Environmental Records Centre
Ian	**Carle**	Herts & Middlesex Wildlife Trust, Herts Environmental Records Centre, Herts Natural History Society
Dan	**Carpenter**	Thames Valley Environmental Records Centre, Earthworm Society of Britain
Wendy	**Carter**	Worcestershire Wildlife Trust
Harriet	**Carty**	Caring For God's Acre
Sara	**Carvalho**	EcoRecord, Birmingham & the Black Country Wildlife Trust
Chris	**Cavalier**	Wildlifowl & Wetlands Trust (London Wetlands Centre)
Melissa	**Chatton**	Wildlifowl & Wetlands Trust (London Wetlands Centre)
Kirstie	**Chippendale**	Avon Meadows, Butterfly Conservation
Ryan	**Clark**	A Focus on Nature
Rachel	**Clark**	Earthworm Society of Britain, Natural History Museum
Jon	**Cole**	Royal Entomological Society, Royal Society of Biology, British Entomological & Natural History Society
Jennie	**Comerford**	Field Studies Council
Mel	**Cousins**	Field Studies Council
Emily	**Cowper**	Field Studies Council (Amersham Field Centre)
Genevieve	**Dalley**	British Dragonfly Society
Rachel	**Davies**	Natural England
Gehan	**de Silva**	London Natural History Society
James	**Drever**	Field Studies Council

Name		Affiliations
Kat	**Duke**	London Natural History Society
Rae	**Edwards**	N/A
Elwyn	**Edwards**	Field Studies Council (Rhyd-y-creuau Field Centre)
Matthew	**Esh**	Silphidae Recording Scheme
Liz	**Etheridge**	Wychavon District Council
Steven	**Falk**	Dipterists Forum, Bees Wasps & Ants Recording Society, British Entomological & Natural History Society
Rebecca	**Farley**	Field Studies Council
Krisztina	**Fekete**	Natural History Museum (ID Trainers for the Future)
Penny	**Fletcher**	Royal Society of Biology
Neil	**Fletcher**	Buckinghamshire & Milton Keyes Environment Records Centre, Buckinghamshire Invertebrate Group, Buckinghamshire Bird Club
Claire	**Fowler**	Field Studies Council
Gill	**Frankling**	Field Studies Council (Bishops Wood Field Centre)
Steve	**Garland**	Tanyptera Trust
Joe	**Gray**	British Naturalists' Association, Hertfordshire Natural History Society, Royal Holloway (University of London)
Harry	**Green**	Worcestershire Wildlife Trust, Worcestershire Biological Records Centre, Worcestershire Recorders
Dave	**Green**	Wildlifowl & Wetlands Trust (London Wetlands Centre)
Jo	**Hall**	Field Studies Council (Margham Discovery Centre)
Beth	**Halski**	Plantlife
Shirley	**Hancock**	British Mycological Society, British Lichen Society, Field Studies Council
Brian	**Harding**	British Entomological & Natural History Society, Dipterists Forum, Linnean Society of London
Felicity	**Harris**	Plantlife
Martin	**Harvey**	Biological Records Centre
John	**Hatto**	N/A
Matt	**Hawes**	Field Studies Council (Bishops Wood Field Centre)
Wil	**Heeney**	Longhorn Beetle Recording Scheme
Katy	**Hillman**	Royal Society for the Protection of Birds
Vivien	**Hodge**	Surrey Fungus Study Group, British Mycological Society, Sussex Wildlife Trust
Lucy	**Hodson**	Royal Society for the Protection of Birds
Sholto	**Holdsworth**	Natural History Museum
Ian	**Holt**	Lesnes Abbey Woods (Bexley Council)
Martin	**Horlock**	Association of Local Environmental Records Centres, Norfolk Biodiversity Information Service
Pete	**Howarth**	London Natural History Society
Jim	**Howell**	Seaford Natural History Society
Tom	**Hunt**	Association of Local Environmental Records Centres
Rhona	**Jardine**	Field Studies Council (London Projects)
Paul	**Jenkins**	N/A
Jo	**Judge**	National Biodiversity Network
Andy	**Keay**	London Natural History Society
Imogen	**Kelly**	Royal Society for the Protection of Birds
Roger	**Kemp**	Butterfly Conservation, Royal Entomological Society, Botanical Society of Britain & Ireland
Colin	**Knight**	Butterfly Conservation – Sussex Branch
Jon	**Kudlick**	Royal Society of Biology
Simon	**Leather**	Harper Adams University
Dick	**Lister**	Botanical Society of Britain & Ireland, British Bryological Society, Berks Bucks and Oxon Wildlfe Trust
Maria	**Longley**	Greenspace Information for Greater London, National Forum for Biological Recording
Miranda	**Lowe**	Natural Sciences Collections Association (NatSCA)
Niki	**Lowndes**	Natural History Museum (ID Trainers for the Future)
Keith	**Lugg**	British Myriapod & Isopod Group, British Entomological & Natural History Society, Earthworm Society of Britain
Chloe	**Lumsden**	N/A
Jeanette	**Maddy**	N/A
Mick	**Massie**	London Natural History Society, British Entomological & Natural History Society, British Arachnological Society
Susan	**McCabe**	Abney Park Cemetery, Springfield Park User Group
Frances	**McCullagh**	Natural England, Botanical Society of Britain & Ireland, Shropshire Botanical Society
Luanne	**Meehitiya**	Birumingham Museum Collections Centre
Joanne	**Moore**	Lancashire Wildlife Trust Ithe Biodiverse Society project)
Olivia	**Morton**	N/A

Name		Affiliations
Deborah	**Needle**	Sylvanus llp, Birmingham Open Spaces Forum, Birmingham Trees for Life
Kathy	**Pain**	Natural History Museum
Anne	**Parouty**	N/A
Claire	**Parton**	Plantlife (Save Our Magnificent Meadows)
Jodey	**Peyton**	Biological Records Centre
Adrian	**Pickles**	Field Studies Council (Preston Montford Field Centre)
Ellen	**Pisolkar**	Highbury Park Friends, Wildlife Trust for Birmingham and the Black Country, Conchological Society
Saoirse	**Pottie**	Field Studies Council (Amersham Field Centre)
Oliver	**Prescott**	Biological Records Centre
Laura	**Quinlan**	Freshwater Habitats Trust (People, Ponds & Water)
Chris	**Raper**	Natural History Museum
Sue	**Rees Evans**	British Dragonfly Society, Shropshire Ecological Data Network
Jackie	**Rham**	Field Studies Council (Amersham Field Centre)
Helen	**Roberston**	Field Studies Council (London Projects)
Stuart	**Roberts**	Bee, Wasp & Ant Recording Society
Lucy	**Robinson**	Natural History Museum
Charles	**Roper**	Field Studies Council
Chloe	**Rose**	Natural History Museum (ID Trainers for the Future)
Helen	**Roy**	UK Ladybird Survey, Biological Records Centre
Mandy	**Rudd**	Greenspace Information for Greater London, Association of Local Environmental Record Centres
Peter	**Seccombe**	Red Kite Environment Ltd. (Back from the Brink)
Emma	**Sherlock**	Earthworm Society of Britain, Natural History Museum
Megan	**Shersby**	A Focus on Nature
Andy	**Slater**	EcoRecord, Birmingham & the Black Country Wildlife Trust
Matt	**Smith**	Bee, Wasp & Ant Recording Society
Dani	**Smith**	Field Studies Council (Amersham Field Centre)
Adrian	**Spalding**	British Entomological & Natural History Society
Leon	**Stone**	Freshwater Biological Association, Anglian Water, Field Studies Council
Richard	**Stott**	Friends of Avon Meadows, Worcestershire Recorders
Rachel	**Stroud**	National Biodiversity Network
Alan	**Stubbs**	Cranefly Recording Scheme, Buglife
Robin	**Sutton**	Field Studies Council
Marc	**Taylor**	British Entomollogical & Natural History Society
Carolyn	**Taylor**	RSPB Sandwell Valley
Ali	**Thomas**	Natural Histpry Museum
Sarah	**Tibbatts**	The Friends of Tower Hamlets Cemetery Park
Sue	**Townsend**	Field Studies Council
Sophie	**Trice**	Natural History Museum (ID Trainers for the Future)
Mike	**Turton**	British Dragonfly Society, Berkshire Invertebrate Group, Berkshire Reptile & Amphibian Group
John	**Tweddle**	Natural History Museum
Hannah	**Van Hesteren**	N/A
David	**Wall**	Botanical Society of Britain & Ireland, Birmingham and Black Country Botanical Group, Staffordshire Wildlife Trust
Simon	**Ward**	Field Studies Council (Juniper Hall Field Centre)
Mark	**Ward**	Field Studies Council
Claudia	**Watts**	London Natural History Society
Steph	**West**	Natural History Museum (ID Trainers for the Future)
Ashleigh	**Whiffin**	Silphidae Recording Scheme
Martin	**Willing**	The Conchological Society of Great Britain & Ireland
Rosemary	**Winnall**	Worcestershire Recorders, Wyre Forest Study Group
Simon	**Wood**	Worcestershire Biological Records Centre
Ben	**Worth**	Field Studies Council
Dan	**Wrench**	Shropshire Ecological Data Network
Jean	**Young**	Friends of Avon Meadows, Worcestershire Wildlife Trust, Worcestershire Biological Recorders
Andy	**Young**	Worcester Biological Records Centre