

Delivering for Invertebrates in Local Nature Recovery Strategies

A Guide for Responsible Authorities



Left: Narrow-headed Ant (*Formica exsecta*) © Alex Hyde/Back from the Brink. Right: Scolt Head © John Fielding

Local Nature Recovery Strategies (LNRS) provide the opportunity for responsible authorities to plan their conservation delivery priorities for many years to come. Done correctly, they will put wildlife at the core of decision making and help to restore thriving populations of invertebrates. Buglife’s guidance is intended to ensure that the LNRSs deliver on their ambition for invertebrates, by highlighting some of the key considerations and addressing the diversity and complexity of the data surrounding them.

Prioritising the needs of invertebrates in LNRSs also provides the opportunity to benefit other wildlife, and is an essential step to help reverse the downward trends for invertebrates that have been experienced in the UK. 1 in 3 invertebrate species included in the [2023 State of Nature Report](#) are declining in distribution. Both the diversity and abundance of insects is in decline – data collected by the [Bugs Matter](#) survey suggests that the abundance of flying insects has fallen by 64% between 2004 and 2022. The [State of the UK’s Butterflies 2022](#) report shows that 80% of butterflies in the UK have declined since the 1970s and in the last century, [twenty bee and wasp species have gone extinct in Britain](#).

Despite the ambitious goals of previous landscape-scale programmes, invertebrates have continued to decline, with many species suffering a retraction in their range and an

overall reduction in abundance. Invertebrates are vitally important to a healthy planet – from the food we eat to the birds and flowers we enjoy. It is more important than ever to make sure that invertebrates are at the heart of our nature recovery ambitions.

All English counties have their own special habitats and invertebrate assemblages which require careful consideration to make sure that priorities and measures are locally relevant. Local and national information, expertise and data are key to helping responsible authorities (RAs) to inform decision making. Unfortunately, Buglife itself isn’t able to provide tailored support and advice to all of the 48 RAs due to the time and resources this would require. However, the recommendations outlined in this document highlight the opportunities to properly incorporate invertebrates within LNRSs, to ensure the best conservation outcomes for this diverse range of animals.

Incorporating invertebrates into a LNRS

It is essential that a fit for purpose nature recovery strategy delivers for its most threatened species. Many invertebrate species have specific habitat requirements that often aren’t addressed when priorities and measures are focused solely on broad habitat types. Invertebrates often rely upon specific microhabitats and localised features or require a set of different habitats in close proximity to complete their lifecycle. The historic focus of landscape-scale strategies on broad habitats and the needs of other species groups has meant that many of our most threatened invertebrates have



Left: Freshwater invertebrate surveying © David Palmar. Right: Habitat mosaic at Canvey Wick Site of Special Scientific Interest, Essex © Steven Falk

continued to decline.

The published 'Species Recovery within Local Nature Recovery Strategies: Advice for Responsible Authorities' provides guidance to RAs to both identify and prioritise species in a consistent manner. Using defined criteria, the guidance proposes using local species data to identify threatened and priority species that are geographically and ecologically relevant, together with local expert knowledge to produce a 'species long list'. This long list is then refined down to a 'species priorities list' based on those that the LNRS can best deliver for, but includes both individual species and assemblages.

Accessing invertebrate data and expertise

Prioritising invertebrates can be a challenging task due to the number of species and the decentralised nature of both expertise and the data that is essential to decision making. For many invertebrate groups there are only a small number of national experts and the data for these groups often isn't held by or shared with Local Environmental Records Centres (LERC), but is with national recording schemes. As a result, relying solely on the data from LERCs could lead to species being overlooked - it is important for RAs to consider sourcing species data from

the network of invertebrate national recording schemes.

There are also many instances where county recorders, the recognised local expert and authority for a species, do not submit their data to LERCs.

Although LERC datasets often contain a wealth of data and are a central part of the species selection process, for many invertebrate groups it is common for LERC datasets to contain significant data gaps and unverified records. Basing decisions purely on this data runs the risk of species being inappropriately identified as a priority when they have actually not been recorded in the strategy area or are more common than records indicate. Conversely failing to get data from national recording schemes could lead to species worthy of prioritisation being overlooked if their records have not been shared with the LERC. To identify genuine local priorities, responsible authorities should ensure that they have captured the data and expertise not just of local naturalists, county recorders and data holders, but also of national ones, which are listed on the [Biological Records Centre's recording and monitoring schemes webpage](#).

What invertebrates to consider?

The species advice for RAs highlights the importance of considering species which have been assessed as threatened with extinction using the IUCN Red List criteria. It also acknowledges that many species have yet to be formally assessed but can be included where there is sufficient evidence to demonstrate, using the IUCN Red List criteria, that they are threatened with extinction. For many invertebrates there has not yet been a formal assessment, in fact there are often significant knowledge and recording gaps that make this assessment challenging.

It is important to consider the limitation of solely using data without assessments to prioritise invertebrates. Data might suggest, for example, that a species is rarer than experts suspect due to under recording, particularly for less surveyed groups or difficult to identify species. Similarly, the results of

Southern Damsel fly (*Coenagrion mercuriale*) © Gilles San Martin (CC BY-SA 2.0)





Left: Horrid Ground-weaver (*Nothophantes horridus*) © John Walters. Right: Freshwater Pearl Mussel (*Margaritifera margaritifera*) © Sue Scott

survey activity by a small number of experts in a geographical area may produce data that indicates a species is more reliant on a geographic area than is the case. Conversely the data alone may not reflect the importance of a geographic area to the future of a species properly, or capture changes in a species' distribution over time. Verification of invertebrate data in prioritising species, to ensure that a species is genuinely present locally and a potential priority is also essential. Coupled with the many complex life histories of invertebrates, it is important to not rely on data alone, but to review lists with recognised taxon experts, both locally and nationally.

There are of course some species for which there is a well-established, recognised geographic focus to their distribution, making it essential that they are prioritised. For example, Freshwater Pearl Mussel (*Margaritifera margaritifera*) has an English stronghold in Cumbria and the Six-banded Nomad Bee (*Nomada sexfasciata*) is now only found in South Devon.

In 2023, Buglife published '[Britain's Endemic Invertebrates](#)', revealing that half of Great Britain's most special species are at risk of global extinction. These are species for which there is an international responsibility to protect them, so it is essential that they are properly considered in the relevant LNRS areas. This includes species such as the Critically Endangered Horrid Ground-weaver (*Nothophantes horridus*) known only from a handful of Plymouth limestone quarries, but also species with a more widespread but still limited distributions such as the Vulnerable Newbery's Rove Beetle (*Thinobius newberyi*) which is found in western and northern Britain, including Cumbria.

[Identifying assemblages using Pantheon](#)

The published species advice for RAs helpfully highlights the importance of considering species assemblages. This can be a particularly useful approach for invertebrates,

where there are challenges in identifying and recording individual species. [Pantheon](#), an analytical tool developed by Natural England and the Centre for Ecology & Hydrology, can help to identify invertebrate assemblages of conservation importance using imported species lists. It can provide the level of detail required to properly identify priorities. It reveals the specific associations of invertebrates found in broad habitats. For example, species of running water habitats can be assigned as associated with bankside trees & river margins; riparian sand & shingle; seepages; fast flowing streams & waterfalls; slow-flowing rivers; mud litter; or wetland vegetation. Or for decaying wood habitats it might highlight broadleaved including sapwood & bark decay; heartwood decay; epiphyte fauna; and roots & underground wood. This can provide RAs with the detailed assemblages and habitat associations to incorporate invertebrates into their LNRS.

[Developing species measures](#)

Once a species priorities list has been produced, it is important to consider how specific measures to benefit each species might be defined. However, it is also possible to incorporate species measures into habitats in the LNRS process, as an integral part of ensuring that habitats are of a

Decaying wood microhabitat © Alex Hyde/Back from the Brink





Red-horned Cardinal Click Beetle (*Ampedus rufipennis*) © Christophe Quintin

high quality. As many invertebrates and assemblages have specific associations with habitat features, species measures could be identified and linked to microhabitats and features within broad habitats. This can help to ensure that habitats are of a high quality for biodiversity and deliver for the full range of species associated with them. A poorly managed or low quality habitat will only support a proportion of the invertebrate species that are associated with a habitat type. On the other hand, a well-managed and high-quality habitat type will provide the full range of microhabitats, niches and opportunities to support more species, often including those of conservation concern. It may help to identify flagship species for specific microhabitats, that can act as an umbrella species for assemblages.

For example, where Purbeck Mason Wasp (*Pseudepipona herrichii*) may be identified as a priority in its Dorset range, measures identified to benefit the species could include maintaining bare ground in its heathland habitats. This can help to deliver for other species within the bare ground assemblage but also make sure that lowland heathland habitat delivery is of a high quality for invertebrates.

Similarly were the deadwood specialist Red-horned Cardinal Click Beetle (*Ampedus rufipennis*) to be identified as a priority in its range, measures may be linked to wood pasture habitats. Suitable measures would be to protect old trees, encourage trees to mature and support white wood rot, to plan for future mature trees, and to encourage Hawthorn for adult feeding. These measures would also benefit a suite of other species within the deadwood assemblage.

Recommendations

- In addition to sourcing data from LERCs, source data from relevant county recorders and the full suite of invertebrate recording schemes: <https://www.brc.ac.uk/>

recording-schemes.

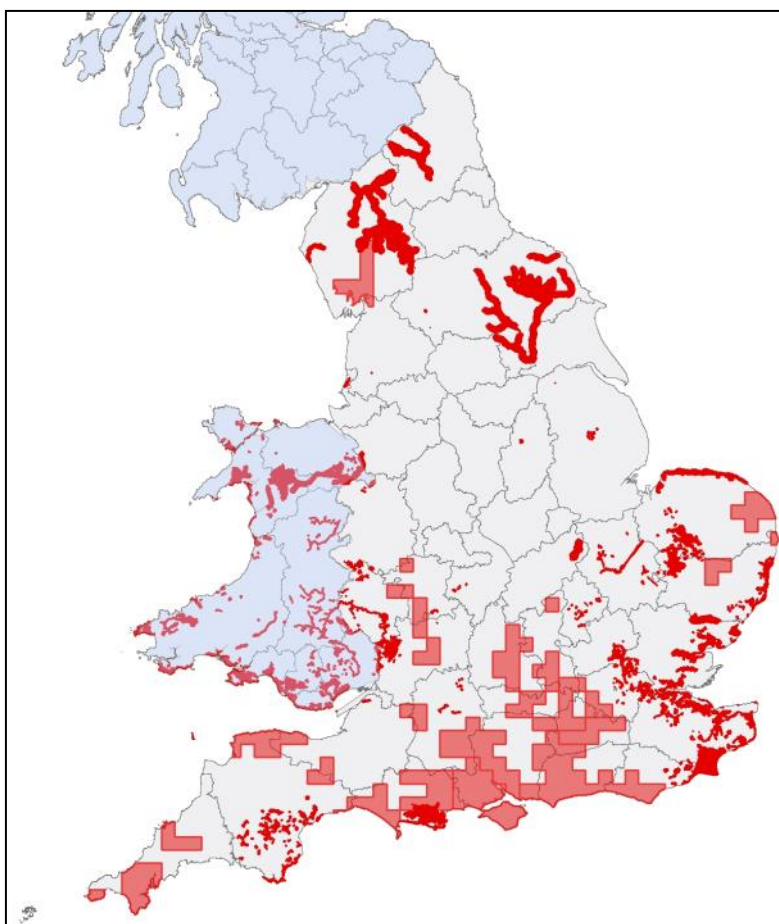
- When a provisional long list of invertebrate species is produced, contact the relevant species or species group experts to scrutinise the list to ensure that the species records obtained are accurate and that the species is a genuine conservation priority.
- Consider how [Pantheon](#) outputs might help to identify assemblages of species that can link to prioritised species lists.
- Measures for prioritised species and assemblages should be linked to broad habitats to ensure that not only are reasonable measures set for species, but that they relate to the eventual quality of habitat delivered through the LNRS.

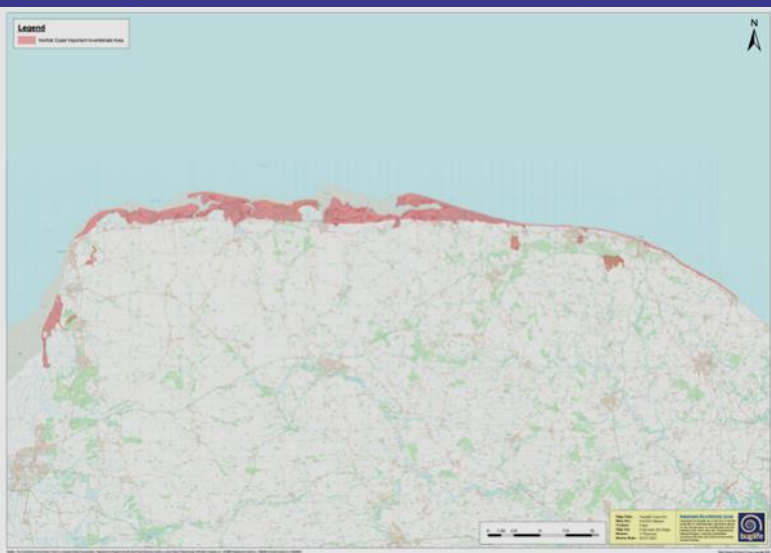
Important Invertebrate Areas

[Important Invertebrate Areas](#) (IIAs) are places that are home to nationally or internationally significant invertebrate populations and their habitats. They have been identified using the most up-to-date verified data available - over 45 million records from [over 80 national expert recording schemes](#). They support some of our most threatened species, vulnerable habitats and unique assemblages of invertebrates.

IIAs are a vital tool that can direct and prioritise conservation efforts for invertebrates and ensure better decisions are

Map of Important Invertebrate Areas showing both unmapped broad-scale areas and the fine-scale mapped network as of December 2023





Left: Fine-scale map of the Norfolk Coast Important Invertebrate Area. Right: Three-banded Wasp-cuckoo (*Nysson interruptus*), a Norfolk Coast IIA qualifying species © Nick Owens

made to help us restore nature. One aim of the IIA project is to make complex information on invertebrates understandable, useable, and readily accessible. This will ensure that everyone is able to better understand key habitats and landscapes for invertebrates and help to make better decisions for their future. However, it is important to remember that habitats outside of IIAs can still be home to rare and threatened invertebrates, including conservation priorities within the LNRS.

IIAs have been identified for either supporting one of our rarest and most threatened species, meaning there is a special responsibility to act and conserve them, or for supporting a nationally important assemblage of rare or threatened species. A current map of IIAs for all of England can be found on the [Buglife website](#), showing the broad-scale hectad (10km x 10km) map of IIAs for all of England,

and those which have now been mapped at a finer scale. The broad-scale IIAs are being mapped to a fine-scale one-by-one, working with local experts to review local post-1990 invertebrate records and site information to map the core areas supporting threatened invertebrates.

Each fine-scale mapped IIA is accompanied by a downloadable profile document that characterises its habitats and importance to invertebrates. The profile also flags up key species and assemblages as well as the local threats that face the IIA's invertebrates and what opportunities there are to improve the landscape for invertebrates. Only some profiles have been completed to date and the full suite will take a number of years, but the IIA webmap will be updated regularly as these are completed.

IIA fine-scale maps and profiles, including GIS files can be downloaded from the [Buglife IIA webpage](#), which includes further information on IIAs, how they were mapped and their potential uses.

IIAs can support the LNRS mapping process by identifying invertebrate hotspots and also identifying key invertebrate species, assemblages and specific habitats that are important within landscapes. This can help to direct where conservation action could benefit invertebrates by targeting habitat creation or restoration within existing sites or near to existing sites to improve connectivity to help populations to expand and become more resilient.

IIAs can help fulfil the LNRS guidelines of identifying “habitats of local importance, including ones that support scarce or declining species” and “the species or groups of species for which the strategy area is, or could feasibly be, of national importance”. The guidelines also recommend using IIAs to identify opportunities to contribute to national species recovery.

Recommendations

Wye Valley & Forest of Dean Important Invertebrate Area profile

IMPORTANT INVERTEBRATE AREA PROFILE

Wye Valley and Forest of Dean

The Wye Valley and Forest of Dean IIA covers four different counties across both sides of the Wales-England border. It includes a considerable stretch of the River Wye and some of its tributaries between the village of Llanidloes in Powys, passing via Hereford and turning south through the Wye Valley AONB, eventually reaching the Upper Severn estuary at Chepstow in Monmouthshire. The IIA also covers a large portion of the Forest of Dean in Gloucestershire.

The River Wye's varied history, topography and underlying geology give rise to a huge number of important habitats for invertebrates along its course – from fast-flowing waters in the deep valleys and gorges, slow currents in its impressive meanders, to stinging, muddy and peaty areas together with varied cliff habitats along its banks. The river is a home to a number of globally and internationally threatened invertebrates including the Depressed River Mussel (*Pseudomus muscipalensis*), Freshwater Pearl Mussel (*Margaritifera margaritifera*) and White-clawed Crayfish (*Austropotamobius pallasi*). It supports over 20 other rare aquatic or semi-aquatic invertebrates including an assemblage of rifle, water penny and longhorned water beetles, caddisfly and damselfly nymphs and caddisflies. The adjacent wetland sites support species like the pond-dwelling

European Medicinal Leech (*Hirudo medicinalis*) or the still-headed assassin bug (long-legged fly *Hemiscapha fulvicollis*). Grassy habitats around the river are also of high importance, including open woodland rides and limestone grassland and cliffs, supporting species like the Downland Vireo (*Vireo olivaceus*). Critically Endangered dung beetle *Aphodius pumilio* and tube-dwelling spider *Agelena* *adriatica*.

A couple of Sites of Special Scientific Interest (SSSI) in Herefordshire designated for their ancient wood pasture and woodland habitats deserve a special

Endangered dung beetle *Aphodius pumilio*

It supports an assemblage of nationally important invertebrates including the English (English) *Agelena*, an air-breathing spider (spider), a caddisfly *Adicella plicicornis*, freshwater beetle (*Coranus monilis*), and freshwater damselfly (*Isotriaena euryptera*). Nationally, the *Agelena* beetle can only be found on a few sites in this IIA. Species like the Yellow Mantis (*Mantispa obscura*), the Little (dark) *Agelena* (*Agelena obscura*), and the Little (dark) *Agelena* (*Agelena obscura*) are restricted to the English-Wales border. The area is also a stronghold for several other species found only in a handful of other counties, the micro-caddisfly *Hydropsyche* *stans*, the stonefly *Phaenocarpa* *stans*, and the stonefly *Phaenocarpa* *stans*.

Wye Valley and Forest of Dean IIA's diverse habitats from river, riparian and cliff systems, with former quarries and mines, to grasslands. Whilst parts of the IIA are under a high protection (e.g. SSSI, SAC), there are also portions that are outside of any special.

ats for rare invertebrates in the IIA. Both the Wye Valley and Forest of Dean IIA's diverse habitats and microhabitats for the selected species, and listed a selection of species associated with them.

- Critically Endangered White-clawed Crayfish (*Austropotamobius pallasi*)
- Globally Vulnerable Depressed River Mussel (*Pseudomus muscipalensis*)
- Critically Endangered Western Wood-vase Mothfly (*Myzaspota potans*)

- Responsible Authorities should utilise any fine-scale mapped IIAs and profiles to support the mapping and prioritisation of key sites for nature conservation and recovery.
- IIA qualifying species and assemblages can be used to help identify LNRS species priorities.
- IIAs also provide information on key habitats for invertebrates, which can be used to identify where an LNRS could help improve the quality, extent and connectivity of these habitats.

Neglected habitats and features

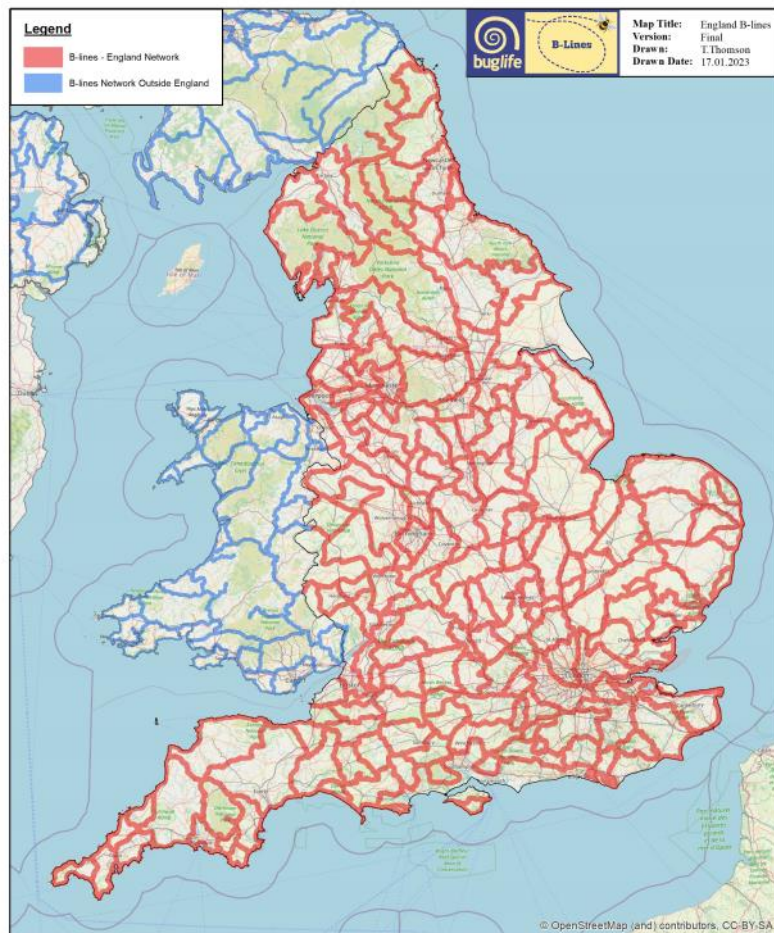
Many invertebrates are associated with specific habitats and features that are not always addressed by broad habitat types and targets. This includes [springs and seepages](#), seasonally wet areas, temporary rivers, bare ground and exposures, [exposed riverine sediments](#), [dead or decaying wood](#), [soft rock cliffs](#) or variations in substrate and topography. They can be habitats in their own right or localised features within larger recognisable habitats.

Diverse invertebrates and assemblages are also often associated with specific vegetation structures or habitat mosaics, often only created under appropriate conservation management regimes. It is important to not just consider broad habitats, but how mosaics of traditional habitats can be targets for habitat restoration. Well-known habitats such as chalk grassland, heathland, coastal grazing marsh and wood pasture all have specialist invertebrates that require specific management approaches and subsequent habitat features to reach their full potential to support nationally rare and scarce species.

Recommendations

- When reviewing and setting measures for broad

Buglife chalk downland mosaic resources



habitats, identify and incorporate the microhabitats and features required for key invertebrate species.

- Consider the specific requirements of all priority invertebrates identified by the LNRS process and ensure they are appropriately linked to associated broad habitat measures.
- Review how habitat measures for important habitats such as [chalk grassland](#), [heathland](#), [coastal grazing marsh](#) and [wood pasture](#) can include mosaic features to maximise their value for invertebrates. As with species prioritisation, identifying species which can act as umbrella species for assemblages and to cover the full range of microhabitats can help to drive high quality habitat mosaics.

B-Lines

[B-Lines](#) is a landscape-scale solution to reverse the decline in pollinating insects. This is a bold and ambitious programme to identify opportunities for the creation and restoration of a national network of wildflower-rich habitats. B-Lines is a network of wildflower insect superhighways, mapped and delivered through partnerships. They are designed to reconnect our landscapes, enabling pollinators and other wildlife to move freely, and supporting nature's recovery.

B-Lines are 3km wide linear pathways, connecting the best remaining wildflower-rich habitats, including Sites of Special

Scientific Interest, Local Wildlife Sites, Local Nature Reserves, nature reserves and Priority Habitats. [B-Lines are mapped](#) at a regional or county level, using national and local datasets and agreed by a partnership of experts including conservation partners, local authorities and other groups who understand the landscape. The aim is to map the best remaining wildflower-rich habitats and the best connections between them for pollinators, while considering where the best opportunities to restore habitats might be and how to link to neighbouring regions.

B-Lines is a shared endeavour - a [landscape-scale biodiversity initiative](#) where all landowners and managers can prioritise their wildflower creation and restoration work to contribute to a nature network to reverse pollinator declines. When 10% of the B-Lines network is filled with patches of flower-rich habitat, it starts to provide the essential connectivity that pollinators and other wildlife need to thrive in the landscape.

The [England B-Lines map network](#) was completed in 2020 thanks to funding from Defra, to give a complete network to help direct action for pollinators. Its success has seen it adopted by county councils, wildlife trusts, water companies, businesses and road and rail infrastructure companies to help drive and guide their biodiversity contributions. B-lines have also proven to be popular among local communities, determined to help the pollinators in their local areas, making them ideal for communicating and gathering support for the delivery of LNRS measures.

B-Lines can help to prioritise areas for restoration of flower-rich broad habitats to help them best deliver for pollinator

species and assemblages. They can be used to identify the best connections to restore habitat types, to coordinate delivery with multiple habitats and to identify the best connectivity benefits for pollinators. In many parts of England, B-Lines habitat creation and restoration works are already underway.

B-Lines delivery can also be a useful delivery measure for specific pollinator species or assemblages that are identified as LNRS priorities.

[Recommendations](#)

- [Download the B-Lines habitat network](#) to examine the overlay with mapped habitats to identify how the network can help to focus or prioritise efforts to increase connectivity.
- B-Lines has the potential to cross habitat types and stakeholders to coordinate and prioritise delivery for pollinators- consider how B-Lines could help instigate future LNRS habitat delivery.
- LNRSs should identify pollinators in their species priorities list that would benefit from habitat restoration within B-Lines and identify B-Lines delivery as a key measure where appropriate.

Author: Jamie Robins

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Left: Wildflower-rich grassland created within B-Lines in Ryedale © Leanna Dixon. Right: Yellow-barred Peat Hoverfly (*Sericomomyia silentis*) © Steven Falk.



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