



Good planning practice for invertebrates: surveys

At least 65% of all species on the planet are invertebrates. There are more than 32,000 terrestrial and freshwater and 7,000 marine species in the UK alone, and many are critically endangered. Due to the vital role that insects have underpinning many day to day ecological processes, it is essential that invertebrates are considered during planning decisions. This will ensure development impacts are avoided and mitigated as necessary.

Biodiversity is a key planning consideration so applications must take account of it—this includes invertebrates as well as other wildlife. Certain invertebrates are either legally protected, identified as a priority species for conservation action and/or are rare and endangered. These are material considerations in a planning decision. It is important for Planning Authorities to have context and understanding to base planning decisions on, ensuring appropriate ecological assessment is carried out in advance of a decision being made. Crucially this will help to ensure that appropriate mitigation is planned if a development is to go ahead without unforeseen delay.

When to ask for invertebrate surveys

Government aims to minimise impacts on biodiversity, provide net gains in biodiversity and contribute to halting the overall decline in biodiversity are outlined in planning policy.



Flower-rich grassland

Consequently if a development is likely to impact on wildlife, a survey is required to identify what is of value on the development site and how the new development will affect it.

Not all sites are valuable for invertebrates and a preliminary assessment can easily be done to establish sites that could be important. Early in the process there should be a data search to find out what species of invertebrates have been recorded locally. The Local Record Centre should be able to provide data or advise on appropriate county contacts.

A scoping visit should be undertaken to gauge the likely invertebrate interest of the site. During this visit an

experienced invertebrate specialist will assess the various habitat features on the site and decide whether a more detailed survey is required. A detailed survey of invertebrate should be carried out if:

1. Species of conservation interest (Box 1) may be affected or, where habitats similar to nearby areas of known invertebrate interest are within the development area.
2. A Phase 1 habitat survey (extended where appropriate), part of application preparation, has identified features or habitats of significant value to invertebrates (Box 2).

Box 1: Species of conservation interest

Important invertebrates which can be identified by the criteria below, are a sign a site may be ecologically rich.

- Any 'priority' species of conservation importance found onsite. These are listed under Natural Environment and Rural Communities Act (Section 41, England and Section 42 Wales), Section 2 of the Nature Conservation Act Scotland or Section 3 of the Wildlife and Natural Environment Act (Northern Ireland).
- Any legally protected invertebrate.
- Any Red Data Book, Nationally or Regionally Notable species.

What habitat? Which survey?

It is important to ensure the right survey is carried out at the right time of year for the right species. This will help to prevent delays and meet the wildlife protection aims of national planning policies. **If any of the habitats below are present alone or in combination an invertebrate study should be carried out.**

Previously developed or 'brownfield' land can be incredibly important for wildlife and may support as many rare and endangered invertebrate species as ancient woodland. They often have a patchwork of habitats such as bare ground, flower-rich grassland, wetland and heathland. This, combined with a low nutrient content of the soil which prevents fast growing plant species becoming dominant, provides a continuity of resources for invertebrates and other wildlife throughout the season.

Suggested surveys: Defra open mosaic habitat assessment methodology, (Lush et al 2013) bees and wasps (aculeate Hymenoptera), butterflies and moths (Lepidoptera), flies (Diptera, selected groups) and beetles (Coleoptera)



High value brownfield land © C. Watts



Wetland habitat

Areas of flower-rich grassland able to flower without interruption, usually without mowing or cutting. These sites might not contain rare plants, often there will be more common species such as thistles, hogweed, Bird's foot trefoil, clovers and vetches, which provide abundant nectar and pollen sources for many insects.

Suggested surveys: Bees and wasps (aculeate Hymenoptera), beetles (Coleoptera), grasshopper and crickets (Orthoptera), moths and butterflies (Lepidoptera), flies (Diptera, selected groups)

Ponds and wet areas includes damp flushes, seepage lines, pools, streams, rivers, wet woodland, coastal habitats and seasonally flooded areas. High numbers of invertebrates are associated with these habitats and their importance shouldn't be underestimated.

Suggested surveys: Aquatic invertebrates, particularly dragonflies and damselflies (Odonata), water beetles (Coleoptera), flies (Diptera, selected groups), moths (Lepidoptera)

Scrubland, hedgerows and scrubby grassland provide food, nesting areas, perches and shelter. Scrub is of particular value where there are a number of habitats in close proximity (such as flower-rich grassland, woodland or wetland).

Suggested surveys: Beetles (Coleoptera), flies (Diptera, selected groups), moths (Lepidoptera, selected groups)

Mature and veteran trees can be a very important for invertebrates due to large quantities of dead and decaying wood.

Trees with hollowed trunks are the most valuable to invertebrates and may occur along hedgerows, within parklands, orchards, wood-pasture, woodlands and in commercial plantations.

Suggested surveys: Beetles (Coleoptera), flies (Diptera, selected groups), moths and butterflies (Lepidoptera)

Mosaics and combinations of these habitats can be exceptionally important and can often increase the interest of a single habitat as one site may not provide all of the features that invertebrates need to complete their lifecycle. For example dragonfly larvae live in streams or pools but use tall grassland and scrub for hunting. Wet grassland will become more interesting as it transitions into a drier grassland as there are different niches for invertebrates to exploit.

Habitats of 'conservation priority' such as peat bogs, coastal vegetated shingle or lowland heathland can support rare and endangered invertebrates. Refer to the [Buglife website](#) for more information about this.



Ancient tree

What should be included in a report?

In most invertebrate surveys it is better to have specific information on carefully chosen groups rather than information on a broad spectrum of invertebrate families. It is also likely that a surveyor will have a specialism in a certain area such as spiders, flies or beetles and may not be skilled in other groups of species and will subcontract out some of the work.

Although not an exhaustive list, if a survey is able to provide the following it will help to assess a site's value for invertebrates and the impact a development would have. This information is necessary if a mitigation strategy is to be developed.

- A description of methodologies and information on which groups have been targeted and why.
- The name of the surveyor and identifiers should be provided as different surveyors have different specialities, and it can help to inform the accuracy of the work.
- Clear descriptions of habitats, highlighting important features such as wet areas or low nutrient substrates. Using photos with notes helps to simply describe features and a their location should be accurately marked on a map.
- A list of all species on site, not just rarities. List alphabetically for non invertebrate specialists but also broken into taxonomic groups. Putting the data in a spreadsheet can be helpful as it allows investigation of data.
- Signposting the rarer species in bold and red aids clarity. Each species of interest should have a written account to provide an up to date assessment of rarity and distribution. There should also be information on how the rare species are using the site e.g. in which areas they are nesting or foraging?

Box 3: Common survey report pitfalls:

- Insufficient survey data from too few visits or inexperienced surveyors. Leads to inaccurate assessment of impacts, and poor evaluation of sites.
- Misidentification of open mosaic habitat on previously developed land.
- Poor selection of target species.
- Surveys carried out at wrong time of year (Box 4) or in poor weather. Invertebrates like sun, if a survey has been carried out when it was cold or wet this could have affected the results. Surveying at the wrong time of year means that species may not be active and incorrectly dismissed as not present.
- Not assessing impacts of a development fully. The loss of just one critical requirement of a species (e.g. a certain food plant, or nesting area) may seem a small overall impact but it could result in the extinction of a species.
- Not distinguishing species that are just 'passing through' a site rather than breeding or foraging there.
- Lack of photos to help explain issues, use of jargon and unclear summaries.
- Failure to keep voucher specimens to support important records.
- Inappropriate mitigation e.g. not including mitigation that relates to the type of habitat to be lost or developing a mitigation strategy based on poor species data.



Brown-banded carder bee
(*Bombus humilis*)



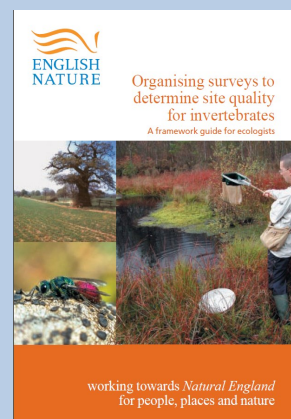
Blue ground beetle
(*Carabus intricatus*)

Box 3: Survey guidance

Buglife recommends that all invertebrate surveys are carried out according to the guidelines in '*Organising surveys to determine site quality for invertebrates*' which is available on the Natural England (previously English Nature) website.

If a site has been previously developed or classed as 'brownfield' it may contain the priority habitat 'Open mosaic on previously developed land'. There is a standard methodology for surveying these sites - please refer to the Buglife guide '[Identifying open mosaic habitats](#)' for further information on this.

The Natural England guide '*Surveying Terrestrial and Freshwater Invertebrates for Conservation and Evaluation*' is a more in depth guide on how and when to survey for invertebrates and interpreting survey findings.

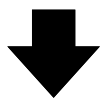


- A report should contain information on species and groups of species that occur together and require similar habitat or ecological features (known as assemblages). Identifying assemblages of species helps to assess which parts or features of a site are important and plan mitigation.
- Provide all data – full scientific name, recorder, location, date, grid reference, weather conditions. This will indicate if the survey has been carried out at the right time of year or if recent weather conditions had an impact e.g. drought or inclement weather.
- Ensure that the site's quality, including comparisons with other sites, has been properly defined. There should also be a list of factors that affect site quality.

What to do if a site is of high value

The mitigation hierarchy of 'avoid, mitigate and compensate' should always be followed:

Avoid high value sites and important features within development sites. Assessing a site's value as early in the process as possible (i.e. before allocating a site for development in the Local Plan) will help to avoid delays later in the process and to reduce the impact of the development.



Mitigate if it is not possible to avoid impact. Look at reducing the impact of a development. Please have a look at Buglife's mitigation series to find out more about this. You can also use the principles of invertebrate mitigation to help increase the potential wildlife value of a new development. This could include creating flower-rich areas, patches of sunny bare ground or a biodiverse green roof.



Compensate if not possible to mitigate. If a development is critical and there is genuinely no other alternative location, compensation can be looked at. The potential for Biodiversity Offsetting to play a role in this is currently being assessed.

If invertebrates are thought about early enough when designing a development there are many ways to avoid and mitigate impacts and it does not have to prevent a development from going ahead.

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Box 4: Timing of surveys

Surveys for terrestrial insects and most other invertebrates should be **carried out between April and September, with adjustment for local weather conditions and latitudes.**



Small scabious bee (*Andrena marginata*)

There should be a number of visits over this time period, especially if several different groups of species are being surveyed—for example the Small scabious bee *Andrena marginata* (above) is usually found on Devil's bit scabious in late August or early September whereas you will only find Grizzled skipper (below) flying in late April or May. A poor spring site could easily be an exceptional summer site and as a result some sites will need a May/June visit as well as an early summer and late summer visit.



Grizzled skipper (*Pyrgus malvae*)

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Natural England guidelines specify that an 'average' site which is between 10 and 50 hectares should have between three and seven days of field work, three and seven days of identification and then two to five days of report writing. A day of

Suggested further information sources:

www.buglife.org.uk/brownfield-hub

Drake C.M., Lott, D.A., Alexander, K.N.A and Webb, J. (2007) Surveying Terrestrial and Freshwater Invertebrates for Conservation and Evaluation. Natural England Research Report NERR005.

Lush M.J., Kirby P. and Shepherd P. (2013) Open Mosaic Habitat Survey Handbook .


Natural England (2005) Organising surveys to determine site quality for invertebrates.

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