

Minibeasts

in the garden



working towards *Natural England*
for people, places and nature

Gardens & minibeast conservation



By far the most numerous and diverse of animals, both on the planet and in the garden, are the minibeasts - invertebrates. They

include spiders, snails,

woodlice, worms,

millepedes and

centipedes, false

scorpions, mites,

earthworms and, of

course, the ever-abundant insects.



Cardinal beetle

Gardens are ideal for minibeasts, full of useful microhabitats like ponds, compost heaps, rockeries, flower borders and shrubberies that mimic good examples of natural habitats. Unlike much of the countryside, gardens provide a continuous habitat, separated only by hedges and fences and are havens for our smaller wildlife. Some rare species, such as the impressive stag beetle, are now commoner in gardens than in the wider countryside.

Thousands of minibeast species inhabit gardens and it is easy to find scores in a single day. A fifteen-year study of a typical Leicester garden found over 2,100 species. Some only turned up very occasionally, but others were long-time residents.

Sadly, some people don't appreciate the wealth of wildlife on their doorstep, regarding minibeasts with fear and revulsion, or all as pests. However, it is just a tiny handful of creatures that bite, sting or ravage our plants, and these have given the rest a bad name.

Minibeasts are vital in the smooth running of both the garden and the world. They pollinate crops and flowers, tidy up the remains of dead plants and animals, and are vital links in the food-chain which includes other favourite garden species - the birds, mammals, amphibians and reptiles.

Minibeasts are fascinating and beautiful creatures. Encouraging and studying them in the garden is an educational and highly addictive pursuit which brings a wider understanding of how the living world works. It also makes a real contribution to their conservation.

Foodplants - minibeast restaurants and cafés

Many minibeasts eat the leaves, stems, flowers, even the wood of garden plants. Lots of attractive butterflies, moths, bugs and beetles



Sycamore moth caterpillar

will take advantage of the plants in our gardens. It's worth increasing the value of the garden by using plants they can use, avoiding those that attract pests. Most minibeasts simply make the odd hole in a leaf here and there, mine the occasional stem or suck a little sap and are not really nuisances.

Native or not?

Books on gardening for wildlife stress the need for native plant species to attract insects. While this is sound, it's not necessary to fill your garden entirely with wildflowers to encourage attractive plant-eating species. You can still be a plant enthusiast and have a host of interesting minibeasts in the garden. Many garden plants are closely related to our native wild plants and are equally acceptable as foodplants, despite their garden pedigree and showy flowers. Generally, the more similar a plant is to our native species' growth-form and leaf texture, the more likely it is to support plant-eating insects. Exotic plants, perhaps with thick waxy leaves, dense woolly hairs or unusually pungent foliage, are less likely to support many species, though there are often surprises as to who will eat what.



Shield bug



Picture-winged fly

Many insects prefer a single variety of plant

Generalists & specialists

Many plant-eating insects are generalists on a wide variety of plants, usually of a particular growth form. Some feed on foliage of shrubs or trees, others on herbaceous plants, and some on grassy plants. Where plants grow can be very influential. As a rule, more minibeasts prefer foodplants growing in sunshine than in shade and plants at the very edge of the border or shrubbery are favourites.

Plenty of minibeasts are, however, highly specific to a few or even a single species and plenty of plants have species that are found solely on them. For example, brimstone butterfly caterpillars feed only on buckthorns, which are rarely grown in gardens. Small tortoiseshell and peacock caterpillars and a host of other species, feed only on nettles. Not every

gardener wants lots of nettles and it's worth bearing in mind that the butterflies only use nettles in full sunshine. Keeping that patch in the shady area behind the garden shed won't do - you will need to sacrifice a prime bit of border if you want them to breed. A good idea might be to check out the local area - there are usually patches of nettles around somewhere - and then persuade the local authority to leave them for the butterflies.



Peacock caterpillars on nettles - detail: peacock butterfly



Figwort sawfly

It can be fun to grow a particular native plant (or closely related species) that supports a wide variety or just a particular 'target' species and see what turns up. Good plants to try are birds-foot trefoil, verbascums, figworts, birches, willows and poplars (remember that the last two make sizable trees so be careful where you put them).



Mullein moth caterpillar

Flowers minibeast bars

Probably the most valuable feature of gardens for the most numerous minibeasts - the insects - is an abundance of flowers.



Example of good garden border



Soldier beetle

After all, they evolved specifically to attract insects and nectar is their main energy source and protein in pollen is vital for eggs. Many adult insects, regardless of what they eat as larvae, visit flowers as their only source of food. Others use flowers as territory markers or meeting and mating places or even lairs from which to catch other flower-visiting species. Some crab spiders, for example, ‘mug’ unsuspecting visitors, changing colour to match that of the flower.



Crab spider

What sort of flowers are best for minibeasts?

Open structures

The widest variety of insects is attracted to flowers with an open, flat structure which allows access to the nectar for insects without specialised mouthparts.

Particularly valuable is the rose family such as hawthorns, crab apples, *Sorbus* & *Rubus* species and potentillas (the best roses are the open-flowered, single varieties). The saxifrage family, such as saxifrages, heucheras and astilbes, the stonecrop family (ice-plant and other *Sedum* species), and the umbel family; angelica, lovage, fennel (and bolted



Hoverfly on Californian poppy

carrots and parsnips), are also particularly good. There are similar-structured flowers in many families and it soon becomes easy to get the ‘jizz’ of what is likely to be a good insect plant.



Bumblebee in garden self-heal

Tubes for bees

Tubular or bell-shaped flowers cater for a more specialised clientele. Snapdragons, foxgloves, penstemons, campanulas, ericas, and members of the pea and mint families like broom, clover, *Lamium* and *Prunella* species are all excellent for attracting bumblebees, solitary bees and the domestic honey bee. While most bees also visit the more open flowers, some specialise in tubular flowers.

A mixture

Some plants mass together tiny tubular flowers, providing a whole carpet of nectar sources, loved by butterflies and moths and many other insects. Buddleias, valerians, hebes, mints and marjoram, as well as the whole of the daisy family are excellent. Daisies provide an open 'landing stage' of petals and central 'button' of nectar sources over a long period. Especially valuable are achilleas, goldenrods, asters, and almost anything with the typical daisy structure.



Ivy blossom – detail: nectaring insects

Flowers through the year

Aim to provide a good variety of flowers throughout most of the year.

Overwintering queen bumblebees, drone flies, small tortoiseshell and brimstone butterflies rely on late-flowering

Michaelmas daisies, ice plants and ivies. On emerging in early spring, they use early-flowering hellebores, narcissi, dornicums, viburnums and *Prunus* species.



Thick-legged flower beetle on *Geranium*

Beware of doubles

Don't fill the garden with 'double' or 'flore pleno' varieties. While attractive, few provide nectar and pollen and what little there is may be difficult for insects to get to amongst a mass of doubled-up petals.

A nectar surprise

Some garden plants provide nectar in surprising places - a cherry-laurel can swarm with nectaring insects, even when not in flower. Look carefully underneath younger leaves for 'extra-floral nectaries' - small green pads at the base of the leaf veins which in particular attract ants, parasitic wasps and flies.

Cover - minibeast hide & seek

Most garden minibeasts need somewhere to hide at certain times, either to sleep, escape from predators or shelter from the rain or sun.

Cover is very important so don't be too tidy in the garden. Dense vegetation, tussocky grasses or sedges and plants with a 'rosette' of leaves that minibeasts can get beneath; all offer good retreats. Dead leaves, grass thatch, old seed heads and hollow stems are all good hideaway places. Think minibeast before tidying these away and keep some dead material throughout the winter.

Winter retreats

Many minibeasts hibernate. Cover is essential, and many species overwinter in our gardens. Stones, bits of wood, loose bark, fissured bark on older trees (flaky bark of old apple trees is excellent) - anything that creatures can get into or underneath is valuable, as is the cooler compost heap in winter. Evergreens with tight-packed leaves or needles provide

overwintering places, as does a good cover of ivy on a wall or tree. Some minibeasts overwinter deep in the

seed heads of their foodplant and it's best not to remove last year's seed heads until late spring or early summer to allow them to make it through.

Some butterflies, moths, lacewings, ladybirds, droneflies, queen bumblebees, wasps and hornets seek out cool, undisturbed spots to pass the winter. They may come indoors, in sheds, garages or spare rooms. If disturbed or they become too warm, they wake and rapidly use up their reserves and don't make it through the winter. If you do need to heat a spare room that has overwintering minibeasts, move them to another cool, protected location, disturbing them as little as possible.



Woodlouse spider and pill woodlouse



Hibernating herald moth



Moulting centipede



Bare soil and stone is a habitat in its own right

Hot-spots minibeast sun-bathers

Minibeasts are, almost without exception, 'cold blooded'. This does not mean they work at lower body temperatures than us - some actually have a higher temperature than we do. However they must get their body heat from external sources rather from their food. Little warm spots in the garden are therefore vital for minibeasts. They need not be very large - but they are important.

Basking red admiral

Sun-baked bare surfaces

Any bare ground, rock or wood in full sunshine rapidly warms up and may be 10⁰ C hotter than planted areas. Bare soil in the vegetable patch, concrete paths, rockery rocks, house or shed walls, especially when facing roughly south, are regular sunbathing spots for minibeasts needing to warm up before they can get on with their daily lives. Particularly useful are those that warm up quickly in the morning,



Basking rubytail wasp

allowing minibeasts an early start. Other predatory minibeasts take advantage of these sunbathers. They are fast, have prominent jaws and large eyes with good 3-D vision. They are the big cats of the minibeast world - a stealthy approach followed by a fast dash across an open space to catch unwary prey.



St Mark's fly in compost heap



Wolf spider with egg ball

Sun-traps

Other useful hot spots are sun-traps within the shrubbery or herbaceous border, especially if amongst nectar flowers. Gaps or indentations along edges, especially south-facing ones, create shelter from cool winds.



Ground beetle

Try and make sure that the garden offers plenty of little hot-spots throughout the day in a variety of situations. These are often the best places for minibeast watching.

Deadstuff minibeasts & decay

Minibeasts are nature's 'clean-up gang', working with fungi to clear away dead plants, from fallen leaves to tree trunks, and return them to the soil.



Woodlouse

Leaving these to decay away naturally greatly increases the diversity of creatures in your garden. If you think them unsightly, hide leaves & plant litter in habitat piles, but try and leave some where it lies on the soil. A well-made compost heap teams with life and is excellent for minibeast watching.

Dead wood

Decaying dead wood attracts a whole suite of often highly colourful minibeasts, especially a variety of

beetles and hoverflies. Some use dead wood while it is still attached to the living tree, instead of wood

which has fallen to

the ground. Unless actually diseased (which is not the same as decaying!) there's usually no need to remove it unless it's likely to be a safety hazard when it eventually falls.

Exit holes of wood-boring beetles are used as nests by solitary bees, as well as solitary small wasps that stock their nests with aphids, plant-hoppers or weevils. Related species nest in broken hollow plant stems.



Little mournful wasp outside its borrowed burrow



Habitat pile of dead wood

Stag beetle & wasp beetle



Fallen wood on the soil is usually damper, with active fungi, home to minibeasts such as

lesser stag, rhinoceros

and longhorn beetles. In the

south, there is also the stag

beetle itself - a species for which England is internationally important and which is a frequent garden denizen.

You can make special habitat piles of dead wood for these species. Big is beautiful - go for branches or trunks in preference to twigs. It's best to site these at the edge of shade or in dappled sunshine (but not in full sun) to get a good balance of warmth and moisture.



The garden pond - minibeast beach, pool & watering hole

A garden pond hugely increases the attractiveness of the garden for minibeasts. Even a very small water body will very quickly bring additional species.

Pond skater & water beetle



However, do try and make your pond as large as practicable (and safe if you have young children). The

larger the pond, the greater the variety of different minibeast microhabitats there can be.



The pond edge

Go for an edge that provides a mixture of cover and open ground. Planting so that water plants gently mingle with those in a neighbouring border allows minibeasts to come and go in safety,



Doli fly

while open areas allow them to sunbathe and hunt. Try to keep small, gently-sloping muddy or sandy ‘beaches’ free of plants. A host of small creatures will use them, including green doli flies, ground and rove beetles and wolf spiders. Solitary bees and wasps may collect mud there to cap their nests.

If your pond plants are too rampant, then try a ‘beach’ of sterile shingle or gravel. Different minibeasts will use it from those on the mud, so why not try both?

Pond plants

Go for a good mixture of floating, submerged and emerging species. Submerged plants with finely dissected (frilly) leaves such as milfoil, hornwort, starwort and water violet are good oxygenators and provide underwater cover and hunting grounds for aquatic minibeasts like water beetles, dragonfly larvae and water spiders. Floating plants also

provide cover, prevent the water going green, and provide ‘platforms’ on which minibeasts can sunbathe, hunt and mate, and a few are good foodplants. Caterpillars of brown and white china-mark moths feed on various floating plants and common waterweed *Potamogeton natans* is the foodplant of an attractive bronze and silver ‘reed’ beetle.



Reed beetles

Emergent plants - ones that root underwater but grow through the surface - are vital for minibeasts. Many pond dwellers, such as dragonflies, damselflies, alderflies and mayflies, need an emerging stem to climb out of the water to turn into adults. Evidence is easily found in ghost-like empty skins still clinging to the emergent plants. The process of moulting into an adult is fascinating to watch.



Alder fly

Beware of aliens!

Avoid invasive alien plants like parrot's feather *Myriophyllum aquaticum*, New Zealand pygmyweed *Crassula helmsii* (or sometimes *Tillaea recurva*) and floating pennywort *Hydrocotyle ranunculoides*. They may seem ideal as minibeast habitat but will take over your pond and all too easily escape into the wild, where they do incalculable damage to aquatic wildlife habitats.

Depth and fish

A pond doesn't need to be particularly deep for minibeasts. Shallow water is warmer and better for most species. Large areas of open water are far too hazardous for most species on the look-out for predators. Think before introducing fish as they reduce the numbers of minibeasts in the pond and bottom-grubbers stir up the sediment making the water cloudy. If there really is plenty of weedy cover in the pond, then minibeasts can just about cope with a few fish, but go for sticklebacks (which will help stop mosquitoes breeding in your pond), rather than goldfish, tench or carp.



Lily beetle



Large red slug

Pests minibeasts we love to hate

A word in their defence....

A fairly small number of minibeasts gives the rest a bad name by eating the plants we like to grow in our gardens.

Gardening books and pesticide adverts demonise these as 'ravaging hoards' of malevolent creatures, 'bent on destruction'. Think minibeast for a moment though.

They are just doing what comes naturally and taking advantage of lots of their foodplant, often that we have bred to be particularly succulent or tasty. Pests are really only species whose foodplants we have chosen to grow and this has led to conflict.

Learning to live with pests

There are, however, plenty of species of slugs, snails, caterpillars, aphids, bugs, flea beetles, weevils, chafers,

wireworms, leatherjackets and many others that do make themselves pretty unwelcome to even the most wildlife-friendly gardener. The trick is to work out what is tolerable - which is likely to be different for each garden and gardener. A whole plant reduced to a stump is unlikely to be tolerated, but it's easy to train yourself to overlook the odd hole in the edge of a leaf or end of a shoot spun together with silk.

What about the really pesky pests? There are several options. The easiest is simply not to grow those plants that you have found in your garden to be especially vulnerable. For example, growing lots of hostas in a shady damp garden on clay is asking for trouble from slugs. Planting 'cottage garden style' in a jumble of varieties is likely to reduce the effects of pests, whose numbers build up more easily in large swathes of a single species.



Queen dark wasp

Chemical warfare - pesticides

It is easy to preach against the use of chemicals and the fully organic garden is likely to be best for minibeasts. There are, however, occasions when pests do overstep the mark and even the keenest wildlife gardener may wish to wage war against a particularly difficult outbreak. Try organic pesticides such as soft soap

and plant-derived chemicals that are short lasting, though they are toxic to nearly all minibeasts - friend or foe. Whenever pesticides are used, always be ultra-careful to avoid any 'drifting' away from the target and killing harmless or beneficial species. Avoid using chemicals anywhere near the garden pond, as aquatic species are especially vulnerable. It is possible to buy 'biological control agents' to reduce pest numbers, though most work well only in confined places such as greenhouses.

Wasps and bees

The black and yellow social wasps that can sting are a mixed blessing. They are valuable predators of many pest species but are also sometimes an intolerable (and sometimes dangerous) nuisance to enjoyment of the garden. Whether to live with a wasps' nest in the garden or to get in professional help to eradicate it (never try it yourself) is an individual choice, depending on the position of the nest and the danger to people and pets.

Bumblebees and solitary bees (and domestic honeybees) are far less aggressive and gardens are now important habitats for them. Only consider having a bumblebee nest removed if it is very close to a children's play area.

Beneficial species minibeasts we should love

Rather than using pesticides, try to make the garden 'predator-friendly'.

Ladybirds, lacewings and hoverflies eat aphids. Ground and rove beetles tackle slugs and caterpillars, while various spiders and parasitic wasps and flies limit most other minibeasts. Providing cover and nectar sources encourages predators and parasitic species to cut down the numbers of pests.



Brown lacewing



7-spot ladybird



Deb Procter

Home for mason bees

Minibeast homes

The best way to encourage minibeasts to the garden is to garden for their needs, providing cover, nectar, decaying plant material and nesting sites.

You can also, however, buy or make structures to encourage them to stay in the garden. There are artificial bumblebee nests, a bit like an inverted ceramic plant pot which can be stuffed with soft dead grass for nesting material. A piece of wood drilled with variously sized holes makes nest sites for solitary bees and wasps, as does a series of hollow bamboo tubes crammed into a frame, mimicking ends of broken stems. There are also ladybird and lacewing 'hibernacula', similar to bird boxes where they (and other species) can safely pass the winter.

Pleasure from minibeasts studying them in your garden

Sexton beetle



Mother of pearl moth

Being right on the doorstep - sometimes literally - means that minibeasts can be studied much more closely than larger animals.

They can be watched going about their private lives in the garden, or brought indoors in transparent tubes or bug boxes to be studied with just a magnifying glass. The Naturalists' Handbooks series (Richmond Press) gives ideas for projects on a wide variety of invertebrate groups, from ladybirds and ground beetles to animals under stones and logs and insects and nettles.



Ichneumon wasp

Standing by an outside light on a warm muggy, moonless night to see what turns up for a couple of hours after sunset is an effective way of finding nocturnal minibeasts you would not usually encounter. Lots of moths, lacewings, caddisflies, beetles, craneflies, ichneumon wasps and many more night flying insects will turn up. Ground beetles, harvestmen, orb-web and jumping spiders will also emerge to capture prey.



Minibeasts in the garden provide an endless source of fascination for young and old. What better way of imbuing an interest and respect for the living world than by allowing children to satisfy their innate curiosity and enthusiasm for life by studying them?



Paul Glende//English Nature 24, 810

Minibeast spotting

Finding out more

There are thousands of species that might turn up in the garden, and no single guide can ever be adequate. A good start is the Collins Field Guide series, which has volumes on Insects, Spiders and Molluscs.

Baines, Chris. 2000. How to make a wildlife garden. Frances Lincoln. 192 pp.

Baker, Nick. 2002. Nick Baker's bug book. Discover the world of minibeasts. New Holland. London. 144pp.

Butterfly Conservation. 1991. Gardening for Butterflies.*

Chinery, Michael. 1998. Garden creepy-crawlies. Whittet. 172pp.

Chinery, Michael. 1997. Garden wildlife of Britain and Europe. Harper Collins. London.

Fellowes, Mark. & Callaghan, Amanda. 2003. Garden entomology: the Royal Entomological Society's introduction to garden insects.*
Email: reg@royensoc.demon.co.uk

Fry, Reg & Lonsdale, David. 1991. Habitat conservation for invertebrates - a neglected green issue. The Amateur Entomologists' Society. Middlesex.

Imes, Rick. 2000. Beginner's guide to entomology. Chancellor Press. London. 160pp.

Kirby, Peter. 2001. Habitat management for invertebrates: a practical handbook. JNCC/RSPB (edn 2).

O'Toole, Chris. 2000. The red mason bee. A practical guide to managing *Osmia rufa* as a pollinator in gardens, allotments and orchards. Osmia Publications, Banbury.

Owen, Jenny. 1991. The ecology of the garden: the first 15 years. Cambridge University Press. 403 pp.

People's Trust for Endangered Species. 2003. Stag beetle friendly gardening.* PTES. London. www.ptes.org/surveys/index.htm

Ryrie, Charlie. 2003. Wildlife Gardening. Cassell. 192pp.

Useful organisations

Butterfly Conservation
PO Box 444, Lindens, Manor Yard
East Lulworth, Wareham, Dorset BH20 5QP
Tel 01929 400209
www.butterfly-conservation.org

BugLife
The Invertebrate Conservation Trust
170A Park Road, Peterborough PE1 2UF
Tel 01733 201210
www.buglife.org.uk

English Nature

'This English Nature leaflet is one of a series about gardening with wildlife in mind.

The others are: *Wildlife-friendly gardening: a general guide*; *Plants for wildlife-friendly gardens*; *Amphibians in your garden*; *Reptiles in your garden*; *Focus on bats*; *Composting and peat-free gardening*; *Meadows - how to create them in your garden*; *Garden ponds and boggy areas: havens for wildlife*; *Dragonflies and damselflies in your garden*; *Enjoying moths and butterflies in your garden*; *Mammals in your garden*; *Wildlife on allotments*; *Birds and your garden*.

All leaflets are freely available from the English Nature Enquiry Service on 01733 455100/101/102 or e-mail enquiries@english-nature.org.uk

English Nature also produces an interactive CD: *Gardening with wildlife in mind*. This has detailed texts and photos of 500 plants and 300 of the more common garden 'creatures', and shows how they are ecologically linked. Details from The Plant Press, 10 Market Street, Lewes, BN7 2NB. Alternatively, call John Stockdale on 01273 476151 or e-mail john@plantpress.com

*indicates a leaflet or similar that is normally available from the authoring organisation rather than from bookshops or libraries.



English Nature, the Rural Development Service, and the Countryside Agency. Working in partnership to conserve and enhance our landscapes and natural environment, to promote countryside access and recreation as well as public well-being, now and for future generations.

This is one of a range of publications published by:
External Relations Team
English Nature
Northminster House
Peterborough PE1 1UA

www.english-nature.org.uk

© English Nature 2004

Printed on Evolution Satin, 75% recycled post-consumer waste paper, elemental chlorine free.

ISBN 1 85716 805 4

Catalogue code IN14.8

Written by Dr Roger Key

Designed by
Coral Design Management.

Printed by
Belmont Press, 20M/7.5M (06).

Front cover photographs:
Top left: General purple and gold moth
Bottom left: Cucumber spider
Main: Deadnettle leaf beetle

All photographs Roger Key/English Nature
except where indicated



Awarded for excellence