

Wildlife products that do and don't work

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Reviewed by Steve Head

The garden centre industry in Britain is very profitable, and a growing part of their trade is in products aimed at wildlife in gardens. The British Trust for Ornithology estimates that the bird feeding industry is worth £200 million annually.

One major garden centre supplier quoted by the Horticultural Trade Associationⁱ now has a third of their total sales coming from wild bird care products alone. In a year the company has sold over 2.6 million bird feeders, 8.2 million packs of bird food and 37.4 million fat balls throughout the UK. Wildlife products are a big industry, but are they all worth buying?

Why wildlife gardening products should work

First, because anything you buy should do what it claims to do. But secondly, and perhaps even more importantly, because although we don't fully understand why people garden for wildlife in the first place (and why some don't), a sense of personal satisfaction or achievement must play some part. Spending money (sometimes quite a lot of money) on products that fail to deliver any obvious benefit for wildlife is very likely to lead to disillusion with the whole enterprise. So let's begin on a positive note: feeders and nest boxes for birds.

Conservation evidence

The Conservation Evidence Project 'summarises evidence from the scientific literature about the effects of conservation interventions such as methods of habitat or species management'. Once they have accumulated enough evidence on a particular subject, they produce a *synopsis*, which 'lists all the possible actions you could take to conserve a given species group or habitat, or to tackle a particular conservation issue', together with how well they worked. All this is freely available from www.conservationevidence.com.

At the time of writing, there are just three synopses. The bird synopsisⁱⁱ is 704 pages long, but fortunately the information of relevance to gardeners can be summarised relatively briefly.

Bird feeders: position

Few wildlife-aware gardeners will need to be told that bird feeders are a worthwhile investment, and the scientific evidence confirms that.

Is position of feeders important? Two studies in gardens in Cardiff found that birds ate more food (peanuts) as feeders got closer to cover (a dense hedge). House sparrows were more dependent on nearby cover than blue tits or greenfinches. The effect of distance from housing varied depending on species: siskins didn't care about distance from houses, greenfinches liked feeders as far as possible (10 m) from housing and house sparrows preferred feeders closest (2.5 m) to houses. But *overall* food consumption increased as feeders got further from housing.

Not surprisingly, the evidence shows that feeders were used more frequently and by more birds if they were a long way (more than 500 m) from other feeders. So fewer birds may visit your bird feeder if lots of your neighbours have them too.

Bird feeders: contents

What should you put in your feeder? A large British study found that five farmland songbirds preferred wheat to oats and oats to barley. But tree sparrows and reed buntings preferred maize to all cereals except wheat, while house sparrows preferred maize to all cereals. On the other hand, corn buntings and yellowhammers preferred all cereals to maize, although neither is exactly a common garden bird. All species preferred cereals to sunflower seeds, but none of the birds in this study were finches, which have a well-known preference for oily seeds. So, although sunflower seeds are strongly promoted by bird food suppliers, perhaps the best advice is that if you have room for two feeders, filling one with oily seeds like sunflower, and the other with starchy seeds like a wheat/maize mixture (which is also much cheaper) will attract the biggest range of birds.

Not surprisingly, studies that monitored use of feeders throughout the year found that use peaked in winter. It's a good idea to feed birds all year round, but the birds in your garden need more food, and will suffer more if it's not there, during cold weather.

What about calcium? Calcium is vital for adult female birds to produce eggshell and for young birds to produce strong bones. Particularly in places where there's not much calcium, such as on acid rocks like sandstone or granite, several studies show it makes sense to provide extra calcium, with positive effects including less bone disease, higher fledging success, larger broods, higher quality eggs or chicks and better physical condition of female birds. You can buy crushed oyster shell, but cheaper and just as effective is smashed chicken eggshells. Most satisfying of all in my opinion, effectively killing two birds with one stone, is bashed snail shells.

Bird feeders: sanitation

If you choose to use bird feeders, you must keep them clean. Two unpleasant diseases of common birds have appeared in recent years. Trichomonosis is a fatal protozoan disease which particularly affects chaffinch and greenfinchⁱⁱⁱ. First seen in 2006, in one year it appears to have killed half a million birds. A study in 2012 showed that greenfinch populations in Britain had dropped from 4.3 million to about .8 million birds^{iv}. Subsequently avian pox, a distressing and disfiguring disease, has appeared in great tits and some other species^v. One important means of transmission of both is infection through shared garden bird feeders. It is vital that you keep your feeders clean, removing any damp and unconsumed food, and sterilising with a proprietary feeder cleaner, or equally well, with domestic bleach.

Nest boxes: colour and position

Not surprisingly, lots of studies across the world (though not all) show that songbirds readily use nest boxes, and most also find that nest boxes increase numbers of birds, or breeding success, or both. So nest boxes are definitely a good thing, but that still leaves plenty of other interesting questions about how to get the best out of them.

Is colour of nest boxes important? Yes and no, but mainly no. Some studies show preferences for, or greater breeding success in, one colour rather than another. But it looks like every

species of bird is different, and since nest boxes are usually a plain neutral colour, there seems no compelling reason not to leave them that way.

On the other hand, orientation probably is important. A British study found that tits avoided nest boxes facing south-west, and that fewer pied flycatcher chicks fledged from south-west facing boxes. So it looks like the official RSPB advice to site nest boxes facing between north and east^{viii} is right.

Nest boxes: construction material

In one American study, eastern bluebirds showed an overwhelming preference for woodcrete (concrete reinforced with wood fibre or sawdust) nest boxes over those made from wood. Meanwhile, a British study found that four species of tits all preferred woodcrete boxes over wood, while an American study also found that tree sparrows preferred woodcrete boxes, and suggested that this may be because they're warmer, allowing the birds to start nesting earlier. So if you're buying a nest box, it looks like the extra expense of a woodcrete box may be worthwhile.

Nest boxes: cleaning and nesting material

Old nest boxes may contain parasites, but old nesting material may provide a nice comfy base for building a new nest, so it's not obvious whether cleaning them out is a good idea or not.

The evidence from bird preferences is mixed. Five studies found that birds preferred clean nest boxes, one study found birds avoided dirty nest boxes but only if they were really grotty, another study found no preference either way, and two studies found a preference for used nest boxes. In one Canadian study, tree swallows preferred clean, empty boxes, but also liked those where the old material had been left, but sterilised by microwaving. So there's a suggestion that most birds prefer clean nest boxes, but the evidence is not overwhelming. Among the five studies that checked whether nest cleanliness affected nesting success or parasitism levels, none found any effect. On balance, if you currently don't bother to clean out your nest boxes every year, the scientific evidence doesn't offer any very urgent reason to change your behaviour.

Does it help to provide extra nesting material? Two Scottish studies here. In one, blue, great and coal tits strongly preferred empty boxes to those containing a layer of wood shavings. In the other, wood pigeon feathers were put out for songbirds to collect during the nesting season over three years. Not many were used, and when surrounding nests were searched, only 2.8 % of the marked feathers turned up in them. The study authors concluded that nest construction is not limited by the availability of nesting material, and therefore providing extra is basically a waste of time.

Reducing predation by cats

Ultrasonic cat deterrents emit high-pitched noise above the hearing of humans, but audible to cats. One study found that an ultrasonic cat deterrent in gardens reduced the number of visits by cats, but another one didn't. There's no evidence, either way, for the effects of ultrasonic cat deterrents on bird populations. Similarly for fitting devices to the cats themselves. One trial found that fewer birds (and mammals) were caught by cats fitted with a collar and bell or a collar with a CatAlert™ sonic device. The sonic device worked no better or worse than a bell. But a second trial in the following year found no effect of wearing a CatAlert™ sonic device, or one bell, or even two bells.

An Australian study found that wearing a CatBib™ ‘pounce protector’ (a neoprene flap that hangs from a collar in front of a cat’s front legs, acting either as a visual warning or as a barrier to pouncing) reduced the number of cats catching birds by a massive 81%. Adding a bell had no additional effect. Cat-lovers sometimes question how safe such bibs are (for cats, that is), but there is no reason to worry. The CatBib attaches to the front of a collar via small hooks and Velcro loops that release if it snags, so your cat can’t strangle itself.

In the study, almost all the cats adapted very quickly to the bib. They ran, jumped, climbed, groomed, chased moving objects, ate normally and had no difficulty picking up and carrying objects e.g. toy prey. None showed any sign of distress, and at the end of the study, 70 % of cat owners said they would be happy to continue using the bibs.

Bird collisions with windows

Birds can be injured or even killed by flying into windows. Does marking windows with wind chimes, silhouettes of falcons, stickers of eyes or model owls reduce bird collisions? No it doesn’t. However, fewer birds fly into windows if they are tinted or largely covered with white cloth, so if birds flying into your windows is a problem, and you don’t want tinted glass, it looks like your only option is to keep the curtains closed.

Bat boxes

Conservation Evidence also have a synopsis on bats nearing completion. There’s basically no research on bat boxes in gardens, and even in the woodlands where bat boxes are usually tested, reported occupancy is often low. Partly this is because bats are just harder to keep track of than birds. Birds tend to use a single nest box, but bats typically move around a group of roosts, using each for a different purpose – nursery colonies, bachelor pads, night roosts, mating roosts.

To boil down a complicated picture, bats also prefer woodcrete to wood, and they also like to be warm, so boxes in sunny locations are more likely to be occupied than shady ones, and darker-coloured boxes (which absorb more sunlight and get warmer) are used more than pale-coloured or white boxes. Recommended if you’re not sure whether or not there are bats in your area is the Schwegler 2F^{viii} ‘starter’ box, since if it’s not occupied after a number of years, it’s easily converted to a bird box by simply changing the front panel.

Finally, don’t panic if nothing happens at first – when it comes to bat boxes, patience is a great virtue. All the evidence shows that boxes that have been up for a few years are far more likely to be used than recently-installed ones. So give it four or five years before abandoning hope, but if there are still no customers, convert your box to a bird box, which is almost guaranteed to work, since birds prefer woodcrete too.

Boxes for bumblebees

Conservation Evidence also has a synopsis on bee conservation, and reports on several trials of artificial nest boxes for bumblebees. Recent large trials in the UK have found very low occupancy of such nests, and the Sheffield BUGS project drew a complete blank^{ix}. Curiously, trials in North America generally showed higher occupancy, although the reasons for this are not clear. Where they were compared, nest boxes entirely buried 5-10 cm underground, with a 30-80 cm long entrance pipe, generally worked better than wooden surface nest boxes (the normal commercial type). More recently, *Which? Gardening*^x (November 2010) conducted a

small trial of a commercial, wooden surface box and found that none were occupied. False underground boxes (at the surface, but with a partially buried entrance pipe giving the appearance of a subterranean nest) also worked better than surface boxes, but not as well as entirely underground boxes.

Boxes and bees

It's also possible to buy boxes complete with a breeding colony of a native bumblebee, *Bombus terrestris*. Here, whether such boxes 'work' depends on what you mean by 'work'. Since *Bombus terrestris* is very common, they do not contribute to bumblebee conservation. Nor is there any evidence that pollination services are deficient in the average garden, indeed bees and other pollinators are already extremely abundant in gardens. The company that markets the colonies claims that they 'give many of our customers much pleasure, many of whom have never seen a bumblebee colony in the wild', but it would arguably be more fun (and certainly much cheaper) to find and observe a wild nest. Bumblebee nests are not uncommon in gardens.

Recent research also revealed that three-quarters of imported bumblebee colonies were infected with microbial parasites, several of which can also infect honeybees^{xi}.

Nests for solitary bees

Solitary bee species nest in hollow stems or holes in wood or masonry, or in the ground. Conservation Evidence found many studies that provided artificial nests of various kinds for such bees, and virtually all reported that some or all of their nests were occupied. Unusually, a few studies also reported that provision of such nests had positive effects on numbers of bees (which is much harder to do than simply observe occupancy). Many species of solitary bees have been recorded occupying such nests, as well as species of solitary wasps (which are *not* to be confused with the generally larger social wasps).

The Sheffield BUGS project showed that nests placed in sunny locations were used more often than those in shade¹. The *Which? Gardening* trial compared a commercial 'Pollinating Log', consisting of bamboo canes in a hollowed-out birch log, with a home-made version consisting of 4, 6, 8 and 10 mm diameter blind holes drilled in softwood blocks.

Much of the difference between the commercial bee logs and the home-made nests probably comes down to a simple matter of relative hole sizes. Extensive previous trials (in the Sheffield BUGS project) with the home-made nests found that in any one year at least one of the 4 mm holes was used in about half the gardens tested, for the 6 mm holes the success rate was about 15 % of gardens, and the 8 mm and 10 mm holes were used in just two gardens and one garden respectively (out of 20 test gardens) in one year only, and not at all in the other two years. In other words the success rate falls off dramatically as hole size increases, for the simple reason that most solitary bees and wasps are small, and holes > 6 mm are less likely to be used.

The results of the *Which?* trial exactly reflected these earlier findings, with around half the home-made boxes used, but only the smallest holes in all but one case.

In the Pollinating Bee Logs specimens used, the *smallest* holes were around 6 mm and the largest were > 10 mm, with most in the 6-10 mm range. Thus the Pollinating Bee Log provides holes that are too large to attract the most numerous potential users. Given that the home-made version is potentially free, or at least very cheap, *Which?* thought they were a

better bet than the commercial version. The bottom line is that *anything* that provides holes of around the right size might be used as a nesting site by solitary bees and wasps.

Other boxes

The same *Which? Gardening* trial that looked at nest boxes for bees also looked at commercial boxes for ladybirds, butterflies, lacewings and hedgehogs. None were occupied by their intended target – in the case of the butterfly box, with or without added ‘butterfly attractant’ (composition unknown). Most ordinary gardens should provide adequate protection for these creatures, and there seems little merit in buying such products. If you want to provide extra overwintering habitat, consider making a “bug hotel”^{xii}, but be aware these have not yet been scientifically evaluated. Finally, think twice before buying a dormouse box, which are extensively advertised on the web. Dormice are largely confined to the southern half of Britain, but even there are extremely patchily distributed^{xiii}. Unless you know you have dormice in an adjacent wood or hedgerow, don’t bother.

ⁱ <http://www.the-hta.org.uk/page.php?pageid=727>

ⁱⁱ Williams, D.R., Pople, R.G., Showler, D.A., Dicks, L.V., Child, M.F., zu Ermgassen, E.K.H.J. and Sutherland, W.J. (2012) *Bird Conservation: Global evidence for the effects of interventions*. Exeter, Pelagic Publishing.

ⁱⁱⁱ Robinson et al. (2010) Emerging infectious disease. PLoS One 5 (8): e12215

^{iv} Lawson, B., Robinson, R.A., Colvile, K.M., Peck, K.M., Chantrey, J., Pennycott, T.W., Simpson, V.R., Toms, M.P. & Cunningham, A.A. (2012) *Philosophical Transactions of the Royal Society B*. 367: 2852–2863.

^v http://www.bto.org/sites/default/files/shared_documents/avian-pox/associated_files/avian-pox-garden-wildlife-health-factsheet.pdf

^{vi} http://www.bto.org/sites/default/files/shared_documents/gbw/associated_files/bird-table-72-avian-pox-article.pdf

^{vii} <http://www.rspb.org.uk/makeahomeforwildlife/advice/helpingbirds/nestboxes/smallbirds/siting.aspx>

^{viii} [schwegler-natur.de](http://www.schwegler-natur.de)

^{ix} Gaston, K.J., et al. (2005) Urban domestic gardens (II): experimental tests of methods for increasing biodiversity. *Biodiversity and Conservation*, **14**, 395-413.

^x See review at <http://www.hortweek.com/which-gardening-warns-against-pointless-wildlife-products/article/1038336>

^{xi} Graystock, P., et al. (2013) The Trojan hives: pollinator pathogens, imported and distributed in bumblebee colonies. *Journal of Applied Ecology*, **50**, 1207-1215.

^{xii} eg <http://www.wildaboutgardens.org.uk/thingstodo/inaweekend/bug-mansion.aspx>

^{xiii} <http://www.dormice.org/distribution>