
**Northfleet Embankment West, Dartford –
Temporary Access to Sales Suite Off
College Road**

Bellway Homes Limited (Thames Gateway)
Bellway House
Anchor Boulevard
Crossways Business Park
Dartford
Kent
DA2 6QH

INTRODUCTION

AA Environmental Limited (AAe) has been commissioned by Bellway Homes Limited (Thames Gateway) to carry out an ecological walkover survey of the above site, carried out on Thursday 12 May 2022, to support the application for a temporary access to the proposed sales suite off College Road. The purpose of the survey was to determine the existence and location of any ecologically valuable areas and to record any evidence of protected species. This information will serve to assess the ecological impact of the proposals and identify any ecological constraints and/or mitigation measures that may be required. A series of photographs has been attached at Appendix A.

The proposals include the construction of a temporary access road and parking area, with associated hard and soft landscaping, requiring the removal of the existing areas of vegetation. It is anticipated that the established boundary vegetation will be retained and protected as part of the proposals.

METHODOLOGY

Baseline Data

A review of BSG's ecological report (BSG Reptile Survey Report, 2018) completed for the whole of the Northfleet Embankment West mixed use redevelopment site was carried out to obtain baseline data. In addition, as certain baseline data is now readily available on the internet, the Multi-agency website (www.magic.defra.gov.uk) was consulted to determine whether any part of the site or nearby habitats have been statutorily or otherwise designated and a review of Google Earth's satellite imagery (http://www.google.co.uk/intl/en_uk/earth/index.html) was completed to determine past land uses of the site and surrounding land.

Walk-over Site Survey

During the walk-over survey (12 May 2022), particular attention was paid to record the presence of badgers, bats and herpetofauna (amphibians and reptiles) that may be using the site or present in adjacent habitats, in accordance with the following survey methodologies:

Badgers

Badgers (*Meles meles*) and their setts are protected by the *Protection of Badgers Act 1992*, under which it is an offence to harm badgers or their setts. A sett is defined as "any structure or place which displays signs indicating current use by a badger". Natural England has provided the following guidance on the interpretation of current use:

A sett is defined as such (and thus protected) as long as signs indicative of 'current use' are present. Thus, a sett remains protected by the Act until such times as the signs (i.e. 'field signs') have deteriorated or decayed to such an extent that they indicate that the sett is no longer in 'current use'.

A thorough survey of the whole site and adjacent habitats, where access was available, was carried out. Particular attention was paid to dense areas of vegetation to check for any evidence of badger activity, which is usually detected by any one or more of the following signs:

- presence of holes with evidence of badger, such as footprints, discarded hair, etc.;
- presence of dung pits and latrines;
- presence of well-used runs with subsidiary evidence of badger activity; and
- presence of other indications of badger activity, such as signs of foraging and footprints.

Bats

Currently there are 17 species of bat known to breed in the UK. All species and their roosts are protected under Regulation 41 of *The Conservation of Habitats and Species Regulations 2010 (as amended)*. As a signatory to the *Bonn Convention (Agreement on the Conservation of Bats in Europe)* the UK is also required to protect their habitats. This legislation makes it illegal to kill, injure, capture or disturb bats, or to obstruct access to, damage or destroy bat roosts. Under the law, a roost is any structure or place used for shelter or protection.

A visual survey of the site was completed to record any evidence of bats or features that could provide potential roosting opportunities. The survey was carried out following the guidelines provided by the Bat Conservation Trust¹. A thorough internal and external examination of any buildings/structures present was carried out, with any potential access points inspected for evidence of bats. All internal roof voids/spaces, where present, were accessed to check for any evidence of bats.

In addition, a careful inspection of each tree on the site was carried out to identify those features that are important for roosting bats. Surveying trees presents particular problems at any time of the year as bats will use a wide variety of roost sites in cavities, splits, cracks, knotholes and under loose bark, many of which are not easily detected from the ground.

Each tree was assessed in accordance with the following criteria:

- **Negligible** – negligible habitat features likely to be used by roosting bats.
- **Low** – a tree of sufficient size and age to contain potential roosting features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential.
- **Moderate** – a tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
- **High** – a tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

The surrounding habitat was also surveyed to identify any important features such as mature trees with suitable features for roosting bats and any established lines of vegetation that might provide important flightlines.

Evidence of bats is usually detected by any one or more of the following signs:

- the presence of bat droppings, which tend to accumulate under established roost sites or at roost entrances;
- the accumulation of large numbers of moth wings, which have been discarded by feeding bats;
- areas of staining by urine or from fur rubbing; and
- the presence of bats themselves or their corpses.

The visual survey was facilitated by the use of binoculars, ladders, powerful torches (1M candlepower) and a Ridgid Micro CA-350 Inspection Camera endoscope. A heterodyne bat detector (Pettersson D200) was also used during the inspection to record any bat calls.

¹ Collins, J. (ed) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edition). The Bat Conservation Trust, London.

Herpetofauna

Amphibians

All amphibian species have some level of protection under the *Wildlife and Countryside Act 1981 (as amended)*. Great crested newts (*Triturus cristatus*) are protected under the *Wildlife and Countryside Act 1981 (as amended)* and *The Conservation of Habitats and Species Regulations 2010 (as amended)*. The intentional or reckless killing, injury or taking, and intentional or reckless disturbance of great crested newts whilst occupying a 'place used for shelter or protection' is prohibited, as is the destruction of these places.

A Habitat Suitability Index (HSI) score for any nearby ponds was calculated. HSI scores, developed by Oldham et al. (2000), are used to assess the potential of a waterbody to support GCNs and Natural England provides a working template on document WML-A14-2. An HSI score defines a pond's suitability for GCNs on a categorical scale where:

- <0.5 = poor;
- 0.5 – 0.59 = below average;
- 0.6 – 0.69 = average;
- 0.7 – 0.79 = good; and
- >0.8 = excellent.

Reptiles

All reptile species are protected at some level under Schedule 5 of the *Wildlife and Countryside Act 1981 (as amended)* and *The Conservation of Habitats and Species Regulations 2010 (as amended)*. The more common species of reptiles, which include slow-worm (*Anguis fragilis*), common or viviparous lizard (*Zootoca vivipara*), adder (*Vipera berus*) and grass snake (*Natrix helvetica*) are protected by the *Wildlife and Countryside Act 1981 (as amended)* by part of Section 9(1) and all of Section 9(5). This means that they are protected against intentional or reckless killing and injuring (but not 'taking') and against sale and transporting for sale.

An assessment of the site was carried out to determine its suitability for herpetofauna by recording the habitats present. In addition, any natural/artificial refugia present on the site was lifted to check for any sheltering animals or evidence of animals, such as sloughs (shed skins).

Other Wildlife

In accordance with good practice, the site was checked for any evidence of other protected species or species of particular note.

ECOLOGICAL SURVEY RESULTS

Baseline Data

BSG Ecology carried out an initial reptile survey in 2014, with an updated survey in 2018. The survey results are summarised below (**N.B. the surveys completed covered the whole Northfleet Embankment site, of which the land off College Road covers only a very restricted area on the site**).

The updated reptile survey carried out in 2018 recorded medium populations of both common lizard (*Zootoca vivipara*) and slow-worm (*Anguis fragilis*), with a medium population of common lizard recorded in the area adjacent to this current application.

There are no ecological statutory designated sites located on or directly adjacent to the site. The only statutory designated sites within the 2 km search area are Swanscombe Peninsular Special Scientific Interest (SSSI), located approximately 0.6 km to the west-south-west of the site and Swanscombe Skull Site National Nature Reserve (NNR) and SSSI, located approximately 1.9 km to the west-south-west.

According to the Multi-agency website, the nearest area of priority habitat is an area of Open Mosaic Habitat, a UK BAP Habitat type listed on *Section 41 of the Natural Environment and Rural Communities Act 2006 (NERC Act)*. However, this area was cleared as part of the wider development area, under reference EDC/16/0004. The next nearest area of priority habitat is an area of Deciduous Woodland and National Forest Inventory Broadleaved Woodland, located c. 76 m to the north-west of the site.

Google Earth Imagery shows that the site appears to have been used as a residential garden, with associated hardstanding areas, shed and vegetation.

Site Description (Photographs 1-4)

The site is located on the corner of College Road and Warwick Place in an industrial area of Northfleet in Kent, centred at National Grid Reference: TQ 618746 and covers approximately 0.1 of a hectare. The site comprised lawns, ornamental planting, individual trees and areas of colonising vegetation. The site is bordered by College Road and residential properties to the west, residential properties to the north, the industrial area of the adjacent Northfleet Embankment site to the east and Warwick Place to the south.

A single timber constructed summerhouse was present on the site. The tongue-groove timber cladding was single skinned and tightly-sealed. The pitched roof was covered by bitumen felt and corrugated Perspex sheets. Windows were present at the northern and western elevations, creating a well-lit interior.

The majority of the site comprised a now unmanaged lawn, with species typical of amenity grassland and included perennial rye-grass (*Lolium perenne*), cock's-foot (*Dactylis glomerata*), yarrow (*Achillea millefolium*), ribwort plantain (*Plantago lanceolata*), red clover (*Trifolium pratense*), dandelion (*Taraxacum* agg.) broad-leaved dock (*Rumex obtusifolius*) and daisy (*Bellis perennis*). Areas around the margins and colonising the site from lack of management included creeping thistle (*Cirsium arvense*), spear thistle (*Cirsium vulgare*), sow thistle (*Sonchus* sp.), buttercup (*Ranunculus* sp.), common ragwort (*Senecio jacobaea*), herb-Robert (*Geranium robertianum*), willowherb (*Epilobium* sp.) and green alkanet (*Pentaglottis sempervirens*), with bramble (*Rubus fruticosus* agg.) also recorded.

A number of ornamental species were also recorded on site, including cherry laurel (*Prunus laurocerasus*), garden privet (*Ligustrum ovalifolium*), pendulous sedge (*Carex pendula*), variegated laurel (*Prunus* sp.), rhododendron (*Rhododendron* sp.), bamboo (*Pleioblastus* sp.), ornamental thistle (*Cirsium* sp.) and poppy (*Papaver* sp.).

An area of ruderal vegetation was present on the west of the site, with species recorded including common nettle (*Urtica dioica*), common ragwort, creeping thistle and cleavers (*Galium aparine*).

A bank ran along the southern site boundary, dominated by established trees and shrubs. Tree species included sycamore (*Acer pseudoplatanus*) and ash (*Fraxinus excelsior*), with a line of conifer (*Cupressaceae* sp.) trees also present on the western site boundary. Shrub species recorded on site and along the bank included hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*) and dogwood (*Cornus* sp.). Ground cover along the bank was dominated by common ivy (*Hedera helix*) and cleavers.

Two small, ornamental ponds were present on site. Pond 1, located on the east of the site, was completely dry at the time of the survey, with no aquatic vegetation recorded. The pond was lined with a plastic membrane and edged with bricks, surrounded by ornamental and grassland vegetation. Pond 2 was located on the northern site boundary, adjacent to the neighbouring property. The pond was full of water at the time of surveying and choked with duckweed, with no other aquatic vegetation recorded. Pond 2 was concrete-lined and sheer sided, surrounded by concrete hardstanding and some colonising vegetation.

Badgers

No evidence of badgers or their setts were recorded on or adjacent to the site. A few mammal runs were recorded, confirmed to be made by fox (*Vulpes vulpes*) and domestic pets that are known to be present in the area.

Bats

The summerhouse was assessed to provide **negligible** bat roosting opportunities due to its construction type and condition. No other structures were present on the site. The majority of trees present at the site boundaries were assessed to provide **negligible** bat roosting potential due to their age/condition and lack of any PRFs, with a single mature ash assessed to provide **low** bat roosting opportunities due to dense cover by climbing common ivy. It should be noted that a single, damaged Schwegler 1FF type bat box was recorded on the ground, beneath a fallen tree limb on the southern site boundary. Despite a careful search, no other bat boxes were recorded on site.

Herpetofauna

Two small ornamental ponds were present on the site. Pond 1 was dry and was therefore did not provide any suitable breeding opportunities for any species of amphibian. Pond 2 was assessed to have poor suitability to support great crested newts (Table 1), due to the poor water quality and heavy shading. The site, comprising a previously managed garden area, with restricted areas of colonising vegetation, does not provide optimal habitat for any species of herpetofauna and despite a careful search, no species were seen or found sheltering under any refugia lifted. Although common lizard and slow worm have been recorded across the wider development area to the east of the site, it is important to note that a successful reptile translocation exercise was completed in 2020 under the supervision of AAe, with all reptiles removed and released within the agreed receptor areas.

Table 1: HSI score for Pond 2

Factor	Pond 2
SI1 – Location	1.00
SI2 - Pond area	0.05
SI3 - Pond drying	0.50
SI4 - Water quality	0.33
SI4 – Shade	0.20
SI6 – Fowl	1.00
SI7 – Fish	1.00
SI8 – Ponds	0.36
SI9 - Terrestrial habitat	0.67
SI10 - Macrophytes	0.80
HSI	0.45

Other Wildlife

Apart from a few common species of birds, either recorded on the site or flying overhead, no other species of any note were recorded.

CONCLUSIONS AND ECOLOGICAL MITIGATION AND ENHANCEMENT RECOMMENDATIONS

The proposals include the construction of a temporary access road and parking area, with associated hard and soft landscaping, requiring the removal of the existing areas of vegetation. It is anticipated that the established boundary vegetation will be retained and protected as part of the proposals.

There are no habitats of international, national, county or local importance that would be directly or indirectly affected by the proposals. The site is of overall low ecological value, with the species recorded described as common or abundant and are found in similar places across much of Britain, with no evidence of protected species recorded.

Although there are considered to be no over-riding ecological constraints to the proposals, a series of specific and generic mitigation measures, as detailed below, should be implemented to reduce any impact the development proposals may have on local wildlife. There is also an opportunity to implement some

enhancement measures to increase the nature conservation value of the site in the long term in accordance with Government guidance as set out in National Planning Policy Framework (NPPF) 2021².

Although no evidence of bats was recorded, all site operatives should be made aware of current legislation protecting bats and their roosts. In the unlikely event of any bats being encountered, then works should stop immediately and Natural England or AAe contacted so that appropriate advice can be provided.

All mammals are protected under the *Wild Mammals (Protection) Act 1996* and, therefore, prior to any site works a check should be made to make sure there are no active fox earths present on the site. The use of an animal repellent, such as Scoot, can be used to facilitate this.

Although no evidence of reptiles has been recorded on the site and a translocation exercise of the adjacent land under the same ownership was completed successfully by AAe in 2020, it is considered best practice that a precautionary approach be adopted for site clearance works. Therefore all works should be supervised by an ecologist and completed during the appropriate time of year when all reptiles are fully active (April through to October). A Precautionary Working Method Statement has been attached at Appendix B.

It should be noted that all species of wild bird and their nests are protected under the *Wildlife and Countryside Act 1981 (as amended)*. Therefore, in order to avoid contravention of current legislation, site clearance works should be timed to avoid the main bird nesting season, which, in general, runs from March to August inclusive. If this is not possible, a check should be carried out prior to any clearance works to ensure there are no active nests present.

In order to protect any established vegetation to be retained, suitable fencing may be required at certain locations to reduce the possibility of any damage that could be caused during the works. To minimise accidental damage, any overhanging branches should be pruned back to suitable live growth points. All works should be undertaken by a suitably qualified and experienced specialist contractor and should conform to current industry best practice, i.e. BS 3998: 2010 '*Tree Work - Recommendations*'.

Although the works are restricted with limited opportunities to implement any enhancement measures, four bird and bat boxes will be installed on site to provide enhanced nesting/roosting opportunities (e.g. x1 Schwegler 2H open nest box, x1 Schwegler 1B enclosed nest box and x2 Schwegler 2F bat boxes, or equivalent). Any boxes installed should be positioned in accordance with good practice (a brief guidance document is attached at Appendix C).

The effects of lighting on plants and animals are difficult to assess, but it is thought that lighting can adversely affect invertebrates, birds and bats. Although the site currently experiences some light spillage from adjacent roads and neighbouring properties, the area will not be lit and therefore there will be no change in light levels.

The recommendations provided within this technical note include standard control measures to be applied to ensure there is no adverse impact on local wildlife and/or contravention of current legislation along with some enhancement measures to be implemented for the scheme informed by a recent site survey.

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² Ministry of Housing, Communities and Local Government (2021). *National Planning Policy Framework*. London.

Appendix A

Gravesham Borough Council



Photograph 1: Showing the site, facing west.



Photograph 2: Showing the site, facing north.



Site Boundary ———
Ownership Boundary ———



Photograph 3: Showing Pond 1, dry with no aquatic vegetation.



Photograph 4: Showing the existing summerhouse.

Rev.	Details	Drawn Chkd.	Date
PROJECT			
Northfleet Embankment West - Temporary Access to Sales Suite			
TITLE			
Photograph Record Sheet			
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Scale	Date 08.06.22	Drg No.	Rev.
NTS	Drawn HRS	Chkd. ARB	193252/01

Appendix B

Gravesham Borough Council

**Northfleet Embankment West, Dartford –
Temporary Access to Sales Suite Off
College Road**

Report for:
Bellway Homes Limited (Thames Gateway)
Bellway House
Anchor Boulevard
Crossways Business Park
Dartford
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INTRODUCTION

AA Environmental Limited (AAe) has been commissioned by Bellway Homes Limited (Thames Gateway) to produce a Precautionary Working Method Statement (PWMS) to cover the proposed works for a temporary access to the proposed sales suite off College Road. Areas of grassland, with some colonising scrub, are scheduled to be cleared in order to permit the construction of the temporary access road.

As reptiles have been recorded in the surrounding area, albeit with a full translocation exercise completed in 2020, in accordance with best practice and under the precautionary approach, all works will be carried out carefully and follow the controls set out in this Method Statement. A copy will be circulated to key site staff and other site operatives so that they are fully aware of the sensitivity of the works and of the possibility of encountering protected and notable species, with a copy kept on site.

LEGISLATION

All reptile species are protected at some level under Schedule 5 of the *Wildlife and Countryside Act 1981 (as amended)* and *The Conservation of Habitats and Species Regulations 2010 (as amended)*. The more common species of reptiles, which include slow-worm (*Anguis fragilis*), common or viviparous lizard (*Zootoca vivipara*), adder (*Vipera berus*) and grass snake (*Natrix helvetica*) are protected by the *Wildlife and Countryside Act 1981 (as amended)* by part of Section 9(1) and all of Section 9(5). This means that they are protected against intentional or reckless killing and injuring (but not 'taking') and against sale and transporting for sale.

SITE CONTROLS TO BE APPLIED

All works will be completed when herpetofauna are active. Although activity is weather and temperature dependent, herpetofauna are usually active from April through to October, inclusive.

Prior to any works the on-site ecologist will remove any refugia (both natural and artificial) from the area. All site personnel will be given a toolbox talk to inform them about the potential presence of herpetofauna on site and the legal protection they are afforded (generic toolbox talks are attached at Appendix A).

The area will then be subject to vegetation management, with the intention to render the area less attractive for herpetofauna, which will move into the more suitable adjacent habitat outside the area of works. The vegetation management will be carried out sensitively, using an excavator mounted flail (operated by a suitably qualified and experienced contractor) and/or hand-held machinery (brush cutters/trimmers).

The vegetation will initially be cut to around 200 mm sward height, the area will then be left for a period of 24 hrs to allow any animals to disperse, after which a second cut will reduce the sward height to around 50 mm. It is important that the works do not break ground. All arisings will be collected using **plastic rakes** (metal rakes will not be permitted) and will either be disposed of off-site or used as habitat enhancement measures within the onsite receptor areas. Works will be completed in a methodical manner with the machine positioned on the adjacent hardstanding to avoid tracking on any vegetation. In the event that any machinery does need to track over the vegetation, then this should be minimised with the same route used to track in and out of the area.

After the Ecologist is satisfied with the above preparatory works on site, he/she will supervise a destructive search of the area. This will involve the removal of all remaining ground vegetation, leaving only bare earth. A 360° excavator will be used for this purpose (with a ditching bucket), with the turf/topsoil being placed carefully to one side. **N.B. Particular care will be required during this exercise, which can only be completed under the direct supervision of the on-site Ecologist.**

Any species of herpetofauna found during the exercise, will be caught and placed in a container and released into the agreed receptor area on adjacent land.

SUMMARY & CONCLUSIONS

A range of control measures have been put forward to ensure that the initial enabling works are carried out sensitively to minimise disturbance to local wildlife and avoid contravention of current legislation. The on-site Ecologist will supervise key stages of the works and a daily log with supporting photographs completed.

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Appendix A
Toolbox Talk (Reptiles)

Gravesham Borough Council

TOOLBOX TALK: REPTILES

Key Contact

AA Environmental Ltd, Units 4-8 Cholswell
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Tel: 01235 536042

Did you know?

- There are six species of reptile native to the UK, three of which are snakes and three are lizards.
- Smooth snakes and Sand lizards are very rare and are presently restricted to a few localised areas.
- Adders, Grass snakes, Common lizards and Slow-worms are widespread and found in a number of different urban and rural habitats across the UK.
- All reptiles are ectothermic. This means they rely upon the sun's heat for warmth. As a result, you may find reptiles basking in sunny places. If it becomes too warm they will seek shade, to avoid overheating.
- Reptiles movement will be slower in cooler conditions.
- Reptiles hibernate during the winter and may not wake up if disturbed. This makes them vulnerable to site works during winter months.
- Reptiles depend upon a varied habitat for survival. They need basking spots, shade, protection from predators, food resources and somewhere to hibernate!

Identification

- Reptiles may be found in a variety of habitats within a site. Most species favour scrubland, heathland or long grassland. Railway embankments are also highly favoured.
- On the right are photos of the reptiles you are most likely to encounter on a site, if any.
- Adders can be distinguished from Grass snakes by the diamond (or jagged) stripe running down the centre of their back.
- Slow-worms look a lot like a snake but are in fact legless lizards! They tend to be light brown/golden in colour, with a smooth appearance.
- Common lizards are fast-moving, but may be sighted from a distance when basking.

Legislation

- All reptile species are protected under UK law.
- This makes it **illegal** to intentionally or recklessly kill or injure and protects them against sale and transporting for sale.

Site Controls

- There is always a **risk** that as reptiles move through the habitat that they could be encountered during site works.
- **If any reptiles are encountered during works the following controls must be applied to avoid breaking the law:**
 1. If reptiles are discovered/suspected works must stop **immediately**, with any reptiles left in-situ and AAe immediately contacted (contact details above).
 2. During works, operatives must wear gloves in case of accidental contact with reptiles.
 3. Site operative must not intentionally handle reptiles.
 4. Care must be taken when moving logs, stones or rubble. These are favoured habitats for reptiles and they may be found sheltering underneath.
 5. Stockpiling of materials is only permitted within designated areas. Any building materials must be stored above ground on pallets and any waste material must be placed into skips, to prevent the risk of reptiles taking refuge within them.
 6. Trenches must be covered overnight to prevent animals falling into them.

These controls have been put in place to protect all site operatives from breaking the law. You are not expected to be able to identify reptiles or their presence so remember, **if in doubt shout and contact the relevant person.**



Adder.



Grass snake.



Pair of Common lizards.



Slow-worms.

Appendix C

Gravesham Borough Council

BIRD AND BAT BOX/TUBE GUIDANCE DOCUMENT

Overview

The boxes/tubes used should be made of woodcrete material¹ (or equivalent) wherever possible and be positioned in accordance with good practice. All of the boxes can be obtained from the following suppliers:

Jacobi Jayne www.jacobijayne.co.uk
Envisage Wildcare www.wildcareshop.com
NHBS www.nhbs.com

Bird Box Installation Guidance

The requirements for nest boxes vary between species. However there are some general rules to follow:

- Boxes should be located in a sheltered position out of strong sunlight, wind and rain. Generally this means that the box should be positioned somewhere between the north east and south east side of a structure.
- For extra shelter, smaller boxes should be positioned at a slight forward angle.
- Large open boxes should be angled upwards when mounted to allow the nest to rest naturally at the back of the box.
- Boxes should be positioned out of the reach of predators where possible (e.g. cats).
- A density of around 10 bird boxes per hectare is acceptable.
- Position boxes away from bird tables and other feeding areas where possible.

Bat Box/tube Installation Guidance

- Boxes should be located in a sheltered position, out of strong wind, but exposed to sunlight for part of the day to provide solar warming.
- When installed on trees, where possible boxes should be put up in groups of two or three, facing in different directions to allow bats access to a range of temperature conditions. Furthermore, it is recommended that, to avoid competition for bat boxes, bird boxes should also be installed on the same trees².
- It should be ensured that the entrance hole to the box is kept clear, so that bats can access it freely.
- Ideally bat boxes should be positioned near linear vegetation (e.g. a hedgerow).
- When installing boxes on trees, the ideal position is at around 5 metres or more.
- On buildings, boxes should be positioned high up by the eaves to avoid bats being predated by cats and other predators.
- Boxes should be installed out of the direct line of artificial lighting, both current and to be installed.

References

1. Du Feu, C. (1993). *Nestboxes BTO Guide No. 23*. BTO, Thetford.
2. The Bat Conservation Trust (2003). *Bat Boxes - Your Questions Answered*.
3. Meddings, A., Taylor, S., Batty, L., Green, R., Knowles, M., Latham, D. (2011). Managing competition between birds and bats for roost boxes in small woodlands, north-east England. *Conservation Evidence*, 8, pg. 74-80.

¹ Woodcrete is a blend of cement and sawdust. This material is found to be as successful as wooden bat boxes/tubes with greater durability and longevity. Schwegler bat boxes/tubes are constructed from this material.

² Research carried out by Meddings *et al.* (2011) suggests that installing bird and bat boxes on the same tree will reduce the likelihood of birds nesting in bat boxes and thus preventing a reduction in roosting opportunities for bats.