Biodiversity Enhancement Plan and Lighting Design Scheme

Land At Chandos Farm, Bull Road, Thornham Parva

for

Stephen Davey and Sandra Newson



Client

Stephen Davey and Sandra Newson

Planning authority

Mid Suffolk District Council

Time limit of reliance

Please note that the reported surveys were conducted on the date(s) stated in the report and that it represents site conditions at the time of the visit. The findings and recommended mitigation are based on these conditions. If site conditions change materially after the site survey, the original report cannot be relied upon and will need to be updated. Ecological reports and surveys can typically be relied on for 18 to 24 months from the date of survey.

Surveys supporting European Protected Species Mitigation Licence applications must be within the current or most recent survey season for bats (May to September), or within two survey seasons for great crested newts (March to June).

| Document | Biodiversity Enhancement Plan and Lighting Design Scheme | |
|------------------|---|--|
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Signed disclosure

The information, data, advice and opinions provided in this report which I have provided is true and has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. I confirm that the opinions expressed are my true and professional bona fide opinions.

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1. INTRODUCTION

- 1.1. Greenlight Environmental Consultancy Limited has been commissioned to prepare a Biodiversity Enhancement Plan and Lighting Design Scheme.
- 1.2. The proposed development is located at Chandos Big Barn, Thornham Parva, Suffolk, IP23 8ES (grid reference: TM 10863 72865).

2. BIODIVERSITY ENHANCEMENT PLAN

- 2.1. The purpose of this report is to provide detailed information on the construction, design and location of mitigation and enhancements.
- 2.2. The conservation objectives include:
 - i. Mitigation and compensation for potential impacts on protected and priority species/habitats.
 - ii. Maintaining the favourable conservation status of protected species.
 - iii. Providing a net gain in biodiversity, as is encouraged by the National Planning Policy Framework (NPPF, 2021).

Mitigation and enhancement measures

Habitats

- 2.3. A soft landscaping scheme to include:
 - The planting of a native species-rich lawns in gardens and wildflower mixtures in open spaces, which are rich in nectar and pollen (see Appendix B for suggested seed mix, Appendix F for location).
 - ii. The planting of new species-rich (≥5 species) trees and hedgerows around the site, using native species between plots and along the north, east and south peripheries (Appendix F for location). New hedgerows will be planted with shrub species 40% blackthorn *Prunus spinosa*, 25% hawthorn *Crataegus monogyna*, 10% crab apple *Malus sylvestris*, 10% hazel *Corylus avellana* and 10% wild privet *Ligustrum vulgare*, and tree species 5% field maple *Acer campestre*.
- 2.4. All bare root stock shall be planted between late October and March inclusive. Plants shall be delivered to site in quantities which can be planted the same day. No plant roots shall be allowed to dry out.

- 2.5. Dig L or T shaped notches and insert eight plants at 25cm intervals in two staggered rows, remove weeds, large stones to 50cm x 50cm and insert whip and cane support and photodegradable guards.
- 2.6. Construction works will be carried out in accordance with British Standards Institution (2012), BS 5837:2012, trees in relation to design, demolition and construction – recommendations, to protect trees which are to be retained and their root protection areas.

Bats

- 2.7. As bats may forage and commute across the site, any external lighting will follow guidance from the Bat Conservation Trust and CIE 150:2003. Warm-white (long wavelength) lights with UV filters will be fitted as close to the ground as possible. Lighting units will be angled below 70° and equipped with movement sensors, baffles, hoods, louvres and horizontal cut off units at 90. Please refer to lighting design scheme detailed within section 3.
- 2.8. As enhancements for bats, the following will be installed:
 - One integrated bat box on the new dwelling onsite (Bat Block Appendix A for examples, Appendix F for location).
 - ii. One standalone bat box installed on a suitable tree within the site ownership (Greenwood's Ecohabitats three crevice bat box Appendix A for examples, Appendix F for location).
- 2.9. Building Regulations state that the energy efficiency of buildings must be improved where possible and that contractors must assess the condensation risk within the roof space and make appropriate provisions in line with BS 5250:2011. This British Standard states that both High Resistance (bitumen type 1F) and Low Resistance (non-bitumen coated roofing membranes (NBCRM)) underlays are acceptable as long as appropriate ventilation is provided. As NBCRM are proven to entangle bats through regular contact, which also compromises the integrity of the membrane, the Bat Conservation Trust recommend only NBCRM that have passed the snagging propensity test (must be supplied/installed with the necessary certification) or traditional type 1F bitumen are used.

Birds

2.10. Any works affecting bird nesting habitat such as management of trees or buildings would ideally need to be conducted outside the main nesting season. If work is planned during the bird nesting season (between 1st March and 31st July), then a precautionary check of all habitats will be conducted by a qualified ecologist immediately prior to starting any work. If any nesting

birds are found, an appropriate protection zone from the nest will be required and will be maintained until the young have fledged.

- 2.11. As enhancements, the following will be implemented:
 - i. One integrated swift box installed on the new dwelling on site (Swift Block Appendix A for example, Appendix F for location).
 - ii. One small bird box installed on a suitable tree on or adjacent the site (Schwegler 1B or 2H Nest Box Appendix A for example, Appendix F for location).

Herpetofauna (Great Crested Newts and Reptiles)

- 2.12. As a precautionary measure, the following mitigation will be implemented to avoid impacts on amphibians and reptiles from the proposed works:
 - Vegetation on site will be cut and maintained short (maximum height of 10cm) until the start of works, to discourage animals from using these areas.
 - ii. Construction materials will be stored off the ground on pallets and waste materials in skips, to prevent providing shelter for animals and subsequent harm when materials are moved.
 - iii. Any excavations will have a rough sawn plank placed inside to act as a ramp to allow any animals that have fallen in to escape. The excavations will be checked each morning works are scheduled for, to remove any animals trapped.
 - iv. In the highly unlikely event that any GCN or reptiles are found, work will cease immediately, and a licenced ecologist contacted to remove animals to safety and advise on how to proceed.
 - v. The construction of a south facing bund/hibernacula on site (Appendix D for example, Appendix F for location), which is covered in low-nutrient soils.

Other animals

- 2.13. General mitigation to protect wildlife during the construction period are as follows:
 - i. Lighting of the construction site at night will be minimised as far as practicable, to reduce the risk of possible disruption to nocturnal animals such as bats and badgers.
 - ii. To maintain potential hedgehog routes within the site and between the site and further habitats, any fencing installed will be porous and provides access openings for hedgehogs (see Appendix C for examples).
- 2.14. As enhancements, the following will be implemented:

i. One bee brick to be installed on the new dwelling (Appendix E for examples, Appendix F for location).

Responsible persons

2.15. The client is the developer and landowner of the site and it will be their responsibility to ensure the safeguarding of the mitigation, enhancements and any post-development management, maintenance and monitoring.

Aftercare and long-term maintenance

- 2.16. The model of bat and bird boxes have been selected for their design and material, which will ensure the boxes will be protected from weather and attacks from other animals.
- 2.17. If the bat and bird boxes experience any damage, they will need to be repaired or replaced.
- 2.18. Bird boxes will need to be cleaned at the end of each bird nesting season; the main nesting seasons lasts from March to August, so it is recommended boxes are cleaned in October to ensure all nests are unoccupied.
- 2.19. Hedgerows and trees may need to be maintained. Management would ideally be undertaken outside the main nesting season, which lasts from March to August, and if work is planned during the bird nesting season, a precautionary check of all habitats will be conducted by a qualified ecologist immediately prior to starting any work. If any nesting birds are found, an appropriate protection zone from the nest will be required and will be maintained until the young have fledged.

3. LIGHTING DESIGN SCHEME

- 3.1. Lighting schemes will follow guidance from the Bat Conservation Trust and CIE 150:2003. Warmwhite (long wavelength) lights with UV filters will be fitted as close to the ground as possible. Lighting units will be angled below 70° and equipped with movement sensors, baffles, hoods, louvres and horizontal cut off units at 90°.
- 3.2. Appendix F demonstrates the proposed lighting scheme using a total of 11 downlights (Table 1). These lights will be connected to motion sensors with short timers and a central control to further minimise temporary light spill.
- 3.3. Any external lighting will be situated away from the periphery, to prevent light spill and maintain bat foraging and commuting routes.

3.4. The Preliminary Ecological Appraisal (Greenlight Environmental Consultancy Ltd., 2023) indicates bat boxes will be installed on the new dwelling. Although external lights will be positioned on the same elevations, the lights will not have any impact on potential roosting locations, as they will be located ≈3m away from box entrances and consist of downlights with motion sensors and timers.



Product: Single fixed 35W wall downlight

Bulb: GU10 warm white (3,000K) LED

Control: Motion sensor with short timer and central control.

Table 1, proposed light units and bulbs.

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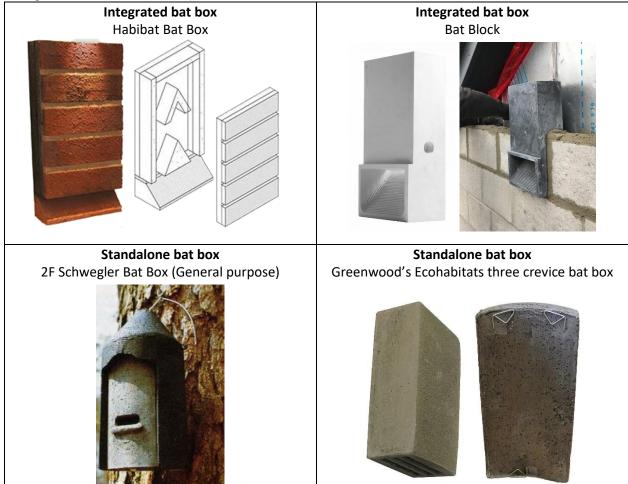
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Appendix A Examples of bat and bird boxes

(images sourced from www.nhbs.com, www.habibat.co.uk, www.manthorpe.co.uk, www.barnowltrust.org.uk and www.greenwoodsecohabitats.co.uk)



Recommendations for installing bat boxes:

(Sourced from Bat Conservation Trust www.bct.org)

Ideally, several boxes should be put up facing in different directions to provide a range of conditions. Locate boxes:

- Where bats are known to feed close to hedges and treelines (some bats use a treeline or hedgerow for navigation, putting boxes near these features may help the bats find the box).
- On trees: boxes should be placed on the trunk of a mature tree, where there is a clear flight line/accessible entrance.
- On buildings: boxes should be placed as close to the eaves as possible.
- As high as possible (ideally, at least 3 to 4m above the ground, where safe installation is possible).
- In sunny places, sheltered from strong winds (usually between south-west and south-east).

Make sure the boxes are secured.

Boxes can be installed on trees using adjustable ties to avoid damaging the trees. Otherwise, timber screw bolts or nails can be used. Aluminium alloy nails are less likely to damage saws and chipping machinery.

Bats need time to find and explore new homes, and it may be several months or even years before boxes have residents. Once bats find a place they want to live they can return over and over again. Droppings on the landing area, urine stains around the lower parts of the box and chittering noises from inside on warm afternoons and evenings are signs of occupation.



Recommendations for installing bird boxes:

(Sourced from British Trust for Ornithology www.bto.org and Manthorpe www.manthorpe.co.uk)

The highest priority when siting a nest box must be to provide a safe and comfortable environment in which birds can nest successfully.

Tips for putting up a nest box:

- Boxes should be sited 1-3m from the ground, ideally on tree trunks but can be placed on the side of a shed or wall. Avoid areas where foliage obscures the entrance hole.
- Don't place boxes too close to another nest box of the same type, as this may promote aggressive behaviour between neighbours.
- Shelter your nest box from prevailing wind, rain and strong sunlight. The box should face between north and east, and angled vertically or slightly downwards to prevent rain entering.
- Make sure cats cannot get into the box.
- Keep nest box away from bird feeders.
- Use galvanized or stainless steel screws or nails. If fixing boxes to trees, galvanised wire can be used to tie the box to the trunk or hang it from a branch. Make sure to regularly inspect these fittings (every two or three years) to ensure the box remains securely attached.

Tips for putting up house sparrow terraces and swift bricks/boxes:

- Locate ≥5m high on the gable wall of the property and above the level of the insulation zone.
- Where possible, install in locations that are unlikely to receive large amounts of direct sunlight during the hottest times of the day, ideal places include below the overhang of the verge and barge board.

Appendix B Native species suitable for planting and sowing

Plants should be obtained from specialist nurseries and preferably be of local genetic stock.

<u>Key</u>: (f) – fruit and berry species; € – evergreen species; (se) semi-evergreen species; (d) – deciduous species

| Trees | | |
|-----------------------|------------------------------|--|
| Alder (d) | Alnus glutinosa | |
| Apples (f; d) | Malus spp. (local varieties) | |
| Ash (d) | Fraxinus excelsior | |
| Beech (d) | Fagus sylvatica | |
| Bird cherry (f; d) | Prunus padus | |
| Elder (f; d) | Sambucus nigra | |
| Elm (d) | Ulmus procera | |
| Field maple (d) | Acer campestre | |
| Pedunculate oak (d) | Quercus robur | |
| Rowan (f; d) | Sorbus aucuparia | |
| Pears (f; d) | Pyrus spp. | |
| Silver birch (d) | Betula pendula | |
| Small-leaved lime (d) | Tilia cordata | |
| White willow (d) | Salix alba | |
| Wild cherry (f; d) | Prunus avium | |
| Walnut (d) | Juglans regia | |

| Shrubs | |
|---------------------|-----------------------|
| Blackthorn (f; d) | Prunus spinosa |
| Buckthorn (f; d) | Rhamnus catharticus |
| Crab apple (f; d) | Malus sylvestris |
| Dog rose (f; d) | Rosa canina |
| Dogwood (f; d) | Cornus sanguinea |
| Field maple (d) | Acer campestre |
| Guelder-rose (f; d) | Viburnum opulus |
| Hawthorn (f; d) | Crataegus monogyna |
| Hazel (d) | Corylus avellana |
| Hol€(e) | Ilex aquifolium |
| Honeysuckle (f; d) | Lonicera periclymemum |
| Spindle (f; d) | Euonymus europaeus |
| Wild privet (f; se) | Ligustrum vulgare |
| Yew (f; e) | Taxus baccata |

| Flowering plants | | |
|---------------------|---------------------------|--|
| B'rd's-foot trefoil | Lotus corniculatus | |
| Black knapweed | Centaurea nigra | |
| Common 'at's-ear | Hypochoeris radicata | |
| Common sorrel | Rumex acetosa | |
| Common vetch | Vicia sativa | |
| Cowslip | Primula veris | |
| Field scabious | Knautia arvense | |
| Foxglove | Digitalis purpurea | |
| L'dy's bedstraw | Galium verum | |
| Meadow buttercup | Ranunculus acris | |
| Meadow vetchling | Lathyrus pratensis | |
| Oxeye daisy | Leucanthemum vulgare | |
| Primrose | Primula vulgaris | |
| Red clover | Trifolium pratense | |
| Selfheal | Prunella vulgaris | |
| Sweet violet | Viola odorata | |
| Wild daffodil | Narcissus pseudonarcissus | |
| Yarrow | Achillea millefolium | |

| Grasses | | |
|---------------------|-----------------------|--|
| Common bent | Agrostis capillaris | |
| Crested 'og's-tail | Cynosurus cristatus | |
| Meadow fescue | Festuca pratensis | |
| Red fescue | Festuca rubra | |
| Rough meadow-grass | Poa trivialis | |
| Small timothy | Phleum bertolonii | |
| Smooth meadow-grass | Poa pratensis | |
| Sweet vernal-grass | Anthoxanthum odoratum | |
| Yellow oat-grass | Trisetum flavescens | |

Wildflower Meadow Mixture – EM3 Emorsgate Seeds

https://wildseed.co.uk/product/mixtures/complete-mixtures/general-purpose-meadow-mixtures/special-general-purpose-meadow-mixture/

Appendix C Examples of hedgehog friendly fencing

(images sourced from www.quercusfencing.com and www.jackson-fencing.co.uk)

Quercus Fencing

Hedgehog friendly oak woven fencing panels



Jacksons-Fencing Hedgehog friendly gravel board for use with slotted posts



Recommendations for installing hedgehog friendly fencing:

(Sourced from Hedgehog Street www.hedgehogstreet.org)

A hedgehog friendly fence should have a gap measuring at least 13cm by 13cm in the gravel board. These gaps allow any hedgehog to pass through but are too small for nearly all pets.

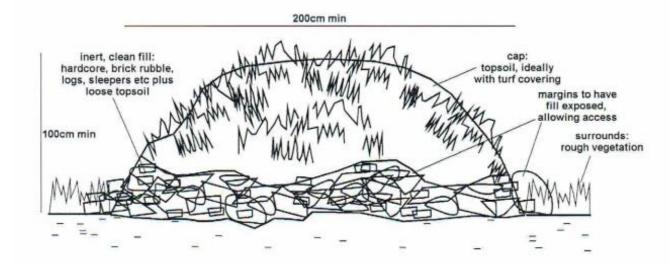
At least one hedgehog friendly fence panel should be located on each side of your garden, to provide unimpeded access.

Almost all fencing materials can be made hedgehog friendly, but may require DIY adaptations. Please note that some concrete gravel boards contain metal rods running along the length of the boards to provide strength and rigidity, and cannot be cut. To overcome this, a gap can be left between the gravel board and post to provide the required gap.

Appendix D Newt and reptile artificial hibernaculum design

Figure 3: Suggested hibernaculum design

This design mimics artificial and natural conditions in which great crested newts have frequently been found overwintering. Dimensions should not be below 2m length x 1m width x 1m height. The illustrated design would be suitable for locating on an impermeable substrate. On free-draining substrates, the design is largely similar but the bulk of the fill is sited in an excavated depression in the ground. Hibernacula should ideally be positioned across a site, both close to and distant from breeding ponds, always in suitable terrestrial habitat and above the flood-line.



Source: English Nature (2001) Great Crested Newt Mitigation Guidelines, Peterborough

Appendix E Bee Bricks

(images sourced from www.nhbs.com and www.greenandblue.co.uk)





Recommended bee brick installation (Sourced from NHBS www.nhbs.com)

- Bee bricks will be installed on a south facing sunny spot of an external wall of the residential dwelling, at a minimum height of 1m. No vegetation should be obstructing the holes.
- Bee posts will be positions south facing in a sun exposed spot, with no vegetation covering the fascia. The posts must be set in a concrete base at a minimum of 30mm, similar to installing a fencepost.

Appendix F Location of enhancement measures

- Indicates location of integrated bat box
- Indicates location of standalone bat box
- Indicates location of integrated swift box
- Indicates location of small bird box
- Indicates location of hibernaculum
- Indicates location of bee brick
- Indicates location of hedgerow
- Indicates location of wildflower meadow
 - Indicates location of wall lights



