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**Phase 1 Preliminary Ecological Appraisal,**  
**with bat emergence survey**  
**Langstone Lodge, Havant**



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## SUMMARY

### Purpose

The phase 1 preliminary ecological appraisal is undertaken in order to identify key ecological constraints to the proposed development; inform planning to allow significant ecological effects to be avoided or minimized; identify any further ecological surveys needed to inform an ecological impact assessment and to support the development of mitigation of compensation measures.

### Methodology

The survey was conducted by carrying out a systematic walkover of the site by Dr. Stefan Bodnar to record habitats, species, and any notable features of interest with regard to flora & Fauna. This is in accordance with standard Phase 1 survey techniques and is a methodology recommended by the Institute of Environmental Assessment (1995) and guidance from CIEEM (2011, 2018).

### Key Issues & Conclusions

This Phase 1 Ecology Report confirms that the proposed development area is of 'low ecological value' consisting primarily of an existing building, hard-standing and an improved grassland with surrounding off site hedges and trees of moderate to high ecological value. These should be protected in accordance the guidance in the BS5837 tree report for the site. A tree protection area and root protection zone should be established to avoid damage during the construction phase around all retained trees and hedges.

- There are no Statutory or Non-Statutory Designated Nature Conservation Sites within the site.
- The Biological Data Search no protected species were recorded within the site.
- There is no evidence of badger use of the site, therefore no further surveys are required.
- The site is of low suitability for both reptiles and Great Crested Newts, therefore no further surveys are required, although a series of precautions should be taken during development, as detailed in section 4.3b.
- The trees and hedges within the survey site are suitable for bird nesting. Site clearance should be undertaken outside of the bird breeding season (mid March to mid August) or undertaken under ecological supervision.
- **Although the building to be demolished has negligible bat roost potential, there is a small residual risk of bats in a small number of lifted tiles, this residual risk being dealt with by timing precautions to the demolition, direct ecological supervision of roof strip and mitigation features for loss of bat roost potential/enhancement on the new structure.**
- External Lighting is to be in accordance with BCT current guidance (see Artificial Lighting and Bats, BCT Guidance note, 2018), also refer to generic guidance (BCT) Appendix 8, at end of this document.

## 1. INTRODUCTION

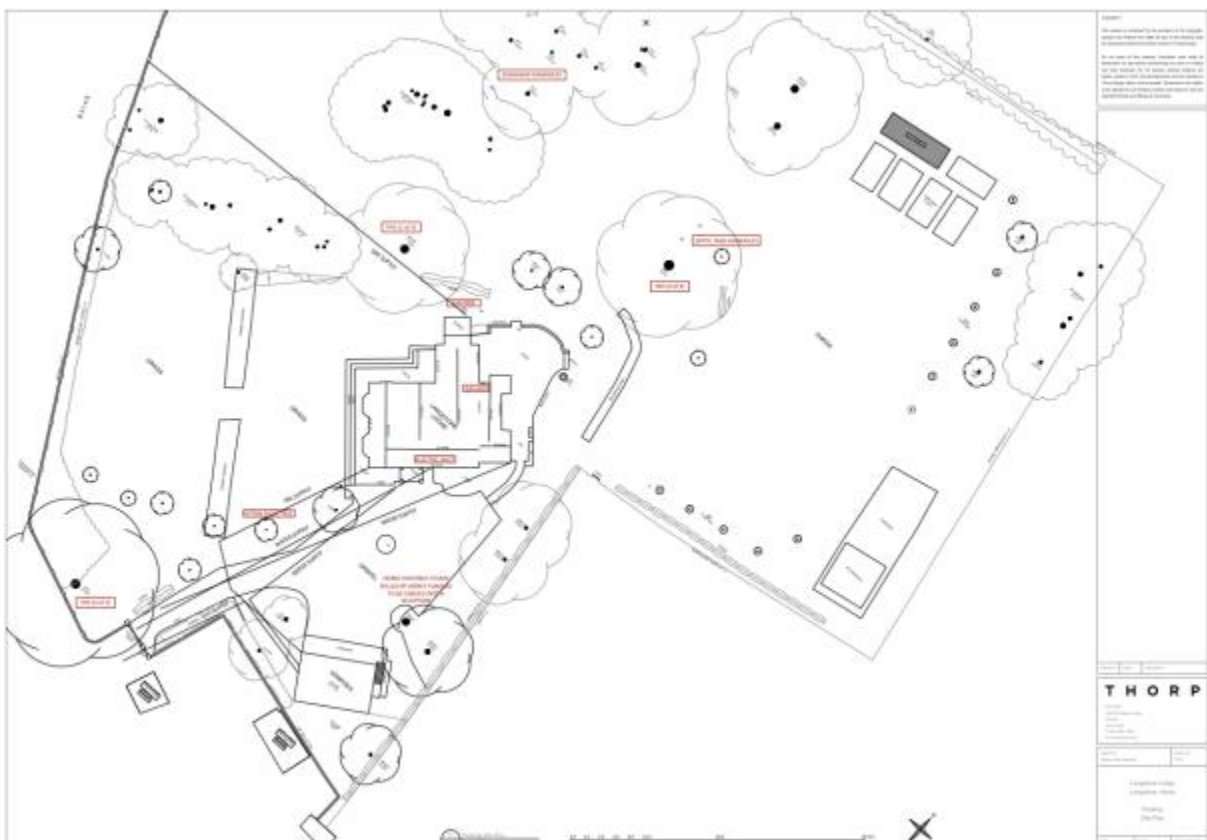
### 1.1. Background

At the request of clients, a Phase 1 Preliminary Ecological Appraisal was carried out at an area of land at Langstone Lodge, haven't, to evaluate the habitats, describe any further surveys required an, in particular to indicate and specify the level of required mitigation/ compensation/ enhancement in relation to a planning application.

### 1.2. Site Location

The site is located on land at Langstone Lodge, 1 Langstone High Street, Havant, PO9 1RY. The plan in Figure 1a below, satellite image Figure 1, and plan also show the area concerned.

**Figure 1a. Plan showing site location and existing elevations (east and north face)**







**Figure 1. Satellite image showing site location**

*Map data 2021 © Google.*



*Map data 2021 © Google.*

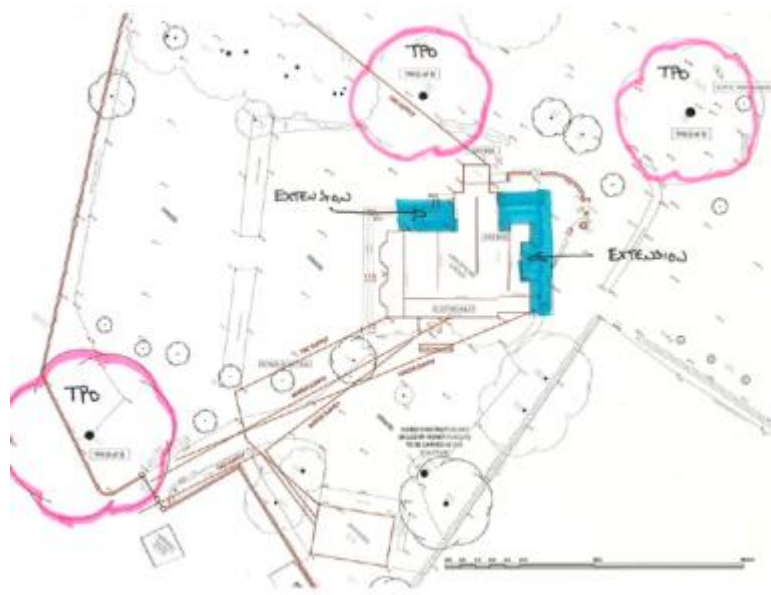
**Figure 2. Satellite image of local area around the site.**

### **1.3. Site Description**

The area involved in the proposed works comprises two proposed extensions to the existing 3 storey building, which is c 1870 in construction, with extensions in the 1920s and 1997, but has had extensive recent renovation works completed including a new roof structure less than a year previously. The area involved comprise hard-standing and improved mown grassland areas to the North and East of the existing building and single storey attached structures to the East that will be demolished. The main building will be unaffected by any works proposed. In addition to this report a Construction Environmental Management Plan and a Pre-development tree survey and Constraints plan has been produced, to demonstrate appropriate safeguards during construction and appropriate tree constraints in relation to the significant trees on site, some of which are protected by Tree Preservation Orders as well as the site lying within a Conservation area.

## 1.4 Brief Description of Project

Two new extensions, one of which involves the demolition of the existing single storey structure. See plans below and refer to planning application for full details. The new structures are mainly ground floor with a small first floor to the East, with a pitched roof





#### 1.4 Purpose of the Preliminary Ecological Appraisal

The phase 1 preliminary ecological appraisal report identifies key ecological constraints to the proposed development; informs planning to allow significant ecological effects to be avoided or minimized; identifies any further ecological surveys needed to inform an ecological impact assessment and supports the development of mitigation or compensation measures.

It is composed of two parts. A site visit, during which a preliminary ecological appraisal of the site is carried out to identify the major habitat types, plant, bird, reptile, mammal and other species using the site. Also a desk study, which gathers ecological data on the site and its surrounding area, to identify protected species and statutory protected sites in the vicinity of the proposed development site, in order to produce recommendations on the key ecological constraints to the proposed development.

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## 2 METHODOLOGY

### 2.1 Desk Study Methodology

Information was gathered from a number of web-based data sources, published ecological reports and where appropriate, the authors own records. The ecological data search covers the following areas:

- Species of particular note
- Local Nature Reserves
- Protected species (badger, grass snake, great crested newts, otter, water vole and bats)

### 2.2. Survey Methodology

The survey was conducted by carrying out a systematic walkover of the site by Dr. Stefan Bodnar to record habitats, species, and any notable features of interest with regard to flora & Fauna. This is in accordance with standard Phase 1 survey techniques and is a methodology recommended by the Institute of Environmental Assessment (1995) and guidance from CIEEM (2013, 2018).

During the survey, emphasis was placed on searching for evidence of and potential of habitats and features supporting protected or notable species, especially those listed under the Conservation of Habitats and Species Regulations 2017 and the Wildlife & Countryside Act 1981 (as amended)

The range of methods used were as follows:

#### **Bats**

The trees within the site were appraised for their potential suitability to support breeding, resting and hibernating bats in accordance with survey methods documented in the Bat Surveys: Good Practice Guidelines (Bat Conservation Trust 2016). Features of medium and high potential for bats were searched for signs of use by bats, such as droppings, urine staining and scratches around entrance holes etc.

A visual inspection of the trees from ground level with the aid of binoculars was undertaken to

search for evidence of actual bats as well as signs of bats (droppings, feeding remains, urine staining, scratch marks, noise and the remains of dead bats etc.). In addition, the trees were assessed for the presence of features likely to be attractive to roosting bats, such as cavities or rot holes in the trunk or branches, splits in the timber, delaminating bark, deep bark crevices, dead branches and dense ivy cover etc.

In accordance with the methodology outlined in the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines (2016) trees were assigned to the following categories:

- **Known or Confirmed Roost** - signs of bats (droppings, etc) or actual bats recorded; or previous records of bats in tree
- **High (Category 1\*)** – trees with multiple, highly suitable features capable of supporting large roosts
- **Medium (Category 1)** – a tree with definite bat potential; fewer features than category 1\* or potential for single bats
- **Low (Category 2)** – No obvious potential, although tree of size and age that elevated surveys may result in cracks/crevices being found; or tree has some features which have limited potential to support bats
- **Nil (Category 3)** – no potential to support bats

The site was also assessed for potential bat foraging areas and commuting routes.

Features of medium and high potential for bats were searched for signs of use by bats, such as droppings, urine staining and scratches around entrance holes etc. The site was also assessed for actual and potential bat foraging areas and commuting routes.

### **Buildings:**

#### **Visual External Assessment**

The external building inspection (from the ground using binoculars) focused particularly on roof areas, soffits, areas of wall with cracks and apertures, vents, openings into the building and the overall structure of the buildings including any features such as crevices or cavities that may be suitable for bats to roost

in. Evidence of roosting such as droppings or staining around entrances was also recorded. Where appropriate gaps and cavities were checked using an endoscope.

Methods of survey used have been based on those outlined in Joint Nature Conservation Committee's Bat Workers Manual (Mitchell-Jones & McLeish, 2004), Bat Surveys for Professional Ecologists (3<sup>rd</sup> Edition), BCT (2016), and English Nature's Bat Mitigation Guidelines (Mitchell-Jones, 2004).

### **Reptiles**

The site was assessed for its suitability to support reptiles based upon the abundance of suitable habitats such as structurally diverse habitats, hedgerows, scrub, rough grassland, wood piles, rubble, banks and compost heaps etc. The site was assessed with respect to its potential for use for hibernation and spring/summer use based on guidance provided in the Herpetofauna Workers' Manual (Joint Nature Conservation Committee, 2003) and the Reptile Management Handbook (Edgar, Foster & Baker 2011).

### **Badgers**

The whole site was searched systematically, with particular attention being paid to features likely to support badger setts (e.g. earth embankments, wooded copses etc.). The location of all badger signs such as runs, dung pits, prints, hair, foraging snuffle holes found during the survey were mapped and all setts characterised as either main, annex, subsidiary or outliers in accordance with guidance given in Surveying Badgers (Harris, Cresswell & Jefferies, 1988).

### **Birds**

All birds observed during the field survey were recorded, in addition to features capable of supporting nesting birds (e.g. trees, hedgerows, buildings, bramble beds, ruderal vegetation and rough grassland etc). The sites was also assessed for its actual and potential suitability to support Schedule 1 and Biodiversity Action Plan priority species.

### **Other Species**

The site was also assessed for its actual and potential suitability to support other protected or notable fauna in accordance with the Guidelines for Preliminary Ecological Appraisal (Chartered Institute of Ecology and Environmental Management, 2013, 2018).

### **2.3. Site Location and Access**

Langstone Lodge, 1 Langstone High Street, Havant, PO9 1RY

All areas were available for access.

### **2.4. Date and Time of Survey**

The site assessment was conducted on 13<sup>th</sup> October 2021.

### **2.5. Weather Conditions**

The weather conditions during the survey were warm and clear.

### **2.6. Survey Constraints**

Due to the time of year the survey was undertaken it can be considered to provide a reasonable, though not exhaustive plant list. This survey noted the habitat types on the site, and the dominant vegetation at the time of the survey, which is likely to be constant and a fair reflection of the habitat quality present.

### 3.1. Desk Study Results

The map below shows all Statutory Nature Conservation Sites (this includes Sites of Special Scientific Interest, Local Nature Reserves, Special Areas of Concern) within proximity of the proposed development.

COUNTY: WEST SUSSEX/HAMPSHIRE SITE NAME: CHICHESTER HARBOUR

DISTRICT: CHICHESTER/HAVANT

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981.

Local Planning Authority: CHICHESTER DISTRICT COUNCIL; HAVANT BOROUGH COUNCIL

National Grid Ref: SU 760 000 Area: 2657 ha 6566.7 acres W Sussex  
3695 ha 9130.3 acres Total

Ordnance Survey Sheet 1:50,000:197 1:10,000: SU 70 NW,NE,SW,SE, SU 80 NW, SW,SE, SZ 79  
NW,NE, SZ 89 NW

Date Notified (Under 1949 Act): 1970 Date of Last Revision: 1980

Date Notified (Under 1981 Act): 1984 (Hants) 1985 (W Sussex)

Other Information: This site lies within the South Coast Plain. It includes Nutbourne Marshes Local Nature Reserve. The site is listed in 'A Nature Conservation Review' and is a Geological Conservation Review site.

Reasons for Notification:

Chichester Harbour is a large estuarine basin in which at low water extensive mud and sandflats are exposed, drained by channels which unite to make a common exit to the sea. The site is of particular significance for wintering wildfowl and waders and also breeding birds both within the Harbour and in the surrounding permanent pasture fields and woodlands. There is a wide range of habitats which have important plant communities.

The intertidal area is fragmented in the upper reaches of the harbour by intruding tongues of land giving a very long and varied coastline. The harbour exhibits a wide range of intertidal and associated terrestrial habitats and with the neighbouring Langstone and Portsmouth Harbours is unusual in providing a large volume of sheltered saline water fed by a few streams of only low volume. The extensive intertidal mudflats are the feeding grounds, at the relevant times of year for internationally important numbers of ringed plover, grey plover, redshank, black-tailed godwit, dunlin, sanderling, curlew and greenshank (the latter two in autumn particularly). Bar-tailed godwit numbers are of European importance. Amongst the wildfowl, shelduck, teal and dark-bellied brent goose numbers are of international importance with 5% of the world population of the latter. The unimproved permanent pasture behind the sea wall provides alternative feeding sites for the geese and major high tide wader roosts. Some of this pasture is floristically rich being a red fescue *Festuca rubra* sward with scarce species such as green-winged orchid *Orchis morio* and adder's tongue fern *Ophioglossum vulgatum*.

The lower saltmarsh habitat fringing the mud flats is dominated by cord grass *Spartina anglica* and in most places the upper saltmarsh is rather restricted by the sea wall but there are some pure stands of sea purslane *Halimione portulacoides* while in some areas there is also sea lavender *Limonium vulgare*, sea aster *Aster tripolium* and other saltmarsh species.

Shingle occurs as spits and islands and most are rather unstable permitting little vegetation to become established. This habitat forms the main breeding grounds in the harbour for ringed plover, blackheaded gull and three species of terns. The extensive sand dunes at East Head are dominated by marram grass *Ammophila arenaria* although the degree of ground cover varies from 90% to 10% on the more recently established dunes.

Notable invertebrates include the long-winged conehead *Conocephalus discolor* and the moths, starwort shark *Cucullia asteris*, the sand dart *Agrotis ripae*, shore wainscot *Mythimna litoralis* and lunar hornet *Sphecia bemeciformis*.

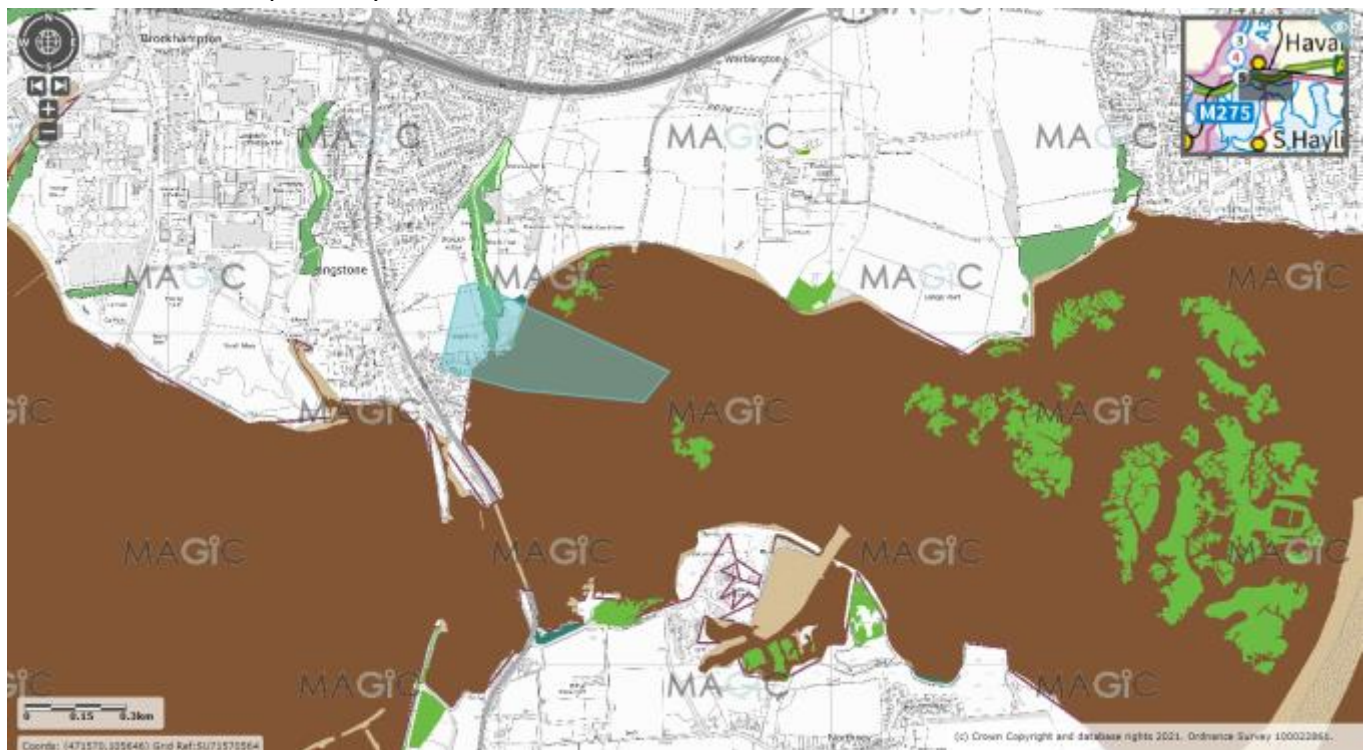
East of Langstone, at SU 725053, a low cliff line at high water mark exhibits a complex of Brickearth and Coombe Rock deposits and at East Head, SZ 769991 there is a sizeable sand dune and shingle system both of which are of geomorphological importance.

The screenshot displays the MAGIC web application interface. The top navigation bar features the MAGIC logo, a search bar, and a series of icons for various map functions. The left sidebar, titled 'Table of Contents', lists several categories: Designations, Habitats, Species, and Birds. Each category has a list of sub-items, some of which are checked or highlighted. The main map area shows a detailed view of a city, likely London, with a red line indicating a specific route or boundary. A blue arrow points from the map to a larger, detailed view of the same area on the right. The bottom status bar shows the copyright notice: '© Crown Copyright and Database rights 2015. Ordnance Survey 100022863'.

## Redshank



Habitats: The SPA is primarily mudflats and salt marsh



### 3.1b. Protected Species Records

In relation to bat species the following were recorded from a variety of online web based resources, (and in places, the authors own records), presented here with the approximate distances of the nearest record. In addition, a number of Ecological survey reports within the area have been interrogated for protected species records. All records are post-2015 unless otherwise stated.

| Species (Latin Name)             | Common Name          | Approximate distance of nearest record from the survey site (km) |
|----------------------------------|----------------------|------------------------------------------------------------------|
| <i>Pipistrellus pipistrellus</i> | Common pipistrelle   | Within 2 km                                                      |
| <i>Myotis nattereri</i>          | Natterer's bat       | Within 2 km                                                      |
| <i>Plecotus auritus</i>          | Brown long eared bat | Within 2 km                                                      |
| <i>Pipistrellus pygmaeus</i>     | Soprano pipistrelle  | Within 2 km                                                      |

In relation to other protected species, the following were recorded within 5 km and are presented here with the approximate distances of the nearest record.

#### Other Notable Species

| Species (Latin Name)            | Common Name     | Approximate distance of nearest record from the survey site (km) |
|---------------------------------|-----------------|------------------------------------------------------------------|
| <i>Meles meles</i>              | Badger          | Within 2 km                                                      |
| <i>Erinaceus europaeus</i>      | Hedgehog        | Within 1 km                                                      |
| <i>Muscradinus avellenarius</i> | Common dormouse | Within 3 km North                                                |



The blue and pink squares on the maps above show the location of all European Protected Species licenses in the vicinity of the site.

### 3.1c Interpretation of Biological Data from Desk Study

Four species of bat are known to roost within 2km of the site. Dormice are recorded at 3 km NW, Badger are recorded within 2 km and Hedgehog within 1km.

## 3.2 Survey Results

### 3.2.1 Habitat Types Present & Baseline Ecological Conditions (see list in appendix 3, for species and Appendix 2: Images).

#### Habitats present:

- **Building:** The main 3 storey building is unaffected by the proposal other than a low level interface, not involving the roof structure. As it has had extensive recent works including a full roof replacement, re-mortared and new roof ridge, lining with breathable membrane, rendering and painting, there are no suitable features for bat access to the main structure and it is in addition unaffected. Therefore the survey was limited to the single storey East extension that is designated for demolition. This consists of a long apexed structure. No cavity wall present, a mid Victorian structure mainly, with clay tile, small retained roofspace in part of the building that was inaccessible. Some of roof covered exteriorly with plastic liner where there has been a leak.

Building below:



- **Improved Amenity grassland:** The area comprises an area of a regularly mown, improved grassland, Dominated by Perennial ryegrass *Lolium perenne* and Creeping Softgrass *Holcus mollis*, with some Daisy *Bellis perennis* and Dandelion *Taraxacum officinale* also present.
- **Hardstanding:** hard-standing areas around the building, patio etc.

### 3.2.2 Protected and Notable Species on Site

#### **Bats:**

There are 18 species of bat found in the UK, 17 of which are known to breed in the UK. All are small, nocturnal, flying, insectivorous mammals that are under considerable conservation threat and many having undergone severe population declines over the last century. Some species, such as pipistrelle bats (*Pipistrellus* sp) still remain relatively common and widespread in the UK, while others, such as greater horseshoe bats (*Rhinolophus ferrumequinum*), have an extremely restricted distribution. All species of bats and their roosting sites are afforded full protection under both UK and European legislation and are designated as 'European protected species'.

#### ***Bat assessment of foraging and commuting features:***

The site affected has moderate opportunities for bat foraging and commuting, being dark, sheltered with mature hedges and trees, adjacent to high quality habitats.

#### **On site Buildings:**

- The single storey structure has limited opportunities for bat access. Although of some age, it has been rendered and re-pointed throughout, so the brickwork is intact. The soffits are either replaced wood (recent, intact with no rot holes) or UPVC, again intact and close fitting. There is no cavity wall although there is a small inaccessible enclosed roofspace on one section of the structure. The residual risk is in a small number of lifted tiles on the Eastern face, the southern tile façade is intact throughout. These were inspected and found to be largely cobwebbed and with no signs of access either by bats or birds. In each case these are in the section of roof, with no internal loft space. These features would at best, only form occasional used poor quality day roost features for crevice dwelling species such as pipistrelle, though there was no evidence of this being the case. After inspection it was classified as negligible bat access and negligible bat roost potential, with the small residual risk of bat use being dealt with by timing precautions to the demolition, direct ecological supervision of roof strip and mitigation features for loss of bat roost potential/enhancement on the new structure.

### **Badgers**

Badgers (*Meles meles*) are protected in England and Wales under the Protection of Badgers Act 1992. Protection applies both to the animal itself and to its nesting burrows (setts), and current interpretation of the Act also confers some protection to key foraging areas. Badgers remain comparatively widespread and common throughout the UK. There is no evidence of badger setts on site or within 30m of the periphery of the development area. The habitats on site are of low suitability for badgers and no further badger surveys are recommended.

### **Other mammals**

The presence of other specially protected mammals, such as otter, pine martin, water shrew, dormouse or water vole, was assessed as unlikely due to the lack of suitable habitat on the site for these species.

## Birds

The Wildlife and Countryside Act 1981 (as amended) makes it an offence (with certain limited exceptions) to intentionally kill, injure or take any wild bird, or to damage, take or destroy the nest of any wild bird whilst that nest is being built or in use, or to take or destroy its eggs. Furthermore, the Act affords additional protection to specific species of birds listed in Schedule 1 of the Act. In respect of these species, it is unlawful to intentionally or recklessly disturb such a bird whilst it is nest-building or is in, on or near a nest containing eggs or young; or to disturb their dependent young. Following recent revisions, fifty-nine species are listed on the UKBAP.

The following species were recorded on-site during the visit:

| <b>Bird Species:</b> | <b>Latin name:</b>         |
|----------------------|----------------------------|
| Blackbird            | <i>Turdus merula</i>       |
| Robin                | <i>Erithacus rubecula</i>  |
| Blue Tit             | <i>Cyanistes caeruleus</i> |
| Woodpigeon           | <i>Columba palumbus</i>    |
| Nuthatch             | <i>Sitta europea</i>       |

The birds listed above were actually recorded on the site itself. The trees, scrub and hedges within the wider site could also provide suitable for nesting habitat for a number of other common woodland bird species.

There are no bird nests within or on the buildings, or within the footprint of development. It is recommended that further distant trees and hedges be protected and retained within the proposed development. This is likely to be a requirement of The Tree Protection Plan. Any site clearance of vegetation is undertaken outside of the bird breeding season (mid March to mid August). If site clearance involving any woody material is undertaken during these months, a suitably qualified and experienced ecologist should be employed to ascertain the presence of any breeding birds within the site.

### **Great Crested Newt**

The Great Crested Newt (*Triturus cristatus*) is one of the two rarest amphibian species in Britain. It is primarily a terrestrial animal, spending much of its life on land, but returning to the water to breed. Great crested newts will often return to breed in the same water-body where they were spawned. In addition, they are highly opportunistic and will also colonise suitable new waterbodies rapidly. Great Crested Newt is a 'European protected species' afforded full protection under both UK and European legislation. This protection extends to the habitats which support it. The habitats within 500m of a breeding pond are generally considered to be protected by the legislation. The great crested newt is a priority species and subject to its own Biodiversity Action Plan.

There are no on-site ponds and the terrestrial habitat is of low suitability for this species. There are no close records of GCNs. It is considered unlikely that GCN's would be present on site and no further survey is recommended. However, to reduce risk of harm to newts or other amphibians as a result of this development, it is recommended appropriate precautions should be taken during development.

- If Great Crested Newts are discovered at any time during processes involved with the development, work should cease immediately and the advice of a licensed ecologist sought.
- All site staff involved with site clearance and construction works are to be made aware of the potential for encountering Great Crested Newts through a tool kit talk and the appropriate measures to be taken if great crested newts are encountered.
- Keep duration of groundworks as short as possible.
- Undertake during the day works that might only affect newts above ground.
- Backfill trenches and other excavations before nightfall, or leave a ramp to allow newts to easily exit.
- Raise stored materials (that might act as temporary resting places) off the ground, e.g. on pallets.

### **Reptiles**

There are four widespread species of British reptile comprising grass snake (*Natrix natrix*), slow-worm (*Anguis fragilis*), adder (*Vipera berus*) and common lizard (*Zootoca vivipara*). These animals are protected under the Wildlife and Countryside Act 1981 (as amended) and the Countryside and

Rights of Way Act 2000. They are given so called 'partial protection', which prohibits the deliberate killing or injury of individuals. The habitats of common reptiles are not specifically protected.

The on-site habitat is of low suitability for reptiles, such as Grass snake and slow worm. It is considered unlikely that reptiles would be present on site and no further survey is recommended. However, to reduce risk to reptiles as a result of the proposed development it is recommended appropriate precautions should be taken during development.

Including where possible:

- Undertaking ground-works along field boundaries when reptiles are active (March to October).
- Ensuring storage of piles of materials and excavated earth on the site should be kept to a minimum.
- Storing piles of materials and excavated earth away from the field boundaries to deter reptiles from using them for temporary cover.

## 4.0 Discussion

**It is important that this proposed development should demonstrate no net loss of biodiversity from the site.** This is a duty placed on Local Authorities in the Natural Environment and Rural Communities Act 2006, Section 40. There are requirements noted for this under The National Planning Policy Framework (2021) which refers to compensation/ mitigation. It is confirmed that the enhancement, mitigation and compensation within this section will comply with all the relevant UK and EU legislation relating to protection and enhancement of ecology.

### 4.0. Ecological Constraints

The value of the site, in terms of ecological value to wildlife, is low, as it is mainly hard standing with buildings, with the residual area improved grassland. None of the habitats are of UK importance or target habitat within the national and county wide UK Post-2010 Biodiversity Framework.

The habitats present within the area consists of the following elements (see Phase 1 Habitat Map in Appendix 1d), none of which are of European and UK importance.

- Building
- Improved grass
- Hard-standing

### 4.1. Additional Ecological Surveys Recommended

- No further surveys are recommended.

## **4.2. Minimising Ecological Impact**

This section states how the negative impacts of development can be addressed:

### ***4.2a Protecting the Ecological Value of the Site.***

The trees and hedges within the wider area should be retained and enhanced. The trees are of suitability for breeding birds and potentially will have a number of nests during the breeding season.

Any trees unavoidably lost to accommodate the development should be replaced with appropriate compensation planting at a minimum of 1:1 ratio, preferably 1:2 in anticipation of the high failure rate of young trees. Ensure landscape planting uses species which are beneficial to wildlife. See appendices for recommended species planting lists.

Nest boxes suitable for common species should be installed on retained mature trees and the new building. Schwegler 1B nest boxes with 32mm entrance holes are recommended. These should be erected in accordance with the manufacturers recommendations. Generally, this will entail mounting the box between 3 – 4 m above the ground, with a north / northwest aspect. Care should be made to make the nest box inaccessible to predators, and generally, nest boxes should not be sited too close to each other.

It is also suggested that bat boxes be attached or integrated into the new build structure. Details can be found in appendix 5.

## **4.3 Precautionary Measures during Development**

The trees, hedges and garden planting could all provide suitable nesting structures, therefore although it is considered clearance will not be necessary, any required site clearance involving woody material, should be carried out outside of the bird breeding season. Bird breeding season is between mid March and mid August, although certain species can breed outside these months and if breeding birds are found then work should cease and the advice of an ecologist sought.

All retained trees should be treated in accordance British Standard BS5837 (2012) Trees in Relation to

Design, Demolition and Construction – Recommendations, to ensure require adequate root protection fencing.

To protect any reptiles or amphibians which might be using the site, it is recommended appropriate precautions should be taken during development. These include;

- If great crested newts are discovered at any time during processes involved with the development, work should cease immediately and the advice of a licensed ecologist sought.
- All site staff involved with site clearance and construction works are to be made aware of the potential for encountering great crested newts and reptiles through a tool kit talk and the appropriate measures to be taken if great crested newts are encountered.
- Keep duration of groundworks as short as possible.
- Undertake during the day works that might only affect newts above ground.
- Backfill trenches and other excavations before nightfall, or leave a ramp to allow newts to easily exit.
- Raise stored materials (that might act as temporary resting places) off the ground, e.g. on pallets.
- Ensuring storage of piles of materials and excavated earth on the site should be kept to a minimum.
- Storing piles of materials and excavated earth away from the field boundaries to deter reptiles from using them for temporary cover.

Appropriate precautionary measures are recommended, in case badgers enter the working areas at night:

- Ensure that all those in work are aware of the potential for setts or badgers to be encountered, and the actions to be taken if these are discovered at anytime.
- All excavations to be covered over or ramped so that any badgers could get out of an excavated structure. Further measures are detailed below:
- Any ground-works that are to be left open overnight will be provided with a means of escape should a badger enter. This could simply be in the form of a roughened plank of wood placed in the trench as a ramp to the surface. This is particularly important if the trench fills with water.
- Any trenches/pits will be inspected each morning to ensure that no badgers have become trapped overnight. Should a badger become trapped in a trench it will likely attempt to dig itself into the

side of the trench, by forming a temporary sett. Should a trapped badger be encountered the Ecologist should be contacted immediately for further advice who, if necessary, will contact Natural England in respect of legislative and licensing issues.

- The storage of topsoil or other 'soft' building materials on site will be given careful consideration. Badgers will readily adopt such mounds as setts; so as to avoid the adoption of any mounds, these will be kept to a minimum and any essential mounds subject to daily inspections (or nightly patrols if 24 hour security is present on site), with consideration given to temporarily fencing any such mounds to exclude badgers.

#### **Bats:**

- For the single storey building to be demolished, although of negligible bat roost potential, with the small residual risk of bat use being dealt with by timing precautions to the demolition (November to end March in any year) , direct ecological supervision of roof strip and mitigation features for loss of bat roost potential/enhancement on the new structure.

#### **External Lighting:**

Lighting is to be in accordance with BCT current guidance (see Artificial Lighting and Bats, BCT Guidance note, 2018), also refer to generic guidance (BCT) Appendix 1, at end of this document.

- There is to be no lighting columns within the development
- Lighting restricted to low bollards and individual lights near doorways (on PIRs)

#### **4.4 Opportunities for Biodiversity Gain**

Following the works, there will be opportunities to enhance the site, through selective landscape and native plantings which should be encouraged, and any element of which would create a net biodiversity gain. Species should be selected, that are both native and wildlife friendly, focusing on measures to encourage birds and foraging bats, wherever possible. See appendix 4 onwards for detailed information.

The opportunities for enhancement lie in the following main areas:

1. Retention and enhancement of value of existing hedges.

2. Planting of additional species rich native hedgerows with native standard in hedge trees is recommended along all site boundaries.
3. Establishing wildflowers along the site margins, through wildflower seeding, plug planting and bulb planting along the site boundaries and within open space and gardens through flowering lawn mixes.
4. Introduction of bat and bird friendly native planting schemes, hibernacula, and wildflower hedgerow edge mix seeding.
5. Bird and bat boxes incorporated within or on the new buildings, in particular should be included.
6. Selection of wildlife-friendly shrub/planting species as part of the terrestrial landscaping scheme within the development. The specification should include 4 elements of landscaping details selected from a palette of species beneficial to wildlife (further information can be found in Appendix 4):
7. Planting of native deciduous specimen tree species.
8. Wildflower seeding areas, in particular flowering lawns.
9. Planting with native nectar rich and berry bearing tree, shrub and plant species.

## 5.0 Conclusion

This Phase 1 Ecology Report confirms that the proposed development area is of 'low ecological value' consisting primarily of an existing building, hard-standing and an improved grassland with surrounding off site hedges and trees of moderate to high ecological value. These should be protected in accordance the guidance in the BS5837 tree report for the site. A tree protection area and root protection zone should be established to avoid damage during the construction phase around all retained trees and hedges.

- There are no Statutory or Non-Statutory Designated Nature Conservation Sites within the site.
- The Biological Data Search no protected species were recorded within the site.
- There is no evidence of badger use of the site, therefore no further surveys are required.
- The site is of low suitability for both reptiles and Great Crested Newts, therefore no further surveys are required, although a series of precautions should be taken during development, as detailed in section 4.3b.
- The trees and hedges within the survey site are suitable for bird nesting. Site clearance should be undertaken outside of the bird breeding season (mid March to mid August) or undertaken under ecological supervision.
- Although the building to be demolished has negligible bat roost potential, there is a small residual risk of bats in a small number of lifted tiles, this residual risk being dealt with by timing precautions to the demolition, direct ecological supervision of roof strip and mitigation features for loss of bat roost potential/enhancement on the new structure.
- External Lighting is to be in accordance with BCT current guidance (see Artificial Lighting and Bats, BCT Guidance note, 2018), also refer to generic guidance (BCT) Appendix 8, at end of this document.

| Date                          | Prepared by                             | Checked and Verified by                                                     |
|-------------------------------|-----------------------------------------|-----------------------------------------------------------------------------|
| 18 <sup>th</sup> October 2021 | Dr Louise Sutherland MIALE<br>Ecologist | Dr. Stefan Bodnar MCIEEM<br>Principal Ecologist<br><i>Dr. Stefan Bodnar</i> |

## **Part 2: Bat emergence survey and additional internal/external inspection**

**13<sup>th</sup> June 2022, Dr. Stefan Bodnar MCIEEM**

### **1. Introduction**

The surveys here are further bat surveys to determine if the level of activity and presence of any potential roosts at the site known as Langstone Lodge, Havant, specifically in relation to proposal including demolition of the existing single storey building building. This building was questioned by the Local authority in terms of its definition as negligible in respect of bat roost potential (see previous part of this report). To resolve the issue a further external/internal inspection of this section of the building was undertaken along with a single bat emergence survey.

The latter comprises a specific surveys: to undertake a site survey to inform what species of bats occupy and/or use the site.

The report to follow the survey will specifically contain the following:

#### **Survey/ Mitigation report**

- Details of habitats on site that may support species of bats
- Results of survey(s) including numbers recorded, location, status of area (with bats whether it is maternity or hibernation site)
- An assessment of the impact of the scheme on bats present on the site
- Any mitigation proposals
- Details of any post construction monitoring proposals and any short, medium and long term management proposals for the habitat or bats
- Any site specific advice

The building in question is the single storey structure in the image below:



**East elevation, single storey structures**

**Renewed internal assessment of this section of building:**

Externally the building remains similar in condition , with the exception that a major roof collapse in Nov/Dec 2021 has been repaired with clay tiles, the gaps and holes present eg at the gable end still remain .

Internally the roofspace is small, to 1.3m boarded or rendered internally, used for storage, with no evidence of bird or bat usage. See below:





## 2.1 Bat Emergence Surveys

### Approach and Brief:

a. The methods employed will follow The Bat Conservation Trust Good Practice survey guidelines (2016) and will involve one dusk survey (see below). There will be a minimum of 2 surveyors using bat detectors.

**Table 7.1 Recommended timings for presence/absence surveys to give confidence in a negative result for structures (also recommended for trees but unlikely to give confidence in a negative result).**

| Low roost suitability                                             | Moderate roost suitability                                                                     | High roost suitability                                                                         |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| May to August (structures)<br>No further surveys required (trees) | May to September <sup>a</sup> with at least one of surveys between May and August <sup>b</sup> | May to September <sup>a</sup> with at least two of surveys between May and August <sup>b</sup> |

**Table 7.2 Recommended timings for presence/absence surveys.**

| Survey type    | Start time                              | End time                              |
|----------------|-----------------------------------------|---------------------------------------|
| Dusk emergence | 15 minutes before sunset <sup>a</sup>   | 1.5–2 hours after sunset <sup>b</sup> |
| Dawn re-entry  | 1.5–2 hours before sunrise <sup>b</sup> | 15 minutes after sunrise <sup>c</sup> |

<sup>a</sup> Survey start time should be adjusted on subsequent surveys if bats are recorded already in flight at 15 minutes before sunset on the first survey (or, if only one survey had been planned, this survey may then need to be repeated).

<sup>b</sup> The possibility of late-emerging and early-returning species should be considered in setting times for surveys (see Section 3.5).

<sup>c</sup> If bats are still in flight 15 minutes after sunrise then ecologists should remain in position until all the bats have entered their roosts.

b. The key surveyor who will be present throughout has a Natural England bat survey license (survey level 2), which he has held for a number of years (over 15) and with 35 years experience of bat surveys. (Dr. Stefan Bodnar) assisted by Dr. L Sutherland MIALE.

### Detailed Methodology

- **1 Evening activity survey**

**One evening** activity survey and a single dawn swarming survey should be carried out using Bat detectors and an appropriate number of surveyors for the building concerned. The evening survey will be fifteen minutes prior to sunset and continued for ninety minutes to 120 after sunset. The dawn survey begins approximately ninety to 120 minutes prior to sunrise and continues until just after sunrise. Weather conditions during the evening activity surveys were recorded. Bat activity at the site will be mapped and any signs of roost formation determined.

The evening emergence/activity Survey was conducted on 4<sup>th</sup> June 2022 and followed standard survey format and guidance, the survey commencing 15 minutes prior to dusk and lasting approximately 2 hours after sunset. (see BCT Survey guidelines, BCT, 2016). (see BCT Good practice Survey guidelines, 2016).

The following detectors were used in heterodyne mode:

- 2x Batbox duet

2 field recorders were present throughout.

Bat species identified on the basis of heterodyne detector evidence alone is a highly skilled and somewhat subjective technique, based on the surveyor's field experience of the "jizz" of individual species (Ahlen, 1990). For this reason a number of authorities will only accept species specific identification in the field if a record is either confirmed in the hand, or accompanied by detailed sonogram evidence. Levels of bat activity are strongly correlated to climatic conditions due to the influence that these factors have on the abundance of insect prey, the surveyors recorded temperature and prevailing weather conditions at the start and finish of each survey session.

## 2.2 Results:

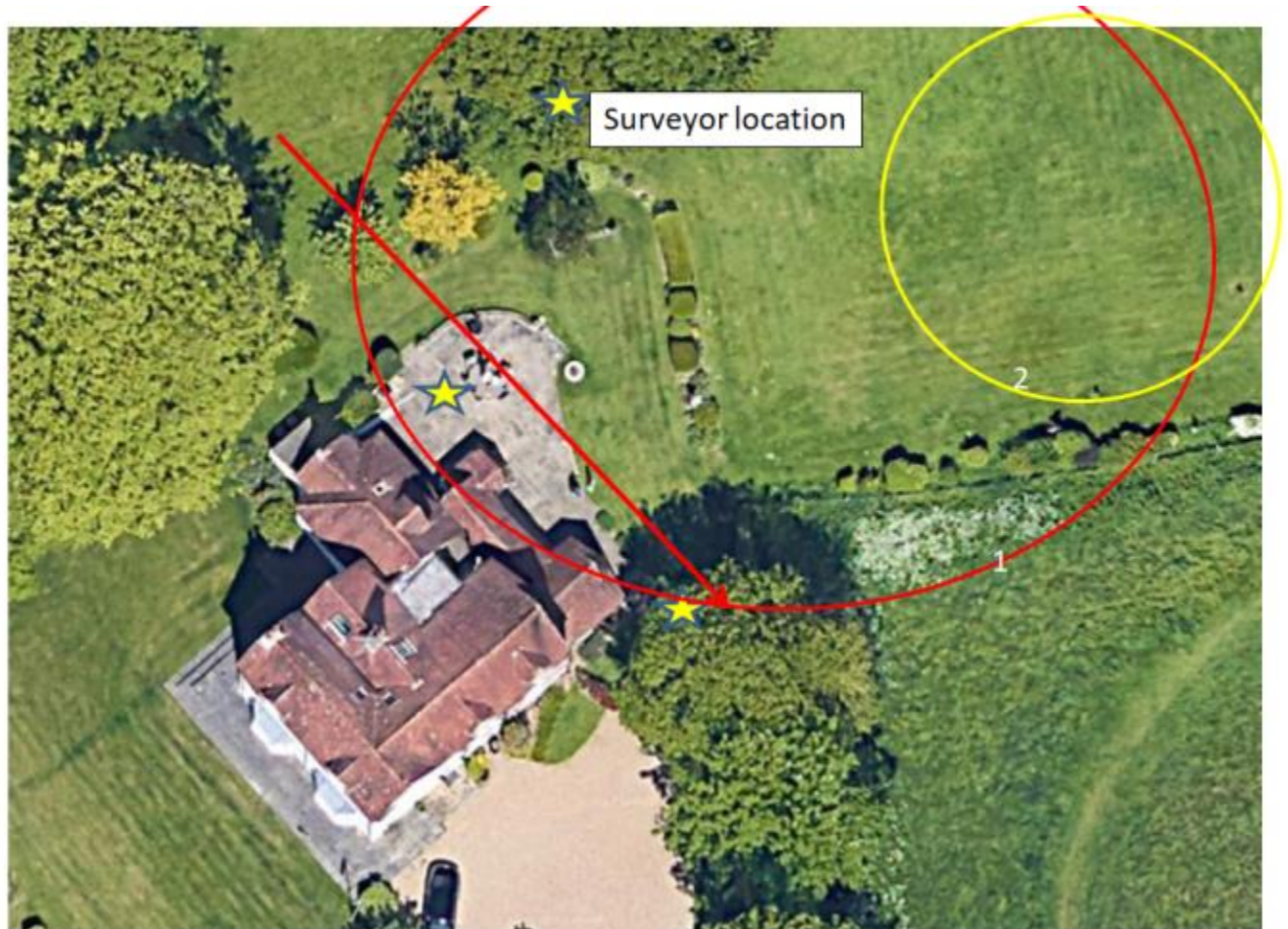
On the maps in the results the symbols below denote location of field surveyor:



## Evening Emergence/ Activity Surveys

**4<sup>th</sup> June 2022** Start time and temperature: 20:50 BST, 17°C, sunset 21:11

Weather conditions: mainly clear (2/8), light wind, Finish time and temperature: 23:11 BST, 15°C



| Species                | Record | Time  | Activity                                             | Detection frequency on heterodyne |
|------------------------|--------|-------|------------------------------------------------------|-----------------------------------|
| Common pipistrelle x 2 | 1      | 21:27 | Commute across site then forages (2 bats) till 23:11 | 45 kHz                            |
| Myotis                 | 2      | 21:47 | Forage/commute                                       | 28-70kHz                          |

Minimum count: Two Common pipistrelle, were noted during the survey, entering from off site and foraging. 1 Myotis sp. foraging

## 2.3 Conclusions:

**The bat emergence/re-entry surveys revealed a small number of common pipistrelle to be present, with a single forage/commute of a *Myotis* sp., relatively low activity and focused on foraging in the mature landscape present. No evidence of emergence, the building can be defined as not having a bat roost present.**

## 2.4 Mitigation /Licensing/Precautions

In relation to the National Planning Framework (2021) there is not likely to be requirement for Mitigation/ Compensation measures for loss of bat and bird roost opportunity.

However, as a basic biodiversity enhancement, two bat boxes are recommended on the building.



## Procedures for emergencies: Protected species

Note 1: If bats are discovered at any time during processes involved with the development, work should cease immediately and the advice of a licensed ecologist sought

Lighting (external) is understood not to be required. If it is to be installed it should be low lux, directional, shielded and on PIRs. In accordance with BCT guidance (2018) 'Bats and External lighting'.

## 6. References:

- Bat Mitigation Guidelines. English Nature, Peterborough, Mitchell-Jones, A.J.& Mcleish, A.P. (Eds)(2004).
- Bat workers Manual, 3<sup>rd</sup> Edn. Joint Nature Conservation committee, Peterborough. (2004)
- Bat Survey guidelines (2016), Bat Conservation Trust

## Appendix 1a Satellite Images



*Map data 2021 © Google.*



**1d Phase 1 Habitats**

## Appendix 2 Photographs



**S elevation (unaffected by works)**



**Interface of East elevation with the 3 storey main building, not tiles intact.**



**East elevation, single storey structures**



**Detail of recent wood boarding to single storey structure**



**Intact soffits**



**Intact render**



**Lifted tiles**



**Detail of lifted tile**



**Intact tiles**



**Wider site boundary**



**Wider site: Entrance drive**

### Appendix 3 Species Lists

#### Grasses, Sedges & Rushes

| <b>Common Name</b> | <b><i>Scientific Name</i></b> |
|--------------------|-------------------------------|
| Creeping softgrass | <i>Holcus mollis</i>          |
| Perennial ryegrass | <i>Lolium perenne</i>         |

#### Other Flowering Plants and Ferns

| <b>Common name</b>  | <b><i>Scientific name</i></b> |
|---------------------|-------------------------------|
| Broad-Leaved        | <i>Epilobium</i>              |
| Willowherb          | <i>montanum</i>               |
| Daisy               | <i>Bellis perennis</i>        |
| White deadnettle    | <i>Lamium alba</i>            |
| Dandelion           | <i>Taraxacum</i>              |
|                     | <i>officinale</i>             |
| Sow-thistle, Smooth | <i>Sonchus oleraceus</i>      |
| Herb robert         | <i>Geranium robertianum</i>   |

## Appendix 4: Specifications for Biodiversity Gain

### Appendix 4a: British Native Trees to Attract Wildlife

| Species            | Average mature / ultimate height |        |      | Growth rate |        |      | Soil/ground conditions |                   |             |      |          | Tolerant of sites that are |          |         |         | Valuable for |         |
|--------------------|----------------------------------|--------|------|-------------|--------|------|------------------------|-------------------|-------------|------|----------|----------------------------|----------|---------|---------|--------------|---------|
|                    | 0.5-5m                           | 6m-15m | 16m+ | Fast        | Medium | Slow | Wet ground             | Light sandy soils | Heavy soils | acid | alkaline | Shaded                     | Polluted | Coastal | Exposed | Birds        | Insects |
| Alder              |                                  | •      |      | •           |        |      | ■                      |                   | •           |      | •        | •                          | •        |         | •       |              | •       |
| Ash                |                                  | •      | •    |             | •      |      | ▲                      | •                 | •           |      | •        | •                          | •        | •       | •       |              | •       |
| Aspen              |                                  | •      |      | •           |        |      |                        |                   | •           | •    |          |                            |          | •       | •       |              | •       |
| Beech              |                                  |        | •    |             |        | •    |                        | •                 |             |      | •        | •                          |          |         |         |              | •       |
| Birch, Downy       |                                  | •      |      | •           |        |      | ▲                      |                   |             | •    |          |                            | •        |         | •       |              | •       |
| Birch, Silver      |                                  | •      |      | •           |        |      |                        | •                 |             | •    |          |                            | •        |         | •       |              | •       |
| Blackthorn         | •                                |        |      | •           |        |      |                        | •                 | •           | •    | •        |                            |          | •       | •       | •            | •       |
| Broom              | •                                |        |      |             | •      |      |                        | •                 |             | •    | •        | •                          | •        | •       | •       |              | •       |
| Buckthorn, Alder   | •                                |        |      |             |        | •    | ▲                      |                   |             | •    |          |                            |          |         |         |              |         |
| Cherry, Wild       |                                  | •      |      |             | •      |      |                        | •                 | •           |      | •        |                            | •        |         |         |              |         |
| Cherry, Bird       |                                  | •      |      |             | •      |      |                        | •                 | •           | •    |          | •                          |          |         |         | •            | •       |
| Crabapple          |                                  | •      |      |             |        | •    |                        | •                 | •           | •    | •        | •                          |          |         |         | •            | •       |
| Elder              |                                  | •      |      | •           |        |      |                        | •                 | •           | •    | •        | •                          | •        | •       | •       |              | •       |
| Elm, Wych          |                                  | •      |      |             | •      |      |                        |                   | •           |      | •        | •                          | •        | •       | •       |              | •       |
| Gorse              | •                                |        |      |             | •      |      |                        | •                 |             | •    | •        |                            |          |         |         | •            | •       |
| Hawthorn           | •                                |        |      |             | •      |      |                        | •                 | •           | •    | •        |                            | •        | •       | •       | •            | •       |
| Hazel              |                                  | •      |      | •           |        |      |                        |                   | •           |      | •        | •                          |          |         |         |              | •       |
| Holly              |                                  | •      |      |             |        | •    |                        | •                 | •           | •    | •        | •                          | •        | •       | •       | •            | •       |
| Lime, small-leaved |                                  |        | •    |             | •      |      |                        |                   | •           |      | •        | •                          |          | •       |         |              | •       |
| Maple, Field       |                                  | •      |      |             | •      |      |                        |                   | •           |      | •        | •                          | •        |         |         |              |         |
| Oak, Pedunculate   |                                  |        | •    |             |        | •    |                        |                   | •           |      | •        |                            |          |         | •       | •            | •       |
| Oak, Sessile       |                                  |        | •    |             |        | •    | ▲                      | •                 | •           | •    |          | •                          |          |         | •       | •            | •       |
| Pine, Scots        |                                  |        | •    |             | •      |      |                        | •                 |             | •    |          |                            |          |         | •       |              | •       |
| Poplar, Black      |                                  |        | •    | •           |        |      | ▲                      | •                 | •           |      | •        |                            |          |         |         |              | •       |
| Rose, Dog          | •                                |        |      |             | •      |      |                        | •                 | •           |      | •        | •                          | •        |         | •       |              | •       |
| Rose, Guelder      | •                                |        |      |             | •      |      | ▲                      |                   | •           |      | •        | •                          |          |         |         |              | •       |
| Rowan              |                                  | •      |      | •           |        |      |                        | •                 |             | •    |          | •                          | •        | •       | •       | •            |         |
| Spindle            | •                                |        |      |             | •      |      |                        |                   | •           |      | •        | •                          |          |         |         |              |         |
| Whitebeam, Common  |                                  | •      |      |             | •      |      |                        | •                 | •           |      | •        |                            |          |         |         |              | •       |
| Wild Service       | •                                |        |      |             |        | •    |                        |                   | •           |      | •        | •                          |          | •       |         | •            |         |
| Willow, Crack      |                                  | •      |      | •           |        |      | ■                      |                   |             |      | •        |                            | •        | •       | •       | •            | •       |
| Willow, Goat       |                                  | •      |      | •           | •      |      | ■                      |                   | •           |      | •        | •                          | •        | •       | •       | •            | •       |
| Willow, White      |                                  |        | •    | •           |        |      | ■                      |                   |             |      | •        | •                          | •        | •       | •       | •            | •       |
| Yew                |                                  | •      |      |             |        | •    |                        | •                 |             |      | •        | •                          |          |         | •       | •            | •       |

- Only species to survive waterlogged sites with anaerobic conditions.  
▲ Will tolerate wet ground if there is some seasonality of "flushing (water movement) within the soil.

## **Appendix 4b: Non-native plants to attract wildlife**

### **Buddleja X weyeriana cultivars**

You can plant the orange-flowered B. X weyeriana hybrids with a clear conscience as they don't appear to produce viable seed, they also attract a broad spectrum of insects including both butterflies and bees, and they flower late into the season when nectar is scarce. The beautiful B. x fallowiana 'Lochinch' with silver leaves is attractive to butterflies and is also said not to produce seeds. The orange ball Buddleja (B. globosa) from South America seems to attract bees rather than butterflies.

### **Bupleurum fruticosum ('Shrubby Hare's Ear')**

A shrubby evergreen umbellifer from Southern Europe, where it is often cultivated. It has leathery aromatic foliage and umbels of yellowish flowers, a bit like those of Fennel, that are very attractive to hoverflies and other small insects. Well worth growing for this reason.

### **Ceanothus X 'Gloire de Versailles'**

Ceanothus come from the Western United States. Most Ceanothus have bunches of very small flowers that don't seem very attractive to insects. 'Gloire de Versailles' however is a hybrid with loose bunches of pale blue tubular flowers that are very attractive to butterflies and bees.

### **Caryopteris X clandonensis 'Kew Blue'**

A deciduous shrub from China for a sunny position, has small tubular blue flowers attractive to insects.

### **Clethra alnifolia ('Sweet Pepper Bush')**

A deciduous shrub from the Eastern United States that likes damp, acid or woodland soil. Has spikes of small scented white flowers attractive to moths and butterflies.

### **Hebe X 'Great Orme' and H. X 'Midsummer Beauty'**

Hebes are close relatives of the herbaceous genus Veronica, and come from New Zealand. Some are much more attractive to insects than others. 'Great Orme' is a medium-sized hybrid with pale pink flowers that are attractive to butterflies. It is a distinctive cultivar and available true to name in the nursery trade.

'Midsummer Beauty' seems to be more of a generic name for a series of large shrubs with blue or grey-blue flowers in long spikes, attractive to both bees and butterflies. There are a number of other blue and white flowered Hebes that seem very popular with bumblebees.

### **Myrtus communis ('European Myrtle')**

An attractive evergreen shrub from the South of France and Spain with small evergreen aromatic leaves. It has been grown in our gardens for centuries, but is susceptible to hard frost and prefers a site against a warm sunny wall. Fluffy white flowers in early summer are bumblebees' heaven. Purplish berries follow later which are stripped by blackbirds in January.

**Amelanchier species ('Shad Bush')**

Shrubs with white cherry-like blossoms early in the year, followed by blackish berries in late summer. Valuable for the berries as a source of food for berry-eating birds when most other berries are not yet ripe.

**Erica terminalis ('Corsican Heath')**

A shrubby heather-like plant popular with bumblebees. The Cornish Heath, *Erica vagans*, from the Atlantic fringes of Europe is also a good bee plant. *Erica manipuliflora*, from Southern Europe, and its hybrid *Erica X griffithii* have fragrant flowers that attract butterflies.

**Eupatorium ligustrinum**

A late-flowering evergreen bush that looks very like a privet, but has bunches of white fluffy flowers in September and October. These flowers seem very attractive to range of insects, especially hoverflies.

**Ribes sanguineum ( Flowering Currant)**

It is a very good early flower for bumblebees, as indeed are the flowers of the closely related blackcurrants and gooseberries.

**Appendix 4c: Plants good for moths, with species of moth they encourage beside**

| Plant                                             | Moths                                                                                                                                                                                                                                                                  |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bird's Foot Trefoil ( <i>Lotus corniculatus</i> ) | Burnet, Belted Beauty, Chalk Carpet, Latticed Heather                                                                                                                                                                                                                  |
| Bladder Campion ( <i>Silene vulgaris</i> )        | Campion, Marbled Coronet, Nettle Pug, Marbled Clover, Dark Brocade, Sandy Carpet                                                                                                                                                                                       |
| Borage ( <i>Borago officinalis</i> )              | Crimson Speckled                                                                                                                                                                                                                                                       |
| Wild Clary ( <i>Salvia horminoides</i> )          | Twin-spot Carpet                                                                                                                                                                                                                                                       |
| Biting Stonecrop ( <i>Sedum acre</i> )            | Yellow Ringed Carpet, Northern Rustic                                                                                                                                                                                                                                  |
| Cowslip ( <i>Primula veris</i> )                  | Plain Clary, Northern Rustic                                                                                                                                                                                                                                           |
| Dropwort ( <i>Filipendula hexapetala</i> )        | Satyr Pug                                                                                                                                                                                                                                                              |
| Evening Primrose ( <i>Oenothera biennis</i> )     | Elephant Hawk                                                                                                                                                                                                                                                          |
| Field Scabious ( <i>Kanutia arvensis</i> )        | Marsh Fritillary, Narrow Bordered Bee Hawk, Lime Speck Pug, Shaded Pug                                                                                                                                                                                                 |
| Foxglove ( <i>Digitalis purpurea</i> )            | Lesser Yellow Underwing, Foxglove Pug                                                                                                                                                                                                                                  |
| Golden Rod ( <i>Solidago</i> )                    | Lime Speck Pug, Bleached Pug, Golden Rod, Wormwood Pug, V Pug                                                                                                                                                                                                          |
| Greater Stitchwort ( <i>Stellaria holostea</i> )  | Dart, Yellow Underwing, Marsh Pug, Plain Clary                                                                                                                                                                                                                         |
| Hedge Bedstraw ( <i>Gallium mollugo</i> )         | Ruddy Carpet, Royal Mantle, Common Carpet, Wood Carpet, Water Carpet, Beech Green Carpet, Mottled Grey, Green Carpet                                                                                                                                                   |
| Hedge Woundwort ( <i>Stachys sylvatica</i> )      | Rosy Rustic, Plain Golden Y, Sub-angled Wave                                                                                                                                                                                                                           |
| Hemp Agrimony ( <i>Eupatorium cannabinum</i> )    | Wormwood Pug, V Pug, Lime Speck Pug, Marsh Pug, Gem, Scarce Burnished                                                                                                                                                                                                  |
| Herb Bennet ( <i>Geum urbanum</i> )               | Riband Wave                                                                                                                                                                                                                                                            |
| Herb Robert ( <i>Geranium robertianum</i> )       | Barred Carpet                                                                                                                                                                                                                                                          |
| Hollyhock ( <i>Althaea rosea</i> )                | Mallow                                                                                                                                                                                                                                                                 |
| Kidney Vetch ( <i>Anthyllis vulneraria</i> )      | 6-belted Clearwing                                                                                                                                                                                                                                                     |
| Lady's Bedstraw ( <i>Gallium verum</i> )          | Hummingbird Hawk, Small Elephant Hawk, Gallium Carpet, Plain Wave, Riband Wave, Bedstraw Hawk, Archer's Dart, Red Chestnut, Ruddy Carpet, Royal Mantle, Common Carpet, Water Carpet, Beech Green Carpet, Red Twin Spot Carpet, Wood Carpet, Mottled Grey, Green Carpet |

|                                                 |                                                                                                                                |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Lady's Mantle ( <i>alchemilla mollis</i> )      | Red Carpet                                                                                                                     |
| Lesser Knapweed ( <i>centaurea nigra</i> )      | Silver Y, Lime Speck Pug, Satyr Pug                                                                                            |
| Lesser Meadow Rue                               | Marsh Carpet                                                                                                                   |
| Maiden Pink ( <i>dianthus deltoides</i> )       | Marbled Coronet                                                                                                                |
| Marjoram ( <i>majorana origanum</i> )           | Sub-angled Wave, Lace Border                                                                                                   |
| Marshmallow ( <i>althea officinalis</i> )       | Marshmallow                                                                                                                    |
| Meadow Clary ( <i>salvia pratensis</i> )        | Brown Spot Pinion, Hebrew Character, Powdered Quaker, Emperor                                                                  |
| Mullein                                         | Mullein, Striped Lychnis                                                                                                       |
| Navelwort ( <i>umbilicus rupestris</i> )        | Weaver's Wave                                                                                                                  |
| Pink                                            | Hawk                                                                                                                           |
| Primrose ( <i>primula vulgaris</i> )            | Pearl Bordered Yellow Underwing, Double Square Spot, Green Arches, Triple Spotted Clary, Ingrained Clary, Silver Ground Carpet |
| Purple Loosestrife ( <i>lythrum salicaria</i> ) | Emperor, Small Elephant Hawk, Powdered Quaker                                                                                  |
| Ragged Robin ( <i>lychnis flos cuculi</i> )     | Campion, Lychnis, Twin-spot Carpet, Marbled Clover                                                                             |
| Red Campion ( <i>melandrium rubrum</i> )        | Rivulet, Campion, Lychnis, Twin-spot Carpet, Sandy Carpet, Marbled Clover                                                      |
| Red Clover ( <i>trifolium pratense</i> )        | Latticed Heath, Chalk Carpet, Belted Beauty, Mother Skipton, Shaded Broad Bar, Narrow-bordered 5-spot Burnet                   |
| Red Valerian ( <i>centranthus ruber</i> )       | Elephant Hawk                                                                                                                  |
| Rock Rose ( <i>helianthemum mummularium</i> )   | Amulet, Cistus Forester, Silky Wave, Ashworth's Rustic, Argus, Wood Tiger, Northern Brown                                      |
| Rosebay Willowherb                              | Twin-spot Carpet, Small Phoenix, White Banded Carpet                                                                           |
| Small Scabious ( <i>scabiosa columbaria</i> )   | Lime Speck Pug, Shaded Pug                                                                                                     |
| Soapwort ( <i>saponaria officinalis</i> )       | Marbled Clover                                                                                                                 |
| St John's Wort                                  | Treble Bar                                                                                                                     |
| Sweet Violet ( <i>viola odorata</i> )           | Broad Bordered Yellow Underwing, Lesser Broad Bordered Yellow Underwing                                                        |
| Tansy ( <i>tanacetum vulgare</i> )              | Essex Emerald                                                                                                                  |
| Thrift ( <i>armeria maritima</i> )              | Amulet, Feathered Ranunculus, Thrift Clearwing, Black Banded                                                                   |

|                                                |                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Thyme                                          | <i>Thyme Pug, Satyr Pug, Lace Border</i>                                                                                                                                                                                                                                                                           |
| Toadflax ( <i>linaria vulgaris</i> )           | <i>Toadflax Pug, Marbled Clover</i>                                                                                                                                                                                                                                                                                |
| Valerian ( <i>valeriana officinalis</i> )      | <i>Valerian Pug, Lesser Cream Wave</i>                                                                                                                                                                                                                                                                             |
| White Campion ( <i>silene latifolia alba</i> ) | <i>Marbled Coronet, Marbled Clover, Sandy Carpet</i>                                                                                                                                                                                                                                                               |
| Wild Clematis ( <i>clematis vitalnba</i> )     | <i>Lime Speck Pug, Haworth's Pug, Small Emerald, The Fern, Pretty Chalk Carpet, Least Carpet, Pug, Chalk Carpet, Small Waved Umber</i>                                                                                                                                                                             |
| White Clover ( <i>trifolium repens</i> )       | <i>Cloudy Wing Skipper, Orange, Clouded Sulphur</i>                                                                                                                                                                                                                                                                |
| Wild Pansy ( <i>viola tricolor</i> )           | <i>Pluvia</i>                                                                                                                                                                                                                                                                                                      |
| Wild Strawberry ( <i>fragaria vesca</i> )      | <i>Amulet, Yellow Shell, Beautiful Carpet, Dark Marbled Carpet</i>                                                                                                                                                                                                                                                 |
| Wild Wallflower                                | <i>Flame Carpet</i>                                                                                                                                                                                                                                                                                                |
| Wormwood ( <i>artemesia absinthium</i> )       | <i>Wormwood Pug</i>                                                                                                                                                                                                                                                                                                |
| Yarrow ( <i>achillea millefolium</i> )         | <i>Essex Emerald, Lime Speck Pug, Straw Belle, Wormwood Pug, Ruby Tiger, Yarrow Pug, V Pug, Sussex Emerald, Grey Pug, Tawny Speckled Pug, Common Pug, Mullein Wave</i>                                                                                                                                             |
| Yellow Flag Iris ( <i>iris pseudacorus</i> )   | <i>Belted Beauty, Water Ermine</i>                                                                                                                                                                                                                                                                                 |
| Barberry                                       | <i>Scarce Tissue, Wheat</i>                                                                                                                                                                                                                                                                                        |
| Blackthorn/Sloe                                | <i>March, Common Emerald, Little Emerald, Mottled Pug, Feathered Thorn, Orange, Scalloped Hazel, Scalloped Oak, August Thorn, Brimstone, Early Thorn, Pale Brindled Beauty, Blue Bordered Carpet, Broken Barred Carpet, November, Pale November, Winter, Sloe Pug, Green Pug, Sharp Angled Peacock, The Magpie</i> |
| Broom                                          | <i>Grass Emerald, The Streak, Broom-tip, Lead Belle, Spanish Carpet, Frosted Yellow</i>                                                                                                                                                                                                                            |
| Dog Rose                                       | <i>V Pug, Little Thorn, Shoulder Stripe, Barred Yellow, Streamer</i>                                                                                                                                                                                                                                               |
| Hawthorn                                       | <i>March, Common Emerald, Little Emerald, November, Pale November, Winter, Mottled Pug, Pinion Spotted Pug, Common Pug, Grey Pug, Peppered, Brindled Beauty, Pale Brindled Beauty, Feathered Thorn, Scalloped Hazel, The Magpie, Scalloped Oak, Large Thorn, Early Thorn, Oak Tree Pug, Broken Barred Carpet</i>   |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hazel       | <i>Oak Beauty, Small White Wave, The Magpie, Clouded Border, Barred Umber, Winter, Pale November</i>                                                                                                                                                                                                                                                                                                                                                          |
| Oak         | <i>Brindled Pug, Oak Tree Pug, Spring Usher, Peppered, Oak Beauty, Brindled Beauty, Pale Brindled Beauty, Small Brindled Beauty, Feathered Thorn, Orange, Lunar Thorn, Purple Thorn, Scalloped Hazel, Scalloped Oak, Scorched Wing, Large Thorn, August Thorn, November, September Thorn, Pale November, Winter, March, Blotched Emerald, Common Emerald, Little Emerald, False Mocha, Maiden's Blush, Marbled ug, Red-green Carpet, Broken Barred Carpet</i> |
| Rowan       | <i>Orange Underwing, Welsh Wave, Mottled Pug, Red-green Carpet</i>                                                                                                                                                                                                                                                                                                                                                                                            |
| Wild Privet | <i>Lilac Beauty, Barred Toothed Striped, Yellow Barred Brindle,</i>                                                                                                                                                                                                                                                                                                                                                                                           |

#### **Appendix 4d: Plants and Habitats to attract Bats**

##### **Flower Borders and Lawns**

Larvae and adults of many insects will be catered for by introducing a wide range of food, in the form of nectar, seeds and fruit as well as vegetation.

- Grow night scented flowers. These attract moths and other night flying insects of particular importance to bats.
- Plant herbs and old fashioned cottage-garden annuals attractive to insects.
- Leave part of your lawn un-mown from about mid-May to encourage insect larvae which feed on grass. Allow to seed before cutting, and rake up the hay afterwards.
- Sow wild flower seed collections in your borders.

##### **Trees and Shrubs**

At woodland edges space and sunshine combine with the trees to give shelter and warmth, and insects will concentrate there. So even in the smallest garden try to have at least one tree or shrub. Native trees are more attractive to insects than foreign species.

If space is limited, silver birch and goat willow are quick growing and are host to many insect visitors. With a little more space, try to make a bank of vegetation to give your garden a woodland edge structure.

### **Shelter Belts**

Rows of bushes or trees can be created or improved, encouraging concentrations of insects and providing a feeding area for bats,

- Plant up gaps in natural hedges,
- A row of fast-growing cypress can be valuable.
- Train climbers using battens against a wall or fence, to provide possible roosting sites.
- Create a sheltered corner by using any combination of walls, fences, hedges or woodland edge at two angles.

### **Scented herbs**

Chives, Borage, Lemon balm, Marjoram, Mint - many varieties

**Night scented flowers for the border (in approximate order of flowering)**

**Bedding Plants**

|                        |                        |
|------------------------|------------------------|
| Nottingham catchfly    | Silene nutans          |
| Night-scented catchfly | S. noctiflora          |
| Bladder campion        | S, vulgaris            |
| Night-scented stock    | Matthiola bicornis     |
| Sweet rocket           | Hesperis natronalis    |
| Evening primrose       | Oenothera biennis      |
| Tobacco plant          | Nicotiana affinis      |
| Cherry pie             | Heliotropun x hybndurr |
| Soapwort               | Saponaria officinalis  |

**Climbers**

|                        |                      |                |
|------------------------|----------------------|----------------|
| European honeysuckle   | Lonicera caprifolium | July-November  |
| Italian honeysuckle    | L. etrusca superba   | July-August    |
| Japanese honeysuckle   | L. japonica halliana | August-October |
| Honeysuckle (native)   | L. periclymenum...   | July-August    |
| White jasmine          | Jasminium otiicinale |                |
| Dogrose                | Rosa canina          |                |
| Sweetbriar             | R. rubiginosa        |                |
| Fieldrose              | R. arvensis          |                |
| Ivy                    | Hedera helix         |                |
| Bramble - many species |                      |                |

**Large trees, small trees and shrubs**

|              |                           |
|--------------|---------------------------|
| Oak          | Quercus robur & Q. petrea |
| Ash          | Fraxinus excelsior        |
| Silver birch | Betula pendula            |
| Field maple  | Acer campestre            |
| Hawthorn     | Crataegus monogyna        |
| Alder        | Ainus glutinosa           |
| Goat willow  | Salix caprea              |
| Guelder rose | Viburnum opulus           |
| Hazel        | Coryllus avellana         |

Blackthorn *Prunus spinosa*

Elder *Sambucus nigra*

*Buddleia davidii*

**Rock plants for walls**

Ivy-leaved toadflax *Cymbana muralis*

Wall pennywort *Umbilicus rupestris*

**Appendix 4e: Plants and Habitats to Attract Birds**

**Plants to Feed Birds.**

Many shrubs, climbers, trees, garden and 'wild' plants provide food, directly or indirectly, through berries, seeds or the insects they attract.

Berry or fruit bearing trees and shrubs will attract members of the Thrush family, Blackbird, Fieldfare, Mistle and song Thrush, Redwing and Robin. Also Starlings and, in some winters, Waxwing and even some Warblers, e.g., Blackcaps who eat berries in the early autumn before they migrate. Unless mentioned, the berries attract all the above birds plus others as specified.

**Shrubs with Berries.**

- *Aronia arbutifolia* (Red Chokeberry) : bright red fruits
- *Berberis*: most forms have black/purple berries, especially loved by Blackbirds.
- *Callicarpa* 'Profusion': bright violet coloured berries.
- *Cornus* (Dogwood): blue tinted white berries (not *C. Mas*).
- *Cotoneaster* : prolific red, orange or yellow berries - birds often choose red first, through orange to yellow last. (Note berries are poisonous to humans).
- *Euonymus europaeus* (spindleberry: large bright red fruits which open to emit orange red seeds.(Note berries are poisonous to humans).
- *Ilex* (Holly): red, orange or yellow berries - red berries preferred (need partner to fruit).(Note berries are poisonous to humans).
- *Mahonia*: decorative black berries.
- *Rosa rugosa* : large red hips, particularly attractive to Greenfinches which pick out the seeds.
- *Sambucus* (Elder): red or black berries - over 32 species reported eating them, especially Blackcap and, occasionally, Collar Doves.
- *Viburnum opulus* (Guelder Rose) : translucent berries

- *Viscum album* (Mistletoe): familiar white globular berries of this parasite that grows in trees, especially apple, are a good food source for Blackbirds.

#### **Climbers with Berries.**

- *Chaenomeles* (Flowering Quince/*Cydonia*): Autumn Quinces.
- *Hedera* (Ivy) : shiny black berries
- *Lonicera* (Honeysuckle: red or black berries attract Thrushes plus Bullfinches and Marsh and Willow Tits. (Note berries are poisonous to humans).
- *Pyracantha* (Firethorn) :red, orange or yellow berries - choose red for the birds to eat before Christmas usually with orange or yellow to follow in a hard winter.
- *Clematis vitalba* (Old Man's Beard): seed heads are enjoyed by many birds.

#### **Trees with Berries or Fruits.**

- *Crataegus monogyna* (Hawthorn : red berries.
- *Malus* (Crab Apple: red fruited varieties are best for birds.
- *Prunus* (Cherries): fruits quickly picked off.
- *Sorbus aucuparia* (Mountain Ash/Rowan) :red, orange or pink flushed white berries. The darker the fruits the more attractive they are to birds. Occasionally bring Spotted Flycatchers to the garden.
- *Taxus* (Yew): sparse red berries attract a wide range of birds. Attractive also to Badgers.(Note berries are poisonous to humans).

#### **Trees with Seed Cones.**

- *Alnus glutinosa* (Alder), and *Betula* (Birch): seeds from cones enjoyed by Goldfinches, Greenfinches, Redpolls, Siskins and Tits.
- *Pinus sylvestris* (Scots pine) : pine cones from which Crossbills and Great Spotted Woodpeckers prise seed.

#### **Trees with Blossom.**

- Although not always welcome, Bullfinches strip the buds of fruit trees in late winter and early spring.

#### **Garden Plants.**

- *Crocus*: yellow and orange flowers are attractive to Sparrows because they contain yellow pigment carotene to brighten up their plumage for the breeding season.

- Echinops ritro (Globe Thistle: seed heads are eaten by Goldfinches and flower heads attract insects.
- Helianthus (Sunflower: seed heads are eaten by Greenfinches. The nectar attracts a wide range of insects.
- Lavandula (Lavender): flowers going to seed are attractive to Goldfinches.
- Primula (Polyanthus/Primrose): yellow and orange flowers are attractive to Sparrows.

### **Wild Plants.**

You can provide a haven for wild plants to exist in their own right recreating a wild meadow to attract insects which, in turn, attract birds and other wildlife. We sell nursery grown 'wild' plants throughout the year so that you can go wild in a corner of your garden.

- Betony.
- Bird's Foot Trefoil.
- Common Poppy - seeds are favourite food of Finches.
- Field Scabious.
- Greater Knapweed.
- Meadow Cranesbill.
- Musk Mallow.
- Ox Eye Daisy.
- Oxlip.
- Primrose.
- Rough Hawkbit.
- Self Heal.
- Teasel - seed heads are a favourite food of Goldfinches.
- Wild Strawberry

### **The Lawn.**

This is one of the principal sources of food for birds who enjoy feeding on insects including:-Ants eaten by Green Woodpeckers; Leatherjackets by Starlings; Snails by Song thrushes; Slugs by Toads and Worms by Blackbirds, Robins and Thrushes.

### **Cover and Protection.**

By surrounding your garden by thick and often prickly hedging and dotting suitable shrubs around, you can provide safe nesting havens that are protected from marauding cats and even the unwelcome attention of unfriendly humans.

The most successful shrubs and trees for this purpose include:-

- Conifers especially chamaecyparis, Taxus (Yew) and Thuja Placata.
  - Crataegus.
  - Eleagnus.
  - Hedera (Ivy) up a tree.
  - Ligustrum (Privet) especially for Blackbirds.
  - Lonicera (Honeysuckle).
  - Pittosporum.
  - Salix caprea (Weeping Kilmarnock Willow).
-

## **Appendix 4f: Plants and Habitats to attract Bees**

### **Native Plants for Bees**

Native plants should be your first choice to help our native bees. Listed below are some plants that are good sources of nectar or pollen for bees. Both the common and Latin names of the plant genus are given. This list is not exhaustive; there are many other plants good for bees. Individual species have not been included because we hope the list will be useful across the U.S. Not all of these genera will have species in your local area, but they do represent plants that will grow in a variety of environments. Use a wildflower guide or contact local nurseries to find your local species.

- Aster *Aster*
- Black-eyed Susan *Rudbeckia*
- Caltrop *Kallstroemia*
- Creosote bush *Larrea*
- Currant *Ribes*
- Elder *Sambucus*
- Goldenrod *Solidago*
- Huckleberry *Vaccinium*
- Joe-pye weed *Eupatorium*
- Lupine *Lupinus*
- Oregon grape *Berberis*
- Penstemon *Penstemon*
- Purple coneflower *Echinacea*
- Rabbit-brush *Chrysothamnus*
- Rhododendron *Rhododendron*
- Sage *Salvia*
- Scorpion-weed *Phacelia*
- Snowberry *Symphoricarpos*
- Stonecrop *Sedum*
- Sunflower *Helianthus*
- Wild buckwheat *Eriogonum*
- Wild-lilac *Ceanothus*

- Willow *Salix*

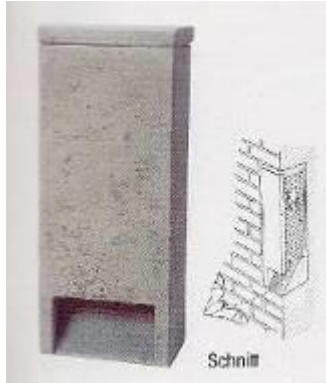
### **Garden plants for bees**

Flower beds in gardens, business campuses, and parks are great places to have bee-friendly plants. Native plants will create a beautiful garden but some people prefer "garden" plants. Many garden plants are varieties of native plants, so this list only includes plants from other countries--"exotic" plants--and should be used as a supplement to the native plant list.

As with the native plants, this list is not exhaustive.

- Basil *Ocimum*
- Cotoneaster *Cotoneaster*
- English lavender *Lavandula*
- Giant hyssop *Agastache*
- Globe thistle *Echinops*
- Hyssop *Hyssopus*
- Marjoram *Origanum*
- Rosemary *Rosmarinus*
- Wallflower *Erysimum*
- Zinnia *Zinnia*

## Appendix 5: Bat Boxes and Bat Brick Specifications to Provide Bat Habitat on Buildings



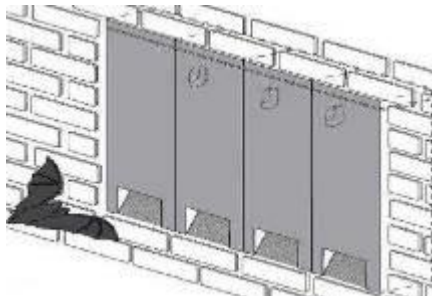
Schwegler 1FR can be installed within brick masonry just leaving the entrance and can be rendered over.



Ibstock Enclosed Bat Box B is designed specifically for the pipistrelle bat.



Schwegler WI integral Summer & Winter Bat Box.



Schwegler 2FR Bat Tube is the same design as the 1FR but with holes in the sides. Multiple tubes to be placed next to each other to form a much larger roost.



Schwegler 27 wall can be installed within brick masonry. It can be rendered over.



Schwegler 1FQ wall-mounted bat box.



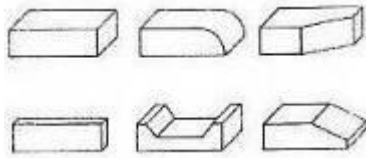
<http://www.jacobijayne.co.uk/nest-boxes-by-species/bats/1fe-bat-access-panel/> Schwegler 1FE Bat Access Panel can be surface-mounted or integrated. The open back enables bats access through exterior walls.



Ibstock Bat Box with Engraved Motif C is designed specifically for the pipistrelle bat and is available in all brick colours.



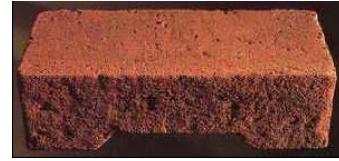
Ibstock Free Access Bat Box allows bats to access the cavity wall of the building.



Modified bricks for creating bat access points. A standard brick is shown top left. Purpose made bat bricks can also be used.



Norfolk Bat Brick allows bats to access the cavity wall of the building. The slits are the perfect size for Natterer's bat, Daubenton's bat, Brandt's bat and Brown



Marshall's Bat Access Brick (Also available in stone) allows bats access into the cavity wall of the building.

**Woodcrete bat box suitable for winter hibernation of small crevice dwelling bats: 1WI Schwegler Summer and Winter Bat box (erected on building).**





## APPENDIX 6: Insect Box Specifications

A variety of insect boxes is recommended to encourage a diversity of insect species and encourage bats.

### Wooden Insect House

A general insect habitat for beneficial insects in summer and, later in the year, over wintering ladybirds and lacewings. Locate in a sheltered place near nectar or pollen plants or by a pond. Durable and strong construction in acacia, oak or larch with no maintenance necessary.

Dimensions: 22 × 13.5 × 13.5cm.



### Woodcrete Insect House

An insect nest made from long-lasting, insulating, woodcrete, with holes of different sizes providing homes for a variety of beneficial insects such as bees and solitary wasps. Dimensions: 14 × 8 × 26cm; Weight: 3.65kg



### Insect House with Inspection Tubes

This nesting and hibernation box for insects has a woodcrete exterior with a wooden front panel which can be removed for observation. Through the transparent tubes you can see the usually hidden lifecycle of many solitary types of bees and hymenoptera including egg-laying, development of larvae and sealing of brood chambers. Typical inhabitants are wild bees and thread-waisted wasps. All the species attracted to this box are harmless non-aggressive pollinating insects.

Dimensions: 33 × 21 × 51 cm; Weight: 7.1kg.



## Appendix 7. Bird Box Specifications

Schwegler boxes have the highest occupation rates of all box types. They are carefully designed to mimic natural nest sites and provide a stable environment for chick rearing and winter roosting. They can be expected to last 25 years or more without maintenance.

### ***Schwegler No 11 House Martin Nest (Code: 002097D)***



It is increasingly difficult for swallows and house martins to find suitable nest-building material. The mud they do find, if any, is often poor quality. In addition, the walls of buildings are nowadays often very smooth. As a result, nests tend to fall down, sometimes with the nestlings inside. In many places, the vibration caused by heavy vehicles shakes the nests loose. This nest has been developed to enable House Martins to breed successfully on external facades without overhanging eaves and has proved highly successful.

### ***Schwegler No 16 Swift Box (Code: 002087D)***

The design of this box mimics bell tower louvres. It has a removable panel for easy inspection of the nest chamber.



### ***2H Robin Box (Code: 002015D)***



This box is attractive to robins, pied wagtails, spotted flycatcher, wrens and black redstarts. Best sited on the walls of buildings with the entrance on one side.

### ***Sparrow Terrace***



House sparrows are gregarious and prefer to nest close to each other, so this woodcrete box provides room for three families under one roof. Made from long-lasting, breathable woodcrete. No maintenance required. Designed for fixing to walls (not suitable for fences or sheds due to the weight of the box). Available in choice of stone colour (pictured) or brown.

### ***Schwegler 1B Bird Box***



The most popular box for garden birds, the 1B appeals to a wide range of species, and is the official nest box of National Nest Box Week. The box can be nailed to the trunk of a tree, or hung from a branch. Woodcrete, 23cm high x 16cm diameter. Available in choice of four colours - brown, green, red or white. Available with 32mm

entrance hole (standard) or with 26mm hole

***Schwegler Built-in Multi-System Main Cavity Bird Box (Code: 002101D)***



The multi-system has exchangeable front panels for kestrels, jackdaws or swifts. The system can be installed in all types of buildings, whether constructed of concrete, brick or timber. To meet the needs of various species of bird, different types of front panel are available for use with the main cavity. The main cavity is supplied without a front panel which should be ordered separately. **Positioning:** At heights of 5m or more on a sheltered external wall. **Suitable for:** Dependant on the type of front panel chosen.

**Material:** Woodcrete **Height:**415mm **Width:** 445mm **Depth:**415mm

**Weight:**2.8Kg

## Appendix 8: Lighting guidance

### MITIGATION OF LIGHTING IMPACTS ON BATS

- **FORAGING AND COMMUTING Type of lamp (light source)** The impact on bats can be minimised by the use of low pressure sodium lamps or high pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its uv filtration characteristics.
- **Luminaire and light spill accessories** Lighting should be directed to where it is needed and light spillage avoided. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Planting can also be used as a barrier or manmade features that are required within the build can be positioned so as to form a barrier. **Suitable examples shown below:**

**Double Asymmetric Luminaire**



**Simple Hood**



- **Lighting column** The height of lighting columns in general should be as short as is possible as light at a low level reduces the ecological impact. However, there are cases where a taller column will enable light to be directed downwards at a more acute angle and thereby reduce horizontal spill. For pedestrian lighting this can take the form of low level lighting that is as directional as possible and below 3 lux at ground level. **Aim for lighting column of 5m or less, hooded and cowled to prevent light spill, for main lighting columns**
- 
- **Light levels** The light should be as low as guidelines permit. If lighting is not needed, don't light. **Timing of lighting** The times during which the lighting is on should be limited to provide some dark periods. Roads or trackways in areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies. These unlit stretches should be 10 metres in length either side

of commuting route. **Direct lighting so that the hedgerow dark corridors to the northern edge and eastern edge of the site remain unlit. So the lighting to be restricted to the main buildings and roadways in and out, and car parking areas angle lighting inwards.**

- **SECURITY LIGHTING Power** It is rarely necessary to use a lamp of greater than 2000 lumens (150 W) in security lights. The use of a higher power is not as effective for the intended function and will be more disturbing for bats.
- **Movement sensors** Many security lights are fitted with movement sensors which, if well installed and aimed, will reduce the amount of time a light is on each night. This is more easily achieved in a system where the light unit and the movement sensor are able to be separately aimed. **Timers** If the light is fitted with a timer this should be adjusted to the minimum to reduce the amount of 'lit time'.
- **Aim of light** The light should be aimed to illuminate only the immediate area required by using as sharp a downward angle as possible. This lit area must avoid being directed at, or close to, any bats' roost access points or flight paths from the roost. A shield or hood can be used to control or restrict the area to be lit. Avoid illuminating at a wider angle as this will be more disturbing to foraging and commuting bats as well as people and other wildlife.
- **Suitable types shown below** (note that these are wall mounted and directed downwards)

**Circular Louvre**



**Cowl & Louvre**



### **Cowl (or Hood)**



**References:** Bats and lighting BCT guidance and Guidance notes for the reduction of obtrusive lighting.