



Woodfired

Merthyr Tydfil

Preliminary Bat Roost and Nesting Bird Assessment

November 2019

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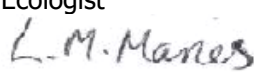
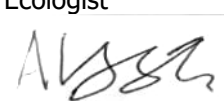
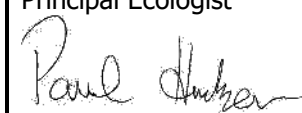
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DOCUMENT CONTROL

Woodfired, Merthyr Tydfil Preliminary Bat Roost and Nesting Bird Assessment				
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Summary

Brief and Site Location	This report presents the findings of a preliminary bat roost assessment and nesting bird survey of a building, known as Woodfired, located at 62 High Street, Merthyr Tydfil, CF47 8DE (Ordnance Survey Grid Reference: SO 04951 06148).
Proposed Works	An additional residential flat will be added to the top storey, which will involve the loss of loft space and the addition of a dormer balcony.
Survey Methodology	The preliminary bat roost assessment comprised a daytime internal and external inspection of the building, searching for signs of bats and nesting birds. The inspection provides a preliminary assessment of the potential of the site to support roosting bats.
Results of Preliminary Bat Roost Inspection	No signs of bats were found during the internal and external inspection of the building. The building is located within an area providing negligible-quality foraging and commuting habitat for bats.
Suitability of the Building to Support Roosting Bats	The building was assessed as having negligible suitability to support roosting bats.
Evidence of Nesting Birds	No evidence of past or current nesting by birds was noted during the surveys either within or on the exterior of the building.
Requirements for Additional Survey	None required.
Predicted Impacts of Development on Bats and Nesting Birds	Based on the conclusion that bats and birds are unlikely to be using the building as a roost site, no negative impacts on bats are anticipated.
Mitigation and Compensation of Proposed Impacts	None required.
Licensing Requirements for Bats	None required.

1. Introduction

1.1. Brief

This report presents the findings of a preliminary bat roost assessment and nesting bird survey of a building, known as Woodfired, located at 62 High Street, Merthyr Tydfil, CF47 8DE (Ordnance Survey Grid Reference: SO 04951 06148). The building proposed for development is referred to as the 'building' throughout the remainder of this report. The building is situated within the boundary of Merthyr Tydfil Council.

1.2. Site Description

The building is bordered to the north by John Street, to the west by High Street, to the south by a neighbouring building of similar size and construction, and to the east by Tesco Extra, a large superstore. The location of the building is shown on Plan 1: Location Plan.

1.3. Proposed Works

An additional residential flat will be added to the top storey, which will involve the loss of loft space and the addition of a dormer balcony. Existing and proposed plans can be found in Drawings 1 and 2: Development Proposals, and on the planning portal (Planning Reference number: P/19/0265).

1.3.1. Review of Historic Site Data

Planning permission for this site was previously applied for and approved in 1998 (Planning Reference Number: P/98/0258) and in 2014 (Planning Reference Number: P/14/0179). No ecological surveys were undertaken as part of either application.

1.4. Legislation and Planning Policy

1.4.1. Bats

All UK species of bat are designated as 'European Protected Species'. Their breeding sites or resting places¹ (roosts) are fully protected under the Wildlife and Countryside Act 1981² (as amended) and the Conservation of Habitats and Species and Planning (various amendments) (England and Wales) Regulations 2018³. Works affecting bats are subject to licensing procedures by Natural Resources Wales (NRW). The legal protection and licensing procedures are summarised in Appendix 1.

¹ Resting places are defined as 'areas that are essential to sustain an animal or group of animals when they are not active' (Anon 2007).

² <https://www.legislation.gov.uk/ukpga/1981/69>

³ <http://www.legislation.gov.uk/uksi/2018/1307/contents/made>

1.4.2. Nesting Birds

All wild British birds (whilst building nests, nesting and sitting on eggs) and their nests and eggs, (with certain limited exceptions⁴) are protected by law under Section 1 of the Wildlife and Countryside Act 1981⁵ (as amended) and the Countryside and Rights of Way Act 2000⁶. Some species, such as barn owls (*Tyto alba*), are listed in Schedule 1 and have extra levels of protection including protection from disturbance whilst nest building and disturbance of dependant young.

1.5. Survey Scope

The preliminary roost assessment (PRA) comprised a daytime internal and external inspection of the building, searching for signs of bats and nesting birds and assessing the potential for bats to roost on site.

1.6. Reporting

The aims of the report are to:

- Outline the methodology used during the survey;
- Present a summary of the survey methods and results;
- Determine if birds are nesting on site;
- Determine if bats are roosting on site or have potential to roost on site, and if so, identify the species of bat, roosting location, roost type, numbers of bats present and the location of access points;
- Determine the need for further targeted surveys on site;
- Provide an interpretation of the findings, in relation to the potential impacts of the development;
- Specify the legal and policy constraints relevant to bats and nesting birds which may affect the development; and
- Provide an indication of potential licensing requirements and mitigation, compensation and enhancement measures that may be required.

⁴ Details of the exceptions are available at <https://bit.ly/2KiQTFH>

⁵ <https://www.legislation.gov.uk/ukpga/1981/69>

⁶ <https://www.legislation.gov.uk/ukpga/2000/37>

2. Methods

2.1. Desk Study

An assessment of the site and surrounding area was carried out, including existing habitats, from maps and aerial photographs. A Geographic Information System (GIS) dataset, obtained from NRW was used to search for statutory conservation designated sites for bats within 10 km. A 2 km search was undertaken for all other statutory and non-statutory conservation designated sites. A search of the local planning portal was undertaken to look for other sites within the same postcode area which have had bat surveys submitted as a part of their planning application.

2.2. Field Study

2.2.1. Daytime Internal and External Inspection

A systematic search was made of the exterior and interior of the building, looking for features that bats could use for entering/exiting and roosting⁷. In addition, a search was made for the presence of bats or evidence of bat use, such as droppings, feeding remains, urine staining, scratch marks and the remains of dead bats. The survey was undertaken on 11th November 2019 by Liam Maries⁸ (NRW Licence Number: SO86589/1). A high-powered torch (Clulite), binoculars and a ladder were used, as appropriate during the survey.

2.2.2. Assessment of Bat Roost Suitability

The value of the site for bats (and any potential roost sites therein) was assessed, in accordance with Table 4.1 of the Bat Surveys for Professional Ecologists (Collins, 2016) (see Appendix 2). The assessment was based on the relative abundance and quality of potential roost sites; and the habitat features within both the site and the surrounding landscape, suitable for roosting, foraging and commuting bats.

2.2.3. Survey for Nesting Birds

Searches were carried out for old nests, as well as any signs which might indicate previous nesting activities, such as piles of discarded nesting materials or large aggregations of guano.

2.2.4. Constraints

General Temporal Constraints

An ecological survey can only identify what was present on site at the time it was conducted. However, habitat usage by species can change over time.

⁷ Bats may utilise gaps as small as 8mm by 20mm (Bat Conservation Trust, Cluster flies leaflet).

⁸ Liam is an experienced bat surveyor who is in his fourth season of ecology work. He has undertaken extensive training with Acer Ecology, is a member of Cardiff, Vale of Glamorgan and Bridgend bat groups and holds Welsh (SO86589/1) and English (2018-34523-CLS-CLS) bat licences. Further details can be found at <https://bit.ly/2KO3zZw>.

Timing

The time of year when the preliminary roost assessment was carried out (October) coincides with the period when bats are seeking suitable hibernation sites and beginning periods of torpor. However, signs of roosting activity from previous summers can still be identified and the potential of a building can be assessed outside the active season. Therefore, the timing of the inspection is unlikely to have significantly constrained the survey.

Restricted Access

Some areas of the roof were not visible from ground level (the south-eastern corner). However, the roof is generally in good condition, and it is therefore considered unlikely that this area is likely to differ significantly from the rest of the roof. The survey is only slightly constrained, and this is not considered to have significantly affected the accuracy of the assessment.

Data Search

A Local Records Centre (LRC) data search was not undertaken due to the small size and nature of the development. The overall impact on biodiversity is likely to be localised and of low significance and current proposals suggest no land will be lost or linear features severed. It is considered very unlikely that the development will have any impact outside the footprint of the works. The data search results are considered unlikely to impact on the decision-making process and therefore a LRC search has not been undertaken.

This approach is consistent with CIEEM's Guidelines for Accessing and Using Biodiversity Data (2016) which states that loft conversions (full or partial) may not require a LRC search where: there is no requirement for any other preliminary survey (e.g. for habitats or other protected species) other than nesting birds or barn owls; and no trees likely to be used by roosting bats are to be affected (e.g. felling, pollarding, crown reduction, limb removal).

3. Results

3.1. Desk Study

3.1.1. Bat Roosts Reported in Planning Applications Within the Same Postcode

The search on the planning portal returned no records of bat roosts within the same postcode area as the proposed development.

3.1.2. Protected Sites

The location of protected sites is shown in Plan 2A: Protected Sites.

Statutory Sites Notified for Bats (Special Areas of Conservation (SACs)) or Sites of Special Scientific Interest (SSSIs) Within 10 km

No SACs or SSSIs that have been specially designated for bats lie within 10 km of the building.

Other Protected Sites Within 2 km

There are two other protected sites within 2 km of the Woodfired:

- Cwm Glo a Glyndyrys SSSI lies approximately 0.8 km to the south-west of the building. This SSSI is designated for its extensive area of marshy grassland, species-rich neutral grassland and acid grassland, and for the association of these habitats with others including woodland and heath; and
- Cwm Taf Fechan Woodlands SSSI and LNR lies approximately 1.9 km to the north-west of the building. This SSSI is described as a partially wooded valley of mixed deciduous woodland.

Bats are not mentioned in either of the citations for these sites.

Non-statutory Protected Sites

SINCS

There are twelve SINCs within 2 km of the building. These are:

- | | |
|-------------------------------------|-----------------------------|
| • Afon Taf; | • Cyfartha Park; |
| • Blaen-Canaid; | • Glynmil; |
| • Cwm Glo; | • Merthyr Common Central; |
| • Cwm Taf Fawr; | • Merthyr Common South; and |
| • Cwm Taf Fechan; | • Rhydicar West. |
| • Cwm Taf Fields and Cefn Coed Tip; | |

Of these, Afon Taf SINC is the nearest and lies approximately 0.2 km to the west of the building.

Ancient Woodland Sites

There are ten areas of Ancient Semi-Natural Woodland (ASNW)⁹, and three Restored Ancient Woodland Sites (RAWS)¹⁰, located within 2 km of the site. The nearest area of ancient woodland is an unnamed area of RAWS located 1.1 km to the north of the building.

Protected Sites Summary

Given the small scale of the proposed development, the localised nature of the proposed works and the limited ecological connectivity, any potential impacts to protected sites are considered to be negligible and they are therefore not mentioned further in this report.

3.2. Field Study

3.2.1. Ecological Context of Site

Lighting

The site is assessed as being within Zone E4: Urban lighting zone, with high district brightness (Institute of Lighting Professionals, 2012). There are several streetlights are present on both the High Street and John Street, (the roads that the building is situated on) which generate extensive artificial lighting. In addition, there is likely to significant light spill from surrounding office space and residential areas above high street shops, and from the neighbouring supermarket, decreasing the quality of foraging and commuting bat habitat¹¹.

Site and Surrounding Habitats

The surrounding environment, which is primarily a commercial town centre, lacks suitable habitat features on site and therefore provides negligible-quality foraging and commuting habitat for bats. There are some features in the wider landscape (such as the Afon Taf river (c.200 m west), and Thomastown Park (c. 300 m east)) which could provide suitable commuting and foraging habitat for bats, but the building is completely ecologically isolated from these features.

3.2.2. Building Description from the Perspective of Bat Habitat

Woodfired is a four-storey urban mixed-use building. The ground floor is currently occupied by a restaurant, and the remaining floors contain several residential units. The roof area proposed for conversion is hipped and lined with bitumen felt, has gables on the western and northern elevations, and is constructed with slates and concrete ridge tiles, all of which are in good condition and provide no obvious potential access

⁹ Ancient Semi-Natural Woodland (ASNW) – broadleaf woodlands comprising mainly native tree and shrub species which are believed to have been in existence for over 400 years.

¹⁰ Restored Ancient Woodland Sites (RAWS) – woodlands which are predominately broadleaves now and are believed to have been continually wooded for over 400 years. These woodlands will have gone through a phase when canopy cover was more than 50% non-native conifer tree species and now have a canopy cover of more than 50 percent broadleaf.

¹¹ Lighting can impact on bats' roosting sites, commuting routes and foraging areas.

points or roosting locations. There are soffit boxes throughout, which are in good condition and offer no obvious potential access points or roosting locations.

Photos Showing the Building and its Features

Photo 1: Western gable and hipped roof



Photo 2: Western gable end



Photo 3: Northern elevation



Photo 4: Internal View



3.2.3. Evidence of Bats

No evidence of bats was noted either externally or in any of the internal loft areas.

3.2.4. Nesting Bird Survey

A small amount of guano was noted on some of the timber joists. No signs of birds having recently nested were found during the survey within or on the exterior of the building.

4. Evaluation

4.1. Summary of Preliminary Roost Assessment

The preliminary roost assessment found no evidence of bats roosting within the building.

4.2. Suitability for Summer Roosts

The survey found no evidence to indicate the building has been occupied by roosting bats, and the building has been assessed as having negligible¹² potential for supporting roosting bats. In this instance, the potential for a bat roost being present in the building is considered extremely unlikely due to the following factors:

- No obvious potential roosting features for crevice dwelling bats, or access points for void dwelling or direct access bats;
- Lack of evidence of current or historic use by bats;
- The building is ecological isolated from features that may be used by commuting or foraging bats; and
- The building is in a town centre which is heavily illuminated with streetlights, as well as light spill from surrounding offices, residential units and the neighbouring supermarket.

4.3. Potential Winter Roosts

It is considered highly unlikely¹³ that the building could be used by winter roosting crevice dwelling bats due to the following factors:

- The lack of direct evidence of bats found using the building during the preliminary roost inspection¹⁴;
- The absence of any underground or subterranean features;
- The lack of potential access points or features suitable for entry by bats; and
- Residential loft spaces are unlikely to have suitable conditions as their temperature is regulated by the residents below. The loft space is therefore likely to be subject to high temperature and humidity fluctuations which are generally thought to be unsuitable for bat hibernation.

¹² Negligible is defined as 'quantities so small that they can be ignored when studying the larger effect'.

¹³ There is limited research on where pipistrelle bats hibernate, but current evidence suggests that they may hibernate adjacent to their breeding roosts in secure locations such as cavity walls that have relatively stable temperatures. Other individuals disperse to roost in small numbers in more exposed locations such as around window frames. In exposed locations pipistrelle bats typically hibernate as one or two individuals. Often there are often no obvious external signs of their presence (JNCC, 2004). Because of the highly exposed location of hibernation sites used by some individuals, it is therefore very difficult to completely rule out hibernation use by this species in almost any building that has some very shallow crevices, openings or gaps.

¹⁴ Due to the low levels of activity of bats in hibernation sites relatively few droppings are produced.

4.4. Birds – Interpretation of Nesting Bird Survey

A small amount of guano was noted on some of the timber joists. However, no evidence of past or current nesting by birds was observed. As there are no obvious access points, and the guano appeared very old, it is likely that birds no longer have access into the void space.

5. Required Actions

5.1. Licensing Requirements for Bats

As there is no evidence of bats roosting within the building, and the building has been assessed as having negligible potential to support roosting bats, no European Protected Species (EPS) licence will be required prior to works commencing.

5.2. Further Work

No further survey work is required, as the building has been assessed as having negligible potential to support roosting bats.

5.3. Precautionary Measures

Given the lack of any evidence of any use by bats, it is highly unlikely that the development proposals will have any impact on bats or their roosts. No precautionary timing restrictions on works are necessary. However, it is not possible to rule out bat use entirely, and there is also a risk of an offence being committed if active birds' nests are present. The following recommendations are made to minimise risks to bats and birds:

- It will be clearly understood that in the event of any bats being found, the contractor must halt works (if bats are encountered, the bat will be carefully covered over again), and appropriate advice will be obtained from a suitably qualified bat consultant or Natural Resources Wales and, if necessary, a bat development licence obtained before work can resume;
- If any active bird nests are found these will be protected, along with an appropriate buffer zone of 5 m, until the nesting is complete, and the young have fledged¹⁵;
- Contractors will check for the possible presence of bats on the undersides of roofing tiles, ridge tiles, fascias, soffits and bargeboards etc. as they are lifted off; and
- The services of an appropriately qualified and licensed ecological consultant will be available on an 'on-call' basis at all stages of the works to deal with any unexpected encounters with bats or nesting birds. Contact details of such will be held on site. Acer Ecology Ltd. could be retained to provide this support.

5.4. Ecological Enhancement

The Environment (Wales) Act 2016, Planning Policy Wales (Edition 8, January 2016), TAN 5 *Nature Conservation and Planning* (2009) and Biodiversity supplementary planning guidance stipulate that development projects minimise ecological damage and contain elements of ecological enhancement. Ecological enhancements measures could be provided within the converted loft. and could include the

¹⁵ Some bird species, especially raptors and owls remain dependent upon the nesting site after fledging and so depending upon the species the nest site may need to be protected for a period of time after fledging.

retention of any unused areas of roof void in a suitable condition for use by roosting bats (i.e. with only bitumen 1F felt used) with suitable access points. Fascias, soffits and gutter-plates etc. could be left with small gaps beneath to allow access by bats behind them¹⁶, and/or purpose-built bat roosting boxes (Appendix 4) and bird nest boxes (Appendix 5) could be installed on the exterior of the building.

5.5. Longevity of Report

Bat Surveys for Professional Ecologists (Collins, 2016) states that the survey data should ideally be from the last survey season before a planning or licence application is submitted, although the length that survey data remains valid should be decided on a case-by-case basis and is dependent upon several factors¹⁷. It is considered that if development works do not begin within eighteen months (CIEEM, 2019) to two years of the date of this report, an update survey may be required in accordance with guidance from NRW¹⁸ and BS 42020:2013¹⁹ and CIEEM (2019) to determine if conditions and evidence of bat use has changed since that described in the current report.

¹⁶ This approach will only be acceptable if breathable membrane will not be installed within the building or the fascia, soffits etc. or the fascias, soffits etc. will be installed in a way where there is no potential for bats to gain access to the breathable membrane.

¹⁷ The factors identified are as follows: Were the original surveys carried out according to good practice guidelines?; Were the original surveys constrained in any way?; Do the results of the original surveys support the original conclusions and are these still relevant?; Has the nature of the site or the surrounding area changed since the original surveys were undertaken; and are additional surveys likely to provide information that is material to a decision, the design of mitigation measures, or specific advice relating to a proposed activity.

¹⁸ As set out in Point 5 of the Natural Resources Wales *Bat Surveys - Frequently Asked Questions* and Point 4 of the guidance included within the Natural Resources Wales European Protected Species Development Application Form.

¹⁹ As set out in Section 6.2.1, Point 7 which states that ecological information should not normally be more than two/three years old, or as stipulated in good practice guidance).

6. References

Anonymous (2007) *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC*. Final version, February 2007.

BSI (2013) *BS 42020:2013 Biodiversity – Code of practice for planning and development*. British Standards Institution, London.

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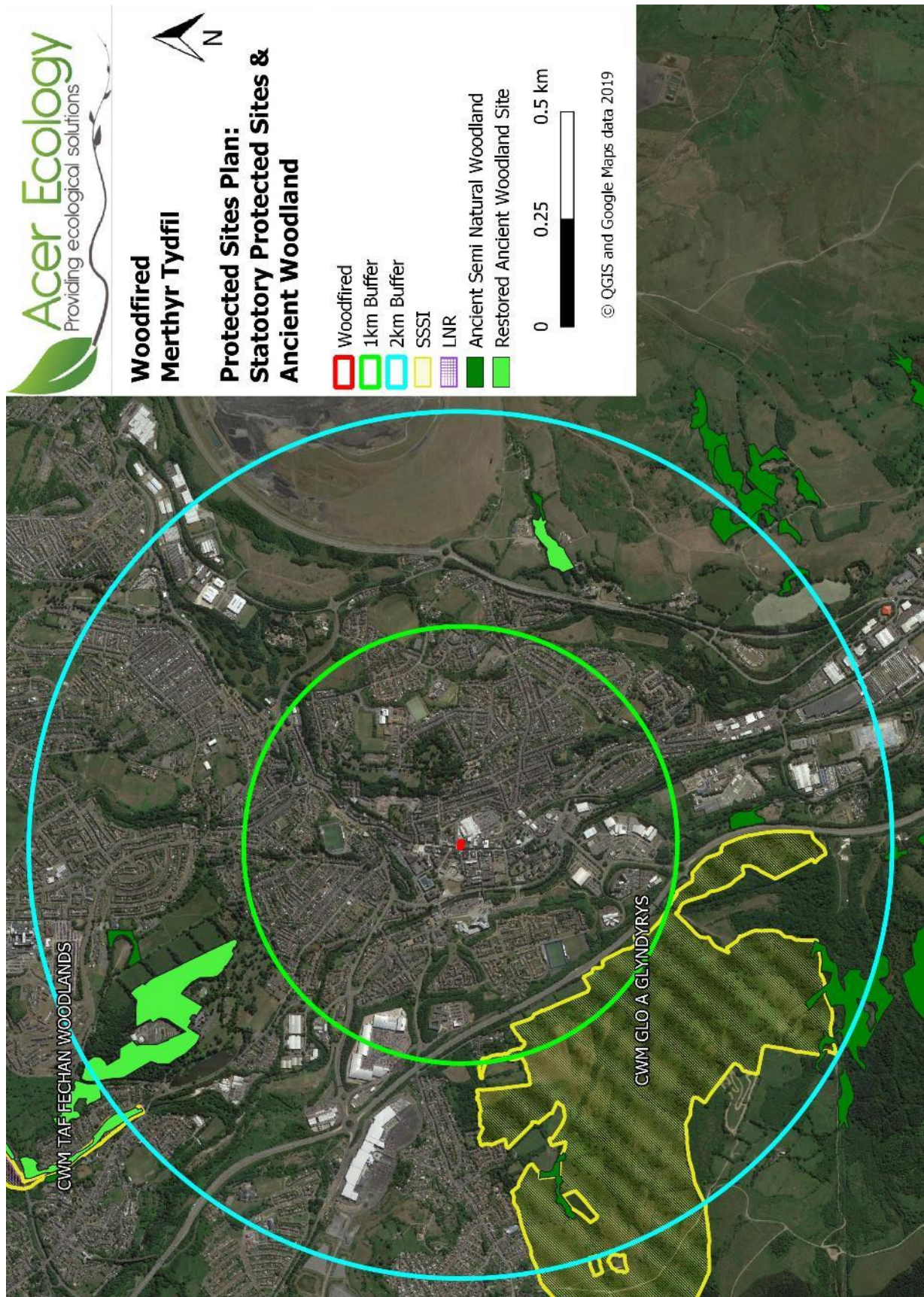
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Mitchell-Jones, A.J. (2004) *Bat Mitigation Guidelines*. Natural England, Peterborough.

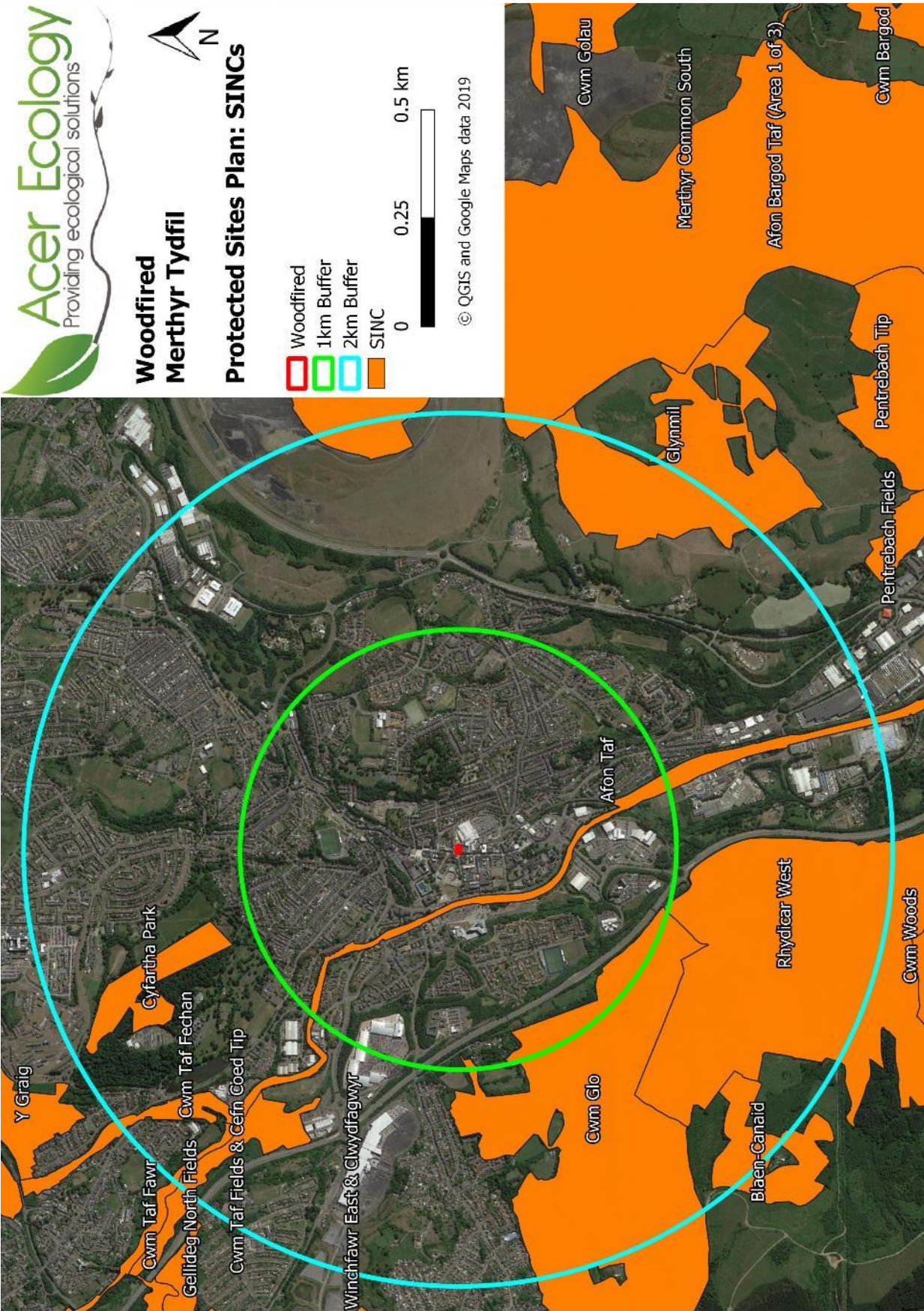
Plan 1: Location Plan



Plan 2A: Protected Sites Within 2 km: Statutory Protected Sites and Ancient Woodland



Plan 2B: Protected Sites Within 2 km: SINCS



Appendix 1: Bat Ecology and Legislation Protecting Bats and Their Roosts

Bat Ecology

There are 17 known breeding species of bat found in the UK, with additional species recorded as migrants or vagrants. All of them are small, nocturnal, flying, insectivorous mammals that are under conservation threat and many having undergone massive population declines over the last century. Some species, such as common and soprano pipistrelle (*Pipistrellus pygmaeus*) are relatively common and widespread in the UK, while others, such as greater horseshoe (*Rhinolophus ferrumequinum*) bats, have an extremely restricted distribution.

Most bats will use a variety of roosts of different types throughout the year. The winter hibernation sites typically have cool, humid conditions with a stable microclimate and low levels of disturbance. Most British bats hibernate in caves or artificial structures that fulfil these requirements such as mines, tunnels and cellars. Bats emerge from hibernation around late March or early April and move into transition or intermediary roosts. Around early May, female bats gather in colonies to form summer or maternity roosts, and it is here where they will give birth between late May and early July. A colony may consist of many individuals (sometimes hundreds of bats) of mixed age and sex. Roosts may be in a variety of habitat types including tree-holes, caves, buildings and other secure crevices or internal spaces with appropriate stable temperatures and humidity. Bats may change roost locations many times during a year and colonies may split up and reform during this period. Males occupy solitary roosts in autumn, to which they attract females for mating.

Legislation

All British bat species and any place used for shelter or protection, or a breeding site or resting place (their roosts) are fully protected under the amended Wildlife and Countryside Act 1981 through inclusion in Schedule 5. The roosts are protected irrespective of whether bats are present at the time. All bats are 'European Protected Species' and fully protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species and Planning (various amendments) (England and Wales) Regulations 2018. These pieces of legislation make it illegal to deliberately or recklessly:

- kill, injure or capture bats;
- disturb bats;
- damage, destroy, or obstruct access to bat roosts (including sites that are currently unoccupied);
- possess or transport a bat or any part of a bat unless acquired legally; or
- sell, barter or exchange bats or parts of bats.

Disturbance is defined as that which is likely to impair bats ability:

- to survive, to breed or reproduce, or to rear or nurture their young;
- to hibernate or migrate; or
- to affect significantly the local distribution or abundance of the species to which they belong.

Habitats Regulations Licensing

If a European Protected Species will be affected by a development, Natural Resources Wales (NRW) can issue licences under the Habitats Regulations to permit otherwise prohibited acts. Licences for certain activities can be granted providing “3 tests” are satisfied, that is:

1. the purposes of “preserving public health or safety, or for reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment”;
2. there must be “no satisfactory alternative”; and,
3. the derogation is “not detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range”.

Licences are issued by NRW, with NRW assessing Test 3, and the Local Planning Authority assessing tests 1 & 2 (where proposals are not subject to planning, then NRW alone will assess all three tests). Where Planning regulations apply, NRW will only issue a licence after determination of the planning application.

The licence application will require the production of a detailed method statement, which sets out the activities to be carried out under the licence to minimise the risk of bats being harmed during construction works, and to ensure that bats will be conserved during the development of the site. This will need to detail the mitigation proposed (such as the replacement or compensation roost), the timescale and schedule of works, the number, size and locations of bat access points to be provided, the type of materials to be used (roofing material, roof lining, fascias, soffits and bargeboards etc.), lighting proposals, action to be taken in the event bats are found during works and a post-development monitoring programme. The method statement will need to be accompanied by scaled plans and maps detailing the bat mitigation features. A cross-section of the access points and roost space is often required. The method statement must ensure that provision is made for new or continued roosting opportunities after the completion of development works. In some instances, a method statement is requested by the Local Planning Authority or Natural Resources Wales before the planning application is determined.

Environment (Wales) Act 2016

The Environment (Wales) Act 2016²⁰ dictates that Local authorities have a duty to have regard to the conservation of biodiversity in exercising their functions. The duty affects all public authorities and aims to raise the profile and visibility of biodiversity, to clarify existing commitments relating to biodiversity, and to make it a natural and integral part of policy and decision making. Part 1 Section 7 of the Act provides a list of the ‘*living organisms of principal importance for maintaining and enhancing biodiversity in relation to Wales*’. This includes seven bat species (soprano pipistrelle, barbastelle (*Barbastella barbastellus*), Bechstein’s (*Myotis bechsteini*), noctule, brown long-eared, lesser horseshoe and greater horseshoe bats).

²⁰ <http://www.legislation.gov.uk/anaw/2016/3/contents>

Appendix 2: Guidelines for Assessing Potential Bat Roosting Suitability and Determining Required Number of Dusk/Dawn Surveys

Suitability	Description of Roosting Habitat	Minimum Number of Dusk/Dawn Surveys Required ²¹
Negligible	Negligible habitat features on site likely to be used by roosting bats.	None.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection appropriate conditions ²² and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity) or hibernation ²³ .	One survey visit. One dusk emergence or dawn re-entry survey (Survey period from May to August) (Collins 2016).
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status ²⁴ (with respect to roost type only) the assessments in this table are made irrespective of conservation status, which is established after presence is confirmed.	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey ²⁵ . Surveys should be undertaken from May to September with at least one of the survey between May and August (Collins 2016).
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn. Surveys should be undertaken from May to September with at least two of the surveys from May to August (Collins 2016).
Confirmed Roost	Evidence of bats or use of bats found.	Minimum of two required to characterise the roost. If it is not possible to characterise the roost on the basis of two surveys, additional surveys may be required. In the event that no evidence of bat roosting is detected during the dusk and dawn surveys a third survey may be required. In this situation DNA analysis of the droppings may also be required.

²¹ Adapted from Tables 7.1 and 7.3 of the Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).

²² For example, in terms of temperature, humidity, height above ground levels, light levels or levels of disturbance

²³ Evidence from the Netherlands, shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for large numbers of this species to be present during the autumn and winter in large buildings in highly urbanized environments.

²⁴ 'High roost status' is not defined within Collins, 2016. Acer Ecology Ltd. interpret maternity, hibernation, swarming sites, mating sites, and satellite roosts as being of 'high roost status' and exclude day roosts, night roosts, feeding roosts, transitional/occasional roosts from this definition. Pre-maternity/collecting roosts are not included within Collins, 2016 and will be assessed on an individual basis.

²⁵ Multiple surveys should be spread out to sample as much of the survey period as possible. It is recommended that surveys are spaced at least two weeks apart, preferably more. A dawn survey immediately after a dusk survey is considered only one visit.

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Appendix 3: Guidelines for Assessing Bat Habitat Suitability

Suitability	Commuting and Foraging Habitat
Negligible	Negligible habitat features on-site likely to be used by commuting and foraging bats.
Low	<u>Commuting Habitat</u> Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. <u>Foraging Habitat</u> Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	<u>Commuting Habitat</u> Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. <u>Foraging Habitat</u> Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	<u>Commuting Habitat</u> Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. <u>Foraging Habitat</u> High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. <u>Proximity to Known Bat Roosts</u> Site is close to and connected to known roosts.

Appendix 4: Kent Bat Box Instructions

Appendix A: The Kent Bat Box (D.I.Y. instructions)

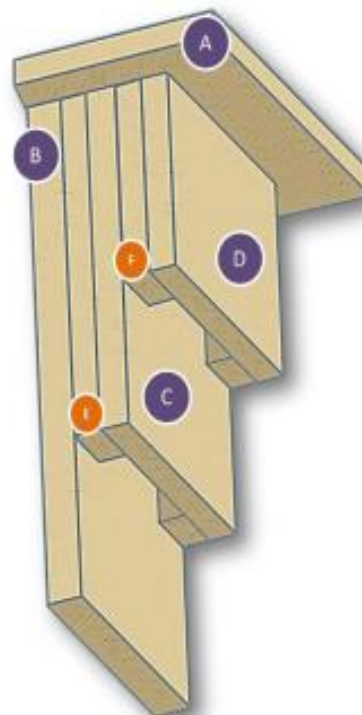
Design and measurements

Simple to construct, self-cleaning and low maintenance, the Kent bat box (designed by the Kent Bat Group) is a great extra home for bats to hang out and rest on a hunting night out. These boxes won't be spacious enough to be used as maternity roosts but are a great way to encourage bats in your garden or your green space. The box should be rainproof and draught-free

The only critical measurement is the width of the crevices: between 15-20mm. Other measurements are approximate. Timber should be approximately 20mm thick.

Measurements for one Kent bat box kit would be as follows:

Part	Quantity	Size (mm)
Roof (A)	1	250 x 160 x 20
Back (B)	1	450 x 200 x 20
Centre (C)	1	330 x 200 x 20
Front (D)	1	210 x 200 x 20
Centre Rails (E)	2	330 x 20 x 20
Front Rails (F)	2	210 x 15 x 15
Stand-offs (optional)	2	200 x 20 x 20



Material and Tools

This kit requires approximately 1.6m of rough wood and 25 screws (8 x 1 ½ inches) to assemble. You can rough it up by scraping with a suitable tool – possibly a saw blade or even a screwdriver but make sure you use untreated wood as some preservative chemicals can kill bats.

Pre-drill the holes to prevent the wood splitting. The hanging screws may either be at the edges of the front panel or in the side centre block (not in the rails!). Fixing may be by use of brackets, durable nylon cord or wires. Alternatively you can assemble your bat box kit with nails although they tend to be less robust than boxes made with screws.

This design has been developed by Kent Bat Group

We'd like to know how successful it is. Please send any comments or records of bats seen using it to: records@kentbatgroup.org.uk

With thanks to Glen Sharman for help in prototype and Lloyd Bore for providing plans.

Kent Bat Group

www.kentbatgroup.org.uk

Reg Charity No. 1079767



Appendix 5: House Sparrow Nest Box

Schwegler 1SP Sparrow Terrace

Sparrows are gregarious and prefer to nest close to each other, so this triple-nest box provides room for three families under one roof. It's made from long-lasting, breathable woodcrete to provide the optimum environment for sparrows to nest and rear their chicks.



Positioning: On buildings of all kinds in typical habitats including industrial buildings and barns at a height of at least 2m (e.g. under eaves).

Suitable for: House and tree sparrows and individual redstarts

Material: Woodcrete PLUS

Height: 240mm

Width: 430mm

Depth: 220mm

Weight: 15kg

Brood chamber dimensions: Height: 16cm, Width: 10.5cm, Depth: 15cm,

External dimensions: Height: 24.5cm, Width: 43cm, Depth: 20cm, Weight: 15kg