

Rhydycar
Merthyr Tydfil
CF48 1DH



An Ecological Survey
Report By:



On Behalf Of:



Llywodraeth Cymru
Welsh Government

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Status	Name	Position	Date
Author	Daniel White LLB MSc	Assistant Ecologist	15th June 2023
Author	Catherine Povey BSc (Hons)	Trainee Ecologist	15th June 2023
Reviewer	Phillip L. Morgan CEnv MCIEEM	Assistant Principal Ecologist	18th June 2023
Author (Revision 2)	Grace Dooley BSc (Hons) MSc ACIEEM	Senior Ecologist	21st July 2023
Reviewer	Carola Hoskins BA (Hons) MSc ACIEEM	Principal Ecologist	21st July 2023

Directors: Carola Hoskins BA (Hons) MSc ACIEEM Robert Morgan Phoebe Williams BA (Hons) MSc
Registered Office: Suite 131 – 136, Plas y Ffynnon, Cambrian Way, Brecon LD3 7HP
Web Site: www.justmammals.co.uk **Email:** grace@justmammals.co.uk **Telephone:** 01874 623616
Registered In: Wales **Registration Number:** 13099914 **VAT No:** 821 6376 35

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1 Executive Summary

- 1.1 The Welsh Government wish to install solar panels on the roof areas of the southern and western wings of their office building at Rhydycar, Merthyr Tydfil. This will require the removal of the existing roof tiles. The proposals require consent from the local planning authority, Merthyr Tydfil County Borough Council. To inform the process, a Preliminary Roost Assessment was carried out in March 2023, by an experienced, licenced ecologist, and an assistant.
- 1.2 Day time inspection found no live bats, droppings, staining, or insect remains, either internally or externally. However, multiple gaps were observed on the roof of the building, which might allow bats entry into the outer shell of Rhydycar. Overall, the building offered a low level of suitability for roosting bats, but the context of the site within the local landscape, was also relevant, as broadleaf woodland is in close proximity. As a consequence of this potential, additional survey effort was required.
- 1.3 A single dusk emergence/activity observation was carried out in May 2023, by a team of experienced, licenced ecologists and observers, using high quality detection equipment. During this observation, on the 18th May 2023, no bats were seen to emerge from the building. The majority of activity noted was of common pipistrelle bats, with soprano pipistrelle bats commuting and foraging to the north of the building, along the treeline. No other species of bat was recorded.
- 1.4 Breeding birds were also considered during the survey. No active bird nest was noted during the survey. Breeding birds are protected under the provisions of the Wildlife and Countryside Act 1981 (as amended), and if an active bird's nest is discovered during the works, it cannot legally be disturbed or destroyed. General advice on the legal protection afforded to breeding birds is provided in this report.
- 1.5 As part of the proposals, recommendations are made in this report relating to improving the general biodiversity of the site, following solar panel installation. This includes the provision of eight bat boxes: four on the western gable end of the main curved building, and four to be affixed on poles at least 5m in height, positioned along the northern boundary of the site close to the boundary vegetation. These are also known as 'rocket boxes' and are available to purchase as a complete kit from various companies in the UK. In addition, four bird boxes, installed on mature trees around the site boundary are also recommended. Specific products are recommended in this report, however, similar products are also suitable should the specific products not be available for purchase at the desired time.

2 Introduction

- 2.1 The Welsh Government wish to install solar panels on the roof areas on both the southern and western wings of their office building, Rhydycar, Merthyr Tydfil, CF48 1DH. Solar panel installation will require the removal of the existing roof tiles. The proposals will require consent from the local planning authority, Merthyr Tydfil County Borough Council.
- 2.2 In order to consider the presence or potential presence of protected species, a Preliminary Roost Assessment (PRA) was commissioned from Just Mammals Limited, and undertaken by a licenced ecologist, and an assistant, in March 2023. Assessment comprised a daytime visual inspection of the building, including external and internal survey. Table 1, below, details the sites location.
- 2.3 The outcome of the PRA was that additional survey was required, due to the potential of the structure being assessed to have a 'low' level of potential to be used by bats. A single bat activity observation was conducted by Just Mammals Limited, in May 2023, within the active bat season, by a team of experienced ecologists and support staff.

Table 1: Survey Site Details

Address	Grid Reference	Altitude
Rhydycar, Merthyr Tydfil, CF48 1DH	SO 04778 05406	176m Above Ordnance Datum

- 2.4 Principal objectives of the survey effort were to;
 - determine if bats are roosting in the building, and if so, identify roost locations;
 - identify the species and the type of roost (maternity, day, transitional etc);
 - identify any important bat foraging or commuting behaviour in relation to the building;
 - identify any important bat flight lines;
 - determine if breeding birds are also using the building;
 - identify potential impacts, if any, from the development proposals;

- gather sufficient information to be able to make appropriate recommendations in order to minimise any impacts.

2.5 This report documents the findings of the assessment which includes the daytime internal/external inspection and one bat activity observation in the active summer period, and makes appropriate recommendations in light of the results.

3 Survey Team Experience

3.1 The lead surveyor was Grace Dooley, an experienced, Natural Resources Wales (NRW) licenced, ecologist (S091842/2) with Just Mammals Limited. Author of this report is Daniel White, and co-author is Catherine Povey, who was also in attendance during the dusk observation.

Table 2: Survey Team Experience

Name/Position/Detectors	Licences	Experience
Grace Dooley BSc (Hons) MSc ACIEEM Senior Ecologist (TE)	S091842/2; expiry November 2024	Grace holds an MSc in Conservation and Ecology and has nine years' practical experience with ecological surveys and impact assessments for bats, great crested newts, badgers, birds, reptiles and botanical communities for projects ranging in size from small-scale householder development projects to large, multi-faceted Developments of National Significance (DNS). Grace holds survey licences for bats and great crested newts in Wales, and great crested newts in England. She is a Senior Ecologist with Just Mammals Limited, and is an Associate Member of the Chartered Institute of Ecology and Environmental Management (ACIEEM)
Phil Morgan CEnv MCIEEM Assistant Principal Ecologist (TE)	S091084/1; expiry April 2024	Nearly 40 years' experience of undertaking building, tree and cave surveys for all bat species. In addition, he has undertaken foraging and flight line surveys using heterodyne and other echo location equipment and in 1991 made a significant contribution to a Bristol University run project, which established the methodology used in the National Bat Monitoring Programme. Phil has also undertaken numerous radio tracking exercises on both lesser horseshoe and Daubenton's bats. He holds NRW licence for other protected species including otter, great crested newt. Phil is an Assistant Principal Ecologist with Just Mammals Limited. He is a Chartered Environmentalist with the Society for the Environment (CEnv), and a full Member of the Chartered Institute for Ecology and Environmental Management (MCIEEM)
Diane Morgan BA (Hons) ACIEEM Senior Ecologist (TE)	S090641/1; expiry January 2024	Diane is an Associate Member of the Chartered Institute of Ecology and Environmental Management (ACIEEM). She has considerable experience (nearly 30 years) surveying built structures for bats and has carried out ringing of Daubenton's bat as part of a multi-year project and monitoring on several important lesser horseshoe bat roosts as well as assisted in radio tracking projects on the same species. Prior to current role. She was the Director of Brecknock Wildlife Trust and was involved in a wide range of nature conservation work including species and habitat protection and conservation land management. Other areas of interest include otter, dormice, water voles, reptiles, amphibians, fungi and crayfish. Diane is a Senior Ecologist with Just Mammals Limited
Nic Aldridge MSc BSc (Hons) Senior Survey Assistant (TE)	S091427/1; expiry July 2024	Following a degree in Botany and Zoology, Nic completed an MSc in Wildlife Management, Conservation and Control, both at the University of Reading. He has practical experience of field based research with a focus on invertebrate and vegetation diversity and has produced Phase 1 habitat surveys and habitat management plans. He has attended courses with the Bat Conservation Trust to improve his knowledge and skills and has led voluntary projects to develop habitats and collect species data. An NRW licenced bat worker, Nic is a Senior Survey Assistant with Just Mammals Limited
Ben Gibson BA (Hons) Survey Assistant (TE)		A graduate of Cambridge University with a degree in Natural Sciences, Ben specialised in Plant Science in his final year studies. Ben is a Survey Assistant with the Just Mammals Limited with fourteen years' experience of undertaking bat surveys flight line observations, and census counts
Catherine Povey Trainee Ecologist (TE)		After graduating from Swansea University, and UCL, Catherine worked in medical research, and as a practitioner. Since the first year of her degree, when she studied Zoology and Botany, she has retained a keen interest in the natural

		world and has recently worked with Bannau Brycheiniog National Park. She is a Trainee Ecologist with Just Mammals Limited, and has conducted a variety of surveys with the company, including dusk emergence observations
Mark Davies Survey Assistant (TE)		Mark has a keen interest in wildlife and a desire to understand more about the natural history. Mark is a Survey Assistant with the Just Mammals Limited

Note: Detectors

TE = Time expansion (Pettersson D-240X)

4 Survey Methodology

- 4.1 An initial day time assessment was carried out in March 2023, which involved a daytime visual inspection of the building, both externally and internally, seeking signs of the presence of bats. External survey involved examining outer surfaces from the ground and looking for signs of bat presence, including bat faeces (droppings). A high-powered lamp and close focusing binoculars were used to examine potential access and roosting areas. Any gaps or crevices were inspected as closely as possible. The context of the building within the surrounding landscape was also assessed.
- 4.2 Internal survey searched for the presence of bats, the remains of dead bats (including dead juvenile bats and babies, which might indicate the presence of a maternity site), and signs of bats, including faeces (droppings) on floors, etc. The roof structure and the loft voids were inspected as thoroughly as possible. The ridge area, which is a favoured roost location, was checked for live bats. Beneath this line, a careful search for droppings and insect parts was conducted. Urine staining caused by oil from bat fur was also searched for, as well as discarded fragments of insects such as moth wings.
- 4.3 A single dusk observation was conducted in the summer period of 2023. In order to carry out these observations, the surveyors were equipped with Pettersson D-240X machines. These devices are particularly sensitive and excellent at separating species which employ the middle range frequencies for foraging (45 – 55 kHz). They are therefore very good at identifying the different pipistrelle species (*Pipistrellus sp.*), and the different myotis bats* (*Myotis sp.*) (*myotis bat is a collective term used where the species could not be specifically identified beyond this broad group). The myotis group encompasses seven species of British bat including Alcaethoe's (*Myotis alcathoe*); Bechstein's (*M. bechsteinii*); Brandt's (*M. brandtii*); Daubenton's (*M. daubentonii*); greater mouse-eared (*M. myotis*); Natterer's (*M. nattereri*); and the whiskered bat (*M. mystacinus*).
- 4.4 The Pettersson D-240X machine can be used in heterodyne or time expansion modes and for the purposes of this survey, only the time expansion facility was used. The received signals were then downloaded to Roland RO-5 recording devices for later analysis. The time expansion method is similar to making a high-speed tape recording of a bat's ultrasonic call and then playing it back at a slower speed. Digital technology is used to make the recording and slow it down for play back. Since the signal is stretched out in time, it is possible to hear details of the sound not audible with other types of detector.
- 4.5 Time expansion is also the only technique which preserves all characteristics of the original signal, which makes time expanded signals ideal for sound analysis. In addition to the simple echo-location calls which can be used for commuting, enabling the bat to find its way about, bats will also produce feeding 'buzzes' when foraging. These buzzes occur when the bat closes in on its prey and are a consequence of the Doppler Effect, which results in a feeding 'buzz' as the reflected signal shortens when the animal approaches its prey. Such buzzes are used to assess the importance of an area for foraging. The recorded echo-location calls are then interpreted using BatSound sound analysis software. By use of the software it is possible to separate the different species by analysis of the sonograms produced.
- 4.6 Nesting birds were also considered, with the surveyors looking for signs of historic bird activity, nest remains, evidence of collections of bird dropping, feathers, or any other indications of use by birds.

5 Site Description

- 5.1 The building is located toward the south of Merthyr Tydfil, and is surrounded by strips of deciduous woodland. Beyond these immediate surroundings, the urban area of Merthyr can be found to the north and east, while expansive areas of deciduous woodland and scrub can be found toward the south and west, across the A470 trunk road.

- 5.2 Roughly C shaped, Rhydycar stands closely aligned to a north-west/south-east axis. The building has both western and southern wings, connected via a central element. Rhydycar is brick built, boasting a skillion type roof structure, with slate-type roof tiles, uPVC capped fascia boards, and rainwater products. Windows are present across large areas on each of the building's elevations, with each window surrounded by uPVC capping. The southern and western sections of the building are surrounded by an extensive car park.
- 5.3 Internally the building contains office space, which is separated from the loft by a suspended ceiling. The loft areas contain large voids, with no solid flooring, limiting access. The floor of the suspended ceiling is covered with black bags, filled with insulation resulting in a markedly warm space. Roof support consisted of large metal girders, with what appears to be metal sheeting covering the internal roof structure. No material liner was present.

6 Desktop Study

- 6.1 The context of the site was considered with regard to statutory sites of nature conservation interest, such as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), National Nature Reserves (NNRs) or Local Nature Reserves (LNRs) etc. Within a 2km radius there is one designated site, with the Cwm Glo a Glyndyrys SSSI, located approximately 260m to the west of Rhydycar. The site has been designated due to the presence of unique species of flora and fungi, and while bats have not been mentioned in the areas designation, they will undoubtedly utilise the woodland, grassland, and open water on site for foraging, commuting and roosting. As the proposed work at Rhydycar is limited to the building's existing footprint, the impacts are considered to be local and unlikely to impact on this SSSI.
- 6.2 A record search was commissioned from the South East Wales Biological Record Centre (SEWBRc), unique reference (0223-946). There are no historic records for bats or birds on the site itself, with the closest bat record being of a soprano pipistrelle (*Pipistrellus pygmaeus*), some 144m to the north. The majority of records within the dataset, within 1km of the building, are common pipistrelle (*Pipistrellus pipistrellus*), and soprano pipistrelle, with occasional records for brown long-eared bats (*Plecotus auritus*), and infrequent records of noctule (*Nyctalus noctula*), and greater horseshoe (*Rhinolophus ferrumequinum*). Other bat species recorded further than 1km from the site, include lesser horseshoe bats (*Rhinolophus hipposideros*), serotine (*Eptesicus serotinus*), and unidentified myotis and nyctalus species. Several bird species were also recorded approximately 300m to the north-west of the survey site, including swift (*Apus apus*), swallow (*Hirundo rustica*), house martin (*Delichon urbicum*), house sparrow (*Passer domesticus*), and pied wagtail (*Motacilla alba*), amongst others.

7 Survey Constraints

- 7.1 No solid flooring was present within the lofts of Rhydycar, limiting access to surveyors during the PRA. Checks could only be undertaken by standing on a step ladder, and viewing through a hole in the suspended ceiling. While this prevented a thorough search of the lofts, it permitted sufficient checking of the spaces to determine the presence or potential presence of bats, and nesting birds.
- 7.2 The office building at Rhydycar is a large, tall building, which made it awkward to survey. This was overcome by deploying enough surveyors to observe the building in its entirety.
- 7.3 The use of Night Vision Aids (NVA) was not employed during the single dusk observation. Current published survey guidelines, the third edition of the Bat Survey Guidelines (Collins [ed.] 2016) indicate that NVA may be used as a complimentary survey technique and are not required as part of a suite of survey equipment. The interim guidance note published by the Bat Conservation Trust (2022) explains the reasoning as to why the fourth edition of the guidelines, which is due to be published shortly at the time of report production, will recommend use of NVA as standard during all emergence and re-entry surveys and justification provided where they are not used. It must be noted that the document published by the BCT (2022) is for guidance purposes only, and that the fourth edition of the survey guidelines is not yet published and the recommendations are therefore not enforceable. That being said, NVA was not utilised during the May 2023 dusk survey at Rhydycar on the basis of there being sufficient ambient artificial lighting to illuminate the features of the building during the survey. Surveyors were able to see all parts of the structure required to complete the survey.

8 Survey Results

- 8.1 Details of the survey activities and weather conditions are summarised in Table 3 below. Sunset times were ascertained in all cases by use of a geo-positioning system (GPS). Wind speeds shown employ the Beaufort scale.

Table 3: Summary of Survey Activity and Weather Conditions

Date	Survey Type	Timing	Weather Conditions
17/03/2023	Day time visual inspection (PRA) (CH/DW)	10.00 – 11.30 hours Greenwich Mean Time (GMT)	Air temperature: 11°C Cloud cover: 8/8 oktas Wind speed: F3, gentle breeze Conditions: Dry
18/05/23	Dusk emergence/activity observation (GD/NA/MD/PM/DM/BG/CP)	20:30 – 22:10 hours British Summer Time (BST) (Sunset 21:04 hours)	Air temperature: 12°C Cloud cover: 7/8 oktas Wind speed: F2, light breeze Conditions: Dry
Surveyors	Grace Dooley (GD), Nic Aldridge (NA), Mark Davies (MD), Phil Morgan (PM), Diane Morgan (DM), Ben Gibson (BG) Carola Hoskins (CH), Daniel White (DW) Catherine Povey (CP)		

- 8.2 Assessment commenced with an internal inspection of the building, which found no live bats, no droppings, staining, or insect remains. Beyond a light covering of dust, and scattered dead flies, the loft areas were notably clear, and no evidence of bat presence was observed.
- 8.3 External survey revealed no evidence of bats, no bat droppings or staining. However, surveyors noted multiple gaps beneath both roof and ridge tiles, on both the western and southern wings of the building. No other features were noted that could be of use to roosting bats, with no observable gaps in the brickwork or under fascias.
- 8.4 A single dusk emergence/activity observation was undertaken, with results shown in Table 4 (see Appendix II). This observation was conducted by seven observers, on the evening of Thursday 18th May 2023. During this observation, no bats were seen to emerge from the building. The first bat observed was a common pipistrelle, at 21:18 hours. A total of fourteen pipistrelle bats were observed. The majority of animals were common pipistrelle bats, apart from three soprano pipistrelle bats. The main bat activity noted was commuting and foraging to the north of the building, along the treeline. No other species of bat was recorded. The last bat recorded, at 21.56 hours was a common pipistrelle.
- 8.5 Evidence of nesting birds was also assessed during the PRA, and while grey wagtail (*Motacilla cinerea*) were seen foraging along the roof of the building, no active or inactive nests were noted on the property. Nothing was seen during the survey to suggest birds have historically nested within Rhydycar.

9 Discussion and Conclusions

- 9.1 Survey results indicate that the Welsh Government building at Rhydycar is not a bat roost. The Welsh Government wish to install solar panels on the roof areas of the southern and western wings of the building. The proposals require the removal of the existing roof tiles, which will be replaced by solar panels. These proposals require consent from the local planning authority. A PRA in March found no live bats, or evidence of bats. However, gaps under roof tiles and other features offered potential for crevice-roosting bats, and therefore, additional survey in the form of a single dusk emergence/activity observation was recommended, and subsequently commissioned.
- 9.2 The dusk observation was carried out in May 2023, and no bats were seen to emerge from the building during this survey. Bat activity observed was primarily by commuting common pipistrelle bats. Three soprano pipistrelle bats were also observed commuting.
- 9.3 As noted above, there were several locations around the exterior of the building which would offer potential access to crevice roosting bat species. Whilst no bats were seen to emerge, this potential needs to be kept in mind, as bat could exploit such features opportunistically. Presence of bats at other times of year, apart from the summer, was also considered. In this respect the property is assessed to have negligible potential to be used by hibernating bats. There are no low-level features on the building that are suitable for hibernating bats. It is not considered a suitable structure for hibernation.
- 9.4 The PRA, conducted in March 2023, found no active bird nests. During the bat activity observation, in May 2023, again no bird nests were noted. Nothing was seen to indicate that birds are nesting in the building. All breeding birds are legally protected and once a nest is established it is an

offence to disturb or destroy the nest. In the event a bird nest is discovered during the roof strip and solar panel installation, advice concerning breeding birds is given below.

10 Recommendations

- 10.1 The Welsh Government office building at Rhydycar is not a bat roost. However, bats are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), whilst their roosting places are also protected under the provisions of the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) 2019. All bats and their places of rest are fully protected under British legislation, and as such, where there is evidence for the presence of bats, or where there is potential for them to be present, detailed assessment is appropriate. Bats can be encountered unexpectedly during building work, and if this occurs, it is important to stop activity in the vicinity of the bat(s). It is possible that a bat will be in a torpid state and unable to fly off for several minutes or even up to 20 minutes. Advice must be sought from NRW, or if this is not possible, then from an ecologist with a licence to disturb bats. To proceed without taking advice may result in an offence being committed.
- 10.2 A Bat Conservation Trust study of the impacts of lighting on bats has considered the increased risk of the bats being preyed on in well illuminated areas. Also, lighting was found to be harmful when present near woodland edges and hedgerows. Inappropriate lighting can result in the isolation of bat colonies and can affect insect behaviour which then adversely affects bats. If the modifications to the building will result in new external light fittings, then a lighting plan designed to minimise impacts on nocturnal wildlife must be prepared. External lighting features must ensure low output; fittings must be attached to external walls at a low level with all light directed downwards. There must be no upward light spill and shrouds or deflector fittings are a simple way of avoiding this. Lights must be on timers to ensure that lights are extinguished within 30 seconds of movement ceasing. It is also desirable that internal lighting is sunk into ceilings, rather than pendant lights, and this appears to reduce external lighting impacts if curtains or blinds are not used.
- 10.3 Breeding birds are protected under the provisions of the Wildlife and Countryside Act 1981 (as amended), and active bird nests cannot legally be disturbed or destroyed. Once a nest is established, the birds must be able to have access at all times until the young have fledged and the nest is no longer active. The bird breeding season commences as early as March for some species and continues to late August for species which rear a second or third brood. If an active nest is found, it must be retained and protected from disturbance. A cordon must be established for a safe working zone a suitable distance from the nest site, and not until the chicks have fledged can the nest be destroyed and the cordon taken down. To avoid nesting birds disrupting the development timetable, it is best for such work to be planned to avoid the breeding season.
- 10.4 Planning policy requires that development provides a positive outcome for local biodiversity. Given the scale of the development enhancements must include the installation of eight Schwegler woodcrete (or equivalent) 1FTH, universal bat summer roosts, and four NHBS wooden bird nest boxes (or equivalent).
- 10.5 Bat boxes must be installed as an enhancement feature. It is recommended that eight are installed in total: four on the western gable end of the curved building, and four mounted on poles along the northern boundary vegetation. Bat boxes on poles are known as 'rocket boxes' and are recommended to be at least 5m in height. Poles will need to be concreted into the ground to ensure a solid installation, and the boxes are self-cleaning and therefore maintenance free. It is recommended that two of the rocket boxes are of the 'crevice' design, and the other of a 'cavity' design. Proposed locations are provided in Figure 2.
- 10.6 Bat boxes installed on the western gable must be installed just below the eaves of the building, ensuring entrances to the roosts are unobstructed by features such as satellite dishes, cables, aerials, or other similar items. The design of the boxes, and materials, are selected for their longevity, with woodcrete boxes offering improved insulation, rot resistance, and protection from squirrel and woodpecker damage. These boxes are also self-cleaning, and ongoing maintenance is therefore not required. This particular box type includes multiple chambers, offering a variety of roost sizes with varying thermal properties. This diversity of conditions allows these boxes to accommodate different species of crevice roosting bat, such as the smaller common pipistrelle, and soprano pipistrelle bats, as well as the larger serotine bat.
- 10.7 Rocket boxes must be positioned as close as possible to the boundary tree vegetation, and positioned in the darkest areas to increase the likelihood of them being used by bats.

- 10.8 Bird boxes must be installed on mature broadleaf trees along the property boundary. Bird boxes must be situated between 1m and 3m above the ground, ensuring a clear flight path to the entrance hole which must be unobstructed by foliage. Boxes must be angled to face either horizontally or angled slightly downwards, to ensure rainwater does not accumulate in the box. Additionally, the boxes must be placed between a northern and eastern axis, avoiding strong sunlight and the prevailing wind/rain. At least two different sized entrance holes must be used, to ensure multiple bird species are provided for in this enhancement scheme, for example 32mm and 25mm entrance holes. Bird boxes must not be placed within close proximity to one another, with approximate locations indicated in Appendix I (see Figure 2).
- 10.9 Recommendations are made with regard to specific products that will fulfil the recommendations laid out above. However, please note that other similar products are also suitable, and the specific products recommended in this report may be unavailable for purchase in the future.
- Bat boxes on western gable: Schwegler 1FF [1FF Schwegler Bat Box With Built-in Wooden Rear Panel | NHBS Practical Conservation Equipment](#)
 - Rocket bat boxes (crevice & cavity – please select at time of purchase): [Eco Rocket Bat Box | NHBS Practical Conservation Equipment](#)
 - Bird box, small entrance: [Vivara Pro Seville 28mm WoodStone Nest Box | NHBS Practical Conservation Equipment](#)
 - Bird box, large entrance: [Vivara Pro Seville 32mm WoodStone Nest Box | NHBS Practical Conservation Equipment](#)
 - Bird box, open entrance: [Vivara Pro Barcelona WoodStone Open Nest Box | NHBS Practical Conservation Equipment](#)

11 References

Collins, J. (Ed.) (2016). *'Bat Surveys for Professional Ecologists – Good Practice Guidelines – 3rd Edition.'* Bat Conservation Trust, London.

Mitchell-Jones, A.J. and McLeish, A.P. (2004). *'The Bat Workers Manual – 3rd Edition'*, English Nature, Peterborough.

Ninnes, R. (2015). *'NRW Approach to Bats and Planning'*, Natural Resources Wales, Bangor

Russ, J. (2021). *'Bat Calls of Britain and Europe: A Guide to Species Identification'*. Pelagic Publishing, Exeter

Appendix I: Location Plans

Figure 1: Site location plan

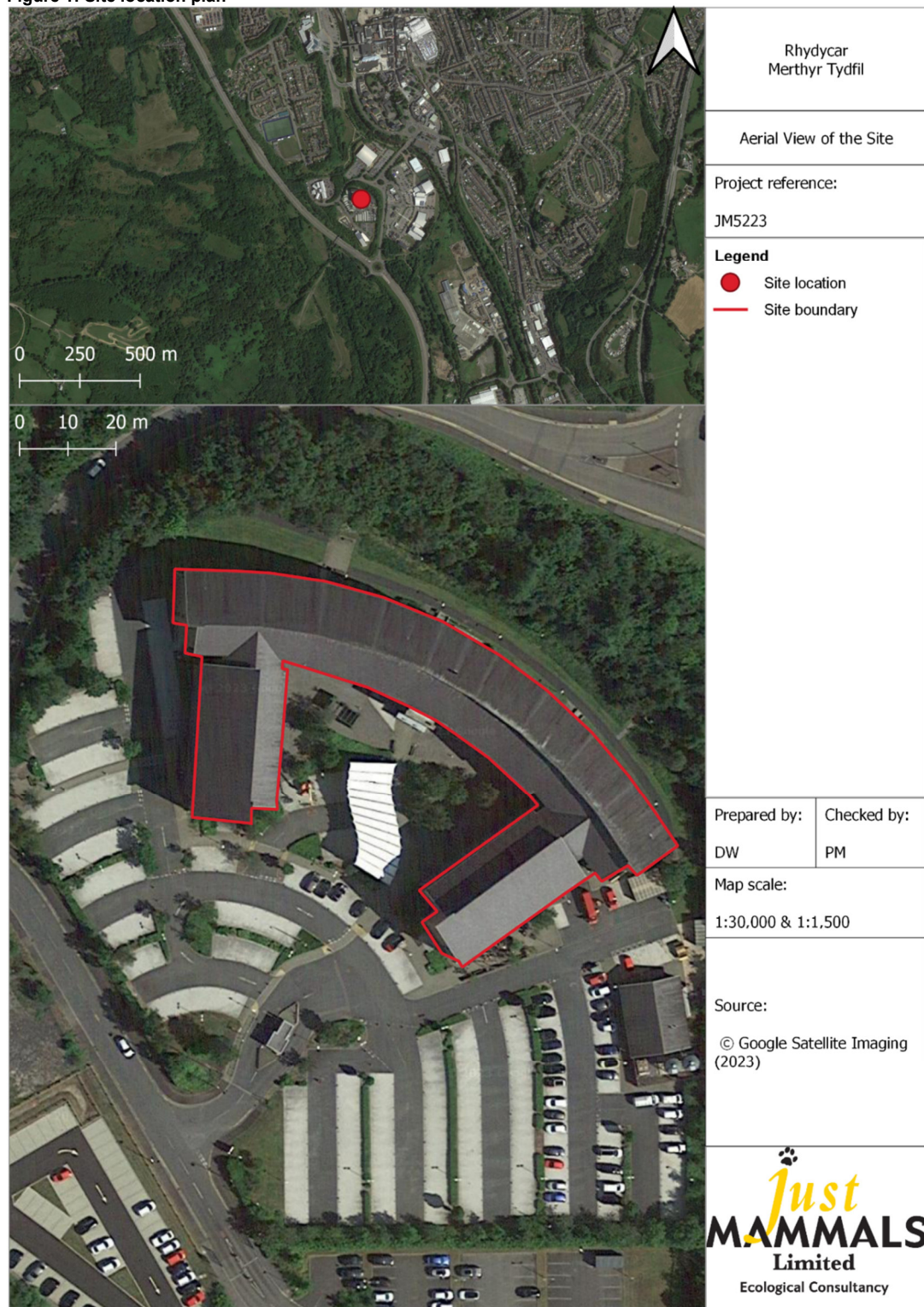
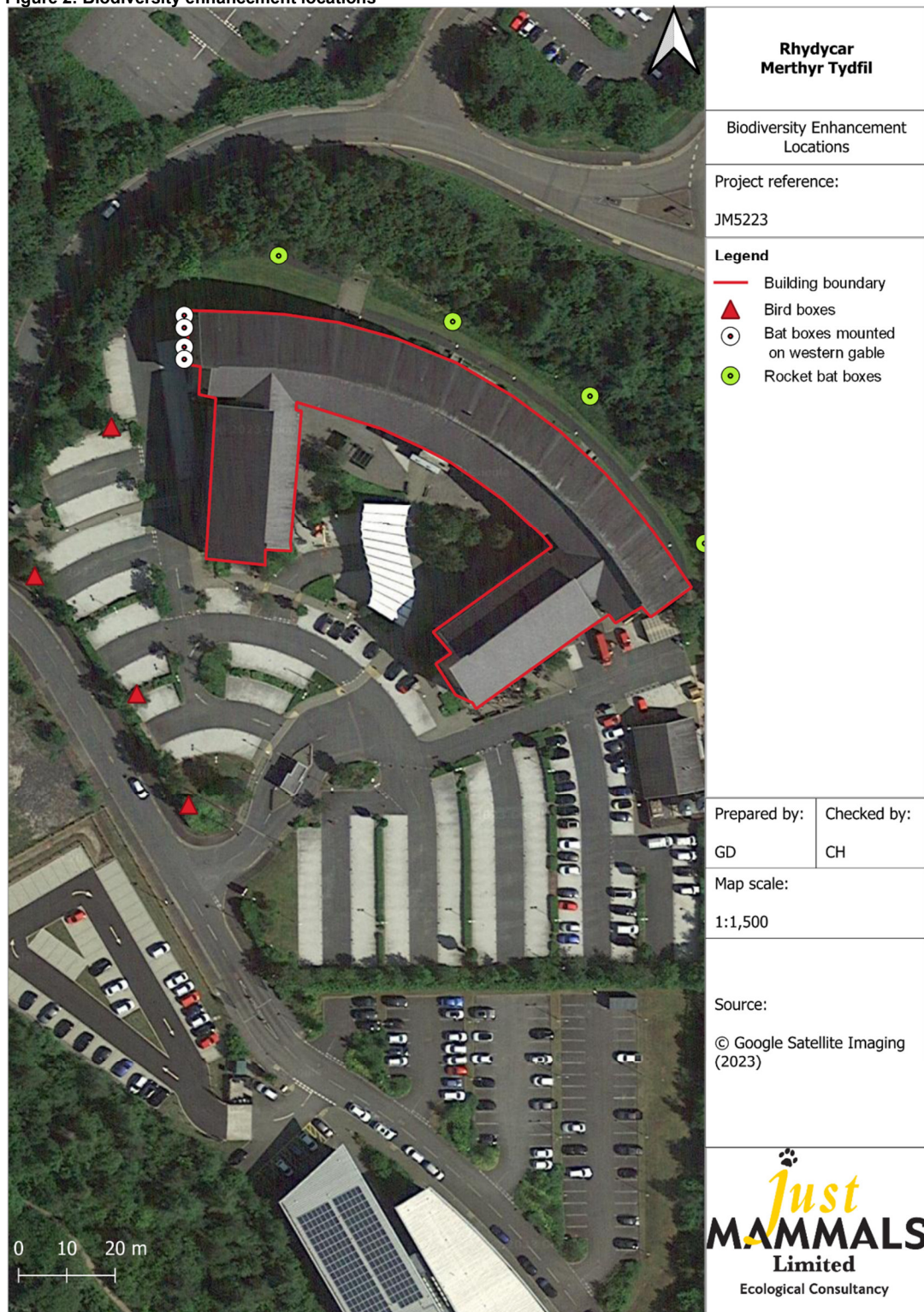


Figure 2: Biodiversity enhancement locations



Appendix II: Results of Bat Activity Observations

Table 4: Rhydycar, Merthyr Tydfil – Dusk Observation 18th May 2023

Time (24 Hour Clock)	Species (Common Name)	Recording No.	Observed Activity
21.18 hours	Common pipistrelle	1 PM	Heard but not seen, west of building
21.23 hours	Pipistrelle sp.	2 PM	Heard but not seen, west of building
21.26 hours	Common pipistrelle	1 BG, 1 CP, 1 NA	Foraging west to east, north of building
21.41 hours	Soprano pipistrelle	1 GD	Heard but not seen, north of the building
21.47 hours	Common pipistrelle	1 DM	Commuting south-east to north-west
21.48 hours	Soprano pipistrelle	2 BG, 2 NA	Commuting west to east along treeline north of building
21.49 hours	Common pipistrelle	2 CP, 3 PM	Heard but not seen, west of building
21.55 hours	Common pipistrelle	3 NA	Commuting west to east along treeline north of building
21.56 hours	Common pipistrelle	3 BG	Commuting west to east along treeline north of building

Note: Highlighted records indicate emergence activity

Appendix III: Site Photographs

Plate 1: Western wing of Rhydycar



Plate 2: Southern wing of Rhydycar



Plate 3: Loft space within southern wing

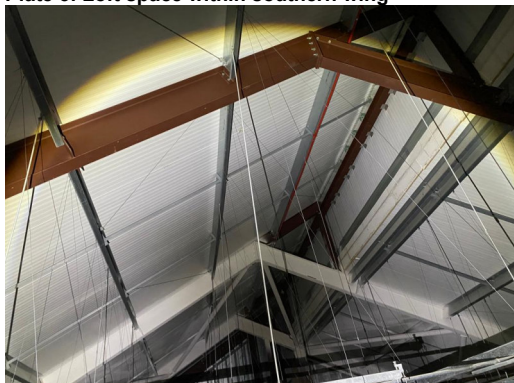


Plate 4: Loft space within the western wing



Plate 5: Loft floor within southern wing



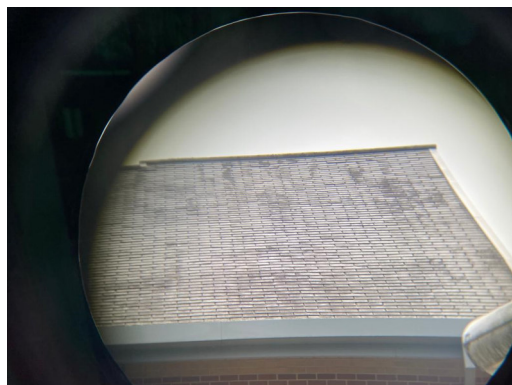
Plate 6: Loft floor within western wing



Plate 7: Gaps under ridge and roof tiles on southern wing



Plate 8: Gaps under ridge and roof tiles on western wing



Appendix IV: Ecology of British Bats

There are at least 18 species of bats breeding in Britain. Most of them are regarded as threatened due to a variety of factors including habitat loss, intolerance and disturbance/damage or loss of roosts. Of these species a number regularly use buildings at certain times of year in order to find safe secure roost sites. Often several different species can use a building over the course of the year, and not all species are present at the same time, making assessment of their presence complex.

Bats are highly mobile flying mammals, which in Britain feed entirely on insects. They have evolved over seventy million years and have developed sophisticated mechanisms to allow them to effectively 'see' in the dark by using sound waves. This system is called echo-location which enables them to track and hunt down small moving insects whilst in flight, rather like radar does in a modern military fighter aircraft. It is possible to record this sound, and because each species of bat echo-locates in a different way, determine what the species is without actually handling the animal which made the call.

In winter, when their prey is scarce, British bats hibernate or enter torpor, in cool parts of caves, buildings (cavity walls), and tree cavities. They may wake occasionally and will feed if evening temperatures are greater than 7°C, when flying insects can be active. Generally however, activity during cold winters is very limited and bats only become fully active in spring, with late March and early April being a critical time for animals desperately trying to save energy whilst gaining weight. Disturbance during these months can therefore be more devastating to bats than at other times of year.

By late spring female bats will gather together in maternity roosts in order to give birth and rear their single baby in June. Such maternity roosts are often near to important foraging areas in order to save energy as flight requires vast energy resources. Flight routes to and from such roosts can therefore also be important and some bats are extremely light averse preferring dark locations without street or security lamps which can force them to take complex routes to reach foraging areas. Such lighting can also badly degrade foraging areas where they occur close to buildings and hedgerows and tree lines can be particularly important areas for bat foraging to take place particularly when close to the roost building.

Whilst females form maternity colonies, usually in warmer roofs or trees, male bats tend to seek out cooler sites which may not be so close to the foraging areas. Males are often solitary and do not exhibit the social behaviour that marks out females during the birthing period. Non-breeding females will also roost in this way, when they have no need to spend energy on raising a single baby.

Several British bat species are known to rely heavily on buildings to roost. Of these species, the most likely are the soprano pipistrelle bat and the common pipistrelle. Other bat species regularly found in buildings are the brown long-eared bat; Natterer's bat; Brandt's bats and whiskered bat. Pipistrelle species and the small myotis or mouse-eared species (Brandt's, whiskered etc) often favour locations at the ridge or around the exterior shell of the structure. Brown long-eared and Natterer's tend to prefer living within the roof area of a building – large lofts being popular.

Other species that are known to use the internal areas of built structures such as barns include the two horseshoe species, the greater horseshoe bat, and lesser horseshoe bat, as well as western barbastelle bat (*Barbastella barbastellus*).

Appendix V: Relevant Legislation

Bats

All species of bat in Britain, and their places of rest are protected under the provisions of the Wildlife and Countryside Act 1981 (WCA), Section 9(1), 9(4)(a) and 9(4)(b) as amended by Schedule 12 of the Countryside and Rights of Way Act 2000. Further protection is afforded by the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) 2019. In relation to structures used by bats for shelter or protection (i.e. roosts), this legislation makes it an offence to either intentionally or recklessly damage, destroy or obstruct access to any site used by bats, whether bats are present at the time or not, or to intentionally or recklessly disturb bats within a roost.

Infringements under this legislation include building demolition, removal of hollow trees, blocking, filling or installing grills over old mines or tunnels, building alteration or maintenance work, re-pointing of stone walls, getting rid of unwanted bat colonies, re-roofing, remedial timber treatment, re-wiring or plumbing in roofs, treatment of wasps, bees or cluster flies (Mitchell-Jones, 1992; Childs, 2001). Greater horseshoe bat, lesser horseshoe bat, Bechstein's bat, greater mouse eared bat and barbastelle are included in Annex II of the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) 2019 and hence require special protection.

Maximum penalties for committing offences relating to bats or their roosts can amount to imprisonment for a term not exceeding six months or to fines of up to Level 5 on the standard scale under the Criminal Justice Act 1982/1991 (i.e. £5000 in April 2001) per roost or bat disturbed or killed, or to both. Bodies corporate and their directors/secretaries are liable for offences under the 2017 Regulations and the WCA. Additionally, where such an offence results in the offender benefitting in a monetary form from the illegal action, confiscation or civil recovery of the proceeds can occur under the Proceeds of Crime Act 2002.

It is sensible to assess as soon as possible if bats are present at potential sites for development – preferable before the land is acquired. In some cases the period required for adequate survey work may span more than one calendar year. If a development, including demolition or change of use, is likely to impact on bats and their roosts then a licence will usually be required. Adequate survey results are a necessary input to any licence application. If bats are not found until late in the development stage this may result in delays while a licence is sought and even in offences being committed.

The law with respect to dwellings and other structures is applied equally. Where disturbance is deemed likely to have a significant effect on bats to survive, breed and rear their young or will affect the local distribution and abundance of the species, a European Protected Species licence issued by Natural Resources Wales. A licence application must demonstrate that the development will not be detrimental to the maintenance and conservation status of the species concerned.

This explanation must be regarded only as a guide to the law. For further details, reference must be made to the Wildlife and Countryside Act 1981 (as amended), the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) 2019 and the Countryside and Rights of Way Act 2000.

Wild birds

All wild birds, their eggs and nests are protected by The Wildlife and Countryside Act 1981 (as amended). It is an offence, with certain exceptions, to:

- intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built;
- intentionally take or destroy the egg of any wild bird;
- sell wild birds or put them on display for sale;
- use traps or similar items to kill, injure or take wild birds; and
- intentionally, or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Penalties that can be imposed for criminal offences in respect of a single bird, nest or egg contrary to the Wildlife and Countryside Act 1981 (as amended) is an unlimited fine, up to six months imprisonment or both. In exceptional cases NRW and Natural England issues licences for specific purposes, so that legitimate work may be undertaken without breaking the law.

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Just Mammals Limited, Suite 131-136, Plas y Ffynnon, Cambrian Way, Brecon
LD3 7HP Tel: 01874 623616