

Appendix 7D

NLG Ecology Ltd (2021) Bat Survey Report

Bat Survey Report

Headbolt Lane, Kirkby



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Bat Activity Survey Report

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SUMMARY

NLG Ecology Ltd (NLG) was commissioned by Buckingham Group Ltd. (Buckingham) in May 2021 to undertake a bat inspection/assessment and subsequent bat activity surveys of trees and bridge structures at Headbolt Lane, Kirkby, Liverpool. The site is shown in Figure 1 (Appendix 1) and is centred on National Grid Reference SJ 41324 99762.

The appraisal was required to inform proposals to construct a new station at Headbolt Lane, and associated engineering works at Kirkby Station and the adjacent track.

The surveys in respect of bats were to determine the potential presence of bat roosting within trees throughout the site and bridge structures subject to repair / expansion. Field data has also been collated for evidence of bat foraging at the proposal site, to take into context the presence of surrounding habitats. In addition, consideration has been given to the potential presence of breeding birds and other notable species such as barn owl (*Tyto alba*).

The initial tree and structure surveys of the Headbolt Lane Station site was completed on 13th and 14th July 2020, by Rowena Tylden-Pattenson (Assistant Ecologist at NLG, Graduate CIEEM member). A further update walkover survey of the study area was undertaken by Sally Conyers (Ecologist at NLG, Associate CIEEM member) on the 21st and 28th March 2021, to gather additional data. Subsequent to these initial surveys the bat activity survey have been completed by surveyors Neil Lee-Gallon (Natural England Level II Survey Licence 2015-10739-CLS-CLS, Registered Consultant under Natural England's Bat Mitigation Class Licence Ref: RC164 and Natural England Barn Owl Survey Licence CL29/00163), Laura Kershaw (Natural England Level I Survey Licence 2015-14818-CLS-CLS), Chloe Warren, Megan Williams (Natural England Level I Survey Licence 2019-38752-CLS-CLS) and Sally Conyers.

Millbrook Bridge UB WKL2 56 was assessed to have '**moderate**' potential for roosting bats. This structure was subject to further survey efforts in the form of two emergence / re-entry surveys for bats in May and June 2021 with no roosts confirmed. As the immediate habitats surrounding Millbrook Bridge provide optimal foraging habitats for bats, then as a precautionary measure, Millbrook Bridge should be inspected from a Mobile elevating work platform (MEWP) by a licensed bat ecologist in advance of any construction activities. If any evidence of opportunistically roosting bats is found then to avoid any compromise of the legal protection afforded the species, works will be completed under a European Protected Species Licence.

Glovers Brow Bridge OB WKL2 57 was assessed to have '**low**' potential for roosting bats. This structure was subject to further survey efforts in the form of one emergence survey for bats in June 2021. No bats were recorded to emerge from the structure during the survey. Therefore, bats are not considered to pose a constraint to the future proposed works to the structure and the future works can proceed without further survey effort for roosting bats.

A Lombardy poplar situated at the eastern extent of the Headbolt Lane development (SJ 41536 99849) was assessed in July 2020 to have 'moderate' potential for roosting bats; however on visiting in May and June 2021 the feature was inspected using an endoscope downgraded to '**negligible**' potential for roosting bats.

An ecological precautionary working method statement in regards to roosting bats as detailed within Section 4 should be followed for removal of mature trees within the rail boundary within the proposed track extension area between Kirkby Station and Headbolt Lane.

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1 INTRODUCTION

1.1 Background

- 1.1.1 NLG Ecology Ltd (NLG) was commissioned by Buckingham in May 2021 to undertake a bat inspection/assessment and subsequent bat activity survey of trees and bridge structures at Headbolt Lane, Kirkby, Liverpool. The site is shown as Figure 1 (Appendix 1) and is centred on National Grid Reference SJ 41324 99762.
- 1.1.2 The appraisal was required to inform proposals to construct a new station at Headbolt Lane, and associated engineering works at Kirkby Station and the adjacent track.
- 1.1.3 The surveys in respect of bats were to determine the potential presence of bat roosting within trees throughout the site and bridge structures subject to repair. Field data has also been collated for evidence of bat foraging at the proposal site, to take into context the presence of surrounding habitats. In addition, consideration has been given to the potential presence of breeding birds and other notable species such as barn owl (*Tyto alba*).
- 1.1.4 The initial tree and structure surveys of the Headbolt Lane Station site was completed on 13th and 14th July 2020, by Rowena Tylden-Pattenson (Assistant Ecologist at NLG, Graduate CIEEM member). A further update walkover survey to include the extension of the toughing works was undertaken by Sally Conyers (Ecologist at NLG Ltd., Associate CIEEM member) on the 21st and 28th March 2021, to gather additional data. Subsequent to these initial surveys the bat activity survey have been completed by surveyors Neil Lee-Gallon (Natural England Level II Survey Licence 2015-10739-CLS-CLS, Registered Consultant under Natural England's Bat Mitigation Class Licence Ref: RC164 and Natural England Barn Owl Survey Licence CL29/00163), Laura Kershaw (Natural England Level I Survey Licence 2015-14818-CLS-CLS), Chloe Warren, Megan Williams (Natural England Level I Survey Licence 2019-38752-CLS-CLS) and Sally Conyers.
- 1.1.5 Relevant legislations that have informed survey effort are detailed as Appendix 1. Note that the text provides a brief summary of the legislation in relation to bats in England and Wales and the original Acts, Regulations and any amendments should be referred to for the precise wording.

1.2 Bat Biology

- 1.2.1 Within the British Isles there are 17 resident (i.e. breed) species of bat. Bats are nocturnal and feed entirely on insects. They use echolocation, a complex sonar system, to navigate around their surroundings and to forage.
- 1.2.2 Depending on the species of bat, habitat requirements vary widely although features such as traditional pasture, woodland edges, parkland, and wetland are particularly good for bats as insects are abundant within these areas (Mitchell-Jones 2004). Linear features such as hedgerows, tree lines and watercourses are important for commuting as they assist navigation.
- 1.2.3 Bats utilise different roosts at different times of the year, and roost requirements vary between species. Typical roost sites include caves, mines, trees, and buildings. Bats hibernate between October and March and usually within a damp, unexposed roost which can maintain a relatively stable temperature such as caves, cellars, mines. Around March bats emerge from hibernation and gradually move to their summer roosts and during spring females gather together to form maternity colonies to give birth and rear their young. Summer and maternity roosts are typically found within man-made structures or suitable crevices in trees.

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- 1.2.4 Birthing usually occurs late June – mid July, with the young able to fly within three to five weeks (Altringham 2003). By the end of August, most of the young bats are independent and the colony begins to break up. Mating takes place between August and December either at autumn swarming sites or winter hibernation sites. Bat roost sizes can vary from individual bats found within summer roosts, to hundreds of bats found within maternity colonies or hibernation sites.

2 METHODOLOGY

2.1 Desk Study

2.1.1 A desk study provides background information on the ecological interest of a site and compliments data collected in the field by providing ecological context for the site and its wider landscape. The search area extended up to 2km and incorporated the following resources:

- Multi-Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk was searched for European and National Statutory designated sites, to identify designations with criteria for bats;
- UK Biodiversity Action Plan (BAP) (<http://jncc.defra.gov.uk/>) and Local BAPS (LBAP) (LBAP WEB Link) were reviewed in respect of those bats;
- The National Biodiversity Network (NBN) Atlas (<https://records.nbnatlas.org>) was consulted with reference to relevant and notable species records on, or within 1km of, the site;
- Google Maps (www.google.co.uk/maps) were reviewed to help provide wider site context in respect of bat commuting. i.e. the presence of a continuous network of surrounding hedgerows may support findings drawn from field survey; and
- An updated desk study was undertaken in October 2020, with information requested from Merseyside Biobank for records of non-statutory designated sites and bat species records.

2.2 Structure Assessment

2.2.1 The structure assessment, adhered to guidance within the Bat Mitigation Guidelines (Mitchell-Jones 2004) and the Bat Surveys Good Practice Guidelines (Collins 2016), involved a detailed external and internal inspection of the following bridge structures: County Road Bridge A502 UB WKL2 55; Millbrook Bridge UB WKL2 56; Glovers Brow Bridge OB WKL2 57; M57 Motorway bridge; an unnamed underpass; and the River Alt Overbridge. (see Figure 1). Equipment used to support the assessment included close-focussing binoculars, an endoscope, high powered torches and ladders to aid access.

2.2.2 Throughout the inspection, evidence of use by bats was searched for in addition to suitable potential access and roosting points. This evidence includes staining and scratch marks around potential entrance points, bat droppings, and feeding remains. The structures were also assessed for their potential to provide suitable roosting conditions for bats.

2.2.3 Each structure was assigned a value for its bat roost potential, as described in Table 1 and adapted from Collins (2016).

Table 1: Visual Assessment Criteria for Buildings

Roost Potential Value	Value description	Reasoning
Confirmed Roost	Evidence of current or recent bat use	Sighting/hearing of bats (inc emergence) Presence of fresh droppings/staining Small numbers of old droppings/staining, Smoothing near gaps, lacking cobwebs Roosts identified from reliable source (i.e. land owner)
High	Building with numerable bat roost features	Buildings with numerous access points; gaps under eaves, loose lead flashing and roof tiles. Holes in brick work, open windows of old barns. Undisturbed voids that remain dark and of suitable humidity with available flying spaces. Good local context to include a good network of habitats that offer commuting and foraging opportunities.
Medium	Building with some bat roost features	Buildings with some of the above features, although to a lesser extent that they do not warrant High Roost Potential.
Low	Building with limited bat roost features	Well maintained buildings (i.e. sheet steel open structures) with few potential access points for bats. High levels of disturbance and regular lighting. Local context, to include poor surrounding habitats.
Negligible	Building with no features suitable for bats	No features throughout building that could be utilised by bats.

2.3 Tree Assessment

- 2.3.1 All trees were visually inspected for their potential to accommodate roosting bats. The assessment involved identifying suitable features that could support roosting bats, such as bark lift, holes, crack/crevices and dense ivy, along with signs of bat usage such as droppings and staining.
- 2.3.2 Each tree was categorised relative to its potential for supporting roosting bats, as defined by the category descriptions in Table 2, as published within the Bat Surveys Good Practice Guidelines (Collins 2016).

Table 2: Visual Assessment Criteria for Trees

Suitability	Description of roosting habitats	Commuting and foraging habitats.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions and surrounding habitat.	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. 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 water courses and grazed parkland. Site is close and connected to known roosts.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high concentration status (with respect to roost type only – the assessments in this table are irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used for bats for commuting such as lines of trees or scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used for bats for foraging such as trees, scrub, grassland or water.
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 and/or suit surrounding habitat to be used on a regular basis by larger numbers of bats. (i.e. unlikely to be suitable for maternity or hibernation).	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. Suitable, but isolated habitat that could be used small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.

2.4 Activity Surveys

- 2.4.1 Survey data drawn from the tree and structure assessment provided the basis for identifying the requirement for additional survey effort, in the form of a bat activity survey. This specifically related to Glovers Brow Bridge OB WKL2 57 which was identified as having low, potential for roosting bats; Millbrook Bridge UB WKL2 56, and an unnamed underpass which were both identified as having moderate potential for roosting bats. Trees included in the activity surveys included a mature Lombardy poplar with moderate potential for roosting bats.
- 2.4.2 In accordance with Collins (2016) additional survey effort comprised of one dusk and one dawn survey for moderate potential structures, and one dusk survey for the low potential structure. One dawn survey was undertaken for the mature tree, followed by survey with an endoscope.
- During the dusk surveys surveyors adopted position 15 minutes prior to sunset and continued for approximately 1.5hrs after sunset. The purpose was to observe and record bat emergence and wider commuting and foraging activity.
 - The Dawn survey surveyors adopted position 1.5 hrs before sunrise to recorded evidence of bat swarming before returning to the roost. Wider commuting and foraging was also recorded.
- 2.4.3 Species identification was aided by Echometer EM3 real time expansion bat detectors. The dates and weather conditions for the dusk and dawn surveys are presented in Table 3.

Table 3: Dates and Weather Condition for the Bat Activity Survey (2021)

Date	Dusk / Dawn	Surveyed structures/trees	Sunset/Sunrise	Cloud	Wind	Weather
18/05/21	Dawn	Poplar tree and Millbrook Bridge WKL2 56	05:06	1	2	10°C, clear, mild, light breeze
09/06/21	Dusk	Millbrook Bridge WKL2 56, Glovers Brow Bridge WKL2 57, and poplar tree endoscope surveyed	21:37	3	2	18°C, light breeze, dry, humid.

2.5 Breeding Birds

- 2.5.1 The tree and building assessment included a visual search for breeding bird activity, to include identification of bird species either observed to be building or occupying a nest.
- 2.5.2 Relevant legislation afforded to birds is presented as Appendix 1.

3 SURVEY FINDINGS

Designations and Notable Habitats

- 3.1.1 Headbolt Lane is located north of Kirkby, Knowsley, Merseyside. The surrounding habitats are suburban, with rural agricultural land in close proximity. Mill Brook and Simonswood Dell woodland, run beneath the railway track to the west of the proposed station location, the woodland is located within Millbrook Park which extends to the south of the track adjacent to the site.
- 3.1.2 Habitats recorded by MAGIC within 2km of the site include deciduous woodland, which is considered to be of 'priority' conservation status in accordance with the UK Post-2010 Biodiversity Framework.
- 3.1.3 Connectivity from the proposed development is moderate, with linear features present in the form of watercourses including Mill Brook, Simonswood Dell and Millbrook Park which run north to south under the rail line and Kirkby Brook which runs within the station development area east to west, and other linear features including the railway track and areas of open grassland connecting to the wider rural landscape.

Protected, Notable and Invasive Species Records

- 3.1.4 No European Protected Species (EPS) mitigation licence records were returned within 1km of the main works proposals. Three EPS mitigation licence records for common pipistrelle (*Pipistrellus pipistrellus*) were returned within 2km of the site: EPSM2013-5715 1.56km away; 2017-30556-EPS-MIT 1.58km away and 2015-7259-EPS-MIT 1.67km away.
- 3.1.5 The NBN Atlas was used to search for records of bat species within 2km of the Headbolt Lane Station development from the past 10 years. These records are summarised as follows:
- Mammals: Four common pipistrelle.
- 3.1.6 Desk study data from Merseyside Biobank was received on the 5th October 2020, this was further updated to cover the entire red line boundary in March 2021 to include the troughing works area, within a 1km search radius of the site. This data is included within Appendix 6 and further summarised below. Merseyside Biobank provided information for non-statutory designations. These include:
- *Simonswood Brook*: a site north-west of Headbolt Lane that supports neutral grassland, notable bird species and a population of water vole. The brook runs south towards the railway line and therefore has habitat connections to the proposal site via the brook water and adjacent riparian habitats. Located at SD 405001.
 - *Mill Brook, Westvale*: a site south of Headbolt Lane that supports neutral grassland, notable invertebrate species, and a population of water vole. The brook runs south from the railway line and therefore has habitat connections to the proposal site via the brook water and adjacent riparian habitats. Located 800m south at SJ 405988.
 - *Kirkby Brook, including Mill Brook*: a site south of Headbolt Lane that supports neutral grassland, woodland and ponds, common amphibian species, notable invertebrate species, and a population of water vole. The brook runs south under the rail line (Bridge 56) and therefore has habitat connections to the proposal site via the brook water and adjacent riparian habitats. Located 200m of the proposed rail track extension at SJ 407990.

- *Northwood Forest Hills*: a site that supports woodland and neutral grassland, and notable plant species. Located directly south of the troughing works at the points with the freight terminal at SJ 425998.
- *River Alt and M57 Corridor*: a nature improvement area along the Alt valley and M57 corridor which is dominated by woodland – this area is within the troughing improvement works to the south west of Kirkby station at SJ 394987.
- *Kirkby Brook, Northwood*: Open watercourse with habitat suitable for water voles. Located to the east of Headbolt Lane development at SJ 427992.
- *Meadow, Kirkby (Mill) Brook, South of Old Hall Lane*: A meadow within a wet flush on the banks of Kirkby Brook. Sandstone exposures on the banks add to the diversity. Located 700m south of the proposed rail track extension at SJ 407988.
- *Kirkby Brook Waterfall*: geographical site (not ecology) for bedrock of Kirkby Brook – located within Headbolt Lane Station development site.

3.1.7 Merseyside Biobank also provided information on bat species and habitats within 1km from the past 10 years. These records are summarized as follows:

- Mammals: Five common pipistrelle (*Pipistrellus pipistrellus*) / unspecified pipistrelle (*Pipistrellus* sp.) species from 2010 – 2016.

3.2 Structure Assessment

3.2.1 Three structures (County Road Bridge A502 UB WKL2 55; Millbrook Bridge UB WKL2 56; and Glovers Brow Bridge OB WKL2 57) on site were assessed for their potential value to roosting bats – see Figure 1, Appendix 1 for their locations. These structures were originally inspected by NLG in July 2020, with a further update walkover survey in March 2021 in accordance with best practice guidance (Collins, 2016), and were considered to be have a range of potential with respect to roosting bats from **negligible** to **moderate**; dusk emergence surveys of structures with roosting potential above **low** were subsequently undertaken in May and June 2021.

3.2.2 The following table includes structure descriptions and assessments of their potential to roosting bats.

Table 4 – Structure Inspections for Bat Roosting Potential: Results Summary 2021

Building	Description	Bat Roosting Potential
County Road Bridge A502 UB WKL2 55	County Road Bridge is a reinforced steel and stone structure, with no signs of weathering or colonisation by plant species. There are no gaps or cracks present that could provide potential spaces for roosting bats. No evidence of bat use, in the form of droppings, prey remains, staining on crevices by fur oils or urine, or bats themselves were identified across the bridge. No further surveys are required due to a lack of evidence of bat use and the absence of any suitable roosting features.	Negligible

Millbrook Bridge UB WKL2 56	Millbrook Bridge is a stone structure with some vegetation growth present on the elevations and underside. Gaps are present above the arch ring, on the north-west elevation, under the river arch on the western side and under the arch of the bridge deck; the depth of these gaps are unknown, and therefore may provide suitable roosting opportunities for bats. It is possible that the presence of ivy growing across the wing walls and above the arch rings may have obscured potential bat roosting features; however, the presence of this vegetation is likely to lessen the likelihood of bats roosting in this particular location due to the decrease in available space and the overly cluttered nature of the vegetation which is thought to obstruct a direct flight path. No evidence of bat use, in the form of droppings, prey remains, staining on crevices by fur oils or urine, or bats themselves were identified across the bridge.	Moderate
Glovers Brow Bridge UB WKL2 57	Glovers Brow Bridge is of solid concrete and sandstone construction, with a section of metal plating underneath the arch. Gaps are present between the concrete arch and metal plating that may provide suitable roosting opportunities for bats, although cobwebs present suggest that these spaces have not been used recently. Some small pockmarks and cracks were present in the eastern sandstone elevation. No evidence of bat use, in the form of droppings, prey remains, staining on crevices by fur oils or urine, or bats themselves were identified across the bridge.	Low

3.3 Tree Assessment

- 3.3.1 A mature Lombardy poplar is present adjacent to Headbolt Lane at SJ 41536 99849. The tree has a knot hole approximately 2.5m high, facing east. The extent of the knot hole could not be fully observed during the preliminary ground-level roost appraisal. Due to the potential of the features to support roosting bats and the suitable surrounding habitat, the tree has been assessed to hold a **moderate** bat roosting potential.
- 3.3.2 All other trees within the Headbolt Lane station site were assessed as offering **negligible** potential for roosting bats based on their age and/or a lack of suitable roosting features.
- 3.3.3 Along the railway embankments, multiple trees including mature sycamore and oak have ivy growth along the length of the trunks. This ivy growth conceals a number of trunks from being directly observed, therefore, due to the maturity of some trees along the embankments, it is considered likely that this ivy may have concealed potential bat roosting features. Due to the maturity of some trees along the railway embankments and highly suitable foraging habitat for foraging bat species, all mature trees have collectively been assessed to hold a **low** bat roosting potential. Trees assessed as holding low bat roosting potential can be de-vegetated adhering to an ecological precautionary working method statement (PWMS) in regards to roosting bats, which will be included within the PWMS / Construction Environmental Management Plan (CEMP) for the site works.

3.4 Activity Surveys

- 3.4.1 Detailed results for the emergence and re-entry surveys undertaken are provided in Appendix 3, with a summary of the findings in Table 3.2 below.

Table 5 - Results of the Emergence/ Re-entry Surveys : May and June 2021

Structure	Emergence/re-entry	
	18/05/2021 (Dawn)	09/06/2021 (Dusk)
Millbrook Bridge UB WKL2 56	Low levels of bat activity in the local area. No re-entry of bats to the structure observed.	No emergences observed. Pipistrelle bats commuting along tree lines to wards bridge with constant foraging in local area along watercourse and adjacent tree lines.
Glovers Brow Bridge UB WKL2 57	-	No emergences. No local activity.
Mature Lombardy poplar tree	No re-entries.	Feature with bat roosting potential inspected with endoscope and no bats found. The original feature is a knot hole with a branch tear out identified in 2020. The feature has significantly rotted since the initial inspection. No cavity was found behind the rotted limb within the knot hole, and the small hole had a slug present. This tree can be downgraded to having negligible potential roosting suitability for bats.

3.4.2 In summary, no bats were recorded to emerge from Glovers Brow Bridge or the mature Lombardy poplar tree during any of the activity surveys. For Millbrook Bridge, no confirmed emergences or re-entries were observed, however due to levels of bat activity around the bridge precautionary working measures are recommended in advance of works.

3.5 Breeding Birds

- 3.5.1 Opportunities for nesting birds are prevalent throughout the vegetation within the survey area, including railway embankments and bridges, where trees, scrub and tall ruderal vegetation are present. The dense bramble scrub within the proposed development is of notable value for nesting long tailed tit (*Aegithalos caudatus*), blackbird (*Turdus merula*) and dunnock (*Prunella modularis*).
- 3.5.2 Old bird's nests identified as being from prior to the 2020 nesting season were observed underneath the steel crossbeams of a metal footbridge adjacent to Glovers Brow Bridge (SJ 40249 99256).

4 CONCLUSION AND RECOMENDATIONS

4.1 Bats

- 4.1.1 Millbrook Bridge UB WKL2 56 was assessed to have '**moderate**' potential for roosting bats. This structure was subject to further survey efforts in the form of two emergence/ re-entry surveys for bats in May and June 2021 with no roosts confirmed. As the immediate habitats surrounding Millbrook Bridge provide optimal foraging habitats for bats, as a precautionary measure, Millbrook Bridge will be inspected from a Mobile Elevating Work Platform (MEWP) by a licensed bat ecologist in advance of any construction activities. If any evidence of opportunistically roosting bats is found then to avoid any compromise of the legal protection afforded the species, works will be completed under a European Protected Species Licence.
- 4.1.2 Glovers Brow Bridge OB WKL2 57 was assessed to have '**low**' potential for roosting bats. This structure was subject to further survey efforts in the form of one emergence survey for bats in June 2021. No bats were recorded to emerge the structure during the survey. Therefore, bats are not considered to pose a constraint to the future proposed works to the structure and the future works can proceed without further survey effort for roosting bats. However, there is always a low risk that any structure can be used on occasion by roosting bats. As a legal requirement, should bat presence be suspected at any time during the works, works must cease and the project ecologist must be contacted immediately. The ecologist will attend site, if necessary, to assess the situation and advise on how to proceed. This may involve seeking further advice from Natural England and the Bat Conservation Trust.
- 4.1.3 Along the railway embankments, multiple trees including mature sycamore and oak have ivy growth along the length of the trunks. This ivy growth conceals a number of trunks from being directly observed, therefore, due to the maturity of some trees along the embankments, it is considered likely that this ivy may have concealed potential bat roosting features. Due to the maturity of some trees along the railway embankments and highly suitable foraging habitat for foraging bat species, all mature trees have collectively been assessed to hold a **low** bat roosting potential. Trees assessed as holding low bat roosting potential can be de-vegetated adhering to an ecological precautionary working method statement in regards roosting bats as detailed below:

Method statement for precautionary works

- Ideally carry out work on trees with potential to support roosting bats in autumn; this avoids periods when bats are particularly vulnerable – during hibernation or when non-flying young are present.
- When preparing to cut a tree look for evidence of bat occupancy, these include – woodpecker hole; staining around the hole; maze of tiny scratch marks around the hole; noise coming from a hole; on close inspection the hole may contain droppings. The hole should be inspected with an endoscope by a suitably qualified person prior to felling.
- Bats may be anywhere inside a hole, try to cut as far above a hole as possible.
- If in doubt it is a roost, do not cut and seek ecological advice.
- Bats may be inside cracks held open by the weight of a branch, which will close when branch taken off. Search such splits for bats before removing large limbs.
- Where possible ring bark and leave up to 15 metres standing dead wood (trunk), with due regard to Health and Safety issues.

If bats are found:

- If the roost is still intact and bats are not injured, seek ecological advice immediately. If help is not available allow bats to fly out of harms way.
- If the timber is felled, the roost is not exposed and the bats are not injured, temporarily seal and isolate roost and seek ecological advice immediately and contact Natural England. If help not readily available, position the roost off the ground, re-open it and allow bats to relocate of their own accord.
- If roost has been exposed, and bats have been injured, collect bats into a secure box or bag (using a glove) and seek ecological advice immediately. Do not handle bats without gloves.
- In all cases where bats are found to occupy a tree, inform ecologist and Natural England immediately.

4.2 Nesting Birds

- 4.2.1 Opportunities for nesting birds are present in and around the structures and mature Lombardy poplar. Old bird's nests identified as being from prior to the 2020 nesting season were observed underneath the steel crossbeams of a metal footbridge adjacent to Glovers Brow Bridge.
- 4.2.2 Any proposed works to the structures should ideally be carried out outside of the main bird breeding season (which runs from March to August inclusive), i.e. carry out works between September and February inclusive. If this is not possible and proposed works are scheduled within the nesting season, then the surrounding vegetation and structure must be checked by a suitably qualified ecologist for active nests no more than 48 hours prior to the start of works. If nests are present, then a minimum 5m exclusion zone should be established around the nest(s) and no de-vegetation or works to the structure (the latter to be advised by an ecologist in the context of the proposals) should be carried out within the exclusion zone(s) until a suitably qualified ecologist has confirmed that the nest(s) is completed and that the young have fledged.

5 REFERENCES

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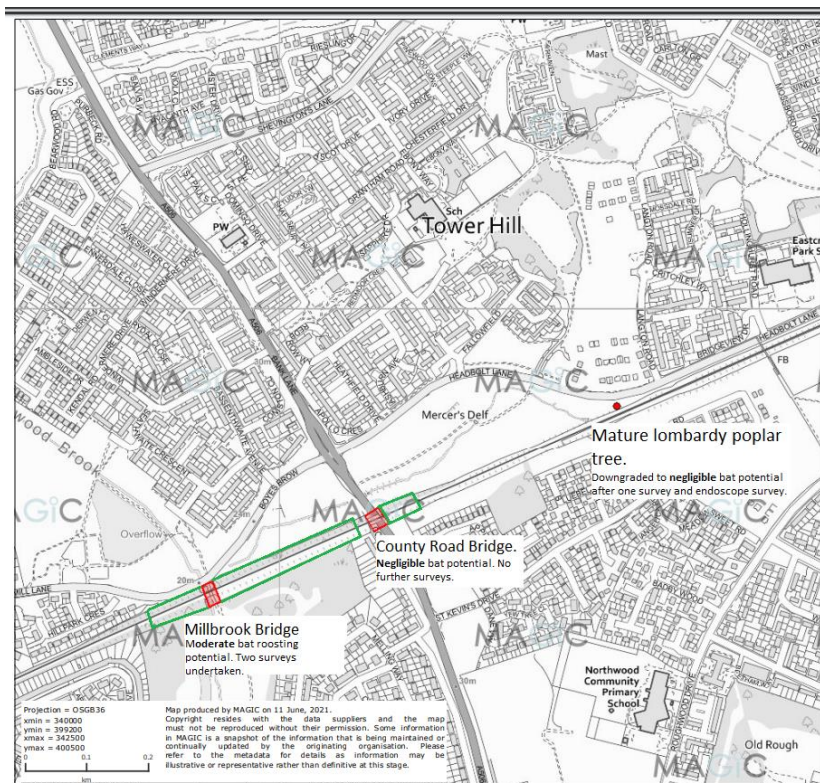
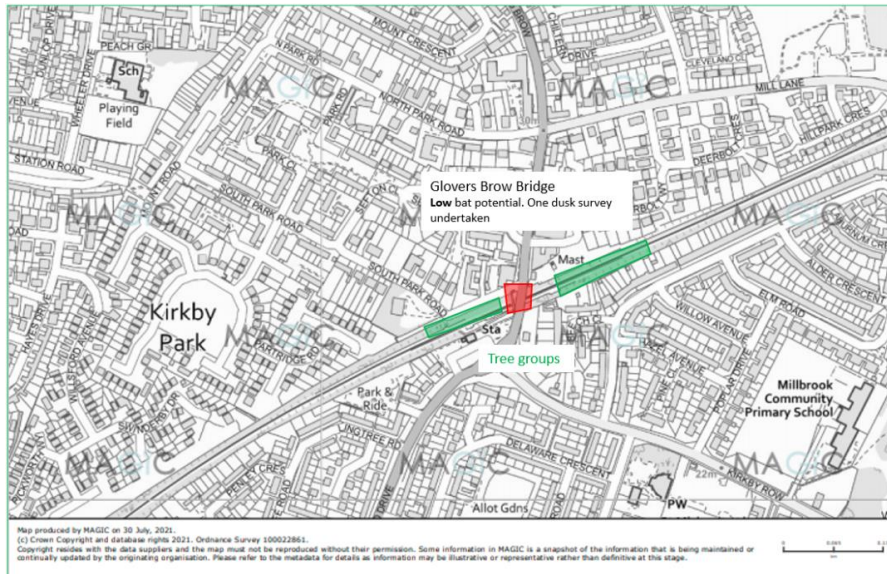
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APPENDIX 1: FIGURE AND PHOTOGRAPHIC PLATES

Figure 1: Location of structures and mature tree surveyed for bats



Photograph 1. Mature Lombardy poplar trees; tree with knot hole seen to left hand side.



Photograph 2. Knot hole in Lombardy poplar with moderate bat roosting potential. After inspection with an endoscope, this has been downgraded to **negligible** bat potential.



Photograph 3. Glovers Brow Bridge (eastern elevation) with crack to left and pockmark to right highlighted (red circles).



Photograph 4. Metal plate underneath Glovers Brow Bridge with **low** bat potential.



Photograph 5. Old bird nest present underneath Glovers Brow footbridge.



Photograph 6. County Road Bridge with **negligible** bat potential.



Photograph 7. Millbrook Bridge with gap present above arch ring. Wing walls have ivy present which may obscure further crevices within the stone work. Considered **moderate** bat roosting potential.



Photograph 8. Gap in arch of Millbrook Bridge near northern elevation, above footpath.



Photograph 9. Cracks and pockmarks in Millbrook Bridge over stream.



APPENDIX 2: LEGISLATION

Bats

All seventeen wild bat species receive full protection (Schedule 5 species) under the Wildlife and Countryside Act 1981, which is further amended by the Countryside and Rights of Way Act 2000 and the Conservation of Habitats and Species Regulations 2010. Taking these Acts together, it is an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection (S9:4b).
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a bat (S9:4c).
- The term 'reckless' is defined by the case of Regina v Caldwell 1982. The prosecution has to show that a person either deliberately took an unacceptable risk, or failed to notice or consider an obvious risk.

A bat roost has been interpreted to mean any structure or place which is used for shelter or protection whether or not bats are present at the time. Bat roosts may be defined (Hunt, L, 2012) as either (i) Transition Roosts, (ii) Maternity roosts, (iii) Satellite Roosts, (iv) Mating Roost, (v) Hibernation roosts, (vi) Night Roost, (vii) Day Roost, (viii) Feeding Roost or (ix) Swarming Sites.

Bats are listed under Annexes IIa and IVa of the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, or the 'Habitats Directive'. Inclusion on Annex IVa means bats are a European Protected Species (EPS) and protected under the Conservation of Habitats and Species Regulations 2010, thus it is an offence to:

- (a) deliberately capture, injure or kill any wild animal of an EPS,
- (b) deliberately disturb wild animals of any such species, in such a way as –
 - (i) to impair their ability to survive, to breed or reproduce, or to rear their young, or
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate, or
 - (iii) to affect significantly the local distribution or abundance of the species to which they belong;

A licence to disturb or take bats can be issued for certain purposes under Section 16 of the Wildlife and Countryside Act 1981 and under Regulation 44 of the Conservation of Habitats and Species Regulations 2010 permitting activities that would otherwise be illegal under the legislation. Licences can take up to thirty working days to be issued by Natural England. Where impacts on bats are unavoidable, mitigation will be required to maintain and enhance the favourable conservation status of bats. Losses of bat roosts must be compensated for by the provision of new roosting sites and planting of new foraging habitat. Mitigation measures will need to be designed on a site specific basis and only in consultation with an expert. All mitigation proposals must be agreed with Natural England and put in place prior to the commencement of works.

Birds

Under the Wildlife and Countryside Act 1981 (as amended) all wild birds, their nests and eggs are protected by law and it is an offence 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.

Barn owl (*Tyto alba*) is listed on Schedule 1 of the Wildlife and Countryside Act, 1981; therefore the birds, their nests, eggs and young are fully protected at all times throughout the UK. It is also an offence to intentionally or recklessly disturb barn owls at an active nest site with eggs or young or before eggs are laid, or to disturb the dependent young.

Loss of barn owl roosts to development must be compensated for by the provision of alternative roost and nest sites within 200 metres of the development, these should be made available at least 30 days prior to the start of works though the longer the better. Timing constraints will apply to avoid the periods when barn owl are nesting and raising dependant young. The provision of permanent roost and nest sites will be required within the redevelopment.

APPENDIX 3: FIELD SURVEY DATA

Bat Activity Findings

Dawn Re-entry Survey Results– 18/05/2021:

Millbrook Bridge UB WKL2 56

Chloe Warren was positioned to the south of the structure, using an EM3+.

Time	Species	No. of Passes	Description of Activity
04:26	Common pipistrelle	1	Seen passing underneath bridge towards lake.

Laura Kershaw was positioned to the north of the structure, using an EM3+.

Time	Species	No. of Passes	Description of Activity
04:04	Common pipistrelle	-	Heard not seen, a single pass.
04:11	Common pipistrelle	Continuous	Until 04:19. Foraging in woodland along railway from park side and back into woodland.
04:20	Common pipistrelle	Continuous	Foraging in woodland.
04:24	Common pipistrelle	-	Heard not seen.

Mature Lombardy poplar tree

Sally Conyers was positioned to the north of the tree, using an EM3+. No bat activity was recorded during the survey.

Dusk Emergence Survey Results- 09/06/2021:

Millbrook Bridge UB WKL2 56

Sally Conyers was positioned to the north of the structure, using an EM3+.

Time	Species	No. of Passes	Description of Activity
22:08	Common pipistrelle	2	Commuting along tree lines dropping down to brook from track level
22:09	Common pipistrelle	Multiple	Foraging around bridge until 22:20.
22:22	Common pipistrelle	2 individuals	Foraging along brook.

Laura Kershaw was positioned to the south of the structure, using an EM touch.

Time	Species	No. of Passes	Description of Activity
22:08	Soprano pipistrelle	1	Commuting along brook.
22:12	Common pipistrelle	-	Heard not seen, until 22:19
22:23	Common pipistrelle	Continuous	From north, foraging under bridge and along brook.

Glovers Brow Bridge UB WKL2 57

Neil Lee-Gallon was positioned to the east of the structure, and Megan Williams was positioned to the west of the structure, both using a EM3+. No bat activity was recorded during the survey.