PHASE II BAT SURVEYS

PROPOSED ARTIFICIAL PITCHES
MANCHESTER SOFTBALL LEAGUE
WILLENHALL ROAD
WYTHENSHAWE
MANCHESTER

A report to:

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Report Title:	Phase II Bat Surveys - Proposed Artificial Pitches

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SUMMARY

This report describes the results of phase II bat surveys with regards to bats and the proposal to construct a complex of four new artificial turf pitches with sports turf floodlighting on an area of the Wythenshawe Sports Ground.

The survey was undertaken to identify the bat fauna in the local area and to assess the ecological effect of the proposal. This was in the form of two seasonal static monitoring periods in July and August 2025, in the peak summer survey season. This was supported by a night-time bat walkover and vantage point survey in July 2025.

The surveys identified that the bats predominant on the site are almost entirely Common pipistrelle bats, with Pipistrellus and Nyctalus species making up 99% of all activity. In contrast, bat species which are adversely affected by artificial lighting were present in very low numbers.

Following the detailed site survey the bat population on the site was assessed using the framework provided by Wray *et al*.. This determined that the bat population using the playing field falls into the status as of 'county' value for bat species. To qualify as a site of county value it has to score between 21 and 30 in the combined metric. The site scores 22, based upon 13 of the overall 4,041 sonograms. This is because the 13 sonograms were from bat species categorised as being 'rarer', comprising of Whiskered bat and Daubenton's bat.

The results of the peak static monitoring was then compared to other similar studies in the region using the Ecobat analysis package. This identified that the none of the bat species present on site are sufficiently abundant to raise conservation concerns on a regional basis.

The sonogram analysis indicates the probable presence of the light sensitive Whiskered bat, Daubenton's bat and Brown long-eared bat, but no more than 13 sonograms generated amongst the 4,041 overall. These are still sufficient to trigger a requirement for mitigation.

In order to comply with best practice the ecological mitigation hierarchy was therefore used in the development of a mitigated floodlighting scheme for the new facility. There are four steps to the mitigation hierarchy. The first step is to avoid any environmental impact and that is not possible and provide such an extensive floodlit sports facility. Therefore the second step of the hierarchy has been implemented, with the design of a modern spill-controlled sports turf floodlighting scheme and a lighting curfew.

Summarised Conclusions

The conclusions of this report with regards to foraging and commuting bats are therefore as follows:

- The surveys found that the playing field boundaries are used almost entirely by commuting and foraging light tolerant bat species made up of Pipistrelle and Nyctalus bats, and totalling over 99% of all activity.
- Bat species that are sensitive to artificial lighting of largely absent from the playing field. The amount of activity recorded from Myotis bats amounted to 0.0027% and Plecotus bats 0.0005% of overall activity. There is a centre of activity for these bats to the north-east between the Chorlton Water Park and Kenworthy Woods LWS, and this area will remain unaffected.
- Despite the scarcity of bats categorised as being "rarer" in the Wray *et al* metric, their presence raises the status of the site above one of 'local or district value' to one of 'county' value, by a single metric point, 22 against 21.
- The Ecobat assessment of bat activity found that the extent of activity by bats that could be adversely affected by the sports turf floodlighting fell into the lowest percentile for bat activity within the region.
- The proposed sports turf floodlighting scheme is a modern mitigated design that will result in a controlled light spillage, but one that will illuminate the north and west boundaries of the playing field.

- The impact of artificial lighting on the playing field is further mitigated by a floodlight curfew of 22:00 hours, meaning for the largest part of the night the entire playing field is in darkness.
- The proposed floodlighting for the four new artificial pitches will see light spillage onto the northern boundary treeline and the western band of woodland of between 50 lux and 5 lux respectively. This is sufficient to have a detrimental impact upon the use of these boundaries by Myotis and Plecotus bats. However, the research which describes this impact also identifies that, in an almost like for like situation, that these bat species will continue to use the impacted boundary by simply switching to the dark side of the vegetation. This is therefore an option available to the low numbers of foraging/commuting Myotis and Plecotus bats using the western boundary woodland in particular.

In summary, taking into account the make-up of the bat fauna using the playing fields, the metrics assessing the status of the bat assemblage in a wider landscape setting and the low number of sensitive bat species affected, it is considered unlikely that the illumination of the north and west boundaries of the affected area of playing field will have a significant detrimental impact upon the favourable conservation status of Myotis or Plecotus bats in the local area.

Considering the above bullet points, the conclusion is that the proposed artificial pitches, and in particular the extensive sports turf floodlight scheme, should have a low impact upon bat activity in this localised area of the landscape of Wythenshawe.

1. INTRODUCTION

This report has been prepared by B J Collins – Protected Species Surveyors Limited for Surfacing Standards Limited. It provides the results of phase II bat surveys undertaken in the peak summer survey period of 2025, at the Wythenshawe Sports Ground.

The surveys were carried out to inform the potential ecological impact upon bat species from the proposal to install four new artificial grass sports pitches, all with associated floodlighting, on a section of the sportsground, comprising an extensive area of amenity grassland.

The Manchester Softball League, Wythenshawe Sports Ground is located off of Willenhall Road, in Wythenshawe, Manchester. Post code M23 0BD. The proposed pitch is to be placed upon the 10 figure Ordnance Survey grid reference of SJ 81706 91111

The aim of the survey was to document the bat species which currently use the boundaries of the affected area of the sports ground, to allow an assessment of any impact from the four new pitches and the associated artificial sportsturf floodlighting. The objective was to develop an effective mitigation strategy for the sportsturf floodlighting, once the bat fauna of the Sports Ground was established.

The legislation with regards to the target species relevant to the survey is listed below.

1.1 Legislation applicable to bats

All species of British bat and their roosts are protected under British law by the Wildlife and Countryside Act 1981 (as amended), and bats are classified as European Protected Species under the Conservation of Habitats and Species Regulations 2017 ('the 2017 Regulations'). This has recently been amended by the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations (2019) which continue the same provision for European protected species, licensing requirements, and protected areas after Brexit.

The legislation makes it an offence to kill, injure or disturb a bat and/or to damage or destroy a breeding site or resting place for a bat. It is also an offence to disturb the animals such that it impairs their ability to survive, to reproduce, to nurture their young, or such that it impairs their ability to hibernate or migrate. Under this legislation development work that could affect a bat or bat roost can only be permitted under a licence from Natural England.

Licences in respect of European Protected Species affected by development can be granted under Section 55(2) (e) of The Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations (2019), for the purpose of preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and beneficial consequences of primary importance for the environment.

Under Section C Regulation 55(9) of the Regulations licences can only be issued if Natural England is satisfied that:

- There is no satisfactory alternative to the work specification and
- The action authorised will not be detrimental to the maintenance of the population of the species at a favourable conservation status in their natural range.

Natural England aim to process EPS licence applications within 35 working days of receipt and Low Impact Class licenses are typically registered within 14 working days of receipt.

Lighting in the vicinity of a bat roost, which may cause disturbance and even a potential abandonment of the roost, may be classed as an offence both to a population and/or individuals.

2. SITE DESCRIPTION

2.1 Location of the proposed Artificial Turf Pitch



Figure 1: The survey area (outlined red), courtesy of Google Earth.

The area for the proposed artificial pitches sits within an extensive area of modified grassland used for sporting activity.

The area of grassland is bounded to the south by an extended area of car park and pavilion building, to the west by a drainage ditch with a band of marshy vegetation adjacent; to the north by a small area of deciduous woodland extending to a linear tree boundary and then to the west by a 10 m wide band of deciduous woodland.

In the wider landscape, to the immediate south is the M-60 motorway, to the west further expanses of amenity grassland sports pitches, to the north further sport pitches with various residential and smallholding development, a large electricity substation and the designated wildlife site, Kenworthy Woods LNR. To the west there is then a further expanse of amenity grassland extending to the eastern boundary of the Kenworthy Woods LNR.

The following photographs indicate the habitats directly affected by the proposal and those of the boundaries of the affected section of playing field.



Photograph 1: view looking from the north-east corner of the affected section of playing field with the southern boundary, car park and pavilion building in the distance.



Photograph 2: showing the eastern boundary of the affected section of playing field.



Photograph 3: looking south along the western boundary of the affected section of playing field.



Photograph 4: the northern boundary of the affected section of playing field.



Figure 2 - showing the layout for the four proposed artificial grass pitches.

3. SURVEY METHODOLOGY

3.1 Desktop Study

An ecological records search was commissioned from the Greater Manchester Ecology Unit (GMEU) on 17 November 2025. This comprised a request for records of wildlife species for a 1km circumference from the centre of the affected section of playing field.

Key elements of this data search, with regards to bat species, have been extracted and described within this report.

3.2 Night-time bat walkover (NBW/VPS)

To allow the physical observation of bat activity, and to assess bat activity over the affected area of sports ground, a single night-time bat walkover (NBW) and combined vantage point survey (VPS) was undertaken in the autumn survey period as specified by best practice guidelines. The NBW/VPS route was specifically designed to acoustically sample the boundaries of the playing field for bat species associated with this area. The survey was designed and implemented by Mr B J Collins MSc MCIEEM, a licensed bat ecologist with over two decades of experience assessing habitat use by bats.

The survey route ran anti-clockwise around the boundary of the playing fields covering a period of up to approximately 94 minutes. The NBW route is shown in figure 7, chapter 4. The NBW was undertaken on the 14th of July 2025. The survey began 38 minutes after sunset, triggered by bat activity. It was undertaken by one surveyor, who was equipped with a Full Spectrum detector, continuously recording bat echolocation calls throughout the surveys. All bat activity/passes were counted and attributed to species (where possible) during the transect, with species identification confirmed by sonogram analysis using the BTO Pipeline where relevant.

3.3 Static/automated bat survey

Two periods of remote monitoring were undertaken. Two Wildlife Acoustics Song Meter Mini Bat detectors were placed out; the units were set to switch on 30 minutes before sunset and run continually until 30 minutes after sunrise.

The first survey cycle took place between 4 July and 14 July 2025. This comprised of a detector being placed on a tree branch adjacent to the southern end of the western drain and a second detector placed on a mature oak tree to the east boundary at the northern end of the woodland band, this second detector failed to record due to SD card corruption.

The second survey cycle also included the placement of two Wildlife Acoustics Song Metre Mini Bats fixed to the mature oak tree at the northern end of the eastern boundary and onto the branch of an overgrown hawthorn on the eastern side of the woodland belt that comprises the east boundary of the proposal.

The units ran for a total of 10 and two 5 nights respectively. On completion the units were collected and the recorded sonograms analysed. The detectors recorded for a total of approximately 7.3 hours per night on each detector in July and 9.7 per night in August. This amounted to 73 hours at the south-west corner of the proposed installation in July and a combined 97 hours of monitoring on the two detector stations on the eastern boundary of the proposed installation.

3.4 Survey effort

The survey effort was designed to assess bat activity over an extended period during one of the three seasonal survey periods identified within best practice guidelines, the peak summer survey period.

The two survey cycles carried out in July and August 2025. Best practice guidance provides an indication of the survey effort required for the level of risk to bat populations affected by development. The 20-night monitoring period over the peak summer compares to best practice

guidance of 5 nights in the spring, summer and autumn. At the time of the production of this document a spring survey cycle is underway.

The combined monitoring on this site recorded 4,041 sonograms in total over a 15 night period in the peak season. This tranche of sonograms allowed the ecologist to identify the presence and status of light averse bat species on the sportsground.

With that information to hand, the survey effort undertaken proportionately addresses the requirement of a bat survey to inform the proposed impact from the artificial pitch, as described by Clause 4.1.2 of BS42020 and section 2.2.17 and 8.2.47 of best practice guidelines (reference 3) as below:

When planning surveys it is important to take a proportionate approach. The number and arrangement of manual and automated/classic surveys undertaken should be determined in consideration of the following factors: likelihood of bats being present, likely species concerned, type and diversity of habitats affected, levels of activity/relative abundance, predicted impact of the proposed development on bats, type and scale/size of the proposed development.

This is as the survey identified the bat fauna present on the boundaries of the playing field, it identified the presence and low abundance of light averse bat species, the report provides context in the status of the bat fauna on the site and compares the static monitoring to others in the region to allow comparison of the potential impact upon the favourable conservation status of bats in the Manchester region.

Given the constraints of area, it is unlikely that further light-sensitive bat species would alter the required mitigation, which has been designed to limit any light spillage to the minimum, although impacting upon the north and east linear habitats surrounding the proposal. Reducing this identified impact, the sports turf floodlighting will operate for only part of the night, up to 22:00 hours.

3.5 Weather conditions and Sunset times

The weather for the night-time bat walkover was as follows:

Survey	Temperature	Cloud cover	Wind speed
14 July 2025 – SS 21:30 hours	20.3°c start, 18.4°c finish	0% / 0%	B1/2 start – B1 at the end

Table 2 – climate conditions at the beginning and after the night-time bat walkover, (B = Beaufort scale)

Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2025-07-04	21:40	04:49	7.1
2025-07-05	21:40	04:50	7.2
2025-07-06	21:39	04:51	7.2
2025-07-07	21:38	04:52	7.2
2025-07-08	21:38	04:53	7.3
2025-07-09	21:37	04:54	7.3
2025-07-10	21:36	04:55	7.3
2025-07-11	21:35	04:56	7.4
2025-07-12	21:34	04:58	7.4
2025-07-13	21:33	04:59	7.4
2025-08-21	20:26	06:02	9.6
2025-08-22	20:24	06:04	9.7
2025-08-23	20:22	06:05	9.7
2025-08-24	20:20	06:07	9.8

Table 3 – Sunset and sunrise across the static survey period

3.6 Personnel

The static monitoring and the NBW/VPS were both designed and carried out by B J Collins – Protected Species Surveyors Limited. The surveys were carried out by Mr Barry J Collins MSc MCIEEM, Bat Licence: 2015-13152-CLS-CLS and Registered Consultant RC110 and B32RC002. BJ Collins is an experienced bat ecologist, qualified to hold two class licenses from Natural England that are only issued to individuals that can demonstrate sufficient experience and competency, and with regards to CL32, for bat roosts of regional and national significance. He is also an experienced trainer having carried out training on behalf of Natural England, The Bat Conservation Trust and CIEEM in bat survey methodologies. The remote monitoring units were set up and deployed by Mr B J Collins, the sonograms collected were analysed using Kaleidoscope pro software, manually verified and then specific species calls verified using the BTO pipeline.

3.7 Ecobat analysis

Ecobat is a measure of relative bat activity obtained using the secure online tool Ecobat (http://www.mammal.org.uk/science-research/ecostat/) (reference 11), initially designed by the University of Exeter and now hosted and developed by the Mammal Society and the University of Sussex (Lintott et al., 2018). The tool compares data entered by the user with bat survey information collected from similar areas at the same time of year and in comparable weather conditions.

Ecobat is a free online tool that gives context to acoustic data recorded from bat surveys. Users upload their data and receive a report which gives a wide range of tables and graphs to explain more about the data they have collected compared to bat records already held in the Ecobat database.

The data from the western boundary by the south-west corner of the proposed development area was selected for analysis. This data was chosen being the detector with the greatest extent of activity. This was then used to provide regional context in the abundance of bats on the site.

The data was also supplemented by all of the sonograms for light averse bat species that were recorded on the eastern boundary. This ensured that the status of Myotis and Plecotus bats on the site and compared to regional results was accurate.

3.8 Categorisation of bat species to light tolerance

In the analyses throughout this report bats are grouped together depending upon the impact upon individual species from artificial lighting, as described by research and technical publications from 3 sources (references 8 and 9), and also as displayed in Guidance Note 08/23: Bats and Artificial Lighting at Night (reference 5):

Table 1: Summary of the effect of ALAN on UK bat species.

Species	Roost	Flight Corridor	Foraging Area	Drinking Site	Migration	Landscape Level	Habitat Type
Greater Horseshoe *Rhinolophus ferrumequinum*		na	na	na	na	na	clutter
Lesser Horseshoe *Rhinolophus hipposideros*			na	na	na		clutter
Brown Long-eared *Plecotus auritus*					na		clutter
Grey Long-eared *Plecotus austriacus*	na	na	na	na	na	na	clutter
Bechstein's *Myotis bechsteinii*	na	na	na	na	na	na	clutter
Natterer's *Myotis nattereri*		na	na		na	na	clutter
Daubenton's *Myotis daubentonii*	na			na	na		edge
Whiskered *Myotis mystacinus*	na	na	na	na	na	na	edge
Brandt's *Myotis brandtii*	na	na	na	na	na	na	edge
Alcathoe *Myotis brandtii alcathoe*	na	na	na	na	na	na	edge
Western Barbastelle *Barbastella barbastellus*					na		edge
Common Pipistrelle *Pipistrellus pipistrellus*	na				na		edge
Soprano Pipistrelle *Pipistrellus pygmaeus*				na			edge
Nathusius' Pipistrelle *Pipistrellus nathusii*	na	na	na	na			edge
Common Noctule *Nyctalus noctula*	na			na	na		open
Lesser Noctule *Nyctalus leisleri*	na	na	na		na		open
Serotine *Eptesicus serotinus*	na	na	na	na	na		open

Positive effect
No effect
Negative effect
na **No data available**

Data in table is indicative only, is drawn predominantly from European studies (where data available) and shows numerous data gaps due to lack of research data, therefore bat behaviour within the UK may vary and needs assessing on a site by site basis.

Table 3 - the summary table on the effects of artificial lighting on bats species from best practice guidance (reference 6).

4. SURVEY RESULTS

4.1 Desktop Study Results – Bats

Bats

There are multiple records of bats for a 1 km circumference of the affected area. This includes for an abundance of records of Common pipistrelle (*Pipistrellus pipistrellus*), records of Daubenton's bat (*Myotis daubentonii*) with most records from Chorlton water Park and surrounds, Myotis species, a single record of Natterer's bat (*M. nattereri*), a single record of whiskered bat (*M. mystacinus*), multiple records of Noctule bat (*Nyctalus noctula*), Soprano pipistrelle (*P. pygmaeus*) and multiple records of Pipistrellus species..

There are two known roosts from a kilometre of the proposal. This includes for an unidentified bat tree roost in Nan Nook Wood SBI, over a kilometre from the proposed pitches. There is then a single roost reported from a residential property some 700 m south of the affected section of playing field. There are no other recorded established roosts within a kilometre of the proposal.

The distribution of records have been mapped in comparison with the affected area of playing field. This shows the total of 7 records in proximity with the sportsground. All of the records are from Common pipistrelle, Pipistrellus or a single record of Soprano pipistrelle. They are from detector records with two of them being recorded as part of the National bat monitoring programme.

There is a single Myotis record, Whiskered bat, recorded a kilometre to the south more closely associated with Wythenshawe Park and Gardens. This was a rescued bat. There are then a total of 14 records of Myotis bats which all occur within the yellow outline in the plan below, associated with Chorlton Water Park and the River Mersey

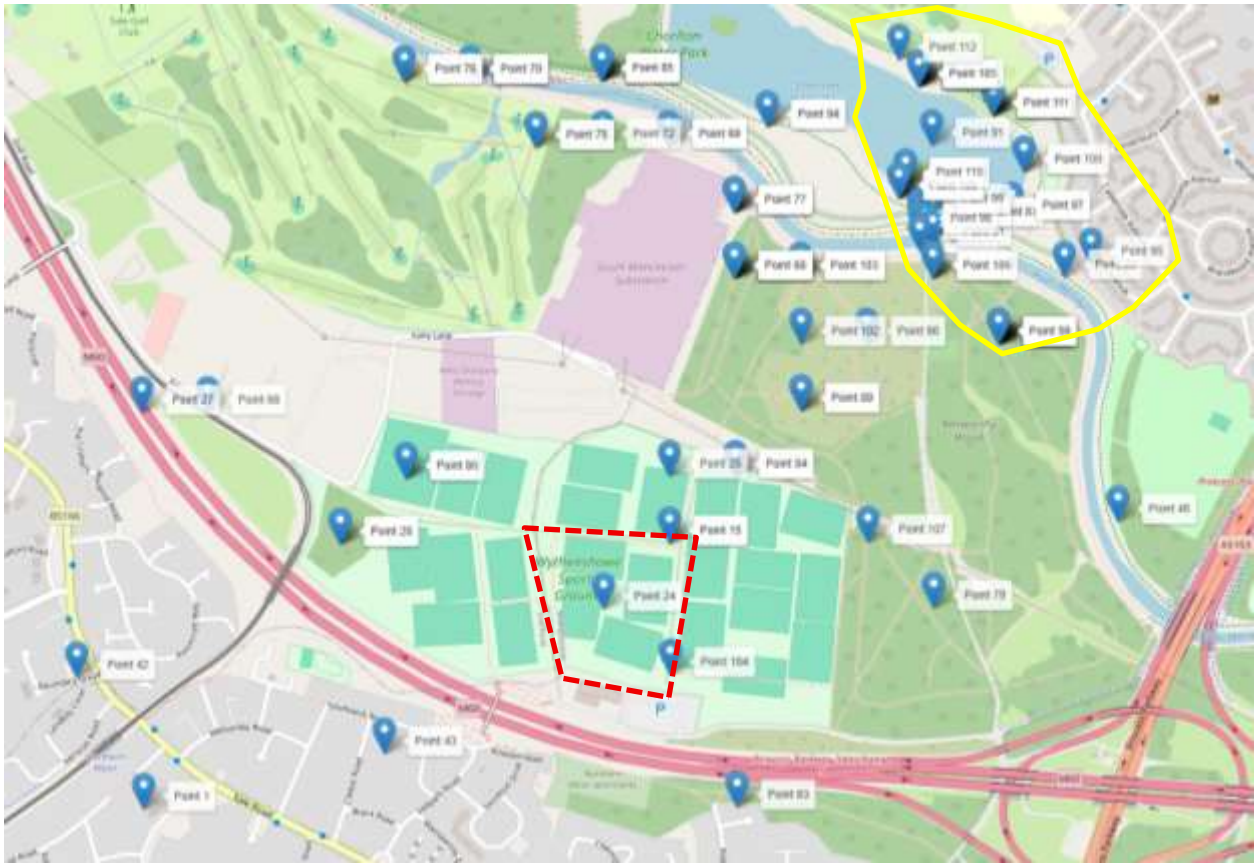


Figure 3 - above showing the distribution of records of bats, almost all detector records, to the playing field area. The area outlined red is the proposed development area. The area outlined yellow is the centre for all bar one Myotis bat record.

4.2 Species verification

To investigate sonograms potentially incorrectly attributed by the Kaleidoscope auto ID function, dubious calls and calls requiring further verification, were extracted and sent to the BTO pipeline.

From the results the calls with a high probability to species are included in table 4 below.

This analysis provided over 93% probability for the light sensitive Whiskered bat (*Myotis mystacinus*), 79% confidence in the identification of Daubenton's bat (*M. daubentonii*) and 93% confidence in Brown long-eared bat (*Plecotus auritus*).

Beyond that there was a 99% confidence in several Common pipistrelle (*Pipistrellus pipistrellus*) calls and 97% confidence in Soprano pipistrelle (*Pipistrellus pygmaeus*) and 96% confidence in Noctule bat (*N. noctula*). There was also a 95% confidence in Leisler's bat (*Nyctalus leisleri*) but this recording requires some caution as this is an unexpected bat in this region of England.

The findings are therefore discussed in the following chapters.

ACTUAL DATE	TIME	SCIENTIFIC NAME	ENGLISH NAME	PROBABILITY	WARNINGS
08/07/2025	23:03:46	Myotis daubentonii	Daubenton's Bat	0.79	
21/08/2025	23:20:07	Myotis mystacinus	Whiskered Bat	0.93	
22/08/2025	00:28:08	Myotis mystacinus	Whiskered Bat	0.92	
23/08/2025	03:54:44	Myotis mystacinus	Whiskered Bat	0.93	
06/07/2025	22:39:31	Nyctalus noctula	Noctule	0.97	
25/08/2025	20:16:23	Pipistrellus pipistrellus	Common Pipistrelle	0.80	
26/08/2025	02:12:39	Pipistrellus pipistrellus	Common Pipistrelle	0.80	
09/07/2025	23:03:34	Pipistrellus pygmaeus	Soprano Pipistrelle	0.90	
09/07/2025	23:03:39	Pipistrellus pygmaeus	Soprano Pipistrelle	0.97	
09/07/2025	23:03:44	Pipistrellus pygmaeus	Soprano Pipistrelle	0.93	
23/08/2025	21:17:01	Plecotus auritus	Brown Long-eared Bat	0.93	
24/08/2025	01:10:14	Plecotus auritus	Brown Long-eared Bat	0.93	
24/08/2025	01:10:19	Plecotus auritus	Brown Long-eared Bat	0.93	
14/07/2025	22:55:07	Nyctalus leisleri	Leisler's Bat	0.95	Caution - rare or unexpected
14/07/2025	22:55:35	Nyctalus noctula	Noctule	0.96	

Table 4 – highlighted results of the BTO pipeline analysis

4.3 Static/automated bat survey

To provide detailed information with regards to the bat species which are present on the boundaries of the affected section of the Wythenshawe Sportsground, the abundance of bat activity on the boundaries and the time that the activity occurs, two periods of remote monitoring were undertaken utilising full spectrum bat detectors.

As previously described, the full spectrum detectors were positioned in three locations. First, on the edge of the ruderal/marginal vegetation to the south-west corner of the proposed complex, secondly attached to the mature oak tree at the northern end of the eastern boundary and thirdly on a hawthorn branch in the gap under the tree canopy connecting the two sections of amenity grassland again on the east boundary.

The locations of the detectors are provided overleaf:



Figure 4 – position of the static detectors

4.3.1. Detector monitoring the southwestern boundary

This detector was located approximately 1.5m above ground level on a branch of a willow tree set within the dense area of tall ruderal vegetation, with the microphone facing into open ground, effectively monitoring the wetland habitats to the south-west of the proposal. The detector was set and left for over a period of 10 nights, between the 4 July 2025 and 14 July 2025.

Over this monitoring period, there was a grand total of 2,124 bat sonograms recorded.

The principal light tolerant species present was the Common pipistrelle bat, with 1,902 of the total sonograms from the 10 night study. There was then 107 sonograms generated by Soprano pipistrelle and 103 generated by Nyctalus bats over this period.

There was very rare activity by “light averse” bat species recorded. This was limited to a single Myotis bat pass, identified as a Daubenton’s bat to 79% confidence by the BTO pipeline. This was the total amount of activity by bats which are recorded as being averse to artificial lighting on the western boundary of the affected section of playing field over 10 nights in July 2025.

This comprises of at most 15 seconds of recorded activity amongst 73 hours of monitoring.

The status of the bat species recorded from this location, in relation to other populations regionally, is demonstrated within the Ecobat report later within this document.

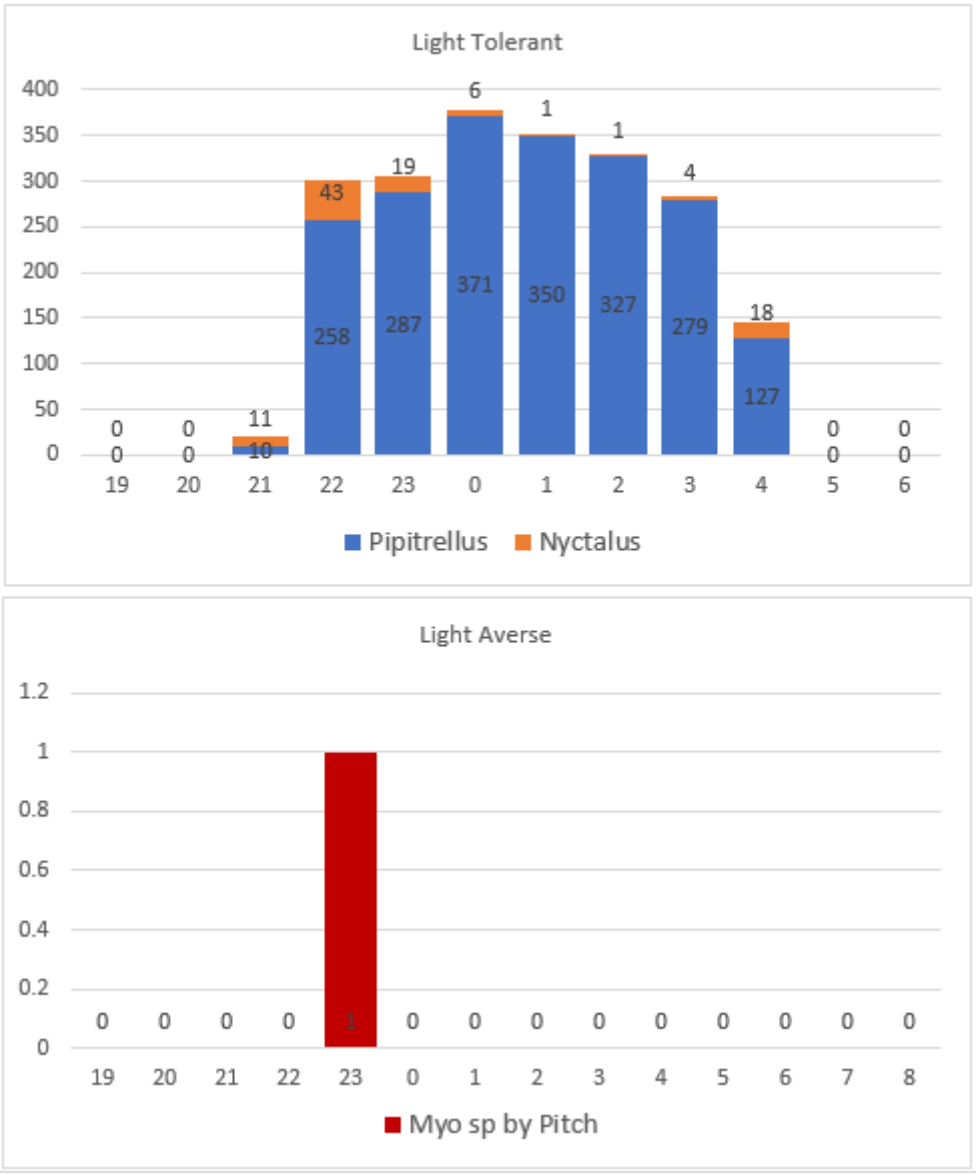


Figure 3 - the distribution of sonograms recorded from the willow tree on the southwest corner of the west boundary. The distribution and number of sonograms from bats categorised as 'light tolerant' is indicated above, the chart below showing the single sonogram by a light averse bat and the time of occurrence, which was one hour after the floodlights will be extinguished under the 22:00 hour curfew.



Photograph 4 - showing the location for the bat detector on the southwest boundary (as indicated by the arrow)

4.3.2. Detector monitoring the north-eastern woodland boundary

The second detector was positioned on a branch stub facing along the western face of the area of woodland, the area affected by the proposed floodlighting.

The detector was positioned approximately 3.5 m above ground level. The detector was first set and left to operate between 4 July and 14 July 2025. On collection it was noted that the detector had recorded no sonograms, with an SD card corruption noted.

The detector was then re-set to operate for a period of 5 nights from 20 August to 26 August 2025.

Over this monitoring period, there was a grand total of 1,264 sonograms collected, which when doubled to represent the same monitoring period as that on the opposite boundary would have resulted in some 2,528, compared to the south-east unit with 2,124 from the south boundary, indicating a similar level of common pipistrelle bat activity on both boundaries .

Once again, the principal light tolerant species present was the Common pipistrelle bat, with 1,042 sonograms from the 5 night study. There was then 194 sonograms generated by Soprano pipistrelle and 9 sonograms generated by Nyctalus bats over this period.

There was a grand total of 1,253 sonograms generated by bat species tolerant of artificial lighting.

The activity by “light averse” bat species comprised of 6 sonograms from Myotis bats, compared to 1 on the detector on the south-west corner. There was then 2 sonograms generated by the Brown long-eared bat, there were no sonograms by this bat on the western boundary.

This amounted to a total of 8 sonograms from light sensitive bats over the 48.5 hours of monitoring at this location.

The sonograms figures showing the distribution and amount of sonograms per hour are provided overleaf.

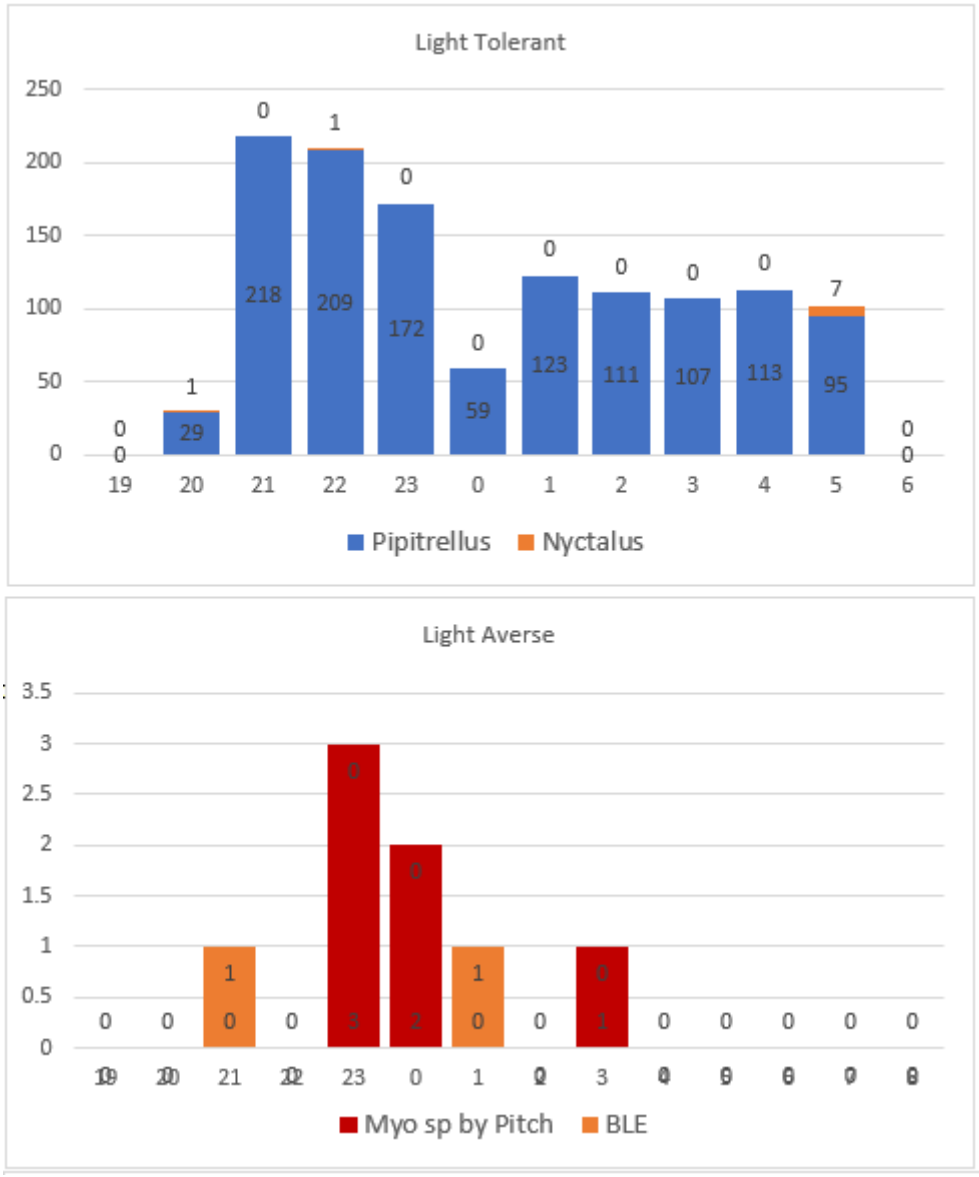


Figure 6 – showing the extent of sonograms to the hour of night by both light tolerant (above) and light averse (below) bats on the mature oak tree to the northern end of the eastern boundary of the affected section of playing field.



Photograph 6 – showing the location for the detector on the eastern boundary

4.3.3. Detector monitoring the eastern woodland boundary

The third detector was positioned on an exposed Hawthorn branch under the tree canopy where the access path passes between the two adjacent areas of amenity grassland to allow for public and machinery to pass, this was monitoring the east side of the woodland block and therefore an area outside the influence of the proposed floodlighting.

The detector was positioned approximately 3m above ground level. The detector was set to operate for a period of 5 nights from 20 August to 26 August 2025.

Over this monitoring period, there was a grand total of 653 sonograms collected, compared to 1,264 on the oak on the opposite side of the woodland block.

Once again, the principal light tolerant species present was the Common pipistrelle bat, with 570 sonograms compared to 1,042 sonograms from the oak tree. There was then 57 sonograms compared to 194 sonograms generated by Soprano pipistrelle and 10 sonograms compared to 9 sonograms generated by Nyctalus bats over this period.

There was a grand total of 639 sonograms generated by bat species tolerant of artificial lighting.

The activity by “light averse” bat species comprised of 4 sonograms from Myotis bats. There were no sonograms generated by the Brown long-eared bat in this location. This amounted to a total of 4 sonograms from light sensitive bats over the 48.5 hours of monitoring at this location.

The sonograms figures showing the distribution and amount of sonograms per hour are provided below

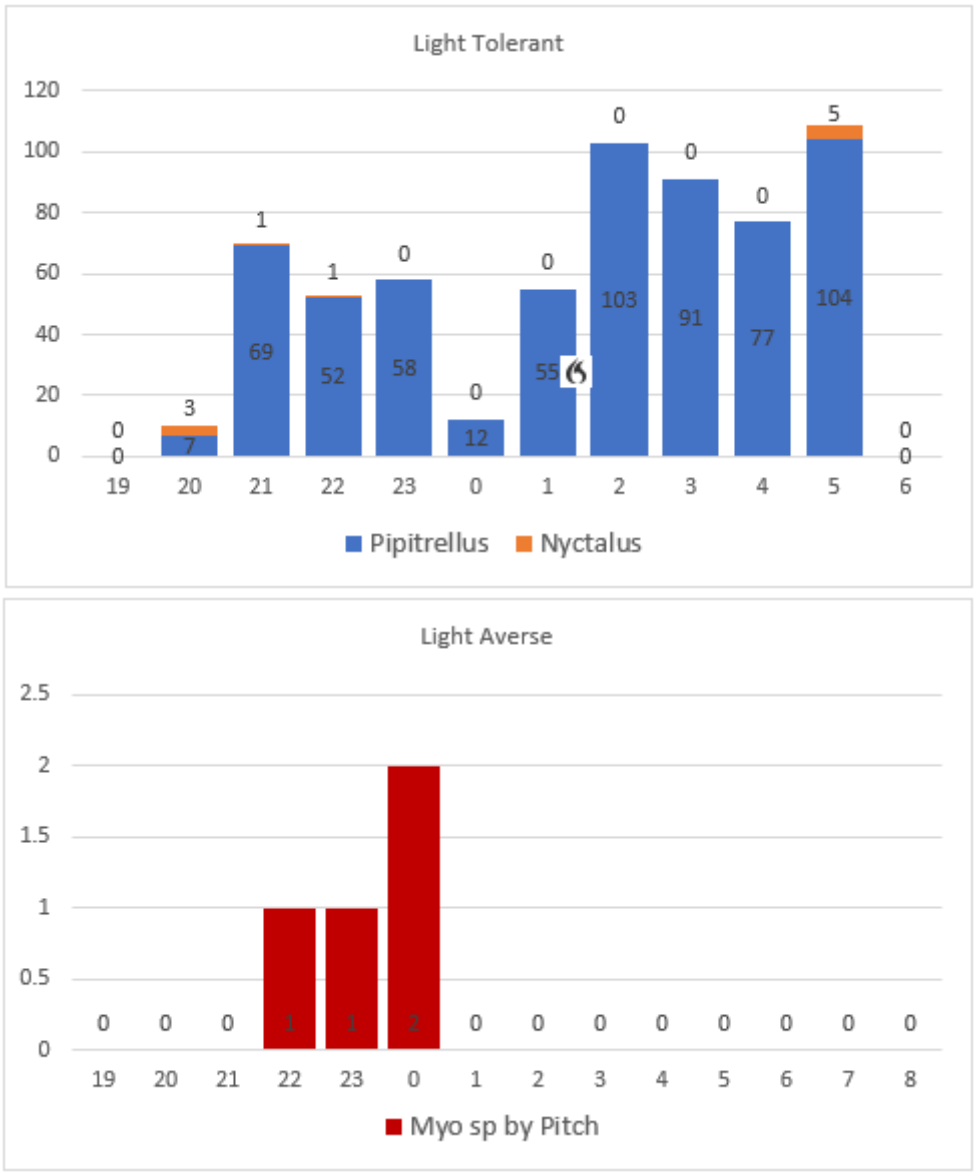


Figure 6 – showing the extent of sonograms to the hour of night by both light tolerant (above) and light averse (below) bats on the fence to the east of the playing field.



Photograph 6 – showing the location for the detector on the eastern boundary

4.4 Night-time bat walkover (NBW/VPS)

There was a single 14 July 2025, mid-summer, night-time bat walkover and vantage point survey undertaken and the results are shown below.

The map shows the location of the vantage point (stop point) where the surveyor recorded for a total of five minutes, alongside is the total number of sonograms generated at the stop point and the three-minute night-time bat walkover section following, combined.

Following the trend from the static monitoring studies the most dominant species on the site was the Common pipistrelle. These accounted for all bar 11 sonograms recorded during the walkover, from a total of 58.

There were 6 bat passes recorded from Soprano pipistrelle and 5 passes by Nyctalus bats. The BTO pipeline split the identification of the Nyctalus bats evenly between Noctule and Leisler's. There is a warning against the identification of Leisler's with this being a rare bat species in this part of England.

There were no bats recorded that are sensitive to artificial lighting.

The results of the survey are shown graphically overleaf:

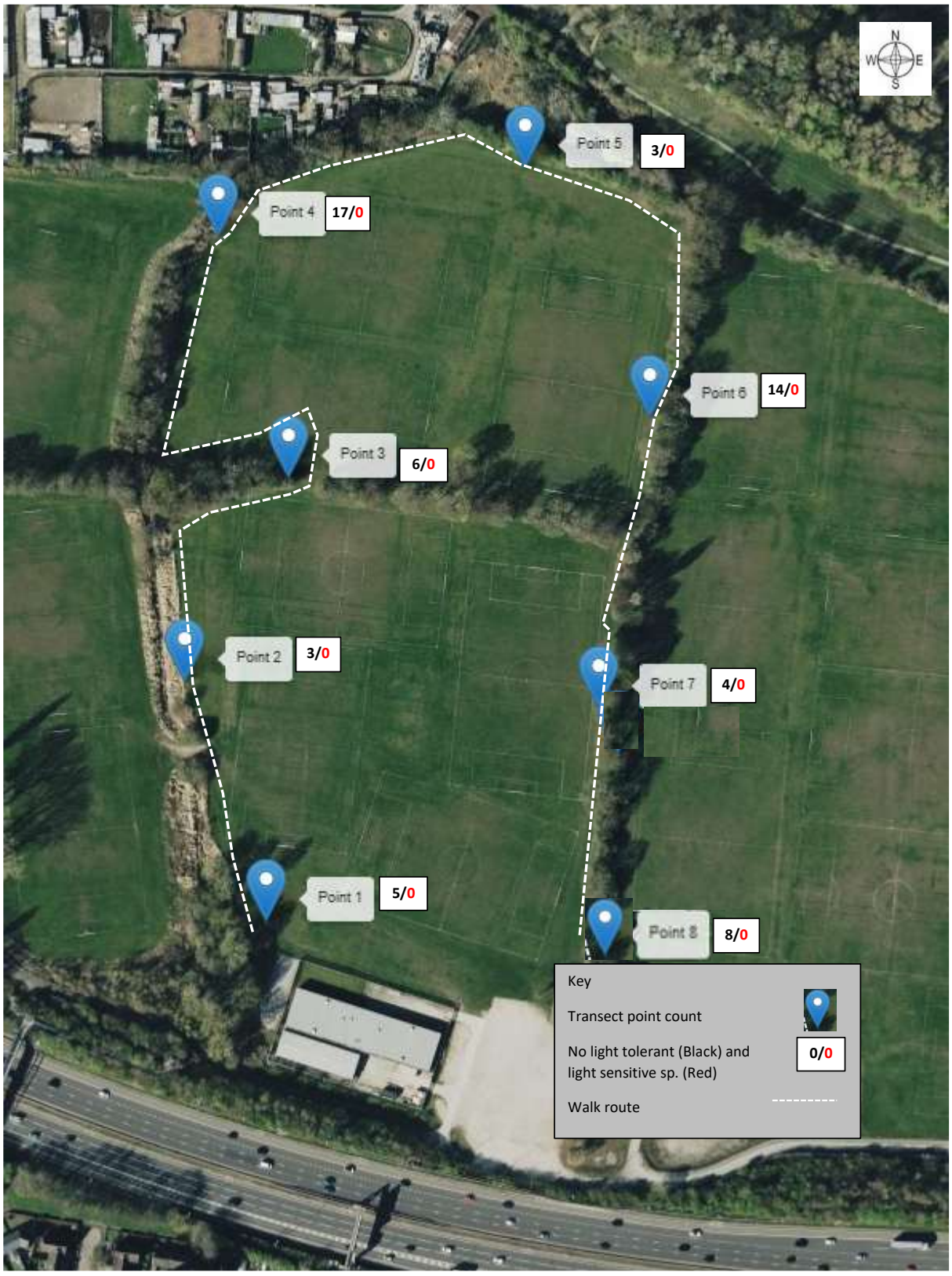


Figure 7 - the distribution of sonograms recorded from the NBW/VPS stop points (and the 3 minutes NBW following) in relation to the overall playing field. The white box includes the number of sonograms from light tolerant bats in black and light averse bats in red text from the static monitoring point and the walking section between combined.

5. STATUS OF THE RECORDED POPULATION

5.1 Valuing Bats in Ecological Impact Assessment

The status of the recorded bat fauna recorded on the area of playing fields is assessed in accordance with Wray *et al* (2010) (reference 10) below. The following tables are extracted from that assessment methodology:

Table 4: Valuing commuting routes

Species	Number of bats	Roosts/potential roosts nearby	Type and complexity of linear features
Common (2)	Individual bats (5)	None (1)	Absence of (other) linear features (1)
-	-	Small number (3)	Unvegetated fences and large field sizes (2)
Rarer (5)	Small number of bats (10)	Moderate number/Not known (4)	Walls, gappy or flailed hedgerows, isolated well-grown hedgerows, and moderate field sizes (3)
-	-	Large number of roosts, or close to a SSSI for the species (5)	Well-grown and well-connected hedgerows, small field sizes (4)
Rarest (20)	Large number of bats (20)	Close to or within a SAC for the species (20)	Complex network of mature well-established hedgerows, small fields and rivers/streams (5)

Table 5: Valuing foraging areas

Species	Number of bats	Roosts/potential roosts nearby	Foraging habitat characteristics
Common (2)	Individual bats (5)	None (1)	Industrial or other site without established vegetation (1)
-	-	Small number (3)	Surburban areas or intensive arable land (2)
Rarer (5)	Small number of bats (10)	Moderate number/Not known (4)	Isolated woodland patches, less intensive arable and/or small towns and villages (3)
-	-	Large number of roosts, or close to a SSSI for the species (5)	Larger or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)
Rarest (20)	Large number of bats (20)	Close to or within a SAC for the species (20)	Mosaic of pasture, woodlands and wetland areas (5)

Table 4 - extracted from Wray et al for the purposes of categorising the bat population recorded from the bat surveys.

Table 3: Scoring system for valuing commuting and foraging bats

Geographic frame of reference	Score
International	>50
National	41 - 50
Regional	31 - 40
County	21 - 30
District, local or parish	11 - 20
Not important	1 - 10

Table 5 - using the above assessment to establish the importance of populations, extracted from the same reference paper.

Using the above metrics, there were 2 and potentially 3 bat species categorised as being "rarer", Whiskered bat, Daubenton's bat and some potential for Leisler's bat, resulting in a species score of **5**, the number of sonograms (on average 205 sonograms per night) are indicative of a small number of bats at any one time, scoring **10**, the surrounding habitat, woodland and houses, are such that there is potentially a small number of roosts nearby, and therefore this scores **3**, the habitat value of the woodland belt, with its connectivity scores **4**.

As a result, using the framework provided by Wray *et al* the current data collected scores 22 for both commuting and foraging bats, valuing the boundaries of the sportsground as being of 'County' value for bat species. It falls at the lower end of that category which extends from an index score of 21 to 30.

5.2 Bat activity – 'Ecobat' analysis

In order to compare the results of the static monitoring against other static monitoring projects in the region, the data for the 10 nights, between 4 July and 14 July 2025, from the static bat detector that was positioned on the south-west corner of the proposal was analysed through the Ecobat database system. These figures were manipulated by adding in all of the Myotis and Plecotus bat passes from the other static monitoring locations to ensure light sensitive bats were adequately accounted for. The following figures are extracted from that analysis report and effectively demonstrate, compared to other monitoring on a regional basis:

- The most abundant bat was the common pipistrelle and over the monitoring period this recorded 1 night of 'moderate' activity, 3 nights of low/moderate activity and 6 nights of low activity, present on every night of the monitoring survey.
- With regards to Myotis bats, there were 5 nights of 'low' activity by this group of light-sensitive bats, as expected given there were no more than 11 sonograms from a combined 20 nights of monitoring.
- With regards to the Brown long eared night, there was 1 night of 'low' activity reflecting just 2 sonograms generated from this light-sensitive bat over a period of 20 nights of monitoring.
- Noctule bat was recorded with 'low' activity over 8 nights.

Table 3. Summary table showing the number of nights recorded bat activity fell into each activity band for each species.

Detector ID	Species/Species Group	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
SMU01222	Myotis	0	0	0	0	0	5
SMU01222	Nyctalus noctula	0	0	0	0	0	8
SMU01222	Pipistrellus pipistrellus	0	0	0	1	3	6
SMU01222	Pipistrellus pygmaeus	0	0	0	0	0	10
SMU01222	Plecotus auritus	0	0	0	0	0	1

Table 4. Summary table showing key metrics for each species recorded. The reference range is the number of nights for each species that your data were compared to. We recommend a Reference Range of 200+ to be confident in the relative activity level.

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
SMU01222	Myotis	0	0 - 0	0	5	2825
SMU01222	Nyctalus noctula	1	1 - 2	3	8	8988
SMU01222	Pipistrellus pipistrellus	16	11.5 - 27.5	46	10	44192
SMU01222	Pipistrellus pygmaeus	2	1.5 - 3	3	10	17746
SMU01222	Plecotus auritus	8	0	8	1	232

Table 5 - showing the number of nights when bat activity levels fell into a percentile band for bat activity, compared to other studies in a regional context. Note that the table below indicates a minimum of 200 is required to provide confidence in the regional assessment.

The analysis of the sonograms, which combined all of the sonograms from the south-west corner of the proposed sports facility, supplemented with all of the light-sensitive bat sonograms from all 3 detector positions, identified that of a total of 20 nights there were 5 nights with low activity by Myotis bats and 1 night of low activity by Plecotus bats. This indicates the scarcity of light sensitive bats in this part of the landscape of Wythenshawe.

It is therefore considered unlikely that there will be any detrimental impact upon the favourable conservation status of light sensitive bat species in this part of greater Manchester. The population centre for this group of bats is currently within the area of landscape between the Chorlton Water Park and Kenworthy Woods LWS, the results suggest that this population centre will be entirely unaffected by the floodlighting proposal for an extensive area of amenity grassland.

The Ecobat analysis does not indicate that the bat fauna on the site is of any regional significance.

6. DISCUSSION

6.1 Survey effort

The basis of this monitoring report is two survey cycles carried out over the mid to late peak summer period of 2025, as described by best practice guidelines. These guidelines specify that habitats that have a "low suitability for bats" should be monitored over an entire season including spring, summer and autumn cycles. There is however a caveat that if the development impacts upon a habitat with low suitability and with relatively few features affected, that proportionality should be considered.

Given that the area affected by floodlighting is relatively extensive, a spring survey cycle is currently underway but it is considered unlikely that this will identify any further changes in the status of the bat population present in this localised area.

The results of a combined 20-nights of survey (a combined 170 hours of monitoring) and supporting transect have sufficiently informed the potential ecological impact from this installation, and subject to the implementation of the mitigated floodlighting scheme provided within the appendices of this document, clearly identifies that the affected landscape is used almost entirely by bat species which are tolerant of artificial lighting and indeed regularly found in the urban landscape.

The survey has identified the rarity of the light sensitive and light averse Myotis and Plecotus bats in the dataset.

Table 8.3. Minimum recommended number of repeats for activity surveys.

Survey type	Low suitability habitat for bats[a]	Moderate suitability habitat for bats	High suitability habitat for bats
NBW	One survey visit[b] per season (spring – April/May, summer – June/July/August, autumn – September/October)[c]. Further surveys may be required if these visits, or the results of static detector surveys, reveal activity of interest that requires more observation on site.		
Automated/static bat detector surveys[d] The same locations should be used for each survey for comparison.	Data to be collected for a minimum of five consecutive nights per season (spring – April/May, summer – June/July/August, autumn – September/October)[c] in appropriate (or the best available) weather conditions for bats.	Data to be collected for a minimum of five consecutive nights per month (April to October)[c] in appropriate (or the best available) weather conditions for bats.	

a If the habitat has been classified as having low suitability for bats, particularly on small sites with relatively few features, an ecologist should make a professional judgement on how to proceed based on all of the evidence available. It may or may not be appropriate for bat activity surveys to be carried out in low suitability habitats. However, caution should be exercised in fringe areas (e.g. some areas of Scotland) where 'low suitability habitat for bats' may be important to local bat populations due to the relative scarcity of better habitats. In such situations, bats are likely to also be more widely dispersed and may use a larger number of sites, therefore survey effort may actually need to be increased to detect use on the proposed site in question.

Table 5 - extract from national best practice guidelines (2023)

6.2 Bat activity

The most valuable element of the survey was the period of remote monitoring that was undertaken overnight over a combined 20 nights between 4 July and 14 July 2025 and 20 August and 26 August 2025.

The overall survey found that the bat activity on site was totally dominated by Common pipistrelle bat, a species which is highly tolerant of artificial lighting and as such one frequently encountered in the urban environment. Therefore the majority of the bats that are using the boundaries of the affected area of playing field are unlikely to be adversely affected by the proposed artificial pitch floodlighting scheme.

There is a scarce population of 'light averse' species, comprising of Whiskered bat, Daubenton's bat

and Brown long-eared bat. The detectors were set to record a 15 second sonogram when triggered. There was a total of 13 sonograms from light sensitive bats, this amounts to at most 3.25 minutes of activity within the overall total of 170 hours of night-time monitoring.

The eco-bat analysis also identifies that this survey area supports a very low population of light averse bats in the Greater Manchester region. As a result, the impact upon these sensitive bats is unlikely to be detrimental to the favourable conservation status of the three bat species in the local area.

Despite that categorisation, light averse bat species are present on the boundaries of the playing field and as a result the ecological mitigation hierarchy should be implemented with regards to bats and artificial floodlighting.

7. MITIGATION

The combined seasonal static monitoring and the NBW/VPS survey results found that the species that utilise the area of sports ground affected by the proposal are bats which are tolerant of artificial lighting.

Comparing the bat populations against others in the region, the extent of bat activity is low for all bar the common pipistrelle bat, using the combined Ecobat data. The regional data upon which this analysis is made comprises some 44,192 sonograms of common pipistrelle, 17,746 soprano pipistrelle, 8988 Nyctalus bats, 2825 Myotis bats and 232 brown long eared bats.

The Wythenshawe dataset is dominated by Pipistrellus and Nyctalus bats, species of bat that are categorised as being tolerant of artificial lighting and one where researchers found there to be no change in their foraging activity on natural linear features that were subsequently illuminated by a total of 50 lux (Zeale *et al* (2018)). Demonstrating the extent of tolerance of artificial lighting by these bats.

Light sensitive bats were present on the boundaries of the area in low numbers and this needs to be taken into account in the mitigation strategy.

Referring to the ecological mitigation hierarchy, it is not possible to provide a viable and functional sports facility without artificial lighting and therefore it is impossible to avoid light pollution from the proposed sports turf floodlighting, and therefore the first step of the hierarchy cannot be delivered.

Therefore, the second phase of the mitigation hierarchy has been implemented, in minimising the potential impact. The lighting engineer has designed a floodlight scheme which avoids significant spillage on the western habitat boundary of the playing field, reduces the spillage falling onto the eastern woodland boundary to around 5 lux but cannot mitigate 50 lux of light spillage onto the northern treeline, due to the constraints of area.

The end result is a scheme that sees the north-west woodland block and the western boundary outside of the impact from artificial lighting.

The resulting light spillage of 5 lux and 50 lux is sufficient to deter light sensitive bats from using the linear feature to the north and west of the playing field area, in accordance with published research. However, within that research (Zeale *et al*, 2018), it was found that on a hedgerow that was illuminated to 50 lux, the same light level as will be encountered on the northern side of the playing field, the light sensitive bat species abandoned the lit side of the linear feature but swapped to the dark side shaded from artificial lighting and continued to commute across the area.

It is likely that this same situation and reaction will occur for the small number of Myotis and Plecotus bat passes recorded on the edge of the western woodland boundary.

Further mitigation is provided by the floodlight curfew of 22:00 hours. This reduces the potential impact further, although with sunset times varying across the year, peak foraging activity will fall

into the operating period of the floodlights for the early and later periods of the year only, as is indicated by the figure below which shows the variation of sunset across the active season, the typical emergence times of Pipistrellus, Myotis and Plecotus bats and outlines the 2200 hour curfew across the graph.

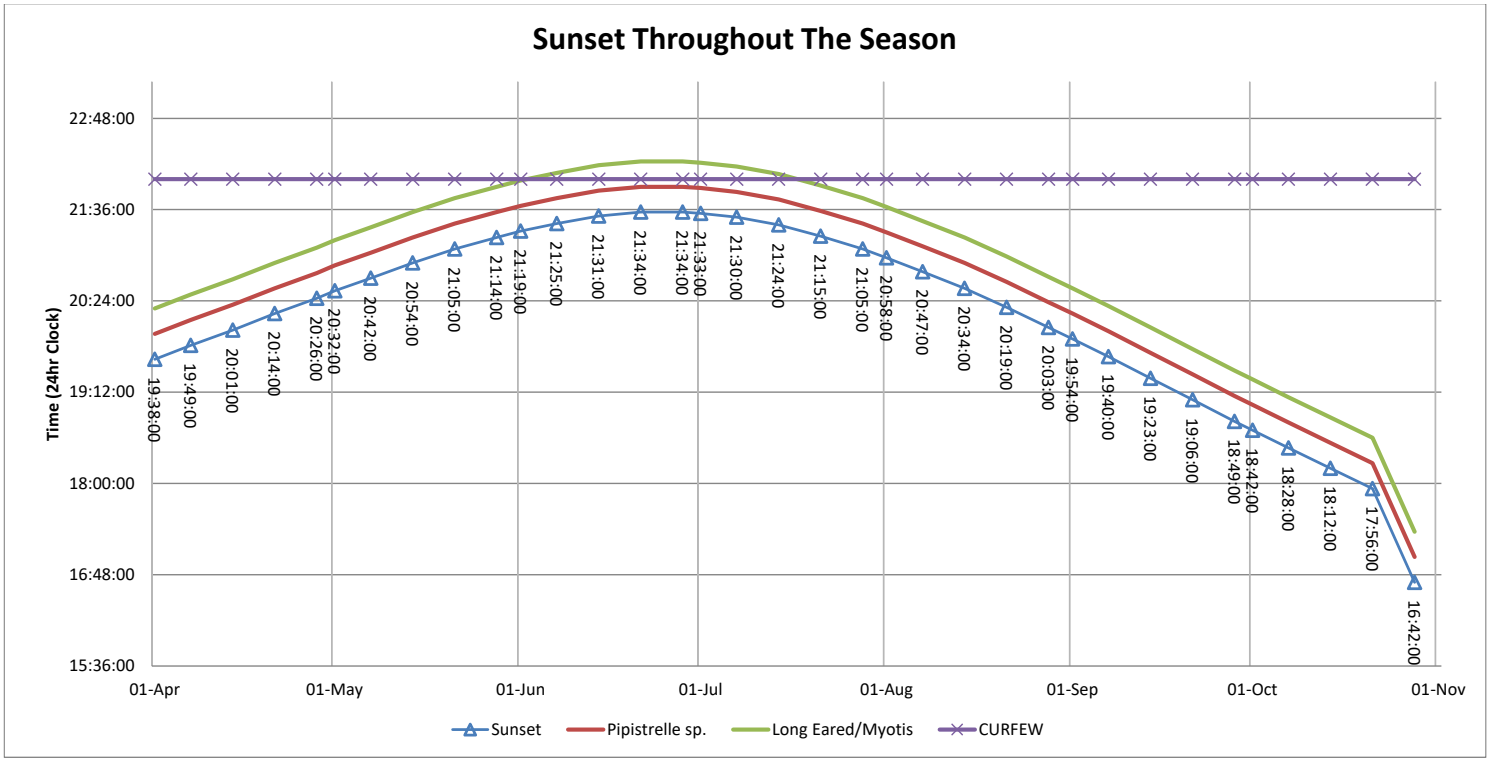


Figure 8 – showing the typical emergence times of bats compared to sunset and the effect of the 22:00 hour curfew, for parts of the peak activity season the lights will not be operating at a time when bats are active.

The mitigated floodlighting scheme is provided overleaf and within appendix A.

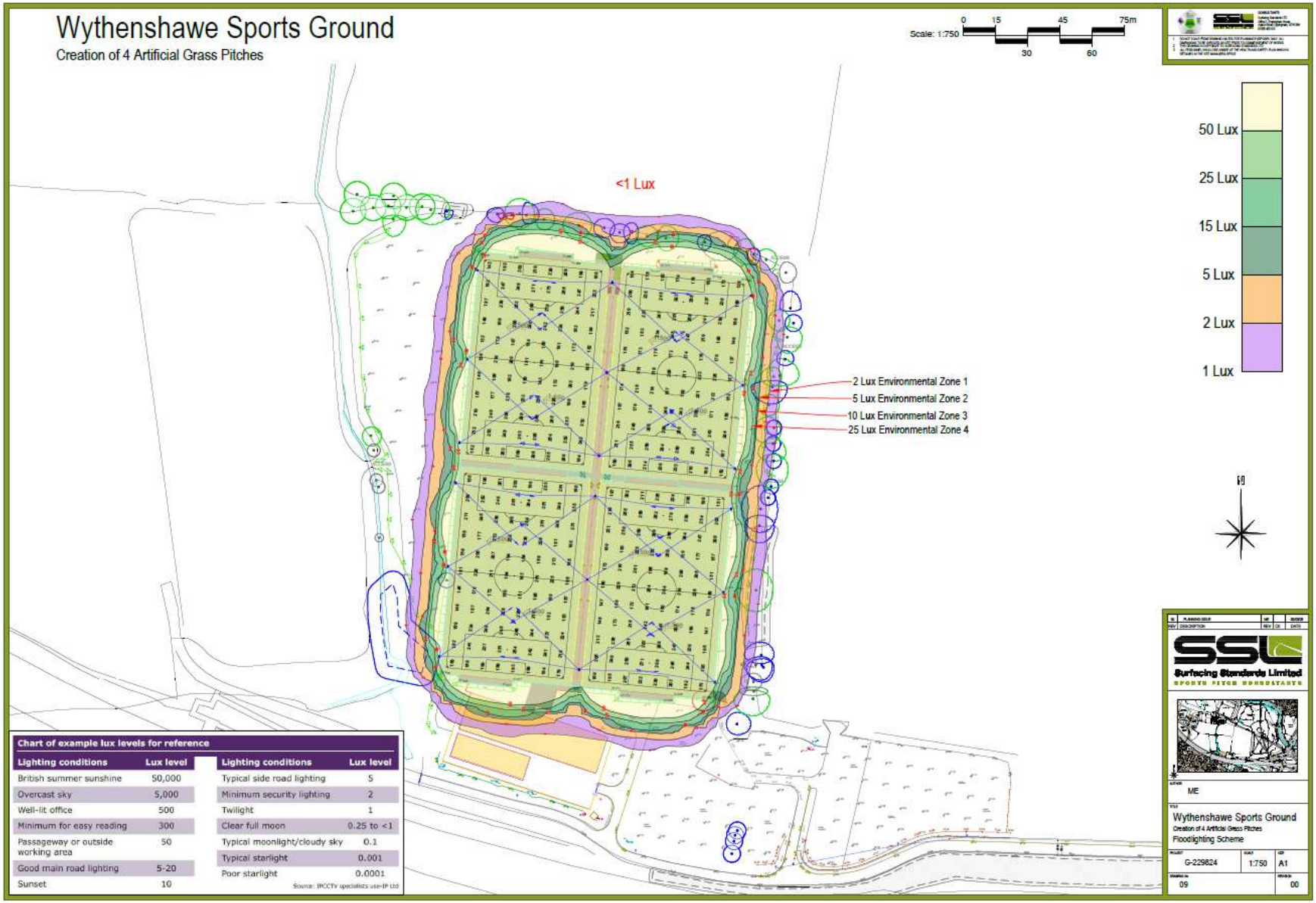


Figure 8 - showing the light spillage mitigation from the proposed artificial pitch floodlighting scheme.

8. CONCLUSIONS AND RECOMMENDATIONS

6.3 Results of Bat Activity Surveys

The transect survey and remote monitoring survey identified that the bats predominant on the site are almost entirely Common pipistrelle bats, by far the most dominant species with over 95% of all sonograms recorded. Over a total of 20 nights, comprising 10 nights between 4 July and 14 July combined with 2 monitoring units over 5 nights between 20 August and 26 August 2025, a grand total of 4,041 sonograms were generated of which 3,873 were from Pipistrelles and 122 from Nyctalus bats, combined these made up of over 99% of all bat activity.

Among the sonograms were 3 bat species that are likely to be impacted by artificial illumination, which research suggests will modify their foraging and commuting activity on the north and east boundaries following the implementation of this extensive floodlighting scheme. These are very rare bats on the playing field and of the 4,041 sonograms recorded there was only a total of 13 of these attributed to light sensitive bats.

The conclusion therefore is that the playing fields are used almost entirely by bat species which are tolerant of artificial lighting, with low levels of Myotis and Plecotus bat activity that will be adversely impacted by the floodlighting scheme to the north and west boundaries.

6.4 Summarised Conclusions

The conclusions of this report with regards to foraging and commuting bats are therefore as follows:

- The surveys found that the playing field boundaries are used almost entirely by commuting and foraging light tolerant bat species made up of Pipistrelle and Nyctalus bats, and totalling over 99% of all activity.
- Bat species that are sensitive to artificial lighting of largely absent from the playing field. The amount of activity recorded from Myotis bats amounted to 0.0027% and Plecotus bats 0.0005% of overall activity. There is a centre of activity for these bats to the north-east between the Chorlton Water Park and Kenworthy Woods LWS, and this area will remain unaffected.
- Despite the scarcity of bats categorised as being “rarer” in the Wray *et al* metric, their presence raises the status of the site above one of ‘local or district value’ to one of ‘county’ value, by a single metric point, 22 against 21.
- The Ecobat assessment of bat activity found that the extent of activity by bats that could be adversely affected by the sports turf floodlighting fell into the lowest percentile for bat activity within the region.
- The proposed sports turf floodlighting scheme is a modern mitigated design that will result in a controlled light spillage, but one that will illuminate the north and west boundaries of the playing field.
- The impact of artificial lighting on the playing field is further mitigated by a floodlight curfew of 22:00 hours, meaning for the largest part of the night the entire playing field is in darkness.
- The proposed floodlighting for the four new artificial pitches will see light spillage onto the northern boundary treeline and the western band of woodland of between 50 lux and 5 lux respectively. This is sufficient to have a detrimental impact upon the use of these boundaries by Myotis and Plecotus bats. However, the research which describes this impact also identifies that, in an almost like for like situation, that these bat species will continue to use the impacted boundary by simply switching to the dark side of the vegetation. This is therefore an option available to the low numbers of foraging/commuting Myotis and

Plecotus bats using the western boundary woodland in particular.

In summary, taking into account the make-up of the bat fauna using the playing fields, the metrics assessing the status of the bat assemblage in a wider landscape setting and the low number of sensitive bat species affected, it is considered unlikely that the illumination of the north and west boundaries of the affected area of playing field will have a significant detrimental impact upon the favourable conservation status of Myotis or Plecotus bats in the local area.

Considering the above bullet points, the conclusion is that the proposed artificial pitches, and in particular the extensive sports turf floodlight scheme, should have a low impact upon bat activity in this localised area of the landscape of Wythenshawe.

9. REFERENCES AND BIBLIOGRAPHY

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3. Collins, J. (ed) (2023) **Bat Surveys for Professional Ecologists: Good Practice Guidelines**, 4th Edition, Bat Conservation Trust, London.
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8. Zeale, MRK, Stone, E. L., Zeale, E., Browne, W. J., Harris, S., & Jones, G. (2018). **Experimentally manipulating light spectra reveals the importance of dark corridors for commuting bats**. Global Change Biology, 24(12), 5909- 5918. https://doi.org/10.1111/gcb.14462
9. Wray et al (2010) **Valuing Bats in Ecological Impact Assessment,** *CIEEM In Practice Issue 70: 2010 Target (Dec 2010) - Stephanie Wray CEnv FIEEM, David Wells CEnv MIEEM, Emma Long MIEEM and Tony Mitchell-Jones MIEEM*
10. Linott P et al (2017) **Ecobat: An online resource to facilitate transparent, evidence-based interpretation of bat activity data, E**cology and Evolution, 12 December 2017. (*Paul R. Lintott, Sophie Davison, John van Breda, Laura Kubasiewicz, David Dowse, Jonathan Daisley, Emily Haddy, Fiona Mathews*). **http://www.mammal.org.uk/science-research/ecostat/**.

Appendix A – Proposed Mitigated Floodlight Design

The lighting spillage from the designed mitigated floodlighting scheme for the artificial pitch is provided overleaf, as provided by Surfacing Standards

Wythenshawe Sports Ground

4Nr. Artificial Grass Pitches

Project code:	G-229824
Date:	04-03-2026
Designer:	ME
Description:	Match play requirements: Maintained average illuminance >200 lux Uniformity Ratio (Ev.min/Ev.ave) >0.60 All luminaires have a zero upward light ratio without the use of additional accessories.

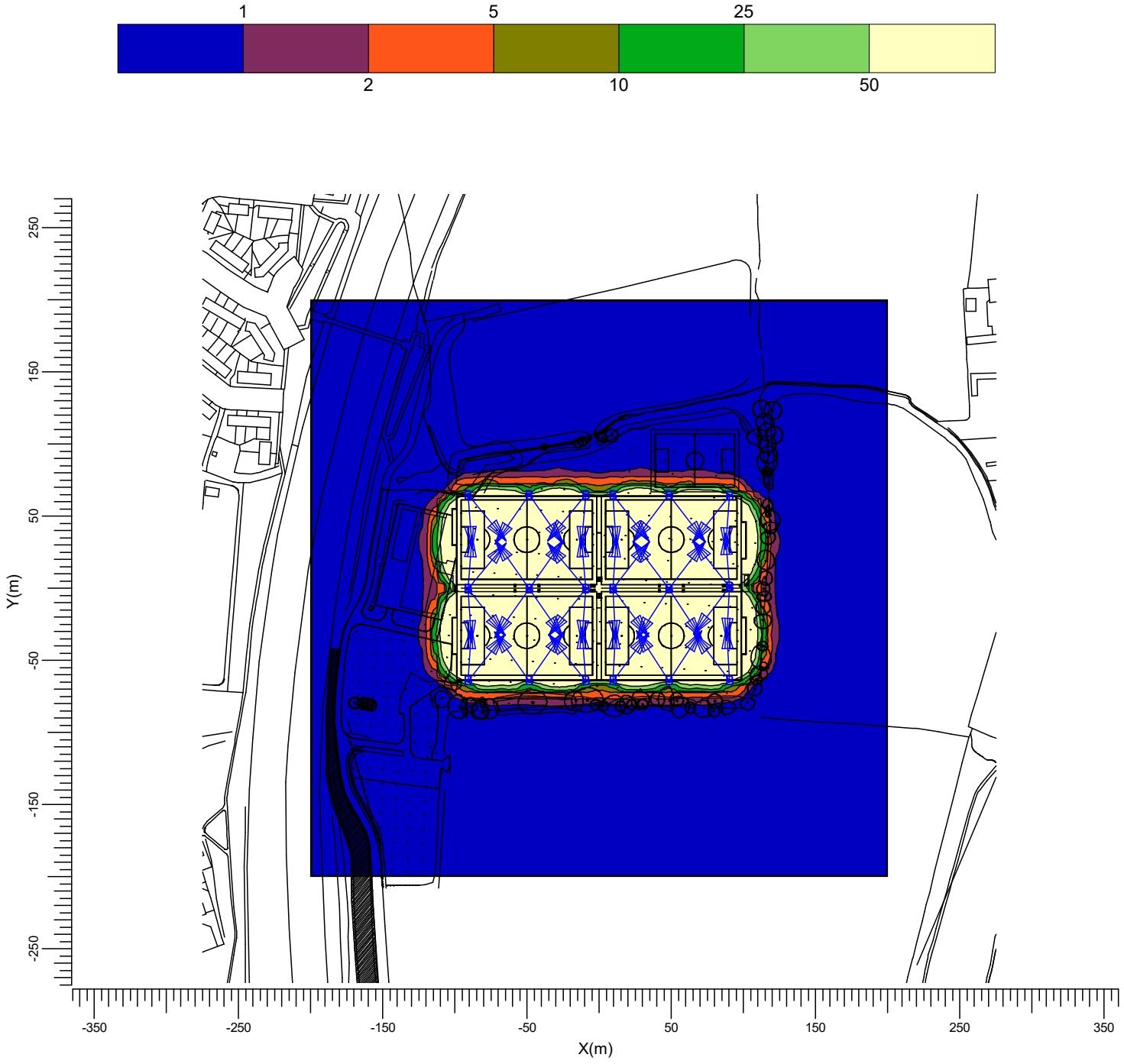
The nominal values shown in this report are the result of precision calculations, based upon precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice the values may vary due to tolerances on luminaires, luminaire positioning, reflection properties and electrical supply.

Surfacing Standards LTD
Office 2
Empingham House
Ayston Road
Uppingham
LE15 9NY

3.5 Ground Spillage: Filled Iso Contour

Spillage Switching

Grid : Spillage Grid at Z = -0.00 m
Calculation : Surface Illuminance (lux)



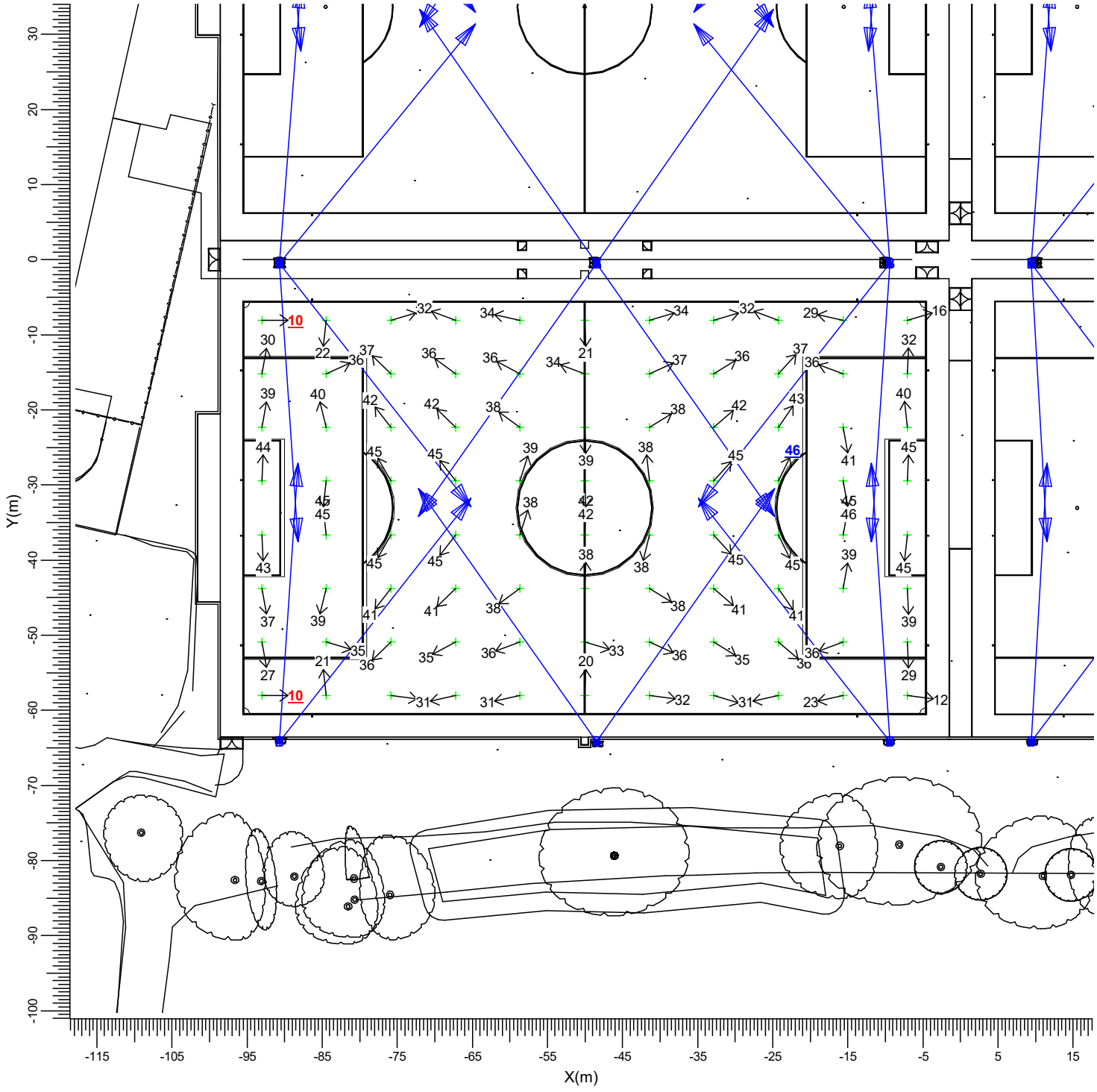
B BVP518 OUT T35 A35-NB LTM E BVP528 OUT T35 A35-NB LO

Average	Min/Ave	Min/Max	Project maintenance factor	Scale
36.4	0.00	0.00	1.00	1:4000

3.6 SW Glare: Graphical Table

Spillage Switching

Grid of Observers : Football SW
Calculation : Glare Rating
Grid for Background Luminance: Football SW (Reflectance: 0.25)
Vertical Viewing Angle : -2.0 deg



Project maintenance factor
1.00

Scale
1:750

4. Luminaire Details

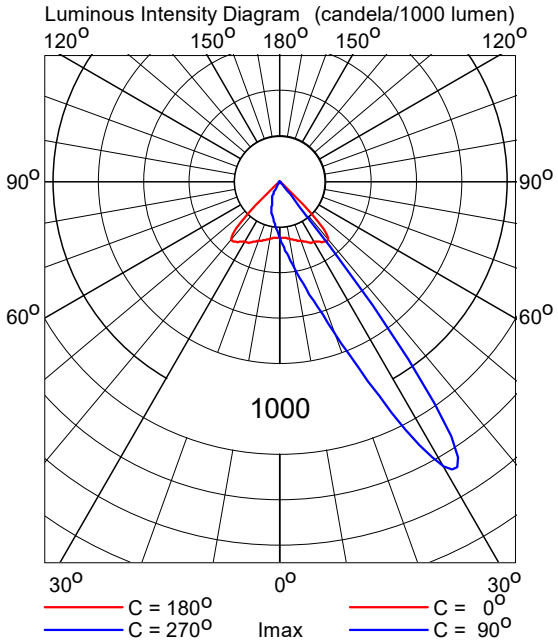
4.1 Project Luminaires

OptiVision LED gen3.5 2022
BVP518 OUT T35 1xLED1720-4S/740/740 E3/D4I A35-NB LTM

Light output ratios

DLOR	:	0.71
ULOR	:	0.00
TLOR	:	0.71
Ballast	:	E3/D4I
Lamp flux	:	172000 lm
Luminaire wattage	:	1006.0 W
Measurement code	:	LVM2047600

Note: Luminaire data not from database.



5. Installation Data

5.1 Legends

Project Luminaires:

Code	Qty	Luminaire Type	Lamp Type	Flux (lm)
B	48	BVP518 OUT T35 A35-NB LTM	1 * LED1720-4S/740	1 * 172000

Switching Modes:

Code	Switching Mode
1	Football SW
2	Football SE
3	Football NE
4	Football NW
5	Spillage Switching

5.2 Luminaire Positioning and Orientation

Qty and Code	Position			Aiming Angles			Switching Modes				
	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	1	2	3	4	5
1 * B	-90.70	-64.20	15.00	86.2	68.0	-0.0	+	-	-	-	+
1 * B	-90.70	-64.20	15.00	51.8	70.0	-0.0	+	-	-	-	+
1 * B	-90.70	-0.50	15.00	85.6	68.0	0.0	-	-	-	+	+
1 * B	-90.70	-0.50	15.00	50.7	70.0	0.0	-	-	-	+	+
1 * B	-90.70	-0.50	15.00	-86.2	68.0	0.0	+	-	-	-	+
1 * B	-90.70	-0.50	15.00	-51.8	70.0	0.0	+	-	-	-	+
1 * B	-90.70	64.80	15.00	-85.6	68.0	-0.0	-	-	-	+	+
1 * B	-90.70	64.80	15.00	-50.7	70.0	-0.0	-	-	-	+	+
1 * B	-48.50	-64.20	15.00	54.9	70.0	-0.0	+	-	-	-	+
1 * B	-48.50	-64.20	15.00	125.1	70.0	0.0	+	-	-	-	+
1 * B	-48.50	-0.50	15.00	55.2	70.0	0.0	-	-	-	+	+
1 * B	-48.50	-0.50	15.00	124.8	70.0	-0.0	-	-	-	+	+
1 * B	-48.50	-0.50	15.00	-54.9	70.0	0.0	+	-	-	-	+
1 * B	-48.50	-0.50	15.00	-125.1	70.0	-0.0	+	-	-	-	+
1 * B	-48.50	64.80	15.00	-55.2	70.0	-0.0	-	-	-	+	+
1 * B	-48.50	64.80	15.00	-124.8	70.0	0.0	-	-	-	+	+
1 * B	-9.40	-64.20	15.00	93.8	68.0	0.0	+	-	-	-	+
1 * B	-9.40	-64.20	15.00	128.2	70.0	0.0	+	-	-	-	+
1 * B	-9.40	-0.50	15.00	94.4	68.0	-0.0	-	-	-	+	+
1 * B	-9.40	-0.50	15.00	129.3	70.0	-0.0	-	-	-	+	+
1 * B	-9.40	-0.50	15.00	-93.8	68.0	-0.0	+	-	-	-	+
1 * B	-9.40	-0.50	15.00	-128.2	70.0	-0.0	+	-	-	-	+
1 * B	-9.40	64.80	15.00	-94.4	68.0	0.0	-	-	-	+	+
1 * B	-9.40	64.80	15.00	-129.3	70.0	0.0	-	-	-	+	+
1 * B	9.40	-64.20	15.00	86.7	68.0	0.0	-	+	-	-	+
1 * B	9.40	-64.20	15.00	53.0	70.0	0.0	-	+	-	-	+
1 * B	9.40	-0.50	15.00	85.9	68.0	-0.0	-	-	+	-	+

Qty and Code	Position			Aiming Angles			Switching Modes				
	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	1	2	3	4	5
1 * B	9.40	-0.50	15.00	51.9	70.0	-0.0	-	-	+	-	+
1 * B	9.40	-0.50	15.00	-86.7	68.0	-0.0	-	+	-	-	+
1 * B	9.40	-0.50	15.00	-53.0	70.0	-0.0	-	+	-	-	+
1 * B	9.40	64.80	15.00	-85.9	68.0	0.0	-	-	+	-	+
1 * B	9.40	64.80	15.00	-51.9	70.0	0.0	-	-	+	-	+
1 * B	48.50	-64.20	15.00	56.9	70.0	-0.0	-	+	-	-	+
1 * B	48.50	-64.20	15.00	123.1	70.0	0.0	-	+	-	-	+
1 * B	48.50	-0.50	15.00	52.6	70.0	0.0	-	-	+	-	+
1 * B	48.50	-0.50	15.00	127.4	70.0	-0.0	-	-	+	-	+
1 * B	48.50	-0.50	15.00	-56.9	70.0	0.0	-	+	-	-	+
1 * B	48.50	-0.50	15.00	-123.1	70.0	-0.0	-	+	-	-	+
1 * B	48.50	64.80	15.00	-52.6	70.0	-0.0	-	-	+	-	+
1 * B	48.50	64.80	15.00	-127.4	70.0	0.0	-	-	+	-	+
1 * B	90.40	-64.10	15.00	93.3	68.0	-0.0	-	+	-	-	+
1 * B	90.40	-64.10	15.00	127.0	70.0	-0.0	-	+	-	-	+
1 * B	90.40	0.90	15.00	94.1	68.0	0.0	-	-	+	-	+
1 * B	90.40	0.90	15.00	128.1	70.0	0.0	-	-	+	-	+
1 * B	90.40	0.90	15.00	-93.3	68.0	0.0	-	+	-	-	+
1 * B	90.40	0.90	15.00	-127.0	70.0	0.0	-	+	-	-	+
1 * B	90.40	64.00	15.00	-94.1	68.0	-0.0	-	-	+	-	+
1 * B	90.40	64.00	15.00	-128.1	70.0	-0.0	-	-	+	-	+