



BJ Collins
PROTECTED SPECIES SURVEYORS

PHASE II BAT SURVEYS

PROPOSED ARTIFICIAL SPORTS PITCH
THE HIGHFIELD SCHOOL
HIGHFIELD
LETCWORTH GARDEN CITY
HERTFORDSHIRE

A report to:

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Report Title:	Phase II Bat Surveys - Proposed Artificial Pitch, Somerhill Independent Prep. School

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Surveyed by:	Barry Collins MSc MCIEEM

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SUMMARY

This report describes the results of phase II surveys with regards to bats and the proposed installation of a floodlit artificial sports pitch within the playing ground of the Highfield School.

The survey methods comprised of a period of automatic/static monitoring using two full spectrum bat detectors over a period of 16 nights from 13 September to 29 September 2024, this was supported by a single walked bat transect (Night-time bat walkover and Vantage Point Survey) on 13 September 2024.

The transect survey and remote monitoring survey identified that the bats predominant on the site are almost entirely *Pipistrellus* bats, almost solely Common pipistrelle bats and by far the most dominant species with over 97% of all sonograms recorded.

The remote monitoring did identify the presence of 4 species of bat on the eastern boundary that are sensitive to artificial lighting. This comprises of a total of 6 of the 3,596 sonograms from the nationally scarce Barbastelle bat, 10 sonograms from *Myotis* bats (confirmed as Daubenton's and Natterer's bats by sonogram analysis) and 25 sonograms from Brown long-eared bat. The eastern boundary supported 87% of all bat activity.

On the western boundary there was significantly less bat activity with only 13% of overall activity and a grand total of 548 sonograms, 538 of which were from common pipistrelle, six were from *Nyctalus* species with only four sonograms from bats identified as being sensitive to artificial lighting. This comprised of a single sonogram from a *Myotis* bat, a single sonogram from a Brown long eared bat and two sonograms from Barbastelle bat.

Summarised Conclusions

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

- The surveys found that the boundaries of the school playground are used almost entirely by bat species which are tolerant of artificial lighting, including lighting above the level that will be encountered on the boundaries from the floodlighting scheme.
- However, the surveys have also recorded activity, particularly on the eastern boundary, by bat species which are sensitive to artificial lighting and are categorised as of conservation significance in England.
- The pitch is proposed for a relatively small area of amenity grassland and it is not possible to move the pitch to achieve the best practice buffer between the 0.5 lx lighting contour and the eastern boundary hedgerows, but mitigation will see this boundary protected from light spillage.
- The mitigation sees the pitch proposal moved as far west as is practically possible, towards the western boundary which supported only 13% of overall bat activity.
- The floodlight design is a modern mitigated scheme which results in minimal light spillage from the area of sports surface.
- A floodlighting curfew of 20:00 hours has been established, resulting in the floodlights non-operational over the peak bat activity period of April to November.

Considering the above bullet points, the conclusion is that the proposed artificial pitch requires the designed mitigated floodlighting scheme. In this, the scheme can be measured against the Ecological Mitigation Hierarchy, where in the first instance the scheme cannot avoid any impact on biodiversity, but has gone a significant way to minimising any potential impacts through a mitigation plan. This mitigation plan sees the eastern boundary kept in darkness.

The importance of compliance with the scheme, to prevent the ecological impact, should be assured through a suitable post-installation planning condition.

1 INTRODUCTION

This report has been prepared by BJ Collins – Protected Species Surveyors Limited for Surfacing Standards Limited on behalf of The Highfield School. It provides the results of phase II bat surveys of the playing ground at the school, following on from an Extended Preliminary Ecological Appraisal, where there is a proposal to install an artificial grass sports pitch, with an associated floodlighting scheme.

The site is located at The Highfield School, Highfield, Letchworth Garden City, Hertfordshire, SG6 3QA.

The survey was carried out to inform the potential ecological impact upon bat species from the installation of an artificial turf pitch, and specifically from the proposal to install sportsturf floodlighting.

The aim of the survey was to document the bat species which use the boundaries of the school playground, to allow an assessment of any impact from the new pitch and its artificial lighting, and to develop a mitigation strategy. Further, to identify whether further survey effort is required to inform the ecological impact of the installation.

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

1.1 Location of the Proposed Artificial Turf Pitch

The area of playground is located on the Highfield School, located to the west of the town of Highfield, Letchworth Garden City. The immediate landscape surrounding the playground comprises of residential areas with mature gardens to the east and south-east, further playing fields to the south-west and areas of woodland to the north-west. The area of playing field sits to the south of the modern school complex.

The approximate location of the proposed artificial turf pitch is centred upon the OS Grid Reference: TL21003138.



Figure 2: The approximate location of area of school playground selected for the installation of the artificial turf pitch, encircled in yellow, in relation to habitats in the wider area, courtesy of Google Earth. (North to the top of page).

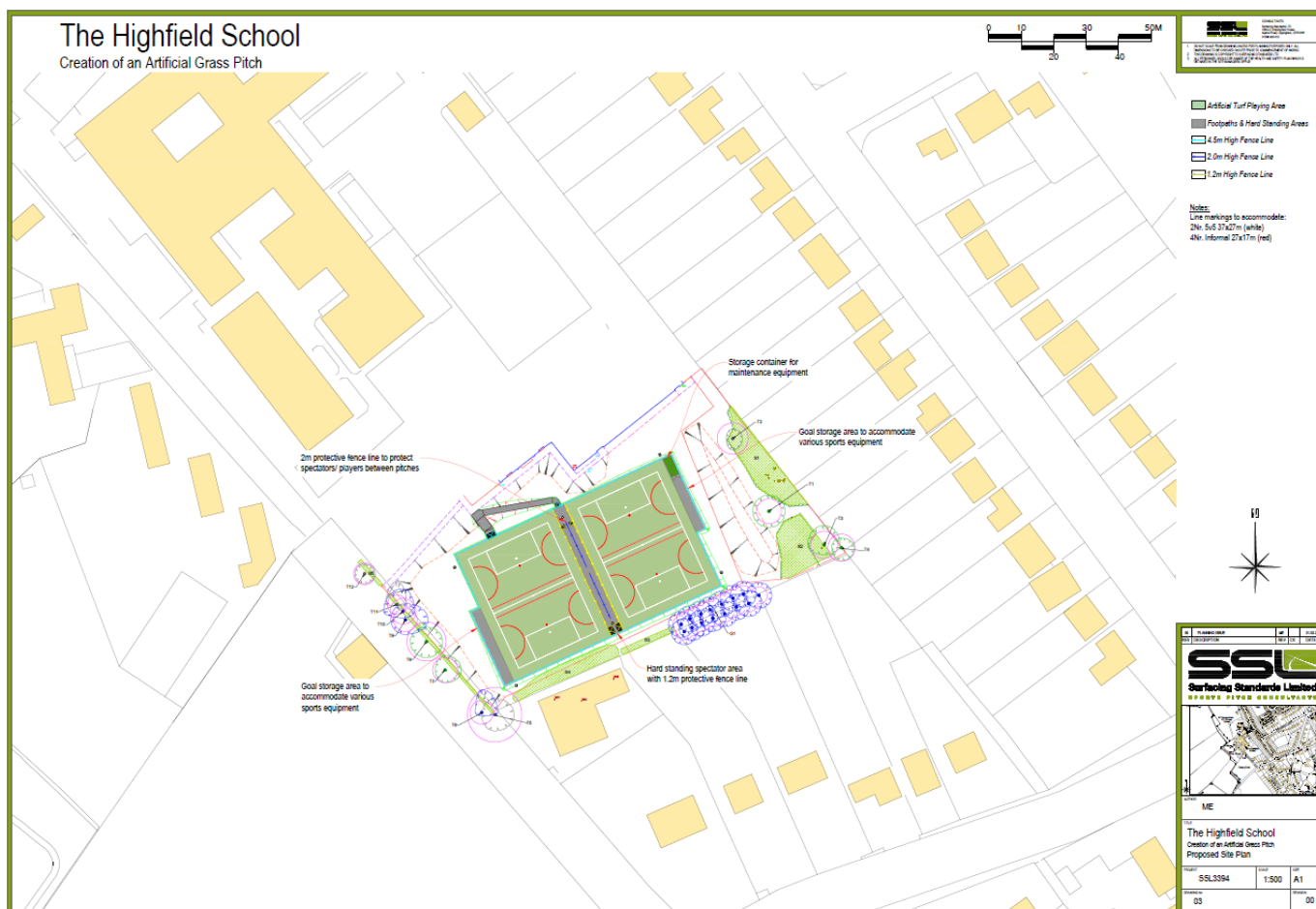


Figure 2 - showing the proposed site layout.

1.2 The Habitats

The area largely affected by the proposal comprises an intensively managed and impacted area of amenity grassland, forming a significant part of the playground associated with the school complex.

The proposal will see the heavily modified area of turf associated with this part of the playground, categorised under BNG as a natural surface, transformed to an artificial plastic grass surface. Biodiversity net gain is required given the scale of the proposal.

The following photographs identify the habitats affected by this proposal.



Photograph 1: showing the linear habitat on the east of the playground boundary.



Photograph 2: showing the western boundary of the area of playground.



Photograph 3: showing the area of grassland where the artificial pitch is proposed.

3 SURVEY METHODOLOGY

3.1 Desktop Study

A desktop study which comprised a request for records of non-designated wildlife sites, wildlife species and, considering the scope of works, records of bats and bat roosts, was commissioned and is described throughout the preliminary ecological appraisal report for the site (reference 3). Key elements of these with regards to bat species have been extracted and described within this report.

3.2 Night-time bat walkover (NBW) and Vantage Point Survey

To allow the physical observation of bat activity, and to assess bat activity over the peak foraging period, a single NBW(transect) and combined Vantage Point Count was undertaken. The transect route was specifically designed to assess the importance of the boundaries of the playing field for bat species, and allow an assessment of the impact on the east and west boundaries of the affected section of playing field, compared to the wider boundaries and school buildings.

The transect 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 and transect route was also designed to sample within the peak activity period for bats, namely a period of up to approximately 90 minutes following sunset, following the methodology for sampling bat activity following the methodologies designed by the Bat Conservation Trust NBMP Field Survey and those recommended within national best practice guidelines (reference 4). The surveyor was static for a five-minute period at each of the designated stop points (vantage point) but then continued to record bat passes for a three-minute walking period between. All bat activity being counted and recorded for the entire walked transect.

The NBW and VPS route is shown in figure 8, chapter 4. There were 7 point counts and the route reversed to ensure a double count of the habitats around the proposed pitch area.

The transect was undertaken on the 13th of September 2024. This falls into the autumn survey window in accordance with national best practice guidelines.

The survey began 15 minutes after sunset (triggered by bat activity). The transect 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 Kaleidoscope pro software.

3.3 Static/automated bat survey

A period of remote monitoring was undertaken over 16 nights between 13 September to 29 September 2024.

The objective of this survey period was to identify the species of bat present on the site and the occurrence of bat activity to allow comparison with the proposed floodlighting scheme and the designed operational times for the new sports pitch floodlighting.

To facilitate this, two Wildlife Acoustics Song Meter Mini Bat detectors were placed on the eastern boundary, the perceived most valuable linear habitat on the proposed pitch boundary, and on a lamppost column alongside the tree canopy on the western boundary.

To operate, the units were set to switch on 30 minutes before sunset and run continually until 30 minutes after sunrise. On completion, the units were collected, and sonograms analysed. The detectors were set to monitor over a 16-night period in September. This comprised a total of approximately 11 hours of recording per night, 176 hours at each detector and over 352 hours of recording from the two units combined.

3.4 Survey effort

The survey effort was designed to assess bat activity in one of the three peak seasons identified within best practice guidelines. This particular survey cycle was carried out in the autumn period, although climatic conditions were comparable with those encountered across the summer period of 2024.

The survey represents a single cycle in a single season. Best practice guidance provides an indication of the survey effort required for levels of risk for bat activity affected by development. This single survey cycle has identified the presence of *Barbastelle*, *Myotis* bats and *Plecotus* bats on the school boundaries, and a mitigation scheme in accordance with best practice has been prepared to reduce any impacts upon these species.

Given the extent of the survey effort and the results from that study, this report proportionately addresses the requirement of a bat survey on site, as described by Clause 4.1.2 of BS42020 and section 2.2.17 and 8.2.7 of best practice guidelines (reference 2).

3.5 Weather conditions

The weather for the transect was as follows:

Survey	Temperatures	Cloud cover	Wind speed
13 September 2024	12.2°C at the start, 9.9°C at close	10% start and 0% at close	Beaufort '0' at the beginning and at the end

Table 1 – climate conditions of the bat activity study

3.6 Personnel and dates

The walked transect was 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. B J 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 further verified using the BTO pipeline.

3.7 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 7, 8 and 9), and also as displayed in Guidance Note 08/23: Bats and Artificial Lighting at Night (reference 6), see overleaf:

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 <i>Rhinolophus ferrumequinum</i>		na	na	na	na	na	clutter
Lesser Horseshoe <i>Rhinolophus hipposideros</i>			na	na	na		clutter
Brown Long-eared <i>Plecotus auritus</i>					na		clutter
Grey Long-eared <i>Plecotus austriacus</i>	na	na	na	na	na	na	clutter
Bechstein's <i>Myotis bechsteinii</i>	na	na	na	na	na	na	clutter
Natterer's <i>Myotis nattereri</i>		na	na		na	na	clutter
Daubenton's <i>Myotis daubentonii</i>	na			na	na		edge
Whiskered <i>Myotis mystacinus</i>	na	na	na	na	na	na	edge
Brandt's <i>Myotis brandtii</i>	na	na	na	na	na	na	edge
Alcathoe <i>Myotis brandtii alcathoe</i>	na	na	na	na	na	na	edge
Western Barbastelle <i>Barbastella barbastellus</i>					na		edge
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	na				na		edge
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>				na			edge
Nathusius' Pipistrelle <i>Pipistrellus nathusii</i>	na	na	na	na			edge
Common Noctule <i>Nyctalus noctula</i>	na			na	na		open
Lesser Noctule <i>Nyctalus leisleri</i>	na	na	na		na		open
Serotine <i>Eptesicus serotinus</i>	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 2 - 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

The search of the MAGIC mapping software recorded no EPS licences for bats within 1 km of the site.

The data search from the Hertfordshire Environmental Records Centre recorded 85 individual bat records for a 2 km circumference of the site. Some 12 of these were of two *Myotis* species, Natterer's bat and Daubenton's bat, which are recorded from hibernation surveys of a hibernacula over 1.7 km from the site.

The remaining 73 records were for 1 km grids surrounding the school location but with no bat records from TL 2131 and TL 2031, the 1 km grids within which the school sits.

The bat species recorded from those areas included Common pipistrelle bat, Noctule bat, Brown long-eared bat, Serotine and Soprano pipistrelle bat.

There are no records of *Myotis* or *Barbastelle* bats within 1 km of the school grounds.

4.2 Static/automated bat survey

To provide detailed information with regards to the bat species which are present in the local area, the bat species which utilise the affected landscape of the school playing fields and the time that the activity occurs, a period of remote monitoring was undertaken utilising full spectrum bat detectors.

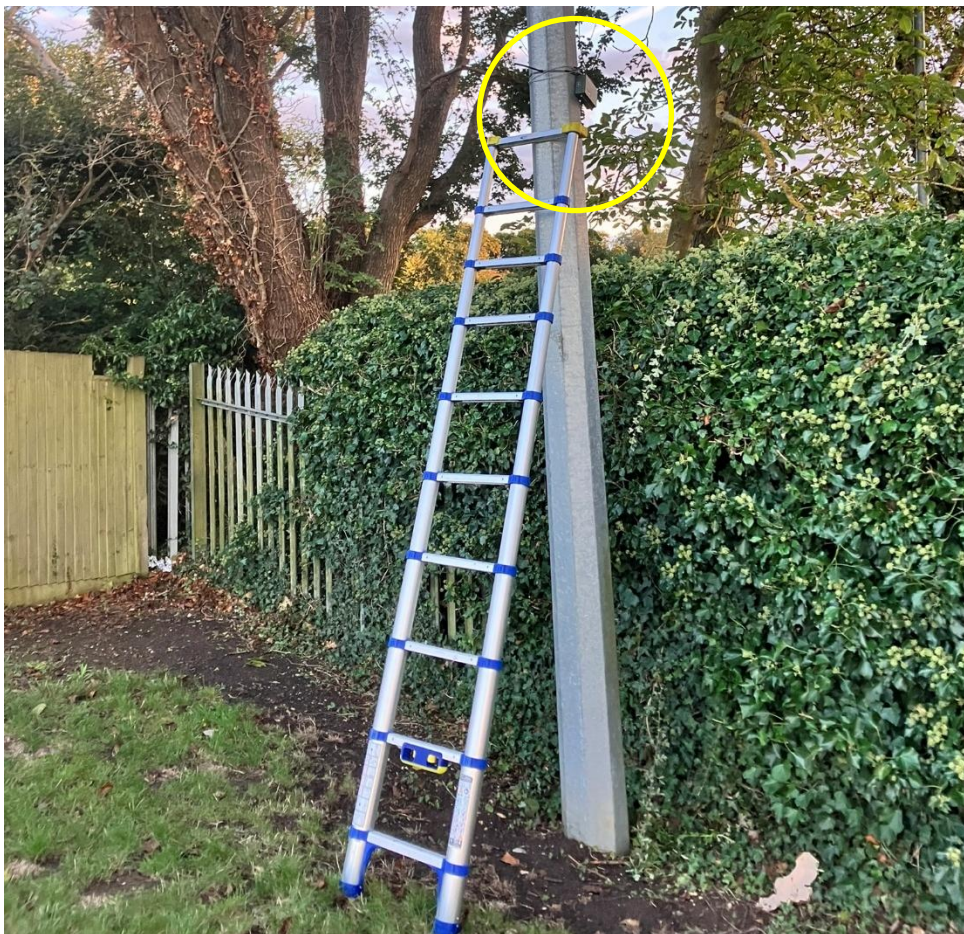
As previously described, the full spectrum detectors were positioned in two locations, on the overgrown hedgerow and trees to the east boundary of the playground and affixed to a disused lighting pole alongside the tree canopy edge of the western boundary.



Figure 5 – position of the static detectors



Photograph 4 - siting of the bat detector placed on the eastern boundary



Photograph 5 - siting of the bat detector placed on the western boundary

4.1.1. Detector monitoring the eastern boundary of the play ground

This detector recorded a total of 3,596 sonograms over the survey period, this comprised of 87% of all sonograms generated from the site overall during the monitoring period, with only 13% of calls recorded from the western boundary (548 sonograms).

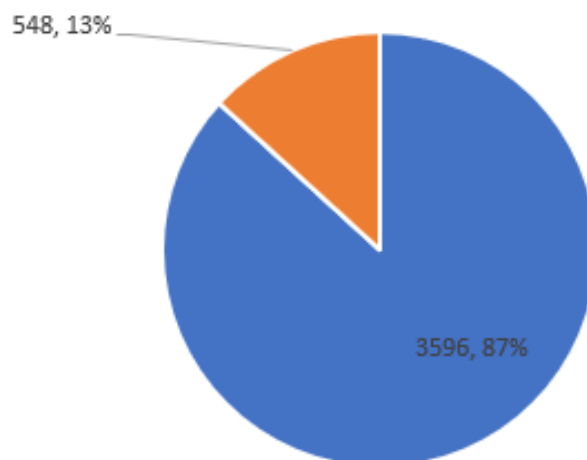


Figure 6 -the proportion of sonograms generated from the detector on the eastern boundary compared to the detector monitoring the western boundary

Of these, 3,555 were from species categorised as being tolerant of artificial lighting, this included Common pipistrelle (with 3,484 sonograms) and Soprano pipistrelle (with 19 sonograms). There was then a total of 52 sonograms typical of *Nyctalus* bats and none from Serotine bat.

In contrast, on the eastern boundary there was only 41 passes over the monitoring period by bats that are categorised as sensitive to light in their foraging and commuting phases. These comprised of 25 sonograms generated from *Plecotus* bats (almost certainly the Brown long-eared bat), 10 sonograms from *Myotis* bats, and of significance, 6 sonograms from the scarce Barbastelle bat (*Barbastella barbastellus*).

The abundance of light sensitive bats by the eastern monitoring station was therefore extremely low with 99% of all activity by bats categorised as being tolerant of artificial lighting.

The percentage of activity by bats which are sensitive to lighting comprised of 0.7% activity by *Plecotus*, 0.28% of activity by *Myotis* bats and 0.17% by *Barbastellus*. Identifying very low activity by these sensitive bat species.

The occurrence of activity, over the hours of the night combined, by the 'light tolerant' bats and the 'light averse' bats is provided overleaf graphically.

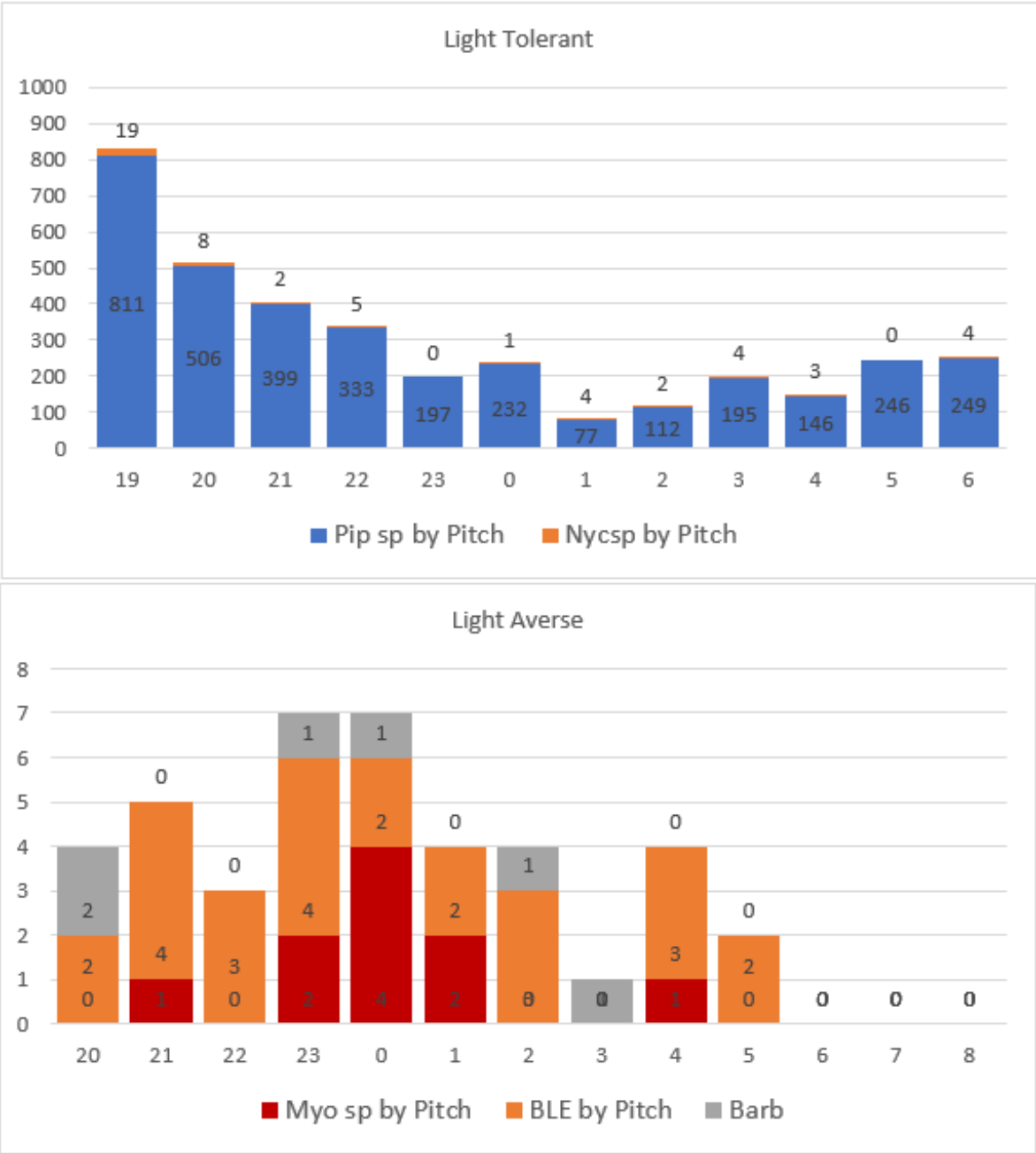


Figure 6 - the distribution of sonograms recorded from bat species categorised as 'light tolerant' and 'light averse' during the September 16 night monitoring period on the eastern boundary, displayed as the number of sonograms per hour of the night combined over the monitoring period.

4.1.2. Detector monitoring the west boundary of the proposal

On this boundary there was only 13% of the overall bat activity on the site.

This comprised of a total of 548 sonograms, 544 of which were from bats tolerant of artificial lighting.

Over the 16 night period there were only four sonograms from bats which are sensitive to artificial lighting. This included for a single pass from a Myotis bat, a single pass from a Plecotus bat and two passes from Barbastelle bat.

The distribution of sonograms are indicated in figure 7 below:

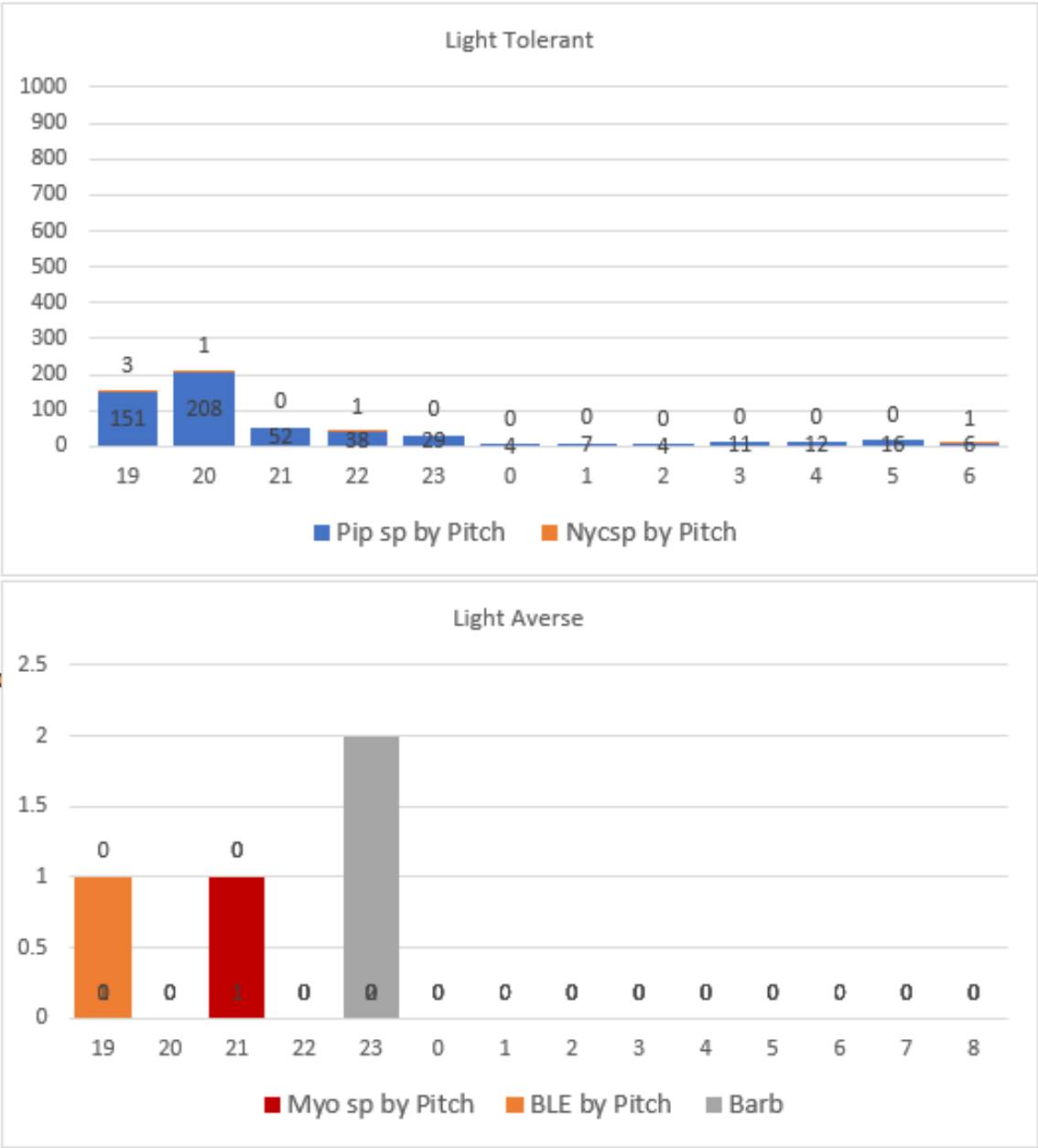


Figure 7 - the distribution of sonograms recorded from bat species categorised as ‘light tolerant’ above, displayed as the number of passes over the hour of the night over the combined 16 night monitoring period on the woodland edge, below the number and occurrence of sonograms generated by the ‘light averse’ bats.

4.1.3. Species verification

Calls from both detectors were initially identified using auto ID functions of Kaleidoscope pro. These were then visually assessed and attributed by the bat ecologist, with many unidentified calls allocated to species. From the allocated sonograms random samples of Barbastelle, Myotis, Nyctalus and Plecotus calls, 37 number, were extracted and then submitted to the BTO pipeline for further verification.

The end result was the confident identification of two species of Myotis bat. The first of these is Natterer’s bat (*Myotis nattereri*), with a confidence limit of 92% and Daubenton’s bat (*Myotis daubentonii*) with a confidence limit of 95%.

There were five sonograms submitted from Barbastelle bat, all of which were ranked with a 99% probability. The Brown long eared bat was identified to 93% probability.

Of interest to the bat records for the local area rather than the analysis of impact from artificial

floodlighting is the presence of both Noctule bat (*Nyctalus noctula*) at 98% confidence and Leisler's bat (*N. leisleri*) at 94% confidence, both these species have a similar reaction to artificial lighting in their foraging and commuting habitats.

SCIENTIFIC NAME	PROBABILITY	WARNINGS
Barbastella barbastellus	0.99	
Barbastella barbastellus	0.99	
Barbastella barbastellus	0.99	
Barbastella barbastellus	0.99	
Barbastella barbastellus	0.99	
Barbastella barbastellus	0.99	
Myotis daubentonii	0.95	
Myotis nattereri	0.88	
Myotis nattereri	0.9	
Myotis nattereri	0.92	
Myotis nattereri	0.89	
Myotis nattereri	0.92	
Nyctalus leisleri	0.94	
Nyctalus leisleri	0.85	
Nyctalus noctula	0.98	
Nyctalus noctula	0.98	
Nyctalus noctula	0.87	
Plecotus auritus	0.91	
Plecotus auritus	0.87	
Plecotus auritus	0.93	
Plecotus auritus	0.93	

Table 3 - Myotis species sonogram samples verification results, BTO pipeline

4.3 Night-time bat walkover (NBW) and Vantage Point Survey

There was a single mid-September transect survey undertaken and the results are shown overleaf. The map contains a cumulative total of the number of passes recorded at the relevant stop point (Vantage point survey) and the subsequent walking section following it (night-time bat walkover).

The transect results were entirely dominated by Common pipistrelle bats.

There were no Myotis or Plecotus species, there were no Barbastelle recorded.

The greatest extent of bat activity was recorded on the eastern boundary, matching the trend identified from the 16 night static monitoring survey.

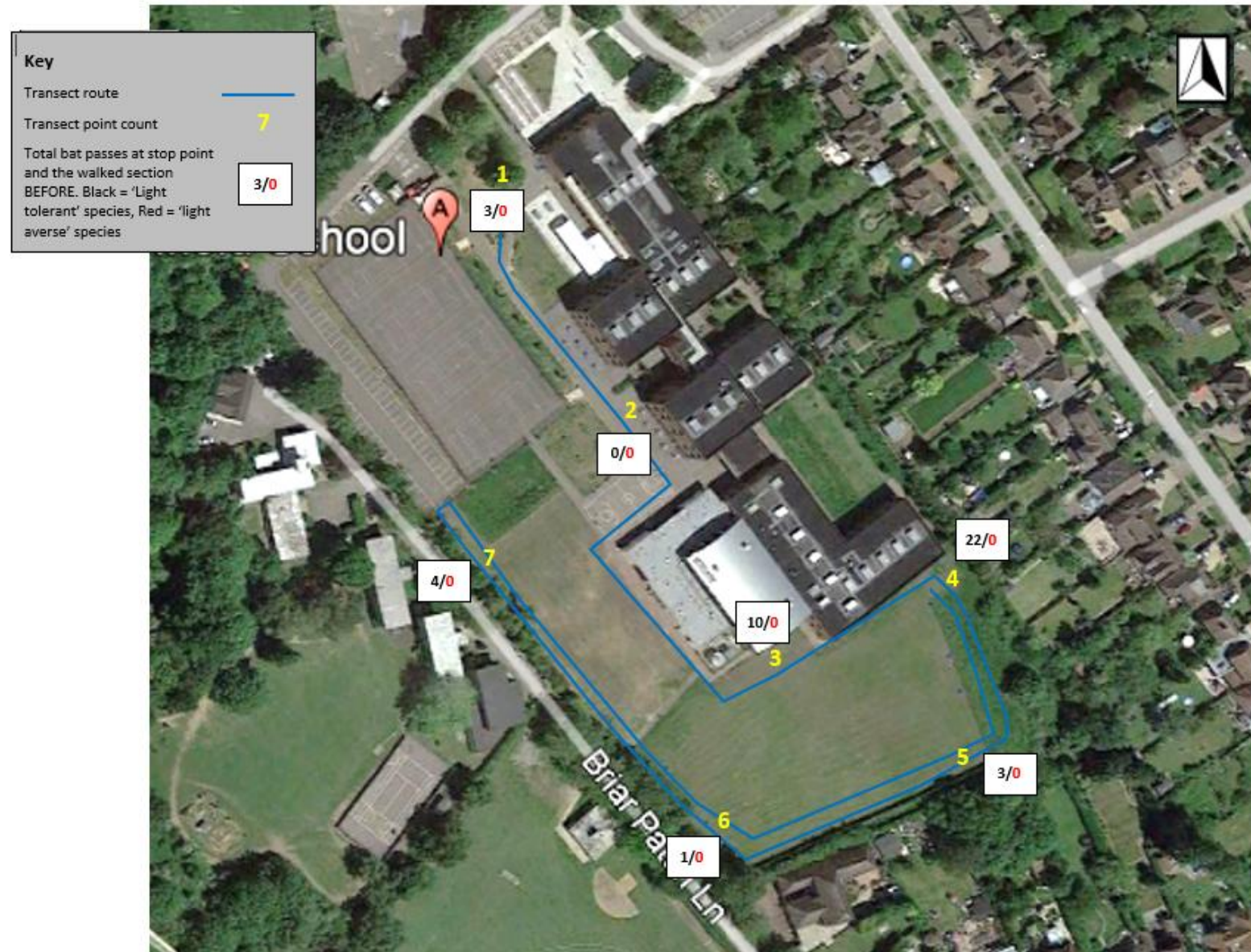


Figure 8 - the distribution of sonograms recorded from the NBW/VPS in relation to the playground, yellow numbers representing the individual stop points, there were no other species recorded apart from *Pipistrellus pipistrellus*.

5 DISCUSSION

5.1 Survey effort

The basis of this monitoring report is a single survey cycle carried out at the beginning of the “autumn” survey period 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. In this instance a very small section of overgrown hedgerow and woodland will be impacted by the proposal.

Furthermore, mitigation is proposed that will significantly reduce any impact, particularly on the eastern boundary.

It is therefore considered that the results of the 16 night autumn survey are sufficient to inform the potential ecological impact of this small development scheme.

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) ^e 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) ^e 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 4 - extract from national best practice guidelines (2023)

5.2 Bat activity

The most valuable element of the survey was the period of remote monitoring that was undertaken overnight between 13 September to 29 September 2024.

The overall survey results from this monitoring period identified that the overgrown hedgerow, linear habitat, along the east (north-east) boundary of the school provides the optimum foraging and commuting habitat for bats. From here 87% of all bat activity occurred.

The results from the west (south-western) boundary of the school grounds found significantly less activity by bats on this boundary with only 13% of total sonograms recorded.

The total usage of the school grounds was dominated by common pipistrelle bat with 97% of all activity, combined with the other light tolerant bats this reached 99% of all activity. The bat fauna is therefore dominated by species which are not adversely affected in their foraging and commuting habitats.

Despite this result, bat species were present on the east boundary that are sensitive to artificial lighting. This includes for Myotis bats, two species were positively identified, and Plecotus bats.

Furthermore, was the recording of the nationally scarce Barbastelle bat. These are all species which trigger a requirement for a mitigated lighting scheme. This is despite their scarcity, with a total of only eight passes by Barbastelle, 11 passes by Myotis bats and 26 passes by the Brown long-eared bat amongst over 4000 bat sonograms recorded.

5.3 The effect of the Lighting Curfew vs Sunset

The next influence to consider is the proposed floodlight curfew. In order to mitigate any impact from artificial lighting the proposal is to restrict the operation of the floodlights during the peak bat activity season of April to October. This will not reduce the impact outside of this period, when bats are still active, and therefore the floodlight mitigation scheme will still be a necessity.

Effectively, through consultation the school proposes to install a floodlight curfew of 20:00 hours each night.

The graph below identifies the impact from that curfew time by comparing it to sunset across the year, and in particular the bat active season of April to November.

This demonstrates that for the largest period of the bats season the sportsturf floodlights are non-functioning from mid-April to the beginning of September.

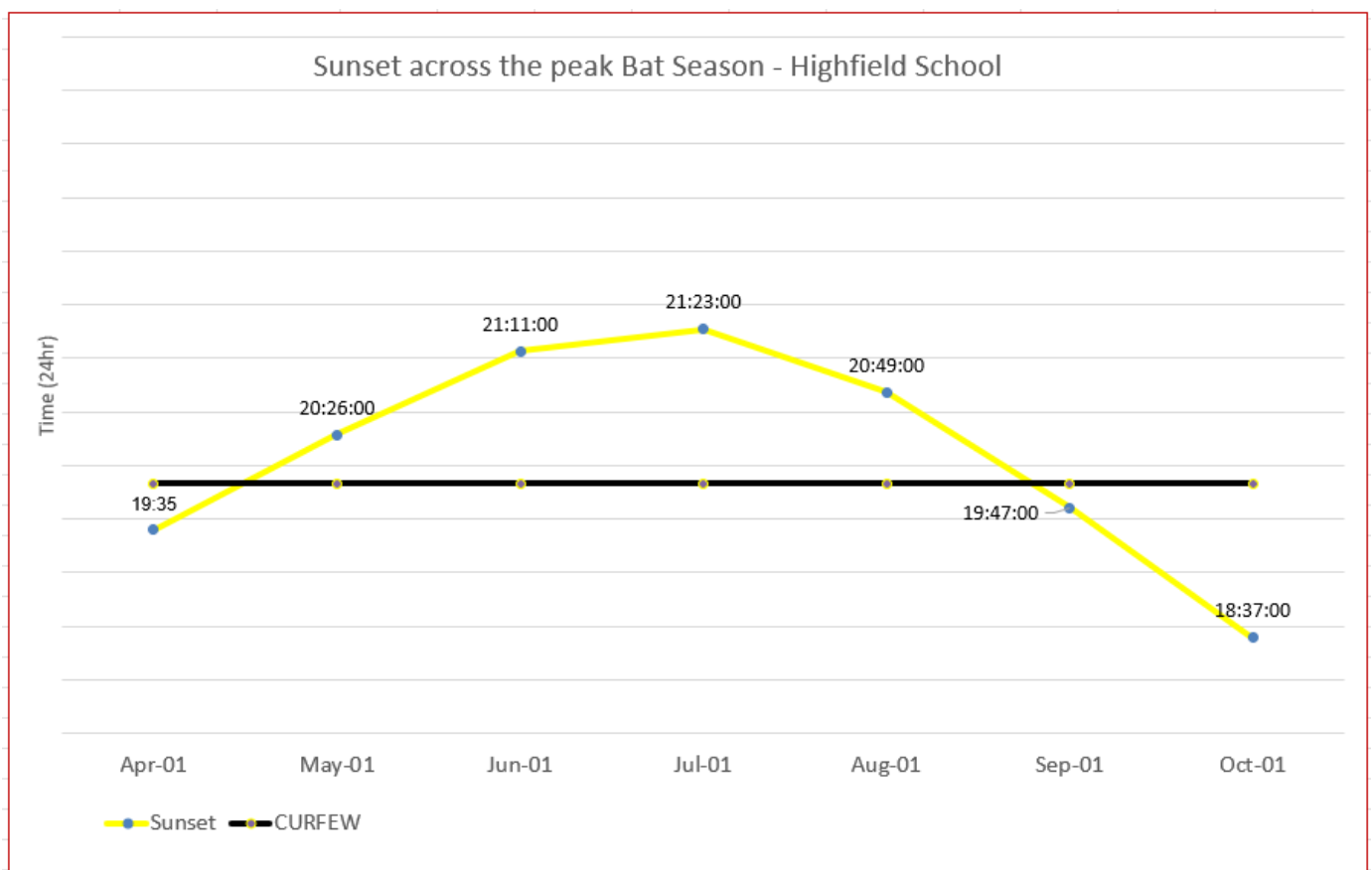


Figure 9 - showing the sunset time across the peak bat survey compared to the 20:00 hour lighting curfew.

6 MITIGATION

Best practice guidance (reference 6) is that there should be a 25 m buffer from the horizontal contour line, specifically the 0.5 lx contour which is closest to the 0.45 lx level identified as significant for the light sensitive bats, to habitat considered to be valuable for commuting and foraging bats, in this case the eastern boundary of the playing field.

The situation at The Highfield School is a lack of space to be able to deliver this objective.

Therefore, mitigation will follow the following key bullet points:

- The pitch has been moved as far west as is practically possible, towards the western boundary which supported a significantly lower extent of bat activity (13% of activity overall).
- The floodlight design is a modern mitigated scheme which results in minimal light spillage from the area of sports surface.
- A floodlighting curfew will be established, in discussion a floodlight curfew of 20:00 hours will be imposed, removing any influence of floodlighting over the peak bat season of April to November.

The delivery of this flexible mitigation strategy should be secured by post-development auditing randomly across the April to October. A written report should be provided showing compliance to the mitigated floodlighting scheme included within this document.



Figure 10 - showing the new artificial pitch and the floodlight contour plan overlaying aerial imagery. The floodlight mitigation has removed all light spillage onto the eastern boundary, and achieved the mitigation objective, although there is insufficient room to move the pitch to achieve the 25 metre buffer zone requested by best practice.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Results of Bat Activity Surveys

The transect survey and remote monitoring survey identified that the bats predominant on the site are almost entirely *Pipistrellus* bats, almost solely Common pipistrelle bats and by far the most dominant species with over 97% of all sonograms recorded. A grand total of 99% of activity was by bats that are tolerant of artificial lighting.

The remote monitoring did identify the presence of 4 species of bat on the eastern boundary that are sensitive to artificial lighting. This comprises of a total of 6 of the 3,596 sonograms from the nationally scarce Barbastelle bat, 10 sonograms from *Myotis* bats (confirmed as Daubenton's and Natterer's bats by sonogram analysis) and 25 sonograms from Brown long-eared bat.

The percentage of activity by bats which are sensitive to lighting comprised of 0.7% activity by *Plecotus*, 0.28% of activity by *Myotis* bats and 0.17% by *Barbastellus*. Identifying very low activity by these sensitive bat species.

On the western boundary there was significantly less bat activity with only 13% of bat activity recorded here.

7.2 Summarised Conclusions

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

- The surveys found that the boundaries of the school playground are used almost entirely by bat species which are tolerant of artificial lighting, including lighting that is above the lux levels that will be encountered on the boundaries from the sports pitch floodlighting scheme.
- However, the surveys have recorded bat species which are sensitive to artificial lighting and are categorised as of conservation significance in England, predominantly on the eastern boundary. Floodlight mitigation has therefore been implemented to avoid lighting this boundary.
- The pitch is proposed for a relatively small area of amenity grassland and it is not possible to move the pitch to achieve the best practice buffer between the 0.5 lx lighting contour and the eastern boundary hedgerow of 25 m. Mitigation is therefore required and is described within section 5.3 and 6 above.

Considering the above bullet points, the conclusion is that the proposed artificial pitch requires the designed mitigated floodlighting scheme combined with the floodlight curfew.

In this, the scheme can be measured against the Ecological Mitigation Hierarchy, where in the first instance the scheme cannot avoid any impact on biodiversity, but has gone a significant way to minimising any potential impacts through moving the location of the pitch combined with a floodlight mitigation plan.

The importance of compliance with the scheme, to prevent the ecological impact, should be assured through a suitable post-installation planning condition.

7.3 The effect of floodlighting on insects and other invertebrates

This study has not considered the potential impact upon invertebrates from floodlighting (Reference 10) beyond referencing records from the desktop study.

8 REFERENCES AND BIBLIOGRAPHY

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- (5) IPL 2023 – The Institute of Lighting Professionals. (2023). **Bats and artificial lighting in the UK**. Guidance note.
- (6) Reason, P.F. and Wray, S. (2023) **UK Bat Mitigation Guidelines**, A guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1. Chartered Institute of Ecology and Environmental Management, Ampfield.
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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) Bruce-White C and Shardlow M (2011) **A Review of the Impact of Artificial Light on Invertebrates**. Buglife – The Invertebrate Conservation Trust

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

The Highfield School

Artificial Grass Pitch

Project code: SSL3394
Date: 28-03-2025

Designer: ME

Description: Football Match Play:
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

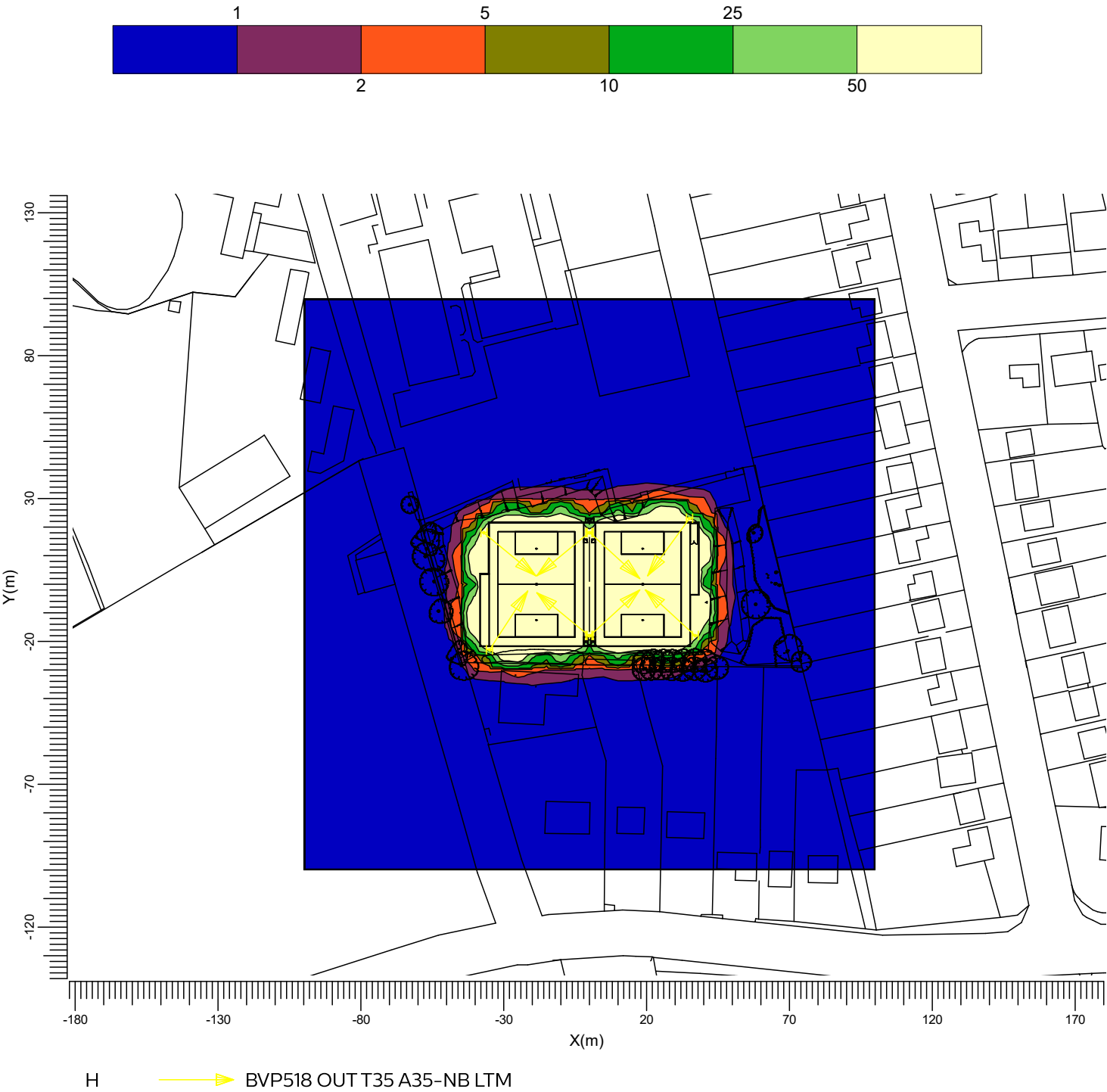
Office 2
Empingham House
Ayston Road
Uppingham
LE15 9NY

2.3 Spillage: Filled Iso Contour

Spillage

Grid : Spillage at Z = -0.00 m

Calculation : Surface Illuminance (lux)



Average	Min/Ave	Min/Max	Project maintenance factor	Scale
18.4	0.00	0.00	1.00	1:2000