Ecological Impact Assessment

Astley High School, Seaton Delaval

April 2020

Faithful and Gould

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	Name	**Position**	**Date**
Report Originator	James Streets	Director	September 2019
Reviewed	Mark Osborne	Director	October 2019
Update (eDNA results)	Emma Gwilliam	Senior Ecologist	April 2020

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Contents

Tables

Summary

OS Ecology Ltd were commissioned by Faithful and Gould in July 2019 to undertake a preliminary ecological appraisal and daytime bat risk assessment of Astley High School, Seaton Delaval. Following the bat risk assessment, dusk bat activity surveys were commissioned. Great crested newt survey work of the pond within 50m of the site was completed in April 2020. Full details of the development are not currently available but it is proposed to construct a new school building on site and demolish the existing building.

Table 1: Summary Table	
Impacts on Designated Sites	No impacts on designated sites are predicted from the development.
Habitats	The site supports limited habitats being dominated by amenity grassland used for sports, hardstanding and buildings. There is vegetation around the site peripheries comprising hedgerow and amenity tree planting however these are of limited ecological value due to their species composition. Some introduced planting is present around the school buildings. A single dry pond was recorded on site which is of greater value.
Daytime Bat Risk Assessment Survey Findings	No evidence of bats was recorded during the daytime risk assessment. The buildings do provide some limited opportunities for bats between gaps under fascia boarding and between window frames in places. Overall the buildings on site were considered to be of low suitability for supporting roosting bats.
Bats (including activity survey results)	A total of four bat roosts used by small numbers of common pipistrelle bats were recorded during dusk activity surveys. Given the time of year of the surveys, no maternity roost is considered to be present, with the roosts on site considered to be day roosts.
Nesting Birds	No evidence of nesting birds was recorded on site however, the site is likely to support breeding by locally common species such as house sparrow, wood pigeon and starling.
Great Crested Newts	A single pond is apparent within 500m of the site on the aerial imagery and Ordnance Survey 1:25,000 maps. This lies within the ground of the adjacent factory, within 50m of the site boundary. eDNA survey of this pond returned a negative result, indicating that great crested newts are absent. A small, dry pond is present on site, but this is considered unlikely to support breeding amphibians as it is unlikely to hold water during the breeding season in the majority of years. Great crested newts are therefore considered absent from the site.
Impacts based on survey to date	Based on the survey work, and likely impacts of the proposals, the following impacts are predicted:

	• The loss of confirmed roosting features within a number of the structures including the bungalow, the sports hall and section 4c of the main building. These buildings are considered to support small numbers of day roosting common pipistrelle bats. • Potential disturbance and harm to roosting bats, should they be present at the time of the demolition. • Potential harm and/or disturbance to nesting birds, should works be undertaken in the breeding bird season (March to August inclusive). • The loss of habitats of up to local ecological value, including semi-mature trees and hedgerow and a small pond. • The low risk that the works may result in harm or disturbance to hedgehog which have been recorded within the site. • The low risk that works may result in harm to common toad. • The low risk of the spread of New Zealand pygmy weed and wall cotoneaster, both species listed on Schedule 9 of the Wildlife and Countryside Act 1981.
Avoidance, Mitigation and Compensation Measures	The following avoidance, mitigation and compensation measures are proposed, however these will need to be updated once the final scheme layout has been produced: • External lighting that may affect the site's suitability for bats will be avoided. If required this will be limited to low level, avoiding use of high intensity security lighting. The final lighting strategy will be determined by the results of the bat activity survey work detailed above. • Building demolition and vegetation clearance will not commence during the nesting bird season (March to August inclusive) unless the site is checked by an appropriately experienced ecologist and nests are confirmed to be absent. • Removal of New Zealand pygmy weed and wall cotoneaster will be undertaken to a method statement to prevent the spread of these species. • Demolition of the buildings where bat roosts have been recorded will not be undertaken unless under an appropriate Natural England licence. • Works on the building to be undertaken to a detailed method statement, including: • Removal of key features around potential bat roosting features by hand; • Supervision of the removal of key features by a suitably qualified ecologist. • Works will be completed under a method statement in order to minimise the risk of harm to hedgehogs. • Bat roosting opportunities will be included within the new school building. These will be required as part of the mitigation and compensation scheme under the Natural England licence.

	• At least 4 bat boxes will be erected within trees on site and will be suitable for use by small numbers of crevice roosting species. • The inclusion of bird nesting opportunities within the site.

1. Introduction

Site Location

1.1 The site is located off Avenue Road, Seaton Delaval at approximate central grid reference of NZ 3039 7511. The site location is illustrated within figure 1 (Appendix 3).

Site Description

1.2 The site comprises a large school building complex and associated playing fields. A bungalow and a small number of outbuildings are also present on site.

Objectives of the Study

1.3 The objectives of this report are:

- To identify and describe any potential ecological receptors that may be present on site or within an identified zone of influence.
- To identify and assess whether proposals may impact on the identified receptors.
- To identify potential mitigation, compensation or enhancement measures if required.
- To identify and detail further surveys, if required.

Development Proposals

1.4 Detailed development proposals are not currently available, but it is proposed to construct a new school building on site and demolish the existing building.

2. Methodology

Scope of Study

2.1 The site was surveyed to identify whether the following were present for legislative and planning purposes:

- Habitats of conservation value
- Priority Habitats
- Protected and Priority Species

2.2 The ecological characteristics of the site were reviewed to identify the scope of the assessment, with the zone of influence determined through professional judgement.

2.3 The survey area comprised the "site" defined within figure 1 (Appendix 3) and where access was available an approximate 50m buffer[1].

2.4 Access permitting, all potential bat roosting sites within the survey area were assessed.

Desk Study

2.5 Desk study was undertaken to assess the nature of the surrounding habitats and included:

- Assessment of aerial imagery and Ordnance Survey mapping.
- A search of the MAGIC website[2] for designated sites and European protected species within 2km of the survey area.
- Data searches submitted to the Local Record Centre and local Bat Group.

Field Survey

Habitats

2.6 The site was subject to a preliminary walk over, during which habitats were assessed in line with the Joint Nature Conservation Committee's Phase 1 Habitat Survey methodology[3].

Protected Species

2.7 During the survey the site was checked for evidence of protected species and the habitats/buildings were assessed for their potential to support such species.

[1] The survey buffer may be increased depending on the species present and their identified core sustenance zones.
[2] Multi Agency Geographic Information for the Countryside (www.magic.gov.uk)
[3] Handbook for Phase 1 Habitat Survey, A Technique for Environmental Audit, JNCC, 2010

Daytime Bat Risk Assessment

2.8 Survey effort has been based on the that provided by the Bat Conservation Trust Good Practice Survey Guidelines[4].

2.9 Structures and trees within the site and adjacent to the site, were fully inspected[5], where access was available, for potential roosting features (PRFs) and to record any field signs, including bats, if present[6].

2.10 Assessment follows the Bat Conservation Trust Guidelines[7], which classifies the suitability (negligible, low, moderate or high) of the potential roosting, foraging and commuting habitats within the site. Full details of the classifications are provided within the table in Appendix 2.

2.11 Survey was undertaken by James Streets BSc MSc CEcol MCIEEM (2017-29117-CLS-CLS) and Emma Gwilliam BSc MSc MCIEEM (2015-18264-CLS-CLS). Both are experienced bat surveyors who hold Class 2 Natural England survey licences for bats.

2.12 The following equipment was utilised during survey:

- Clulite CB2 high powered torch.
- Digital camera.

Preliminary Survey Conditions

2.13 The survey was undertaken on the 22nd July 2019 in the following weather conditions:

Table 2: Habitat and Protected Species Survey Conditions

Date	Temperature (℃)	Cloud Cover (%)	Precipitation	Wind Conditions
22nd July 2019	20	100	Dry	2-3W

Dusk Activity Survey

2.14 The buildings on site were considered to be of low suitability to roosting bats and one dusk survey was completed in July 2019. However, as bat roosts were recorded within

[4] Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

[5] It should be noted that assessment relates entirely on the structure or tree's suitability to support bats and or other protected species. Assessment must in no way be taken as an assessment of the structure's integrity or safety.

[6] If bats are recorded during appropriate measures are undertaken to limit any potential disturbance

[7] Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

the main school complex and the bungalow during the survey a further dusk survey of these buildings was completed in September 2019 to characterise the roosts.

2.15 Due to the number of buildings on site, each survey was completed over a number of nights. The first survey was completed on four consecutive nights from the 22nd to the 25th July. The second survey was completed on four consecutive nights from the 9th to the 12th September. The surveys were undertaken in the following weather conditions:

Table 3: Dusk Activity Survey Conditions

Date	Temperature (℃)		Cloud Cover (%)	Precipitation	Wind Conditions	Sunset Time	Survey Period
	Start	End					
22nd July 2019	20	17	10	None	SW2-3	21:27	21:10 – 23:00
23rd July 2019	24	23	0	None	SW0-1	21:26	21:10 – 23:00
24th July 2019	21	19	10	None	0	21:24	21:15 – 22:54
25th July 2019	21	19	30	None	SW2-3	21:23	21:05 – 23:00
9th September 2019	13	10	20	None	0	19:39	19:30 – 21:10
10th September 2019	15	13	100	None	F1SW	19.37	19.20 – 21.10
11th September 2019	15	14	50	None	E2-3	19.35	19.20 – 21.05
12th September 2019	16	13	70	Light shower 19:39 – 19:47	1-2 (gusts)	19:32	19:17 – 21:02

2.16 Activity surveys were undertaken in suitable weather conditions (no constant rain or high winds and sunset temperature of at least 10°C).

2.17 Surveyor locations are chosen to enclose the site to identify whether bats enter or leave the site.

2.18 Surveyors are placed where practicable to cover all potential entry/exits sites.

2.19 All surveyors are equipped with full spectrum detectors to enable high quality recordings to be taken and analysed following the survey, to allow for any potential surveyor error and to enable the cross referencing of calls.

2.20 Detectors enable the surveyors to listen to all activity during the survey.

2.21 Where required Infra-red cameras and lighting are used to provide more robust data.

2.22 Infra-red cameras and lighting were used on the 22nd July and 9th September by the surveyors covering the bungalow on site as light levels on the southern edge of the bungalow are much lower than elsewhere on site so it was considered that this would provide the best method to view emerging bats.

2.23 The activity surveys were undertaken by Mark Osborne (2015-14412-CLS-CLS & 2015-14496-CLS-CLS), James Streets (2017-29117-CLS-CLS), Emma Gwilliam (2015-18264-CLS-CLS) and a number of assistants including Victoria Mordue, Michael Underwood, Julie Dyson, Emma Archer, Amy McCallum, Zoe Dunnett and Taryn Rodgers.

2.24 The following equipment was utilised during survey:

- Anabat Swift.
- Anabat Scout.
- Elekon Bat Logger.
- Elekon Bat Scanner.

Data Analysis

2.25 Following the survey, all bat calls are manually assessed and analysed using Analook Insight, enabling the full spectrum of the call to be assessed.

2.26 Where possible bat calls are identified to species, referencing call parameters as detailed within Russ (2012)[8], Middleton et al (2014)[9] and Barataud (2015)[10].

2.27 Bats are identified to species, where possible, though it is noted that there can be a significant overlap in call parameters in some species, particularly the *Myotis* genus.

2.28 *Myotis* bat calls are assessed using a range of indicators, though due their modulated calls a number of external factors can impact the reliability. As such *Myotis* bats will often be identified as *Myotis* sp. where identification to species cannot be confirmed.

2.29 Where possible further detail on the *Myotis* species will be gathered, such as DNA. The use of full spectrum detectors gives a greater success rate in identification. This can also be backed up by computer programmes such as Bat Classify.

2.30 Although a greater certainty can be provided in other species, there is still an overlap in calls between other genera of bats such as *Pipistrellus* and *Nyctalus,* which can be

[8] Russ, J. (2012) British Bat Calls: A Guide to Species Identification. Pelagic Publishing
[9] Middleton, N., Froud, A. and French, K. (2014) Social Calls of the Bats of Britain and Ireland. Pelagic Publishing
[10] Barataud, M. (2015) Acoustic Ecology of European Bats – Species Identification, Study of their Habitats and Foraging Behaviour

affected by a range of environmental factors. The following table details the parameters utilised by OS Ecology Ltd and are based on "typical" open flight calls.

Table 4: Bat Species Identification Parameters	
Species	**Peak Frequency Range (KHz)[8]**
Pipistrellus	
Common pipistrelle	>42 and <49
Soprano pipistrelle	≥51
Nathusius' pipistrelle	<39
Common or soprano pipistrelle ('50KHz pip')	≥49 and <51
Common or Nathusius' pipistrelle ('40KHz pip')	≥40 and ≤42
Nyctalus	
Noctule	≥17 and <23.5
Leisler's	≥23.5 and <29.9
Eptesicus	
Serotine	≥24.1 and <32.2
Plectocus	
Brown Long-eared Bat	≥25.5 and <42.1
Barbastellus	
Barbastelle	≥29.2 and <44.7
Rhinolophus	
Greater Horseshoe	77-84
Lesser Horseshoe	107-114

2.31 Where there is uncertainty in species identification species are identified to genus only.

Habitat Suitability Index Assessment

2.32 A Habitat Suitability Index Assessment (HSI) was completed of the pond within the factory grounds to the east of the site on the 25th September 2019.

2.33 The assessment was completed with reference to the guidance provided by the NARRS guidance document[11].

2.34 The survey was undertaken under the following conditions:

Table 5: HSI Survey Conditions				
Date	**Temperature (℃)**	**Cloud Cover (%)**	**Precipitation**	**Wind Conditions**
25th September 2019	17	100	Light rain	0

[11] http://www.narrs.org.uk/documents/HSI%20guidance.pdf

2.35 The assessment was undertaken by Emma Gwilliam MCIEEM, an experienced surveyor who holds a Natural England Class licence for great crested newt survey.

eDNA Survey

2.36 The eDNA survey was completed in line with the guidance provided within Defra's technical advice note[12].

2.37 The purpose of eDNA survey is to determine the presence/absence of great crested newts within a pond by taking water samples during a single daytime visit and analysing them for environmental DNA (eDNA).

2.38 eDNA is DNA that is released by organisms into the environment in which they are found. In aquatic environments, the eDNA can be from shed skin cells, cells released during reproduction, waste products etc. This eDNA will persist for several weeks and can therefore still be detected if samples are taken during or immediately following the breeding season, when newts are most likely to have been active in the ponds.

2.39 To give confidence in a negative result, the samples must be collected between the 15th April and 30th June, as per the guidance provided by Natural England[13].

2.40 Sample kits were obtained from the laboratory and stored as per the instructions prior to use. One sample kit was used per pond surveyed. All equipment within the kit is sterile.

2.41 Gloves are worn throughout the collection process to reduce the risk of contamination of the samples and are changed between the collection of the samples and transfer to preserving tubes.

2.42 Samples of water were taken from 20 locations, aiming to include all habitat types, around the edge of the pond, where access was available. Care was taken to mix the water column but avoid disturbing the substrate.

2.43 Once collected the samples were combined in a sterile bag and shaken for at least ten seconds to ensure the samples were well mixed and to prevent eDNA settling to the bottom.

[12] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths Ra, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

[13] https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects (Accessed December 2019

2.44 Following this 15ml of sampled water was pipetted into each of six tubes which already contain 35ml of ethanol to preserve the sample. Each tube was then shaken for 10 seconds to ensure the two were mixed.

2.45 The samples were then stored as per the instructions provided with the kit and returned to the laboratory for analysis.

2.46 The eDNA survey was undertaken on the 16th April 2020 under the following conditions:

Table 6: eDNA Survey Conditions				
Date	**Temperature**	**Cloud Cover**	**Precipitation**	**Wind Conditions**
16.04.2020	14°C	20%	None	0-1

2.47 The eDNA survey was completed by James Streets CEcol MCIEEM, an experienced surveyor who holds a Natural England Class licence for great crested newt survey.

Limitations to Survey Work

2.48 There were not considered to be any major constraints to survey. Trees were in leaf but due to their age and size it is considered that sufficient information was obtained to assess their value to bats.

Assessment Methodology

2.49 Guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM) is utilised to provide receptor valuations.

2.50 The level of value of specific ecological receptors is assigned using a geographic frame of reference. For, example international value being most important (SACs, SPAs and pSPAs), then national (SSSIs), regional, county (LWS), district (LNR), local and lastly, within the immediate zone of influence of the site only (low).

2.51 In terms of species, for example breeding birds, should the population within the site constitute greater than 1% of the geographic population, it would be considered significant at that level. In addition, presence of designated sites, scarce species and or quality[14]/diversity of habitats are used to guide that valuation

2.52 Assessment methods for bats have been undertaken with reference to Wray et al. (2007)[15], which correlates with the geographic frame of reference. Within which they

[14] Quality can be subjective and vary in different geographic areas. Reasoned professional judgement is therefore used to inform the assessment.
[15] Wray et al (2007) Valuing Bats in Ecological Impact Assessment. In Practice. Based on a presentation at the Mammal Society – Specific Issues with Bats

define the relative rarity of each species based on the known distribution[16] at the time and the value of the roost type, assuming that roosts such as feeding perches are of lower value that maternity roosts or sites that have a high level of fidelity.

[16] It should be noted that there are regular changes to our understanding of distribution as further studies are undertaken.

3. Results

Desk Study

Designated Sites

3.1 A search of the Multi Agency Geographic Information for the Countryside (MAGIC) Website[17] identified two Sites of Special Scientific Interest (SSSIs) and a Local Nature Reserve (LNR) within the 2km search area.

Table 7: Designated Sites

Designation	Site Name	Reason for Designation	Distance from Survey Area (Closest point)
SSSI	New Hartley Ponds	Group of ponds supporting good amphibian populations, including a large population of great crested newts.	1km
	Holywell Pond	Large pond used by wintering and migratory waterfowl.	1.1km
SSSI Impact Risk Zone (IRZ) The site is found within an identified SSSI impact Risk Zone for the above sites. However the development does not fall within the identified risk categories and as it is understood that the school will remain on site adverse impacts on these sites are not anticipated.			
LNR	East Cramlington		1.3km

European Protected Species

3.2 The MAGIC website highlighted that two European Protected Species Licences have been granted within the 2km search area, pertaining to the following species:

- Common pipistrelle (destruction of a resting place 2013-2014)
- Great crested newt (destruction of a resting place 2013-2020)

Priority Habitats

3.3 In addition to the European Protected Species, although unaffected by the proposals, the MAGIC website also highlighted the presence of ancient and semi-natural woodland and the following priority habitats within the 2km search area:

- Deciduous woodland
- Reedbeds

[17] Multi Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk (Accessed March 2019)

General Land use

3.4 The site is surrounded by residential development to the north, east and west, with a factory to the south. Beyond the areas of development arable and pasture fields dominate, with occasional blocks of woodland.

3.5 Holywell Dene Lies approximately 570m to the south of the site, through which flows the Seaton Burn.

3.6 A pond is shown on the Ordnance Survey map within the grounds of the factory to the south of the site, within 50m of the boundary.

Data Search

Local Records Centre

3.7 Consultation with the Environmental Records Information Centre for the North East (ERIC NE) found that in addition to the above sites there are two non-statutorily designated sites within 2km of the development site. These are East Cramlington Pond Local Wildlife Site (LWS) and the Backworth C Pit Plantation Site of Local Conservation Interest (SLCI). Both the LWS and SLCI lie over 1km from the site and no adverse impacts are predicted as a result of the development.

3.8 The table below detailed the protected and notable species records provided by ERIC NE that date from within the past 10 years. Given the extensive number of records from Holywell Pond SSSI these are excluded from the table and are listed within a separate table in the appendices.

Table 8: Records from LRC Data Search

Taxon	Species	No. of Records within Search Area	Records of Particular Note
Amphibians	Common toad	2	-
	Great crested newt	10	From New Hartley SSSI and East Cramlington Pond
Mammals (excluding bats)	Hedgehog	28	-
	Brown hare	2	-
	Otter	6	-
	Badger	1	-
	Red squirrel	204	390m away in 2010
Bats	Whiskered/Brandt's	2	-
	Noctule bat	4	-
	Pipistrelle sp.	3	-
	Common pipistrelle	25	-
	Soprano pipistrelle	7	-
	Bats	15	-
Butterflies	Wall	23	-
Birds	Skylark	7	-
	Red-legged partridge	4	-

	Shoveler	4	-
	Teal	4	-
	Wigeon	2	-
	Gadwall	2	-
	White-fronted goose	4	-
	Greylag goose	22	-
	Pink-footed goose	27	-
	Bean goose	2	-
	Tundra bean goose	2	
	Meadow pipit	1	-
	Swift	13	-
	Short-eared owl	3	-
	Long-eared owl	1	-
	Little owl	1	-
	Pochard	2	-
	Dunlin	5	-
	Linnet	5	-
	Little ringed plover	1	-
	Black-headed gull	4	-
	Dipper	3	-
	Marsh harrier	3	-
	Stock dove	3	-
	House martin	5	-
	Lesser spotted woodpecker	1	-
	Yellowhammer	6	-
	Reed bunting	4	-
	Kestrel	12	-
	Snipe	1	-
	Oystercatcher	5	-
	Herring gull	3	-
	Common gull	2	-
	Great black-backed gull	2	-
	Black-tailed godwit	1	-
	Common scoter	1	-
	Gannet	1	-
	Grey wagtail	2	-
	Spotted flycatcher	1	-
	Curlew	11	-
	Whimbrel	1	-
	House sparrow	13	-
	Tree sparrow	14	-
	Grey partridge	6	-
	Willow warbler	7	-
	Golden plover	10	-
	Black-necked grebe	1	-
	Dunnock	7	-
	Bullfinch	9	-
	Tawny owl	1	-

	Starling	5	-
	Wood sandpiper	1	-
	Greenshank	2	-
	Green sandpiper	2	-
	Redshank	9	-
	Redwing	1	-
	Willow tit	2	-
	Marsh tit	1	-
	Dunnock	14	-
	Bullfinch	6	-
	Tawny owl	1	-
	Starling	10	-
	Redshank	2	-
	Redwing	3	-
	Song thrush	7	-
	Fieldfare	4	-
	Mistle thrush	1	-
	Barn owl	1	-
	Lapwing	17	-

Local Bat Group

3.9 The local bat group hold no bat records from the site itself.

3.10 They provided records of roosts of bats (7), brown long-eared bats (1), common pipistrelle (10), soprano pipistrelle (3) pipistrelle bats (11), Natterer's bat (1) and *Myotis* sp. (4) from within 2km of the site, including hibernation and maternity roosts. A number of these records may originate from the same location.

3.11 Flight records of bats of common pipistrelle, soprano pipistrelle, pipistrelle sp., *Myotis* sp., noctule and brown long-eared bats from within 2km were also provided.

Field Survey

Habitats

Table 9: On-site Habitats
Overview of habitats The site comprises a large school complex, bungalow and outbuildings, with playing fields to the west. Semi-mature tree planting is present, predominantly at the site boundaries. A small, dry pond was recorded within an area of scrub to the south of the site. There are areas of introduced shrub planting around the site. Habitats on site are considered to be of low value, with the exception of the bounding hedgerows mature trees and dry pond, which are considered to be of local value.

The habitats within the site are illustrated within figure 3.

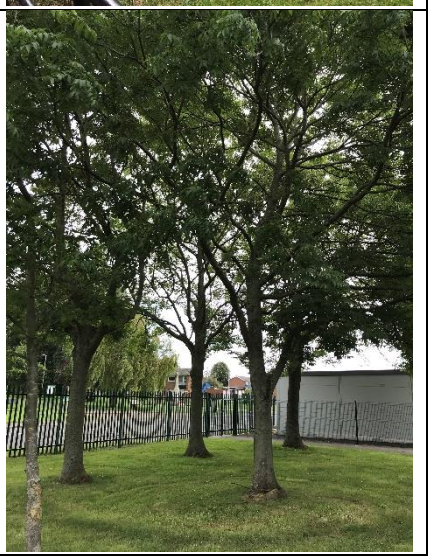
Amenity Grassland

The playing fields and other smaller areas of amenity grassland on site were mown to approximately 5cm at the time of survey.

The areas of amenity grassland are dominated by perennial rye grass (*Lolium perenne*), with daisy (Bellis perennis), dandelion (*Taraxacum officinale* agg.) and white clover (*Trifolium repens*) recorded.

Hedgerow

Hedgerows are present along the western and part of the northern site boundaries. Where present, they are hawthorn (*Crataegus monogyna*) dominated and to a height of approximately 2m.

Introduced Shrub A number of small areas of introduced shrub are present around the site. A small area of vegetable and herb planting is also present to the centre of the school complex. There are also small areas of invasive species present within the site, namely wall Cotoneaster.	 
Trees There are a small number of trees on site including ash (*Fraxinus excelsior*) and oak (*Quercus* sp.). None of the trees were considered to have the potential to support roosting bats.	

Target Notes

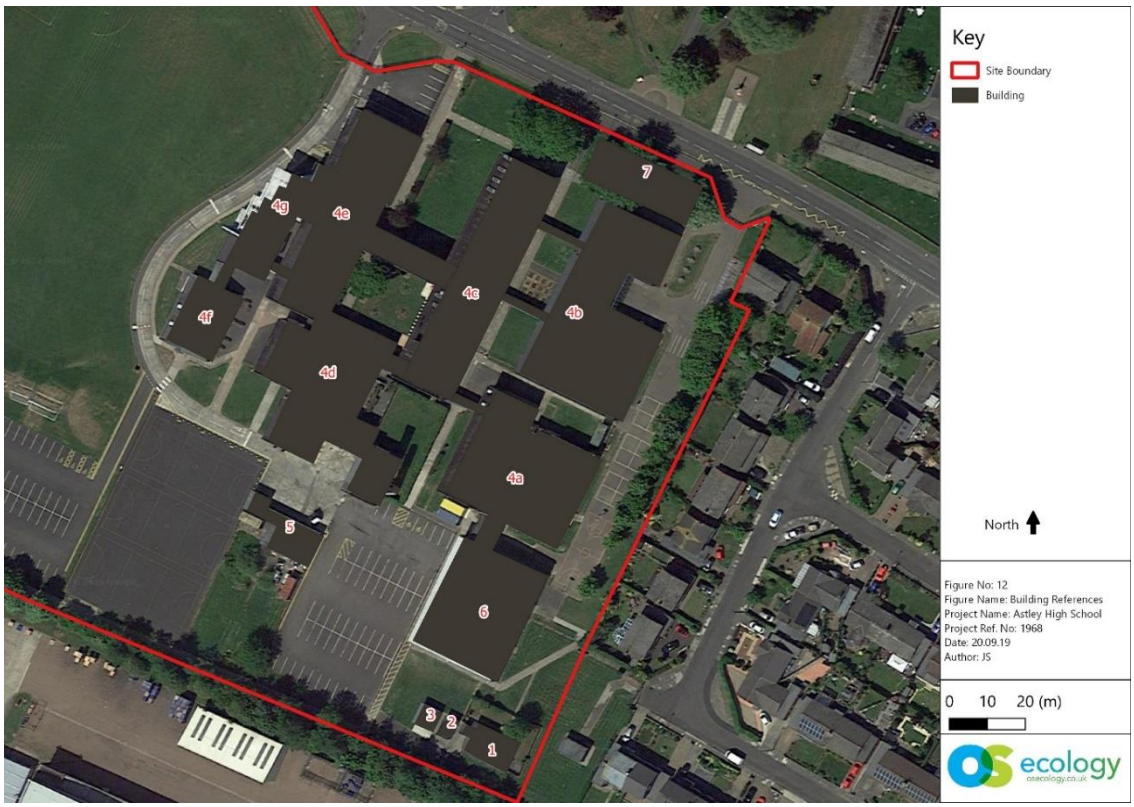
Table 10: Target Notes

Target Note 1 – Dry Pond A small, dry pond was recorded within an area of dense scrub to the south of the main school complex. This is approximately 1m by 1m in size and covered by a metal grid. Aquatic vegetation was limited to a small area of yellow flag iris (*Iris pseudacorus*) adjacent to it and New Zealand Pygmy Weed (*Crassula helmsii*) within it. ***New Zealand Pygmy Weed is listed on Schedule 9 of the Wildlife and Countryside Act as an invasive, non-native species. As such, it is an offence to cause this species to spread in the wild.***	
Target Note 2 – Offsite pond A pond is present within the grounds of the factory to the south of the site. It is likely to have been created as part of the drainage system for the factory site but appears unlikely to dry out on a regular basis, if at all. It is surrounded by willow (*Salix* sp.) scrub, which shades the majority of the margins. Vegetation was covering approximately 40% of the ponds surface at the time of survey and predominantly comprised *Typha* sp. and pond weed (*Potamogeton* sp.). There were no waterfowl present at the time of survey although staff on site reported seeing heron and other species may use the pond on occasion. No fish were recorded, but there is potential for them to be present. Water quality appears good.	 
Target Note 3 – Wall Cotoneaster Wall cotoneaster (*Cotoneaster horizontalis*) is present growing on a small wall to the south east of the site. ***Wall cotoneaster is listed on Schedule 9 of the Wildlife and Countryside Act as an invasive, non-native species. As such, it is an offence to cause this species to spread in the wild.***	

Protected Species

Bats

3.12 The site comprises a range of structures associated with Astley High School, including a complex made up of a number of buildings linked by walkways, as well as three buildings which are not linked to the others and two timber sheds. The location of the buildings is presented below and in the appendices:



3.13 The results of the bat risk assessment of the structures on site is provided below:

Table 11: Bat Risk Assessment		
Building 1 - Bungalow		
Building type	Single storey bungalow used for teaching with a single storey extension to the west.	
Building height	Single storey.	
Roof type	Tiled, pitched roof with gable ends to the east and west. The extension has a flat roof.	
Roof material	Tiles and roofing felt on the single storey extension.	
Roof height	Approximately 2.5m to the wall tops of the main building.	
Ridge tiles	Generally well-sealed, however small gaps in the mortaring were noted.	

Coping tiles	N/A	
Gable ends	No gaps associated specifically with the roofing materials at the gable ends internally or externally.	
Chimney	Vent present on the roof but no gaps associated with it.	
Skylights/velux	N/A	
Roof condition	Generally good with no gaps in the tiles noted.	
Other Roof Features	N/A	
Roof lining	The roof is lined with tradition roofing felt.	
Roof support system	The roof is supported on a timber truss.	
Ridge beam	No evidence of bat use along the timber beam.	
Flashing	Well-sealed around the vent in the roof.	
Soffits	Timber soffits surround the property and there are gaps where the timber meets the wall	
Fascia boarding	Well-sealed with the soffits where present. On the single storey extension there are timber fascia boards which are well sealed.	
Bargeboards	N/A	
Wall material and condition	Rendered blockwork and brick – well sealed with no gaps recorded.	
Lintels and sills – material and condition	uPVC where present and well sealed.	
Windows – material and condition	uPVC, well sealed.	
Doors – material and condition	Timber, well-sealed.	
Other wall features	None.	
Evidence of Bats	None recorded.	

Buildings 2 and 3 – Storage Sheds		
Building type	Two small garden shed buildings.	
Building height	Single storey.	
Roof type	Flat roofs.	
Roof material	Timber plyboard with a roofing felt covering.	
Roof height	2.5m.	
Roof condition	Good.	

Other Roof Features	None.	
Flashing	None.	
Soffits	None .	
Fascia boarding/ bargeboards	Well-sealed timber boards.	
Wall material and condition	Timber and well-sealed.	
Lintels and sills – material and condition	Well-sealed timber .	
Windows – material and condition	N/A	
Doors – material and condition	Timber and well-sealed.	
Other wall features	None.	
Evidence of Bats	None recorded.	

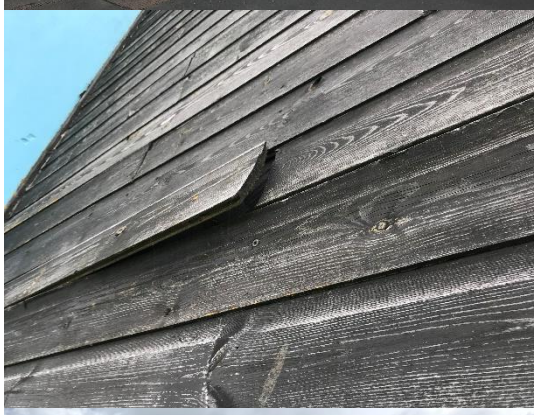
Building 4a – Main School		
Building type	A section of the main school to the south east of the complex.	
Building height	Single storey.	
Roof type	Flat roof.	
Roof material	Roofing material appears to be felt .	
Roof height	The building comprises three sections with varying heights from 2.5-4m.	
Ridge tiles	N/A	
Coping tiles	N/A	
Gable ends	N/A	
Chimney	There are no chimneys on this section of the structure.	
Skylights/velux	There are roofing vents on the roof.	
Roof condition	The roof appears to be in good condition from what could be seen.	
Other Roof Features	There is a small single storey timber structure on the roof of the building.	
Soffits	Above the windows the soffit boards appear to be in good condition.	
Fascia boarding	Fascia boarding, where present is generally in good condition however there are sections which have lifted where they are present at the wall tops.	
Bargeboards	None present.	
Wall material and condition	The building is brick and well-sealed with no gaps associated with the brickwork recorded.	
Lintels and sills – material and condition	These features are uPVC and well-sealed.	
Windows – material and condition	These features are uPVC and well-sealed.	
Doors – material and condition	Timber and in good condition.	
Other wall features	The building is linked to the sports hall by a single storey section of the building which is of similar design, and by a walkway to the west.	
Evidence of Bats	None recorded.	

Building 4b – Main School		
Building type	A section of the main school to the north east of the complex.	
Building height	Single storey.	
Roof type	Flat roof	
Roof material	Roofing material appears to be felt.	
Roof height	The building is approximately 3m in height.	
Ridge tiles	N/A	
Coping tiles	N/A	
Gable ends	N/A	
Chimney	There are no chimneys on this section of the structure.	
Skylights/velux	There are roofing vents on the roof.	
Roof condition	The roof appears to be in good condition from what could be seen.	
Other Roof Features	None.	
Soffits	Above the windows the soffit boards appear to be in good condition.	
Fascia boarding	Fascia boarding, where present is generally in good condition however there are sections which have lifted where they are present at the wall tops.	
Bargeboards	None present	
Wall material and condition	The building is brick and well-sealed with no gaps associated with the brickwork recorded.	
Lintels and sills – material and condition	These features are uPVC and well-sealed.	
Windows – material and condition	These features are uPVC and well-sealed.	
Doors – material and condition	Timber and in good condition.	
Other wall features	To the central eastern section there is a glazed entrance area to the school building.	
Evidence of Bats	None recorded.	

Building 4c – Main School		
Building type	A section of the main school to the centre of the complex.	  
Building height	Two storey.	
Roof type	Flat roof.	
Roof material	Appears to be a modern sheet material.	
Roof height	6-8m.	
Chimney	None.	
Skylights/velux	None.	
Roof condition	Appears to be good.	
Other Roof Features	There is a single timber shed apparent.	
Soffits	Generally well-sealed with only a small number of gaps noted around the building link which is a walkway.	
Fascia boarding	Some gaps under boarding at the wall tops.	
Bargeboards	None recorded.	
Wall material and condition	Brick – well sealed.	
Lintels and sills – material and condition	Some gaps apparent in places.	
Windows – material and condition	There are small gaps in some of the windows between sections of glazing and associated sheet materials.	
Doors – material and condition	Timber and in good condition.	
Other wall features	No other features recorded.	
Evidence of Bats	None recorded.	

Building 4d – Main School		
Building type	A section of the main school to the centre of the complex.	
Building height	Single storey, however there is one section which comprises a hall which is a greater height than the other sections.	
Roof type	Flat roofed.	
Roof material	Modern sheet material.	
Roof height	3-8m.	
Chimney	There are two large industrial type chimneys associated with this section of the school, however neither have suitable opportunities for bats.	
Skylights/velux	There are a number of vents on the roofs.	
Roof condition	Roofs appear to be in good condition.	
Other Roof Features	None.	
Soffits	Soffits, where present appear to be in moderate condition.	
Fascia boarding	There are gaps in places associated with these features however in general they appear to be in good condition.	
Bargeboards	Not present.	
Wall material and condition	Brick, well-sealed.	
Lintels and sills – material and condition	uPVC where present and well sealed.	
Windows – material and condition	uPVC and well-sealed.	
Doors – material and condition	Timber and in good condition.	
Other wall features	None recorded.	
Evidence of Bats	None recorded.	

Building 4e – Main School		
Building type	A section of the main school to the centre of the complex, very similar to building 4d.	
Building height	Two storey.	
Roof type	Flat roof.	
Roof material	Appears to be a modern sheet material.	
Roof height	6-8m.	
Chimney	None.	
Skylights/velux	None.	
Roof condition	Appears to be good.	
Other Roof Features	None.	
Soffits	Generally well-sealed with only a small number of gaps noted around the building link which is a walkway.	
Fascia boarding	Some gaps under boarding at the wall tops.	
Bargeboards	None recorded.	
Wall material and condition	Brick – well sealed.	
Lintels and sills – material and condition	Some gaps apparent in places.	
Windows – material and condition	There are small gaps in some of the windows between sections of glazing and associated sheet materials.	
Doors – material and condition	Timber and in good condition.	
Other wall features	No other features recorded.	
Evidence of Bats	None recorded.	

Building 4f – Main School		
Building type	Part of the main school complex to the south west.	
Building height	Single storey.	
Roof type	These buildings have pitched roofs with the southernmost building in this section having an offset, pitched roof with glazing between the two sections of roof.	
Roof material	Modern sheet materials.	
Roof height	4-6m.	
Ridge tiles	Not present.	
Coping tiles	Not present.	
Gable ends	Well-sealed with the roofing materials with no obvious bat roosting opportunities noted.	
Chimney	None present.	
Skylights/velux	None present although a small number of roofing vents were noted.	
Roof condition	The roof appeared to be in good condition.	
Other Roof Features	No other roofing features were noted.	
Flashing	Where present this appear to be in good condition.	
Soffits	Soffits are in good condition.	
Fascia boarding	Sections of fascia boarding were noted to have potential opportunities for roosting bats.	
Bargeboards	The barge boards are well sealed where present.	
Wall material and condition	The walls are brick and in good condition.	
Lintels and sills – material and condition	Some gaps apparent in places.	
Windows – material and condition	There are small gaps in some of the windows between sections of glazing and associated sheet materials.	
Doors – material and condition	Timber and in good condition.	
Other wall features	On the western elevation of the northern structure there is timber cladding on the walls which has come away in places.	
Evidence of Bats	None recorded.	

Section 4g - Modern Extension		
Building type	Two storey modern extension to the existing school building.	
Building height	10m.	
Roof type	Largely flat roofed.	
Roof material	Unclear but likely to be modern flat roof material.	
Roof height	N/A	
Ridge tiles	None.	
Coping tiles	None, although some sections of the walls extend above the roof. These appear to be well sealed however.	
Gable ends	None.	
Chimney	N/A	
Skylights/velux	None.	
Roof condition	Good from what was visible.	
Other Roof Features	N/A	
Flashing	N/A	
Soffits	Appear tightly fitted with no gaps noted.	
Fascia boarding	Modern sheet materials where present. No gaps recorded.	
Bargeboards	None recorded.	
Wall material and condition	Modern sheet materials, rendered blockwork and exposed blockwork. No gaps recorded.	Back wall of the extension described here (blue wall at the back of the photo).
Lintels and sills – material and condition	Well-sealed with the surrounding walls.	
Windows – material and condition	uPVC which appears tightly fitted.	
Doors – material and condition	uPVC or similar, well-sealed.	
Other wall features	No other features of use to bats recorded.	
Evidence of Bats	None recorded.	

Building 5 – Storage buildings		
Building type	Detached building away from the main school complex.	
Building height	Single storey.	
Roof type	Flat.	
Roof material	Modern sheet materials.	
Roof height	3-4m.	
Chimney	None present.	
Skylights/velux	None present.	
Roof condition	The roof appears to be in good condition.	
Other Roof Features	None.	
Soffits	These appear to be in good condition generally.	
Fascia boarding	There are a small number of gaps associated with these features however in general they appear to be in good condition.	
Wall material and condition	Brick, in good condition.	
Lintels and sills – material and condition	Well sealed uPVC.	
Windows – material and condition	Well sealed uPVC.	
Doors – material and condition	Timber, well sealed.	
Other wall features	None recorded.	
Evidence of Bats	None recorded.	

Building 6 – Sports Hall		
Building type	Large modern sports hall.	 
Building height	Single storey, however two storey in height.	
Roof type	Pitched.	
Roof material	Modern sheet materials.	
Roof height	6-8m.	
Chimney	None present.	
Skylights/velux	None present.	
Roof condition	The roof appears to be in good condition.	
Other Roof Features	None.	
Soffits	These appear to be in good condition generally.	
Fascia boarding	There are a small number of gaps associated with these features at the gable ends.	
Wall material and condition	Brick on the gable ends in good condition, modern sheet metal on the other two elevations, again in good condition.	
Lintels and sills – material and condition	None present in main structure.	
Windows – material and condition	None present in main structure.	
Doors – material and condition	Timber, well sealed.	
Other wall features	None recorded.	
Evidence of Bats	None recorded.	

Building 7 – Portacabin		
Building type	Temporary classrooms.	 
Building height	Single storey.	
Roof type	Flat.	
Roof material	Modern sheet materials.	
Roof height	3-4m.	
Chimney	None present.	
Skylights/velux	None present.	
Roof condition	The roof appears to be in good condition.	
Other Roof Features	None.	
Soffits	None present.	
Fascia boarding	Well-sealed.	
Wall material and condition	Modern sheet materials – well sealed.	
Lintels and sills – material and condition	uPVC, well-sealed.	
Windows – material and condition	uPVC, well-sealed.	
Doors – material and condition	Appears to be composite, well-sealed.	
Other wall features	None recorded.	
Evidence of Bats	None recorded.	

Table 12: Bat Habitat Appraisal	
Foraging Habitats The site provides a range of foraging opportunities to bats, primarily associated with the hedgerow and mature trees. Plantations in the wider area will also provide foraging habitat to locally roosting bats.	
Commuting Routes The site is linked to habitats in the wider area by mature hedgerow, which lead to the south, east and west.	
Alternative Roosting Opportunities Numerous alternative roosting opportunities are present in the local area, with residential housing present to the north, a middle school to the east and mature trees in the wider landscape.	
Summary Buildings on site are considered to provide several opportunities for roosting bats, with abundant foraging habitat present surrounding the site.	

3.14 Details of the bat survey results are presented in the appendices. Overall four common pipistrelle bat roosts were recorded within the site. These were located on the bungalow (building 1), on the sports hall (building 6) and two from building 4c. These roosts are considered to be day roosts used by small numbers of bats on an occasional basis. No evidence of a maternity roost was recorded. There remains a risk that the buildings are used by hibernating bats however. No other bats were recorded roosting within the building although small numbers of soprano pipistrelle and noctule bats were recorded commuting within the local area during survey work.

Additional Species Groups

Birds

3.15 The building may provide opportunities for nesting birds. Species such as starling are likely to nest on buildings in this area.

3.16 The trees on site may provide nesting and foraging opportunities for birds, and the playing field has potential to support foraging bird, potentially including gulls.

Great crested newt

3.17 The site offers low quality terrestrial habitats for great crested newts overall, with small areas of scrub and hedgerow offering some limited opportunities.

3.18 The pond on site was not holding water at the time of survey and is considered likely to be dry for the majority of the year. Given this and its small size, it is considered unlikely that it would support breeding great crested newts.

3.19 The pond to the south of the site has an average HSI score. eDNA survey of the pond returned a negative result, indicating that great crested newts are likely to be absent.

Other protected species

3.20 It is considered that other protected species are likely absent given the nature and location of the site. The site provides a foraging area for hedgehog. Common toad may also be present on site on occasion. Both of these species are national priority species.

4. Site Assessment

Assessment of survey findings

4.1 The assessment is based on survey effort undertaken to date.

Habitats

4.2 Habitats on site are considered to be of no more than local value, comprising school buildings and playing field with some tree and hedgerow planting to the site boundaries.

4.3 Wall cotoneaster and New Zealand Pygmy Weed have been recorded on site, which if they are to be affected by the works should be removed to a method statement.

Bats

4.4 The initial bat assessment of the site concluded that the buildings are of low suitability for roosting bats being relatively well sealed in an urban area.

4.5 Survey in July 2019 recorded low levels of common pipistrelle flight activity in the local area, with roosts recorded associated with the bungalow, sports hall and section 4c of the main building.

4.6 Survey in September 2019 recorded a similar level of activity and a roost within section 4c of the main building, but from a location different to that recorded in July.

4.7 It is considered that based on the results of the survey works to date, the building supports four small day roosts used by common pipistrelle bats. The buildings are not considered to support a maternity roost.

4.8 The urban nature of the site is likely to limit the potential for void roosting species (Natterers bat and brown long-eared bats) to be present and these species were not recorded on site.

4.9 Foraging habitat on site is of low value, and as a result is unlikely to support large numbers of bats. The site is in close proximity to areas of better-quality habitat, however the level of activity on site in July further confirms that larger numbers of bats such as maternity roosts are likely to be absent.

4.10 The buildings provide opportunities for bat throughout the year, with the walls potentially providing opportunities to hibernating bats.

Nesting Birds

4.11 The site provides potential opportunities for nesting birds, within the buildings and trees on site, such as starling and house sparrow.

4.12 The habitats on site will provide foraging opportunities for bird species, potentially including gulls on the playing field.

Great Crested Newt

4.13 Survey of the pond within 50m to the south of the site found that great crested newts are absent. Given this, the unsuitability of the pond on site and the lack of other known ponds within 500m of the site, great crested newts are unlikely to be impacted by the development.

Other protected species

4.14 Hedgehog, which is a national priority species is known to use the site as well as other greenspace in the local area.

4.15 Common toad, also a national priority species, may also be present on site at times.

Designated sites

4.16 No impacts on designated sites are predicted.

5. Impacts

5.1 The following impacts are based on the survey work to date and the understanding that the existing school building will be demolished following the construction of a new school building on the western side of the site.

5.2 As a result of the assessment completed and the nature of the proposed works, the likely impacts, without appropriate avoidance measures, mitigation and/or compensation scheme, are:

- The loss of confirmed roosting features within a number of the structures including the bungalow, the sports hall and section 4c of the main building. These locations are considered to support small numbers of day roosting common pipistrelle bats.
- Potential disturbance and harm to roosting bats, should they be present at the time of the demolition.
- Potential harm and/or disturbance to nesting birds, should works be undertaken in the breeding bird season (March to August inclusive).
- The loss of habitats of up to local ecological value, including semi-mature trees and hedgerow and a small pond.
- The low risk that the works may result in harm or disturbance to hedgehog which have been recorded within the site.
- The low risk that works may result in harm to common toad.
- The low risk of the spread of New Zealand pygmy weed and wall cotoneaster, both species listed on Schedule 9 of the Wildlife and Countryside Act 1981.

6. Recommendations

Further Survey

6.1 Should no demolition of the buildings take place within 12 months of the last activity survey, additional updating survey work for bats is likely to be required.

6.2 Should no works on site have commenced by March 2022, it is likely that updating survey work for great crested newts will be required.

Avoidance Measures

6.3 The following measures should be incorporated into the design of the scheme to avoid impacts on wildlife:

- External lighting that may affect the site's suitability for bats will be avoided. If required this will be limited to low level, avoiding use of high intensity security lighting. The final lighting strategy will be determined by the results of the bat activity survey work detailed above.
- Building demolition and vegetation clearance will not commence during the nesting bird season (March to August inclusive) unless the site is checked by an appropriately experienced ecologist and nests are confirmed to be absent.
- Alternatives to timber treatments that are injurious to mammals will be sought and used on site (see http://www.jncc.gov.uk/pdf/batwork_manualpt4.pdf).
- Removal of New Zealand pygmy weed and wall cotoneaster will be undertaken to a method statement to prevent the spread of these species.

Mitigation Strategy

6.4 The following elements of mitigation are proposed to address the impacts on bats which cannot be avoided:

- Demolition of the buildings where bat roosts have been recorded will not be undertaken unless under an appropriate Natural England licence.
- Works on the building to be undertaken to a detailed method statement, including:

  a) Removal of key features around potential bat roosting features by hand;
  b) Supervision of the removal of key features by a suitably qualified ecologist.

- Works will be completed under a method statement in order to minimise the risk of harm to hedgehogs.

Compensation Scheme

6.5 The following elements of compensation are proposed to address the impacts which cannot be avoided:

- Bat roosting opportunities will be included within the new school building. These will be required as part of the mitigation and compensation scheme under the natural England licence.
- At least 4 bat boxes will be erected within trees on site and will be suitable for use by small numbers of crevice roosting species.
- The inclusion of bird nesting opportunities within the site.

Appendix 1 – Bat Suitability and Survey Effort

Classifications of suitability are based on those provided within the Bat Conservation Trust Good Practice Survey Guidelines[18], with the table below taken from page 35 of the guidelines (table 4.1).

Table 13: Guidelines for assessing the potential suitability of proposed development sites for bats
(based on the presence of habitat features within the landscape, to be applied using professional judgement)

Suitability	**Description**	
	Roosting Habitats	**Commuting and foraging habitats**
Negligible	Negligible habitat features on site, likely to be used by roosting bats	Negligible habitat features on site, likely to be used by commuting and foraging bats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[a] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation[b]. A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential[c].	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or unvegetated stream, but isolated, i.e not very well connected to the surrounding landscape by other habitat. Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions[a] and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats	Continuous high-quality habitat that is well connected to the wider landscape that is

[18] Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

	on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions[a] and surrounding habitat	likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourse and grazed parkland. Site is close to and connected to known roosts.
a. For example in terms of temperature, humidity, height above ground level, light levels or levels of disturbance. b. Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten et al., 2015). This phenomenon requires some research in the UK but ecologists should be aware of potential for larger numbers of this species to be present during the autumn and winter in larger buildings in highly urbanised environments. c. The system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015)		

The classification of the suitability relates to the level of further survey recommended.

Table 14: Survey effort and timing depending on suitability of the structure or tree (Tables 7.1-7.3 in the BCT Guidelines

	Low roost suitability	**Moderate roost suitability**	**High roost suitability**
Survey Effort	One survey visit One dusk emergence or dawn re-entry survey	Two separate visits One dusk emergence and a separate dawn re-entry survey	Three separate visits At least one dusk emergence and a separate dawn re-entry survey. The third can be either dusk or dawn.
Timings	May-August (structures) No further survey (trees)	May to September. At least one must be in the optimum period (May to August)	May to September. two must be in the optimum period (May to August)
If bats are recorded	If bats emerge during surveys, the survey schedule will be adjusted to increase the survey effort so that enough information can be collected to characterise the roost and provide data should a Natural England Licence be required.		

Appendix 2 – Policy and Legislation

Planning Policy

National Planning Policy Framework (NPPF)[19]

The revised National Planning Policy Framework sets out the government's planning policies for England and how these are expected to be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced. Planning law requires that applications for planning permission be determined in accordance with the development plan. The key paragraphs from the relating to the natural environment are detailed below:

Table 15: Ecologically Relevant Paragraphs of the NPPF

Paragraph	Statement
170	Planning policies and decisions should contribute to and enhance the natural and local environment by: a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate; d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.
171	Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework[20]; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.
172	Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads[21]. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development[22] other

[19] NPPF February 2019 (https://www.gov.uk/government/publications/national-planning-policy-framework--2)
[20] Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.
[21] English National Parks and the Broads: UK Government Vision and Circular 2010 provides further guidance and information about their statutory purposes, management and other matters.
[22] For the purposes of paragraphs 172 and 173, whether a proposal is 'major development' is a matter for the decision maker, taking into account its nature, scale and setting, and whether it could have a significant adverse impact on the purposes for which the area has been designated or defined.

Table 15: Ecologically Relevant Paragraphs of the NPPF	
Paragraph	**Statement**
	than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of: a) the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy; b) the cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.
173	Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.
174	To protect and enhance biodiversity and geodiversity, plans should: a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity[23]; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation[24]; and promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.
175	When determining planning applications, local planning authorities should apply the following principles: a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), b) adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; c) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest; d) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons[25] and a suitable compensation strategy exists; and development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.
176	The following should be given the same protection as habitats sites: a) potential Special Protection Areas and possible Special Areas of Conservation;

[23] Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.
[24] Where areas that are part of the Nature Recovery Network are identified in plans, it may be appropriate to specify the types of development that may be suitable within them.
[25] For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.

Table 15: Ecologically Relevant Paragraphs of the NPPF	
Paragraph	**Statement**
	b) listed or proposed Ramsar sites[26]; and sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.
177	The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

Government Circular ODPM 06/2005 Biodiversity and Geological Conservation[27] (England only)

This Circular provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England.

Part IV - Conservation of Species protected by Law details that the presence of a protected species is a material consideration when considering a development proposal that may result in harm to the species or its habitat and that planning authorities must have regard to species protected under the Habitat Regulations.

It goes on to say that: *it is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted.*

Natural Environment and Rural Communities (NERC) Act 2006[28] [29]

Section 40 – To conserve biodiversity

Section 40 puts a duty on public authorities to conserve biodiversity when undertaking its duties and functions,

Section 41 – Biodiversity list and Action

Section 41 – Requires the Secretary of State *to publish a list of the living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose*

[26] Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site.
[27]ODPM Circular 06/2005 Office of the Deputy Prime Minister Eland House, Bressenden Place, London SWIE 5DU Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System
[28] https://www.legislation.gov.uk/ukpga/2006/16/section/40
[29] https://www.legislation.gov.uk/ukpga/2006/16/section/41

of conserving biodiversity. They must also *take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section or promote the taking by others of such steps*.

The 2007 lists were superseded by the UK Post-2010 Biodiversity Framework.

Table 16: UK Priority Habitats (excl. marine habitats)[30]

UK BAP broad habitat	UK BAP priority habitat
Rivers and Streams	Rivers
Standing Open Waters and Canals	Oligotrophic and Dystrophic Lakes
	Ponds
	Mesotrophic Lakes
	Eutrophic Standing Waters
	Aquifer Fed Naturally Fluctuating Water Bodies
Arable and Horticultural	Arable Field Margins
Boundary and Linear Features	Hedgerows
Broadleaved, Mixed and Yew Woodland	Traditional Orchards
	Wood-Pasture and Parkland
	Upland Oakwood
	Lowland Beech and Yew Woodland
	Upland Mixed Ashwoods
	Wet Woodland
	Lowland Mixed Deciduous Woodland
	Upland Birchwoods
Coniferous Woodland	Native Pine Woodlands
Acid Grassland	Lowland Dry Acid Grassland
Calcareous Grassland	Lowland Calcareous Grassland
	Upland Calcareous Grassland
Neutral Grassland	Lowland Meadows
	Upland Hay Meadows
Improved Grassland	Coastal and Floodplain Grazing Marsh
Dwarf Shrub Heath	Lowland Heathland
	Upland Heathland
Fen, Marsh and Swamp	Upland Flushes, Fens and Swamps
	Purple Moor Grass and Rush Pastures
	Lowland Fens
	Reedbeds
Bogs	Lowland Raised Bog
	Blanket Bog
Montane Habitats	Mountain Heaths and Willow Scrub

[30] http://jncc.defra.gov.uk/page-5706

Inland Rock	Inland Rock Outcrop and Scree Habitats
	Calaminarian Grasslands
	Open Mosaic Habitats on Previously Developed Land
	Limestone Pavements
Supralittoral Rock	Maritime Cliff and Slopes
Supralittoral Sediment	Coastal Vegetated Shingle
	Machair
	Coastal Sand Dunes

Protected Species Legislation

European Protected Species

European Protected Species (EPS) are species of plants and animals (other than birds) protected by law throughout the European Union. They are listed in Annexes II and IV of the European Habitats Directive and receive full protection under The Conservation of Species and Habitats Regulations 2017. This make it an offence to:

- deliberately capture, injure or kill any European Protected Species (EPS)
- to deliberately disturb any European Protected Species (EPS);
- to damage or destroy a breeding site or place of rest or shelter used by any European Protected Species (EPS).

The Wildlife and Countryside Act 1981 (as amended) adds further protection by making it an offence to intentionally or recklessly[31] disturb an EPS while it is occupying a structure or place which it uses for shelter or protection, or to obstruct access to any structure or place the species uses for shelter or protection.

Table 17: European Protected Species relevant to the UK			
Animals		**Plants**	
All bat species	**Great Crested Newt**	Yellow marsh saxifrage	Creeping marshwort
Large blue butterfly	Otter	Shore dock	Slender naiad
Wild cat	Smooth snake	Killarney fern	Fen Orchid
Dolphins, porpoises and whales (all species)	Sturgeon fish	Early gentian	Floating-leaved water plantain
Dormouse	Natterjack toad	Lady's slipper	
Sand lizard	Pool Frog		
Fisher's Estuarine Moth	Snail, Lesser Whirlpool Ram's-horn		

[31] Under the Countryside and Rights of Way Act 2000 (CROW Act) extended the protection to cover reckless damage or disturbance

Other Protected Species relevant to this site

Table 18: Other Protected Species		
Species	**Legislation**	**Level of Protection**
Birds	Wildlife and Countryside Act 1981 (as amended)	Under the Wildlife and Countryside Act (1981) it is an offence if any person: • intentionally kills, injures or takes any wild bird • intentionally takes, damages or destroys the nest of any wild bird whilst that nest is in use of being built; • intentionally takes, damages or destroys eggs of any wild bird; Wild birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) are protected from: • intentional or reckless disturbance whilst it is building a nest or is in, on or near a nest containing eggs or young; • disturbance of dependent young

Appendix 3 – Records from Holywell Pond SSSI

Table 19: Records from LRC listed from Holywell Pond SSSI			
Taxon	**Species**	**Taxon**	**Species**
Amphibians	Common toad	Birds	Snipe
Mammals (excluding bats)	Hedgehog		Moorhen
	Brown hare		Jay
	Otter		Black-throated Diver
	Red squirrel		Great Northern Diver
Bats	Common pipistrelle		Red-throated Diver
	Soprano pipistrelle		Crane
	Noctule bat		Oystercatcher
	Bats		Swallow
Butterflies	Wall		Little Gull
	Small heath		Little Bittern
Birds	Common Sandpiper		Herring Gull
	Mandarin Duck		Common Gull
	Carolina Wood Duck		Lesser Black-backed Gull
	Skylark		Iceland Gull
	Kingfisher		Glaucous Gull
	Red-legged Partridge		Great Black-backed Gull
	Egyptian Goose		Mediterranean Gull
	Pintail		Black-Headed Gull
	American Wigeon		Bar-tailed Godwit
	Shoveler		Black-tailed Godwit
	Teal		Linnet
	Wigeon		Grasshopper Warbler
	Mallard		Common Crossbill
	Garganey		Jack Snipe
	Gadwall		Common Scoter
	White-fronted Goose		Smew
	European Greater White-fronted Goose		Goosander
	Greenland Greater White-fronted Goose		Red-breasted Merganser
	Greylag Goose		Red Kite
	Pink-footed Goose		Pied Wagtail
	Snow Goose		White/Pied Wagtail
	Bean Goose		White Wagtail
	Tundra Bean Goose		Pied Wagtail
	Meadow Pipit		Grey Wagtail
	Tree Pipit		Yellow Wagtail
	Swift		Blue-headed Wagtail
	Great White Egret		Spotted Flycatcher
	Grey Heron		Red-crested Pochard
	Turnstone		Curlew
	Short-eared Owl		Whimbrel

	Long-eared Owl		Wheatear
	Little Owl		Ruddy Duck
	Pochard		Osprey
	Tufted Duck		Great Tit
	Scaup		House Sparrow
	Waxwing		Tree Sparrow
	Bittern		Grey Partridge
	Brent Goose		Coal Tit
	Canada Goose		Cormorant
	Barnacle Goose		Southern Cormorant
	Red-breasted Goose		Pheasant
	Goldeneye		Ruff
	Buzzard		Redstart
	Sanderling		Wood Warbler
	Dunlin		Willow Warbler
	Knot		Magpie
	Curlew Sandpiper		Green Woodpecker
	Purple Sandpiper		Spoonbill
	Pectoral Sandpiper		Snow Bunting
	Little Stint		Golden Plover
	Ruff		Grey Plover
	Temminck's Stint		Slavonian Grebe
	Lesser Redpoll		Great Crested Grebe
	Linnet		Red-necked Grebe
	Goldfinch		Black-necked Grebe
	Greenfinch		Willow Tit
	Redpoll		Dunnock
	Siskin		Bullfinch
	Treecreeper		Water Rail
	Little Ringed Plover		Avocet
	Ringed Plover		Firecrest
	Black Tern		Goldcrest
	Greenfinch		Sand Martin
	Black-headed Gull		Kittiwake
	Black Stork		Whinchat
	Dipper		Stonechat
	Marsh Harrier		Stonechat
	Hen Harrier		Woodcock
	Long-tailed Duck		Nuthatch
	Rock Dove		Eider
	Stock Dove		Siskin
	Woodpigeon		Arctic Skua
	Carrion Crow		Great Skua
	Rook		Common Tern
	Jackdaw		Arctic Tern
	Quail		Collared Dove
	Cuckoo		Tawny Owl
	Blue Tit		Starling
	Bewick's Swan		Whitethroat

	Whooper Swan		Little Grebe
	Mute Swan		Ruddy Shelduck
	House Martin		Shelduck
	Great Spotted Woodpecker		Spotted Redshank
	Lesser Spotted Woodpecker		Wood Sandpiper
	Little Egret		Greenshank
	Corn Bunting		Green Sandpiper
	Yellowhammer		Redshank
	Reed Bunting		Wren
	Robin		Redwing
	Merlin		Blackbird
	Peregrine		Song Thrush
	Hobby		Fieldfare
	Kestrel		Ring Ouzel
	Brambling		Mistle Thrush
	Coot		Barn Owl
	Fulmar		Lapwing

Appendix 4 – Bat Survey Data

Table 20: Survey Results from 22nd July 2019

Date	22nd July 2019	**Sunset**	21:27
Start Time	21:10	**End Time**	23:00

Time	Surveyor 1	Surveyor 2	Surveyor 3	Surveyor 4	Surveyor 5	Surveyor 6	Surveyor 7
21:10	No bats recorded	No bats recorded					
21:15							
21:20							
21:25							
21:30							
21:35							
21:40							
21:45							
21:50							
21:55	21:59 - 45 HNS						
22:00		22:02 - Noc commuting	22:02 - Noc HNS	22:02 - Noc commuting	22:02 Noc commuting	22:02 - Noc HNS	22:02 Noc commuting
22:05	22:06 - 45 foraging 22:07 - 45 emergence from ridge of building 1, near chimney	22:07 - 45 commuting over roof of building 1	No bats recorded	No bats recorded			
22:10		No bats recorded					
22:15	22:15 - 45 foraging						
22:20	22:24 - 45 foraging						
22:25							
22:30	22:30 - 45 foraging	22:30 - 45 HNS					
22:35	22:39 - 45 foraging						
22:40	22:43 - 45 foraging	22:44 - 45 commuting	22:41 - 50 pip HNS				
22:45	22:46 - 45 foraging 22:48 45 - foraging	22:45 - 45 HNS	No bats recorded				
22:50	No bats recorded	22:52 - 45 HNS					
22:55		22:58 - 45 HNS					
23:00							

	Flight Activity	
	Potential Emergence	
	Confirmed Emergence	
HNS	Heard Not Seen	
SNH	Seen Not Heard	

Species

39 = Nathusius' pipistrelle
Myo = Myotis sp.
45 = Common pipistrelle
55 = Soprano pipistrelle
Noc = Noctule
BLE = Brown long-eared bat

Table 21: Survey Results from 23rd July 2019

Date	23rd July 2019	**Sunset**	21:26
Start Time	21:10	**End Time**	23:00

Time	Surveyor 1	Surveyor 2	Surveyor 3	Surveyor 4	Surveyor 5	Surveyor 6
21:10	No bats recorded	No bats recorded	No bats recorded			
21:15						
21:20						
21:25						
21:30						
21:35						
21:40						
21:45						
21:50						
21:55						
22:00	22:03 45 - foraging until 22:08					
22:05						
22:10	22:11 - 45 foraging					
22:15	22:16 - 55 55 commuting and foraging 22:18 - 45 foraging	22:17 55 - commuting				
22:20		22:20 45 - HNS				
22:25	No bats recorded					
22:30						
22:35	22:35 Noc HNS	22:35 - Noc HNS	22:36 - 55 HNS	22:36 - Noc HNS	22:36 - Noc HNS	22:35 Noc HNS
22:40					22:42 - Noc HNS	
22:45	No bats recorded					
22:50						
22:55						
23:00						

	Flight Activity	
	Potential Emergence	
	Confirmed Emergence	
HNS	Heard Not Seen	
SNH	Seen Not Heard	

Species

39 = Nathusius' pipistrelle
Myo = Myotis sp.
45 = Common pipistrelle
55 = Soprano pipistrelle
Noc = Noctule
BLE = Brown long-eared bat

Table 22: Survey Results from 24th July 2019

Date	24th July 2019	**Sunset**	21:24
Start Time	21:15	**End Time**	22:54

Time	Surveyor 1	Surveyor 2	Surveyor 3	Surveyor 4	Surveyor 5	Surveyor 6	Surveyor 7
21:15	No bats recorded	No bats recorded	No bats recorded	No bats recorded			
21:20							
21:25							
21:30							
21:35							
21:40							
21:45							
21:50							
21:55	21:55 - 45 emerged from boiler housing of building 4c and foraged in courtyard				21:55 - 45 HNS	21:55 - 45 commuting	
22:00					22:03 - 55 commuting from around the building	22:03 - 45 commuting	
22:05	22:06 - 45 foraging						
22:10	No bats recorded						
22:15					22:16 - 45 commuting	22:16 - 45 commuting 22:18 - 45 commuting	
22:20	22:23 - 45 HNS	22:23 45 HNS				22:23 - 45 commuting	22:22 - 45 commuting
22:25		No bats recorded					
22:30	22:32 - 45 HNS				22:33 - 45 HNS	22:31 - 45 commuting 22:33 - 45x2 commuting	
22:35	22:35 - 45 foraging in courtyard		22:39 45 HNS		22:36 - 45 HNS	22:35 - bat seen not heard commuting 22:36 - 45 HNS	
22:40	No bats recorded				22:41 45 HNS		
22:45						22:45 - 45 HNS	22:45 - Noc HNS
22:50							
22:55							
23:00							

	Flight Activity	
	Potential Emergence	
	Confirmed Emergence	
HNS	Heard Not Seen	

Species

39 = Nathusius' pipistrelle
45 = Common pipistrelle
Noc = Noctule
Myo = Myotis sp.
55 = Soprano pipistrelle
BLE = Brown long-eared bat

SNH	Seen Not Heard		

Table 23: Survey Results from 25th July 2019

Date	25th July 2019	**Sunset**	21:23
Start Time	21:05	**End Time**	23:00

Time	Surveyor 1	Surveyor 2	Surveyor 3	Surveyor 4
21:05				
21:10				
21:15				
21:20				
21:25	21:29 - Noc commuting	21:29 - Noc HNS		
21:30			21:30 - Noc commuting	21:30 - Noc commuting
21:35				
21:40				
21:45				
21:50		21:52 - 45 emergence from building 6		21:52 - 45 commuting
21:55			21:57 - 45 commuting	
22:00	22:01 - 50 pip commuting			
22:05				
22:10				
22:15				
22:20				
22:25	22:28 - 50 pip HNS			
22:30		22:34 - 45 HNS		
22:35			22:39 - 45 HNS	22:35 - 45 HNS 22:39 - 45 HNS
22:40				
22:45			22:47 - 45 HNS	
22:50				
22:55				
23:00				

	Flight Activity	Species	
	Potential Emergence	39 = Nathusius' pipistrelle	*Myo* = Myotis sp.
	Confirmed Emergence	45 = Common pipistrelle	55 = Soprano pipistrelle
HNS	Heard Not Seen	50 pip = Common/Soprano pipistrelle	BLE = Brown long-eared bat
SNH	Seen Not Heard	Noc = Noctule	

Table 24: Survey Results from 9th September 2019

Date	9th September 2019	**Sunset**	19:39
Start Time	19:30	**End Time**	21:10

Time	Surveyor 1	Surveyor 2	Surveyor 3	Surveyor 4	Surveyor 5	Surveyor 6
19:30						
19:35						
19:40						
19:45						
19:50						
19:55						
20:00	20:02- 45 commuting off site				20:03 - 45 HNS	
20:05	20:08 - 45 commuting off site		20:08 - 55 commuting			
20:10					20:11 - 45 HNS; 20:13 - 45 HNS	
20:15						
20:20	20:24 - Noc HNS	20:24 - Noc HNS	20:24 - Noc HNS	20:24 - Noc HNS		20:24 - Noc HNS
20:25						20:28 - 45 HNS
20:30					20:30 - 45 HNS; 20:33 - 45 HNS	
20:35						
20:40						
20:45						20:49 - 45 HNS
20:50			20:50 - 45 HNS			
20:55	20:55 - 55 HNS	20:55 - 55 HNS	20:55 - 45 HNS 20:58 - 55 HNS			
21:00						
21:05						

	Flight Activity	
	Potential Emergence	
	Confirmed Emergence	
HNS	Heard Not Seen	
SNH	Seen Not Heard	

Species

39 = Nathusius' pipistrelle

45 = Common pipistrelle

Noc = Noctule

Myo = Myotis sp.

55 = Soprano pipistrelle

BLE = Brown long-eared bat

Table 25: Survey Results from 10th September 2019

Date	10th September 2019	**Sunset**	19:37
Start Time	19:30	**End Time**	21:10

Time	Surveyor 1	Surveyor 2	Surveyor 3	Surveyor 4	Surveyor 5	Surveyor 6
19:30						
19:35						
19:40				19.41 - 45 returned to building 4c		
19:45						
19:50				19.50 45 HNS		
19:55	19:59 - 45x2 foraging	19:58 45 HNS			19:59 - Noc commuting	
20:00						
20:05						
20:10	20:12 - 45 HNS		20:13 - flew into the area then then out again		20:12 - 45 commuting 20:13 - 45 HNS	
20:15						
20:20	20:24 - 45 foraging					
20:25						
20:30						
20:35						
20:40						
20:45	20:49 - 45 HNS					
20:50						
20:55						
21:00		21:03 - 45 HNS				
21:05					21:05 - 45 commuting	
21:10						

	Flight Activity	
	Potential Emergence	
	Confirmed Emergence	
HNS	Heard Not Seen	
SNH	Seen Not Heard	

Species

39 = Nathusius' pipistrelle
45 = Common pipistrelle
Noc = Noctule
Myo = Myotis sp.
55 = Soprano pipistrelle
BLE = Brown long-eared bat

Table 26: Survey Results from 11th September 2019						
Date		11th September 2019		**Sunset**		19:34
Start Time		19:20		**End Time**		21:04
Time	**Surveyor 1**	**Surveyor 2**	**Surveyor 3**	**Surveyor 4**	**Surveyor 5**	**Surveyor 6**
19:30		NO ACTIVITY		NO ACTIVITY	NO ACTIVITY	NO ACTIVITY
19:35						
19:40						
19:45						
19:50						
19:55						
20:00	20:00 - 45 commuting					
20:05						
20:10						
20:15	20:19 - 45 HNS					
20:20						
20:25						
20:30						
20:35						
20:40						
20:45						
20:50			20:51 - 45 HNS; 20:52 HNS 45 commuting			
20:55			20:58 – HNS 45 social calling			
21:00						
21:05						
21:10						

	Flight Activity	Species	
	Potential Emergence	39 = Nathusius' pipistrelle	*Myo* = Myotis sp.
	Confirmed Emergence	45 = Common pipistrelle	55 = Soprano pipistrelle
HNS	Heard Not Seen	Noc = Noctule	BLE = Brown long-eared bat
SNH	Seen Not Heard		

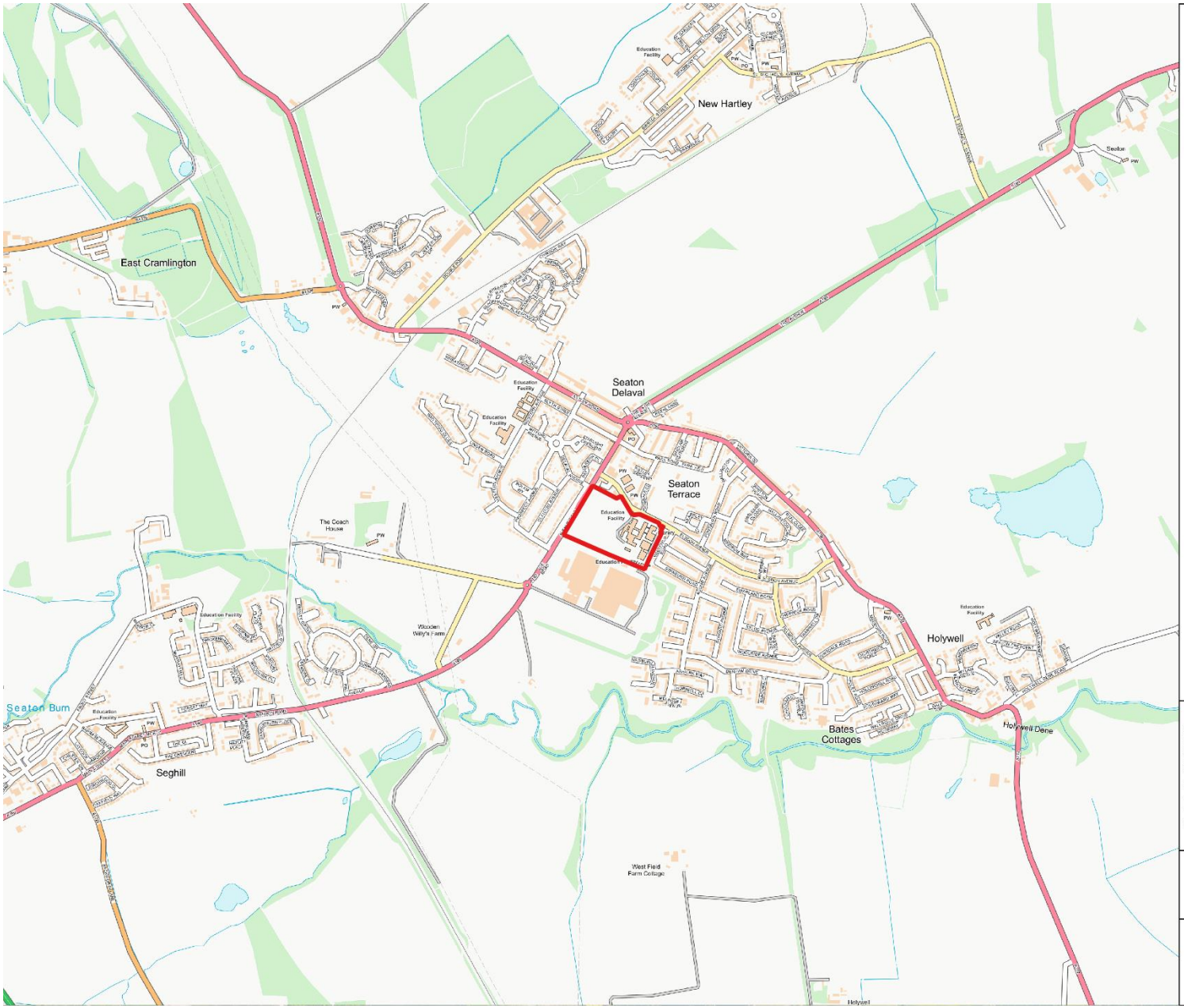
Table 27: Survey Results from 12th September 2019

Date	12th September 2019	**Sunset**	19:32
Start Time	19:17	**End Time**	21:02

Time	**Surveyor 1**	**Surveyor 2**
19:15	No bats recorded	No bats recorded
19:20		
19:25		
19:30		
19:35		
19:40		
19:45		
19:50		
19:55		
20:00		
20:05		
20:10		
20:15		
20:20	20:22 - 45 HNS	
20:25		
20:30	20:33 - 55 HNS	
20:35	No bats recorded	
20:40		20:44 - 45 HNS
20:45		No bats recorded
20:50		
20:55		
21:00		
21:05		

	Flight Activity	Species	
	Potential Emergence	39 = Nathusius' pipistrelle	*Myo* = Myotis sp.
	Confirmed Emergence	45 = Common pipistrelle	55 = Soprano pipistrelle
HNS	Heard Not Seen	50 pip = Common/Soprano pipistrelle	BLE = Brown long-eared bat
SNH	Seen Not Heard	Noc = Noctule	

Appendix 5 – Figures



Key

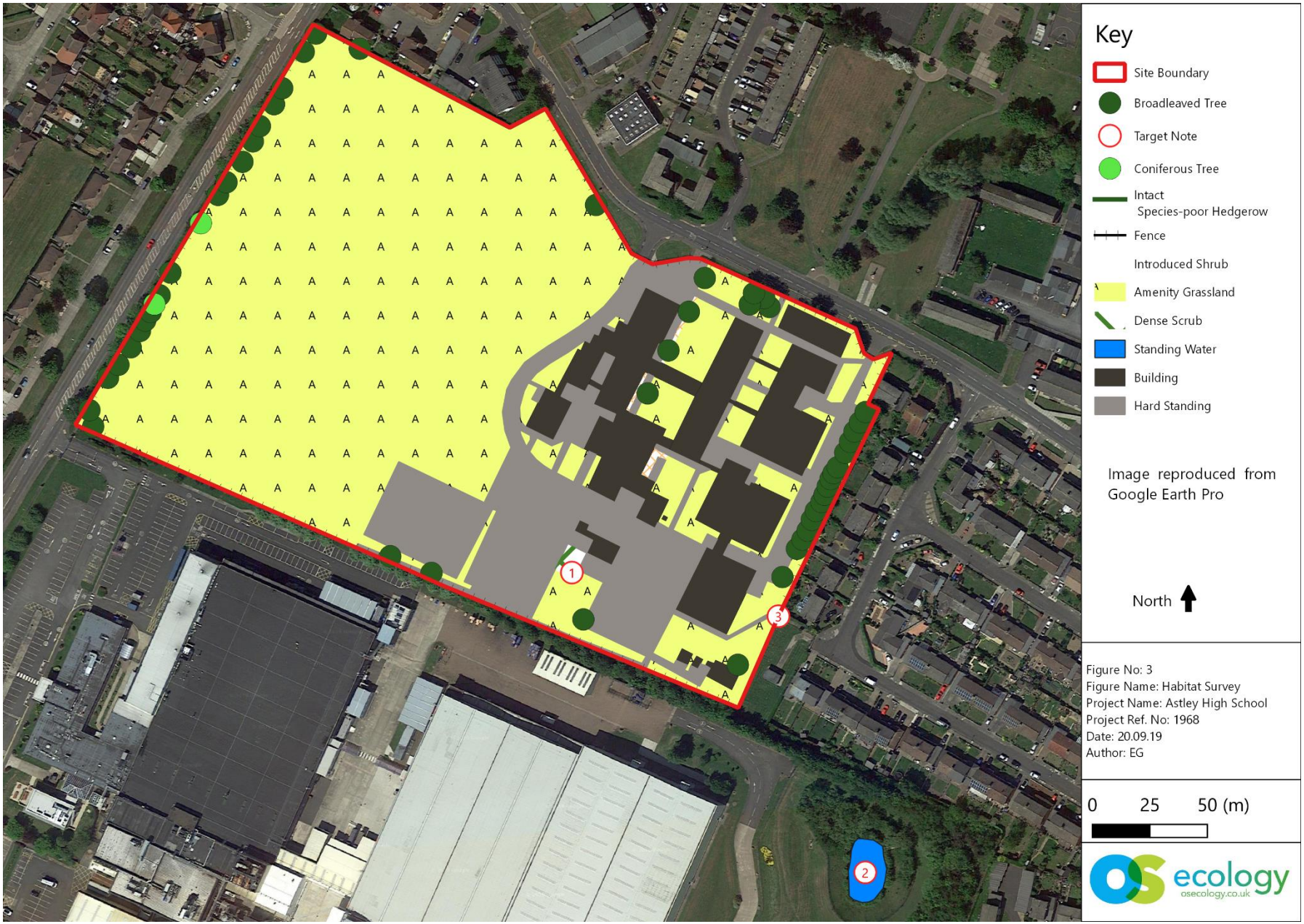
Site Boundary

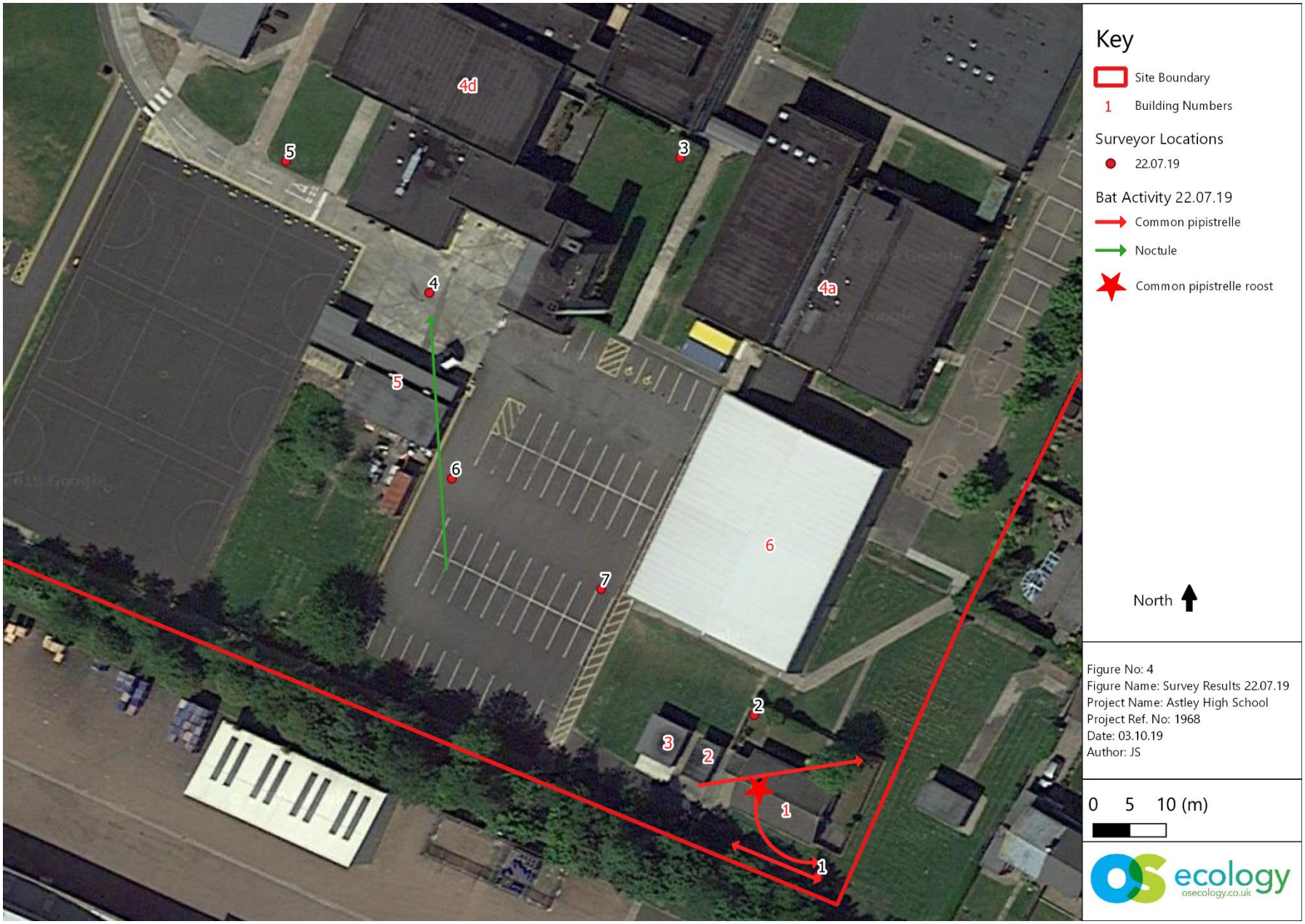
North

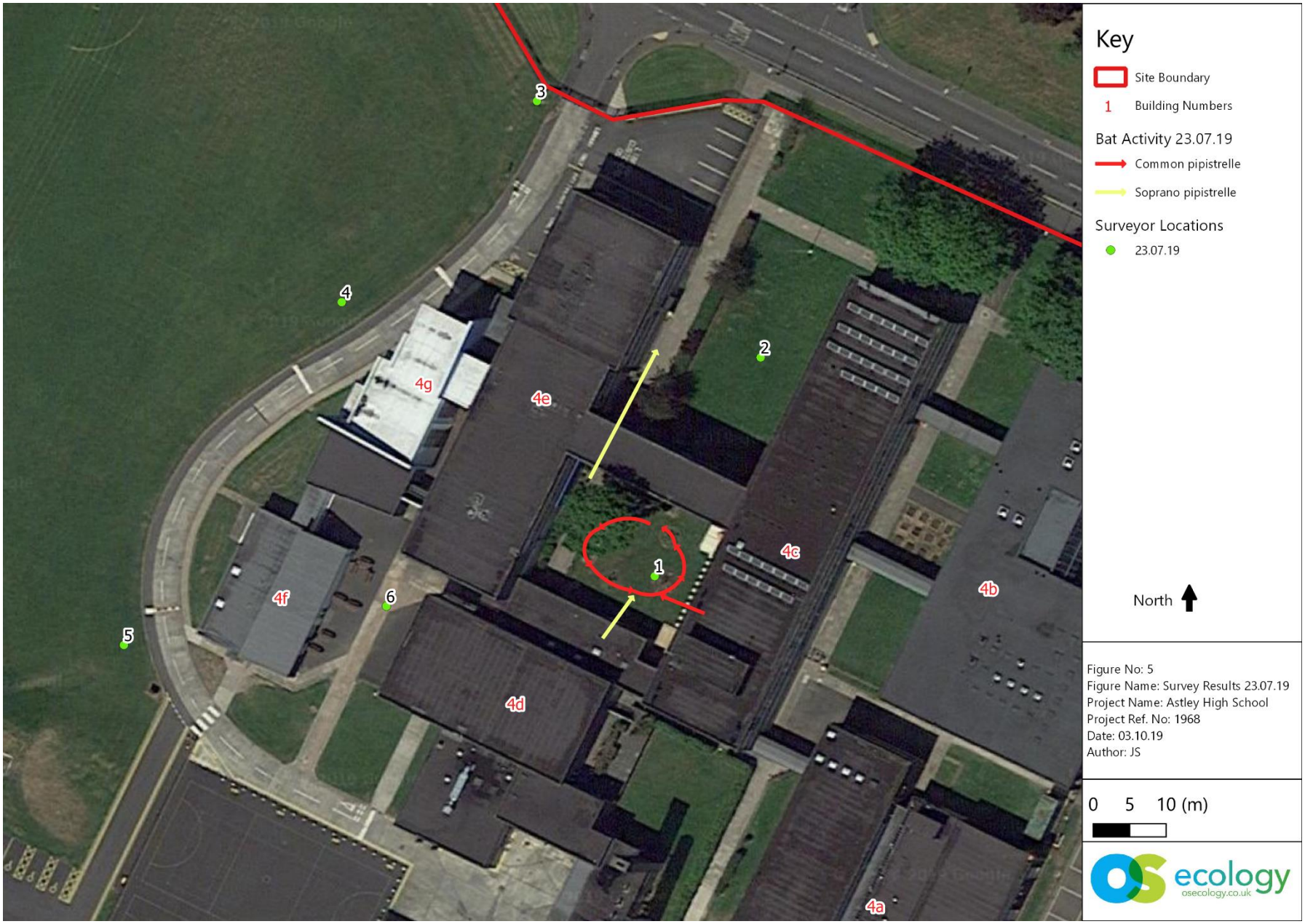
Figure No: 1
Figure Name: Site Location
Project Name: Astley High School
Project Ref. No: 1968
Date: 20.09.19
Author: EG

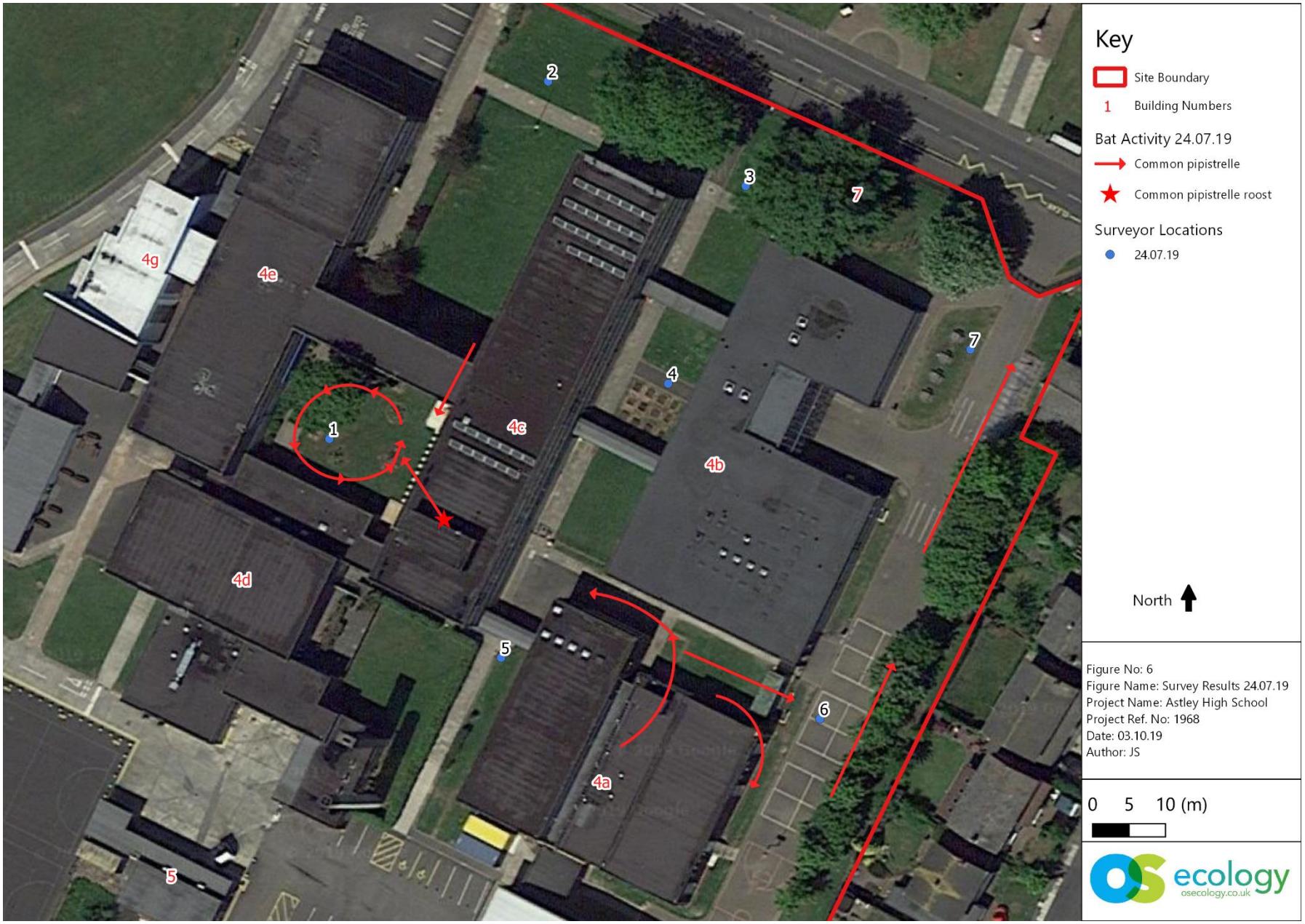
0 250 500 (m)

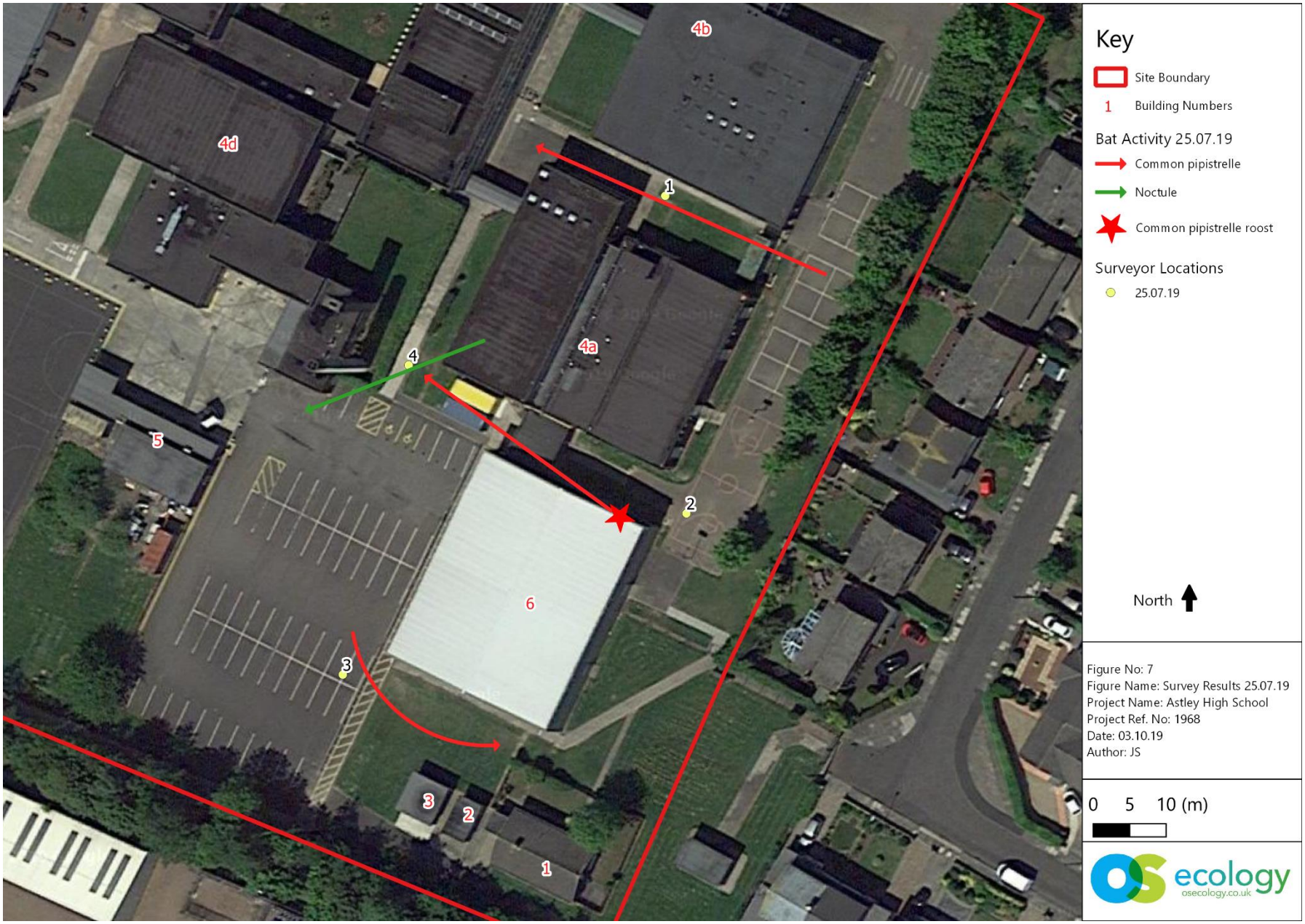

Key
Site Boundary
500m Buffer
North
Figure No: 2
Figure Name: Site Boundary
Project Name: Astley High School
Project Ref. No: 1968
Date: 20.09.19
Author: EG
0
100
200 (m)

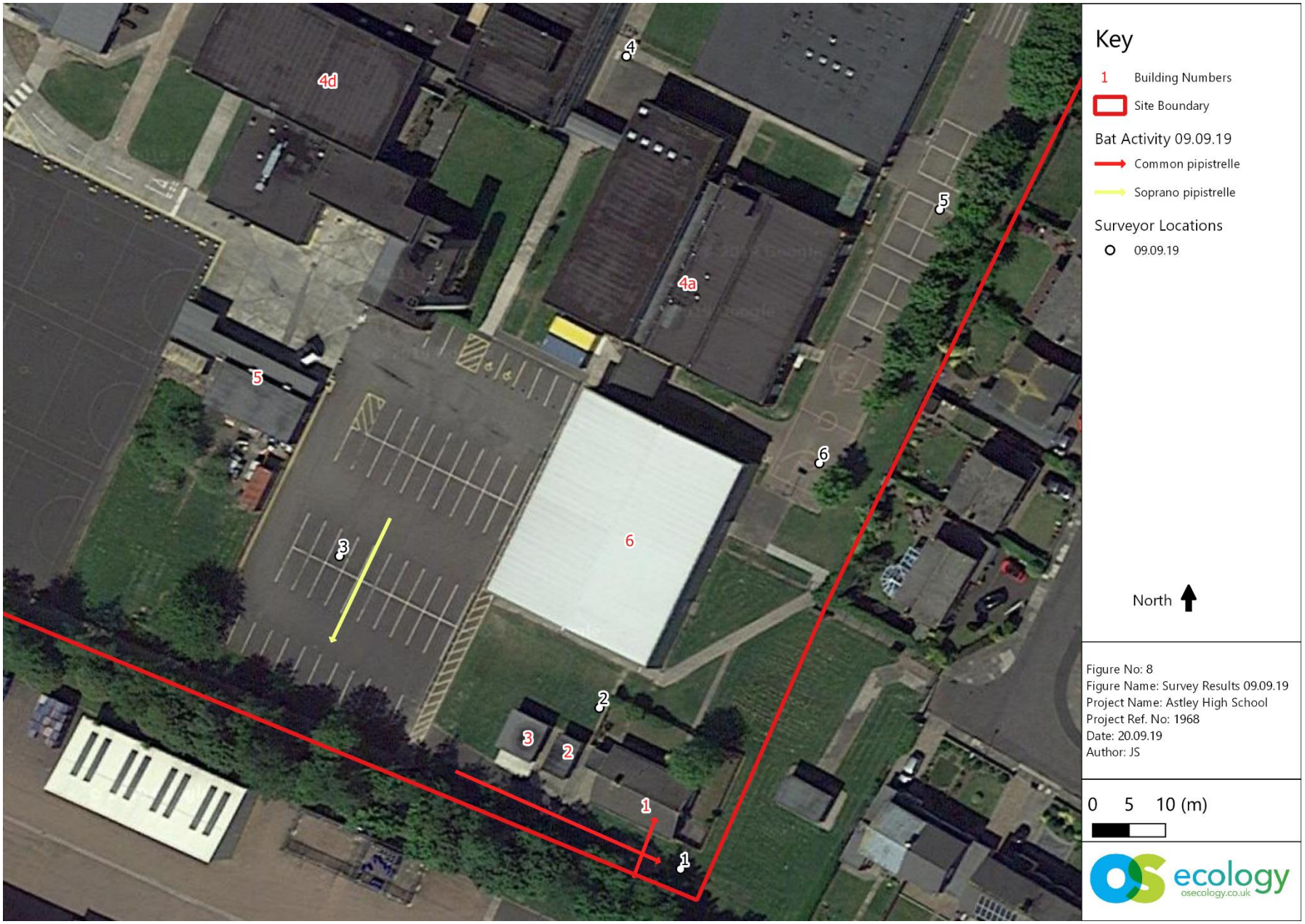

Key
Site Boundary
Broadleaved Tree
Target Note
Coniferous Tree
Intact Species-poor Hedgerow
Fence
Introduced Shrub
Amenity Grassland
Dense Scrub
Standing Water
Building
Hard Standing
Image reproduced from Google Earth Pro
North
Figure No: 3
Figure Name: Habitat Survey
Project Name: Astley High School
Project Ref. No: 1968
Date: 20.09.19
Author: EG
0 25 50 (m)
1
2
3

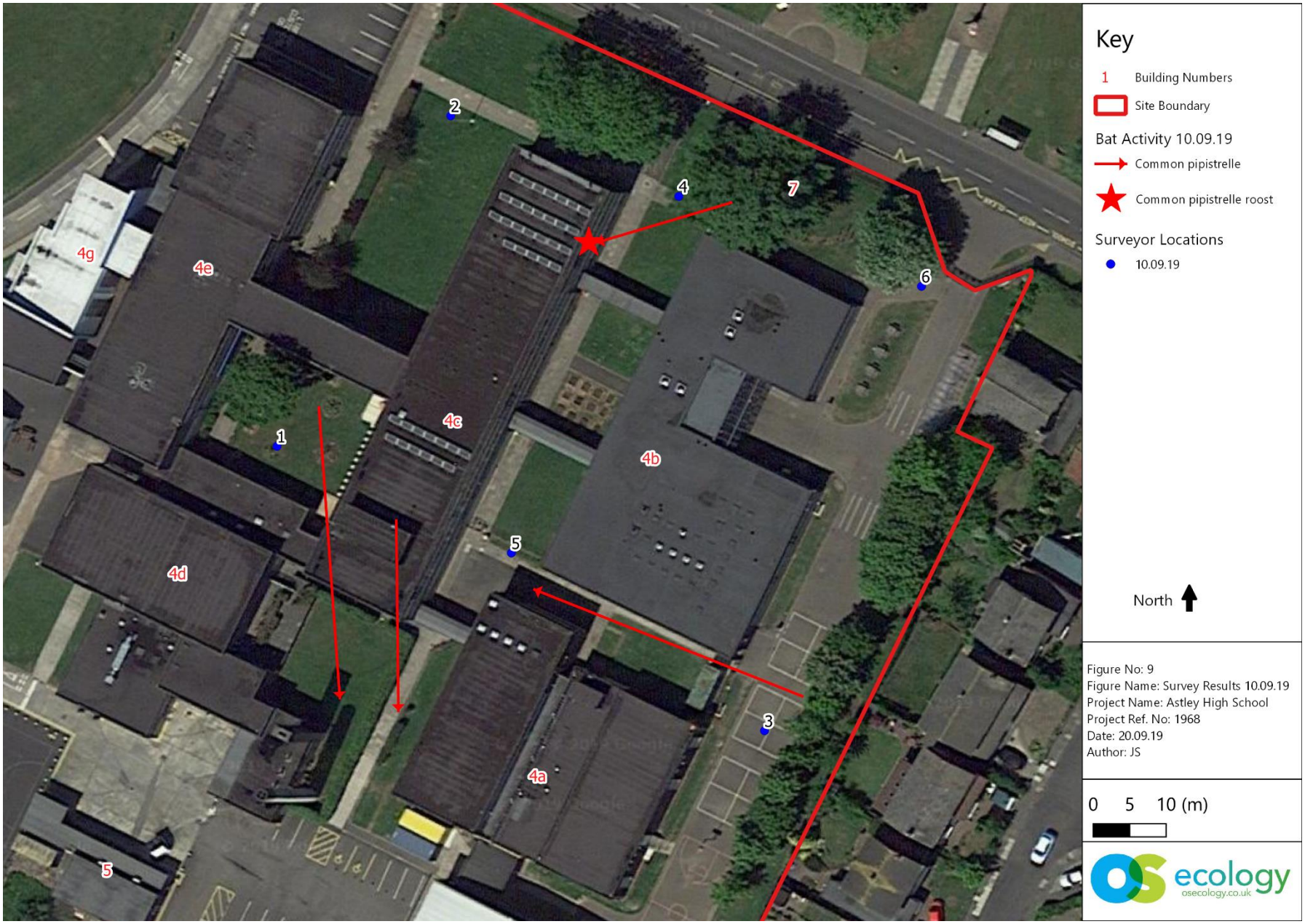

4d
5
3
4
4a
5
6
6
7
2
3
2
1
1
Key
Site Boundary
1 Building Numbers
Surveyor Locations
22.07.19
Bat Activity 22.07.19
Common pipistrelle
Noctule
Common pipistrelle roost
North
Figure No: 4
Figure Name: Survey Results 22.07.19
Project Name: Astley High School
Project Ref. No: 1968
Date: 03.10.19
Author: JS
0 5 10 (m)

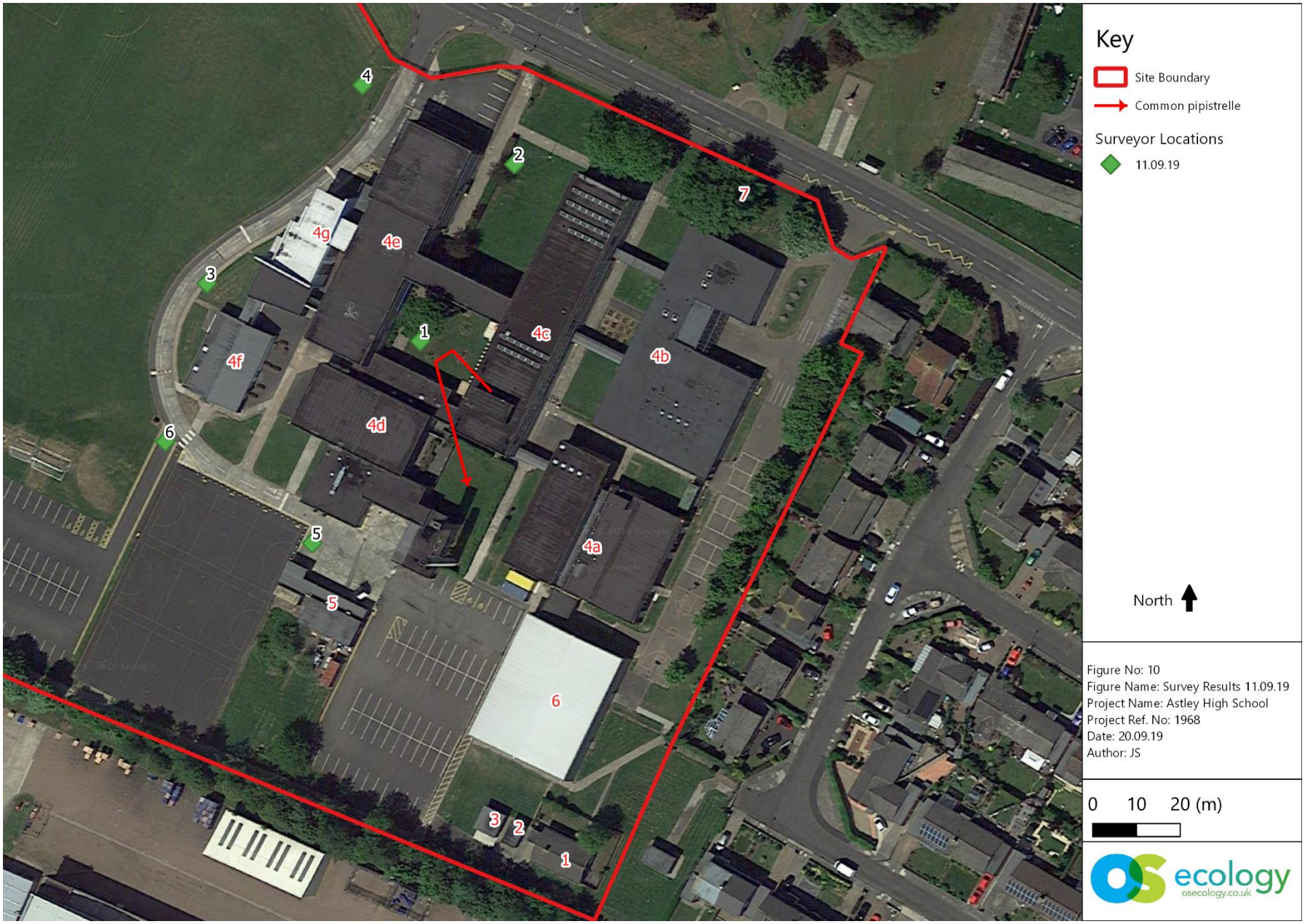

Key
Site Boundary
1 Building Numbers
Bat Activity 23.07.19
Common pipistrelle
Soprano pipistrelle
Surveyor Locations
23.07.19
North
Figure No: 5
Figure Name: Survey Results 23.07.19
Project Name: Astley High School
Project Ref. No: 1968
Date: 03.10.19
Author: JS
0 5 10 (m)
ecology
osecology.co.uk
1
2
3
4
5
6
4a
4b
4c
4d
4e
4f
4g

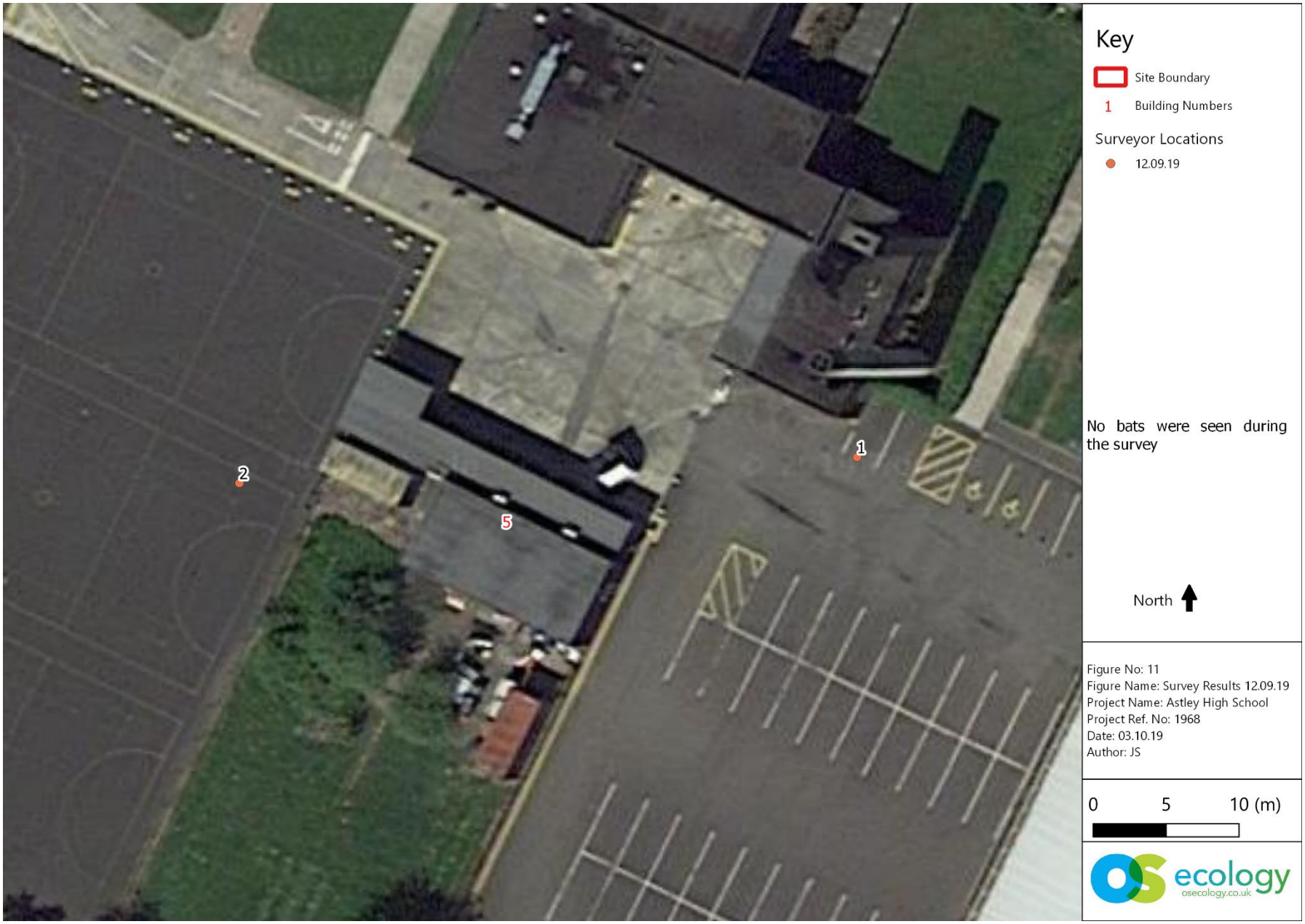

Key
Site Boundary
1 Building Numbers
Bat Activity 24.07.19
Common pipistrelle
Common pipistrelle roost
Surveyor Locations
24.07.19
North
Figure No: 6
Figure Name: Survey Results 24.07.19
Project Name: Astley High School
Project Ref. No: 1968
Date: 03.10.19
Author: JS
0 5 10 (m)
ecology
osecology.co.uk
1
2
3
4
5
6
7
4a
4b
4c
4d
4e
4g

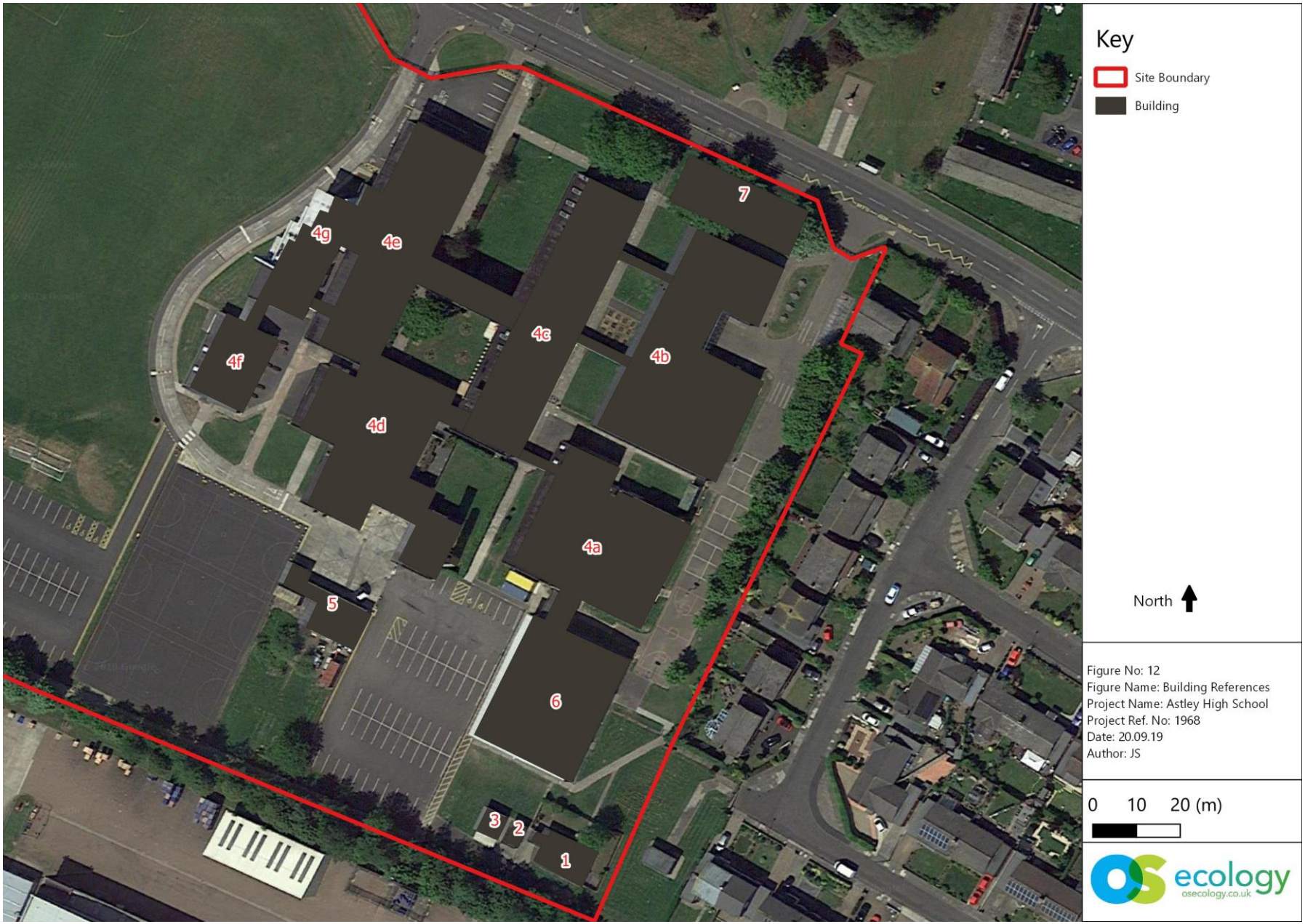

4b
4d
4a
1
2
3
4
5
6
3
2
1
Key
Site Boundary
1 Building Numbers
Bat Activity 25.07.19
Common pipistrelle
Noctule
Common pipistrelle roost
Surveyor Locations
25.07.19
North
Figure No: 7
Figure Name: Survey Results 25.07.19
Project Name: Astley High School
Project Ref. No: 1968
Date: 03.10.19
Author: JS
0 5 10 (m)


4d
4
4a
5
5
6
6
3
2
3
2
1
1
Key
1 Building Numbers
Site Boundary
Bat Activity 09.09.19
Common pipistrelle
Soprano pipistrelle
Surveyor Locations
09.09.19
North
Figure No: 8
Figure Name: Survey Results 09.09.19
Project Name: Astley High School
Project Ref. No: 1968
Date: 20.09.19
Author: JS
0 5 10 (m)


Key
1 Building Numbers
Site Boundary
Bat Activity 10.09.19
Common pipistrelle
Common pipistrelle roost
Surveyor Locations
10.09.19
North
Figure No: 9
Figure Name: Survey Results 10.09.19
Project Name: Astley High School
Project Ref. No: 1968
Date: 20.09.19
Author: JS
0 5 10 (m)
ecology
osecology.co.uk
1
2
3
4
5
6
7
4a
4b
4c
4d
4e
4g
5


4
2
7
4g
4e
3
1
4c
4b
4f
4d
6
5
4a
5
6
3
2
1
Key
Site Boundary
Common pipistrelle
Surveyor Locations
11.09.19
North
Figure No: 10
Figure Name: Survey Results 11.09.19
Project Name: Astley High School
Project Ref. No: 1968
Date: 20.09.19
Author: JS
0 10 20 (m)


Key
Site Boundary
1 Building Numbers
Surveyor Locations
12.09.19
No bats were seen during the survey
North
Figure No: 11
Figure Name: Survey Results 12.09.19
Project Name: Astley High School
Project Ref. No: 1968
Date: 03.10.19
Author: JS
0 5 10 (m)
1
2
5


Key
Site Boundary
Building
North
Figure No: 12
Figure Name: Building References
Project Name: Astley High School
Project Ref. No: 1968
Date: 20.09.19
Author: JS
0 10 20 (m)
1
2
3
4a
4b
4c
4d
4e
4f
4g
5
6
7

Appendix 6 – HSI Assessment Results

Table 28: HSI Assessment Results

Pond reference	Pond Location		Pond Area		Pond Permanence		Water Quality		Shade		Waterfowl		Fish		Pond count		Terrestrial Habitat		Macrophytes		Total
	Survey	HSI	Survey	HSI	Survey	HSI	Survey	HSI	Survey	HSI	Survey	HSI	Survey	HSI	Survey	HSI	Survey	HSI	Survey	HSI	
1	A	1	350	0.7	Never Dries	0.9	Good	1	90	0.4	Minor	0.67	Possible	0.67	1	0.40	Moderate	0.67	40	0.7	0.681

Appendix 7 – eDNA Results

SureScreen Scientifics

Folio No: E6841
Report No: 1
Purchase Order: 1968
Client: OS ECOLOGY
Contact: James Streets

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 22/04/2020
Date Reported: 23/04/2020
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
0210	Astley		Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Sarah Evans

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

SureScreen Scientifics

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940