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Ecological Impact Assessment

Land at Byfields, Nyton Lane, Westergate

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Report Summary

1. Mrs. Halton and Mrs. Hickie instructed the Ecology Co-op to undertake a Phase 1 Habitat Survey and Preliminary Ecological Appraisal (PEA) of Land at Nyton Road, Westergate which was completed in September 2017.
2. Based on the findings of the Phase 1 Habitat Survey and PEA further ecological survey work was completed during the period of April – September 2018. Phase 2 surveys that were undertaken include:
 - Bat emergence surveys of three buildings
 - Bat activity surveys,
 - Reptile presence/absence surveys
 - Great crested newt Habitat Suitability Index (HSI) assessments of ponds
 - Great crested newt presence/absence surveys and population size survey
3. The site boundary plan was modified following the completion of suite of Phase 2 surveys across 2018. The site now includes the Byfields property including its dwelling and surrounding garden space, measuring approximately 0.2ha in area. It excludes Nightingale Cottage and its associated garden space, and a southern parcel of land covered by the Phase 1 Habitat survey and Phase 2 surveys.
4. The Phase 2 surveys which covered the entire 0.9ha site identified;
 - the presence of at least eight species of foraging and commuting bats including barbastelle (an Annex II species);
 - a low population of slow worms within suitable habitat contained by the southern parcel of land;
 - a low population of great crested newts within two ponds situated 290m and 365m south west of the site
 - a common pipistrelle bat roost within the Byfields property.
5. As the proposed development involves the demolition of the existing residential dwelling, the destruction of a common pipistrelle day roost cannot be avoided and, in the absence of mitigation, this could potentially result in harm to individual bats. Therefore, a European Protected Species (EPS) Mitigation licence will be required for the development to legally proceed. Based on the results of the survey, this development will be eligible for registration under the Bat Mitigation Class Licence issued by Natural England and held by certain registered consultants.
6. As a result of the proposed construction zone being comprised of mown amenity grassland, hardstanding, scattered trees and a variegated garden hedge, the proposed development will have no foreseeable negative impacts on slow worms or great crested newts through habitat loss and/or killing/injury during site preparation and construction.
7. It will be important for the site to have a sensitive lighting scheme to avoid light spillage onto the woodland edge habitat adjacent to the southern site boundary as this could potentially



result in negative impacts upon bat activity.

8. In line with the national planning policy, ecological enhancements such as the in planting of native species-rich hedgerows, scattered trees and inclusion of bat boxes upon the proposed dwellings should be incorporated into the site design.



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1 INTRODUCTION

1.1 Background to the Proposed Development

Mrs Halton and Mrs Hickie intend to submit a planning application for residential development to include 7 dwellings on the Land at Byfields, Nyton Lane, Westergate (see Figure 1). The proposed site boundary was modified following the completion of the Phase 1 Habitat survey and a suite Phase 2 surveys in 2018. The site now includes the Byfields property (dwelling and surrounding garden space) but excludes Nightingale Cottage and its associated garden space and a southern parcel of land.

The National Grid Reference for the centre of the site is SU93710559 and the closest postcode is PO20 3US. The impact assessments in this report are based on the proposed site plan provided on the 12th April 2019 (see Figure 2).



Figure 1. An aerial image showing the location of the site. The original site boundary line covered by the Phase 2 Habitat Survey and suite of Phase 2 surveys is outlined in orange. The revised approximate proposed site boundary line is shown in red.

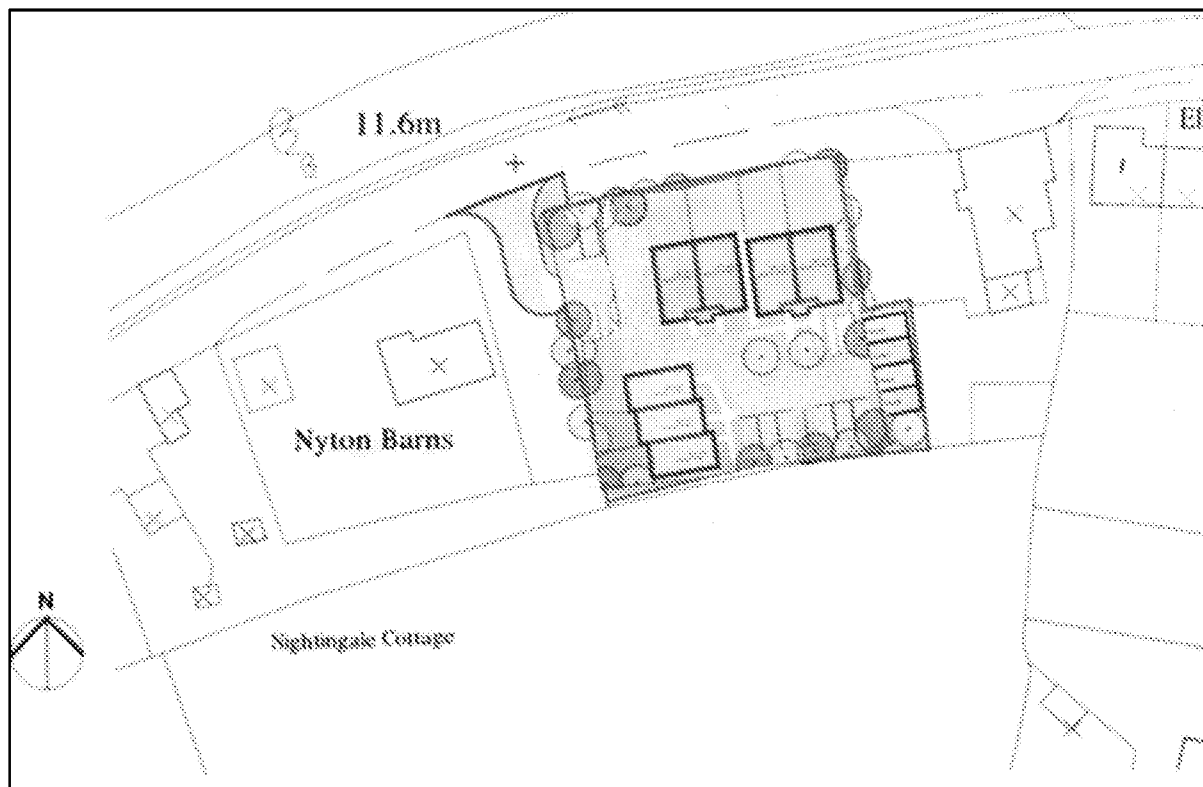


Figure 2. The proposed site plan for the development of the Land at Byfields, Westergate.

1.2 Site Description

The revised site boundary now only includes only the Byfields property and surrounding garden space measuring approximately 0.2 hectares in area. Upon this site is a residential dwelling (Byfields) and its garden space comprised of mown amenity grassland, hardstanding, scattered trees and a variegated garden hedge.

1.3 Purpose of this Report

A Phase 1 Habitat Survey and Preliminary Ecological Appraisal, completed by the Ecology Co-op on the 14th July 2017¹, identified the potential for reptiles, bats (roosting, foraging and commuting) and great crested newts (given the presence of ponds within 250m to the site) to be present on the site. As such, Phase 2 surveys for each of these species/taxonomic groups were recommended.

These surveys commenced in April 2018 and were completed in September 2018. This report provides details of the findings of these surveys and an outline of the potential impacts of the proposed development together with an indication of impact avoidance and mitigation measures likely to be required for the development to proceed.

This work has been overseen by Briony Hill, a Graduate member of the Chartered Institute for Ecology

¹ The Ecology Co-op (2017). *Bat Scoping, Preliminary Ecological Appraisal and Phase 1 Habitat Assessment – Land to the rear of Byfield, Nyton Road, Westergate.*



and Environmental Management (CIEEM) and Paul Whitby, a full member of CIEEM and a Chartered Ecologist (CEcol).

1.4 Policy and Legislation

Legal protection applying to relevant bird, mammal, herpetofauna and invertebrate species and current nature conservation planning policy is outlined in Appendix 1 of this report.

2 SURVEY METHODOLOGY

All methodologies used in the Phase 2 surveys are in accordance with current best practice guidance for the respective specie/taxonomic groups, as detailed below.

2.1 Bats

2.1.1 Bat Emergence Surveys

Bat activity surveys of Byfields, Nightingale Cottage and Nightingale Cottage Barn were undertaken during the period May-June 2018. Byfields, Nightingale Cottage and Nightingale Barn were assessed as having 'high', 'moderate' and 'low' bat roost potential following the bat scoping and were subjected to three, two and one bat activity respectively in accordance with current best practice guidelines². Weather conditions, timings personnel details for each survey visit are presented in Table

The emergence surveys aimed to determine the presence of roosting bats and evaluate the conservation importance of the building for bats. The surveys focused on all potential roost features identified during the scoping assessment. Infrared cameras were also used during some of the surveys, with footage analysed retrospectively to watch for emerging bats.

The surveyors recorded any bat activity on or around the potential roosting features identified during the scoping survey, using full spectrum hand held bat detectors to identify species through call frequencies. The bat calls were logged and recorded as sonograms for later confirmation of species where necessary.

Positions of the surveyors during the bat activity surveys are shown in Figures: 3-5.

² Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). Bat Conservation Trust, London.



Figure 3. An aerial image of the dwelling know as Byfield (highlighted in orange). The positioning of the three surveyors during the bat activity surveys of 2018 are indicated by the red dots. The location of a camera used during the final survey is indicated with a yellow dot.





Figure 4. An aerial image of Nightingale Cottage (highlighted in blue), subjected to two bat emergence surveys. The positions of the two surveyors during the survey of 15th May are indicated with red dots, with the positions adopted during the survey of 4th June shown as orange dots.



Figure 5. An aerial image of the Nightingale Cottage Barn (highlighted in green). The position adopted by the single surveyor during the bat activity survey of the 6th June 2018 is indicated by the red dot. The position of a infrared camera utilised during the survey is indicated by the yellow dot.

2.1.2 Bat Activity Surveys – Walked Transects

Three walked bat activity transects were carried out at the site on the 23rd April, 20th June and 4th September 2018. Bat activity surveys followed current standard best practice guidelines³. Pre-determined transect routes were followed by surveyors, focussing on all linear features within the site boundary (tree-lines and hedgerows) (see Figure 6).

The transect routes were walked at a constant pace at dusk (from sunset up to two hours after sunset) by two surveyors, such that each part of the route was passed approximately every 15 minutes. Five stopping points were marked out where surveyors stopped and recorded bat activity for 5 minutes throughout the surveys period. All surveys were undertaken during weather conditions suitable for bat activity and at ambient temperatures above 10°C.

The surveyors recorded bat activity using 'Echo Meter Touch' bat detectors featuring auto-identification of bat species and automatically triggered recording for later review. The locations of all bat

³ Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London.



'registrations' was recorded onto a field map during the survey to correspond with all sound recordings. Where possible, additional notes on size, flight height, type of flight (such as commuting, foraging, fast or slow) and direction of flight were also recorded.

2.1.3 Bat Activity Surveys - Automated Static Bat Detecting

Two static bat detectors (Peersonic Detector and Full Spectrum Recorder RPA2 enclosed within a waterproof IP67 box) were deployed across the site on three separate occasions (spring, summer and autumn), and left in the field for a minimum of five days, which is the expected maximum lifetime of the battery.

The static bat detectors comprise passive recording devices with real-time full-spectrum calls that can be viewed in detail on analysis software once downloaded to a computer, allowing accurate identification of most bat calls to species level (or genus level in the case of *Myotis* spp. and *Plecotus* spp.). The loggers were programmed to record bat echolocation calls from 30 minutes prior to dusk until 30 minutes after dawn.

The recorded WAV files were analysed in full spectrum using Kaleidoscope software (version 4.5.5). All sound files were subject to manual analysis by an experienced bat ecologist. Where possible, identification was carried out to species level, except for the *Myotis* bats, as they are often inseparable through sound analysis alone due to overlapping call parameters, which were identified to genus level only. Descriptions of bat species assemblage therefore represent the minimum number present rather than a definitive list of all species present.

Analysed data was used to produce a Microsoft Excel table comparing the location of the static bat detectors and the total number of passes per species per night.

These two methodologies complement each other with the transect surveys providing information on foraging and commuting patterns across the site and automated static detector surveys giving more extensive coverage over the whole of the active foraging period for bats, thus increasing the likelihood of detecting scarce species.



Figure 6. The transect route walked during bat activity surveys is indicated with a red dashed line. During the April and September survey this was walked by two surveyors. Surveyors start at points A and C. During the June survey this route was walked by one surveyor. Stop points are indicated with coloured letters. Static logger locations are indicated with dots. The original site boundary line covered by the Phase 2 Habitat Survey and suite of Phase 2 surveys is outlined in orange. The revised site boundary line is shown in red.

2.2 Great Crested Newt

2.2.1 Habitat suitability assessment

The Phase 1 and PEA identified five ponds within 500m of the site boundary (see Figure 7).

It was recommended that Ponds: 1, 3 & 4 were subjected to visual assessment (pending access). Access permission was successfully gained to survey four of these ponds and during this process four additional ponds were identified (see Figure 7). Where access permission was granted, all ponds were assessed for their potential to support great crested newts *Triturus cristatus* using the Habitat Suitability Index (HSI)⁴ in accordance with best practice guidance⁵.

Ponds 1 & 3 were assessed on the 31st February 2018, Pond 4 and four additional ponds (Ponds: 6a, 6b & 7) were assessed on the 15th March 2018 and an additional pond at Westergate Lodge, (Pond 8) was assessed on the 9th March 2018 (see Figure 7).

Those ponds calculated as having 'below average' or above suitability for breeding great crested newts

⁴ Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) *Evaluating the suitability of habitat for the great crested newt (Triturus cristatus)*. *Herpetological Journal* 10, 143-155.

⁵ English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.



were carried forward for presence/absence surveys.

Ponds 2 & 5 were scoped out due to Nyton Road and a stream acting as barrier to movement for amphibians.

2.2.2 Presence/Absence Survey and Population Size Assessments

Ponds: 4, 6a, 6b & 7 were subjected to a presence/absence surveys. The survey methodology followed standard guidance on presence/absence surveys for great crested newts⁶. Four survey visits were undertaken using a combination of trapping, torchlight searching, netting and egg searching for presence of great crested newts during each survey visit. All surveys were undertaken during weather conditions suitable for great crested newts, above the minimum temperature of 5°C and at least two of the survey visits were undertaken during the 'peak activity period' for breeding great crested newts (i.e. between 15th April to 15th May). Weather conditions, temperature and pond turbidity during each survey visit is presented in Appendix 3.

Full population assessments were undertaken on Pond 4 and 7 as evidence of great crested newts was identified during the first four survey visits. This involved undertaking two addition visits as detailed above. It was ensured that at least three of the survey visits were undertaken during the 'peak activity period' for breeding great crested newts (i.e. between 15th April to 15th May).

Net traps were used instead of typical bottle traps during surveys. This was to prevent puncturing of the liners within Pond 4, 6a, 6b and 7.

⁶ English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

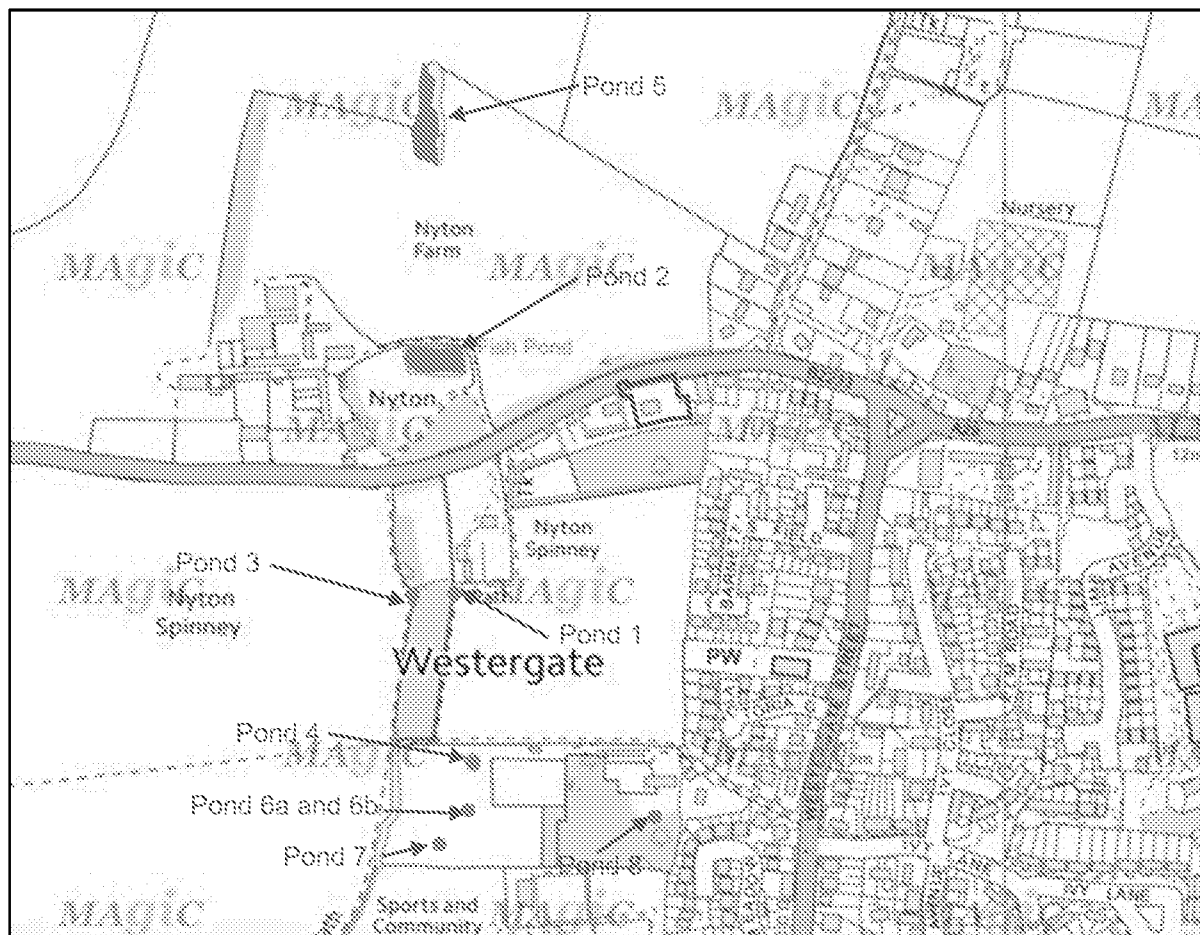


Figure 7. Ponds located within 500 metres of the site boundaries. The original site boundary line covered by the Phase 1 Habitat Survey and suite of Phase 2 surveys is shown in orange. The revised site boundary is shown in red.

2.3 Reptiles

Standard reptile presence/likely absence surveys involve setting out artificial refugia (reptile 'mats') in potentially suitable habitat for reptiles. Reptile mats are either pieces of roofing bitumen felt or corrugated metal sheets, which absorb heat from the sun more rapidly than the surroundings and provide cover and basking places attractive to reptiles. These are then checked for presence of animals under suitable weather conditions. There are no up to date guidelines for reptile surveys, but a minimum of seven survey visits under suitable weather conditions is generally considered to be sufficient to determine their presence/likely absence.

A total of 10 roofing felt mats were used in this survey and placed in sunny locations in the long semi-improved grassland and in clearings of the woodland habitat. The sheets were placed out on the 20th March 2018 and left *in situ* for a minimum of 10 days to 'bed in' and allow reptiles to locate them before the first check.

The highest count of reptiles from the visits is used to classify the population of each reptile species on



the site as: 'low', 'medium' or 'exceptional' based on best practice guidance⁷.

2.4 Survey Constraints

The surveys described in Section 2 recorded any flora or fauna that was present at the time of the survey visits. It is therefore possible that some species may not have been present during the surveys, but may be evident at other times of the year and may appear or disappear from the site if habitat conditions change. For this reason, the surveys are considered valid for up to 18 months for bats, 2 years for reptiles and three years for great crested newts and dormice. If the habitat conditions change significantly beyond that time, it is recommended that the surveys are updated.

2.4.1 Bats

In accordance with best practice guidelines, three survey visits were undertaken upon Byfields, two upon Nightingale Cottage and one upon Nightingale Cottage Barn during the peak period in bat activity and during good weather conditions. The results presented here are therefore considered to be an accurate representation of the general use of the property by roosting bats.

Nevertheless, bats can use roosting features intermittently throughout the year and may be present in larger or smaller numbers depending on their breeding cycle, weather conditions, and in response to disturbance. These surveys record the emergence of bats at the time of the survey visits and therefore only provide a snapshot of bat roosting activity at the site at that time. Bats may be present at other times and the results should therefore be viewed with caution.

2.4.2 Great Crested Newts

The water of Pond 4 was turbid with low visibility, although amphibians were identified through torching. Netting was used as a method during the first survey however based on the disturbance created was not used on following survey visits. Typical bottle traps were not employed as the pond was lined. Instead crayfish nets were utilised in a ratio of one net to three bottle traps. Egg searching was employed for all four surveys.

Pond 6a was too shallow to trap and netting was not possible following the first visit due to the high density of oxygenators within the pond. Egg searching was employed for all four surveys.

Pond 6b was too shallow to net or trap. Torching of this pond also proved difficult as it was swarming with tadpoles and this method could only be used on the final two surveys. Egg searching was employed for all four surveys. It is therefore considered that there is a low detectability warning.

Pond 7 was too shallow to net or trap however the water was very clear allowing good visibility of the entire waterbody while torching. Egg searching was also employed on all survey visits.

⁷ Froglife (1999). *Froglife Advice Sheet 10: reptile survey*. Froglife, London.



3 ASSESSMENT METHODOLOGY

The assessment of ecological impacts in Section 4 of this report follows best practice guidelines for impact assessment⁹.

The mitigation hierarchy underpins this assessment:

- Avoidance - “Seek options that avoid harm to ecological features (for example, by locating on an alternative site).”
- Mitigation - “Adverse effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.”
- Compensation – “Where there are significant residual adverse ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.”
- Enhancements – “Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.”

Six steps are required as part of an ecological impact assessment. These are summarised below and explained in more detail in Appendix 2:

1. Identify important ecological features (habitats, species, ecosystems and their functions/processes);
2. Identify and characterise the impact to important ecological features;
3. Incorporate measures to avoid and mitigate these impacts;
4. Assess the significance of any residual effects after mitigation;
5. Identify appropriate compensation measures to offset significant residual effects; and
6. Identify opportunities for ecological enhancement.

4 RESULTS

4.1 Bats

4.1.1 Bat Emergence Surveys

Weather conditions and personnel details for the bat emergence surveys undertaken at the site in 2018 are provided in Table 1.

⁹ CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*. Chartered Institute of Ecology and Environmental Management, Winchester.



Table 1. Timings, weather conditions and personnel details for the bat emergence surveys undertaken of the dwelling known as Byfield within the Land at Byfields, Westergate.

Date	Building Surveyed	Survey start time/end time	Temp. degrees centigrade, weather conditions throughout survey	Surveyors
07/05/18	Byfield	20:06 – 22:00 Sunset – 20:26	Max/Min temp.: 11-8°C 70% cloud cover, 0-5mph wind and dry	Sam Lunn MSc ACIEEM (Natural England Licence Number: 2017-28250-CLS-CLS) Simon Rayburn Matt Howard
15/05/18	Nightingale Cottage	20:50 – 22:40 Sunset – 21:10	Max/Min temp.: 19-13°C 10% cloud cover, 0-5mph wind and dry.	Kristina Lewis MSc MCIEEM (Natural England Licence Number: 2015-15379-CLS-CLS) Emma Baker MSc
04/06/18	Nightingale Cottage	20:50 – 22:40 Sunset – 21:10	Max/Min temp.: 18-16°C 20% cloud cover, 0-5mph wind and dry.	Ryan Walker MSc PhD MCIEEM (2015-16736-CLS-CLS) Emma Baker
04/06/18	Byfield	20:55 – 22:55 Sunset: 21:10	Max/Min temp.: 18-16°C 20% cloud cover, 0-5mph wind and dry.	Sam Lunn MSc ACIEEM Jess Burkitt BSc GradCIEEM Hamish Muirden BSc
04/06/18	Nightingale Cottage Barn	20:50 – 22:40 Sunset – 21:10	Max/Min temp.: 18-16°C 20% cloud cover, 0-5mph wind and dry.	Sophie Bradfield (+infrared camera)
20/06/18	Byfield	21:05 – 23:00 Sunset: 21:20	Max/Min temp.: 17-14°C 80% cloud, 0-5mph wind and dry	Sam Lunn MSc ACIEEM Jess Burkitt BSc GradCIEEM Sophie Bradfield BSc (+infrared camera)_

4.1.1.1 Byfields

3rd May 2018

No bats were recorded emerging from the dwelling during this survey.

Bat activity was moderate to high during the survey. Six species: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, common noctule *Nyctalus noctula*, serotine *Eptesicus serotinus*, long-eared species *Plecotus* spp. and *Myotis* spp. were recorded foraging and commuting between 20:45 and 21:49.

A common noctule flew north to south over head of the property at 20:51 and was heard again at 21:01. This species was heard but not seen at the end of the survey. A soprano pipistrelle flew west to east



across the northern face of the property at 20:59. Two social calling individuals flew west across the front of the property at 22:00. This species foraged for 3 minutes along the woodland edge to the south from 21:10. This species foraged just north of the property at 21:14 and 22:20. This species was heard but not seen on ten occasions. At 21:09 two common pipistrelles foraged along the woodland edge to the south. This species foraged within the eastern garden space at 21:34. Common pipistrelles were heard but not seen on ten occasions during the survey.

An individual *Myotis* sp. foraged across the eastern garden space at 21:21. A serotine was recorded foraging at 21:06 and although not seen is expected to have been foraging along the tree line north of the road. This species was heard but not see at 21:28. At 21:20, 21:39 and 21:49 a long-eared was heard but not see.

4th June 2018

A common pipistrelle emerged from a roof tile on the north or western elevation of the attached garage at 21:37 (see Figure 8). The exact feature could not be determined due to it being located in a blind spot. The bat proceeded to commute south toward the woodland habitat.

General bat activity was moderate. Six species; common pipistrelle, soprano pipistrelle, common noctule, serotine, long-eared species *Plecotus* spp. and *Myotis* spp. were recorded foraging and commuting between 21:37 and 22:43.

At 22:12 a *Myotis* sp. foraged briefly within the north eastern garden space. Five minutes later an individual also commuted along the east and southern face of the property. *Myotis* sp. were heard but not seen on three occasions. A commuting common pipistrelle travelled along the southern and eastern face of the property at 21:41. This species foraged within the eastern garden space briefly at 22:11 and between 22:41 and the end of the survey north of the property. Common pipistrelles and soprano pipistrelles were heard but not seen on 11 and 4 occasions respectively.

Long-eared bats *Plecotus* spp. were heard but not seen on four occasions during this survey. At 22:19 and 22:39 a noctule and a serotine were heard commuting respectively but not seen.





Figure 8. Approximate emergence location and flight route of a common pipistrelle during the emergence survey of Byfields on the 4th June 2018.

20th June 2018

No bats were recorded emerging from the property at any time during this survey. The night-vision camera footage was reviewed and no bats were observed emerging from the location it was focused upon.

General bat activity was moderate. Five species; common pipistrelle, soprano pipistrelle, common noctule, long-eared species and *Myotis* spp. were recorded foraging and commuting between 21:47 and 22:59.

Two soprano pipistrelles commuted south to north across the eastern garden space a minute apart at 21:48. Two individuals passed west to east over the garden space at 22:13. This species was heard but not seen on seven occasions. A common pipistrelle commuted north to south along the eastern face of the property at 21:54. Common pipistrelles commuted through the eastern garden space on six occasions. This species was heard but not seen on nine occasions.

A *Myotis* sp. commuted along the east and southern face of the property at 22:26. Two individuals commuted north to south towards the woodland along the eastern face of the property at 22:39. This species was heard but not seen on four occasions. At 21:47 and 22:22 a noctule was heard but not seen. A long-eared was heard but not seen at 22:28, 22:46 and 22:53.

4.1.1.2 Nightingale Cottage

15th May 2018

No bats were recorded emerging from the property at any time during the survey.

General bat activity was relatively high during this survey. Six species; common pipistrelle, soprano pipistrelle, common noctule, serotine, long-eared species and *Myotis* spp. were recorded foraging and commuting between 21:00 and 22:47.

A soprano pipistrelle commuted west to east overhead of the property at 21:00. An individual of this species commuted in the opposite direction at 21:26. This species was heard but not seen on six occasions. A common pipistrelle travelled west to east overhead of the property at 21:22. A common pipistrelle foraged overhead of the flat rooved section of the building at 21:31. This species was heard but not seen on 14 occasions.

At 21:13 a common noctule commuted north to south overhead of the property. Two passes by this species were heard but not seen. A long-eared was heard but not seen at 21:43 and 21:59. A *Myotis* sp. commuted along the northern face of the property at 22:00. This species was heard but not seen on three occasions. Serotine bats were heard but not seen on two occasions.

4th June 2018

No bats were recorded emerging from the property at any time during this survey.



General bat activity was low during this survey. Five species; common pipistrelle, soprano pipistrelle, serotine, long-eared species and *Myotis* spp. were recorded foraging and commuting between 21:33 and 22:37.

A common pipistrelle commuted south east to north west over the barn at 21:33. A foraging individual was recorded to the west of the property. This species was heard but not seen commuting at 22:29 and 22:34. Early in the survey soprano pipistrelles were heard but not seen foraging intermittently. A *Myotis* sp. commuted east to west over head of the residential property at 22:02 and 22:10. This species was heard but not seen on four other occasions. A serotine commuted north to south into the woodland habitat at 22:21. Finally, 22:25 a long-eared commuted north to south to the west of the property.

4.1.1.3 Nightingale Cottage Barn

4th June 2018

No bats were recorded emerging from the property at any time during this survey. The night-vision camera footage was reviewed and no bats were observed emerging from the building at any time.

General bat activity was the same as described above for Nightingale Cottage 4th June 2018.

4.1.2 Bat Activity Surveys – Walked Transects

Weather conditions and personnel details for the bat activity surveys undertaken at the site in 2018 are provided in Table 2.

Table 2. Timings, weather conditions and personnel details for bat activity surveys undertaken of the Land at Byfield, Westergate in 2018.

Date	Survey start time/end time	Temp. degrees centigrade, weather conditions throughout survey	Surveyors
23/04/18	19:55 – 22:05 Sunset – 20:10	Max/Min temp.: 14 – 10°C 40% cloud cover at start, 90% cloud cover at finish 0-5mph wind Dry	Briony Hill BSc GradCIEEM (Natural England Licence Number: 2018-34640-CLS-CLS) Emma Baker MSc
20/06/18	21:05 – 23:00 Sunset: 21:20	Max/Min temp.: 17 – 14°C 30% cloud cover and 0-5mph breeze	Hamish Muirden
04/09/18	19:30-21:20 Sunset: 19:42	Max/Min temp.: 18 – 12.5°C 100% cloud cover, 0-5mph wind and dry.	Briony Hill Natural England bat licence holder - Level 2 Emma Baker MSc

Results of the bat activity transect r are summarised below and detailed results are presented in Table 3 where the number of recordings made for each bat species on each activity survey is provided. A map illustrating the use of the site by individual bat species is also provided as a summary of all three surveys is shown in Figure 9. The colour coding for bat species is provided in the figure reference for each map.



A minimum of six bat species; common pipistrelle, soprano pipistrelle, common noctule, serotine, long-eared *Plecotus sp.* species and *Myotis sp.* were recorded foraging and commuting across the site. By far the most frequently recorded species were common pipistrelle and soprano pipistrelle, which were recorded across all three surveys. A small number of *Myotis sp.* bats (species undetermined) were recorded in all three months across the site. It is not possible to confidently determine species of *Myotis* from analysis of sonographs of the echolocation calls alone. Common noctule were recorded in June and September. Three serotine passes and one long-eared pass were recorded in September only.

Table 3. Total bat passes recorded during each activity survey at Nyton Road, Westergate.

Survey date	Number of passes					
	Common pipistrelle	Soprano pipistrelle	Noctule	<i>Myotis sp.</i>	Serotine	Long-eared
23/04/18	52+	57+	-	2	-	-
20/06/18	43+	21+	1	2	-	-
04/09/18	30	28	8	2	3	1



Figure 9. Bat activity recorded at the Land at Byfields, Westergate across all surveys, with red representing common pipistrelle bats, orange representing soprano pipistrelle, blue representing common noctule, yellow representing serotine, pink representing *Myotis sp.* and purple representing long-eared bat. Thicker lines represent greater activity observed. The approximate proposed site boundary line is shown in red.

4.1.3 Bat Activity Surveys - Automated Static Bat Detecting

In summary, a minimum of 8 species were recorded by static loggers; common pipistrelle (86.1% of all recorded calls); soprano pipistrelle (8.9%); *Myotis spp.* (2.7%); serotine (0.8%); barbastelle *Barbastella barbatellus* (0.6%); common noctule (0.6%); nathusius' pipistrelle *Pipistrellus nathusii* (0.3%) and long-eared *Plectotus sp.* (0.1%).



These figures reflect the level of activity by bats and not the number of individuals and should be viewed with caution.

May

Location 1

The detector recorded calls for five consecutive nights from the 3rd - 7th May 2018. A minimum of eight species were recorded during this deployment: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, serotine, common noctule, barbastelle, long-eared species *Plecotus* sp. and *Myotis* species.

Common pipistrelle bats and soprano pipistrelles were recorded on 3 nights and accounted for just over 78% and 10% respectively of the calls recorded, with a peak count of 202 and 16 calls respectively. Serotine, *Myotis spp.* and long-eared bats *Plecotus* sp. were recorded across 3 nights. These species accounted for 5.6% of all calls with a peak count of 18, 2.8% of calls with a peak count of 4 and 0.8% of calls with a peak count of 1 call, respectively. Nathusius' pipistrelle were recorded on two nights accounting for 0.8% of all calls, with a peak count of 2 calls. Common noctules and barbastelles were recorded on 1 night only accounting for 0.5% and 0.3% respectively. Across two nights only noise files were recorded.

Table 4 provides the full results from the static logger deployment in Location 1 during May 2018.

Table 4: Species recorded and the total number of passes per night in Location 1 for May 2018.

Date	Serotine	Common noctule	<i>Myotis</i> sp.	Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Long-eared bat	Barbastelle
3/05/18	3	-	3	60	13	-	1	-
4/05/18	1	-	4	47	16	1	1	-
5/05/18	-	-	-	-	-	-	-	-
6/05/18	18	2	4	202	13	2	1	1
7/05/18	-	-	-	-	-	-	-	-
Percentage total	5.6%	0.5%	2.8%	78.6%	10.7%	0.8%	0.8%	0.3%

Location 2

The detector recorded calls for five consecutive nights from the 3rd - 7th May 2018.

A minimum of four species were recorded during this deployment: common pipistrelle, soprano pipistrelle, serotine and *Myotis* species.

Bats were only recorded on one of the nights that the static logger was deployed for with only noise recorded on all other nights. During this night common pipistrelles accounted for 48.9% of calls, soprano pipistrelles accounted for 47.4% of calls, *Myotis* sp. accounted for 3% of calls and finally serotines accounted for 0.8% of calls.

Table 5 shows the full results from the static logger deployment in Location 2 during May 2018.

**Table 5.** Species recorded and the total number of passes per night in Location 2 for May 2018.

Date	Serotine	Common noctule	<i>Myotis</i> sp.	Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Long-eared bat	Barbastelle
3/05/18	1	-	4	65	63	-	-	-
4/05/18	-	-	-	-	-	-	-	-
5/05/18	-	-	-	-	-	-	-	-
6/05/18	-	-	-	-	-	-	-	-
7/05/18	-	-	-	-	-	-	-	-
Percentage total	0.8%	0%	3.0%	48.9%	47.4%	0%	0%	0%

June

Location 1

The detector recorded calls for five consecutive nights from 20th - 24th June 2018.

A minimum of eight species were recorded during this deployment: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, serotine, common noctule, barbastelle, long-eared species *Plecotus* sp. and *Myotis* species.

Common pipistrelle bats were recorded on 4 nights and accounted for just over 78% of the calls recorded, with a peak count of 113 calls. Soprano and Nathusius' pipistrelle bats were recorded on 3 nights accounting for 4.2% and 2.7% of calls respectively with a peak count of 11 and 6 calls respectively. Common noctules, *Myotis* spp. and barbastelles were recorded on 3 nights. These species accounted for 5.2% of all calls with a peak count of 10, 4.9% of calls with a peak count of 11 and 2.5% of calls with a peak count of 7 call, respectively. Long-eared bats *Plectotus* sp. were recorded on one night only, accounting of 0.5% of calls. Only noise files were recorded during the final night this logger was deployed.

Table 6 shows the full results from the static logger deployment in Location 1 during June 2018.

Table 6. Species recorded and the total number of passes per night in Location 1 for June 2018.

Date	Serotine	Common noctule	<i>Myotis</i> sp.	Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	Long-eared bat	Barbastelle
20/06/18	-	-	5	110	-	-	-	2
21/06/18	7	10	11	113	11	6	-	7
22/06/18	1	4	-	37	4	3	2	-
23/06/18	-	7	4	57	2	2	-	1
24/06/18	-	-	-	-	-	-	-	-
Percentage total	2.0%	5.2%	4.9%	78.1%	4.2%	2.7%	0.5%	2.5%

Location 2



The detector recorded calls for four consecutive nights from the 20th - 23rd June 2018.

A minimum of four species were recorded during this deployment: common pipistrelle, soprano pipistrelle, barbastelle and *Myotis* species.

Common and soprano pipistrelles were recorded on 3 nights accounting for 94.2% and 3.1% of all calls respectively, with a peak count of 1785 and 66 calls respectively. *Myotis* sp. were recorded on 3 nights accounting for 2.3% of calls with a peak count of 30 calls.

Table 7 shows the full results from the static logger deployment in Location 2 during June 2018.

Table 7. Species recorded and the total number of passes per night in Location 2 June 2018.

Date	Serotine	Common noctule	<i>Myotis</i> sp.	Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	Long-eared bat	Barbastelle
20/06/18	-	-	27	420	11	-	-	2
21/06/18	-	-	30	1758	66	-	-	6
22/06/18	-	-	11	614	15	-	-	4
Percentage total	0%	0%	2.3%	94.2%	3.1%	0%	0%	0.4%

August/September

Location 1

The detector recorded calls for four consecutive nights from the 30th August - 2nd September 2018.

A minimum of four species were recorded during this deployment: common pipistrelle, soprano pipistrelle, serotine and *Myotis* species.

Common and soprano pipistrelles were recorded on all 4 nights accounting for 37.8% and 58.4% of calls respectively with a peak count of 34 and 77 calls. *Myotis* sp. were recorded on 2 nights accounting for 3.7% of calls with a peak count of 9 calls. Serotines were recorded on 1 night only accounting for 0.4% of calls overall.

Table 8 shows the full results from the static logger deployment in Location 2 during August/September 2018.

Table 8. Species recorded and the total number of passes per night in Location 2 for August/September 2018.

Date	Serotine	Common noctule	<i>Myotis</i> sp.	Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Long-eared bat	Barbastelle
30/08/18	1	-	-	34	77	-	-	-
31/08/18	-	-	-	29	16	-	-	-
01/09/18	-	-	1	29	54	-	-	-
02/09/18	-	-	9	8	9	-	-	-
Percentage total	0.4%	0%	3.7%	37.5%	58.4%	0%	0%	0%



4.2 Great Crested Newts

4.2.1 Habitat Suitability Assessment

HSI values were obtained for seven ponds. Two ponds (Ponds 2 & 5) were not assessed because these were scoped out during the Phase 1 Habitat survey due to the presence barriers to movement being located between them and the site. The calculated HSI values, together with a brief description of the ponds and a summary of the recommendations for further surveys results is provided in Table 9. Full details of the HSI calculations are presented in Appendix 3.



Table 9. Details and HSI results of all ponds within 250m of the Land at Byfields, Westergate including recommendations of further surveys.

Pond	NGR	Distance and direction from site	Description	H.S.I value	Interpretation	Survey recommendations
1	SU93560545	190m south west	- Rectangular in shape measuring approximately 50m². - Completely dry in February. - Heavily shaded with a deep leaf litter layer.	N/A – dry in February	N/A	No further survey required
2	SU93540563	125m north west	- Site visit not undertaken. - Scoped out in Phase 1 due to fish presence and barriers to movement between the pond and the site.	N/A - Barriers to movement and fish pond	N/A	No further survey required
3	SU93520544	210m north west	Connected to a flowing stream which runs through the pond north to south.	N/A – flowing water	N/A	No further survey required
4	SU93570530	290m south west	Circular man-made wildlife pond.	0.76	'Good' suitability	Presence/absence survey
5	SU93540582	230m north west	- Site visit not undertaken. - Scoped out in Phase 1 due to barriers to movement being located between the pond and the site.	N/A – Barriers to movement	N/A	No further survey required.
6a	SU93580527	330m south west	- Very small lined wildlife pond which is heavily vegetated with oxygenators. - In close proximity to wildflower habitat.	0.59	'Below Average' suitability	Presence/absence & population size assessments (if presence confirmed)
6b	SU93570527	330m south west	- Very small and shallow lined wildlife pond. - In close proximity to wildflower habitat.	0.61	'Average' suitability	Presence/absence survey
7	SU93560526	365m south west	- Small lined wildlife pond with a planted island. - In close proximity to wildflower habitat.	0.62	'Average' suitability	Presence/absence & population size assessments (if presence confirmed)
8	SU93720528	300m south	- Garden pond with very small surface area with and non-native aquatic plants. - Owner noted the presence of palmate newt <i>Lissotriton helveticus</i> and smooth newts <i>L. vulgaris</i> in the past.	0.48	'Poor' suitability	No further survey required.



4.2.2 Presence/Absence Survey and Population Assessments

A low population of great crested newts were identified in Pond 4 with a peak count of 2 individuals recorded and great crested newts recorded on two of the six visits. The identification of great crested newt eggs confirmed breeding within the pond (see Figure 10). A low population of great crested newts was identified in Pond 7 with a peak count 1 individual recorded during one of the six visits.

In addition, smooth newts, palmate newts and common frogs *Rana temporaria* were identified within Ponds 4 & 7.

No great crested newts were found in Ponds 6a or 6b, although smooth newt and palmate newt were present in Pond 6a and common frog spawn and tadpoles in both ponds. Detailed results for the presence/absence and populations are presented in Appendix 3.

Table 10. Summary of presence/absence surveys and population assessments of Ponds: 4, 6a, 6b & 7. Abbreviations: Lv=Smooth newt *Lissotriton vulgaris*; Lh=Palmate newt *Lissotriton helveticus*; Bb=Common toad *Bufo bufo*; Rt=Common frog *Rana temporaria*; ad=adult; spwn=spawn (toad or frog); td=tadpoles.

Pond	GCN present Y/N	No. visits	Peak Count	Population size class	Low detectability warning	Peak count visit number	GCN eggs found?	Other amphibian species present	Other relevant notes
4	Y	6	2	Low		6	Y (see Figure 10).	Lv, Lh, Rt adult	
6a	N	4	-	-		-	N	Lv, Lh, Rt spawn and tadpoles	
6b	N	4	-	-	Yes – see section 2.5.	-	N	Rt spawn and tadpoles	
7	Y	6	1	Low		3	N	Lv, Lh, Rt adult	



Figure 10. A great crested newt egg identified in Pond 4 in April 2018.



4.3 Reptiles

The reptile presence/absence survey identified a low population of slow worms *Anguis fragilis* within the southern parcel of land, with a peak count of one adult recorded. Table 11 provides weather data and findings from each reptile survey.

Table 11: Results of reptile surveys undertaken at the Land at Byfields, Westergate. SW – slow worm, GS – grass snake, CL – common lizard, Juv – juvenile, SA – sub-adult, F- female, M – male, A - adult

Date	Start time	Max/min air temp °C	Weather notes	Species total
05/04/2018	14:30	12/20°C	15% cc, 13mph wind	None
09/04/2018	12:00	11/13°C	100%cc, 8mph wind, humid with drizzle	None
11/04/2018	17:00	15/17°C	10%cc, 10mph wind	None
18/04/2018	10:50	18/23°C	5%cc, 13mph wind	1 SA SW
01/05/2018	14:10	14/32°C	10%cc, 13mph wind	1x F SW 1 x Juv SW
08/05/2018	09:10	18/27°C	10%cc, 3mph wind	None
11/05/2018	09:45	16/26°C	0%cc, 14mph wind	None

5 IMPACT ASSESSMENT

5.1 Bats

5.1.1 Roosting - Potential impacts

Byfields

The bat emergence surveys of the dwelling identified an occasional common pipistrelle day roost with one individual recorded emerging during the survey on the 4th June 2018.

As the proposed development involves the complete demolition of the existing residential building, the destruction of the feature used by as a common pipistrelle roost cannot be avoided and, in the absence of mitigation, this could potentially result in harm to individual bats.

The common pipistrelle is most common bat species in England which is widespread across the UK. Overall, in the absence of mitigation the development is considered to result in a **certain significant (negative) impact** at a **local level**.

Nightingale Cottage & Nightingale Cottage Barn

No bat roosts were identified during the emergence surveys completed at Nightingale cottage and Nightingale cottage barn. These buildings are now excluded from the proposed development site boundary and will not be impacted as part of this proposal.



5.1.2 Bat Activity – Potential Impacts

A diversity of species were recorded within the southern parcel of land covered by bat activity surveys and static logger deployment. This included a minimum of 6 species; common pipistrelle, soprano pipistrelle, common noctule, serotine, long-eared species and *Myotis* species. Static loggers also identified barbastelle and Nathusius' pipistrelle.

The most significant findings are the presence of barbastelle bat. Barbastelle's, an Annex II species, are rare in the UK and found only in the south, with an estimated population of 5,000 individuals according to the Bat Conservation Trust's website. Barbastelle bats are very sensitive to light disturbance.

Barbastelle activity was generally low with 1 call detected in May, a peak of 7 calls in Location 1 and 6 calls in Location 2 in June specifically on the 21st June.

Nathusius pipistrelle is one of the less common bat species in the UK, with an estimated population of 16,000 individuals according to the Bat Conservation Trust's website. The species has a scattered distribution in the UK but is generally more common in the southeast and it is a species believed to be expanding, with greater records having been made in successive years.

This southern parcel of land is excluded from the development proposal which will cover Byfields and its surrounding garden space. Therefore, there will be no permanent loss of woodland habitat as a result.

During the bat emergence surveys completed across Byfields general bat activity was moderate and a total of six species; common pipistrelle, soprano pipistrelle, common noctule, serotine, long-eared species and *Myotis spp.* were recorded foraging and commuting within the garden space and woodland edge habitat on the southern boundary.

The proposed development site is considered to be of **local** ecological value in relation to foraging and commuting bats whilst the parcel of land to the south is considered to have **district** value.

The development of Byfield's and its associated garden space will result in the loss of a line of scattered pine and sycamore, a variegated privet hedgerow and tight mown amenity grassland considered to be lower value foraging bats. However, woodland edge habitat meets the southern boundary. There is the potential for disturbance to commuting and foraging bats, both temporary during construction and permanently after completion, through increased artificial lighting, which could illuminate foraging and commuting habitats.

Overall, in the absence of mitigation, the impact of the proposed development on foraging and commuting bats is considered to be a **certain medium impact**, which is considered **significantly negative** at a **local level**.



5.2 Great Crested Newts

5.2.1 Potential Impacts

The assessments, including HSI calculations, presence/absence surveys and population assessments, for great crested newts identified a low population of great crested newts within Pond 4, situated 290m south west where a peak count of 2 individuals were recorded and in Pond 7, situated 365m south west where a peak count of one individual was recorded. Since the completion of the phase 2 surveys the site boundary has been modified to include only Byfields and its surrounding garden space. This proposed construction zone is comprised of tight mown amenity grassland, hardstanding parking and access and a building. These habitats represent a negligible value for foraging amphibians. Therefore, this site is considered to be of **negligible** ecological value for great crested newts.

Based on this assessment, the impact of the proposed development upon great crested newts is considered to be **negligible**.

As a result, no further mitigation measures are recommended for great crested newts and an EPS (GCN) Mitigation Licence is not considered necessary for the works to proceed.

5.3 Reptiles

5.3.1 Potential Impacts

The reptile presence/absence survey identified a low population of slow worms, with a peak count of one adult, within suitable ruderal and long grassland habitat across the southern parcel of land. Since the completion of the phase 2 surveys the site boundary has been modified to include only Byfields and its surrounding garden space. This proposed construction zone is comprised of tight mown amenity grassland, hardstanding parking and access and a building and does not provide any suitable habitats for reptiles.

Therefore, this site is considered to be of **negligible** ecological value in relation to reptiles.

Based on this assessment the impact of the proposed development upon reptiles is considered to be **negligible**.

6 MITIGATION STRATEGY

6.1 Bats

6.1.1 Bat Roosts

The proposed development will involve the destruction of a common pipistrelle day roost. Therefore, a European Protected Species (EPS) Mitigation licence will be required for the development to legally proceed. Based on the results of the survey, this development will be eligible for registration under the 'Bat Mitigation Class Licence' issued by Natural England and held by certain registered consultants.

License applications can only be made once planning permission is approved and it typically takes Natural England 10 working days to determine a Bat Mitigation Class Licence application. The license



application must be supported by data that is no more than 18 months old. Therefore, should a license be applied for after 20th December 2019, updated bat emergence surveys will be necessary during the bat activity period (May – September). As a condition of the Bat Mitigation Class Licence works must commence within 3 months of the registration.

As part of the licence application, a mitigation method statement will need to be prepared to demonstrate that favourable conservation status of bats will be maintained through the life of the project. The possible measures that would be required to safeguard bats and achieve this are outlined below:

- **Preparatory works - ‘Soft strip’**

All features with a confirmed bat roost and the potential to be used by roosting bats should be carefully hand stripped under the direct supervision of a licenced bat ecologist. Any bats found shall be gently captured and placed into bat boxes that have been secured to trees surrounding the site in advance.

- **Timing**

The hand stripping of hanging tiles should be undertaken in the period between mid-March and the end of October to avoid disturbing bats that could be in hibernation. As no maternity roosts have been identified during the surveys of this property, avoiding the breeding period (May-August inclusive) is not considered necessary.

- **Replacement roost site**

The detailed design of the new buildings should incorporate integral bespoke bat roosting features. In relation to the license a minimum of two replacement roosting features will need to be provided. These must be located upon buildings as close to the roost which will be lost, in close proximity to boundary tree lines, on a south or eastern facing aspect and away from any artificial lighting. Suitable features for common pipistrelle, a crevice roosting species, are detailed below and shown in Figure 11.

- **Bat Access Tiles.** These should be placed on south and eastern roof elevations. Where they are installed bitumen lining must be used as opposed to tyvec type which can fray over time and trap bats. These are available as clay tiles or slates can be modified.
- **Beaumaris Woodstone Bat Box.** This box should be mounted on a wall surface facing south or east at a height of at least 3m from the ground.
- **2FE Schegler Wall-Mounted Bat Shelter.** These shelters should be fixed to the external wall surfaces facing south or east at a height of at least 3m from the ground.

- **Artificial lighting**

The use of artificial lighting inappropriately can result in significant disturbance to bats. The detailed design should include a lighting scheme that minimises these impacts by following the Bat Conservation Trust’s guidance on lighting, reproduced in Appendix 4 of this report.

In addition, in line with the National Planning Policy Framework (NPPF) guidelines, integrated bat roosting features should be incorporated into new buildings to provide a net gain in roosting opportunities for bats. The creation of no less than three new roosting features is recommended across the seven properties in addition to those required as part of the Bat Mitigation Class Licence. This



should include a mixture of the features detailed above. These must be located upon buildings in close proximity to boundary tree lines, on a south or eastern facing aspect and away from any artificial lighting. Proposed locations are shown in Figure 12. Importantly where bat access tiles are used, bitumen must be used instead of Tyvec type linings which over time fray and entangle bats.

The residual impact is considered to be a **significant (positive) impact** at a **neighbourhood level**.

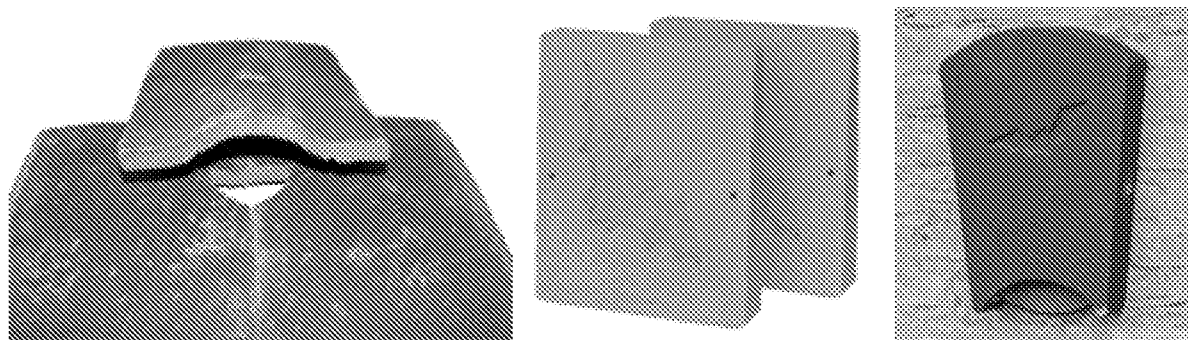


Figure 11. Left - Bat Access Tile Set. Middle - 2FE Schwegler Wall-Mounted bat shelters. Right – Beaumaris Woodstone Bat Box.

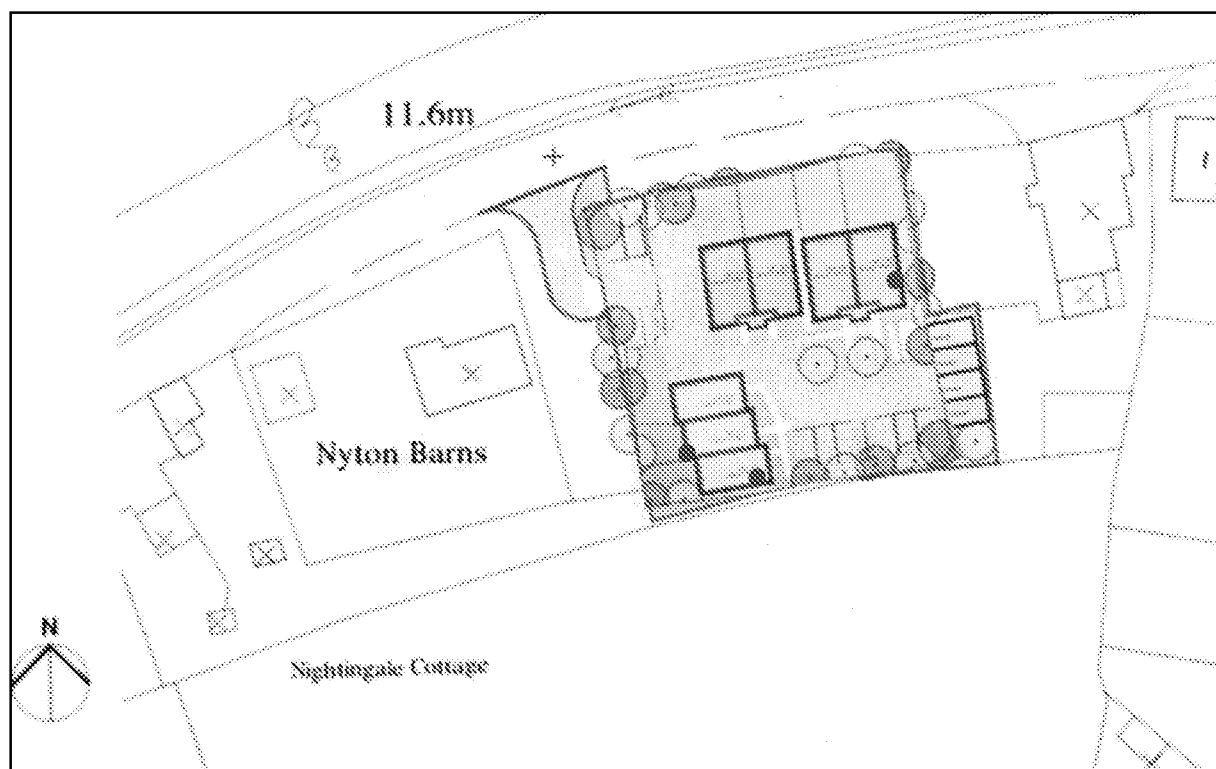


Figure 12. Proposed locations for three bat roosting features (indicated with blue dots) which are to be installed in addition to that which will be required as part of the bat EPS license.

6.1.2 Bat Activity

It is important for the proposed scheme to have a 'sensitive lighting plan', in accordance with guidelines set out by the Bat Conservation Trust (see Appendix 4). Overall the following measures must be implemented into the site design:



1. No 'upward pointing' or bare bulb lights will be installed anywhere on the development.
2. Column heights of external lights should be as low as reasonably possibly to limit light spill. Shields should be installed to focus light towards footpaths and roads only. No light will be allowed to emit light past horizontal (90 degrees from the ground).
3. A 'no-light zone' to protect southern boundaries from any artificial light. No lamp posts or other artificial lights should be positioned within 10 metres of these boundaries and no lights should be positioned to face towards these boundaries.
4. No external lights will be installed on new buildings above a height of 2 metres and all external lights will have shields to prevent light splash beyond horizontal.
5. A restriction on luminaires so that they lack UV elements or metal halide fluorescent sources, use of a warm white spectrum that is <2700 Kelvin and feature wavelengths higher than 550nm.

To compensate for the loss of the line of scattered trees it is recommended that native species rich hedgerows are planted along the sites boundaries and scattered native trees are planted within the site. In addition, any ornamental planting schemes should include species known to be beneficial to insects. This will aid to increase foraging resources for bats by increasing invertebrate prey.

Any new hedgerow should comprise a variety of native species. These hedgerows should be created using only native species from UK stock and where possible of local provenance. It is recommended that 50% is composed of hawthorn *Crataegus monogyna* to match the character of the area with the remaining 50% made up of four of the following species; blackthorn *Prunus spinosa*, spindle *Euonymus europaeus*, dogwood *Cornus sanguinea*, Wayfaring-tree *Viburnum lantana*, field or dog rose *Rosa arvensis/Rosa canina*, guelder rose *Viburnum opulus*, field maple, wild privet *Ligustrum vulgare* and hazel.

In addition, scattered tree planting is recommended which should include the planting of a minimum of six flowering and fruiting tree species such as; guelder rose, wayfaring tree, spindle, elder *Sambucus nigra*, wild cherry *Prunus avium*, rowan *Sorbus aucuparia*, whitebeam *Sorbus aria* or crab apple *Malus sylvestris*.

The residual impact is considered to be a **low (certain) impact**, which is considered **significant negative** at a **local level**.

6.2 Great Crested Newts & Reptiles

No further mitigation measures are recommended for reptiles. However, it is important that the amenity grassland is maintained below 5cm in height through regular mowing or strimming to prevent suitable habitat establishing within the construction zone.



Appendix 1 – Legislation and Policy

Introduction

The following text is intended for general guidance only and does not constitute comprehensive professional legal advice. It provides a summary of the current legal protection afforded to wildlife in general and certain species. It includes current national planning policy relevant to nature conservation.

The ‘Birds Directive’, ‘Habitats Directive’ and ‘Natura 2000 Sites’.

The Council Directive 79/409/EEC on the Conservation of Wild Birds (“the Birds Directive”) sets a framework for the protection of wild birds. Under the directive, a number of provisions are made including the designation and protection of ‘Special Protection Areas’ (SPAs) – areas which support important bird populations, and the legal protection of rare or vulnerable species.

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”) directs member states of the EU to take measures to maintain favourable conservation status of important habitats and species. This requires the designation of a series of sites which contain important populations of species listed on Annex II of the directive. Together with ‘Special Areas of Conservation’ (SPAs), designated under the Birds Directive, SACs form a network across Europe of protected areas known as the ‘Natura 2000’.

Annex IV lists species in need of more strict protection, these are known as “European Protected Species (EPS)”. All bat species, common dormice *Muscardinus avellana*, otter *Lutra lutra* and great crested newts *Triturus cristatus* are examples of EPS that are regularly encountered during development projects.

The ‘Habitats Regulations’

The Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations”) is the principle means of transposing the Habitats Directive and the Birds Directive, and updates the Conservation (Natural Habitats, &c.) Regulations 1994 (“the 1994 regulations”) in England and Wales.

‘Natura 2000’ sites receive the highest level of protection under this regulation which requires that any activity within the zone of influence of these sites would be subject to a Habitats Regulations Assessment (HRA) by the competent authority (e.g. planning authority), leading to an Appropriate Assessment (AA) in cases where ‘likely significant effects on the integrity of the site are identified.

For European Protected Species, Regulation 41 makes it a criminal offence to;

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb wild animals of such species;
- Deliberately take or destroy their eggs (where relevant);
- Damage or destroy a *breeding or resting place* of such an animal;
- Possess, control, sell or exchange any live or dead animal or plant, of such species;
- Deliberately pick, collect, cut, uproot or destroy a wild plant of such species.

The Habitats Directive and Habitats Regulations provide for the derogation from these prohibitions for specific reasons provided certain conditions are met. An EPS licensing regime allows operations that would otherwise be unlawful acts to be carried out lawfully. Natural England is the licensing Authority



and, in order to grant a licence, ensures that three statutory conditions (sometimes referred to as the 'three derogation tests') are met:

- A licence can be granted for the purposes of "preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment" (Regulation 53 (2) (e).
- A licence can be granted if "there are no satisfactory alternatives" to the proposed action.
- A licence shall not be granted unless the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Wildlife and Countryside Act (1981) as amended.

This remains one of the most important pieces of wildlife legislation in the UK. There are various schedules to the Act protecting birds (Schedule 1), other animals including insects (Schedule 5), plants (Schedule 8), and control of invasive non-native species (Schedule 9).

Under the Wildlife and Countryside Act (WCA) 1981, all wild birds (with the exception of those listed on Schedule 2), their eggs and nests are protected by law and it is an offence to:

- Take, damage or destroy the nest of any wild bird while it is in use or being built.
- Take or destroy the egg of any wild bird.
- Disturb any bird listed on Schedule 1, while it is nest building, or at a nest with eggs or young, or disturb the dependant young of any such bird.

Schedule 5 lists all non-avian animals receiving protection to a varied degree. At its strongest, the Act makes it an offence to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturb animals while occupying such places. Examples of species with *full protection* include all EPS, common reptile species, water vole *Arvicola amphibius*, white-clawed crayfish *Austropotamobius pallipes* and Roman snail *Helix pomatia*. Other species are protected from sale, barter or exchange only, such as white letter hairstreak *Satyrrium w-album*.

The Act makes it an offence to intentionally pick, uproot or destroy any plant or seed, and sell or possess any plant listed on Schedule 8. It is also an offence to intentionally uproot any wild plant not listed on Schedule 8 unless authorised [by the land owner]. Species on Schedules 5 and 8 are reviewed every 5 years when species can be added or removed.

Measures for the prevention of spreading non-native species which may be detrimental to native wildlife is included in the Act, which prohibits the release of animals or planting of plants into the wild of species listed on Schedule 9 (for example Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandifera*, New Zealand Pygmyweed *Crassula helmsii*).

The Wildlife and Countryside Act 1981 (as amended) also prohibits certain inhumane methods of traps and devices for the capture or killing of wild animals and certain additional methods such as fixed trap, poisoning with gas or smoke, or spot-lighting with vehicles for killing species listed on Schedule 6 of the Act (this includes all bat species, badger, otter, polecat, dormice, hedgehog and red squirrel).

Natural Environment and Rural Communities (NERC) Act (2006)

The NERC Act (2006) places a statutory duty under Section 40 on all public bodies, including planning authorities, to take, or promote the taking by others, steps to further the conservation of *habitats and*



species of principal importance for the conservation of biodiversity in England (commonly referred to as the 'Biodiversity Duty'). This duty extends to all public bodies the biodiversity duty of Section 74 of the Countryside and Rights of Way (CROW) Act 2000, which placed a duty only on Government and Ministers. Section 41 lists the habitats and species of principle importance. This includes a wide range of species from mosses, vascular plants, invertebrates through to mammals and birds. It originates from the priority species listed under the UK Biodiversity Action Plan (UK BAP) with some omissions and additions.

Protection of Badgers Act (1992)

The Badger *Meles meles* is afforded specific legal protection in Britain under the Protection of Badgers Act (1992), and Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) (see above).

Under this legislation, it is a criminal offence to:

- intentionally kill, injure, take, possess, or cruelly ill-treat, a Badger, or to attempt to do so;
- interfere with a sett, by damaging or destroying it;
- to obstruct access to, or any entrance of, a Badger sett; or
- to disturb a Badger when it is occupying a sett.

A licence may be obtained from Natural England to permit certain prohibited actions for a number of defined reasons including interference of a sett for the purpose of development, provided that a certain number of conditions are met. Note that licenses are not normally granted for works affecting badgers between the end of November and the start of July.

National Planning Policy Framework

The National Planning Policy Framework (NPPF 2012) sets out the Government's view on how planners should balance nature conservation with development and helps ensure that Government meets its biodiversity commitments with regard to the operation of the planning system.

The NPPF states that the wider benefits of an ecosystem should be recognised and the presence of a protected species is a material consideration for a development proposal (Circular 06/2005, 2005).

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), published in 1994, was the UK's response to the commitments of the Rio Convention on Biological Diversity (1992). The UK BAP was replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 to 2020 and forms the UK government's response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. This promotes a focus on individual countries delivering target for protection for biodiversity through their own strategies.

The most recent biodiversity strategy for England, 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' was published by Defra (2011), and a progress update was provided in July 2013 (Defra 2013).

'Biodiversity 2020' builds on the Natural Environment White Paper for England – 'The Natural Choice', published on 7 June 2011, and sets out the strategic direction for biodiversity policy for the next decade. Biodiversity 2020 deliberately avoids setting specific targets and actions for local areas because Government believes that local people and organisations are best placed to decide how to implement



the strategy in the most appropriate way for their area or situation.

In Kent, the themes identified as priorities in Biodiversity 2020 are carried forward by the Kent Biodiversity Partnership that administers the Kent Biodiversity Action Plans and Biodiversity Opportunities Areas (Kent BAP, 2014).

Birds of Conservation Concern (BoCC)

In 1996, the UK's leading non-governmental bird conservation organisations reviewed the conservation status of all bird species in the UK against a series of criteria relating to their population size, trends and relative importance to global conservation. The lists, known as the 'Red', 'Amber' and 'Green' lists (in order of decreasing concern) are used to inform key conservation policy and decisions. The lists are reviewed every 5 years and are a useful reference for determining the current importance of a particular site for birds. The most recent review was undertaken in 2015 (Eaton et al, 2015), which provides an up to date assessment of the conservation status of birds in the UK.

References

Circular 06/2005 (2005). *Government Circular: Biodiversity and geological conservation – statutory obligations and their impact within the planning system*. Office of the Deputy Prime Minister, London.
Countryside and Rights of Way (CRoW) Act (2000). HMSO London.

Defra (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Available at: <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>. [Accessed July 2014]

Defra (2013) Progress Update. Available at: <https://www.gov.uk/government/publications/biodiversity-2020-simple-guide-and-progress-update-july-2013>. [Accessed July 2014]

Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D., and Gregory, R. (2015) Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds* 108. December 2015. 708–746

Natural Environment and Rural Communities Act (2006). HMSO London.

Wildlife and Countryside Act (WCA) (1981). HMSO London.



APPENDIX 2 – Methodology for Assessment of Ecological Impacts

The assessment of ecological impacts follows best practice guidelines for impact assessment¹⁰.

Six steps are required as part of an ecological impact assessment which are detailed below:

1. Identify important ecological features (habitats, species, ecosystems and their functions/processes)

A summary of the approach to valuing important ecological features is detailed in Table 1.

Table 1: Categorisation of the level of value an important ecological feature has

Level of value	Example
International	Internationally designated site; Special Protected Area (SPA), Special Areas of Conservation (SAC), Ramsar, Biosphere Reserves. A viable area of a habitat or area important for maintaining viability listed as in Annex 1 of the Habitats Directive. Regularly occurring population of internationally important species listed in Annex 1, 2 or 4 of the Habitats Directive and Annex 1 of the Birds Directive.
National	Nationally designated sites; Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Local Nature Reserves (LRN). Regularly occurring population of nationally important species listed in UK BAP, Schedules 1, 5 and 8 of the Wildlife and Countryside Act or UK Red Data Book Species.
County / Regional	Non-statutory designated sites; Local Wildlife Sites (LWSs), Sites of Nature Conservation (SNCs) and Site of Importance for Nature conservation (SINCs). Ancient woodland more than 0.25ha. A viable area of a habitat or area important for maintaining viability identified in local/county BAPs listed as in Annex 1 of the Habitats Directive. Regularly occurring population of a species listed as being nationally scarce or a local/county BAP due to its rarity or localisation.
Local	Sites designated at a local level due to meeting ecological selection criteria. Habitats and species which are scarce in the local area.
Neighbourhood	Common widespread habitats (poor-semi improved grassland, arable fields, coniferous plantations etc).
Less than neighbourhood / negligible	Habitats with little to no ecological value (amenity grassland and hardstanding)

2. Identifying and characterising impacts to important ecological features

Impacts are characterised based on the changes expected to the extent and integrity of the important ecological features. This takes in to account permanent and temporary effects, timings and reversibility.

¹⁰ CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*. Chartered Institute of Ecology and Environmental Management, Winchester.



Impacts can be high, medium, low or neutral – see table 2. Each impact has a varying probability of occurring – see table 3. Impacts can either be negative or positive.

Table 2: Categorisation of the level of impact occurring to important ecological features

Impact type	Description
High	Large-scale, permanent changes to an important ecological feature which will impact on its integrity. This will likely result in changes in the conservation status of a species population or habitat type at the site.
Medium	Moderate-scale, permanent changes to an important ecological feature or large-scale temporary changes which will not impact upon its integrity. This will likely result in temporary changes in the conservation status of a species population or habitat type at the site, however these are unlikely to be reserved long-term.
Low	Small-scale, temporary changes to an important ecological feature or large-scale temporary changes which will not impact upon its integrity. This will likely result in temporary changes in the conservation status of a species population or habitat type at the site, however these are unlikely to be reserved long-term.
Neutral	No change in important ecological features.

Table 3: Categorisation of the probability of an impact occurring to important ecological features

Impact type	Description
Certain	It is reasonable to conclude that the impact will occur as a result of the proposal
Likely	It is reasonable to conclude that the impacts are more likely to will occur than not as a result of the proposal.
Unlikely	It is reasonable to conclude that these impacts are less likely to occur than to occur as a result of the proposal.

The following four steps lead on from the information identified in the above two steps:

3. **Incorporating measures to avoid and mitigate these impacts;**
4. **Assessing the significance of any residual effects after mitigation;**
5. **Identifying appropriate compensation measures to offset significant residual effects; and**
6. **Identifying opportunities for ecological enhancement.**



7 Appendix 3 – Great Crested Newt Survey Conditions, 'Habitat Suitability Index' values, and Survey Data.

Table 1. HSI calculation for ponds assessed during the survey.

	Pond 1		Pond 2		Pond 3	
NGR	SU93560545		SU93540563		SU93520544	
SI attribute	SI value	Notes	SI value	Notes	SI value	Notes
Location						
Pond area						
Pond drying						
Water quality						
Shade cover						
Water-fowl						
Fish presence						
No. ponds						
Terrestrial habitat						
Macrophytes						
H.S.I. value	N/A	Scoped out - Pond dry in February	N/A	Scoped out - Barriers to movement and fish pond	N/A	Scoped out - Flowing water as connected to flowing stream

	Pond 4		Pond 5		Pond 6a	
NGR	SU93570530		SU93540582		SU93580527	
SI attribute	SI value	Notes	SI value	Notes	SI value	Notes
Location	1.00	SE England			1.00	SE England
Pond area	0.16	80m ²			0.01	6m ²
Pond drying	0.90	Never			0.50	Sometimes
Water quality	1.00	Good			1.00	Good
Shade cover	1.00	0%			1.00	0%
Water-fowl	0.67	Minor			1.00	Absent
Fish presence	1.00	Absent			1.00	Absent
No. ponds	1.00	9			1.00	9
Terrestrial habitat	1.00	Good			1.00	Good
Macrophytes	0.71	40%			0.91	60%
H.S.I. value	0.76	'good' suitability	N/A	Scoped out - Barriers to movement	0.59	'below average' suitability



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	Pond 6b		Pond 7		Pond 8	
NGR	SU93570527		SU93560526		SU93720528	
SI attribute	SI value	Notes	SI value	Notes	SI value	Notes
Location	1.00	SE England	1.00	SE England	1.00	SE England
Pond area	0.01	4m ²	0.01	6m ²	0.01	3.5m ²
Pond drying	1.00	Rarely	1.00	Rarely	0.50	Sometimes
Water quality	1.00	Good	1.00	Good	0.67	Moderate
Shade cover	1.00	0%	1.00	0%	1.00	0%
Water-fowl	1.00	Absent	1.00	Absent	1.00	Absent
Fish presence	1.00	Absent	1.00	Absent	1.00	Absent
No. ponds	1.00	9	1.00	9	1.00	9
Terrestrial habitat	1.00	Good	1.00	Good	0.33	Poor
Macrophytes	0.90	90%	0.72	40%	0.90	90%
H.S.I. value	0.61	'average' suitability	0.62	'average' suitability	0.48	'poor' suitability

Table 2. Weather conditions and temperature during presence/absence and population surveys

Survey date	Air temperature evening/morning	Weather notes evening/morning	Surveyor
03/04/18	10.5°C	0-5mph wind, cloud 60%, dry	Briony Hill, Emma Baker
10/04/18 – 11/04/18	12°C/ 10.5°C	0-5mph wind, cloud 70%, dry / 0-5mph wind, cloud 40%, dry	Briony Hill, Sophie Bradfield
19/04/18 – 20/04/18	18°C/ 8.5°C	0-5mph wind, cloud 0%, dry / 0-5mph wind, cloud 0%, dry	Briony Hill, Emma Baker
24/04/18 – 25/04/19	14.5°C/ 9.5°C	5-10mph wind, cloud 100%, dry / 0-5mph wind, cloud 90%, dry	Briony Hill, Kate Lewis
30/04/18 – 01/05/18	9°C/ 4°C	0-5mph wind, cloud 100%, light rain / 0-5mph wind, cloud 10%, dry	Briony Hill, Sophie Bradfield
06/06/18 – 07/06/18	16°C/ 14.5°C	0mph wind, cloud 80%, dry / 0mph wind, cloud 100%, dry	Briony Hill, Kate Lewis



Table 3. Weather conditions and temperature during Great crested newt *Triturus cristatus* presence/absence and population surveys

Abbreviations: Lv=Common newt *Lissotriton vulgaris*; Lh=Palmed newt *Lissotriton helveticus*; Bb=Common toad *Bufo bufo*; Rt=Common frog *Rana temporaria*; ad=adult; spwn=spawn (toad or frog); td=tadpoles.

Pond 4	Torching results			Trapping results			Egg search	Netting	Other species			
Date	M	F	Juv	M	F	Juv	Present – Y/N		Lv	Lh	Bb	Rt
03/04/18	0	0	0	N/A - lined			Y – 2 identified	0	11	7	0	0
10/04/18	0	0	0	0	0	0	-	N/A	23	14	0	0
19/04/18	0	0	0	0	0	0	-	N/A	17	5	0	2
24/04/18	0	0	0	0	0	0	-	N/A	10	3	0	0
30/04/18	0	0	0	1	0	0	-	N/A	12	4	0	0
06/06/18	0	0	0	2	0	0	-	N/A	8	18	0	0

Pond 6a	Torching results			Netting			Egg search	Other species		
Date	M	F	Juv	M	F	Juv	Present – Y/N	Lv/Lh	Bb	Rt
03/04/18	0	0	0	0	0	0	N	5	0	Spwn
10/04/18	0	0	0	N/A – dense oxygenators			N	2	0	Spwn and td
19/04/18	0	0	0	N/A – dense oxygenators			N	eggs	0	td
24/04/18	0	0	0	N/A – dense oxygenators			N	4	0	td

Pond 6b	Torching results			Netting			Egg search	Other species		
Date	M	F	Juv	M	F	Juv	Present – Y/N	Lv/Lh	Bb	Rt
03/04/18	N/A – packed with frog spawn			N/A - packed with frog spawn			N	-	-	Spw n
10/04/18	N/A – packed with frog spawn			N/A - packed with frog spawn			N	-	-	Spw n and td
19/04/18	0	0	0	N/A – packed with tadpoles and too shallow			N	0	0	td
24/04/18	0	0	0	N/A – too shallow			N	0	0	td

Pond 7	Torching results			Netting			Egg search	Other species		
Date	M	F	Juv	M	F	Juv	Present – Y/N	Lv/Lh	Bb	Rt
03/04/18	0	0	0	0	0	0	N	1	0	0
10/04/18	0	0	0	N/A – too shallow			N	0	0	0
19/04/18	0	1	0	N/A – too shallow			N	11	0	0



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24/04/18	0	0	0	N/A – too shallow	N	10	0	1 ad
30/04/18	0	0	0	N/A – too shallow	N	6	0	1 ad
06/06/18	0	0	0	N/A – too shallow	N	6	0	0



APPENDIX 4 – Reducing Impacts of Artificial Light

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts on other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness. Guidelines issued by the Bat Conservation Trust¹¹ should be considered while designing the lighting scheme. A simple process which should be followed where the impact on bats is being considered as part of a proposed lighting scheme. It contains techniques which can be used on all sites, whether a small domestic project or larger mixed-use, commercial or infrastructure development. This includes the following measures:

Avoid lighting on key habitats and features altogether

there is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24-hour operation. However, in the public realm, while lighting can increase the perception of safety and security, measurable benefits can be subjective. Consequently, lighting design should be flexible and be able to fully consider the presence of protected species

Apply mitigation methods to reduce lighting to agreed limits in other sensitive locations – lighting design considerations

Where bat habitats and features are considered to be of lower importance or sensitivity to illumination, the need to provide lighting may outweigh the needs of bats. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved. The following are techniques which have been successfully used on projects and are often used in combination for best results;

- Dark buffers, illuminance limits and zonation
- Sensitive site configuration, whereby the location, orientation and height of newly built structures and hard standing can have a considerable impact on light spill
- Consider the design of the light and fittings, whereby the spread of light is minimised ensuring that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Consider the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures. Consider no lighting solutions where possible such as white lining, good signage, and LED cat's eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times.
- Screening, whereby light spill can be successfully screened through soft landscaping and the installation of walls, fences and bunding
- Glazing treatments, whereby glazing should be restricted or redesigned wherever the ecologist and lighting professional determine there is a likely significant effect upon key bat habitat and features.
- Creation of alternative valuable bat habitat on site, whereby additional or alternative bat flightpaths, commuting habitat or foraging habitat could result in appropriate compensation for any such habitat being lost to the development.

¹¹ Bat Conservation Trust and Institute for Lighting Professionals (2018) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



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- Dimming and part-night lighting. Depending on the pattern of bat activity across the key features identified on site it may be appropriate for an element of on-site lighting to be controlled either diurnally, seasonally or according to human activity. A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

Demonstrate compliance with illuminance limits and buffers

- *Design and pre-planning phase*; It may be necessary to demonstrate that the proposed lighting will comply with any agreed light-limitation or screening measures set as a result of your ecologist's recommendations and evaluation. This is especially likely to be requested if planning permission is required.
- *Baseline and post-completion light monitoring surveys*; baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on key habitats and features and so may prevent the agreed or modelled illuminance limits being achieved.
- *Post-construction/operational phase compliance-checking*



Further reading:

Buglife (2011) *A review of the impact of artificial light on invertebrates*.

Royal Commission on Environmental Pollution (2009) *Artificial light in the environment*. HMSO, London.
Available at: <https://www.gov.uk/government/publications/artificial-light-in-the-environment>

Rich, C., Longcore, T., Eds. (2005) *Ecological Consequences of Artificial Night Lighting*. Island Press.
ISBN 9781559631297.

CPRE (2014) *Shedding Light: A survey of local authority approaches to lighting in England*. Available
at: <http://www.cpre.org.uk/resources/countryside/dark-skies/item/3608-shedding-light>

Planning Practice Guidance guidance (2014) When is light pollution relevant to planning? Available
at: <https://www.gov.uk/guidance/light-pollution>

Institution of Lighting Professionals (2011) *Guidance Notes for the Reduction of Obtrusive Light*
GN01:2011. Available at: <https://www.theilp.org.uk/resources/free-resources/>