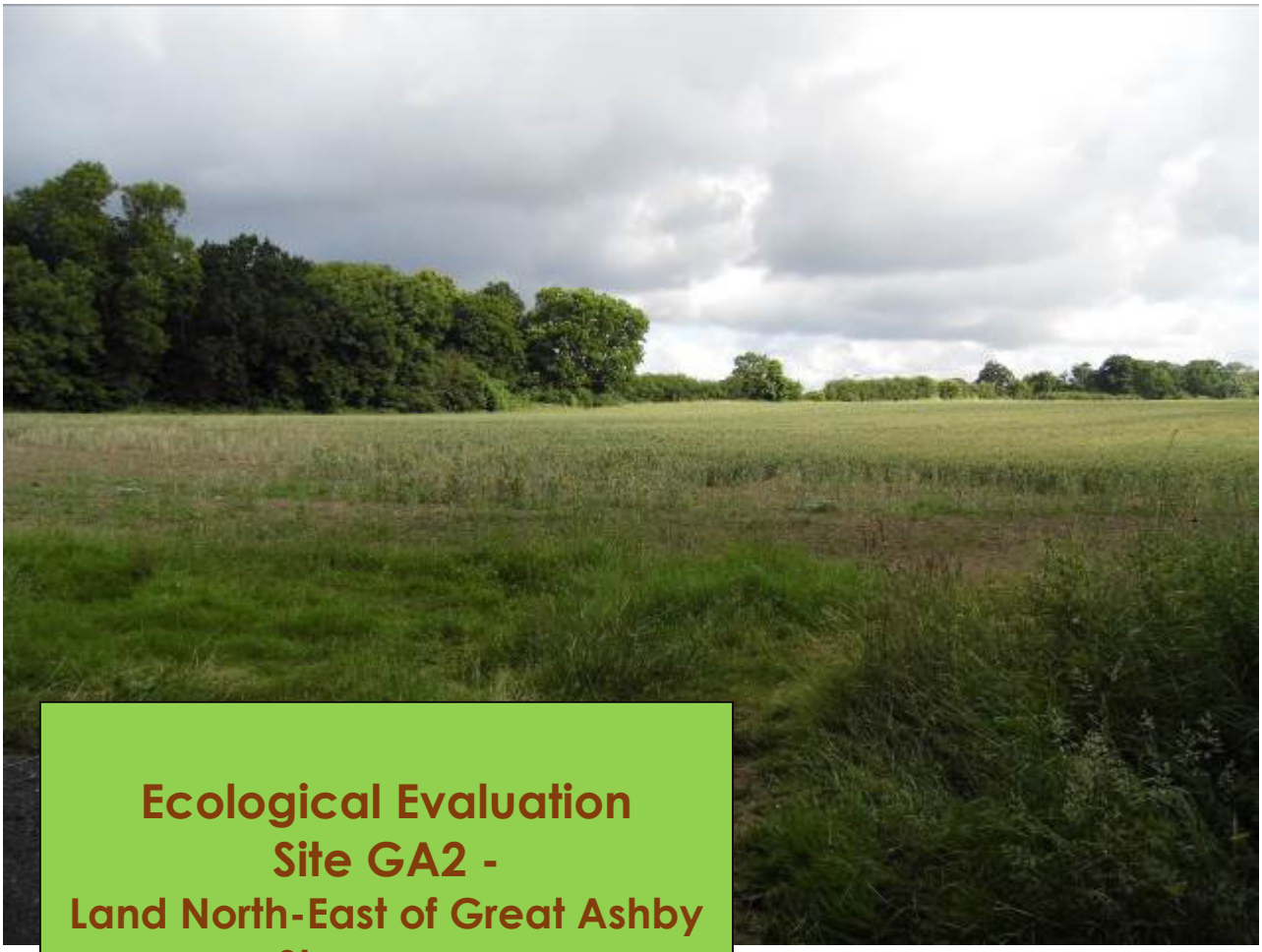

Ecological Evaluation
Site GA2 -
Land North-East of Great Ashby
Stevenage
Hertfordshire

December 2017

ELMAW Consulting
Consultant Ecologists &
Wildlife Biologists

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Date of Completion

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Declaration of Compliance

This report has been produced following the guidelines published by The Chartered Institute of Ecology and Environmental Management

Quality Assurance

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Special Note

Whilst every effort has been taken to ensure this report accurately identifies potential ecological constraints to development or the likely presence or absence of species and the spatial and temporal use of the site by such species, it must only be viewed as a snap shot in time and should therefore not be viewed as definitive.

Because of external influencing factors such as weather, season, access etc. affecting survey results, no liability can be assumed for omissions or changes that may or may not occur after the production of this report. The author of this report must be consulted as to the current applicability of the results if there are any seasonal delays in the use of this report.

This report can only be used for the purposes for which it was instructed and agreed at the time of commission.

Executive Summary

This report endeavours to demonstrate that residential development within the GA2 site – land north-east of Great Ashby, Stevenage, Hertfordshire can be delivered sustainably, in accordance with both national and local planning polices which protect important biodiversity. Specifically the purpose of the report is to establish, through the gathering of baseline ecological data concerning important and protected species and habitats, the ecological condition of the GA2 site and its intrinsic geographical value.

The report goes on to discuss the potential impacts, both constructional and operational, that may significantly affect important and protected species and habitats. It presents various mitigation, compensatory and enhancement mechanisms which would be used to ensure the development will accord with legislation and policy and specifically comply with the requirements of the emerging North Hertfordshire Local Plan 2011 - 2031 Policy SP18: Site GA2 - Land off Mendip Way, Great Ashby.

To provide the baseline ecological data in order to evaluate the intrinsic value of the GA2 site, a number of habitat, species and species-groups surveys have been identified and completed of the site during 2017. Specifically, the site has been habitat-mapped and valued; the arable fields, ponds, hedgerows, woodland edges and woodlands within and adjacent to the GA2 site have been surveyed for dormice *(Muscardinus avellanarius)*, great crested newts *(Triturus cristatus)*, nesting and wintering birds, feeding, roosting and foraging bats, reptiles, badgers *(Meles meles)* and invertebrates.

The surveys have been carried out and overseen by Mr Keith Seaman, Principal Ecologist with ELMAW Consulting in accordance with industry standards and published methodologies. Where survey constraints

and limitations in the resulting data have been encountered, these have been acknowledged within the report.

The key issues arising from these ecological studies have established that whilst there are no statutorily protected habitats within or adjacent to the GA2 site, there are a number of Local Wildlife Sites (LWSs) that include Tilekiln Wood & Parsonsgreen Wood LWS, New Spring Wood LWS, Brooches Wood LWS and Claypithills Spring Wood LWS within or adjacent to the site. In addition there are three priority Biodiversity Action Plan (BAP) habitat woodlands within and adjacent to the site; Newberry Grove, Longdell Wood and Nine Acre Spring, and the site is linked by a network of hedgerows, considered to be priority BAP habitats.

Species and species group surveys have established that the GA2 site is considered to be generally of local/parish value with a few exceptions; Local Wildlife Sites are considered to be of at least district value with Tilelkiln Wood considered to be of regional value due to the presence of the rare barbastelle *(Barbastella barbastellus)* bat.

It has also been established that the GA2 site is unlikely to support reptiles or great crested newts and there was no current evidence to suggest that dormice are still present within the GA2 site. Foraging and feeding bat habitat was confirmed along every woodland edge and hedgerow within the site and badger activity was found throughout the site with seven setts with varying degrees of usage in Brooches Wood LWS and Nine Acre Spring. Surrounding most arable fields, grass field margins are found with some potential value to invertebrates. This value however is not considered likely high as the field margins are generally narrow and comprise species-poor grassland with limited structural and floristic diversity. The hedgerows and woodlands are considered likely to be of more value to invertebrates.

With the exception of the new primary road proposed to cut through New Spring Wood LWS, and the scrub within New Spring Wood LWS and Brooches Wood LWS, the majority of the built development will be retained within the arable fields. Where the primary road intersects existing hedgerows, sections of hedgerow with existing gaps to facilitate the movement of farm machinery have been identified to avoid unnecessary damage to the hedgerows. To further avoid unnecessary damage or disturbance to important habitat features such as the hedgerows and woodlands, all development is designed to be buffered by the creation of 15m wide buffers around ancient woodland and 2-5m buffers around other woodlands and hedgerows, ecotones, dark zones and drainage swales.

Where potential damage or disturbance has not been avoidable, mitigation measures alongside compensatory and enhancement measures are described. Opportunities exist within the GA2 site for considerable amounts of habitat creation which would be designed to compensate in part for the impacts of the development on important biodiversity and contribute to achieving habitat LBAP targets; specifically hedgerows (under the Farmland LBAP), Neutral Grassland LBAP and Woodlands LBAP.

The provision of species-rich hedgerows along with the creation of green corridors and managed dark zones will provide an opportunity for the continued dispersal and foraging of nesting birds, badgers, hedgehogs *(Erinaceus europaeus)*, bats, possibly dormice and invertebrates around the GA2 site.

In addition, the proposed open space surrounding Dell Spring pond will provide an opportunity to enhance the site's biodiversity value through the creation and management of a variety of grassland regimes. Areas of neutral grassland 'meadow' will be created and managed to provide maximum biodiversity value through the cultivation and use of locally appropriate species. Opportunities exist to diversify the

biodiversity further through the conservation management of existing wetlands and the creation of new wetland habitats with the drainage basins and swales.

It is considered that the development of the GA2 site is unlikely to result in any significant impacts on important or protected species or habitats although it is acknowledged that some impacts cannot be avoided. However, opportunities exist within the site for considerable amounts of compensation and biodiversity enhancement which would mitigate potential impacts on important and protected species and habitats and demonstrate a no net loss of biodiversity and a net gain.

It is also considered that the proposed residential development of the GA2 site is deliverable in biodiversity terms and can, with careful planning and consideration, meet the requirements of the emerging North Hertfordshire Local Plan 2011 - 2031 Policy SP18: Site GA2 - Land off Mendip Way, Great Ashby.

1.0 Introduction

1.1 Background

1.1.1 Approximately 54ha of farmland north-east of the Great Ashby estate in Stevenage is being promoted to the local planning authority, North Hertfordshire District Council, for inclusion in the emerging proposed North Hertfordshire Local Plan 2011 - 2031 as a Strategic Housing Site for residential development. It is proposed to build approximately 600 homes and the site is referenced within the proposed North Hertfordshire Local Plan 2011-2031 and specifically discussed in Policy SP18 of the aforementioned proposed Local Plan and referred to as Site GA2 - Land off Mendip Way, Great Ashby.

1.1.2 To support this proposal, a number of technical documents are being provided including this Ecological Appraisal of Site GA2 which endeavour to demonstrate, in principle, that the proposed development is consistent with national policy and enables the delivery of sustainable development in accordance with the National Planning Policy Framework (NPPF). Paragraph 152 of the NPPF states that local planning authorities should seek to achieve net gains in biodiversity whilst avoiding significant adverse impacts, particularly on priority habitats, ecological networks and priority species populations, linked to national and local targets. Where adverse impacts are unavoidable, appropriate mitigation and compensatory measures should be used to minimise impacts on biodiversity and should contribute to and enhance the natural and local environment.

1.1.3 In order for the proposed development of Site GA2 to demonstrate compliance with the NPPF with regard to biodiversity, this report provides a general ecological evaluation of the site detailing the findings of a number of habitat and species/species-groups surveys of the GA2 site, carried out in 2017. It provides a geographical valuation of the site's important biodiversity and discusses the available

mitigation and compensatory measures which are both considered proportionate and appropriate, in accordance with the NPPF.

1.1.4 The resulting habitats and species/species-group surveys completed in 2017 are guided and scoped by the August 2016 *Preliminary Ecological Appraisal; Farmland north-east of Great Ashby, Stevenage*, ELMAW Consulting report.

1.2 Terms of Reference

1.2.1 The report's author is Keith Seaman who holds a first degree in Environmental Studies; Agri-Ecosystem Management, a diploma of Higher Education in Ecology and a Certificate of Higher Education in Ecology and Conservation. His professional qualifications include membership of the Royal Society of Biology (RSB) - registered as a Chartered Biologist and full membership of The Chartered Institute of Ecology and Environmental Management (CIEEM). Keith Seaman also holds Natural England Scientific and Research surveyor's licences for all species of bat, great crested newt, otter (*Lutra lutra*), barn owl *(Tyto alba)* and dormouse and has held numerous Natural England development licences for badgers.

1.2.2 This Ecological Evaluation has been commissioned by the proposer Picture srl, and is the second of two ecological reports concerning the GA2 Site with the first report entitled *Preliminary Ecological Appraisal, Farmland north-east of Great Ashby Stevenage* - ELMAW Consulting August 2016. This original report was completed as a Preliminary Ecological Assessment of the site's potential ecological value and scoped a number of baseline surveys to be completed to establish the relative ecological value of the site and should be read in conjunction with this Ecological Evaluation.

1.2.3 This current report details the results of these baselines surveys completed in the winter, spring, summer and autumn of 2017, assesses the ecological value of the site and advises on mitigation and

compensatory measures considered necessary to demonstrate deliverability of the GA2 proposal, in compliance with national and local planning policies.

1.3 Study Area

GoogleearthPro licence no. JCPM1QZUX6HR1KA

Plate 1: Aerial photo with indicative GA2 and study area boundary

1.3.1 The study area (GA2) has been annotated on the above aerial photograph and the site boundary has been informed by the drawing *Development Framework Plan, Land north-east of Great Ashby, November 2016, CSA Environmental* – drawing number CSA/993/029.

1.3.2 Where considered ecologically appropriate, the study area has been extended beyond the defined GA2 site boundary, for example the bat surveys have been extended to include Tilekiln Wood and the great crested newt surveys have included three ponds at Dane End Farm, outside and east of the red line boundary.

2.0 Planning Policy and Legislation

2.1 Planning Policy

National Planning Policy Framework

2.1.1 The National Planning Policy Framework superseded Planning Policy Statement 9 (PPS9) in March 2012. The NPPF states that the planning system should 'contribute to and enhance' the natural and local environment by;

- 'Recognising the wider benefits of ecosystem services and
- Minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures'.

2.1.2 Other key principles of the NPPF which relate to biodiversity are;

- The conservation of international and national statutorily designated sites
- Protection of ancient woodland and veteran trees
- The creation, protection, enhancement and management of networks of biodiversity and green infrastructure
- The preservation, restoration and recreation of priority habitats and ecological networks and
- The recovery of priority species populations

2.2 Country Biodiversity Action Plan

2.2.1 The Country Biodiversity Action Plan (UK BAP) 1995 produced a list of national priority species and habitats with all listed species/habitats having specific Action Plans defining the measures required to ensure their conservation.

2.3 Local Biodiversity Action Plan Priorities

2.3.1 Notably important habitats and species are considered under the country's Biodiversity Action Plans under Section 41 of the Natural Environment & Rural Communities (NERC) Act 2006.

2.3.2 Actions that need to be undertaken in order to maintain and/or enhance the nature conservation status of these habitats and species are implemented at a local level in the County Local Biodiversity Action Plan (LBAP).

2.4 Local Plan Policies

North Hertfordshire District Council Local Plan No.2 with Alterations April 1996:

Policy 14: Nature Conservation

'For Local Nature Reserves, Sites of Special Scientific Interest, Nature Reserves of the Hertfordshire and Middlesex Wildlife Trust, and sites of local Wildlife Significance, the Council will preserve their wildlife importance by not normally granting planning permission for development proposals in these sites, or which may harm their value, and will seek their continued management for nature conservation.

For sites of Wildlife Value, the Council will not normally grant planning permission for development proposals which do not take account of and encourage the potential nature conservation value of the site.

Elsewhere or when a development proposal is acceptable, the Council will expect development proposals to take account of, and where possible, to show improvements to the nature conservation value of the site and its surroundings. In addition, the Council may require the preparation and implementation of a management scheme to maintain or enhance the site's nature conservation value.'

The following draft policy is from the emerging North Hertfordshire District Council Local Plan;

Policy SP18: Site GA2 – Land off Mendip Way

'Land to the north-east of Great Ashby within Weston parish, as shown on the proposals map, is allocated as a Strategic Housing Site for approximately 600 homes. Planning permission for residential development will be granted where the following site-specific requirements (in part listed here) *are met:*

i. Appropriate mitigation, compensation and/or enhancement of key features of biodiversity including;

i. Local Wildlife Sites at Tilekiln Wood, Parsonsgreen Wood, New Spring Wood, Brooches Wood and Claypithills Spring Wood and

ii. identified protected species and priority habitats

2.5 Legislation

The Conservation of Habitats and Species Regulations

2.5.1 The Conservation of Habitats and Species Regulations 2010 (formerly the Conservation [Natural Habitats &c] Regulations 1994 as amended) implement the EC Habitats Directive in the UK. These regulations mainly deal with the protection of sites that are important for nature conservation in a European context (eg Special Areas of Protection [SACs] and Special Protection Areas [SPAs]). The legislation also gives protection to certain species of flora and fauna.

2.5.2 The Conservation of Habitats and Species Regulations 2010 make it an offence to deliberately capture, kill or disturb wild animals under Schedule 2 of the Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time).

Wildlife & Countryside Act (WCA)

2.5.3 The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act (CRoW) 2000 and the Natural Environment and Rural Communities Act (NERC) 2006, consolidate and amend existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive).

Natural Environment & Rural Communities Act (NERC)

2.5.4 The NERC Act of 2006 places a duty on authorities to have due regard for biodiversity and nature conservation during the course of their operations.

3.0 Methodology

3.1 Site Surveys & Technical Approach

3.1.1 This report has been produced following, in part, the *Guidelines for Ecological Impact Assessment* 2016 (Chartered Institute of Ecology and Environmental Management). Based in part on the scoping recommendations made in the *Preliminary Ecological Appraisal Farmland north-east of Great Ashby Stevenage* 2016, the following baseline species and species-group surveys have been completed during 2017;

- Bat activity surveys
- Preliminary ground-level bat roost assessment – hedgerows trees
- Reptile presence/likely absence survey
- Wintering bird survey
- Invertebrate site assessment
- Badger sett and activity mapping survey
- Breeding bird survey
- Amphibian - great crested newt survey
- Dormouse survey

3.1.2 The Institute of Ecology and Environmental Management in 2016 identified various ecological features and resources which are likely to be important in terms of biodiversity. These include;

- Rare or uncommon animals and plants internationally, nationally or locally;
- Habitats which provide for the plants and animals and assemblages of species of the above;
- Endemic or locally distinct sub-populations;
- Habitat and connectivity of habitat that provides important feeding habitat for rare species;
- Notable large populations of species considered uncommon or threatened;
- Plant and animal communities which are regarded as typical of valued habitats and semi-natural vegetation;

- Species-rich assemblages of plants and animals and typical assemblages that are characteristic of homogenous habitats.

3.1.3 For the purposes of this study, protected and species of importance are defined within the following legislation; The Conservation of Habitats & Species Regulations 2010, the Wildlife & Countryside Act (as amended) 1981, the Protection of Badgers Act 1992, the Hedgerow Regulations 1997, IUCN (International Union for Conservation of Nature) BoCC Red and Amber Lists and the Natural Environment & Rural Communities (NERC) Act 2006.

3.1.4 Notably important habitats and species are considered under the Country's Biodiversity Action Plans (UKBAP) under Section 41 of the Natural Environment & Rural Communities (NERC) Act 2006.

3.1.5 Both Country BAP and Local BAP habitats and species are included in the scope of this Ecological Evaluation.

3.1.6 The IUCN Birds of Conservation Concern (BoCC) Red and Amber Lists relate specifically to bird conservation internationally and the criteria for species inclusion is described below;

Red List Criteria

- Globally threatened
- Historical population decline in UK during 1800–1995
- Severe (at least 50%) decline in UK breeding population over last 25 years, or longer-term period (the entire period used for assessments since the first BoCC review, starting in 1969)
- Severe (at least 50%) contraction of UK breeding range over last 25 years, or the longer-term period.

Amber List Criteria

- Species with unfavourable conservation status in Europe (SPEC = Species of European Conservation Concern)
- Historical population decline during 1800–1995, but recovering; population size has more than doubled over last 25 years
- Moderate (25-49%) decline in UK breeding population over last 25 years, or the longer-term period

- Moderate (25-49%) contraction of UK breeding range over last 25 years, or the longer-term period
- Moderate (25-49%) decline in UK non-breeding population over last 25 years, or the longer-term period
- Rare breeder; 1 – 300 breeding pairs in UK
- Rare non-breeders; less than 900 individuals
- Localised; at least 50% of UK breeding or non-breeding population in 10 or fewer sites, but not applied to rare breeders or non-breeders
- Internationally important; at least 20% of European breeding or non-breeding population in UK (NW European and East Atlantic Flyway populations used for non-breeding wildfowl and waders respectively).

3.1.7 Geographical Range of Reference

Value Category	Site or Ecological Feature
International	All internationally important Sites or candidate/proposed Sites. Regularly occurring, nationally significant population of protected or internationally important species. A viable area of habitat type listed in Annex 1 of The Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of a larger whole
National/ Regional	SSSIs and other nationally designated Sites. A viable area of a priority habitat identified in the UKBAP or an area of such habitat which are essential to maintain the viability of a larger area Regularly occurring, regionally or nationally significant population of European Protected Species or habitats Regularly occurring, locally significant population of a regionally or nationally important species.
County	County designated Sites (CWS) Other Sites with BAP priority habitats or species of appreciable value not included in the above. Regularly occurring, locally significant population of a County important species. Local Nature Reserves and other viable areas of key habitat identified in the County or LBAP.
District	Area of habitat identified in a District/Borough BAP and other natural or semi-natural Sites of significant biodiversity. Regularly occurring, locally significant population of a District/Borough important species during a critical stage of its life cycle.
Parish/Neighbourhood	Areas of habitat considered to appreciably enrich the local habitat resource within approximately 2km of the application site, parish or neighbourhood.
Site Level only	Sites with limited biodiversity, providing some biodiversity enrichment at project site only.

3.1.8 The valuation and levels of geographical importance have been determined following the guidance of the CIEEM in the *Ecological*

Impact Assessment in the UK 2016 and the *Handbook of Biodiversity Methods. Survey, Evaluation and Monitoring 2005.*

3.1.9 The baseline conditions of the application site have been determined for the year 2017.

Bat Transect Surveys

3.1.10 The primary aim of the activity surveys of the site was to assess the general levels of bat activity throughout the site, to identify the species utilising the site and to identify which habitats were preferentially being used by bats. To achieve the survey aims, both walked transect and automated static detector surveys were completed following the guidelines for bat surveys and assessments published by The Bat Conservation Trust, *Bat Surveys for Professional Ecologists Good Practice Guidelines, 3rd Edition 2016.*

3.1.11 For a site potentially considered to have moderate to high suitability for bats, two survey visits of a single walked transect were completed in each of the months of May, June, July, August, September 2017. Due to weather restrictions, no walked transect surveys were completed in the month of April as temperatures were below the accepted minimum for bat activity surveys and due to time limitations, only one transect was carried out in October of 2017.

3.1.12 As indicated in Figure 1 (appended), the walked transect route followed linear features of hedgerows, woodlands and woodland edges. The transects were completed by Mr Keith Seaman; Natural England licensed bat Ecologist (licence no. 2015-15559-CLS-CLS) and Mrs Emma Seaman (Natural England licence no. 2015-14021-CLS-CLS). Transects were commenced at sunset and concluded at the end of the transect, approximately one and half to two hours after sunset. To limit potential missed habitual bat activity along the transect route, the start and finish of the transect were reversed on every other transect, to provide a range of sampling times.

3.1.13 Pettersson D230 and Anabats SD1/2 were used in the recording of bat call registrations and Anabats SD1/2 recordings were later analysed using Analook software. *British Bat Calls*. 2012, Jon Russ and *Social Calls of the Bats of Britain and Ireland*. 2014, Middleton, Frond and French, were used to aid the identification of the resulting bat call recordings.

Automated Bat Surveys

3.1.14 As recommended in The Bat Conservation Trust, *Bat Surveys for Professional Ecologists Good Practice Guidelines, 3rd Edition 2016,* for a site with potentially moderate to high bat suitability, automated bat surveys were selected which were considered to provide a spread of sampling locations and each sampling location recorded for a period of five nights set to commence recording 30 minutes before sunset and finishing 30 minutes after sunrise from May through to October 2017 inclusive.

3.1.15 Automated bat survey locations were identified using the 'judgmental' approach with 18 sampling locations chosen on what was deemed to provide a spread of sampling from all hedgerows and within all woodlands within and adjacent to the site.

3.1.16 Anabat Expresses and Anabats SD1/2 were used and strapped to trees at the identified locations at an approximate height of three metres.

3.1.17 Analysis of the recorded data was undertaken using Analook W Express and Analook with *British Bat Calls*. 2012, Jon Russ and *Social Calls of the Bats of Britain and Ireland*. 2014, Middleton, Frond and French, used to aid the identification of the resulting bat call recordings.

3.1.18 It should be noted that the automated bat surveys will provide both quantitative as well as qualitative data, however, whilst they will enable species identification passing the recorder it cannot record the number of bats passing. Numerous bat call registrations could mean one bat passing many times or numerous bats passing just once.

3.1.19 Figure 2 (appended) shows the locations of the automated bat surveys within the site.

Preliminary Ground-Level Bat Roost Assessment – Hedgerow Trees

3.1.20 Following The Bat Conservation Trust, *Bat Surveys for Professional Ecologists Good Practice Guidelines, 3rd Edition 2016,* all mature trees within the GA2 site's hedgerows have been surveyed from ground level for the presence of potential roosting features. Using the published guidelines, trees with potential roosting features have been subjectively assessed using professional judgement and classified as either having moderate or high roosting potential.

3.1.21 Trees considered to have moderate or high potential are expected to have at least an off-ground inspection and or an emergence survey to be confident of a negative or positive conclusion. Trees considered to have a low bat roosting potential are not expected to be surveyed further. As such, with regard to ensuring protected species are adequately considered in any development proposals particularly with regard to adverse impacts, only those trees considered to have a moderate or high bat roosting potential have been considered here.

3.1.22 Trees within or adjacent to the site's woodlands have not been assessed for roosting potential as it is considered highly unlikely, with the exception of a small number of trees in New Spring Wood LWS, that woodland trees would be directly affected by the proposed development.

Reptiles

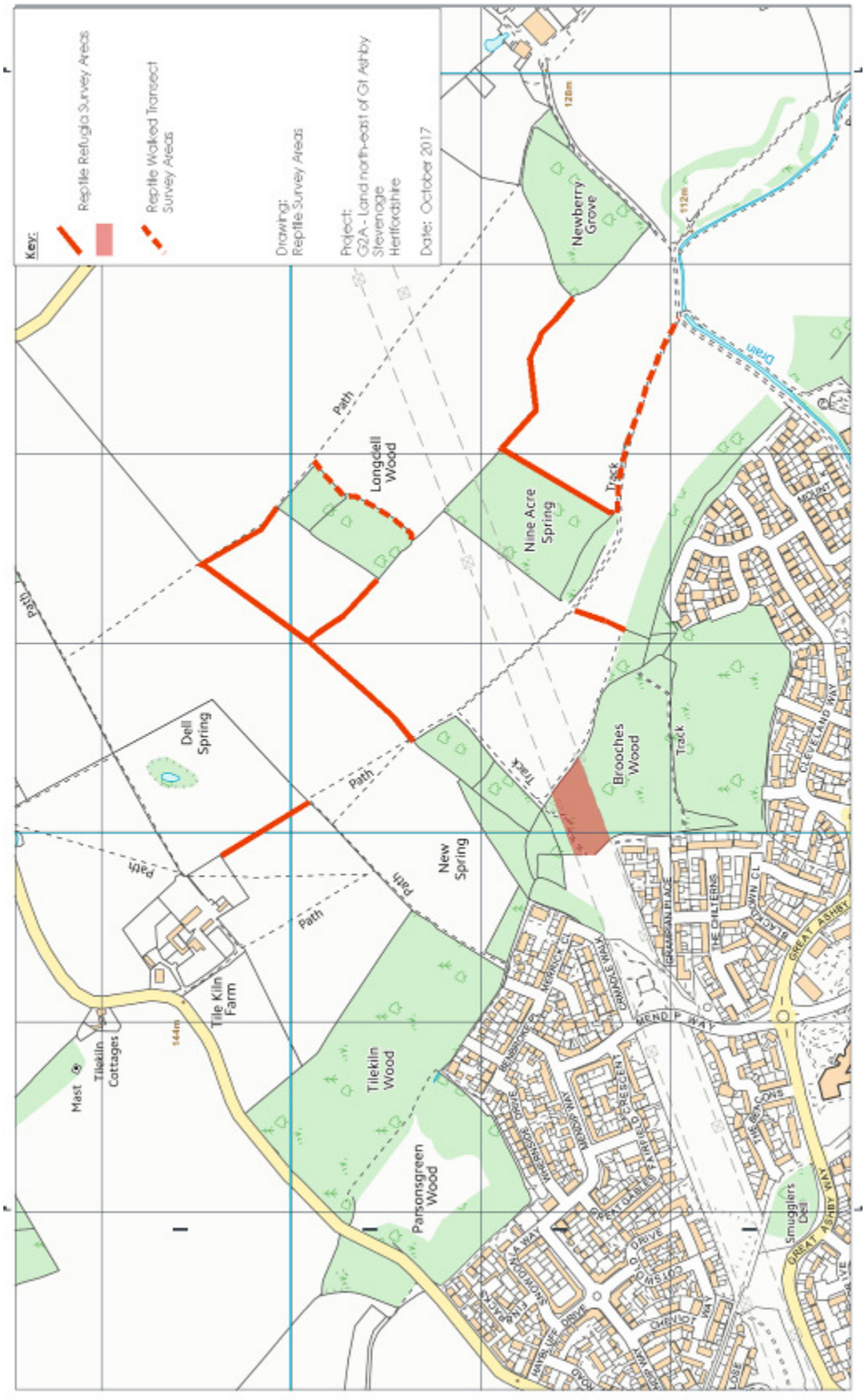
3.1.23 Whilst no reptiles are recorded locally, it was considered that potentially all three common but protected species of reptile could use various areas of the site. A number of locations have been identified for survey, based on habitat which is considered to offer the highest likelihood of supporting reptiles. Specifically, areas of rough and structurally diverse grass headlands abutting woodland or hedgerows on the southern, western or eastern elevations have been selected for surveying (shown in Figure 1 below).

3.1.24 Following the guidelines published in the *Survey Protocols for the British Herpetofauna Version 1.0, 2013, a* mix of techniques was employed which included the use of artificial refugia in the form of 0.5m^2 size corrugated bitumen sheeting and roofing felt laid at a density of 100 sheets per hectare. As a result of public interference to some sections of refugia, some areas of habitat were restricted to a slowly-walked transect.

3.1.25 The survey was completed during August, September and early October 2017, considered to be an optimum time of year to locate reptiles; seven survey visits were completed at which time each of the refugia was checked and the transects walked. All surveys were completed in suitable weather conditions and within acceptable industry standard parameters.

Surveyed Area	Dates of Survey	Techniques Employed
South-western field margin of H4	14th August, 6th, 11th, 18th, 25th September & 9th, 12th October 2017.	Refugia & walked transect
South-eastern field margin of H2	14th August, 6th, 11th, 18th, 25th September & 9th, 12th October 2017.	Refugia & walked transect
South-western field margin of H3	14th August , 6th, 11th, 18th, 25th September & 9th, 12th October 2017.	Refugia & walked transect
South-eastern edge of Longdell Wood	14th August, 6th, 11th, 18th, 25th September & 9th, 12th October 2017.	Walked transect only
South-eastern edge of Nine Acre Spring	14th August, 6th, 11th, 18th, 25th September & 9th, 12th October 2017.	Refugia & walked transect
Southern field margin of H8	14th August, 6th, 11th, 18th, 25th September & 9th, 12th October 2017.	Refugia & walked transect
Southern field margin of H7	14th August, 6th, 11th, 18th, 25th September & 9th, 12th October 2017.	Walked transect only
Eastern field margin of H6	14th August, 6th, 11th, 18th, 25th September & 9th, 12th October 2017.	Refugia & walked transect
Scrub below the pylons adjacent to Brooches Wood	14th August, 6th, 11th, 18th, 25th September & 9th, 12th October 2017.	Refugia & walked transect

Figure 1 – Reptile Survey Areas



Wintering Bird Survey

3.1.26 Broadly based on the British Trust for Ornithology (BTO) Wintering Farmland Bird Survey technique, a transect route was walked consistently throughout the site once a month in November & December 2016 and January and February 2017, by Keith Seaman. All birds seen or heard were recorded on a site map using the standard BTO species codes and activity symbols.

Survey Dates	Weather conditions	Temperature
27th November 2016	Cloudy, no wind	6°C
2rd December 2016	Light cloud, wind BS2, light breeze	7°C
23rd January 2017	Bright, little wind, BS1	2°C
27th February 2017	Cloudy, damp with light breeze, BS2	8°C

Breeding Bird Survey

3.1.27 In accordance with the BTO's Breeding Bird Survey (BBS) methodology, three surveys of the site were carried out during the spring of 2017 by Keith Seaman; in April, May and June. A single walked transect was completed of the site following the adopted standard site survey transect route on one morning in each of the three months. All birds seen or heard were recorded on a site map using the standard BTO species codes and activity symbols.

Survey Dates	Weather conditions & time	Temperature
19th April 2017	Dry, light wind, BS3 with cloud @ 7.00am	2°C
15th May 2017	Dry, overcast with slight breeze, BS 2 @ 7.20am	11°C
18th June 2017	Dry and sunny with little wind, BS3 @ 7.15am	20°C

3.1.28 To enable an evaluation of the relative conservation status and geographical value of each of the bird species recorded within the GA2 site, the Hertfordshire Natural History Society's 2015 Birds of Hertfordshire has been referenced.

Badger Sett and Activity Mapping Survey

3.1.29 The GA2 site and immediate adjacent land have been surveyed through a walk-over for indicative signs of badger including denning (setts), feeding, foraging or territorial activity following the methodology published by The Mammal Society (Harris, Cresswell & Jefferies. 1989). This was carried out in March 2017 by Mr Keith Seaman in suitable dry weather conditions and regularly updated as additional badger activity signs were either discovered or became more evident throughout the year. The mapped badger activity should not however be viewed as a definitive map of the extent of the local badger population but only an indication of their activity within the GA2 site at the time of recording.

Invertebrate Survey & Assessment

3.1.30 The invertebrate survey and assessment was completed by Mr David Goddard of WYG, Executive Park, Avalon Way, Anstey, Leicester. The survey and assessment was carried out on the 25th August 2017 and involved a suite of surveys to establish a baseline of invertebrates for the site, mainly within the grass field margins, woodland edges and along hedgerows and areas considered to offer the richest invertebrate habitat in comparison to the intensively farmed arable fields.

3.1.31 A number of techniques which included direct observation, sweep and aerial netting, beating of trees and shrubs and a limited amount of destructive searching of fallen deadwood were employed.

3.1.32 The resulting assessment is detailed and discussed in the *Invertebrate Site Assessment, North of Stevenage*. 28th September 2017, WYG.

Dormouse Survey

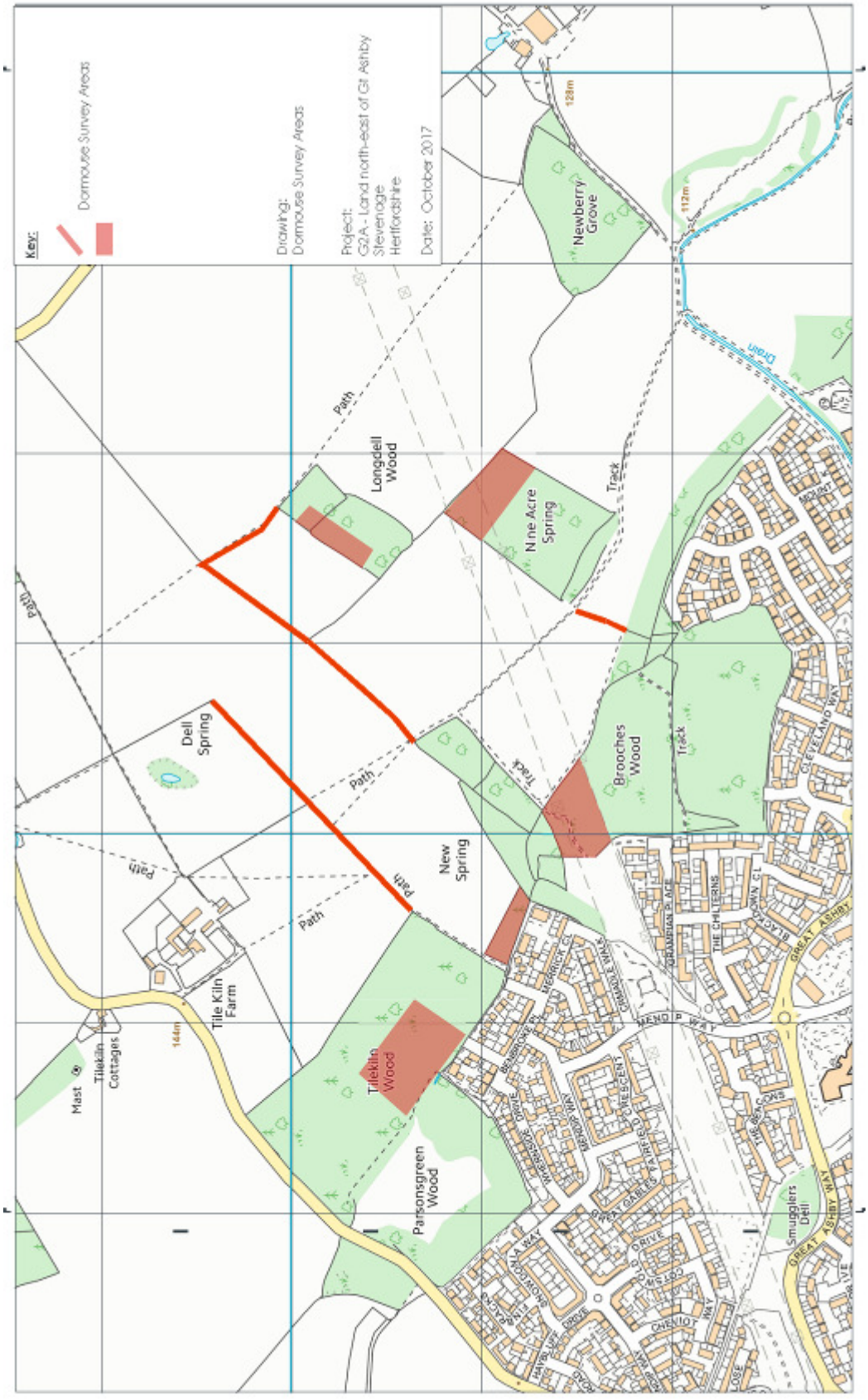
3.1.33 Following the survey methodology for carrying out a nest tube survey published in English Nature's *Dormouse Conservation Handbook* 2006, the presence/likely absence survey for dormice within the site was carried out within a number of hedgerows and woodlands.

3.1.34 Specifically, parts of Tilekiln Wood, Brooches Wood, New Spring Wood and Longdell Wood as well as hedges H1 (part), H2 and, H3 were surveyed (as shown in Figure 2 below). The survey focused on the parts of the site's woodlands with discernible amounts of understory and/or hazel/scrub coppice and the hedgerows which were found to have some dormouse evidence in a previous survey of the site carried out in 2008 by ELMAW Consulting.

3.1.35 Dormouse tubes were installed at a spacing of 10m - 15m apart along the hedgerows H1, H2 and H3 during the winter of 2016/17 and checked three times during then season for indicative signs of dormouse occupancy. In addition, clusters of dormouse nest boxes where installed in Tilekiln Wood, New Spring Wood and Longdell Wood also during the winter of 2016/17 and checked three times during the season. A total of 105 nest tubes were installed along with a total of 65 wooden nest boxes.

3.1.36 The installation and checking of tubes and boxes was carried out by Keith Seaman, a Natural England dormouse licensed surveyor (licence ref. no. 2016-20875-CLS-CLS).

Figure 2 – Dormouse Survey Areas



Amphibians - Great Crested Newt Survey

3.1.37 Ponds/open water exists within the site in just one location at Dell Spring, referenced pond P1. Three other ponds are located just outside the GA2 site boundary at Dane End Farm, east of the site - these ponds are referenced ponds P2, P3 & P4.

3.1.38 P1 was surveyed following Natural England guidelines (English Nature 2004) in 2008 and was found to have no evidence that it supported great crested newts. P1 was considered to have a low great crested newt potential because of its low water level, lack of macrophytic vegetation and complete over-shadowing by trees. The very poor and degraded condition of P1 still exists in 2017 and therefore was considered unsuitable for great crested newts and was not surveyed. A Habitat Suitability Index (HSI) (Oldham *et al.* 2000) was carried out on P1 (the results of which are appended).

3.1.39 P2 and P4 at Dane End Farm were also assessed through a HSI (results appended), and were found to support very little, shallow water, were also over-shadowed by trees and scrub and were considered to be unsuitable for great crested newts. P3 however was found to have low great crested newt suitability; whist the water level was found very low, areas were found open and not over-shadowed and some macrophytic vegetation existed. Consequently P3 was surveyed in the spring of 2017.

3.1.40 Because of the low level of water, the pond could not be funnel-trapped. However the pond was torched and netted at night and an egg search was undertaken of the limited amount of aquatic vegetation present. The pond became too shallow by the fourth survey on the 5th May 2017 to either torch or net and could only be egg-searched.

Pond Reference	Date	Survey Methods Employed
P3	20th March 2017	Egg search Torch survey Netting
P3	18th April 2017	Egg search Torch survey
P3	27th April 2017	Egg search Torch survey
P3	5th May 2017	Egg search

4.0 Survey Results & Evaluation

4.1 Designated Sites of Nature Conservation Interest

4.1.1 Whilst there are no statutorily protected sites of nature conservation importance within the GA2 site, there is one Local Wildlife Site wholly within the site; New Spring Wood LWS(ref. no. 22/009) with a second which lies partly within the site; Brooches Wood LWS (ref. no. 22/008). In addition Tilekiln Wood & Parsonsgreen Wood LWS(ref. no. 22/010) lies on the north-western boundary of the site. Potentially, three LWSs could be impacted by the development at area GA2.

4.1.2 As described in the *Preliminary Ecological Appraisal; Farmland north-east of Great Ashby, Stevenage*, ELMAW Consulting 2016 (PEA 2016) report, New Spring Wood LWS is described as a 1.0ha ancient woodland supporting English oak (*Quercus robur*), ash *(Fraxinus excelsior)* and some hornbeam (*Carpinus betulus*) coppice. The ground flora supports ancient woodland indictors such as bluebell (*Hyacinthoides non-scripta*) and is shown on Bryant's map (1822). Brooches Wood LWS is described as 6.5ha of ancient woodland of oak and hornbeam coppice with ancient woodland indicator plants such as bluebell. Tilekiln Wood & Parsonsgreen Wood LWS is described as ancient; 8.25ha, supporting coppice with standards, oak and hornbeam with ancient woodland indicator ground flora.

4.1.3 Local Wildlife Sites are described as non-statutory sites designated at a county level for conservation importance and often recognised in local authority Development Plans. Whilst it is acknowledged that LWSs have no statutory protection, they are considered materially important in the planning process and supported by appropriate local planning policies such as Local Plan Policy 14: *Nature Conservation* for the protection for sites of wildlife and nature Interest.

5.0 Reptiles

5.1 Desk Study & Background Data

5.1.1 The biological data search carried out in 2016 returned no records of any species of reptile from within the data search area which comprised a two kilometre radius around the site. It is however considered unlikely that any one of the common but protected species of reptiles such as grass snake (*Natrix natrix*), common lizard (*Zootoca vivipara*) and slow worm (*Anguis fragilis*) are not found locally. All three species were considered potentially likely within a number of the arable field margins, woodland and hedgerow edges particularly, on the southern, eastern and western orientations.

5.2 Survey Results

Date	Weather	Temperature	Results
14th August 2017	Sunny with some cloud. Wind speed BS2	20^{0}C	Zero reptiles
6th September 2017	Sun with light cloud. Wind speed BS3	18^{0}C	Zero reptiles
11th September 2017	Partial sun and cloud. Rain earlier. Wind speed BS4	18^{0}C	Zero reptiles
18th September 2017	Partial sun and light cloud. Wind speed BS1	15^{0}C	Zero reptiles
25th September 2017	Sunny with light cloud. Wind speed BS2	17^{0}C	Zero reptiles
9th October 2017	Sunny with limited cloud cover. No wind.	14^{0}C	Zero reptiles
12th October 2017	Overcast with no wind	12^{0}C	Zero reptiles

5.3 Limitations and Constraints

5.3.1 Some public interference with a number of refugia was encountered in August along hedgerow H2 and Longdell Wood and where this was encountered refugia sheeting was removed and the survey in these areas restricted to a slow-walked transect. Whilst not ideal for detecting species such as slow worms, species such as common lizards

are easily detected using this method. In addition to this constraint, a line of refugia along H2 was damaged by the flail of the farmer's tractor during post-harvest field margin maintenance operations. Once the tractor mowing had been finished, the damaged and destroyed refugia were replaced with new refugia and the survey of these areas re-commenced.

5.3.2 It should be acknowledged that not all potentially suitable reptile habitat within the GA2 site has been surveyed. However, the optimum reptile habitat within the site was surveyed and considered to be an appropriate sample to survey on the basis that if reptiles are not found extant within optimum habitat conditions they are highly unlikely to be extant within sub-optimal areas of the site.

5.4 Evaluation

5.4.1 Whilst acknowledging the survey constraints encountered, the survey found no evidence that reptiles are currently extant within the GA2 site. Therefore, it is considered that the GA2 site has a negligible value to reptiles at this time.

6.0 Wintering & Breeding Birds

6.1 Desk Study & Background Data

6.1.1 As discussed in the PEA 2016, 39 specially protected or notably important species of bird have been recorded from within the data search area, the closest record is of marsh tit *(Poecile palustris)* dated 2012 from Brooches Wood which lies adjacent and partly inside the application site's southern boundary. Of the recorded specially protected or important species of birds, seven are deemed to inhabit hedgerows, 11 are woodland species and 12 are associated with farmland; the remainder are generalist species found throughout these habitat types.

6.1.2 In addition to the arable fields, the site supports 2.3km of hedgerows and 7.9ha of woodland which are all considered to have potential to support farmland species of importance both resident and winter visitor species. It should be noted however, that the majority of the recorded important species of bird within the data search area are considered fairly common and widespread in Hertfordshire.

6.2 *Survey Results – Wintering Bird Survey*

Species (common names)	Conservation status	Survey Date: 27th Nov 2016	Survey Date: 23rd Dec 2016	Survey Date: 23rd Jan 2017	Survey Date: 27th Feb 2017	# of observations
Blackbird	RD Green	X	X	X	X	19
Blue tit	RD Green	X	X	X	X	10
Chaffinch	RD Green	X	X	X	X	11+ flock 20
Dunnock	SPI/RD Amber			X	X	2
Goldfinch	RD Green	X	X			3
Goldcrest	RD Green	X				3
Green woodpecker	RD Green	X			X	5
Great-spotted woodpecker	RD Green		X	X	X	3
Great tit	RD Green	X	X	X	X	8
Jackdaw	RD Green	X		X	X	3 + flock 10
Long-tailed tit	RD Green	X				1
Magpie	RD Green	X	X	X	X	13
Mistle thrush	RD Red				X	1
Nuthatch	RD Green	X				1
Pied wagtail	RD Green	X				1
Reed bunting	RD Amber	X				Flock 30
Redwing	RD Red	X				1
Robin	RD Green		X	X		4
Rook	RD Green		X			Flock 10
Skylark	SPI/RD Red	X	X	X		4 + flock 6
Song thrush	SPI/RD Red	X			X	2
Tree creeper	RD Green				X	1
Wren	RD Green	X	X	X		10
Woodpigeon	RD Green	X	X	X	X	8 + Flock of 50
Yellowhammer	SPI/RD Red		X	X	X	4

SPI – Species of Principal Importance, RD – Red Databook

6.2.1 25 species of bird were recorded throughout the winter survey period, with individual birds observed and counted. Six species were recorded in flocks of varying sizes; chaffinch *(Fringilla coelebs)*, jackdaw *(Corvus monedula)*, wood pigeon *(Columba palumbus)*, rook *(Corvus frugilegus)*, reed bunting *(Emberiza schoeniclus)* and skylark *(Alauda arvensis)*, with the largest flock encountered being wood pigeon with a flock of over 50 counted on three of the four survey occasions. The smallest flock encountered was of skylark with just six individuals, counted on the 27th November 2016.

6.2.2 Of the species recorded, only five are listed as species of conservation concern; mistle thrush *(Turdus viscivorus)* is listed as RD Red and skylark,

song thrush *(Turdus philomelos)* and yellowhammer *(Emberiza citronella)* are both RD Red listed as well as Section 41. NERC Species of Principal Importance and dunnock *(Prunella modularis)* is RD Amber listed.

6.2.3 The remainder of the species are listed as RD Green; species that occur regularly in the UK but do not qualify under Red or Amber and are considered not to be under any conservation threat.

6.3 Survey Results – Breeding Bird Survey

Species (common names)	Conservation status	Estimated breeding territories within and immediately adjacent to GA2
Blackbird	RD Green	3-4
Blackcap	RD Green	3-4
Blue tit	RD Green	4-6
Chaffinch	RD Green	1-3
Chiffchaff	RD Green	1
Dunnock	SPI/RD Amber	3-4
Great spotted woodpecker	RD Green	2
Great tit	RD Green	3-5
Linnet	SPI/RD Red	1
Magpie	RD Green	2-5
Robin	RD Green	2-5
Skylark	SPI/RD Red	1
Willow warbler	RD Amber	2
Whitethroat	RD Green	2-3
Woodpigeon	RD Green	4-6
Wren	RD Green	5-8
Yellowhammer	SPI/RD Red	3

SPI – Species of Principal Importance, RD – Red databook

6.3.1 17 species of bird were considered to be holding a breeding territory within and immediately adjacent to the GA2 site. Of the 17 species, only three would be considered 'farmland birds'; linnet *(Carduelis cannabina)*, yellowhammer and skylark. The remaining 14 are considered generalist species found in woodlands, parks and gardens.

6.3.2 Four species of importance have been recorded as likely occupying a breeding territory; dunnock, yellowhammer, skylark and linnet. As discussed above, skylark, yellowhammer and linnet are RD Red listed and the dunnock is RD Amber listed as well as all four species being

Section 41. NERC Species of Principal Importance. The remainder of the species are either listed as RD Amber or RD Green.

6.4 Limitations and Constraints

6.4.1 Both the wintering bird and spring breeding bird surveys were completed in ideal weather conditions and full access to the site was gained on each of the survey occasions. No material constraints were encountered in the gathering of the baseline data. With regard to the estimated number of breeding territories recorded from within the site, this number must be viewed as a minimum and an estimate based on the observations of repeated calling by signing males in one location (or in close proximity) on at least two of the three survey occasions (generally the two last surveys occasions; 15th May 2017 & 18th June 2017).

6.5 Evaluation

6.5.1 In total, 13 species were recorded occupying breeding territories along the woodland edges, eight species within the hedgerows and just one species within the arable land.

6.5.2 The woodland edges appear to support just one species of conservation concern; the dunnock, where a single male was recorded in Longdell Wood. The dunnock is a Species of Principal Importance and is RD Amber listed and the remaining 12 species are RD Green listed; species which are widespread, common and under no conservation threat.

6.5.3 Within the hedgerows, eight species are recorded holding an estimated 12 breeding territories throughout the site with just three species considered important; linnet, yellowhammer and dunnock. Both linnet and yellowhammer are considered Species of Principal Importance and are RD Red listed and were recorded holding territories in hedgerows H1, H2, H4 and H8.

6.5.4 Only a single breeding territory of skylark was recorded within the arable field north of New Spring Wood.

- Dunnock, whilst considered a Species of Principal Importance is only RD Amber listed. An estimated three to four breeding territories have been recorded within the GA2 site. Within the county, the dunnock is considered a widespread and common resident species with an estimated breeding population in Hertfordshire of 15,000-27,000 territories.
- The linnet is RD Red listed which implies this species is in decline in the UK and only one territory was recorded in H4 within the GA2 site. In Hertfordshire, the linnet is considered to be widespread and a numerous breeding and wintering species with an estimated breeding population of 2,000 - 5,000 within the county.
- Yellowhammers were estimated as holding three breeding territories within the site; within H1, H2 and H8. This species is considered a Species of Principal Importance in the UK and is RD Red listed. In Hertfordshire however this species is regarded as a widespread resident with an estimated breeding population of 9,100 - 18,000 territories.
- The skylark was only recorded as holding one breeding territory within the site, adjacent to New Spring Wood. The skylark is a species of conservation concern and a RD Red listed species. Confined to nesting in open arable and grassland fields in Hertfordshire, the skylark is considered a common resident and winter visitor with an estimated 8,000 - 20,000 breeding territories.

6.5.5 With an estimated length of 2.3km of hedgerow within the GA2 site and an estimated 12 breeding territories within the hedgerows, it is estimated that the hedgerows support nesting birds at a minimum density of one territory per 192m.

6.5.6 An estimated 3.5km of woodland edge is located within or on the GA2 boundary. Within this woodland edge, 13 species of bird were recorded holding breeding territories with one - the dunnock - regarded as important. Of the 13 species, an estimated 25 territories were occupied which suggests that the woodland edges support nesting birds at a density of one territory every linear 140m of woodland edge.

6.5.7 Bird breeding density is considered to be very low in the site's hedgerows, although slighter higher along the woodland edges. Few species of conservation importance were found breeding within the GA2 site and those which are recorded are considered widespread and common/numerous. As such, the GA2 site is considered to be of only Parish/Neighbourhood geographical value.

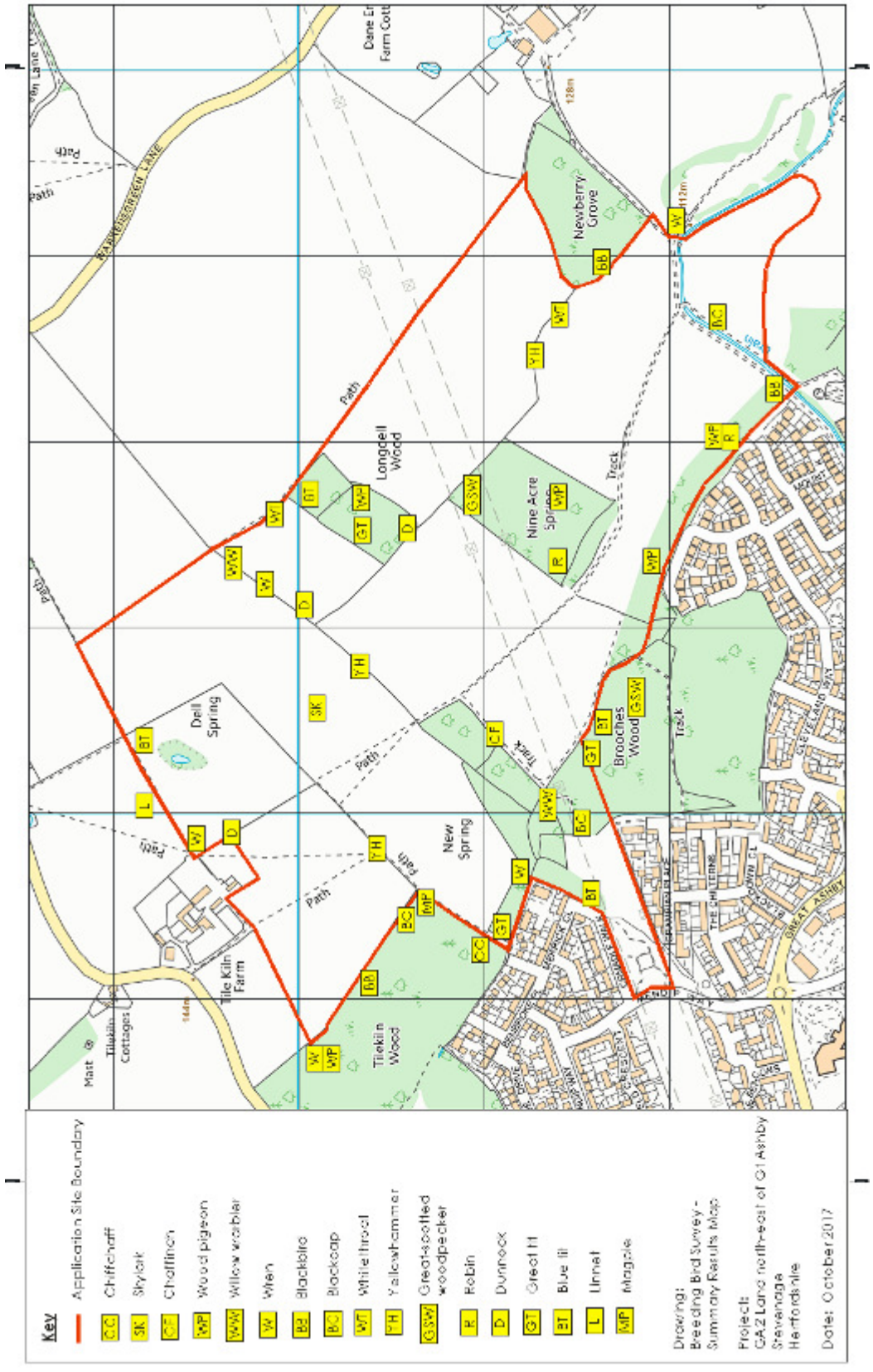
6.5.8 The wintering bird survey confirmed that at least 25 species are utilising the GA2 site during the winter at varying times and as either individuals or in flocks. 18 of the 25 species are considered to be common and widespread resident species and RD green listed; found in the UK all year round whist the redwing *(Turdus iliacus)* is considered to be a winter visitor. Only a single redwing was recorded on one survey occasion within the site.

6.5.9 Typically, certain wintering bird species flock together forming small to large groups foraging over wetlands, in woodlands and over farmland (typically on stubble and within conservation headlands). Of the 25 species recorded wintering within the GA2 site, six species were recorded in flocks; chaffinch #20, rook #10, jackdaw #10, reed bunting #30+, skylark #6 and wood pigeon #50+. Of the six species, only one,

the skylark is considered a species of importance and a RD Red listed species, and the reed bunting is RD Amber listed only. Whilst the reed bunting flock numbered over 30, the skylark flock numbering six is considered a very small flock; both species are considered common resident birds in Hertfordshire.

6.5.10 Large areas of arable fields, winter stubble and conservation headlands are found locally, specifically north and east of the GA2 site and as such, the site becomes much less important to wintering flocks of birds. Considering the amount of alternative arable farmland in close proximity to the site and the relative low numbers of recorded birds in the flocks, the GA2 site is unlikely to be important to either species during the winter. As such the GA2 site is considered to be of site value only.

Figure 3 – Results of Breeding Bird Survey



7.0 Invertebrates

7.1 Desk Study & Background Data

7.1.1 The desk study revealed only one species of notably important butterfly recorded from within the data search area that may potentially utilise the habitats of the GA2 site – the white admiral *(Limenitis camilla)*. All other butterfly records are at least 1km from the site and not considered material to this evaluation.

7.1.2 A total of 37 species of notably important moth have been recorded from within the data search area which could potentially utilise the habitats of the site – grassland, woodland and hedgerows. These are listed in the Appendix 4 of the September 2016 PEA report.

7.1.3 Most of the recorded important species of moth are regarded as generalists or found in woodland and grasslands; they are likely to be widespread and common in Hertfordshire.

7.1.4 Both the woodlands and grasslands within the site have the potential to support important assemblages of invertebrates. Laying, decaying and standing deadwood within the site's woodlands can provide important microhabitats for important saproxylic invertebrates. Arable field margins may also host valuable species of insect, although the areas of grassland are species-poor which may limit their potential invertebrate biodiversity.

7.1.5 This invertebrate assessment is based on the commissioned report *Invertebrate Site Assessment; North of Stevenage, Hertfordshire*, WYG, September 2017. The report summaries the findings and concluded that the survey and assessment carried out in August 2017 found just one species of importance; the small heath butterfly *(Coenonympha pamphilus)*. The survey and assessment was restricted to the arable field margins, grassland, hedgerows and woodland edges of the GA2 site.

7.2 Survey & Assessment Results Summarised

Common name	Scientific Name	Protective Status	Number
7 – spot ladybird	*Coccinella septempunctata*	None	Few
A cynipid wasp	*Neuroterus quercusbaccarum*	None	Numerous galls recorded
A hoverfly	*Volucella pellucens*	None	1
A hoverfly	*Eristalis interruptus*	None	1
A hoverfly	*Helophilus pendulus*	None	1
A hoverfly	*Sphaerophoria sp.*	Requires a male to make a positive identification to species, a female was collected. This species group includes four notable species.	2
A hoverfly	*Sphaerophoria scripta*	None	1
Brimstone	*Gonepteryx rhamni*	None	1
Bronze furrow bee	*Halictus tumulorum*	None	1
Brown argus	*Aricia agestis*	None	1
Buff-tailed bumblebee	*Bombus terrestris*	None	2
Chalk furrow bee	*Lasioglossum fulvicome*	None	1
Comma	*c-album*	None	Several
Common blue	*Polyommatus icarus*	None	Few
Common carder bumblebee	*Bombus pascuorum*	None	Numerous
Common wasp	*Vespula vulgaris*	None	Several
Field grasshopper	*Chorthippus brunneus*	GB Post-2001 IUNC LC	Few
Garden spider	*Araneus diadematus*	None	2
Gatekeeper	*Pyronia tithonus*	None	2
Green shieldbug	*Palomena prasina*	None	1
Green-veined white	*Pieris napi*	None	1
Honey bee	*Apis mellifera*	None	Several
Knopper gall wasp	*Andricus quercuscalicis*	None	Numerous galls recorded
Large white	*Pieris brassicae*	None	Few
Meadow brown	*Maniola jurtina*	None	3
Meadow grasshopper	*Chorthippus parallelus*	GB Post-2001 IUNC LC	Few
Migrant hawker	*Aeshna mixta*	GB Post-2001 IUNC LC	2
Mint moth	*Pyrausta aurata*	None	1
Oak apple wasp	*Biorhiza pallida*	None	Few galls recorded

Oak artichoke wasp	*Andricus fecundatrix*	None	Few galls recorded
Red admiral	*Vanessa atalanta*	None	Several
Scorpion fly	*Panorpa communis*	None	1
Sloe bug	*Dolycoris baccarum*	None	1
Small heath	*Coenonympha pamphilus*	GB Post-2001 IUNC NT, BAP 2007, NERC Section. 41	1
Small white	*Pieris rapae*	None	Numerous
Speckled wood	*Pararge aegeria*	None	Numerous
Strawberry snail	*Trochulus striolatus*	GB Post-2001 IUNC LC	1
Thistle gall fly	*Urophora cardui*	None	Several galls recorded
Vestral cuckoo bee	*Bombus vestalis*	None	1

Key:
GB Post-2001 IUCN LC Least Concern
GB Post-2001 IUCN NT Near threatened
BAP 2007 UK Biodiversity Action Plan Species
NERC Section 41 Natural Environment and rural Communities Act

7.3 Limitations and Constraints

7.3.1 Whilst only one important species of invertebrate was found during the survey in August 2017, it is acknowledged that potentially more species could have been detected during multiple visits to the site, specifically in the spring and early summer. As such, the geographical value attributed of the GA2 for its invertebrates specifically concerns the arable environment of the site and should only be viewed as an initial and tentative evaluation which, through further surveys, could potentially change through review and assessment.

7.4 Evaluation

7.4.1 Whilst it is acknowledged that the invertebrate survey and assessment was based on just one visit in August 2017 - albeit within the optimum time - only one invertebrate species was found which would be considered important; the small heath butterfly. The small heath butterfly has shown a sharp decline nationally even though they are found in a variety of grassland habitats. In Hertfordshire this species has

shown a sharp declined since the 1980s and it has been suggested that this decline correlates with the loss of dry grassland in the County.

7.4.2 Whilst the GA2 site supports few semi-natural habitat types, the majority of the site and more specifically the majority of the proposed development footprint is comprised of arable land, currently under cereal cultivation. The ancient woodlands found within the GA2 site do support both standing and lying deadwood and are likely to support a more diverse assemblage of invertebrates, increasing their potential for important and/or protected species.

7.4.3 Generally, monoculture arable land, in association with species-poor field grass margins, is unlikely to support diverse assemblages of invertebrates which may then limit the site's potential geographical value. However, to fully understand the overall invertebrate diversity of GA2 site, additional surveys are required in the spring and early summer months, although following Colin Plant Associates (2006) *criteria to define significance of invertebrate habitats*, the lack of scarce, threatened or unique habitats within the GA2 arable environment would suggest the site is unlikely to be geographically more important than local/district.

8.0 Dormice

8.1 Desk Study & Background Data

8.1.1 The common or hazel dormouse is regarded as rare in the UK having declined in numbers and distribution over the last 100 years and is a European protected species. In Hertfordshire, dormouse populations are thought to be centered on woodlands in Stevenage, Broxbourne Woods and the Ashridge Estate but surveys carried out in 1993 suggest the populations are now much reduced.

8.1.2 Locally, dormice have been recorded between 1976 and 2008 including within Pryor's Wood LWS and Box Wood LWS (over 1.5km to the south-east of the GA2 site). In 2008, (ELMAW Consulting. 2008) a survey of part of the GA2 site (Tilekiln Farm) for the presence or likely absence of dormice was completed, concentrating on hedgerow H2 and within New Spring Wood and part of Brooches Wood. Follow-up dormice surveys carried out in 2010 (ELMAW Consulting. 2011) were extended to include hedgerows, H2, H4, H8 as well as Newberry Grove and Nine Acre Spring woodlands.

8.1.3 The 2008 surveys confirmed the presence of dormice through the location of nests in surveying tubes in hedgerow H2 and in New Spring Wood, although nesting evidence was limited.

8.1.4 In 2010, surveys of Nine Acre Spring, Newberry Grove and hedgerows H2, H4 and H8 along with a number of hedgerows outside the current GA2 boundary failed to locate any further evidence that dormice were at that time extant beyond H2 and within New Spring Wood.

8.1.5 Following the dormouse surveys of 2008 and 2010, the presence of dormice was confirmed from just a single location in hedgerow H2 and from two locations in New Spring Wood within the GA2 site.

8.2 2017 Dormouse Survey Results

Installation & Survey Dates	Locations		Survey Results
Installation January 2017	**Nest Tubes**	**Wooden nest boxes**	
26th May 2017	H1, H2, H3, H4, H8 & New Spring Wood	Tilekiln Wood, Longdell Wood & Nine Acre Spring	No dormice occupancy or indicative signs.
24th July 2017	H1, H2, H3, H4, H8 & New Spring Wood	Tilekiln Wood, Longdell Wood & Nine Acre Spring	No dormice occupancy or indicative signs.
13th October 2017	H1, H2, H3, H4, H8 & New Spring Wood	Tilekiln Wood, Longdell Wood & Nine Acre Spring	No dormice occupancy or indicative signs. Evidence of two wood mouse *(Apodemus sylvaticus)* nests in two tubes.

8.3 Limitations and Constraints

8.3.1 Dormice typically live at very low densities with population numbers suggested to be in the range of just four adult males per hectare in optimum broad-leaved woodland habitat (English Nature 2006). As such, it would not be expected to have found a high occupancy rate in either the nest tubes or boxes. However, when nest tubes and boxes are installed at a high enough density within optimum habitat for at least one season, the indicative evidence of the presence of dormice would normally be expected, as was the case in 2008 within the site, when only two of over 100 nest tubes were confirmed as supporting dormouse evidence.

8.3.2 Whilst some minor interference of the wooden boxes in Longdell Wood is acknowledged; some boxes had their lids opened and left open by a member of the public on one occasion, this survey is not considered to have been materially constrained.

8.4 Evaluation

8.4.1 Historically dormice are recorded locally, with local sites such as Pryor's Wood LWS and Box Wood LWS known to support dormice in 1983. As

recently as 1994, dormice were recorded locally but not from any specified site. The most recent records of dormice locally are found within the GA2 site, established in 2008 (ELMAW Consulting. 2008) within the scrub below the electricity pylons in New Spring Wood and from just one location in hedgerow H2. Further surveys of the remainder of the site in 2010 found no evidence of dormouse at that time and it was concluded that they were likely absent from the rest of the surveyed site, referred to today as the GA2 site.

8.4.2 In 2017, no current evidence of extant dormice has been found within the GA2 site. 165 nest tubes and nest boxes have be installed within optimum habitat within Tilekiln Wood, New Spring Wood and Longdell Wood as well as hedgerows H1, H2 and H3 for the entire 2017 season. Nest tubes and nest boxes were installed at a high density of 10m - 15m spacings and three seasonal checks found no nesting or loafing evidence of dormice. It is therefore considered that dormice may no longer be extant within the GA2 site. It should be acknowledged however, that there is a possibility that if the local population is persisting at a very low density, adult numbers may be very low, below the average expected in optimum habitat, and therefore their presence may have gone undetected.

8.4.3 Potential dormouse habitat within the GA2 site could be considered to comprise the entire site's hedgerows and all the broad-leaved woodlands within and adjacent to the site. However, the GA2 site is not considered to offer optimum conditions for dormice at this time. Generally, the site's hedgerows lack woody species diversity but do maintain connectivity to the woodlands and hedgerows adjacent and beyond the GA2 site boundaries. However, in numerous locations connectivity is interrupted by large wide gaps within hedgerow sections where farm access tracks and public rights of way cut through sections of hedge. There are at least eight large gaps in hedgerows and linkages between hedgerows and woodland which would

ordinarily be deemed wide enough to interrupt the unimpeded dispersal of dormice.

8.4.4 Other than the maintenance-coppiced scrub below the electricity pylons in New Spring/Brooches Woods, the site's woodlands generally lack substantive amounts of understory thicket, coppice or scrub and importantly lack substantive amounts of fruit-bearing hazel *(Corylus avellana)* or bramble *(Rubus fruticosus agg.),* both considered important components of dormouse habitat.

8.4.5 Dormice are considered rare in Hertfordshire - in 2006, English Nature (now Natural England) considered Hertfordshire as only supporting scattered populations. Because of the rarity of dormice in the county, the GA2 site was considered to be of regional value to dormice as a result of the 2008/10 surveys. However, if the local dormouse population is now extinct within the site, as the 2017 surveys suggest may be the case, it can no longer be viewed as of regional importance to this species and it is tentatively suggested that the GA2 site may be of negligible value to dormice at this time. This tentative valuation of the GA2 site's value to dormice must be considered in the context that whilst the presence of dormice was not confirmed in 2017 within the site, its absence cannot be conclusively precluded either.

9.0 Amphibians - Great Crested Newts

9.1 Desk Study & Background Data

9.1.1 Whilst the GA2 site only supports one pond (P1) there are nine ponds within 500m of the site, clustered at Warrens Green Farm, Friends Green Farm and Dane End Farm. The ponds at Friends Green Farm and Warrens Green Farm lack habitat connectivity and are separated from the site by a road, thus greatly limiting the potential of amphibian migration between these ponds and site. There are however, three ponds at Dane End Farm (P2, P3, & P4) which are found within 250m east of the GA2 site.

9.1.2 Two species of protected and/or notably important species of amphibian are recorded from the 2km radius data search area. There is a single record of great crested newt dated 2008 from Stevenage town – approximately 1km to the south-west of the application site.

9.1.3 In addition, there are two records of common toad *(Bufo bufo)* dated 1985 and 1988. No locations were provided for these records however.

9.1.4 P1 was surveyed for great crested newts in 2008 but found no evidence of great crested newts although low numbers of smooth newts *(Lissotriton vulgaris)* and common frogs *(Rana temporaria)* were found.

9.2 *Survey & Assessment Results*

Pond Reference	HSI Score	Surveyed? Y/N	Results	
			Egg search	Amphibians Trapped/observed
P1	0.37 - Poor	N		
P2	0.47 – Poor	N		
P3	0.56 – Below average	Y	Negative	No GCNs Numerous toads
P4	0.47 - Poor	N		

9.2.1 Ponds P1, P2 and P4 were found unsuitable to support great crested newts and were not species-specifically surveyed. P3 was found to have a below average potential but was nevertheless surveyed in April and May of 2017. The survey of P3 found no breeding evidence of great crested newts and no great crested newts were either observed through the night time torch survey or netted. P3 was found however to support numerous toads, observed throughout the pond.

9.3 *Limitations and Constraints*

9.3.1 Ponds P1, P2 and P4 were found to have poor HSI scores which indicated that they were generally considered to have negligible potential to support great crested newts. The suitability evaluation was based on the standard HSI Index which is considered to be the industry standard assessment at this time. Ponds P1, P2 and P4 were found to be completely over-shadowed and in March and April 2017 were found to have very limited amounts of water, unsuitable for great crested newts.

9.3.2 P3 was found to have a HSI of below average and was subsequently surveyed. However, the water level was found to be very low and was considered too low to funnel trap. The water level also constrained the suitability of netting, therefore the survey was limited to night time torch surveying and egg searching. The water was however found to be clear and torching was considered suitable. Limited amounts of

macrophytic vegetation were evident around the eastern end of the pond therefore egg searching could be completed. By the 5th May 2017, the water level had dropped too low and had become too turbid to torch survey and the fourth survey was constrained to an egg search only.

9.4 *Evaluation*

9.4.1 P1, P2 and P4 are considered unsuitable to support great crested newts and all three were found to have poor HSI potential to support great crested newts. Generally, all three ponds were found to be over-shadowed, with no macrophytic vegetation and all three were found to dry up within the spring months. P1 was also found to be highly turbid through habitual cattle access.

9.4.2 Pond P3 was found to have a below average potential, this pond was also heavily over-shadowed and the water level was very low; considered to offer sub-optimal breeding conditions for great crested newts. Nevertheless, P3 was surveyed in April and May 2017 but found no evidence that it was being used by great crested newts at that time.

9.4.3 It has been concluded therefore that great crested newts are not likely to be a material consideration for the development and the GA2 area is deemed to be of negligible value to great crested news at this time.

10.0 Badgers

10.1 Desk Study & Background Data

10.1.1 The desk study revealed 48 records of badger in the locality, dated between 1975 and 2015. Badgers are recorded throughout the data search area and are considered common and widespread.

10.2 Mapping Survey Summary

Sett reference number	Sett type	# of entrance holes	Level of sett activity
A	Outlier	3	2 in use 1 unused
B	Outlier	1	1 in use
C	Main	8	4 in use 4 unused
D	Subsidiary	20	Inactive
E	Outlier	2	Inactive
F	Outlier	2	Inactive
G	Outlier	2	Inactive

10.2.1 The mapping survey has revealed the presence of seven badger setts, six within and one immediately adjacent to the GA2 site. Of the seven badger setts Setts A, B and C were found to be active with varying degrees of use. Sett C whilst not supporting the largest number of entrance holes was considered at the time to be the extant population's main sett. Sett D with 20 entrance holes is likely to have been the main sett at some time but in 2017, was found to be inactive and not currently used as the main sett. Both setts C & D however are located within Nine Acre Spring. Also found within Nine Acre Spring are two unused outlier setts; Setts E and F which are linked by a network of well-worn badger paths within the woodland. Currently maintained latrines are found at Setts C & D and another latrine is also found on the western edge of Nine Spring Wood where a badger path leaves the woodland in a north-westerly direction across the arable field.

10.2.2 Two outlier setts Setts A & B, both in use at the time of survey, are found on the north-western edge of Brooches Wood. No latrines were found

in association with these two setts but well-worn badger paths radiate out from the setts in a north-easterly and southerly direction.

10.2.3 A two entrance hole outlier sett (Sett G) is found on the eastern side of Newberry Grove, outside the GA2 site. This sett was found to be inactive, with no evidence of its current use by badgers. There were no latrines or badger paths found in close proximity to this sett.

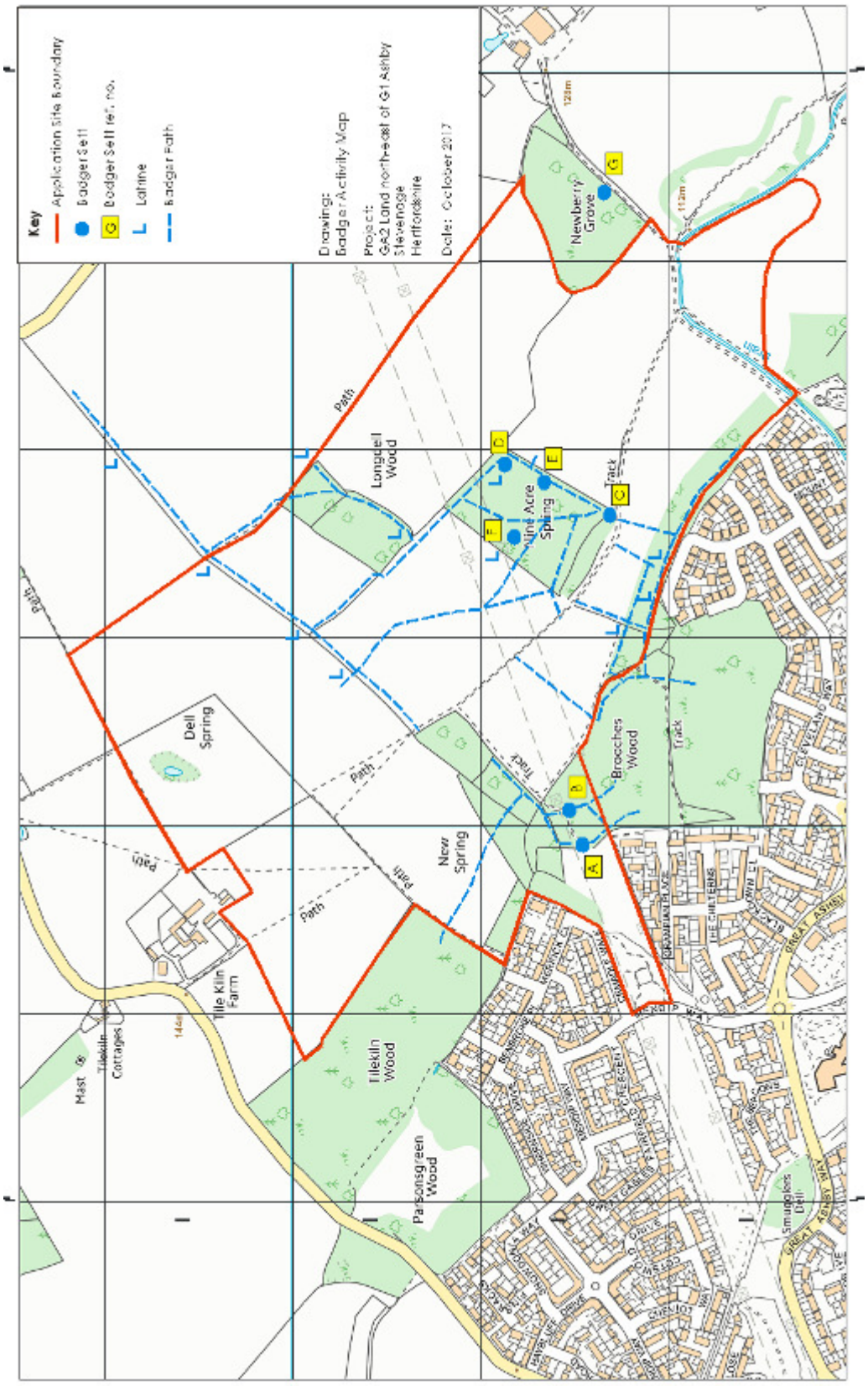
10.2.4 Well-worn badger paths were found to radiate out from Nine Acre Wood in a northerly, westerly, easterly and southerly direction, around the woodland/field margins and across the arable field towards Hedgerow H2 and south across the arable field into Brooches Wood. A badger path was also found to run along the northern edge of Nine Spring Wood, towards and into Longdell Wood. This path circumnavigates Longdell Wood and exits in the north-western corner towards hedgerow H2, along H3.

10.2.5 A well-worn badger path is found inside the double H2 hedge and runs the length from south-west to north-east and continues out along the hedge beyond the GA2 boundary. Four badger latrines are found along H2 where badger paths cut across or join the H2 hedge; three inside and one outside the GA2 boundary.

10.2.6 Some badger activity is noted through New Spring Wood with a badger path which crosses the wood from a south-easterly and southern direction and enters the south-eastern edge of Tilekiln Wood. Limited badger activity was noted north-east of H2 and Tilekiln Wood.

10.2.7 Three latrines are located just inside Brooches Wood opposite Nine Acre Spring and numerous badger paths radiate out from the latrines south-easterly and westerly along Brooches Wood towards Claypithills Spring and further into Brooches Wood towards The Chilterns, Grampian Place and Blackdown Close.

Figure 4 – Badger Activity Map



10.3 Limitations and Constraints

10.3.1 It must be acknowledged that the badger mapping exercise was carried out in the late winter, spring and early summer of 2017 and represents a snap-shot in time of badger activity within the GA2 site. It should therefore be acknowledged that the status of the extant badger population within the site could change at any time and should not be relied upon beyond the current 2017 season. Any resulting Ecological Impact Assessment of development upon badgers and their setts must be carried out with the most current badger population data at that time.

10.4 Evaluation

10.4.1 It would appear that at least one population 'clan' of badgers is centered within Nine Acre Spring woodland with the presence of a main, subsidiary and numerous outlier setts. It would also appear that the main badger activity within the site radiates in a southerly, north-westerly and westerly direction from Nine Acre Spring, with well-worn badger paths across a number of arable fields, along and across hedge H2 and into Tilekiln Wood, Longdell Wood and Brooches Wood. It has not been possible to map the furthest extent of the extant badger population territory which is likely to extend well beyond the GA2 site boundary. However the presence of four latrines along H2, which would normally be used by the badgers to demarcate their territory boundary, would suggest that at the very least, the north-western boundary of their territory is likely known; the H2 hedgerow.

10.4.2 Sett C, is described as the current main sett with four of the eight entrance holes displaying evidence of regular use. The largest sett within Nine Acre Spring is Sett D with 20 entrance holes however at the time of survey none were showing any signs of habitual use. It is suggested that at some time in the past Sett D would have been the main sett because of its size however, for whatever reason, the

population is likely to have contracted considerably and moved to the much smaller sett. This occupation of the much smaller sett would suggest the extant badger population is likely to be small and may not support any more than three or four adult badgers.

10.4.3 Badgers are considered to be common, widespread and increasing and stable in the UK (*Roper* 2010), becoming less common in the uplands and intensively farmed land but much more common in woodlands. In Hertfordshire, badgers are considered to be widespread and stable (Clark M. 2001).

11.0 Bats

11.1 Desk Study & Background Data

11.1.1 Seven species of bat have been recorded within the 2km radius data search area. Whilst no exact locations are given for the records, some are from the same 1km grid square as the GA2 site, including records of common pipistrelle *(Pipistrellus pipistrellus)* and Natterer's *Muotis nattereri)*. There is also a known common pipistrelle and brown long-eared (*Plecotus auritus*) bat roost at Tile Kiln Farm.

11.1.2 Further afield, there are records of several unidentified bats, brown long-eared, soprano pipistrelle *(Pipistrellus pygmaeus),* noctule *(Nyctalus noctula),* serotine *(Eptesicus serotinus)* and the rare western barbastelle. All these records are from over 1km from the site, but within commuting distance of the site. The barbastelle bat record originates from Park Wood, Weston Park and is dated 2013.

11.1.3 In 2008, bat activity surveys were completed of hedges H1, H2 and H4 along with the woodland edges of Tilekiln Wood and New Spring Wood by ELMAW Consulting (*ELMAW Consulting 2008*). A bat commuting route along the hedgerows and foraging areas along the woodland edges of common pipistrelle and brown long-eared bats were confirmed, with the bats likely originating from the roost at Tile Kiln Farm. These bats appeared to be dispersing in a south-easterly direction, further into the GA2 site. An unidentified *Myotis* species of bat was also recorded at that time.

11.2 Survey Results

<u>Bat Activity Transect Surveys</u>

11.2.1 Evening bat activity transects were completed on 10th May 2017, 22nd May 2017, 12th June 2017, 26th June 2017, 10th July 2017, 28th July 2017, 8th August 2017, 22nd August 2017, 26th September 2017 and 9th October

2017. A dawn transect was completed on the 12th September 2017. April was deemed too cold to complete surveys as the temperatures dipped below 10°C - below the permitted minimum threshold.

11.2.2 A total of six species were recorded on the transect surveys - common pipistrelle, soprano pipistrelle, noctule, unidentified *Myotis* sp., Leisler's *(Nyctalus leisleri)* and brown long-eared. As with the static recordings, by far the most frequently recorded species on the bat activity transect surveys was the common pipistrelle. Figure 1 (appended) illustrates the results of the transect surveys.

Static Recording Surveys

11.2.3 Anabat Express static recording devices and Anabat SD1 and SD2 units were deployed twice each month, randomly across a total of 18 locations, within the application site, throughout the season, for five night recording periods.

11.2.4 The surveys recorded seven species of bat within the site; common and soprano pipistrelle, noctule, unidentified *Myotis* sp., Leisler's, Daubenton's *(Myotis daubentonii)* and barbastelle. As with the transect surveys, the vast majority of bat registrations were from common pipistrelles.

11.2.5 The locations of the static recorders and the species they recorded are shown in Figure 2 (appended).

11.2.6 Whilst it is not possible to gauge the number of times a single bat passes the recorder, meaning that a count of individual bats is not possible, the number of bat passes has been calculated to give an index per hour of general bat activity within the site. The results of the analysis of the static recorders survey data is shown in the table below. The highest bat activity index was recorded in July at Location 10 (in the central part of the site, to the west of Longdell Wood). Here

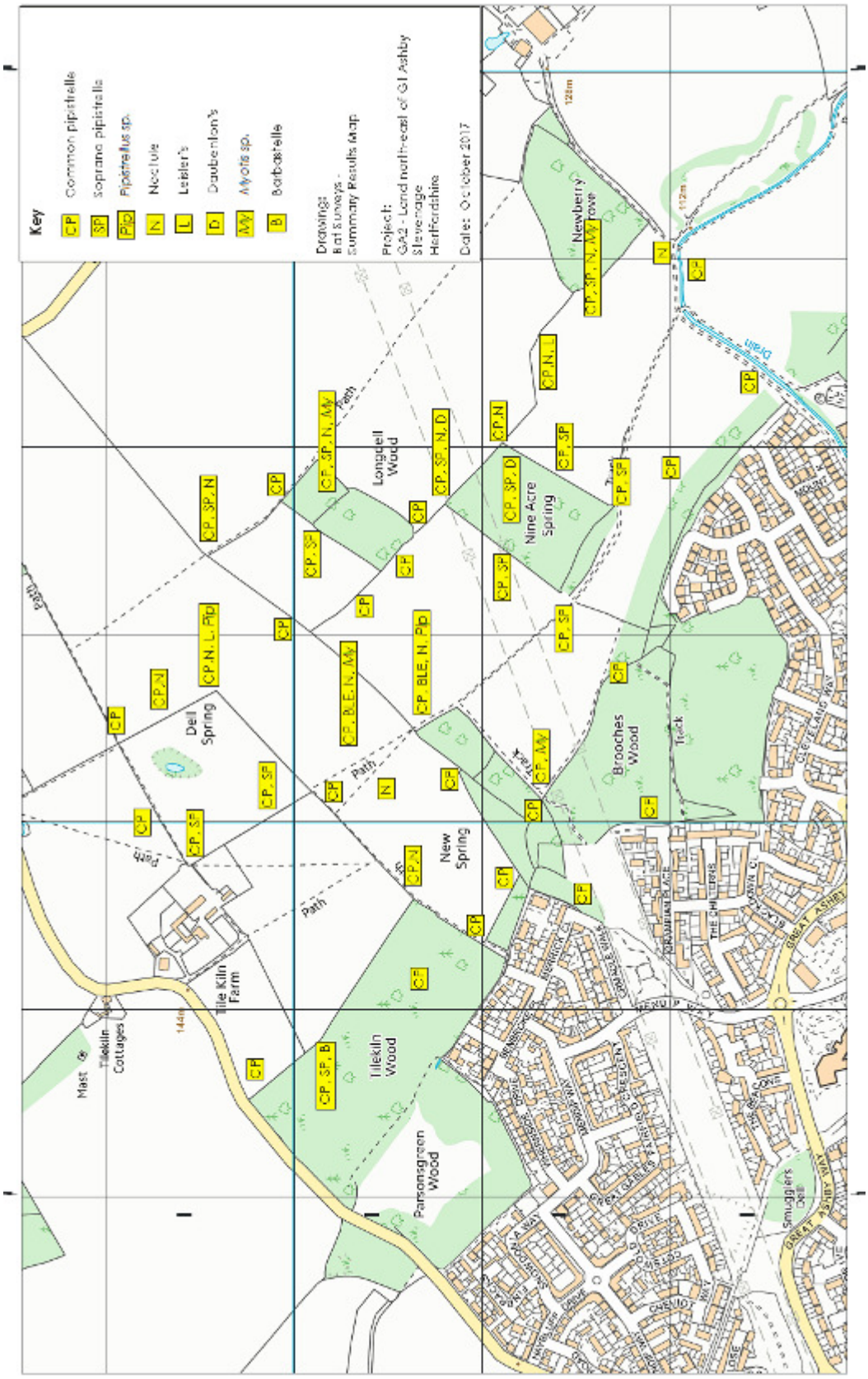
Anabat Express recorded a total of 3,079 bat passes which equates to 77 bat passes per hour.

11.2.7 The vast majority of static detector bat registrations on the site were of common pipistrelles with 98% of all recordings being from this species.

Month	Static recorder ref: No.	Species recorded	Total number of species recorded	Total hours surveyed	Total number of bat passes	Average bat passes per hour
May 2017	2	Common pipistrelle	1	42.5	11	0.3
	4	Common pipistrelle	1	42.5	116	2.7
	6	Common pipistrelle	1	45	5	0.1
	12	Common pipistrelle Unidentified *pipistrellus*	2	45	52 4	1.2 0.09
	13	Common pipistrelle	1	42.5	26	0.6
	16	Common pipistrelle	1	45	9	0.2
	17	Common pipistrelle Soprano pipistrelle Noctule Unidentified *Myotis*	4	45	832 2 1 1	18.5 0.04 0.02 0.02
June 2017	3	Common pipistrelle Noctule	2	35	237 36	6.8 1.0
	8	Common pipistrelle Noctule	2	35	113 6	3.2 0.2
	9	Common pipistrelle Soprano pipistrelle	2	35	573 105	16.4 3.0
	10	Common pipistrelle Unidentified *Myotis* Noctule	3	37.5	2,789 3 3	74.4 0.08 0.08
	14	Common pipistrelle Soprano pipistrelle Noctule Daubenton's	4	37.5	2,418 3 1 3	64.5 0.08 0.03 0.08
	18	Common pipistrelle	1	37.5	396	10.6
July 2017	1	Common pipistrelle	1	40	1,656	41.4
	3	Common pipistrelle Noctule	2	40	196 40	4.9 1.0
	5	Common pipistrelle Soprano pipistrelle	2	40	1,776 4	44.4 0.1
	6	Common pipistrelle	1	40	59	1.5
	7	Common pipistrelle Noctule	2	40	394 4	9.9 0.1
	9	Common pipistrelle Soprano pipistrelle	2	40	652 65	16.3 1.6
	10	Common pipistrelle Unidentified *Myotis* Noctule	3	40	3,079 1 1	77.0 0.03 0.03
	12	Common pipistrelle Soprano pipistrelle	2	40	76 6	1.9 0.2
	13	Common pipistrelle Soprano pipistrelle Noctule	3	40	101 9 3	2.5 0.2 0.08
	17	Common pipistrelle Soprano pipistrelle Noctule	3	40	1,091 9 6	27.3 0.2 0.2
	18	Common pipistrelle	1	40	568	14.2
	1	Common pipistrelle Soprano pipistrelle	3	47.5	135 1	2.8 0.02

		Barbastelle			14	0.3
	7	Common pipistrelle Noctule	2	47.5	552 5	11.6 0.1
	8	Common pipistrelle Noctule	2	47.5	111 3	2.3 0.1
	11	Common pipistrelle Soprano pipistrelle Noctule	3	42.5	3,115 56 2	73.3 1.3 0.05
August 2017	14	Common pipistrelle Soprano pipistrelle Noctule Daubenton's	4	47.5	2,987 21 3 3	62.9 0.4 0.06 0.06
	15	Common pipistrelle Noctule	2	42.5	173 6	4.1 0.1
	16	Common pipistrelle	1	42.5	52	1.2
	2	Common pipistrelle	1	52.5	649	12.4
	4	Common pipistrelle	1	52.5	126	2.4
	5	Common pipistrelle	1	60	1,051	17.5
Sept 2017	6	Common pipistrelle Inidentified *pipistrellus*	1	60	57 3	0.9 0.05
	11	Common pipistrelle Soprano pipistrelle Noctule	3	52.5	2,782 19 2	53.0 0.4 0.04
	13	Common pipistrelle Noctule	2	60	99 5	1.7 0.08
	17	Common pipistrelle Soprano pipistrelle Noctule	3	60	418 7 5	7.0 0.1 0.1
	9	Common pipistrelle Soprano pipistrelle	2	67.5	399 50	5.9 0.7
Oct 2017	12	Common pipistrelle	1	67.5	81	1.2
	15	Common pipistrelle Soprano pipistrelle Leisler's	3	67.5	2,861 2 1	42.4 0.03 0.01
	16	Common pipistrelle	1	67.5	124	1.8

Figure 5 – Bat Surveys – Summary Results Map



Preliminary Ground-Level Bat Roosting Assessment – Hedgerow Trees

11.2.8 Twelve mature and over-mature trees have been identified along and within the site's hedgerows which were found to have a moderate or high bat roosting potential. Of the twelve trees, nine were oaks (*Quercus robur*) and three were ash (*Fraxinus excelsior*). All 12 trees were found to support potential bat roosting features which included all or a mix of features such as rot holes and cavities, exfoliated bark and timber splits and breakages.

11.3 Limitations and Constraints

11.3.1 No public interference was encountered and all static recorders remained in place and suffered no vandalism or damage. As discussed above, the static recordings whilst they do provide both qualitative and limited quantitative data, the number of individual bats passing the recorder cannot be derived from this data. *Myotis* species of bat are generally difficult to separate into species from recordings even with the use of Analook analysis software. Therefore where a positive identification of the *Myotis* species could not be confidently carried out, the genus has been used. This approach has also been applied to other bat genera or families such as *Nyctalus* where the recordings were not of sufficient quality. Because of the very low amplitude of brown long-eared bat call registrations, it is likely that brown long-eared bats have been under-recorded throughout the site.

11.3.2 A number of trees are found within the site's hedgerows that have been assessed as having potential to support roosting bats; however it is considered that the majority of the site's bat roosting potential is to be found in its woodlands. It must be acknowledged that whilst 12 trees have been found to support potential bat roosting features, this assessment is based on a ground-level assessment. Further investigations such as off-ground inspections may reveal that a number of the observed bat roosting features may not be suitable for bats and

therefore this number of trees must be viewed as a provisional assessment of potential.

11.4 Evaluation

11.4.1 The common pipistrelle was the most commonly encountered bat species within the GA2 site; recorded on every section of hedgerow and along most woodland edges. Common pipistrelle bats were also recorded from within Tilekiln, New Spring, Longdell, Brooches, Nine Acre Spring and Newberry Grove woodlands.

11.4.2 Within Hertfordshire and the UK as a whole, common pipistrelle bats are considered to be our most common bat displaying a long term trend of population increase (*Bat Conservation Trust*. 2014), with the current population estimated to be over 2,000,000. Common pipistrelle bats are also considered to be generalist bats, often found in both rural and urban habitats and locations, within and alongside woodlands and hedgerows, as well as in locations such as gardens and open spaces.

11.4.3 The soprano pipistrelle bats were found in fewer locations and with considerably fewer registrations than the common pipistrelle bat within the GA2 site which may be a reflection on this species' preference for riparian habitats. This species of bat is also considered to be common and widespread in Hertfordshire and the UK (*Bat Conservation Trust*. 2014).

11.4.4 Noctule bat registrations were recorded throughout the GA2 site from both the walked bat activity transects and static recordings. It is likely however, that a number of these registrations will be from bats flying high over the site, although some noctules were observed and recorded foraging along hedgerows and woodland edges within the site. Considered to be scarce in the UK, noctule bats are described as widespread but scarce in Hertfordshire (HMBG. 2014).

11.4.5 Few brown long-eared bat registrations were recorded from within the site, mainly from the H2 hedgerow and New Spring Wood area. However, because of the difficulty in recording passing brown long-eared bats, it is considered that this limited recording represents an underestimate of their presence within the site. It is likely therefore that brown long-eared bats will be found throughout the GA2 site within woodlands, alongside woodland edges and hedgerows as they are a common species of bat with a preference for woodland. Within the UK the brown long-eared bat, whilst considered one of our most common species, is showing a slight decrease in population. In Hertfordshire, the brown long-eared bat is considered widespread and relatively frequent (HMBG 2014.)

11.4.6 As discussed in the limitations and constraints, *Myotis* species are difficult to positively identify to species level because of the closeness in their resulting sonogram registrations. Where a positive identification could not be made, the registration location has been attributed to genus only. Few *Myotis* registrations were recorded within the site and, as expected, they appeared to be associated with woodland within the centre of the site. Where a positive identification could be made, Daubenton's bat was recorded on a few occasions within and adjacent to Nine Acre Spring.

11.4.7 Daubenton's bats are considered to be fairly widespread in the UK although never common. Often associated with open water, Daubenton's bats can spend at least 60% of their time in and around woodland, typically roosting in woodland trees. In Hertfordshire this species of bat is considered to be widespread and relatively frequent near still water (HMBG 2014).

11.4.8 Two nationally rare bats; the western barbastelle and Leisler's have been recorded within and immediately adjacent to the GA2 site. The barbastelle bat has only been recorded within Tilekiln Wood on a number of occasions throughout the season, although never recorded

outside Tilekiln Wood within the GA2 site. Barbastelle bats are not historically recorded locally other than a record in 2013 from Park Wood in Weston Park. Recently however, barbastelle has been recorded locally within a wood within the town of Stevenage.

11.4.9 Within the UK, barbastelle bats are considered to be rare, restricted to southern and central counties of England and Wales with few breeding sites known nationally. One such breeding site is reported to exist within the National Trust's Wimpole Estate in southern Cambridgeshire, 24km north of the GA2 site. In Hertfordshire it is reported that the barbastelle is only found in a few locations with recent studies showing Panshanger Park, Hertford proving to be an important location for this species.

11.4.10 Leisler's bats are also considered one of the UK's rarest bats with a UK estimated population of just 5,000. This species is recorded from just two locations within the GA2 site; at the north-eastern end of hedgerow H2 and on hedgerow H8. The Leisler's is considered to be a rare bat within the site where it was recorded on a very few occasions which may suggest a bat dispersing through the site. In Hertfordshire, Leisler's bats are considered widespread but scarce.

11.4.11 The GA2 site was found to support at least seven species of bat with three species considered locally common, two species considered locally widespread and two rare species. The majority of registrations and the most broadly spread throughout the site was found to be common pipistrelle, followed by soprano pipistrelle which does reflect their local and national common and widespread status. Whilst the GA2 site supports an unremarkable diversity of habitat types, the small broad-leaved woodlands and hedgerows within the site were found to support regularly occurring species typical of such habitats within Hertfordshire.

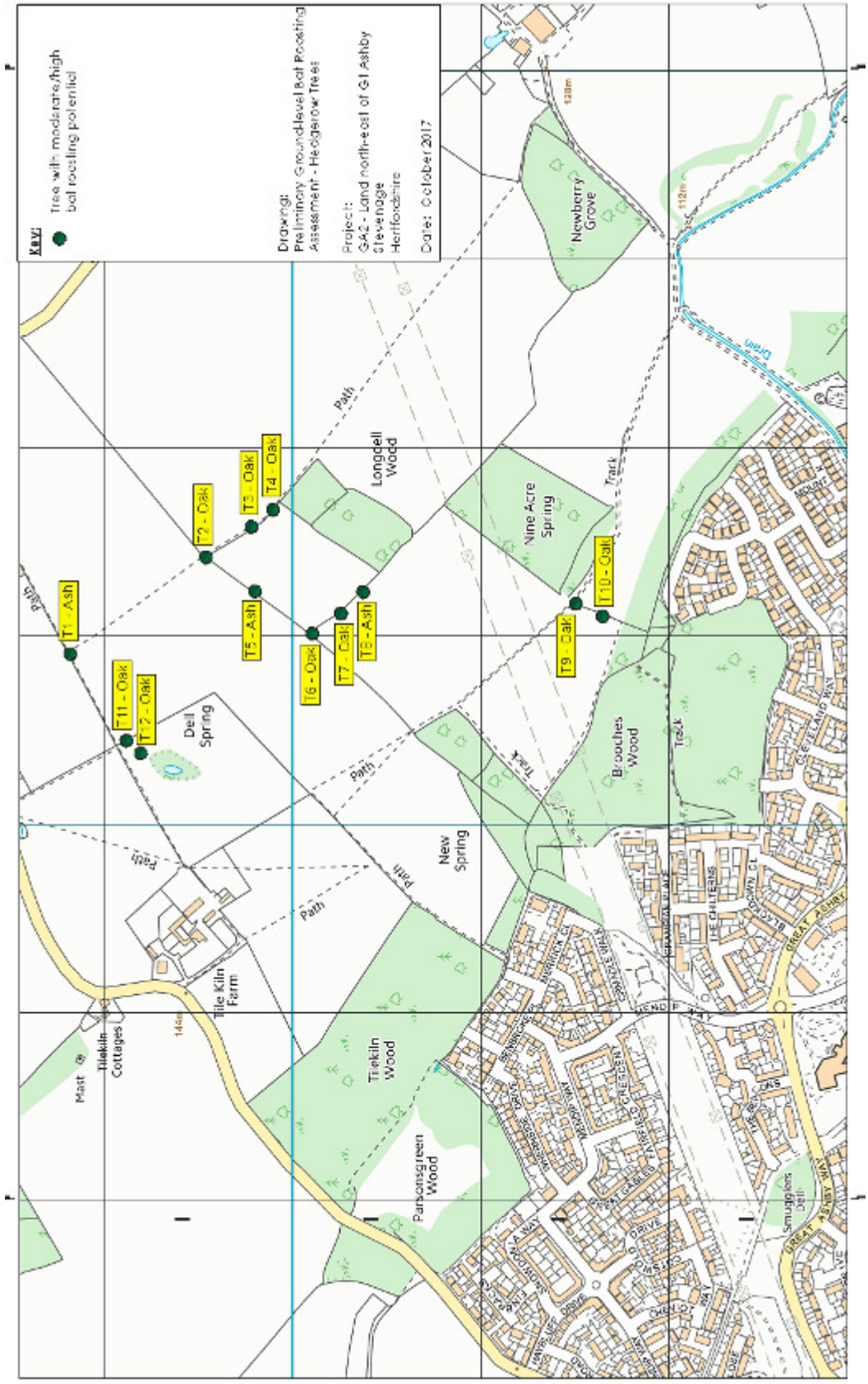
11.4.12 Utilising the appended *Valuing Bat Commuting Routes & Foraging Areas* chart, the value of the hedgerows and woodland edges to the assemblage of common species of bat are considered to be geographically of Parish/Neighbourhood value.

11.4.13 Whilst acknowledging the presence of barbastelle bat outside but in close proximity to the GA2 site, Tilekiln Wood is considered to be possibly of regional value for this species of bat.

11.4.14 It is suggested that the potential bat roosting habitat is concentrated within the woodlands within and adjacent to the GA2 site. However, a number of mature oak and ash trees have been found to support a number of qualifying features which may suggest their value to support roosting bats. Each of the 12 trees identified and shown on Figure 5 were all found to support typical features preferentially chosen by bats seeking either day or night time shelter. For these trees to have been considered to offer either moderate or high potential, a number of typical roosting features would need to have been present which in professional judgement may support an important bat roost such as a maternity or hibernation roost. In addition, these trees have been identified and classified as such because all are located within the site's hedgerows which are considered ideal to support feeding and foraging bats and provide connectivity to the wider countryside, including woodlands.

11.4.15 Definitive use of the trees by roosting bats cannot however be determined without an off-ground climbing inspection and possibly evening emergence or dawn re-entry surveys.

Figure 6 – Preliminary Ground-level Bat Roosting Assessment – Hedgerow Trees



12.0 Summary of Valued Sites, Habitats, Species and Species Groups within the GA2 Site

12.1.1 Based on the Preliminary Ecological Scoping Appraisal September 2016 and the results of the species/species group survey carried out in 2017, the following summarises the GA2 site's habitats and species of importance and attributes a geographical value to each.

12.1.2 Whilst the GA2 site was found not to support any statutorily designated sites, a number of non-statutory Local Wildlife Sites are found within GA2; New Spring Wood LWS and part of Brooches Wood LWS.

12.1.3 Two Local Wildlife Sites lie adjacent to and on the boundary of the GA2 site; Tilekiln Wood & Parsonsgreen Wood LWS and Claypithills Spring Wood LWS.

12.1.4 In addition to the aforementioned woodland Local Wildlife Sites, two other small woodlands within and adjacent to the GA2 site, not designated LWS are considered to be potentially of district value; Longdell Wood and Newberry Grove. Parts of both woodlands are considered to be semi-natural and of some age and do support features that may qualify them as a LWS. Both woodlands are considered to be NERC Sect 41 Priority Habitats and would qualify as both Country and LBAP lowland mixed deciduous woodlands.

12.1.5 The GA2 site supports 2.3km of hedgerow of which hedgerow H2 is considered species-rich (supporting at least five woody species in a 30m section) and may be considered important under the 1997 Hedgerow Regulations. All hedgerows within the site are however considered to be NERC Sect. 41 Priority Habitats as they all support at least 80% native woody species.

12.1.6 Whilst acknowledging the constraints of the invertebrate survey, ie the absence of spring and early summer data, the majority of the GA2 site is comprised of arable land. As such, the assemblages of important

invertebrates within the site are expected to be limited, with areas of woodland, woodland edges and hedgerows considered to offer the best potential habitat for important invertebrates.

12.1.7 The majority of the woodland, woodland edges and hedgerows within the GA2 site were found to support feeding and foraging bats. However, the majority of bat activity throughout the site was restricted to just one species - the common pipistrelle. Whilst it is acknowledged that two rare bats have been recorded; the barbastelle bat in Tilekiln Wood and the Leisler's bat within the centre of the site, the GA2 site is generally considered to be used by a limited number of common species of bat and therefore deemed to be local value; Parish/neighbourhood.

12.1.8 Both breeding and wintering birds within the GA2 site were considered generally to be common and/or widespread species and mainly considered to be generalist with some farmland species such as skylark and yellowhammer having been recorded in very limited numbers. Numbers and species diversity were considered to be unremarkable with wintering flocks limited to unimportant farmland species with the exception of a very small flock of skylark.

12.1.9 The woodland edges and hedgerows which support the breeding bird assemblages, whilst considered limited in their overall importance to nesting birds, are considered to enhance the locality and neighbourhood. The very limited number of important and wintering farmland birds is deemed to be of site value only.

12.1.10 Whilst badgers are considered a very common mammal, widely distributed in both the UK and Hertfordshire, sites such as the GA2 site which supports the centre of at least one sub population of badger activity as well as the main breeding sett are considered important at site level.

12.1.11 Herptiles that include both reptiles and great crested newts are not considered extant within the GA2 site and therefore the site is currently considered to be of negligible value to these species.

12.1.12 The dormouse is a rare and elusive mammal in Hertfordshire and is recorded in very few locations within the county. In 2008 dormice were confirmed as extant within the GA2 site but only from two locations within New Spring Wood and hedgerow H2. In 2017, the surveys found no evidence that dormice were still extant within the GA2 site although it must be acknowledged that this elusive creature lives at very low densities. Consequently, at this time dormice are considered likely absent from within the site and therefore the site is considered tentatively to have a negligible value to this species at this time.

Valued Sites, Habitats & Species/Species-Groups	**Considered Value & Geographical Importance**
Designated Local Wildlife Sites: New Spring Wood LWS Brooches Wood LWS (part) Tilekiln Wood & Parsonsgreen Wood LWS Claypithills Spring Wood LWS	 District/County District/County District/County District/County
Hedgerow H2 considered potentially important/species-rich	Parish/neighbourhood
Ancient semi-natural woodland other than LWS itemised above: Longdell Wood Newberry Grove Nine Acre Spring	 District District District
Invertebrates	Provisionally Parish/District
Bats Common assemblages of bats Barbastelle	 Parish/neighbourhood Regional
Breeding birds	Parish/neighbourhood
Wintering birds	Site
Badgers	Site
Great crested newt	Negligible
Reptiles	Negligible

Dormice	Negligible

13.0 Assessment of Possible Development Effects and Opportunities for Mitigation

13.1.1 Policy SP18: Site GA2 – land off Mendip Way, Great Ashby states that "…'*Planning permission for residential development will be granted where the following site-specific requirements are met':*

i. Appropriate mitigation, compensation and/or enhancement of key features of biodiversity including:

i. Local Wildlife Sites at Tilekiln Wood & Parsonsgreen Wood, New Spring Wood, Brooches Wood and Claypithills Spring Wood; and

ii. Identified protected species and priority habitats"

13.1.2 The ecological studies carried out in 2008, 2010 and 2017 of the GA2 site have identified and valued priority and protected species and habitats within and adjacent to the GA2 site. Policy SP18 requires that appropriate mitigation, compensation and/or enhancement is a requirement to ensure that the proposed development of the GA2 site does not result in significant impacts on important species and habitats, in accordance with both the NPPF and Local Plan policies.

13.1.3 To ensure compliance with Policy SP18, important biodiversity considerations such as legislative compliance, the need to protect certain species, avoidance of damage to important sites and habitats and the enhancement of priority habitats are driving the design of the development. This design first and foremost proposes avoidance measures where harm or disturbance to important species and habitats is considered significant or where mitigation measures are not considered sufficient to maintain the satisfactory continued ecological functionality of the feature or species. Where avoidance measures cannot be designed into the development scheme, mitigation measures are proposed to reduce the impacts on important biodiversity and, hand-in-hand with compensatory measures, the residual impacts are considered to be acceptable in both legislative

terms and in the spirit of Policy SP18. In compliance with NPPF, opportunities for biodiversity enhancement are exploited, giving an opportunity to contribute to achieving Country and Local Action Plan targets and for the development to demonstrate a biodiversity gain.

13.2 Summary Description of the Development Proposals in the Context of Likely Impacts on Important Biodiversity Features

13.2.1 The proposed housing comprising over 600 dwellings is located wholly within the existing arable land, affecting mostly land which supports generally monoculture cereal crops of very limited biodiversity value. In a number of locations, development is proposed within the arable fields - between New Spring Wood LWS and Tilekiln Wood LWS and within the arable field sandwiched by Brooches Wood LWS and Nine Acre Spring. Here the potential for both constructional and occupational impacts such as noise, dust, light spillage and illumination on the woods themselves, as well as on woodland edge mammals, nesting bird habitat and feeding and foraging bats are acknowledged.

13.2.2 To avoid such potential outcomes, the buildings are to be constructed sufficiently far enough away from the woodland edges, buffered by a mix of ecotones, (vegetated transitional zones between the valued feature and development), vegetated SuDS, swales, and dark corridors around the woodland edges. In places, buffers will be created where considered necessary, and the bases of the hedgerows and woodland edges will be managed as long, uncut grassland.


Plates 2 and 3 - Two examples of woodland edge and hedgerow buffering which greatly limits residual impacts on important wildlife that uses such features

13.2.3 Proposed housing in other parts of the site as well as the proposed primary school have been located far enough away from the woodland edges of Tilekiln Wood LWS, Nine Acre Spring and Brooches Wood LWS to avoid constructional effects on the important ecology of the woodlands.

13.2.4 To facilitate access into the proposed residential development, a primary vehicular route is proposed off Mendip Way, across the formal play area and through New Spring Wood LWS, with one road spur radiating north through the wood and the other spur north-east under the electricity pylons through the scrub habitat of New Spring Wood LWS and Brooches Wood LWS. The northern spur will result in the loss of a linear strip of the ancient woodland, it will result in the loss of a number of semi-mature and mature trees and some ground flora and the north-eastern spur will result in the loss of scrub. Whilst this outcome cannot be avoided, the overall impact on New Spring Wood LWS and Brooches Wood LWS can be mitigated to reduce the significance of the residual impact on the important habitat and species within the two woodlands. It is acknowledged that the loss, albeit a small amount, of ancient woodland cannot be satisfactorily mitigated however the loss is considered small, and will isolate the western end of New Spring Wood LWS.

13.2.5 To mitigate disturbance impacts on the woodland edges and limit light spillage and avoid the edge effect on either side of the proposed northern road spur through the wood, street lighting in the wood will be avoided or, if considered necessary, low pressure sodium lamps will be used, directed onto the road with light spillage reduced through the use of hoods and cowls. To avoid disturbing mammals such as hedgehogs, nesting birds or roosting bats and as a precautionary approach to disturbing dormice within the proposed lost trees and scrub, trees and scrub within the road spurs through the wood would be checked by an appropriately licensed Ecologist and appropriate legislative action taken, if necessary.

13.2.6 To avoid the removal of large sections of hedgerow within the GA2 site, the scheme proposes to access the development site through the use of a primary road off Mendip Way and importantly, to use existing farm machinery tracks that already transect sections of hedgerow through the site, avoiding the necessity for large-scale hedgerow removal.

Plates 4 – 7: Views of existing gaps in hedgerows identified to provide vehicular access for the primary road through the development, designed to limit damage to important hedgerows

13.2.7 This primary road is proposed to intersect hedgerow H2 where it meets the north-eastern end of New Spring Wood LWS. Here a large 10m gap in the hedge already exists for farm machinery access. However it is anticipated that this gap may have to be enlarged, slightly increasing the gap between the hedge and the wood, but this proposal is not predicted to impact on any of the trees identified with bat roosting potential. The northern spur primary road is proposed to intersect H1; as with the intersection in H2, there is already a 10m gap in H1, through which the road is proposed. It is also anticipated that the existing gap will need to be widened slightly. Where the primary road is proposed to run in a south-easterly direction through the site it will pass between Nine Acre Spring and hedgerow H6. Here the road is proposed to use an existing farm machinery track at the end of H6.

13.2.8 As the gaps already exist in H1, H2 and H6, widening them slightly for road/footpath access is considered likely to have minimal effect on

the integrity of the hedgerows. At this time H1, H2 and H6 are used to a greater or lesser degree by feeding and foraging bats and the existing gaps are not considered a hindrance to the free movement of bats along these hedgerows at this time. Retaining these hedgerows within dark corridors and avoiding the use of street lighting at the hedgerow and road intersections will ensure that bats can continue to use the hedgerows at night.

13.2.9 Should it become necessary to either remove or carry out tree surgery on any one of the aforementioned 12 trees with bat roosting potential within the site's hedgerows, further bat surveys would be carried out before any tree work is carry out. Initially climbing inspections of the affected tree(s) would be carried out by a qualified, licensed bat surveyor and, if further surveys were required, these will also be completed. This would enable an informed impact assessment of the tree work on roosting bats and determine whether mitigation measures are necessary to facilitate the tree work.

13.2.10 Badger activity was found to be centered within Nine Acre Spring with foraging paths radiating out towards Brooches Wood LWS, New Spring Wood LWS and Tilekiln Wood LWS, across arable fields and along primarily hedgerow H2. Of the six badger setts extant with the GA2 site, two outlier setts within New Spring Wood will be lost as the result of the proposed primary road. Outlier setts are generally considered to be infrequently used, non-breeding setts of low status (albeit protected) and are often numerous within the territory of a badger clan (*Roper* 2010).

13.2.11 The impact of the loss of an outlier sett to the badger population is not considered significant as alternative outlier setts will be available and considerable habitat within adjacent woodlands, unaffected by development, is available for badgers to dig replacement outlier setts. The actively used main and subsidiary setts within the GA2 site remain

within woodland retained and unaffected directly by the development.

13.2.12 Badger and hedgehog movement throughout the site will be maintained through the retained woodlands and hedgerows as well as through the creation of a network of interconnecting green and dark corridors. The creation and maintenance of interconnecting green corridors is considered fundamental in the management of the predicted interactions between rural/urban fringe badgers and people as a result of the urbanisation of the GA2 site.

13.2.13 The badger mapping survey showed the clear use of a number of woodlands including Brooches Wood LWS via an arable field and hedgerow H6 between Nine Acre Spring and Brooches Wood LWS. Here, this well-used badger access route is to be transected by the proposed primary road. It is acknowledged that this new road potentially comes into conflict with the badgers, especially when it is so close to a main sett and where badgers are clearly utilising a path between woodlands. Badger mortality on the road at these points is considered a likely outcome without the instigation of some mitigation measures.

13.2.14 To ensure badgers can safely access woodlands within the GA2 site especially Brooches Wood LWS and hedgerow H6, badger tunnels with guiding fencing and headwalls will be installed below the roads at the most appropriate point. This mitigation measure will ensure a safe route for badgers from their sett into Brooches Wood LWS and other important areas for badgers within and adjacent to the site. This mitigation measure is also likely to be considered to facilitate badger access between New Spring Wood LWS and Tilekiln Wood LWS. All under-road badger tunnels would be located and installed in accordance with the provisions of The Protections of Badgers Act 1992 and The Highways Agency's *Design Manual for Roads and Bridges Mitigating Against Effects on Badgers*. 2001.


Plates 8 & 9: Examples of under-road badger tunnels, with extended headwalls directing badgers to the tunnel entrance but badger-proof fencing could also be used

13.2.15 Whilst badger habitat within the woodlands and hedgerows is to be retained, there will be a total loss of the arable fields. Valuable badger habitat is considered to consist of the woodland and hedgerows; arable land, whilst considered generally of low ecological value, is acknowledged as of some foraging value to badgers. This loss may not be deemed significant in relation to the quality of retained woodland and hedgerow habitat but is to be compensated for nonetheless.

13.2.16 Compensation for general loss of biodiversity within the GA2 site would at least address the minor loss of hedgerow and field margins and its impact on invertebrates, hedgehogs, bird nesting and possibly dormouse habitats, the loss of a small part of New Spring Wood LWS, scrub within Brooches Wood LWS and the loss of badger foraging habitat within the arable fields. Opportunities exist within the GA2 site for considerable amounts of habitat creation which would be designed to compensate, in part, for the impacts of the development on important biodiversity and contribute to achieving habitat LBAP targets; specifically, hedgerows (under the Farmland LBAP), Neutral Grassland LBAP and Woodlands LBAP.

13.2.17 For example, new, wide, species-rich hedgerows are to be planted in part to buffer the development. This presents an opportunity to create linear habitats; a species-rich hedgerow which connects Tilekiln Wood to hedgerow H5 and Longdell Wood and Newberry Grove. When

planted in association with a green corridor and managed as a dark zone, this will provide an opportunity for wildlife dispersal and for foraging by nesting birds, badgers, hedgehogs, bats, possibly dormice and invertebrates.

13.2.18 The proposed open space within the field surrounding Dell Spring pond provides an opportunity to create and manage a variety of grassland regimes. In juxtaposition with the amenity management of some formal grassland, areas of neutral grassland 'meadow' will be created and managed to provide maximum biodiversity value through the cultivation and use of locally appropriate species-diverse neutral grassland. As an additional compensatory and enhancement measure within this public open space, Dell Spring pond would be opened up and desilted which would considerably improve its currently low biodiversity value.

13.2.19 Connecting hedgerows H4 to H3 and H2 and creating a buffer between the development and the public footpath, a wide linear habitat of species-rich hedging and scrub will be planted. This feature will connect to Longdell Wood and continue adjacent to the public footpath to connect with Newberry Grove. This compensatory and enhancement biodiversity feature will compensate for the loss of scrub within Brooches Wood LWS and considerably increase the amount of hedgerow within the GA2 site, substantially increasing nesting bird and bat foraging habitat as well as habitat for invertebrates and small mammals, potentially including dormice.

13.2.20 A large open space/nature area is proposed between Longdell Wood and Newberry Grove. Here, as with the open space around Dell Spring Pond, exists an opportunity to substantially increase the amount of species-diverse neutral grassland as well as parkland trees within the GA2 site. When managed appropriately, it will provide foraging opportunities for badgers and ideal conditions for invertebrates and small mammals. This large open space provides habitat connectivity

between Newberry Grove, Longdell Wood and Nine Acre Spring and will ensure that these woodlands (especially Nine Acre Spring) are not isolated within the proposed built development.

13.2.21 The provision of an attenuation pond as part of the SuDS in the far south-eastern corner of the GA2 site presents an opportunity to substantially increase the wetland provision within the site as well as contributing to the Wetland LBAP target. The SuDS drainage system throughout the GA2 site will diversify the habitats within the site, especially where they are incorporated alongside the retained hedgerows and woodland edges. Increased amounts of wetland will increase the invertebrate habitat which, in turn, will increase the feeding and foraging opportunities for birds, bats and badgers.

13.2.22 The retained woodlands within the GA2 site whilst small, do provide a reservoir and hub for the local wildlife and are noted in part for their value to badgers which radiate out from the woodlands, dispersing along the hedgerows and arable fields within the GA2 site. Longdell Wood, New Spring Wood LWS and Nine Acre Spring would be particularly vulnerable to increased levels of disturbance which may arise from construction and the occupancy of the development, through pressures of recreational access into the woods. As such, construction in close proximity to all woodlands including those adjacent; Brooches Wood LWS and Tilekiln Wood LWS, would be carefully monitored and managed by the appointed Ecological Clerk of Works, to ensure that building works carried out in close proximity to the badger setts are carried out within the legislative parameters, nesting birds are not disturbed and that there is no night-time illumination of woodland edges or hedgerows.

13.2.23 It is also acknowledged that unofficial public access into the site's woodlands is already taking place and the development will no doubt lead to an increase in public access of these woodlands. However, resident access into the GA2 site woodlands will be carefully managed

through signage, education and the establishment of fenced paths, guiding the public through the woodlands and limiting the potential for disturbance and damage to the woodlands. Public access however will not be permitted into either Longdell Wood or Nine Acre Spring to protect primarily the badgers, but other assemblages of important wildlife which may include dormice.

13.2.24 The management of the larger ancient semi-natural woodlands of Brooches, Tilekiln and New Spring Woods LWSs provides an opportunity for biodiversity enhancements and an opportunity for Woodland LBAP targets to be, in part, met. It is anticipated that conservation enhancement plans would be formulated for these woodland Local Wildlife Sites in consultation with the Wildlife Sites Project and the Hertfordshire Countryside Management Service. It is anticipated that the Woodland Management Plans for these woodlands as well as making provision for managed public access will focus on a number of European protected and targeted LBAP species including bats (specifically barbastelle) and Natterer's, dormice and deadwood invertebrates such as the stag beetle *(Lucanus cervus)*.

14.0 Conclusion

14.1.1 It is proposed to residentially develop farmland north-east of Great Ashby, Stevenage and, as such, the site is being promoted for inclusion in the emerging North Hertfordshire District Council Local Plan. Policy SP18: Site GA2 – Land off Mendip Way, Great Ashby of that plan states that residential development within this proposed area would be granted where the site-specific requirements are met which include mitigation, compensation/enhancement of key biodiversity features such as a number of Local Wildlife Sites, protected species and priority habitats.

14.1.2 In order to demonstrate the deliverability of a planning application that can satisfactorily meet these local authority biodiversity requirements, ecological studies have been completed of the GA2 site since 2008, by ELMAW Consulting. These studies have resulted in an ecological evaluation of the GA2 site, the identification and valuation of important biodiversity, and the inclusion of generic proposals for important biodiversity mitigation and compensation/enhancements which would form an important component of an Ecological Impact Assessment of any forthcoming planning application for the residential development of the site.

14.1.3 The ecological surveys of the site found no evidence to suggest that important or protected great crested newts or reptiles are extant within the GA2 site. Assemblages of wintering and nesting birds within the site were found to be of just site and local importance, with no evidence to suggest the site is important to species of birds of principal importance. Generally the assemblages of bats utilising the GA2 site were found to be unremarkable and likely to be of local parish value, with the notable exception of barbastelle in Tilekiln Wood which would be considered to be of regional importance. With the presence of a number of badger setts within the GA2 site, its value to the common and widespread badger is considered to be of site level.

14.1.4 Whilst acknowledging that further invertebrate surveys may be needed, the data gathered in 2017 suggests that the majority of the site which is comprised of arable land is unlikely to be important and may support assemblages of invertebrates of possibly parish/district value.

14.1.5 Previous surveys had confirmed the presence of dormice in a few limited locations within the GA2 site. However in 2017, no evidence that dormice are still extant was found. Due to the difficulties and constraints in establishing positively the presence of dormice when persisting at very low densities, their presence cannot confidently be discounted.

14.1.6 A number of non-statutorily protected designated sites of nature conservation importance (LWS) and Priority BAP Habitats (Lowland Broad-leaved Woodlands) have been identified within and adjacent to the GA2 site; Brooches Wood LWS, Tilekiln Wood & Parsonsgreen Wood LWS, Clayhillpits Spring Wood LWS and New Spring Wood LWS, with additionally three non-LWS but priority woodland habitats, Longdell Wood, Nine Acre Spring and Newberry Grove. All these woodland sites are considered to be of district value, as all are considered either wholly or part ancient semi-natural broad-leaved woodlands.

14.1.7 The entire GA2 site is either bounded by or linked by a network of hedgerows, some considered important and all considered to be Priority BAP Habitats.

14.1.8 Whilst the woodlands, hedgerows and a number of species extant within the site are considered to be important, the majority of the development will be contained within the arable environment; considered to be of low biodiversity significance. The only exception to this is the proposed primary road route which will dissect New Spring Wood LWS, directly impacting on this woodland.

14.1.9 With considerable amounts of arable open space within the GA2 site not proposed to be built upon, opportunities exist for the development to demonstrate compliance with Policy SP18 as well as NPPF and demonstrate a no net loss of biodiversity as well as a net biodiversity gain. Areas of arable land will be converted to open space, species-rich wildflower meadows will be created, hedgerows will be enhanced and considerably extended, ecotones consisting of green unlit corridors, swales and basins will be created to maintain wildlife corridors and provide woodland buffers and wetlands will be enhanced and new wetlands created.

14.1.10 The GA2 site is not considered ecologically remarkable although it does support important and protected species and habitats. It is considered highly feasible, based on the residential development proposals with the provision of arable land availability for biodiversity enhancement and having control of the site's woodland LWSs, that the site-specific requirements for granting planning permission can satisfactorily be met.

15.0 References

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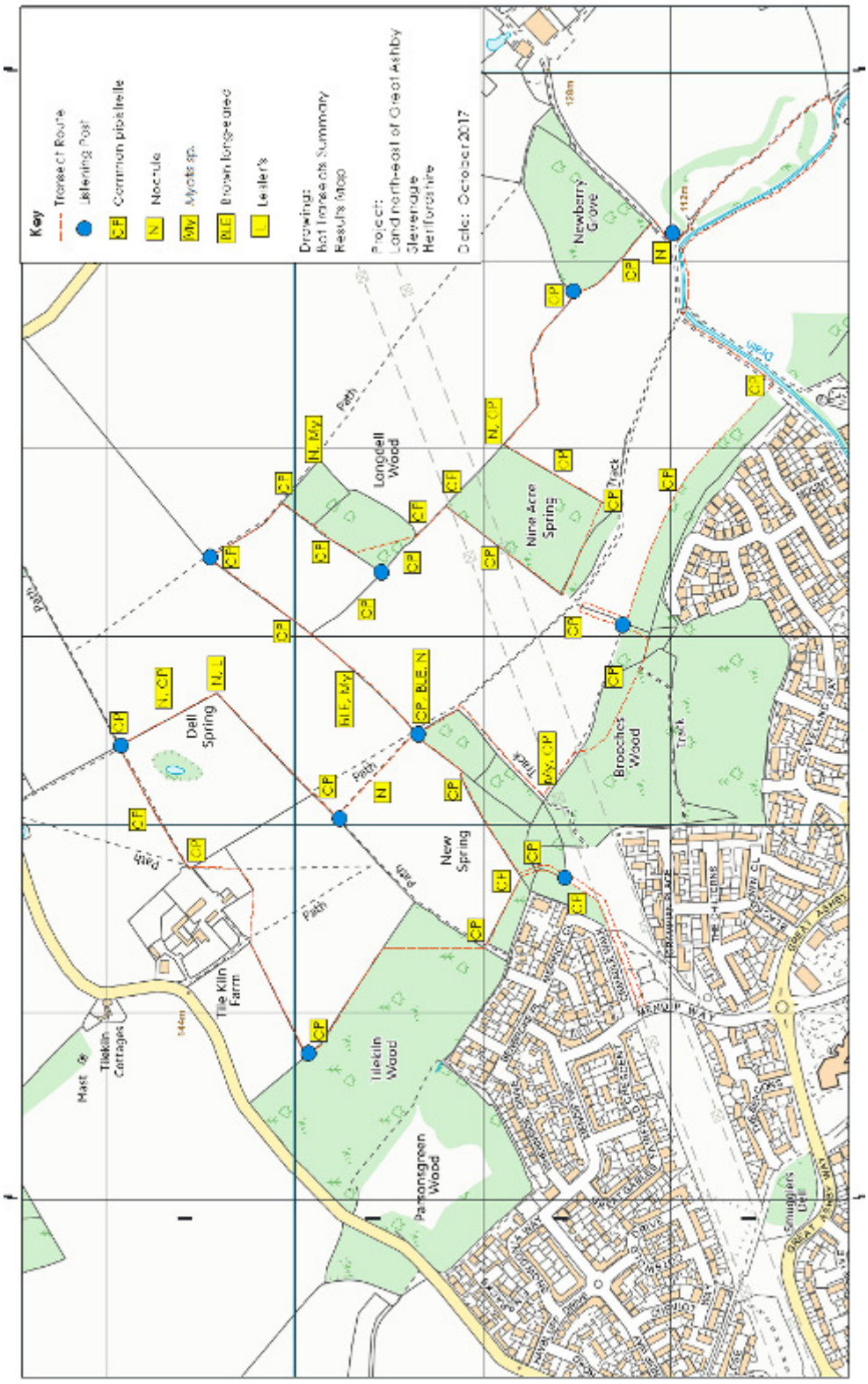
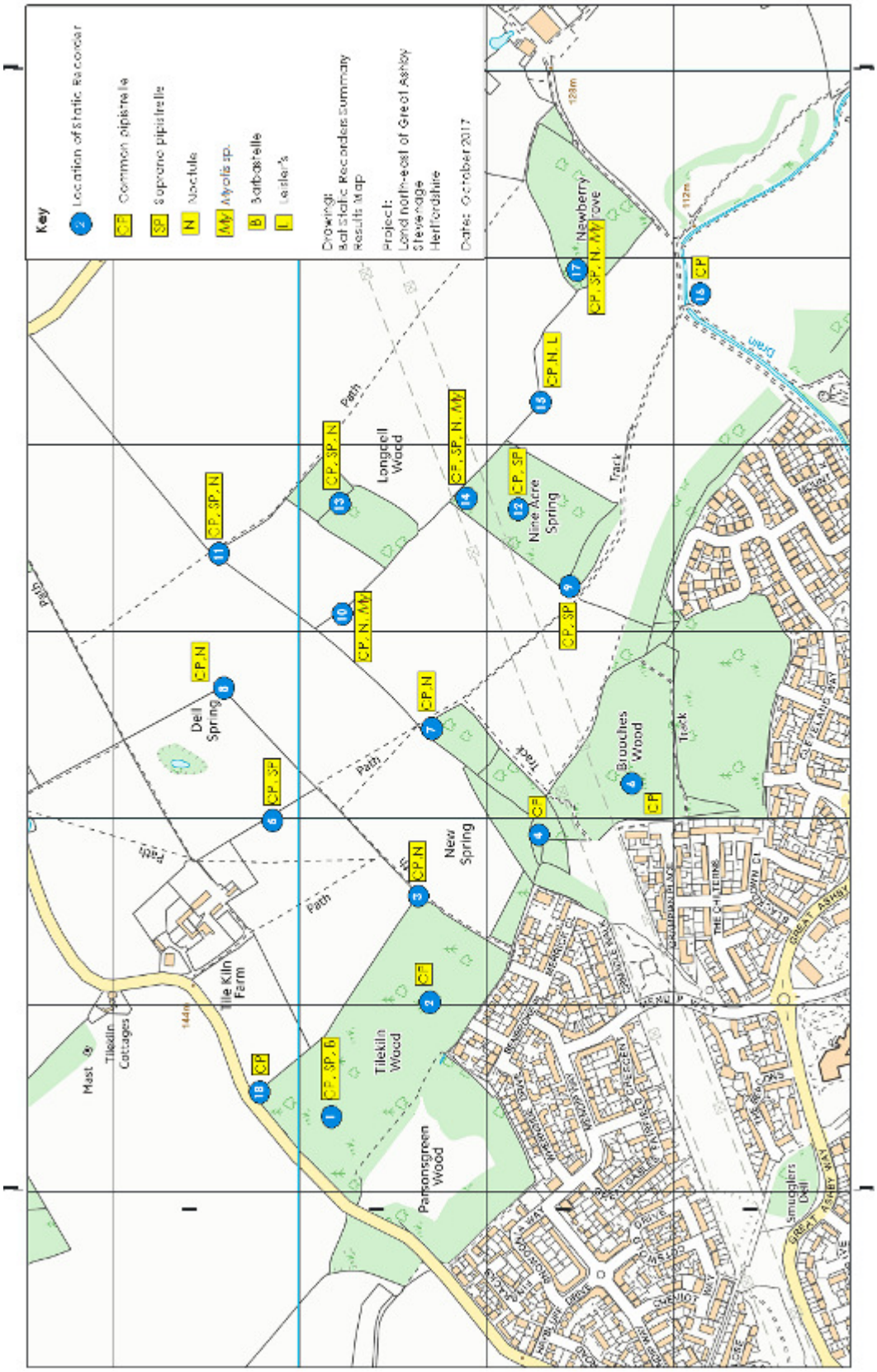
16.0 Appendix 1

16.1 Bat Transect Summary Results Map



16.2 Bat Static Recorders Summary Results Map



17.0 Appendix 2 – Results of HIS Pond Assessments

17.1 Pond P1

Habitat Suitability Index – Fieldwork Proforma

Name of Site GA2 Gt Ashby Date May 2017
Pond Number P1

	Criteria Factor										Suitability Index
1	Location (see map-SE is zone A)	Zone A	√	Zone B		Zone C					1.0
2	Pond Area (m^2)	190m^2									0.4
3	Pond drying out in last 10 years	Never dries out		Dries out no more than 2 years in 10 or only in drought		Dries between 3 years in 10 to most years	√	Dries annually			0.5
4	Water quality	1.0 Good		0.67 Moderate		0.33 Poor		0.01 Bad	√		0.01
5	Shade (%)	0 10	20	30 40		50 60		70 80	90		0.2
6	Waterfowl (number seen)	1 Absent		0.67 Minor	√	0.01 Major					0.67
7	Fish (subjective scale)	1 Absent	√	0.67 Possible		0.33 Minor		0.01 Major			1.0
8	Pond counts within 1km of site (not separated by major barriers)	8									1.0
9	Terrestrial habitat within 250m of site	1 Good		0.67 Moderate √		0.33 Poor		0.01 None			0.67
10	Macrophyte (% of pond surface area covered by macrophyte cover)	0 10	20	30 40		50 60		70 80	90		0.3
										Total HSI <0.5 = Poor 0.5-0.59 = Below average 0.6-0.69 = Average 0.7-0.79 = Good >0.8 = Excellent	0.37
	Notes										

17.2 Pond P2

Habitat Suitability Index – Fieldwork Proforma

Name of Site Dane End Farm Date May 2017
Pond Number P2

	Criteria Factor												Suitability Index
1	Location (see map-SE is zone A)	Zone A	√		Zone B			Zone C					1.0
2	Pond Area (m^2)	169m^2											0.4
3	Pond drying out in last 10 years	Never dries out			Dries out no more than 2 years in 10 or only in drought			Dries between 3 years in 10 to most years			Dries annually	√	0.1
4	Water quality	1.0 Good			0.67 Moderate			0.33 Poor	√		0.01 Bad		0.33
5	Shade (%)	0	10	20	30	40		50	60	70	80	90 √	0.2
6	Waterfowl (number seen)	1 Absent	√		0.67 Minor			0.01 Major					1.0
7	Fish (subjective scale)	1 Absent	√		0.67 Possible			0.33 Minor			0.01 Major		1.0
8	Pond counts within 1km of site (not separated by major barriers)	8											1.0
9	Terrestrial habitat within 250m of site	1 Good			0.67 Moderate √			0.33 Poor			0.01 None		0.67
10	Macrophyte (% of pond surface area covered by macrophyte cover)	0 √	10	20	30	40		50	60	70	80	90	0.3
													0.47
	Notes												

Total HSI
<0.5 = Poor
0.5-0.59 = Below average
0.6-0.69 = Average
0.7-0.79 = Good
>0.8 = Excellent

17.3 Pond 3

Habitat Suitability Index – Fieldwork Proforma

Name of Site Dane End Farm Date May 2017
Pond Number P3

	Criteria Factor					Suitability Index
1	Location (see map-SE is zone A)	Zone A √	Zone B	Zone C		1.0
2	Pond Area (m^2)	371m^2				0.7
3	Pond drying out in last 10 years	Never dries out	Dries out no more than 2 years in 10 or only in drought	Dries between 3 years in 10 to most years	Dries annually √	0.1
4	Water quality	1.0 Good	0.67 Moderate	0.33 Poor √	0.01 Bad	0.33
5	Shade (%)	0 10 20 30 40 50 √ 60 70 80 90				1.0
6	Waterfowl (number seen)	1 Absent √	0.67 Minor	0.01 Major		1.0
7	Fish (subjective scale)	1 Absent	0.67 Possible √	0.33 Minor	0.01 Major	0.67
8	Pond counts within 1km of site (not separated by major barriers)	8				1.0
9	Terrestrial habitat within 250m of site	1 Good	0.67 Moderate √	0.33 Poor	0.01 None	0.67
10	Macrophyte (% of pond surface area covered by macrophyte cover)	0 √ 10 20 30 40 50 60 70 80 90				0.3
					Total HSI <0.5 = Poor 0.5-0.59 = Below average 0.6-0.69 = Average 0.7-0.79 = Good >0.8 = Excellent	0.56
	Notes					

17.4 Pond 4

Habitat Suitability Index – Fieldwork Proforma

Name of Site Dane End Farm Date May 2017
Pond Number P4

	Criteria Factor												Suitability Index
1	Location (see map-SE is zone A)	Zone A	√		Zone B			Zone C					1.0
2	Pond Area (m^2)	193m^2											0.4
3	Pond drying out in last 10 years	Never dries out		Dries out no more than 2 years in 10 or only in drought		Dries between 3 years in 10 to most years		Dries annually	√				0.1
4	Water quality	1.0 Good		0.67 Moderate		0.33 Poor	√	0.01 Bad					0.33
5	Shade (%)	0	10	20	30	40	50	60	70	80	90	√	0.2
6	Waterfowl (number seen)	1 Absent	√		0.67 Minor			0.01 Major					1.0
7	Fish (subjective scale)	1 Absent	√	0.67 Possible		0.33 Minor		0.01 Major					1.0
8	Pond counts within 1km of site (not separated by major barriers)	8											1.0
9	Terrestrial habitat within 250m of site	1 Good		0.67 Moderate √		0.33 Poor		0.01 None					0.67
10	Macrophyte (% of pond surface area covered by macrophyte cover)	0	√	10	20	30	40	50	60	70	80	90	0.3
												Total HSI <0.5 = Poor 0.5-0.59 = Below average 0.6-0.69 = Average 0.7-0.79 = Good >0.8 = Excellent	0.47
	Notes												

18.0 Appendix 3

18.1 Valuing Bat Commuting Routes & Foraging Areas

Species	Number of Bats	Roosts/potential roosts nearby	Type & complexity of linear features (for commuting value)/foraging habitat characteristics
Common (2)	Individual bats (5)	None (1)	Low value (1)
-	-	Small number (3)	Low-moderate (2)
Rarer (5)	Small numbers of bats (10)	Moderate number/not known (4)	Moderate value (3)
-	-	Large number of roosts, or close to a SSSI for the species (5)	Moderate-high (4)
Rarest (20)	Large numbers of bats (20)	Close to or within a SAC for the species (20)	High value (5)

18.2 Scoring System for Valuing Commuting and Foraging Bats

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

Valuing Bats in Ecological Impact Assessment – S Wray, D Wells, E Long, T Mitchell-Jones - December 2010 - In Practice

19.0 Appendix 4 – Protected and Notably Important Species Legislation and Protection

19.1 Birds

19.1.1 Legislation covering bird protection includes; The Birds Directive (1979), the Wildlife & Countryside Act 1981 (as amended), the Countryside & Rights of Way (CROW) Act 2000.

19.1.2 A number of British birds are UK Priority Species for Conservation and Species of Principal Importance under the Natural Environment and Rural Communities (NERC) Act 2006. The protection of UK BAP Priority Species and Species of Principal Importance is implemented through NPPF and Local Planning Policy.

19.1.3 All birds, their nests and eggs are protected by law and it is thus an offence (with certain exceptions), to:

- intentionally kill, injure or take any wild bird
- intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built
- intentionally take or destroy the egg of any wild bird
- intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

19.2 Bats

19.2.1 All bats and their roosts in the UK are protected by the Wildlife & Countryside Act 1981 (as amended), and under Schedule 2 of the Conservation of Habitats and Species Regulations 2010.

19.2.2 In England the legislation makes it illegal to;

- Deliberately capture, injure or kill a bat,
- Deliberately disturb a bat which is likely to impair their ability to survive, breed or reproduce, rear or nurture their young, hibernate, migrate or affect significantly their local distribution or abundance
- Damage or destroy a breeding site or resting place of a bat
- Possess, control, transport, sell, exchange or offer for sale or exchange any live or dead bat or any part of a bat

19.2.3 Bats' roosts (including resting places) are protected whether or not bats are present at the time. The Wildlife & Countryside Act 1981(as amended) additionally makes it an offence to;

- Intentionally or recklessly disturb a bat at a roost
- Intentionally or recklessly obstruct access to a roost

19.2.4 Finally, under the Natural Environment and Rural Communities Act (NERC) 2006, a duty is placed on all public bodies to promote and enhance biodiversity in all its functions. There is a general biodiversity duty in the NERC Act (Section 40) which requires every public body in the exercising of its functions to 'have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. Section 41 draws up lists of species of principal importance to which special attention must be given and a number of bats are included in this list.

19.3 Badger

19.3.1 Badgers are protected under the Protection of Badgers Act 1992. This act provides comprehensive protection for badgers and their setts. Authorised sett disturbance or destruction can be carried out but only under a licence.

19.3.2 Again, it is the animal and its home (sett) that are protected and a sett is defined as 'any structure or place which displays signs indicating the current use by badgers and includes seasonally used setts.

Normally, machine digging is not permissible within 20/30m (according to the size of the machine) of a sett and hand digging is not permissible within 10 metres. During the months of November-July inclusive is the closed season where no works in the vicinity of a sett are allowed at all