

North East Stevenage Environmental Statement

Chapter 9: Ecology and Biodiversity

Prepared by
CSA Environmental

On behalf of
Pictures Estate Limited

October 2023

Appendix 9.1

Legislation and Planning Policy

- 1.1. The **Conservation of Habitats and Species Regulations 2017** (as amended) make prescriptions for the designation and protection of Sites of Community Importance ('European sites', i.e. Special Areas of Conservation and Special Protection Areas) and European Protected Species (EPS). The latter include all native bats, great crested newts, dormice, otters and certain reptiles, listed under Annex II of the Regulations. Following the UK's departure from the European Union, the provisions of the Regulations have been retained through enactment of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which came into force on 31 December 2020.
- 1.2. The **Wildlife and Countryside Act 1981** (as amended, principally by the Countryside and Rights of Way Act 2000) forms the basis for protection of statutory designated sites of national importance (e.g. Sites of Special Scientific Interest; SSSIs) and native species that are rare and vulnerable in a national context. Additionally, badgers are protected under the **Protection of Badgers Act 1992**.
- 1.3. The **Environment Act 2021** received Royal Assent in November 2021. Through an amendment to the Town and Country Planning Act 1990 the Environment Act will introduce a mandatory requirement for all planning permissions to be conditional upon the submission of a Biodiversity Gain Plan for approval by the Local Planning Authority. The Plan will need to demonstrate a net gain of at least 10% in the biodiversity value of the development site. These provisions are not yet in force, pending their enactment through secondary legislation.
- 1.4. Section 40(1) of the **Natural Environment and Rural Communities (NERC) Act 2006** states that each public authority, "must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity." This legislation makes it clear that planning authorities should consider impacts to biodiversity when determining planning applications, with particular regard to the Section 41 (S41) lists of 56 habitats and 943 species of principal importance. The UK Biodiversity Action Plan (BAP) has been superseded by the Biodiversity 2020 Strategy, however Local BAPs continue to influence biodiversity management and conservation effort, including through the spatial planning system, at the local scale.
- 1.5. The **National Planning Policy Framework (2023)** (NPPF) sets out government planning policies for England and how they should be applied. With regards to ecology and biodiversity, Chapter 15: Conserving and Enhancing the Natural Environment, paragraph 174, states that the planning system and planning policies should minimise impacts on and provide net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

- 1.6. Paragraph 180 sets out the principles that local planning authorities should apply when determining planning applications:
- If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.
 - Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest.
 - Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.
 - Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.
- 1.7. Accompanying the NPPF, central government guidance on the implementation of planning policies is set out within online Planning Policy Guidance (PPG). The Natural Environment PPG addresses principles across a broad spectrum of topics targeting biodiversity conservation, from individual site and species protection through to the supporting of ecosystem services, and the use of local ecological networks to support the national Nature Recovery Network. In particular, the PPG promotes the delivery of measurable Biodiversity Net Gain through the creation and enhancement of habitats alongside development.
- 1.8. The **Government Circular 06/2005**, which is referred to within the NPPF, defines statutory nature conservation sites and protected species as a material consideration in the planning process.
- 1.9. Local planning policies of relevance to ecology, biodiversity and/or nature conservation have been set out in Table 1 below.

Table 1. Summary of regional and local planning policy relating to ecology

Policy	Summary
North Hertfordshire Local Plan 2011-2031 (Adopted November 2022)	
Policy SP12: Green infrastructure, landscape and biodiversity	We will accommodate significant growth during the plan period whilst ensuring the natural environment is protected and enhanced. We will: a) Protect, identify, manage and where possible enhance a strategic multi-functional network of green infrastructure; b) Consider and respect landscape character, scenic beauty and locally sensitive features, particularly in relation to the Chilterns Area of Outstanding Natural Beauty; c) Protect, enhance and manage designated sites in accordance with the following hierarchy of designations and features: • Internationally designated sites • Nationally designated sites • Locally designated sites; • Non-designated sites that include important habitats and species d) Protect, enhance and manage biodiversity networks including wildlife corridors, ancient woodlands and hedgerows, wetland and riverine habitats, Local Geological Sites, protected species, priority species and habitats, and non-designated sites of ecological value and ensure measurable net gains for biodiversity; and e) Protect other open spaces and support provision of new and improved open space.
Policy SP18: Site GA2 – Land off Mendip Way, Great Ashby	Land to the north-east of Great Ashby within Weston parish, as shown on the Policies Map, is allocated as a Strategic Housing Site for a new neighbourhood of approximately 600 homes. A comprehensive and deliverable Strategic Masterplan for the entire allocation is to be prepared and agreed between the landowner/developer and the Council. Where applications have already been submitted to the Council a Strategic Masterplan should be agreed prior to the or as part of the grant of planning permission. Any application on part of the site will be assessed against its contribution to the Strategic Masterplan and must not prejudice the implementation of the site as a whole. Development proposals should provide the following planning and masterplanning requirements: a) Neighbourhood-level facilities providing approximately 500m² (net) of retail and food and beverage floorspace and other necessary medical and social infrastructure; b) Four hectares of land at the north of the allocation site, broadly bounded by Footpaths Weston 044 and Weston 027 and Dell Spring reserved for education use to accommodate 2FE of primary-age provision and 4FE of secondary age provision;

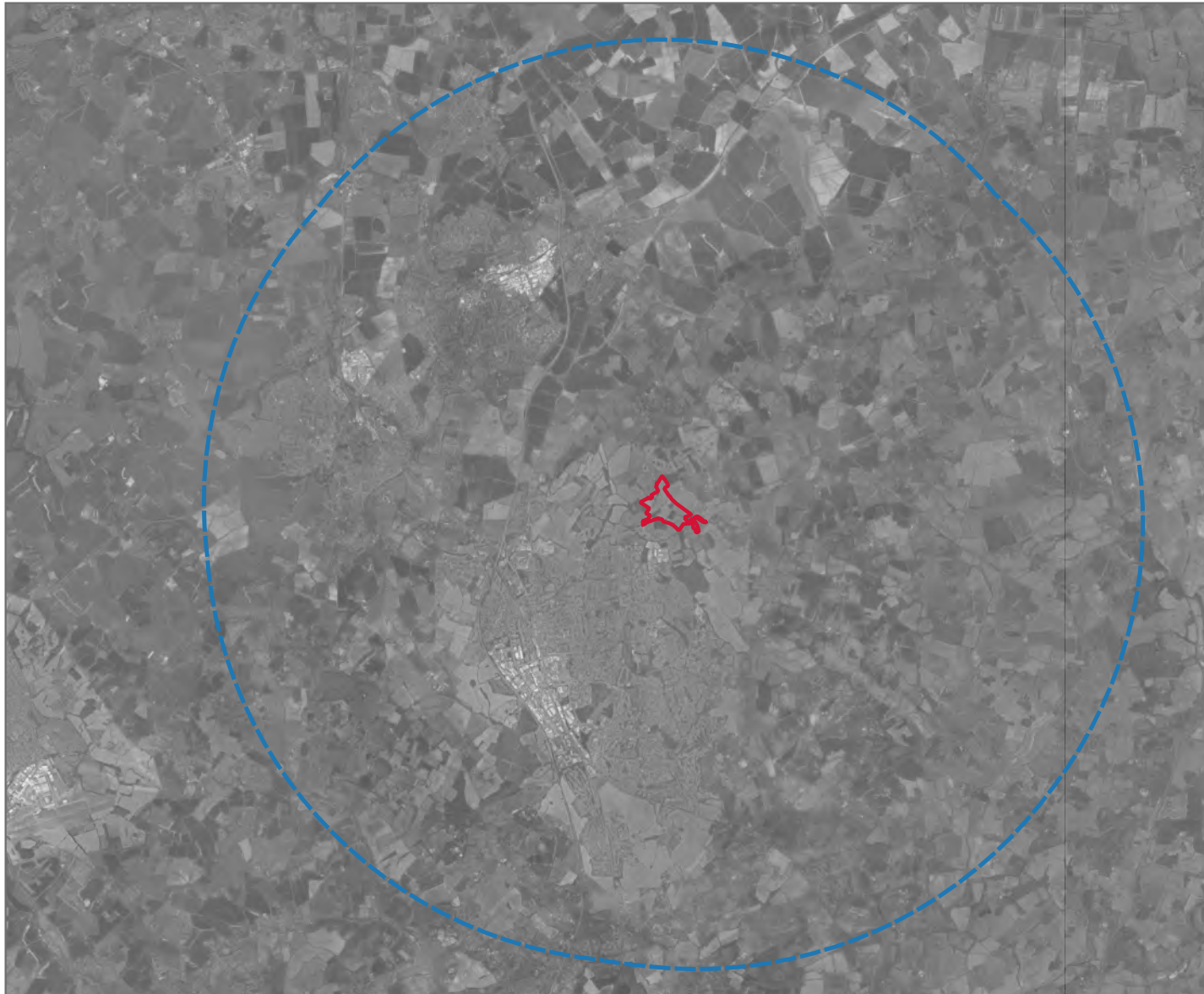
Policy	Summary
	c) Principal access from Mendip Way with: i. provision for sustainable modes of transport having regard to the Stevenage Mobility Strategy; and ii. comprehensive integration into the existing pedestrian and cycle, public transport and road networks; d) Transport Assessment to identify and secure measures to manage traffic flows arising from the development along Back Lane; e) A detailed drainage strategy identifying water infrastructure required and mechanism(s) for delivery; f) At least 6 serviced plots for self-build development; g) Structural planting along site boundaries as informed by detailed landscape assessments to reinforce the revised Green Belt boundary and mitigate landscape impacts; h) Address existing surface water flood risk issues, particularly running south-east from Dell Spring to Newberry Grove, through SUDs or other appropriate solution; 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; ii. identified protected species and priority habitats; and iii. retention of green infrastructure connectivity and corridors to the wider countryside; j) Integration of existing public rights of way within and adjoining the site to provide routes to the wider countryside including i. Footpaths Weston 027 and Weston 044 and Bridleway Weston 033 as features which help define the perimeters of the site; and ii. Footpath Weston 029 as a potential green corridor through the site; k) Provision of a green infrastructure corridor beneath the current alignment of the pylon lines to respect statutory safety clearance requirements for residential development; and l) Lower intensity development and / or green infrastructure provision to the north of the site to minimise harm to the setting of listed buildings.
Policy NE1: Strategic green infrastructure	Planning permission will be granted provided that development: a) Protects, conserves and where possible enhances the strategic green infrastructure network; b) Avoids the loss, fragmentation, severance or negative impact on the function of the strategic green infrastructure network;

Policy	Summary
	c) <i>Creates new strategic green infrastructure where appropriate and is accompanied by a plan for its long-term maintenance and management; and</i> d) <i>Has suitable mitigation measures or appropriate replacement to satisfactorily address adverse impacts on the strategic green infrastructure network.</i>
Policy NE4: Biodiversity and geological sites	<i>Planning permission will only be granted for development proposals that appropriately protect, enhance and manage biodiversity in accordance with the hierarchy and status of designations and features listed in Policy SP12.</i> <i>All development should deliver measurable net gains for biodiversity and geodiversity, contribute to ecological networks and the water environment, and/or restore degraded or isolated habitats where possible.</i> <i>Applicants should, having regard to the status of any affected site(s) or feature(s):</i> a) <i>Submit an ecological survey that is commensurate to the scale and location of the development and the likely impact on biodiversity, the legal protection or other status of the site;</i> b) <i>Demonstrate that adverse effects can be avoided and / or satisfactorily minimised having regard to the hierarchy of protection below:</i> i. <i>locating on an alternative site with a less harmful impact;</i> ii. <i>providing adequate mitigation measures; or</i> iii. <i>as a last resort compensated for.</i> <i>The acceptability of approach(es) to avoidance, mitigation and compensation will be commensurate with the status of the asset(s) likely to be affected by the application; Compensation is unlikely to be an appropriate solution for proposals affecting nationally or internationally designated sites other than in the most exceptional circumstances.</i> c) <i>Include appropriate measures to manage construction impacts by demonstrating how existing wildlife habitats supporting protected or priority species will be retained, safeguarded and managed during construction;</i> d) <i>Integrate appropriate buffers of complimentary habitat for designated sites and other connective features, wildlife habitats, priority habitats and species into the ecological mitigation and design. The appropriateness of any buffers will be considered having regard to the status of the relevant habitat. 12 metres of complimentary habitat should be provided around wildlife sites (locally designated sites and above), trees and hedgerows. It may be necessary to exceed this distance for fragile habitats such as ancient woodland or to provide appropriate root protection for mature trees; and</i> e) <i>Provide a long-term management and monitoring plan including mitigation measures as necessary.</i>

Policy	Summary
	<i>Local Geological Sites are ratified by the Herts & Middlesex Wildlife Trust (HMWT) and are afforded the same protection as Local Wildlife Sites.</i>

Appendix 9.2

Desk Study Information



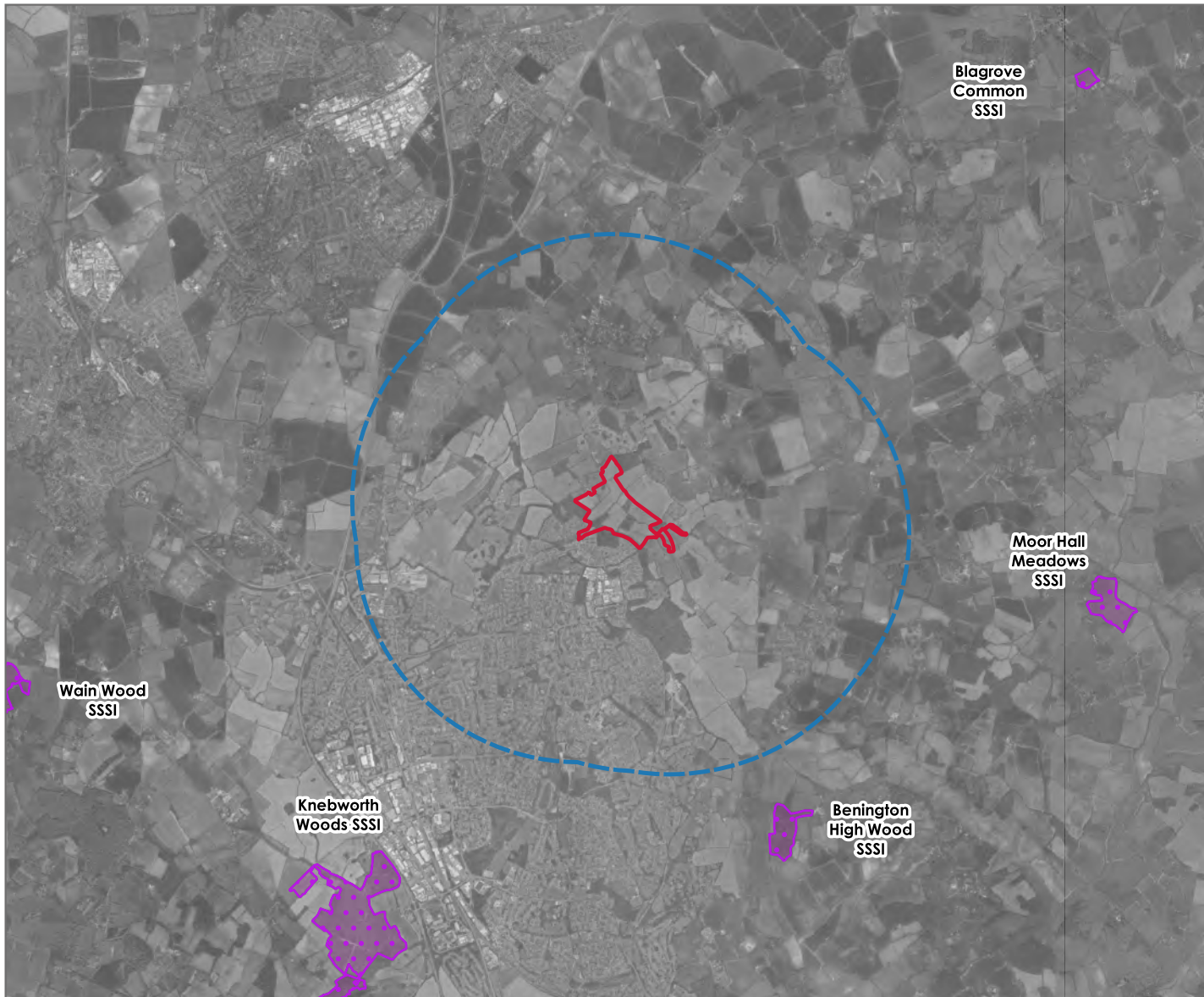
-  Site boundary
-  10km Buffer
-  Special Area of Conservation (SAC)
-  Special Protection Area (SPA)
-  Ramsar

No international statutory designations were identified within the search area.



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Project	North-East Stevenage	Date	Dec. 2024	Drawing No.	CSA/0993/149
Drawing Title	International Statutory Designations	Scale	Refer to scale	Rev	-
Client	Picture Estates Limited	Drawn	LF	Checked	JW



-  Site boundary
-  3km Buffer
-  Site of Special Scientific Interest (SSSI)

No national or local statutory designations were identified within the search area.



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Project	North-East Stevenage	Date	Dec. 2024	Drawing No.	CSA/0993/150
Drawing Title	National/Local Statutory Designations	Scale	Refer to scale	Rev	-
Client	Picture Estates Limited	Drawn	LF	Checked	JW



- Site boundary
- 1km Buffer
- Local Wildlife Sites (LWS)



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Project	North-East Stevenage	Date	Dec. 2024	Drawing No.	CSA/0993/151
Drawing Title	Non-Statutory Designations	Scale	Refer to scale	Rev	-
Client	Picture Estates Limited	Drawn	LF	Checked	JW



 Site boundary

Ancient Woodland Inventory Sites

 Ancient and Semi-Natural Woodland

 Ancient Replanted Woodland

Ancient Woodland

 Onsite/Immediately adjacent Ancient Woodland



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Project North-East Stevenage

Drawing Title Ancient Woodland

Client Picture Estates Limited

Date October 2023

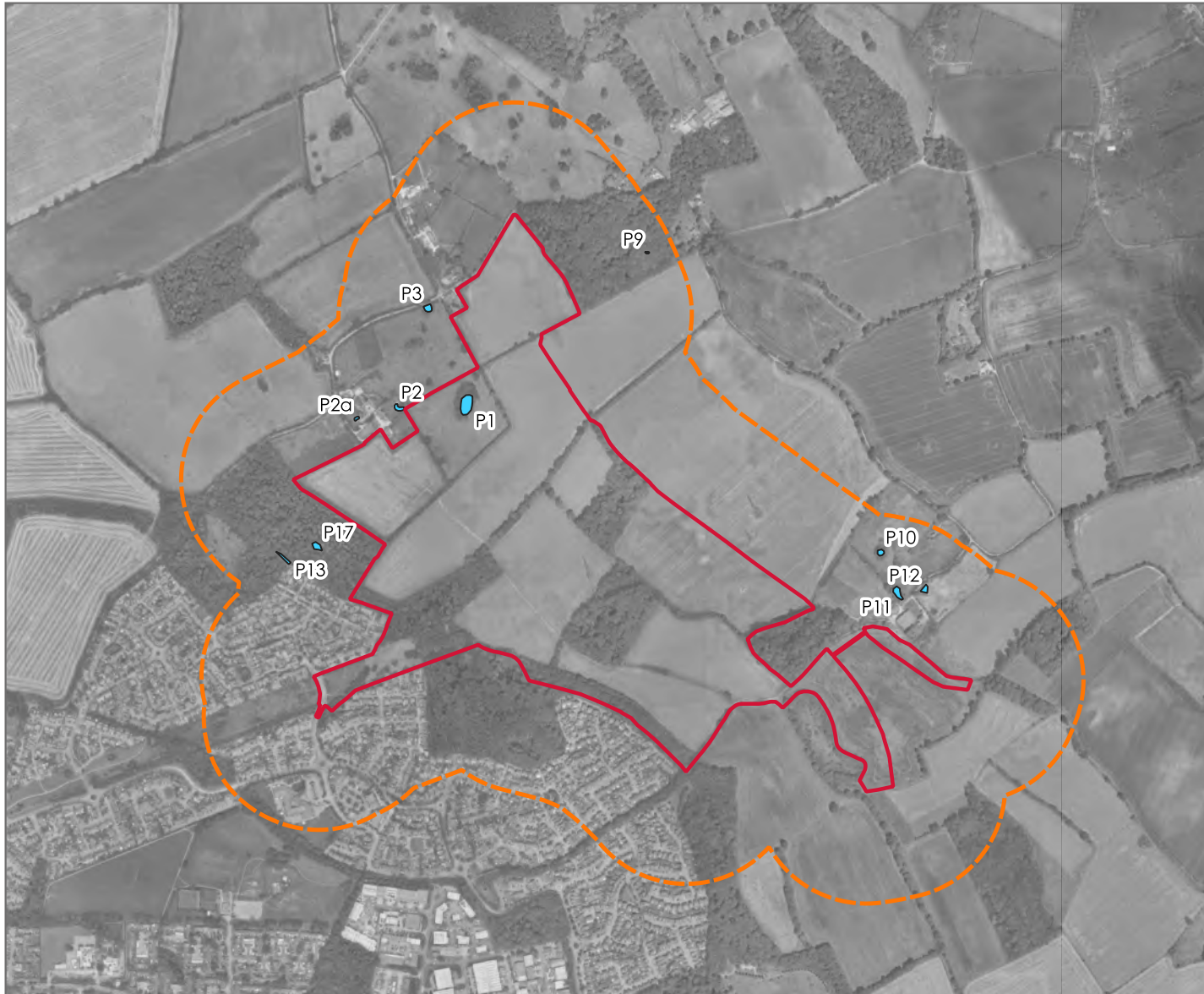
Scale Refer to scale

Drawn LF

Drawing No. CSA/0993/152

Rev -

Checked JW



- Site boundary
- 250m Pond Buffer
- Pond (with reference)

Only ponds within 250m of the Site boundary have been mapped. A further eight fall between 250m and 500m of the Site.



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Project	North-East Stevenage	Date	Dec. 2024	Drawing No.	CSA/0993/152
Drawing Title	Pond Plan	Scale	Refer to scale	Rev	-
Client	Picture Estates Limited	Drawn	LF	Checked	JW

Appendix 9.3

Habitats & Botany



- Site boundary
- Temporary grass and clover leys (c1b5)
- Cereal crops (c1c)
- Other neutral grassland (g3c)
- Modified grassland (g4)
- Dense scrub (h3)
- Developed land, sealed surface (u1b)
- Lowland mixed deciduous woodland (w1f)
- Other woodland; broadleaved (w1g)
- Other coniferous woodland (w2c)
- Ponds
- Other coniferous woodland (w2c)
- Hedgerows (h2a); with reference
- Wet ditch
- Scattered trees

Target notes:

- T1: SUDS feature
- T2: Fallow (80)
- T3: Former chalk pit
- F1: Field reference

0 250 500 m

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Project	North-East Stevenage	Date	Dec. 2024	Drawing No.	CSA/0993/140
Drawing Title	Habitats Plan	Scale	Refer to scale	Rev	B
Client	Picture Estates Limited	Drawn	LF	Checked	JW



Photograph 1. Arable land.



Photograph 2. Other neutral grassland of F2.



Photograph 3. Mown modified grassland and play area of Mendip Park.



Photograph 4. New Spring Wood Ancient woodland with emerging bluebells.



Photograph 5. Off-site Plantation woodland W10.



Photograph 6. SUDS basin of grassland with encroaching scrub.



Photograph 7. Access route through Mendip Park (under pylons).



Photograph 8. Dell Spring with surrounding mature oak and beech.



Photograph 9. [REDACTED]



Photograph 10: Dormouse tube

Table 1. Habitat Polygons

Site Name	North East Stevenage																																	
Survey Date and Surveyor(s)	08/04/2023 and 13/04/2023 Michelle Bullock																																	
Scientific Name	Common Name	Habitat Parcel Number/Habitat Type																																
		Modified grassland F4	F4: Q1 (long sward)	F4: Q2 (long sward)	F4: Q3 (long sward)	F4: Q4 (long sward)	F4: Q5 (long sward)	F4: Q1 (short sward)	F4: Q2 (short sward)	F4: Q3 (short sward)	F4: Q4 (short sward)	F4: Q5 (short sward)	Modified grassland F2	F2: Q1	F2: Q2	F2: Q3	F2: Q4	F2: Q5	Other neutral grassland SUDS	SUDS: Q1	SUDS: Q2	SUDS: Q3	SUDS: Q4	SUDS: Q5	Cereal crops (F1, F3, F5-6, F8, F10-11)	Field margins	Cereal crop Followed F7	Temporary grass and clover leys (F9)	Dense scrub	Lowland mixed deciduous woodland (W1, W2, W4, W9, W11- W13)	Hedgerows	Plantation W3	Plantation W10	
			TL 25866 27579	TL 25884 27569	TL 25890 27586	TL 25901 27580	TL 25928 27601	TL 25784 27549	TL 25784 27512	TL 25801 27541	TL 25824 27541	TL 25840 27570		TL 26113 28182	TL 26118 28130	TL 26048 28122	TL 26050 28072	TL 25993 28125		TL 26835 27456	TL 26852 27437	TL 26871 27403	TL 26894 27375	TL 26928 27344										
Fern																																		
Pteridium aquilinum	Bracken																			x														
Herb Species																																		
Achillea millefolium	Yarrow												x							x				x	x									
Ajuga reptans	Bugle																																x	
Alliaria petiolata	Garlic mustard																																x	
Anagallis arvensis	Scarlet pimpernel																																x	
Anemone nemorosa	Wood anemone																									x							x	
Anthriscus sylvestris	Cow parsley												x																				x	
Arctium sp.	Burdock sp.																										x						x	
Artemisia vulgaris	Mugwort																										x							
Arum maculatum	Lords-and-ladies																																x	
Ballota nigra	Black horehound																																x	
Bellis perennis	Daisy	x						x	x	x	x	x								x													x	
Calystegia arvensis	Field bindweed																			x	x	x		x			x							
Centaurea nigra	Common knapweed																			x	x			x	x	x		x						
Cerastium sp.	Common mouse-ear	x									x									x							x	x						
Cirsium arvense	Creeping thistle	x				x							x				x			x	x			x			x							
Clematis vitalba	Traveler's-ivy																																x	
Conopodium majus	Pignut																																x	
Cotoneaster sp.	Cotoneaster																			x														
Cytisus scoparius	Broom																																x	
Daucus carota	Wild carrot																				x	x												
Epilobium hirsutum	Great willowherb																			x														
Epilobium montanum	Broad-leaved willowherb																			x								x						
Ficaria verna	Lesser celandine																																x	
Galium aparine	Cleavers												x							x													x	
Geranium columbinum	Long-stalked crane's-bill	x		x		x														x														
Geranium dissectum	Cut-leaved crane's-bill	x																		x														
Geranium molle	Dove's-foot crane's-bill	x																																
Geranium robertianum	Herb Robert																																x	
Geum urbanum	Wood avens																																x	
Glechoma hederacea	Ground-ivy																																x	
Helminthotheca echinoides	Bristly ox-tongue	x								x																								
Heracleum sphondylium	Hogweed																			x							x							
Hyacinthoides non-scripta	Bluebell																																x	
Lamiasium galeobdolon	Yellow archangel																																x	
Lamiasium galeobdolon arge	Variegated yellow archangel																																x	
Lamium album	White dead-nettle												x																					
Lamium purpureum	Red dead-nettle												x																					
Leontodon sp.	Hawkbit	x								x																								
Leucanthemum vulgare	Oxeye daisy																			x				x	x	x								
Lotus corniculatus	Common bird's-foot-trefoil																			x														
Matricaria discoidea	Pineappleweed																																x	
Medicago lupulina	Black medick	x																																
Mercurialis perennis	Dog's mercury																																x	
Myosotis arvensis	Field forget-me-not																																x	
Odonites vernus	Red bartia																																	
Picris hieracioides	Hawkweed ox-tongue																																	
Plantago lanceolata	Ribwort plantain	x			x		x	x		x	x	x								x	x			x	x	x		x						
Plantago major	Greater plantain	x							x	x										x	x													
Polygonum sp.	Knotgrass																																x	
Potentilla reptans	Creeping cinquefoil																																x	
Potentilla sterilis	Barren strawberry																																x	
Primula veris	Cowslip																																x	
Primula vulgaris	Primrose																																x	
Prunella vulgaris	Selfheal	x																		x													x	
Ranunculus acris	Meadow buttercup																			x	x	x			x	x								
Ranunculus repens	Creeping buttercup												x																					
Rumex acetosa	Common sorrel																			x														
Rumex obtusifolius	Broad-leaved dock																																x	
Rumex sanguineus	Wood dock																																x	
Rumex sp.	Dock																																	
Sanicula europaea	Sanicle																			x													x	
Scorzonoides autumnalis	Autumn hawkbit	x				x																												

[illegible]

Table 2. Linear Habitats

Site Name	North East Stevenage									
Survey Date and Surveyor(s)	08/04/2023 and 13/04/2023 Michelle Bullock									
Scientific Name	Common Name	Habitat Parcel Number/Habitat Type								
		Native Hedgerow H1	Native Hedgerow H2	Native Hedgerow H3	Native Hedgerow H4	Native Hedgerow H5	Native Hedgerow H6	Native Hedgerow H7	Native Hedgerow H8	Native Hedgerow H9
Ferns										
<i>Pteridium aquilinum</i>	Bracken									x
Herb Species										
<i>Anthriscus sylvestris</i>	Cow parsley									
<i>Arum maculatum</i>	Lords-and-ladies	x							x	
<i>Clematis</i> sp.	Clematis									x
<i>Galium aparine</i>	Cleavers	x								
<i>Geranium dissectum</i>	Cut-leaved crane's-bill								x	
<i>Hyacinthoides non-scripta</i>	Bluebell									
Grasses										
<i>Arrhenatherum elatius</i>	False oat-grass									
Woody Species										
Broadleaved										
<i>Acer campestre</i>	Field maple	x		x	x	x			x	
<i>Acer pseudoplatanus</i>	Sycamore								x	
<i>Carpinus betulus</i>	Hornbeam								x	
<i>Corylus avellana</i>	Hazel	x					x	x	x	
<i>Crataegus monogyna</i>	Hawthorn	x		x	x	x				
<i>Fraxinus excelsior</i>	Ash	x	x	x	x				x	
<i>Hedera helix</i>	Ivy					x				
<i>Ilex aquifolium</i>	Holly	x								
<i>Prunus spinosa</i>	Blackthorn	x			x	x		x	x	x
<i>Quercus</i> sp.	Oak	x	x	x	x		x	x	x	
<i>Rosa</i> sp.	Rose sp.		x							x
<i>Rubus fruticosus</i> agg.	Bramble	x		x		x	x	x	x	x
<i>Sambucus nigra</i>	Elder					x		x		

Table 2. Linear Habitats

Site Name	North East Stevenage								
Survey Date and Surveyor(s)	08/04/2023 and 13/04/2023 Michelle Bullock								
Scientific Name	Common Name	Habitat Parcel Number/Habitat Type							
		Native Hedgerow H10	Native Hedgerow H11	Native Hedgerow H12	Native Hedgerow H13	Native Hedgerow H14	Native Hedgerow H15	Native Hedgerow H16	Native Hedgerow H17
Ferns									
<i>Pteridium aquilinum</i>	Bracken				x	x			
Herb Species									
<i>Anthriscus sylvestris</i>	Cow parsley			x					
<i>Arum maculatum</i>	Lords-and-ladies								x
<i>Clematis</i> sp.	Clematis				x	x			
<i>Galium aparine</i>	Cleavers								
<i>Geranium dissectum</i>	Cut-leaved crane's-bill								
<i>Hyacinthoides non-scripta</i>	Bluebell								x
Grasses									
<i>Arrhenatherum elatius</i>	False oat-grass			x					
Woody Species									
Broadleaved									
<i>Acer campestre</i>	Field maple	x		x					
<i>Acer pseudoplatanus</i>	Sycamore				x	x			
<i>Carpinus betulus</i>	Hornbeam								
<i>Corylus avellana</i>	Hazel				x	x			x
<i>Crataegus monogyna</i>	Hawthorn	x	x	x	x	x	x		x
<i>Fraxinus excelsior</i>	Ash			x	x	x	x		x
<i>Hedera helix</i>	Ivy								
<i>Ilex aquifolium</i>	Holly								
<i>Prunus spinosa</i>	Blackthorn		x	x				x	
<i>Quercus</i> sp.	Oak	x				x	x	x	x
<i>Rosa</i> sp.	Rose sp.	x			x	x		x	
<i>Rubus fruticosus</i> agg.	Bramble	x	x	x	x	x	x	X	x
<i>Sambucus nigra</i>	Elder								x

Table 1. Hedgerow Survey Results (H1 - H18)

Date of Survey	17-May-23
Surveyor(s)	Carly Howes ACIEEM and Laura Farrar ACIEEM

General Hedgerow Information	H1	H2	H3	H4	H5	H6
Hedgerow length (m)	73	189	330	186	145	377
Average height along length of hedgerow (m)	3	3	3	4	3	3.5
Average width at widest point of hedgerow (m)	2	3	2.5	2	3	3
Is woody component of hedgerow <5m at base?	No	No	No	No	No	No
Number of 30m sections for specified sampling technique	1	3	3	2	2	3
Average number of native woody species (following specified sampling technique)	3	3.5	3	3	3.5	3.6
Number of native woody species (along total length)	6	4	9	7	6	10
Species-rich hedgerow? (5 or more native woody species in 30m section)	No	No	No	No	No	No

Table 2. Assessment of Important Hedgerows (H1 - H18)

Application of Regulations	H1	H2	H3	H4	H5	H6
Does the hedgerow lie within, or mark the boundary to, a private garden?	No	No	No	No	No	No
Regulation 4: Criteria for determining "Important Hedgerows"						
Has the hedgerow existed for 30 years or more? (Consider age of trees/coppice and review aerial photography or historic mapping.)	Yes	Yes	Yes	Yes	Yes	Yes
If so, does it meet one or more of the criteria listed in Part II of Schedule 1, listed below?	No	No	No	No	No	Yes
As such, is it an Important Hedgerow ?	No	No	No	No	No	Yes
Schedule 1: Additional Criteria for Determining "Important Hedgerows" - Part II, Criteria						
Archaeology and history						
Has a desk-based assessment of historic/archaeological significance been undertaken?	No	No	No	No	No	No
If so, has the hedgerow been considered 'important' under these criteria?	-	-	-	-	-	-
Wildlife and Landscape						
Does the hedgerow 'contain' any of the following species, or are there records of these species (within the last five or ten years for animals or plants, respectively) with no subsequent negative records?:	No	No	No	No	No	No
Those listed in Part I of Schedule 1 (birds protected by special penalties e.g. barn owl), Schedule 5 (animals which are protected e.g. hazel dormouse) and schedule 8 (plants which are protected e.g. bluebell) of the Wildlife and Countryside Act 1981.	No	No	No	No	No	No
Those included on the Birds of Conservation Concern 'Red' or 'Amber' list. (Primary legislation refers to the outdated 'Red Data Birds in Britain', 1990.)	No	No	No	No	No	No
Those categorised as 'endangered', 'extinct', 'rare' or 'vulnerable' in Red data books for Vascular Plants, Insect, Invertebrates other than insects (see primarily legislation for more details)	No	No	No	No	No	No
Does the hedgerow include at least 7 woody species? (Subject to specified sampling technique)	No	No	No	No	No	No
Does the hedgerow include 6 woody species and support at least 3 additional features, or 5 woody species and at least 4 of the following additional features, as set out below?:	No	No	No	No	No	No
Bank or wall which supports the hedge along half its length?	No	No	No	No	No	No
Gaps <10% aggregate length of hedgerows?	Yes	Yes	Yes	Yes	Yes	Yes
One standard tree per 50m?	Yes	No	Yes	Yes	Yes	No
At least three woodland (ground flora) species within 3m of the hedgerow?	No	No	No	No	No	Yes
Ditch along at least half hedgerow length?	No	No	No	No	No	No
At least 4 points based on the following: 1 point for 'connection' with another hedgerow and 2 points for connection with a pond or broadleaved woodland? (N.B. A hedgerow is considered connected when it meets or ends within 10m of another feature, where it would meet it if continued.)	No	Yes	Yes	No	Yes	Yes
Parallel hedgerow within 15m?	No	No	No	No	No	No
Does the hedgerow include at least 6 woody species including one of the following: black-poplar tree, large-leaved lime, small-leaved lime or wild service-tree?	No	No	No	No	No	No
Is the hedgerow adjacent to a bridleway or footpath?	Yes	No	Yes	No	No	Yes
Is the hedgerow adjacent to a bridleway or footpath and include at least four woody species and two additional features?	No	No	No	No	No	Yes
Schedule 2: Woodland Species (ground flora)	0	0	0	1	0	3
Bluebell <i>Hyacinthoides non-scriptus</i>						✓
Dog's mercury <i>Mercurialis perennis</i>						
Herb-robert <i>Geranium robertianum</i>						
Lords-and-ladies <i>Arum maculatum</i>				✓		
Pignut <i>Conopodium majus</i>						✓
Wood avens/Herb bennet <i>Geum urbanum</i>						

Wood false-brome <i>Brachypodium sylvaticum</i>						
Wood sedge <i>Carex sylvatica</i>						✓
Schedule 3: Woody Species (including species native in the UK and archaeophytes)^Λ *Species only found in Hedgerow Regulations **Species only found in Hedgerow Survey Handbook	6	4	9	7	6	10
Apple, crab <i>Malus sylvestris</i>						✓
Ash <i>Fraxinus excelsior</i>			✓	✓	✓	✓
Birch, silver <i>Betula pendula</i>	✓					
Blackthorn <i>Prunus spinosa</i>	✓	✓	✓	✓	✓	✓
Cherry, wild <i>Prunus avium</i> *	✓					
Dog-rose <i>Rosa canina</i> sp.		✓		✓		
Dogwood <i>Cornus sanguinea</i>						
Elder <i>Sambucus nigra</i>	✓	✓	✓	✓	✓	✓
Elm <i>Ulmus</i> species			✓			
Field-rose <i>Rosa arvensis</i>			✓	✓	✓	✓
Hawthorn <i>Crataegus monogyna</i>	✓	✓	✓	✓	✓	✓
Hazel <i>Corylus avellana</i>						✓
Holly <i>Ilex aquifolium</i>						✓
Hornbeam <i>Carpinus betulus</i>						
Lime, large-leaved <i>Tilia platyphyllos</i>						
Maple, field <i>Acer campestre</i>			✓			✓
Oak, pedunculate <i>Quercus robur</i>	✓		✓	✓	✓	✓
Plum <i>Prunus domestica</i> ^{Λ**}			✓			
Spindle <i>Euonymus europaeus</i>						
Sycamore <i>Acer pseudoplatanus</i> **						
Willow, goat <i>Salix caprea</i>						

Table 3. Biodiversity Metric 4.0 Condition Assessment of Hedgerows (H1 - H18)

Hedgerow Condition Assessment	H1	H2	H3	H4	H5	H6
Hedgerow Type	Native hedgerow	Native hedgerow	Native hedgerow	Native hedgerow	Native hedgerow	Native hedgerow
A1. Height >1.5m average along length	Pass	Pass	Pass	Pass	Pass	Pass
A2. Width >1.5m average along length	Pass	Pass	Pass	Pass	Pass	Pass
B1. Gap - hedge base, Gap between ground and base of canopy <0.5 m for >90% of length [unless 'line of trees']	Pass	Pass	Pass	Pass	Pass	Pass
B2. Gap - hedge canopy continuity. Canopy gaps <5m and <10% of total length [excluding access points and gates]	Pass	Pass	Pass	Pass	Pass	Pass
C1. Undisturbed ground and perennial vegetation. >1m width of undisturbed ground with perennial herbaceous vegetation for >90% of length [measured from outer edge of hedgerow], on at least 1 side of hedgerow	Pass	Pass	Pass	Pass	Pass	Pass
C2. Undesirable perennial vegetation. <20% of undesirable ground vegetation = nettle, cleavers & docks	Fail	Pass	Pass	Fail	Fail	Pass
D1. Invasive neophyte species. >90% of hedgerow and undisturbed ground vegetation is free of invasive non-native or neophyte [i.e. <10% invasives]	Pass	Pass	Pass	Pass	Pass	Pass
D2. >90% of hedgerow and undisturbed ground vegetation free of damage caused by human activities [i.e. pollution, manure, rubble, poor management]	Pass	Pass	Pass	Pass	Pass	Pass
Hedgerows with Trees Only						
E1. Tree age. At least 1 mature tree per 30m stretch of hedgerow [i.e. at least 2/3 of expected fully mature height]	-	-	-	-	-	-
E2. Tree health. At least 95% of hedgerow trees are in a healthy condition [excluding veteran features valuable for wildlife]	-	-	-	-	-	-
Condition						
Poor, Moderate or Good	Good	Good	Good	Good	Good	Good

Table 1. Hedgerow Survey Results (H1 - H18)

Date of Survey	17-May-23
Surveyor(s)	Carly Howes ACIEEM and Laura Farrar ACIEEM

General Hedgerow Information	H7	H8	H9	H10	H11	H12
Hedgerow length (m)	177	180	103	60	75	226
Average height along length of hedgerow (m)	6	3	7	8	5	5
Average width at widest point of hedgerow (m)	3	2	3	4	3	3
Is woody component of hedgerow <5m at base?	No	No	No	No	No	No
Number of 30m sections for specified sampling technique	2	2	2	1	1	3
Average number of native woody species (following specified sampling technique)	4	5.5	7.5	6	5	7.3
Number of native woody species (along total length)	8	7	9	9	7	15
Species-rich hedgerow? (5 or more native woody species in 30m section)	Yes	Yes	Yes	Yes	Yes	Yes

Table 2. Assessment of Important Hedgerows (H1 - H18)

Application of Regulations	H7	H8	H9	H10	H11	H12
Does the hedgerow lie within, or mark the boundary to, a private garden?	No	No	No	No	No	No
Regulation 4: Criteria for determining "Important Hedgerows"						
Has the hedgerow existed for 30 years or more? (Consider age of trees/coppice and review aerial photography or historic mapping.)	Yes	Yes	Yes	Yes	No	Yes
If so, does it meet one or more of the criteria listed in Part II of Schedule 1, listed below?	No	Yes	Yes	Yes	No	Yes
As such, is it an Important Hedgerow ?	No	Yes	Yes	Yes	No	Yes
Schedule 1: Additional Criteria for Determining "Important Hedgerows" - Part II, Criteria						
Archaeology and history						
Has a desk-based assessment of historic/archaeological significance been undertaken?	No	No	No	No	No	No
If so, has the hedgerow been considered ' Important ' under these criteria?	-	-	-	-	-	-
Wildlife and Landscape						
Does the hedgerow 'contain' any of the following species, or are there records of these species (within the last five or ten years for animals or plants, respectively) with no subsequent <i>negative</i> records?:	No	No	No	No	No	No
Those listed in Part I of Schedule 1 (birds protected by special penalties e.g. barn owl), Schedule 5 (animals which are protected e.g. hazel dormouse) and schedule 8 (plants which are protected e.g. bluebell) of the Wildlife and Countryside Act 1981.	No	No	No	No	No	No
Those included on the Birds of Conservation Concern 'Red' or 'Amber' list. (Primary legislation refers to the outdated 'Red Data Birds in Britain', 1990.)	No	No	No	No	No	No
Those categorised as 'endangered', 'extinct', 'rare' or 'vulnerable' in Red data books for Vascular Plants, Insect, Invertebrates other than insects (see primarily legislation for more details)	No	No	No	No	No	No
Does the hedgerow include at least 7 woody species? (Subject to specified sampling technique)	Yes	No	Yes	No	No	Yes
Does the hedgerow include 6 woody species and support at least 3 additional features, or 5 woody species and at least 4 of the following additional features, as set out below?:	Yes	No	Yes	Yes	No	Yes
Bank or wall which supports the hedge along half its length?	No	No	No	No	No	No
Gaps <10% aggregate length of hedgerows?	Yes	Yes	Yes	Yes	Yes	Yes
One standard tree per 50m?	Yes	Yes	Yes	Yes	No	Yes
At least three woodland (ground flora) species within 3m of the hedgerow?	Yes	No	No	Yes	No	No
Ditch along at least half hedgerow length?	No	No	No	No	No	Yes
At least 4 points based on the following: 1 point for 'connection' with another hedgerow and 2 points for connection with a pond or broadleaved woodland? (N.B. A hedgerow is considered connected when it meets or ends within 10m of another feature, where it would meet it if continued.)	Yes	No	Yes	Yes	No	Yes
Parallel hedgerow within 15m?	No	No	No	No	No	No
Does the hedgerow include at least 6 woody species including one of the following: black-poplar tree, large-leaved lime, small-leaved lime or wild service-tree?	No	Yes	Yes	Yes	No	Yes
Is the hedgerow adjacent to a bridleway or footpath?	No	Yes	Yes	Yes	Yes	Yes
Is the hedgerow adjacent to a bridleway or footpath and include at least four woody species and two additional features?	No	Yes	Yes	Yes	No	Yes
Schedule 2: Woodland Species (ground flora)	3	2	2	3	0	2
Bluebell <i>Hyacinthoides non-scriptus</i>	✓	✓	✓	✓		
Dog's mercury <i>Mercurialis perennis</i>						
Herb-robert <i>Geranium robertianum</i>				✓		
Lords-and-ladies <i>Arum maculatum</i>	✓			✓		
Pignut <i>Conopodium majus</i>						
Wood avens/Herb bennet <i>Geum urbanum</i>	✓	✓	✓			✓

Wood false-brome <i>Brachypodium sylvaticum</i>						✓
Wood sedge <i>Carex sylvatica</i>						
Schedule 3: Woody Species (including species native in the UK and archaeophytes)^Λ *Species only found in Hedgerow Regulations **Species only found in Hedgerow Survey Handbook	8	7	9	9	7	15
Apple, crab <i>Malus sylvestris</i>			✓			✓
Ash <i>Fraxinus excelsior</i>	✓	✓	✓	✓		✓
Birch, silver <i>Betula pendula</i>						
Blackthorn <i>Prunus spinosa</i>	✓	✓	✓	✓	✓	✓
Cherry, wild <i>Prunus avium</i> *						
Dog-rose <i>Rosa canina</i> sp.					✓	✓
Dogwood <i>Cornus sanguinea</i>		✓				
Elder <i>Sambucus nigra</i>	✓		✓	✓	✓	✓
Elm <i>Ulmus species</i>						✓
Field-rose <i>Rosa arvensis</i>	✓	✓	✓	✓		✓
Hawthorn <i>Crataegus monogyna</i>	✓	✓	✓		✓	✓
Hazel <i>Corylus avellana</i>	✓		✓	✓		✓
Holly <i>Ilex aquifolium</i>						
Hornbeam <i>Carpinus betulus</i>				✓		✓
Lime, large-leaved <i>Tilia platyphyllos</i>						✓
Maple, field <i>Acer campestre</i>	✓	✓	✓	✓	✓	✓
Oak, pedunculate <i>Quercus robur</i>	✓	✓	✓	✓	✓	✓
Plum <i>Prunus domestica</i> ^{Λ**}						
Spindle <i>Euonymus europaeus</i>						✓
Sycamore <i>Acer pseudoplatanus</i> **				✓	✓	✓
Willow, goat <i>Salix caprea</i>						

Table 3. Biodiversity Metric 4.0 Condition Assessment of Hedgerows (H1 - H18)

Hedgerow Condition Assessment	H7	H8	H9	H10	H11	H12
Hedgerow Type	Species rich - native hedgerow with trees	Species rich - native hedgerow	Species rich - native hedgerow with trees	Species rich - native hedgerow with trees	Species rich - native hedgerow	Species rich - native hedgerow
A1. Height >1.5m average along length	Pass	Pass	Pass	Pass	Pass	Pass
A2. Width >1.5m average along length	Pass	Pass	Pass	Pass	Pass	Pass
B1. Gap - hedge base, Gap between ground and base of canopy <0.5 m for >90% of length [unless 'line of trees']	Pass	Pass	Pass	Pass	Pass	Pass
B2. Gap - hedge canopy continuity. Canopy gaps <5m and <10% of total length [excluding access points and gates]	Pass	Pass	Fail	Pass	Pass	Pass
C1. Undisturbed ground and perennial vegetation. >1m width of undisturbed ground with perennial herbaceous vegetation for >90% of length [measured from outer edge of hedgerow], on at least 1 side of hedgerow	Pass	Pass	Pass	Pass	Pass	Pass
C2. Undesirable perennial vegetation. <20% of undesirable ground vegetation = nettle, cleavers & docks	Pass	Fail	Pass	Fail	Pass	Fail
D1. Invasive neophyte species. >90% of hedgerow and undisturbed ground vegetation is free of invasive non-native or neophyte [i.e. <10% invasives]	Pass	Pass	Pass	Pass	Pass	Pass
D2. >90% of hedgerow and undisturbed ground vegetation free of damage caused by human activities [i.e. pollution, manure, rubble, poor management]	Pass	Pass	Pass	Pass	Pass	Pass
Hedgerows with Trees Only						
E1. Tree age. At least 1 mature tree per 30m stretch of hedgerow [i.e. at least 2/3 of expected fully mature height]	Pass	-	Pass	Pass	-	-
E2. Tree health. At least 95% of hedgerow trees are in a healthy condition [excluding veteran features valuable for wildlife]	Pass	-	Pass	Pass	-	-
Condition						
Poor, Moderate or Good	Good	Good	Good	Good	Good	Good

Table 1. Hedgerow Survey Results (H1 - H18)

Date of Survey	17-May-23
Surveyor(s)	Carly Howes ACIEEM and Laura Farrar ACIEEM

General Hedgerow Information	H13	H14	H15	H16	H17	H18
Hedgerow length (m)	142	146	32	125	236	159
Average height along length of hedgerow (m)	6	6	2.5	5	6	5
Average width at widest point of hedgerow (m)	2	2	2	4	3	4
Is woody component of hedgerow <5m at base?	No	No	No	No	No	No
Number of 30m sections for specified sampling technique	2	2	1	2	3	2
Average number of native woody species (following specified sampling technique)	6.5	5.5	4	3.5	5	4.5
Number of native woody species (along total length)	10	9	4	9	8	10
Species-rich hedgerow? (5 or more native woody species in 30m section)	Yes	Yes	No	No	Yes	No

Table 2. Assessment of Important Hedgerows (H1 - H18)

Application of Regulations	H13	H14	H15	H16	H17	H18
Does the hedgerow lie within, or mark the boundary to, a private garden?	No	No	No	No	No	No
Regulation 4: Criteria for determining "Important Hedgerows"						
Has the hedgerow existed for 30 years or more? (Consider age of trees/coppice and review aerial photography or historic mapping.)	Yes	Yes	No	Yes	Yes	Yes
If so, does it meet one or more of the criteria listed in Part II of Schedule 1, listed below?	Yes	Yes	No	Yes	Yes	Yes
As such, is it an Important Hedgerow ?	Yes	Yes	No	Yes	Yes	Yes
Schedule 1: Additional Criteria for Determining "Important Hedgerows" - Part II, Criteria						
Archaeology and history						
Has a desk-based assessment of historic/archaeological significance been undertaken?	No	No	No	No	No	No
If so, has the hedgerow been considered 'important' under these criteria?	-	-	-	-	-	-
Wildlife and Landscape						
Does the hedgerow 'contain' any of the following species, or are there records of these species (within the last five or ten years for animals or plants, respectively) with no subsequent negative records?:	No	No	No	No	No	No
Those listed in Part I of Schedule 1 (birds protected by special penalties e.g. barn owl), Schedule 5 (animals which are protected e.g. hazel dormouse) and schedule 8 (plants which are protected e.g. bluebell) of the Wildlife and Countryside Act 1981.	No	No	No	No	No	No
Those included on the Birds of Conservation Concern 'Red' or 'Amber' list. (Primary legislation refers to the outdated 'Red Data Birds in Britain', 1990.)	No	No	No	No	No	No
Those categorised as 'endangered', 'extinct', 'rare' or 'vulnerable' in Red data books for Vascular Plants, Insect, Invertebrates other than insects (see primarily legislation for more details)	No	No	No	No	No	No
Does the hedgerow include at least 7 woody species? (Subject to specified sampling technique)	Yes	No	No	No	No	No
Does the hedgerow include 6 woody species and support at least 3 additional features, or 5 woody species and at least 4 of the following additional features, as set out below?:	Yes	Yes	No	No	Yes	No
Bank or wall which supports the hedge along half its length?	No	No	No	No	No	No
Gaps <10% aggregate length of hedgerows?	Yes	Yes	Yes	No	Yes	Yes
One standard tree per 50m?	Yes	Yes	No	Yes	Yes	No
At least three woodland (ground flora) species within 3m of the hedgerow?	No	No	No	No	Yes	No
Ditch along at least half hedgerow length?	Yes	Yes	No	Yes	No	No
At least 4 points based on the following: 1 point for 'connection' with another hedgerow and 2 points for connection with a pond or broadleaved woodland? (N.B. A hedgerow is considered connected when it meets or ends within 10m of another feature, where it would meet it if continued.)	Yes	Yes	No	No	Yes	Yes
Parallel hedgerow within 15m?	Yes	Yes	No	No	No	No
Does the hedgerow include at least 6 woody species including one of the following: black-poplar tree, large-leaved lime, small-leaved lime or wild service-tree?	Yes	Yes	No	No	No	No
Is the hedgerow adjacent to a bridleway or footpath?	Yes	Yes	Yes	Yes	Yes	Yes
Is the hedgerow adjacent to a bridleway or footpath and include at least four woody species and two additional features?	Yes	Yes	No	Yes	Yes	Yes
Schedule 2: Woodland Species (ground flora)	0	1	0	1	3	1
Bluebell <i>Hyacinthoides non-scriptus</i>					✓	
Dog's mercury <i>Mercurialis perennis</i>					✓	
Herb-robert <i>Geranium robertianum</i>						
Lords-and-ladies <i>Arum maculatum</i>						✓
Pignut <i>Conopodium majus</i>						
Wood avens/Herb bennet <i>Geum urbanum</i>		✓		✓	✓	

Wood false-brome <i>Brachypodium sylvaticum</i>						
Wood sedge <i>Carex sylvatica</i>						
Schedule 3: Woody Species (including species native in the UK and archaeophytes)^Λ *Species only found in Hedgerow Regulations **Species only found in Hedgerow Survey Handbook	10	9	4	9	8	10
Apple, crab <i>Malus sylvestris</i>	✓					
Ash <i>Fraxinus excelsior</i>	✓	✓	✓	✓		✓
Birch, silver <i>Betula pendula</i>						
Blackthorn <i>Prunus spinosa</i>	✓	✓	✓	✓	✓	✓
Cherry, wild <i>Prunus avium</i> *					✓	
Dog-rose <i>Rosa canina</i> sp.			✓	✓		
Dogwood <i>Cornus sanguinea</i>						
Elder <i>Sambucus nigra</i>	✓	✓		✓	✓	✓
Elm <i>Ulmus species</i>						
Field-rose <i>Rosa arvensis</i>	✓	✓			✓	✓
Hawthorn <i>Crataegus monogyna</i>	✓	✓	✓		✓	✓
Hazel <i>Corylus avellana</i>	✓	✓		✓	✓	
Holly <i>Ilex aquifolium</i>						✓
Hornbeam <i>Carpinus betulus</i>				✓		✓
Lime, large-leaved <i>Tilia platyphyllos</i>						
Maple, field <i>Acer campestre</i>	✓	✓		✓	✓	✓
Oak, pedunculate <i>Quercus robur</i>	✓	✓		✓	✓	✓
Plum <i>Prunus domestica</i> ^{Λ**}						
Spindle <i>Euonymus europaeus</i>						
Sycamore <i>Acer pseudoplatanus</i> **	✓	✓		✓		
Willow, goat <i>Salix caprea</i>						✓

Table 3. Biodiversity Metric 4.0 Condition Assessment of Hedgerows (H1 - H18)

Hedgerow Condition Assessment	H13	H14	H15	H16	H17	H18
Hedgerow Type	Species rich - native hedgerow with trees	Species rich - native hedgerow with trees	Native hedgerow	Native hedgerow	Species rich - native hedgerow with trees	Native hedgerow
A1. Height >1.5m average along length	Pass	Pass	Pass	Pass	Pass	Pass
A2. Width >1.5m average along length	Pass	Pass	Pass	Pass	Pass	Pass
B1. Gap - hedge base, Gap between ground and base of canopy <0.5 m for >90% of length [unless 'line of trees']	Pass	Pass	Pass	Pass	Pass	Pass
B2. Gap - hedge canopy continuity. Canopy gaps <5m and <10% of total length [excluding access points and gates]	Pass	Pass	Pass	Fail	Fail	Pass
C1. Undisturbed ground and perennial vegetation. >1m width of undisturbed ground with perennial herbaceous vegetation for >90% of length [measured from outer edge of hedgerow], on at least 1 side of hedgerow	Pass	Pass	Pass	Pass	Pass	Pass
C2. Undesirable perennial vegetation. <20% of undesirable ground vegetation = nettle, cleavers & docks	Fail	Fail	Fail	Pass	Pass	Pass
D1. Invasive neophyte species. >90% of hedgerow and undisturbed ground vegetation is free of invasive non-native or neophyte [i.e. <10% invasives]	Pass	Pass	Pass	Pass	Pass	Pass
D2. >90% of hedgerow and undisturbed ground vegetation free of damage caused by human activities [i.e. pollution, manure, rubble, poor management]	Pass	Pass	Pass	Pass	Pass	Pass
Hedgerows with Trees Only						
E1. Tree age. At least 1 mature tree per 30m stretch of hedgerow [i.e. at least 2/3 of expected fully mature height]	Pass	Pass	-	-	-	-
E2. Tree health. At least 95% of hedgerow trees are in a healthy condition [excluding veteran features valuable for wildlife]	Pass	Pass	-	-	-	-
Condition						
Poor, Moderate or Good	Good	Good	Good	Good	Good	Good

Appendix 9.4

Bats

1.0 Legislation

1.1 All British bat species are legally protected under Regulation 43 of the Conservation of Habitats and Species Regulations 2017 (as amended). These Regulations make it an offence to:

- Deliberately capture, injure, or kill a bat
- Deliberately disturb bats, impairing their ability to survive, breed, reproduce or rear/nurture their young, or which significantly affects the local distribution or abundance of the species
- Damage or destroy a breeding site or resting place used by bats

1.2 All bats and their roosts in the UK were previously fully protected under the Wildlife & Countryside Act 1981 (as amended). Amendments to the Act have removed most provisions as they relate to bats, however it remains an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection

1.3 It is important to note that bat roosts are protected throughout the year, regardless of whether or not bats are present at the time. Under the Regulations, the offence of damaging or destroying a breeding site or resting place is subject to 'strict liability', i.e. an offence is committed irrespective of whether the causal act was deliberate or otherwise.

1.4 Where development is proposed that would result in an offence under the Regulations, a European Protected Species (EPS) statutory derogation licence (often termed 'EPS Mitigation Licence') will need to be secured from Natural England to permit an act that would otherwise be unlawful. Such a licence can only be granted following receipt of planning permission with all relevant conditions discharged, and where it has been demonstrated that specific statutory derogation tests have been met.

2.0 Methods

2.1 The following survey methods, design, data analysis and interpretation have been undertaken with due consideration of the Bat Conservation Trust (BCT) guidelines 3rd edition (Collins, 2016).

Preliminary Roost Assessment (PRA)

Trees

2.2 All trees to be affected by development were inspected from ground level, using binoculars, and high-powered torches, as appropriate. Particular attention was given to woodpecker holes, limb splits, lifting bark and mature ivy stems. The survey was completed on 11 August 2023

by Carly Howes ACIEEM (Natural England Class Licence WML-CL17, Registration Number 2021-55125-CLS-CLS) and Rosie Billington.

- 2.3 A description of each tree was made, including the species, height, diameter at breast height and condition.
- 2.4 The aim of this inspection was to record direct (i.e. actual roosting bats) or indirect evidence of roosting bats (e.g. droppings), as well as the nature and number of features with 'potential' to support roosting bats. This includes consideration of trees to support bats whilst in hibernation.

Assessing 'Potential' of Trees to Support Roosting Bats

- 2.5 All trees were assigned to one of four categories in respect of their 'potential' to support roosting bats, or the confirmation of any bat roosts identified. 'Potential' in this context is taken to be the broad suitability of features to support roosting bats, based upon the nature, condition or structure of such features, in the absence of confirmed evidence of roosting.
- 2.6 Assigning the following categories is intended to determine the effort of any further targeted survey or inspections which are necessary to prove presence or likely absence of roosting bats, rather than to assign importance to such features.
- 2.7 The following categories are assigned to structures and/or trees herein, Either:
 - **Confirmed Roost** – where one or more bat roosts are identified during PRA inspections, either through direct sightings of bats, and/or indirect evidence such as bat droppings. Or;
 - **High** – A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
 - **Moderate** – A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, assessments at this stage are made irrespective of species conservation status).
 - **Low** – A structure or tree with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
 - **Negligible** – Negligible habitat features on site likely to be used by roosting bats.

- 2.8 The potential of a tree or structure to support roosting bats is often influenced by its age and construction, thermal stability, lighting and levels of human activity. Furthermore, the proximity to foraging habitat - particularly woodland, parkland and wetland- as well as the presence of navigational routes (e.g. hedgerows, treelines and watercourses) influence both the potential for bats to roost, as well as the species which may roost. Professional judgement is therefore applied, based upon known factors which effect the potential of features to support roosting bats, insofar as determining the need or scope of further surveys or inspections.

Limitations

- 2.9 Although not affecting the overall aims of the survey, the trees were in full leaf at the time of the survey limiting visibility to the tree trunks and potentially covering some potential roosting features.

Activity Surveys

Transect Surveys

- 2.10 Transect surveys were undertaken in May, June, July, August and September 2023. On each occasion two transect routes were followed to cover all accessible areas, features and habitats at the Site. Each transect route was repeated at least once during each survey to minimise temporal bias.
- 2.11 Each transect was walked at a moderate and consistent speed with qualitative observations of bat behaviour made by the surveyor. Each survey commenced at sunset (British Summer Time), continuing for the following two hours. The surveys were led by Laura Farrar ACIEEM (Natural England Class Licence WML-CL17, Registration Number 2020-44517-CLS-CLS) and Matthew Dale alongside Owen de Graaf, Rosie Billington and Carly Howes ACIEEM in suitable weather conditions (see Table 2).
- 2.12 Bat calls were recorded using Elekon Batlogger M detectors. This detector automatically records ultrasonic signals with a one second delay between recordings. Recordings of bat contacts were subsequently analysed using BatExplorer software, with sonograms reviewed to confirm bat identification to genera, or where possible, species level.
- 2.13 Each of the recorded files, which contain a variable number of call 'pulses', was designated a 'bat contact'. At the point of contact, each sound file is assigned a GPS location.
- 2.14 Transect surveys are intended to gather data on the spatial distribution of bat activity across the Site, identifying areas of relative importance for bats, including key flight lines. In addition, direct observation of bats allows for qualitative assessments of how bats use the Site to be made

complementing quantitative data collected through remote monitoring.

Remote Monitoring

- 2.15 Four Wildlife Acoustics Songmeter (SM4s) detectors were deployed during May, June, July, August and September 2023 to provide five data-sets. The location of this Monitoring Location (ML) is shown on Figure 1 below.



Figure 1. The locations of each Monitoring Location (ML) surveyed during remote monitoring surveys in May, June, July, August and September 2023.

- 2.16 The detectors were setup to automatically record ultrasonic signals for the period from half an hour before sunset to half an hour after sunrise each night, with each monitoring period spanning at least five consecutive nights.
- 2.17 Weather conditions were obtained for each night surveyed using historic weather data from the World Weather Online website, with weather

observations taken from the nearest weather station in Stevenage. The five nights showing the most optimal weather conditions (in terms of temperature, precipitation and wind speed, see Table 5) were taken forward for analysis.

- 2.18 Recordings are triggered when a bat echolocation call is detected and will contain a variable number of call 'pulses'. Each file containing call pulses by a bat/s is designated as a 'bat contact' for each species present. The maximum recording duration is 15 seconds after which time a new recording file, and thus a new bat contact, is generated if echolocation calls are still being detected. This means that periods of prolonged bat activity near a detector is represented as multiple bat contacts, rather than a single one.
- 2.19 Recorded bat calls were analysed using the specialist software AnalookW to identify the species present. Quantitative analysis of bat activity was then undertaken by calculating the average bat contacts per hour on each night monitored, for each species.
- 2.20 Bat activity can show considerable inter-night variability and is dependent on a number of variables, including temperature, wind, and seasonality, amongst others. To account for this variability the median values for the average hourly bat contacts per night are reported, rather than a mean value which would misrepresent the average activity.

Limitations

- 2.21 It should be noted that the findings described herein for remote monitoring surveys are based on the bat activity recorded at the location immediate to each detector, and therefore only describe localised activity at the Site.
- 2.22 In addition, comparisons drawn on the number of detector activations by different species/genera can only give an indication of relative species abundance at the Site, as detectability varies between species.
- 2.23 It is acknowledged that the quantum of bat contacts recorded during a survey may not give a true reflection of the abundance of bats using the Site. For example, a single bat foraging close to a detector may trigger several hundred activations in the course of one night. However, this activity level does provide a proxy for the level of use by bats, and therefore its relative importance.

3.0 Results

Preliminary Roost Assessment (PRA)

Trees

- 3.1 A total of 16 trees and five tree groups, a single woodland and a single hedgerow were included in the assessment. Full results of the survey and

a map showing the location of trees with bat roosting potential can be found in Table 10 and CSA/0993/148 at the end of this report.

Table 1: Summary of trees with bat roosting potential (see Table 10 for descriptions)

Tree Reference	Species	Bat roost potential
T38	Common hazel	Negligible
T39	English oak	Low
T40	Common ash	Negligible
T41	Common ash	Moderate
T42	English oak	Negligible
T43	English oak	Negligible
T56	English oak	Low
T55	Common hazel	Negligible
T57	English oak	Negligible
T72	Ash	Low
T73	Oak	Low
T74	English oak	Moderate
T75	English oak	Moderate
T76	English oak	Negligible
T79	Common beech	Negligible
T82	Ash	Moderate

Tree Group Reference	Species	Bat roost potential
G5	Ash	Negligible
G6	Hawthorn, blackthorn, hazel, bramble	Negligible
G9	Common ash, English oak, hawthorn, hazel, blackthorn, wild cherry	Negligible
G11	Field maple, hawthorn, blackthorn, hornbeam, oak	Negligible
G12	Field maple	Low

Woodland Reference	Species	Bat roost potential
W6	Common ash, English oak, hornbeam, hazel, silver birch, hawthorn, blackthorn	Low

Hedgerow Reference	Species	Bat roost potential
H11	Blackthorn, hawthorn	Negligible

Activity Surveys

Transect Surveys

- 3.2 The weather conditions experienced during the transect surveys are provided in Table 2 below.

Table 2. Bat transect survey timings and weather conditions.

Survey Date	Sunset Time	Start Time	End Time	Temp. (°C)		Cloud Cover (oktas)		Wind (Beaufort Scale)		Precipitation
				Start	End	Start	End	Start	End	
04/05/23	20:29	20:29	22:29	18	14	6	5	1	1	None
01/06/23	21:10	21:10	23:10	13	12	8	7	3	3	None
06/07/23	21:21	21:21	23:21	16	15	1	0	1	0	None
03/08/23	20:47	20:47	22:47	20	17	5	3	1	0	None
08/09/23	19:34	19:34	21:34	24	19	0	1	0	1	None

- 3.3 At least six species of bat were recorded during the transect surveys, including common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula*, brown long-eared bat *Plecotus auritus*, serotine *Eptesicus serotinus* and barbastelle *Barbastella barbastellus*. Recordings were also heard from Myotis *Myotis* spp., and *Nyctalus* sp. *Nyctalus* sp.
- 3.4 The number of bat contacts recorded for each species are summarised in Table 3 below. The locations of each bat contact and the overall distribution of activity across the Site are illustrated in Figures 2 and 3 below.

Table 3. Summary of bat contacts recorded during transect surveys

Month	Common pipistrelle	Soprano pipistrelle	Myotis species	Noctule	Brown long-eared bat	Nyctalus species	Serotine	Barbastelle
May	208	1	0	1	0	0	0	0
June	67	0	0	0	0	0	0	1
July	66	0	0	1	0	1	1	0
August	60	0	1	0	0	0	0	0
September	188	1	0	3	3	0	0	1
Total	589	2	1	5	3	1	1	2
Percentage of Total (%)	97.52	0.33	0.17	0.83	0.50	0.17	0.17	0.33



Figure 2. Locations of bat contacts recorded across all transect surveys

- 3.5 Figure 3 below provides an indicative illustration of 'hotspots' in bat activity recorded across all transect surveys undertaken at the Site. Levels of activity were mostly concentrated around woodlands W6, W8, W9 and W12, as well as H12 to the centre of the Site. Distribution of recordings suggest that H12 and H13 are commonly used as flight lines moving from north to south and east to west respectively.



Figure 3. Indicative 'Utilisation Distribution' (UD) of all bat species/genera at the Site estimated from all transect data combined. The UD illustrates the relative probability of a bat in flight being present at a given point at the Site, with higher/central contours having a greater probability, and lower/peripheral contours having less probability.

- 3.6 The majority of contacts were recorded along woodland edges and hedgerows. Common pipistrelle were recorded throughout the Site, however noctule were only recorded within the western part of F3 and along the boundary of W10 and with only two recordings barbastelle was only recorded within the northern section of F3 and on the southern edge of W8. Brown long-eared bats were recorded foraging around H12 and H13 towards the centre of the Site.
- 3.7 Barbastelle bats are the UK's rarest bat and are rare in Hertfordshire with records limited. According to Zeale *et al.*, 2012, barbastelle are known to emerge from their roost during early dusk, on average between 17 minutes before sunset to 36 minutes after sunset. The Bat Conservation Trust suggest that usual activity for barbastelles includes foraging within the woodland whilst light levels are beginning to fall before proceeding beyond the woodlands to forage in more open habitats. Although the on-site woodlands are considered suitable for roosting barbastelle, when looking at the timings of the two barbastelle recordings on Site

(see Table 4 below) due to the amount of time post sunset, it can be suggested that these two bats were not roosting on-site.

Table 4: Summary of barbastelle bat contacts recorded during transect surveys

Date	Sunset	Recording Time	Location
01/06/2023	21:10	22:44 (94 minutes after sunset)	Along the southern boundary of W8
07/09/2023	19:34	20:55 (81 minutes after sunset)	In the northern section of F3

- 3.8 During efforts from Hertfordshire bat group for the Hertfordshire Barbastelle Bat Project, two barbastelle roosts were found within woodland 'locally,' located c. 7km to the south-west of the Site. These roosts are monitored yearly with radiotracking of lactating females back to the roost and emergence surveys on known roost trees. The Bat Conservation Trust suggest that barbastelles tend to forage over wide areas with their typical nightly foraging radius at around 7km.

Remote Monitoring

- 3.9 The weather conditions experienced during the five nights where data was analysed are provided in Table 5 below.

Table 5. Overnight weather conditions during remote monitoring

Survey Month	Dates (2023)	Temp. (°C)		Cloud Cover (%)		Wind (km/h)		Precipitation
		Min	Max	Min	Max	Min	Max	
May	18/05	3	12	65	100	3	7	Moderate rain from 15:00 to 21:00
May	19/05	5	9	7	70	9	17	Patchy rain at 15:00
May	20/05	6	9	3	57	14	19	None
May	21/05	7	11	22	43	17	20	None
May	22/05	7	9	6	73	15	21	None
June	03/06	6	10	2	21	13	18	None
June	04/06	6	9	3	80	12	16	None
June	05/06	6	9	0	86	13	18	None
June	06/06	5	9	18	53	12	16	None
June	07/06	6	10	0	13	12	17	None
July	06/07	12	15	3	12	7	10	None
July	07/07	17	19	6	89	9	18	None
July	08/07	15	19	30	100	9	12	Light rain 03:00-12:00
July	09/07	12	17	4	13	11	16	None
July	10/07	17	19	78	100	18	30	None
August	05/08	10	12	17	100	23	32	Light rain from 06:00 to 03:00
August	06/08	10	13	8	88	13	14	None
August	07/08	11	14	4	88	11	12	None
August	08/08	11	14	2	38	6	10	None
August	09/08	15	18	5	13	8	10	None

September	07/09	19	21	18	99	1	8	None
September	08/09	20	23	4	7	3	4	None
September	09/09	20	22	12	86	5	12	Very patchy light rain from 21:00 to 00:00
September	10/09	17	22	16	53	11	16	None
September	11/09	16	18	37	100	8	10	None

3.10 The total number of bat contacts recorded across all monitoring locations and monitoring periods for each bat species/genera are provided in Figure 4 and Table 6 & 7 below.

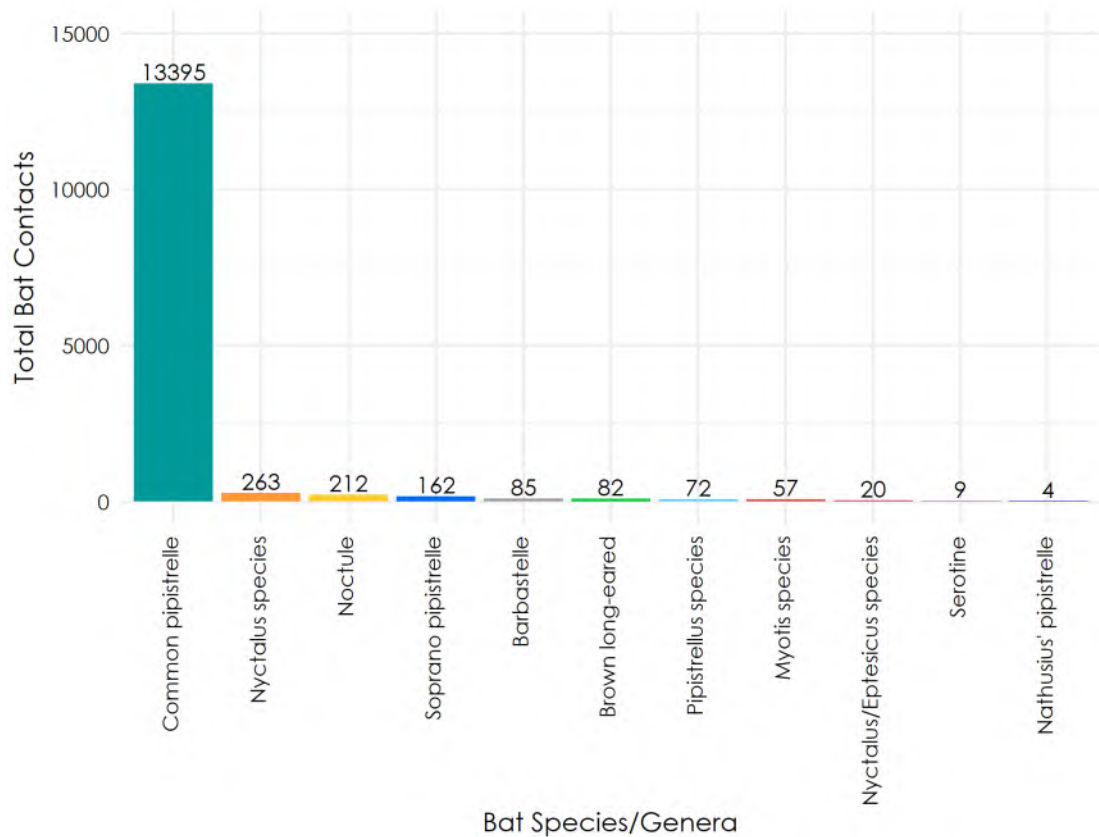


Figure 4. Total bat contacts by species/genera recorded across all remote monitoring periods and monitoring locations

Table 6. Summary of bat contacts recorded during remote monitoring surveys

Month	Common pipistrelle	Nyctalus species	Noctule	Soprano pipistrelle	Barbastelle	Brown long-eared bat	Pipistrellus species	Myotis species	Nyctalus/Eptesicus	Serotine	Nathusius pipistrelle
May	2170	30	14	21	6	5	19	11	0	0	0
June	5600	83	46	24	20	16	13	18	1	4	0
July	2476	77	68	91	34	38	23	13	15	3	1
August	1692	23	21	15	8	9	4	5	0	0	0
September	1457	50	63	11	17	14	13	10	4	2	3
Total	13395	263	212	162	85	82	72	57	20	9	4

Percentage of Total (%)	93.27	1.83	1.48	1.13	0.59	0.57	0.50	0.40	0.14	0.06	0.03
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Table 7. Summary of the total number of bat calls per month

Month	Total Number of Calls
May	2276
June	5825
July	2839
August	1777
September	1644
Total:	14361

- 3.11 At least eight species of bat were identified during the five monitoring periods, including common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat, serotine, *Nathusius pipistrelle* *Pipistrellus nathusii* and barbastelle. In addition to this a number of contacts were recorded for bats which fall within the genera of *Pipistrellus*, *Myotis*, and *Nyctalus* but were unidentifiable to species level. Twenty contacts were also identified as 'big bat' which could not be identified to species level and is attributable to either of the *Nyctalus* species bats or serotine.
- 3.12 The vast majority of contacts are attributable to common pipistrelle accounting for 93.27% of total contacts. Lower levels (between 1 – 2%) of *Nyctalus* sp., noctule, and soprano pipistrelle contacts were also recorded, which collectively accounted for 4.44% of total contacts recorded. All other species contacts contributed less than 1% of total calls recorded over the monitoring periods.
- 3.13 As expected, more calls were recorded within June and July, which can be attributed to the breeding pattern of common pipistrelle and other bat species, which give birth to young in June or early July, with the young able to fly at four weeks old.
- 3.14 Figure 5 below shows the variance in nightly activity levels for common pipistrelle. Figure 6 shows this data for each of the remaining bat species recorded on-site. More detailed data describing Figures 5 and 6 are provided in Table 9. The activity data is presented as boxplots for each bat species, which show the inter-night variability in bat activity across the 25 nights monitored. The median value (middle line of the boxplot) is taken as the typical level of activity for that species on-site at the point monitored. The length of each coloured boxplot is the interquartile range which shows the variance in nightly activity around the median value. The ends of each whisker line define the minimum and maximum nightly activity values recorded at the monitoring location. Outlying values are nightly activity levels that are greatly different when compared to the distribution of the remaining nightly activity levels. Outliers are illustrated as black points away from the boxplot. While important to note, these outliers do not represent the bat activity more commonly found at the Site for the species in question.

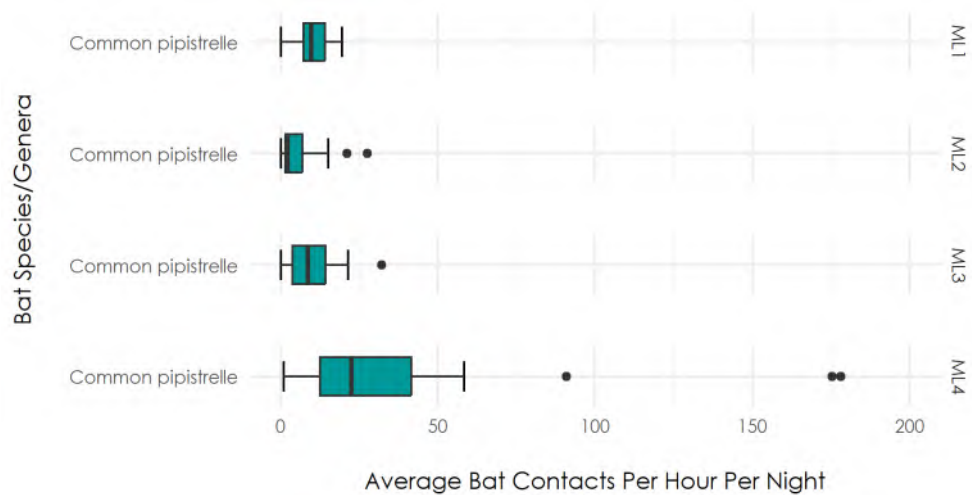


Figure 5. Average bat contacts per hour per night for common pipistrelle recorded across all remote monitoring

- 3.15 Activity levels for common pipistrelle are highest at ML4, with a median value of 22.5 average contacts per hour per night for common pipistrelle at ML4, compared with a median of 9.6 average contacts per hour per night at ML1, 2.2 at ML2 and 8.7 at ML3.

Table 7. Summary of the total number of bat calls per month

	ML1	ML2	ML3	ML4	Total
Common pipistrelle	1637	1274	2388	8096	13395
<i>Nyctalus</i> species	24	49	58	132	263
Noctule	24	58	13	117	212
Soprano pipistrelle	8	13	120	21	162
Barbastelle	20	36	0	29	85
Brown long-eared bat	49	9	11	13	82
<i>Pipistrellus</i> sp.	3	2	55	12	72
<i>Myotis</i> sp.	15	17	6	19	57
<i>Nyctalus/ Eptesicus</i> species	6	4	7	3	20
Serotine	6	2	0	1	9
Nathusius' Pipistrelle	0	2	1	1	4
Monitoring Location Total	1792	1466	2659	8444	14361

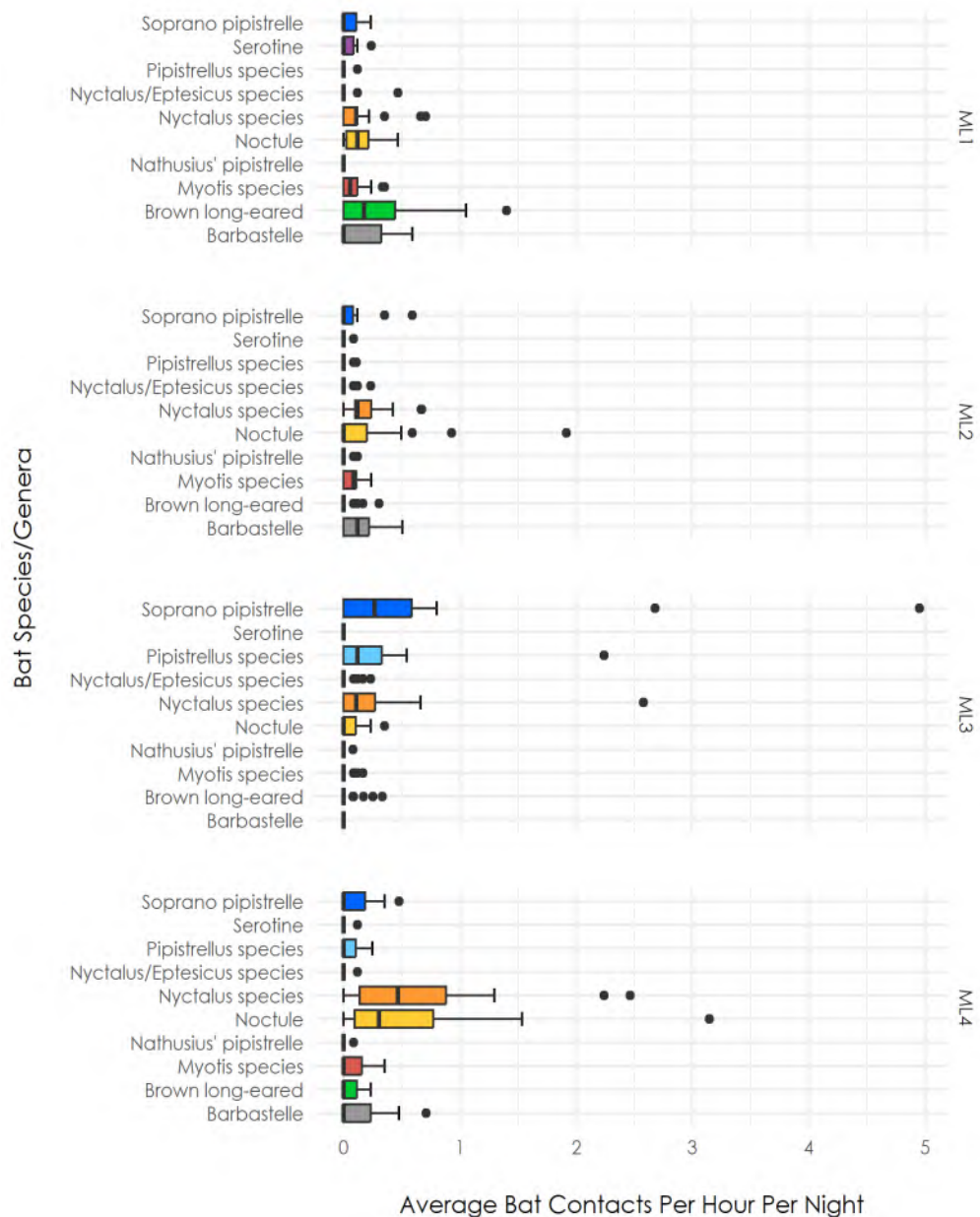


Figure 6. Average bat contacts per hour per night for each remaining bat species/genera recorded across all remote monitoring

- 3.16 For all remaining species, the frequency of bat contacts at all monitoring locations suggests relatively low levels of bat activity, with a median of less than 1 contact per hour for all species, at each monitoring location.
- 3.17 Although ML2 recorded the lowest number of bat calls overall, activity levels for barbastelle are highest at ML2 within open space with connecting hedgerows rather than woodland. With a median value of 0.117 average contacts per hour per night for barbastelle in ML2, compared with a median of 0 average contacts per hour per night at ML1 and ML4. No barbastelle bats were recorded at ML3 within W8 to the north of the Site. As above, all barbastelle recordings were at least one hour post sunset and so it can be assumed that barbastelles are not

roosting immediately within the woodlands where the statics were placed (W4/W6, W8 and W9).

Table 9. Average bat contacts per hour per night recorded during remote monitoring surveys

ML	Species	Average bat contacts per hour per night				Total bat contacts	Number of nights monitored
		Min	Max	Median	IQ range		
ML1	Barbastelle	0.000	0.588	0.000	0.322	20	25
ML1	Brown long-eared	0.000	1.399	0.177	0.441	49	25
ML1	Common pipistrelle	0.101	19.558	9.654	6.836	1637	25
ML1	Myotis species	0.000	0.353	0.054	0.119	15	25
ML1	Nathusius' pipistrelle	0.000	0.000	0.000	0.000	0	25
ML1	Noctule	0.000	0.469	0.118	0.190	24	25
ML1	Nyctalus species	0.000	0.703	0.110	0.118	24	25
ML1	Nyctalus/Eptesicus species	0.000	0.467	0.000	0.000	6	25
ML1	Pipistrellus species	0.000	0.118	0.000	0.000	3	25
ML1	Serotine	0.000	0.236	0.000	0.088	6	25
ML1	Soprano pipistrelle	0.000	0.235	0.000	0.110	8	25
ML2	Barbastelle	0.000	0.503	0.117	0.220	36	25
ML2	Brown long-eared	0.000	0.305	0.000	0.000	9	25
ML2	Common pipistrelle	0.201	27.594	2.249	5.454	1274	25
ML2	Myotis species	0.000	0.237	0.085	0.111	17	25
ML2	Nathusius' pipistrelle	0.000	0.118	0.000	0.000	2	25
ML2	Noctule	0.000	1.913	0.000	0.200	58	25
ML2	Nyctalus species	0.000	0.673	0.118	0.135	49	25
ML2	Nyctalus/Eptesicus species	0.000	0.235	0.000	0.000	4	25
ML2	Pipistrellus species	0.000	0.109	0.000	0.000	2	25
ML2	Serotine	0.000	0.085	0.000	0.000	2	25
ML2	Soprano pipistrelle	0.000	0.590	0.000	0.083	13	25
ML3	Barbastelle	0.000	0.000	0.000	0.000	0	25
ML3	Brown long-eared	0.000	0.333	0.000	0.000	11	25
ML3	Common pipistrelle	0.101	32.075	8.772	10.345	2388	25
ML3	Myotis species	0.000	0.166	0.000	0.000	6	25
ML3	Nathusius' pipistrelle	0.000	0.083	0.000	0.000	1	25
ML3	Noctule	0.000	0.352	0.000	0.103	13	25
ML3	Nyctalus species	0.000	2.579	0.108	0.270	58	25

ML3	Nyctalus/Eptesicus species	0.000	0.233	0.000	0.000	7	25
ML3	Pipistrellus species	0.000	2.241	0.117	0.329	55	25
ML3	Serotine	0.000	0.000	0.000	0.000	0	25
ML3	Soprano pipistrelle	0.000	4.953	0.268	0.585	120	25
ML4	Barbastelle	0.000	0.710	0.000	0.234	29	25
ML4	Brown long-eared	0.000	0.235	0.000	0.114	13	25
ML4	Common pipistrelle	1.022	178.066	22.509	29.176	8096	25
ML4	Myotis species	0.000	0.353	0.000	0.159	19	25
ML4	Nathusius' pipistrelle	0.000	0.083	0.000	0.000	1	25
ML4	Noctule	0.000	3.147	0.304	0.677	117	25
ML4	Nyctalus species	0.000	2.462	0.466	0.744	132	25
ML4	Nyctalus/Eptesicus species	0.000	0.118	0.000	0.000	3	25
ML4	Pipistrellus species	0.000	0.250	0.000	0.106	12	25
ML4	Serotine	0.000	0.117	0.000	0.000	1	25
ML4	Soprano pipistrelle	0.000	0.474	0.000	0.185	21	25

4.0 References

Chartered Institute of Ecology and Environmental Management, 2017. *Guidelines for Ecological Report Writing*. Winchester: CIEEM.

Chartered Institute of Ecology and Environmental Management, 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1*. Winchester: CIEEM.

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

Lintott, P. R., Davison, S., van Breda, J., Kubasiewicz, L., Dowse, D., Daisley, J., Haddy, E. and Mathews, F, 2017. *Ecobat: An online resource to facilitate transparent, evidence-based interpretation of bat activity data*. Ecology and evolution, 8(2), pp.935-941.

Zeale M, Davidson-Watts I & Jones G, 2012. *Home range use and habitat selection by barbastelle bats (Barbastella barbastellus): implications for conservation*. Journal of Mammalogy 93(4): 1110-1118.

Appendix 9.6

Hazel Dormouse

1.0 Legislation

- 1.1 The dormouse is legally protected through inclusion under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is afforded further protection as a European Protected Species (EPS) under Regulation 43 of the Conservation of Habitats and species Regulations 2017 (as amended).
- 1.2 Collectively and in summary, this legislation makes it an offence to:
 - Intentionally or deliberately kill, injure or capture dormice
 - Intentionally, deliberately or recklessly disturb dormice in such a way as to be likely to significantly affect the ability of any significant group of dormice to survive, breed, or rear or nurture their young or the local distribution of or abundance of the species
 - Intentionally or recklessly damage, destroy or obstruct access to places used by dormice for shelter or protection (whether occupied or not) or intentionally or recklessly disturb a dormouse whilst it is occupying such a place
 - Damage or destroy a breeding site or resting place of a dormouse.
- 1.3 Where development is proposed that would result in an offence under the Regulations, an EPS statutory derogation licence (often termed 'EPS Mitigation Licence') will need to be secured from Natural England to permit an act that would otherwise be unlawful. Such a licence can only be granted following receipt of planning permission with all relevant conditions discharged, and where it has been demonstrated that specific statutory derogation tests have been met.

2.0 Methods

- 2.1 Dormouse nest tubes and dormouse footprint tunnels were installed at the site on 13 April 2023 by Carly Howes ACIEEM and Laura Farrar ACIEEM. The intention of these surveys is to determine the presence or likely absence of dormice within suitable habitat across all areas of the Site that will be impacted by the proposals. A total of 115 dormouse nest tubes and 50 dormouse footprint tunnels were distributed across the Site, along boundary vegetation, including hedgerows and within on-site broadleaved woodland. Ten dormouse boxes used for previous survey work were checked throughout the 2023 suite of surveys and checked with the same methodology as the nest tubes described below. The location of these nest tubes and boxes is shown on the Dormouse Survey Plan (CSA/0993/142).

Nest tubes

- 2.2 Nest tubes are made from stiff, double-walled black plastic sheets or similar material, 25cm long with a 5cm x 5cm cross-section. A thin plywood tray is inserted into the tube with a short projection at one end and an end block at the other which seals the tube. The tubes are then

tied in a suitable location along a horizontal branch in vegetation. Dormice are known to readily use these tubes to build their nests (Bright *et al.*, 2006).

- 2.3 Monthly checks were carried out between April and November 2023 in accordance with the Dormouse Conservation Handbook 2nd ed. (Bright *et al.*, 2006) and intended to demonstrate a minimum combined 'search effort' score of 20, as based upon the indices of probability within Table 1 below. A search effort score of 20 is taken to be the minimum to adequately determine presence or likely absence of dormice within a survey area.

Table 1. Index of probability of finding dormice present in nest tubes in any one month

Month	Index of probability	Cumulative search effort score
April	1	1
May	4	5
June	2	7
July	2	9
August	5	14
September	7	21
October	2	23
November	2	25

- 2.4 Checks were undertaken by Carly Howes ACIEEM (Natural England Class Licence WML-CL10a – Registration Number 2017-28220-CLS-CLS), Michelle Bullock (WML-CL10a – Registration Number 2017-30837-CLS-CLS), Laura Farrar ACIEEM and Rosie Billington. Bird droppings and other material such as wood mouse nests were cleaned out if found, to maintain the potential of each tube to be used by dormice.

Limitations

- 2.5 Some of the dormouse tubes on Site appeared to have been tampered with between survey set-up and dormouse survey 1. These were replaced during other protected species surveys being undertaken on Site.
- 2.6 There were no further limitations to the dormouse surveys, which were conducted at an optimum time of year and in good conditions.

Dormouse footprint tunnels

- 2.7 Dormouse footprint tunnels are made from plastic down pipe, 39cm long with a 6cm x 6cm cross-section. A thin plywood insert (48cm in length) is inserted into the tunnel with a short projection at each end. A piece of card or thick paper is laid along the length of the wooden insert, with masking tape placed at either end. A mixture of charcoal and oil is then painted in a thick layer onto the masking tape, acting as the ink to record footprints. The card/thick paper and masking tape can be easily removed for repeated surveys where footprints have been recorded. The tunnels are then tied in a suitable location along a horizontal branch

in vegetation. A footprint tunnel was placed beside the odd numbers of the first 100 nest tubes on Site.

- 2.8 Fortnightly checks were carried out between May and August 2023. Checks were undertaken by Carly Howes ACIEEM (Natural England Class Licence WML-CL10a – Registration Number 2017-28220-CLS-CLS), Michelle Bullock (WML-CL10a – Registration Number 2017-30837-CLS-CLS) and Laura Farrar ACIEEM.

Limitations

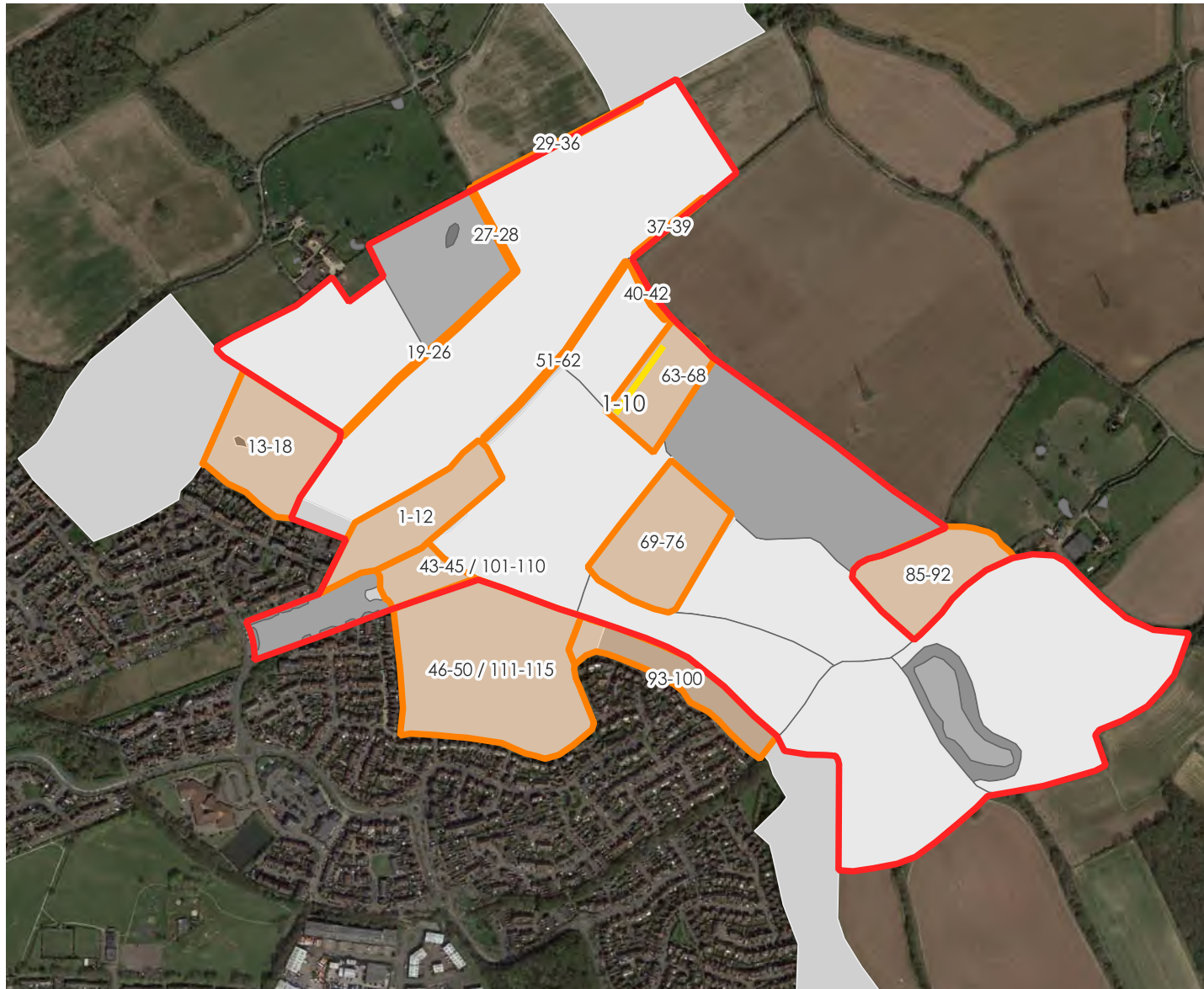
- 2.9 Two dormouse footprint tunnels on Site appeared to have been tampered with between surveys, however these were replaced back in-situ.
- 2.10 There were no further limitations to the dormouse surveys, which were conducted at an optimum time of year and in good conditions.

3.0 Results

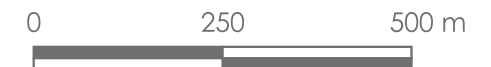
- 3.1 During the 2023 surveys there has been no active evidence to suggest hazel dormouse are using the Site for foraging, breeding and nesting. A further survey is due to be conducted in November 2023.
- 3.2 Numerous wood mouse *Apodemus sylvaticus* nests and caches were recorded within the dormouse boxes and were appropriately removed. A single wood mouse was seen within Box 1 on Site during the initial cleaning period of the boxes (during dormouse tube set-up).
- 3.3 Dormice are therefore taken as likely absent from the Site.

4.0 References

Bright *et al.*, 2006. *The Dormouse Conservation Handbook*. 2nd ed. Peterborough: English Nature



-  Site boundary
-  Dormouse box location, with number of refugia (total 10)
-  Dormouse tube location, with number of refugia (total 115)



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Project	North-East Stevenage	Date	May 2023	Drawing No.	CSA/0993/142
Drawing Title	Dormouse Survey Plan	Scale	Refer to scale	Rev	-
Client	Picture Estates Limited	Drawn	LF	Checked	MJB

Appendix 9.7

Birds

1.0 Legislation

- 1.1 All wild birds, their nests and eggs are protected under subsection 1(1) of the Wildlife and Countryside Act 1981 (as amended). It is an offence to kill or injure any wild bird, to take or destroy their eggs, or to take, damage or destroy their nests while in use or being built.
- 1.2 In addition, certain species of wild bird, listed within Schedule 1 of the Wildlife and Countryside Act, receive additional protection under subsection 1(5) of the Act. This makes it an offence to disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young. It is also an offence to disturb the dependent young of such a bird.
- 1.3 Consideration is also taken of Birds of Conservation Concern ('BoCC 5') (Stanbury *et al.*, 2021) which assigns bird species to a Red, Amber or Green list depending on factors such as their rarity, importance in an international context and severity of declines in population or range. Species on the Red list are of greatest conservation concern whilst those on the Green list do not fulfil any of the BoCC assessment criteria and are not currently of conservation interest. Full details can be found in Stanbury *et al.* (2021).

2.0 Methods

Breeding Birds

- 2.1 Breeding bird surveys were carried out by experienced bird surveyors from Skopeo Limited over four visits between 21 April 2023 and 09 June 2023 to gain an understanding of the breeding bird assemblage at the Site. Surveys were conducted with the following aims:
 - To determine the potential for breeding species of birds across the survey area;
 - To review the rarity and conservation status of each species found;
 - To review the likely breeding potential within the habitats present;
 - To assess the impacts of the proposed developments with regards to the species/ likely species determined; and
 - To recommend appropriate mitigation and protection measures where necessary.
- 2.2 The survey area included all accessible areas of the Site and immediately adjacent land visible from the Site. On each survey the surveyor walked a slow route across the whole site which ensured that both species of open and boundary habitats would be detected. Alternative versions of the route were taken on each visit so that different parts of the site would be surveyed at different parts of the morning, thus avoiding temporal bias associated with bird activity. Each survey commenced shortly after dawn or one hour prior to sunset, when birds are most active, and continued for approximately two hours during

suitable weather conditions. Birds were detected by sound or sight, using a pair of 10 x 42 binoculars.

- 2.3 The survey methodology used considers the recommended mapping conventions given within the Bird Survey Guidelines published by the Bird Steering and Assessment Group (2022). All birds detected at the site were recorded using standardised codes to map their distribution and behaviour, and to differentiate between individuals for the purposes of territory mapping (adapted from the standard Common Birds Census method). A full map of all species is created for each survey visit, with a consolidated map of priority species created for all survey visits combined.
- 2.4 Priority species are classified using the following hierarchy:
- 1) Species listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
 - 2) Species listed under Section 41 of the Natural Environment and Rural Communities Act 2006;
 - 3) Red & Amber listed by the 5th Birds of Conservation Concern Review (Stanbury *et al*, 2021).
 - 4) Localised or highly specialised species regardless of inclusion above (e.g. crossbill in coniferous woodland);
 - 5) Nationally- or locally-declining species regardless of inclusion above
 - 6) Colonial nests or roost sites containing more than one individual of any species; or,
 - 7) Exceptional counts or aggregations of any species.
- 2.5 On each survey visit the following objectives were met:
- Identification of potential breeding species within the habitats present;
 - Identification of all birds seen and heard;
 - Breeding status of each bird seen and heard;
 - Total numbers of birds, including juveniles recorded.
- 2.6 The criteria used during the 'Bird Atlas' surveys of 2007-2011 were used to ascertain the breeding status of birds at the Site (as given in Table 1 below).

Table 1. Categories of Breeding Bird Evidence

Breeding Status Categories	Evidence Criteria
Confirmed breeding:	• Distraction display or injury feigning • Used nests or eggshells found (occupied or laid within the survey period) • Recently fledged young or downy young • Adults entering or leaving a nest site in circumstances indicating occupied • Nest or an adult sitting on nest • Adults carrying food for young or faecal sacs • Nest containing eggs • Nest with young seen or heard
Probable breeding:	• Pairs observed in suitable nesting habitat in breeding season • Permanent territory presumed through registration or territorial behaviour (song etc.) on at least two different days, a week apart, at the same place • Display and courtship • Visiting probable nest site • Agitated behaviour or anxiety calls from adults • Building nest or excavating nest hole
Possible breeding:	• Species observed in breeding season in possible nesting habitat • Singing male(s) present or breeding calls heard in breeding season

Limitations

- 2.7 Only a proportion of individuals of each species will be detected on each visit, and some particularly secretive or low-density species, can be elusive and require several visits to detect. Furthermore, the importance of a site for birds can change depending on factors such as food availability, presence of roosting/nesting features and weather conditions.

Evaluation

- 2.8 The importance of the breeding bird assemblage at the Site was assessed using the criteria suggested by Fuller (1980) (see Table X below).

Table 2. Assessment criteria for breeding bird assemblage at a Site

Importance	Number of Breeding Species
Local	25-49
County	50-69
Regional	70-84
National	85+

3.0 Results

Breeding Birds

- 3.1 The weather conditions during the breeding bird surveys are summarised in Table 3 below.

Table 3. Weather conditions for breeding bird surveys

Date	Start time	End time	Temp (°C)		Cloud (Oktas)		Wind (Beaufort scale)		Precipitation
			Start	End	Start	End	Start	End	
21/04/23	05:30	07:55	6	6	8	8	2	2	Light rain
05/05/23	05:00	07:25	11	13	4	6	2	3	None
19/05/23	19:40	21:50	14	11	4	2	3	2	None
09/06/23	04:20	06:40	9	11	7	4	3	3	None

- 3.2 A total of 49 species were recorded on or adjacent to the survey area during the surveys. The Breeding Bird Survey Plan (CSA/0993/145) shows a consolidated map from the four survey visits, highlighting suspected territories for priority species and other notable sightings.
- 3.3 Of these, 48 species were recorded to be using the Site for foraging or breeding. The remaining single species was recorded flying over the Site only, but unlikely to be using the Site to breed.
- 3.4 A total of 23 priority species as summarised in Table 4 below.

Table 4. Priority bird species recorded breeding at the Site during the breeding bird surveys

Species	BoCC 2021 Red/Amber	Section 41	Sch1
Bullfinch	Amber	•	
Common whitethroat	Amber		
Cuckoo	Red		
Dunnock	Amber	•	
Grey partridge	Red	•	
House martin	Red		
House sparrow	Red	•	
Linnet	Red	•	
Mallard	Amber		
Marsh tit	Red	•	
Red kite	Green		•
Rook	Amber		
Skylark	Red	•	
Song thrush	Amber	•	
Sparrowhawk			
Starling	Red	•	
Stock dove	Amber		
Tawny owl	Amber		
Willow warbler	Amber		
Woodpigeon	Amber		
Wren	Amber		
Yellow wagtail	Red	•	
Yellowhammer	Red	•	

- 3.5 In addition, 26 secondary species were identified on or adjacent to the Site, listed below in Table 5.

Table 5. Secondary species identified on or adjacent to the Site (2023)

Species
Blackbird
Blackcap
Blue tit
Buzzard
Canada goose
Carion crow
Chiffchaff
Coal tit
Collared dove
Goldcrest
Goldfinch
Great spotted woodpecker
Great tit
Green woodpecker
Grey heron
Jackdaw
Jay
Lesser redpoll
Lesser whitethroat
Magpie
Nuthatch
Pheasant
Pied wagtail
Robin
Swallow
Treecreeper

- 3.6 The majority of birds recorded fall within an arable assemblage, with some falling within a woodland assemblage and some migrant birds recorded on-site.
- 3.7 Within the arable assemblage are birds including yellow wagtail, skylark and grey partridge, all seen to be breeding on-site. Although not recorded on-site, it was noted that in the local area, corn bunting was recorded in good numbers and are likely to winter on-site.
- 3.8 Arable fields on the Site provide good foraging potential to skylark, however the species' productivity is likely to be lower dependent on the ploughing regime/management of the crop. This species benefits from open arable with mosaic land use. Skylark will move between fields in song flight, so therefore not all individuals recorded will necessarily be nesting in that specific field. Following a precautionary principle, singing birds as treated as potential breeding pairs.
- 3.9 The woodland assemblage on-site includes marsh tit, tawny owl, lesser redpoll and willow warbler. A single male marsh tit was recorded within W4. Marsh tit have mixed breeding success locally in Hertfordshire/Middlesex based on the 'Breeding Bird Atlas 2007'. This has been considered a new record (at the time of survey), however the breeding bird atlas has not been updated since 2007. This record is

associated with old broadleaved woodland, where the species can nest in cavities. Due to this, broadleaved woodland on-site should be conserved with a suitable buffer for development to allow for the advancement of this species. Willow warbler was recorded on-site within Newbury Grove (W12), a species now scarce within lowland England. They prefer to breed within dense scrub, woodland and woodland clearings with new growth.

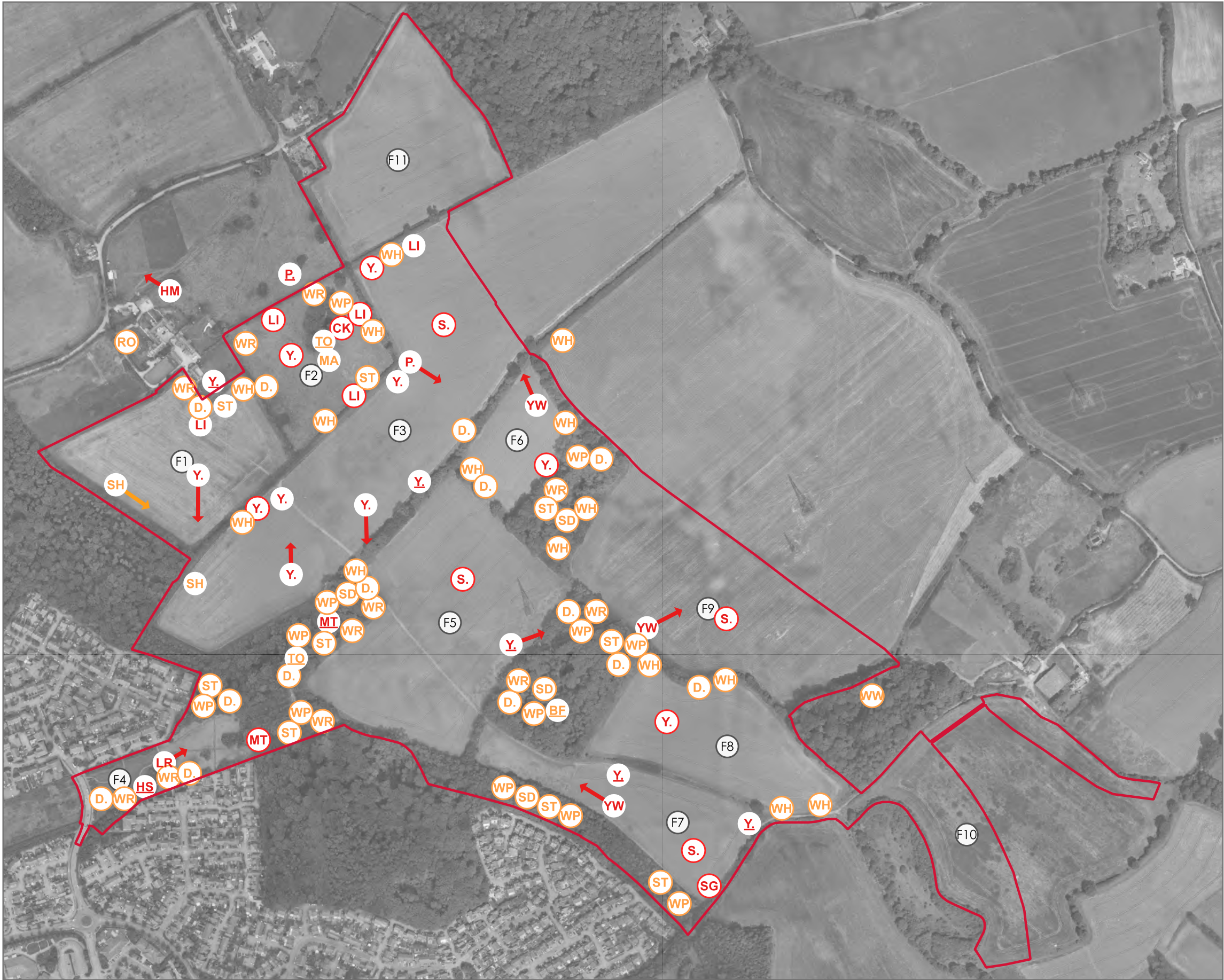
- 3.10 The suite of surveys recorded a number of long-distance migrant species which may be breeding on-site, including cuckoo and willow warbler. On-site records are considered to be 'passage birds,' stopping on-site within suitable habitats before moving further north for breeding. Cuckoo, although parasitic are protected by proxy of the host species. The two most likely migrant species breeding on-site include dunnock and meadow pipit, the latter which was not recorded on-site but expected to be breeding locally.
- 3.11 Several birds of prey were recorded on the site, notably red kite (Schedule 1), which is considered likely to breed on site within the tall, mature trees or locally.

4.0 References

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds*, 114, pp 723-747.

Fuller, R.J. 1980. *A method for assessing the ornithological interest of sites for conservation*. Biological Conservation. 17. 229-239. 10.1016/0006-3207(80)90058-0.

Rodewald, P. & Shumar, M. 2013. *Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland*. The Auk: Ornithological Advances. 131. 252-254. 10.1642/AUK-14-22.1.



- Site boundary
- Field reference
- Amber birds - Territories/Singing
- Amber birds - Calling
- Amber birds - Individuals
- Flight line
- Red birds - Territories/Singing
- Red birds - Calling
- Red birds- Individuals
- Flight line

Species List

Red-list species	Amber-list species
CK - Cuckoo	BF - Bullfinch
HM - House martin	D. - Dunnock
HS - House sparrow	MA - Mallard
LI - Linnet	RO - Rook
LR - Lesser redpoll	SD - Stock dove
MT - Marsh tit	SH - Sparrowhawk
P. - Grey partridge	ST - Song thrush
S. - Skylark	SD - Stock dove
SG - Starling	TO - Tawny owl
Y. - Yellowhammer	WH - Whitethroat
YW - Yellow wagtail	WP - Wood pigeon
	WR - Wren
	WW - Willow warbler

Only species included in Birds of Conservation Concern 5 (Stanbury et al. 2021), Section 41 of the NERC Act (2006) or Schedule 1 of the Wildlife and Countryside Act (1981) are considered 'notable' and included on this plan.

Locations are indicative. Circles denoting territory/colony do not show extent of territory only approximate location. Territories are presumed based on breeding evidence or multiple registrations of a species across visits.

Species flying over the Site only have been omitted (unless utilising the Site).



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Project	North-east Stevenage	Date	December 2024	Drawing No.	CSA/0993/145
Drawing Title	Breeding Bird Survey Plan	Scale	Refer to scale	Rev	A
Client	Picture Estates Limited	Drawn	RG	Checked	JW

Appendix 9.8

Reptiles

1.0 Legislation

- 1.1 All native British reptile species are listed within Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are afforded protection against killing and injury under parts of sub-section 9(1) of the Act. In addition, all native British reptile species are adopted as Species of Principal Importance for the Conservation of Biodiversity in England in respect of Section 41 of the Natural Environment and Rural Communities Act 2006.

2.0 Methods

- 2.1 A total of 100 reptile refugia, comprising rectangles of roofing felt measuring 1.0 x 0.5m, were installed in areas of suitable habitat present at the Site on 31 March 2023 by Matthew Dale and Owen de Graaf. The location of these refugia is shown on the Reptile Survey Plan (CSA/0993/139).
- 2.2 Following an initial 2-week 'bedding-in' period for refugia, surveys were carried out on seven occasions during favourable weather conditions (e.g. intermittent or hazy sunshine, not too windy, sunny spells following wet or cloudy weather) between April and June 2023. The surveys were led by Laura Farrar ACIEEM. Each survey visit comprised a slow walk of the Site to visually and physically check refugia for the presence of reptiles. On each occasion a visual search was also carried out within areas of suitable habitat whilst walking between refugia locations.
- 2.3 The primary aim of the reptile survey was to establish the presence or likely absence of widespread reptile species within the survey area, rather than to estimate abundance or population size. To this end, seven survey checks, an effort generally considered 'reasonable effort' in establishing the presence or likely absence of reptiles at a Site, were carried out.
- 2.4 Given the inherent problems in detecting reptiles, greater survey effort and/or identification or marking of individuals would be required to establish the actual or relative abundance of reptile populations.

Limitations

- 3.0 The reptile surveys were conducted at an optimum time of year and in good conditions.
- 3.1 Up to 10 mats on Site had been moved or folded away from their original locations. This was first noted on 13 April 2023 (survey 1 of six), but also when collecting the mats on 13 June 2023.

4.0 Results

- 4.1 It should be noted that although the Site is c. 70ha, suitable reptile habitat, comprising grassland, scrub and field margins, account for c.

10.5ha within the Site. Within this area 100 artificial refugia were used to provide a survey refugia density of 9.5 refugia per ha.

4.2 No reptiles were recorded on-site during the survey period.

4.3 Full survey results are provided in Table 1 below.

5.0 References

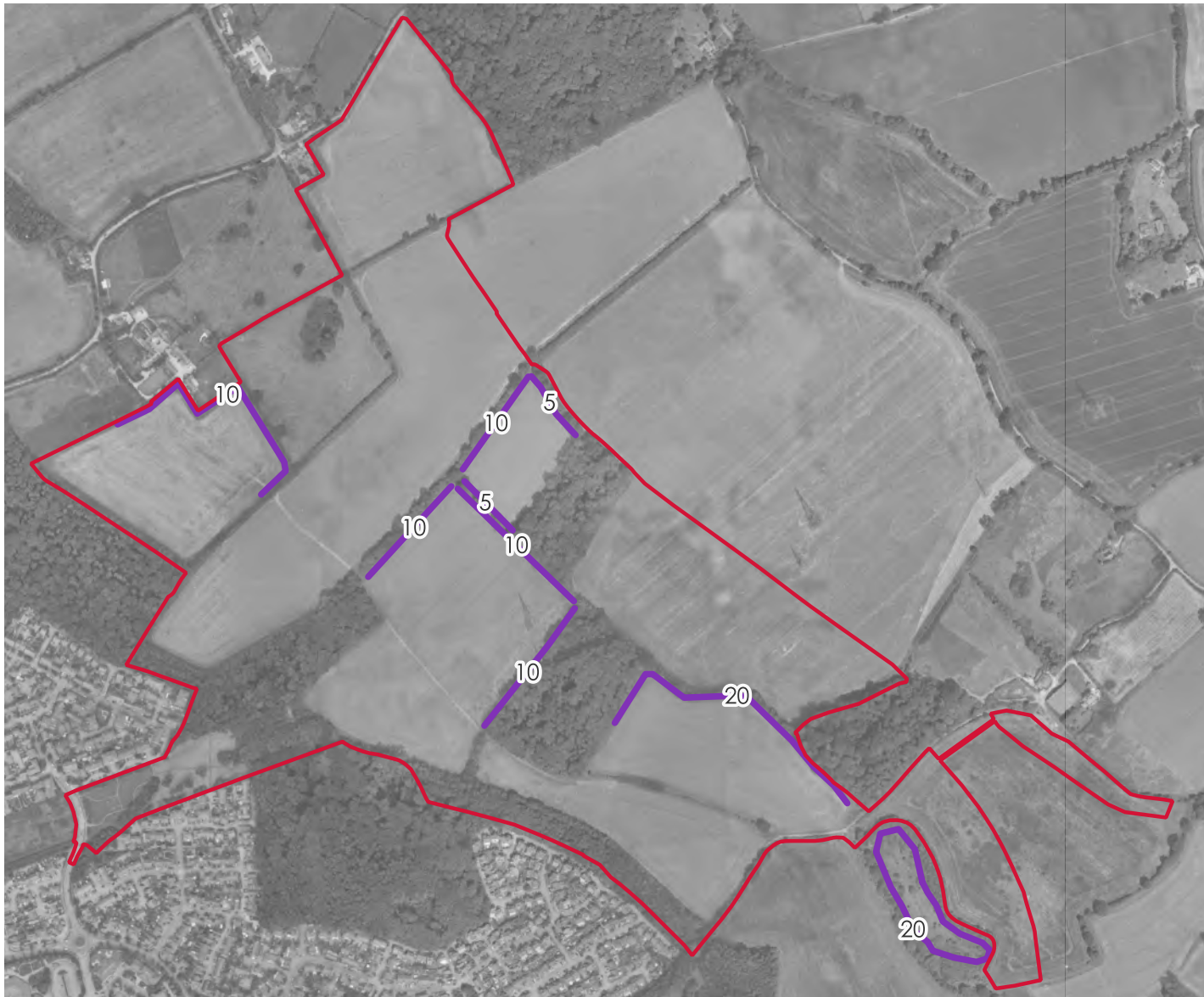
Froglife, 1999. *Reptile Survey: an introduction to planning and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Halesworth: Froglife.

HGBI, 1998. *Evaluating local mitigation/translocation programmes: Maintaining Best Practice and lawful standards*. HGBI advisory notes for Amphibian and Reptile Groups (ARG's). Halesworth: Herpetofauna Groups of Britain and Ireland.

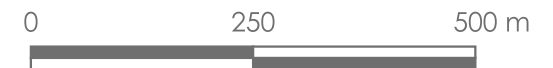
Natural England, 2011. *Reptile Mitigation Guidelines*. Natural England Technical Information Note TIN102. York: Natural England.

Table 1: Reptile Survey Results 2023

Job Name & No.		0993 - North-East Stevenage						Beaufort Scale: 0. Calm. Vertical smoke. 1. Light air. Smoke drifts. 2. Light breeze. Leaves rustle. 3. Gentle breeze. Small twigs constantly move. 4. Moderate breeze. Small branches begin to move. 5. Fresh breeze. Small trees in leaf begin to sway. Precipitation: select from (type) No Rain / Light / Moderate / Heavy & (duration) Intermittent / Continuous															Other notes								
Set-up Surveyor / Project Manager		Matthew Dale (Ecologist) and Owen deGroot (Assistant Ecologist)																													
Set-Up Date		31/03/2023		Total number of refugia		100																									
Date	Time	Surveyor	Weather				Area / Field No	Slow worm <i>Anguis fragilis</i>					Common lizard <i>Zootoca vivipara</i>					Grass snake <i>Natrix natrix</i>													
			Temp (°C)	Cloud Cover (Okta; n/8)	Wind (Beaufort Scale)	Rain (type & duration)		Adult Male (>230mm)	Adult Female (>230mm)	Unidentified adult	Sub-Adult	Newborn	Male	Female	unidentified adult	Sub-Adult	Newborn	Male	Female	Unidentified adult	Sub-Adult	Newborn									
Survey 1																															
13/04/2023	15:30 - 18:15 (during dormouse set-up)	CH & LF	10-10	0-1	2-1	Light rain intermittently within survey period	A																No reptiles found								
							B																								
							C																								
							D																								
							E																								
							F																								
Survey 2																															
19/04/2023	10:45 - 13:30 (during dormouse disturbance checks)	LF	11-12	8-4	2-1	None	A																No reptiles found								
							B																								
							C																								
							D																								
							E																								
							F																								
Survey 3																															
26/04/2023	14:20 - 17:15	LF	10-10	5-7	1-1	None	A																No reptiles found 1 toad located at S. 26372 27940								
							B																								
							C																								
							D																								
							E																								
							F																								
Survey 4																															
11/05/2023	10:00-14:00	BB and CH	14-14	7	1	Light rain intermittently within survey period	A																No reptiles found								
							B																								
							C																								
							D																								
							E																								
							F																								
Survey 5																															
24/05/2023	09:00-10:00	MD&LF	15-14	3-2	2-2	None	A																No reptiles found 1 toad located at S. 26372 28581								
							B																								
							C																								
							D																								
							E																								
							F																								
Survey 6																															
08/06/2023	09:30-11:00	LF	14-19	0-0	3-1	None	A																No reptiles found 1 toad located at S. 26372 28581								
							B																								
							C																								
							D																								
							E																								
							F																								
Survey 7																															
13/06/2023	07:45 - 10:00	LF & CH	17-20	0-0	1-1	None	A																No reptiles found								
							B																								
							C																								
							D																								
							E																								
							F																								
								Total Adult			Total Juvenile		Total Adult			Total Juvenile		Total Adult			Total Juvenile										
								0			0		0			0		0			0										



- Site boundary
- Reptile refugia location, with number of refugia (total 100)



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Project	North-East Stevenage	Date	Dec. 2024	Drawing No.	CSA/0993/139
Drawing Title	Reptile Survey Plan	Scale	Refer to scale	Rev	-
Client	Picture Estates Limited	Drawn	LF	Checked	JW

Appendix 9.9

Great Crested Newt

1.0 Legislation

- 1.1 Great crested newts *Triturus cristatus* are legally protected as European Protected Species (EPS) under Regulation 43 of the Conservation of Habitats and Species Regulations 2017. These Regulations make it an offence to:
- Deliberately capture, injure, kill or capture a great crested newt
 - Deliberately disturb great crested newts, impairing their ability to survive, breed, reproduce or rear/nurture their young
 - Damage or destroy a breeding site or resting place used by a great crested newt
- 1.2 Great crested newts are also fully protected under the Wildlife & Countryside Act 1981 (as amended), making it an offence to:
- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place of shelter or protection
 - Intentionally or recklessly obstruct access to any structure or place of shelter or protection
- 1.3 Disturbance of great crested newts is covered by both the 2017 Regulations and the 1981 Act. Disturbance that impairs survival or successful reproduction would be covered by the Regulations, while less significant acts of disturbance may only be covered by the Act.
- 1.4 It is important to note that great crested newts and their habitats (such as breeding ponds) are protected throughout the year, regardless of whether or not newts are present at the time.
- 1.5 Great crested newts are also listed as a species of principal importance for the conservation of biodiversity in England, under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. The S41 species list is used to guide decision-makers, including planning authorities, in implementing their duty under Section 40 of the NERC Act to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

Licensing

- 1.6 Where development is proposed that would result in an offence under the Habitats and Species Regulations, a statutory derogation licence may be granted by Natural England to permit an act that would otherwise be unlawful. To obtain an EPS licence for development, it must be demonstrated that the purpose of the act to be licensed is for:
- “preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and beneficial consequences of primary importance for the environment” (Regulation 55(2)(e))

1.7 In addition, Natural England will not grant an EPS licence unless they are satisfied that:

- "There is no satisfactory alternative" (Regulation 55(9)(a))
- "The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" (Regulation 55(9)(b))

2.0 Methods

Desk Study

2.1 In accordance with Natural England's Great Crested Newt Mitigation Guidelines (2001), a desktop search was undertaken in April 2023 to identify ponds within 500m of the Site which may have potential to support breeding great crested newts, using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography. 500m is the generally accepted typical maximum dispersal range of this species, with great crested newt most likely to use terrestrial habitat within 250m of breeding ponds.

Habitat Suitability Index (HSI) Assessment

2.2 Where ponds were situated within an 500m radius and connected to the Site by traversable terrestrial habitats, access permission was requested to undertake a Habitat Suitability Index (HSI) assessment, using the standard approach set out by Oldham *et al.* (2000). These assessments were undertaken on 08 April 2023 by Michelle Bullock MCIEEM (Natural England Class Licence WML-CL08 – Registration Number 2015-16715-CLS-CLS) and on 15 April 2023 by Michelle Bullock MCIEEM, Laura Farrar ACIEEM (Natural England Class Licence WML-CL08 – Registration Number 2019-41162-CLS-CLS) and Matthew Dale (Natural England Class Licence WML-CL08 – Registration Number 2022-10646-CL08-GCN).

Limitations

2.3 There were no limitations to the surveys, which were conducted at an optimum time of year and in good conditions.

2.4 Ponds 2a, 6, and 14 were not accessible at the time of the HSI surveys.

Environmental DNA (eDNA) Sampling

2.5 Environmental DNA (eDNA) sampling was used to determine the presence/ likely absence of great crested newts from ponds P1, P12, P13 and P17. This method has been shown to be a highly effective in detecting the presence of great crested newts (Biggs *et al.*, 2014).

2.6 Water samples were collected from ponds P1 & P17 on 11 May 2023 by Carly Howes ACIEEM (Natural England Class Licence WML-CL08 – Registration Number 2017-32238-CLS-CLS) and Rosie Billington (Natural England Class Licence WML-CL08 – Registration Number 2022-10864-

CL08-GCN). Ponds P12 & P13 on 17 May 2023 by Carly Howes ACIEEM) and Laura Farrar ACIEEM (Natural England Class Licence WML-CL08 – Registration Number 2019-41162-CLS-CLS) following the recommended procedure. Appropriate biosecurity measures were taken to avoid cross contamination of great crested newt eDNA. Subsequently the samples were sent to ADAS for DNA analysis.

Limitations

- 2.7 There were no limitations to the surveys, which were conducted at an optimum time of year and in good conditions.

3.0 Results

Desk Study

- 3.1 The desktop search for ponds and subsequent site visits identified 18 water bodies occurring within 500m of the Site. These ponds are identified on the Pond Plan (CSA/0993/144). No ponds were ruled out due to dispersal barriers such as major roads or river systems.

Habitat Suitability Index (HSI) Assessment

- 3.2 Full results of the surveys are included in Table 2 below, with a summary in Table 1 below.

Table 1. Habitat suitability index (HSI) results for ponds within 500m

Pond Reference	Suitability Score	Suitability Rating
1	0.59	Below Average
2	0.70	Good
2a	No access	N/A
3	0.55	Below Average
4	0.38	Poor
5	Not a pond	N/A
6	No access	N/A
7	0.47	Poor
8	0.39	Poor
9	0.64	Average
10	Not a pond	N/A
11	0.58	Below Average
12	0.55	Below Average
13	0.46	Poor
14	No access	N/A
15a	0.38	Poor
15b	0.55	Below Average
16	0.26	Poor
17	0.26	Poor

Environmental DNA (eDNA) Sampling

- 3.3 In 2023, P1, P12, P13, and P17 all returned a negative result for great crested newts. All samples passed the sample integrity check (SIC), degradation check (CD) and inhibition check (IC).

- 3.4 Ponds P13 and P1, both returned with a value of sediment present in the sample; medium sediment and low sediment respectively. This is a limitation with regards to sampling for eDNA as it is possible for DNA to persist for longer within sediment than an open water body which could potentially lead to false positive results. However, in the case of P13 and P1 both returned a negative result for great crested newt.
- 3.5 No other waterbodies were subject to surveys due to separation from the Site and/or no access granted.
- 3.6 Full eDNA results are included at the end of this report.

4.0 References

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

English Nature, 2001. *Great Crested Newt Mitigation Guidelines*. Peterborough: English Nature.

Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M., 2000. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10(4), 143-155.

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Sample ID: ADAS-5297 Condition on Receipt: Low Sediment Volume: Passed
Client Identifier: P1 Description: pond water samples in preservative
Date of Receipt: 15/05/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	17/05/2023
Degradation Control [§]	Within Limits	Real Time PCR	17/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	17/05/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:



Signed:



Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 19/05/2023 Date of issue: 19/05/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

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Sample ID: ADAS-5485 Condition on Receipt: Good Volume: Passed
Client Identifier: P17 Description: pond water samples in preservative
Date of Receipt: 15/05/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	18/05/2023
Degradation Control [§]	Within Limits	Real Time PCR	18/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	18/05/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

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Date of preparation: 19/05/2023 Date of issue: 19/05/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

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Sample ID: ADAS-4993 Condition on Receipt: Medium Sediment Volume: Passed
Client Identifier: P13 (Tilekin Wood), 0993 NE Stevenage Description: pond water samples in preservative
Date of Receipt: 22/05/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	24/05/2023
Degradation Control [§]	Within Limits	Real Time PCR	24/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	24/05/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	25/05/2023	Date of issue:	25/05/2023

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Sample ID: ADAS-5118 Condition on Receipt: Good Volume: Passed
Client Identifier: Pond 12, 993 Description: pond water samples in preservative
Date of Receipt: 22/05/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	24/05/2023
Degradation Control [§]	Within Limits	Real Time PCR	24/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	24/05/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

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- Site boundary
- 250m Buffer
- 500m Buffer
- Ponds (with reference)



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Project	North-East Stevenage	Date	Dec. 2024	Drawing No.	CSA/0993/152
Drawing Title	Pond Plan	Scale	Refer to scale	Rev	-
Client	Picture Estates Limited	Drawn	LF	Checked	JW

Table 1: Habitat Suitability Index (HSI) full results within 500m

Habitat Suitability Factors:		Pond Number and Grid Reference				
		1	2	3	4	5
		TL 26079 28156	TL 25951 28100	TL 25994 28368	TL 25997 28467	TL 25994 28496
					Dry	No pond
Map location	Category	Zone A	Zone A	Zone A	Zone A	Zone A
	SI Value	1	1	1	1	1
Pond area in m ²	Category	200m2	225m2	225m2	<50m2	
	SI Value	0.4	0.45	0.45	0.05	FALSE
Permanence / Desiccation	Category	Sometimes Dries	Never Dries	Sometimes Dries	Dries Annually	
	SI Value	0.5	0.9	0.5	0.1	FALSE
Water quality	Category	Poor	Moderate	Poor	Poor	
	SI Value	0.33	0.67	0.33	0.33	FALSE
Percentage perimeter shade to at least 1m from shore	Category	91-95%	0-60%	96-100%	96-100%	
	SI Value	0.3	1	0.2	0.2	FALSE
Waterfowl impact (excluding moorhen)	Category	Absent	Absent	Minor	Absent	
	SI Value	1	1	0.67	1	0
Fish presence	Category	Absent	Minor	Absent	Absent	
	SI Value	1	0.33	1	1	0
Number of ponds within 1km not separated by barriers	Category	>12	>12	>12	>12	>12
	SI Value	1	1	1	1	1
Terrestrial habitat	Category	Moderate	Moderate	Moderate	Moderate	
	SI Value	0.67	0.67	0.67	0.67	0
Percentage of pond surface occupied by aquatic vegetation (March – May)	Category	11-15%	16-20%	11-15%	1-5%	
	SI Value	0.45	0.5	0.45	0.35	0
Product		0.0059697	0.029997743	0.002999774	0.000077385	FALSE
HSI Score		0.59923235	0.704220815	0.559382476	0.388030335	FALSE
HSI Suitability		Below Average	Good	Below Average	Poor	N/A

Habitat Suitability Factors:		Pond Number and Grid Reference				
		6	7	8	9	10
		TL 25992 28630	TL 26295 28683	TL 26365 28939	TL 26528 28528	TL 27080 27827
		No access				Not a pond
Map location	Category	Zone A	Zone A	Zone A	Zone A	Zone A
	SI Value	1	1	1	1	1
Pond area in m ²	Category		200m2	50-100m2	125m2	
	SI Value	FALSE	0.4	0.1	0.25	FALSE
Permanence / Desiccation	Category		Never Dries	Dries Annually	Sometimes Dries	
	SI Value	FALSE	0.9	0.1	0.5	FALSE
Water quality	Category		Moderate	Poor	Moderate	
	SI Value	FALSE	0.67	0.33	0.67	FALSE
Percentage perimeter shade to at least 1m from shore	Category		0-60%	96-100%	76-80%	
	SI Value	FALSE	1	0.2	0.6	FALSE
Waterfowl impact (excluding moorhen)	Category		Major	Minor	Minor	
	SI Value	0	0.01	0.67	0.67	0
Fish presence	Category		Absent	Absent	Absent	
	SI Value	0	1	1	1	0
Number of ponds within 1km not separated by barriers	Category	>12	>12	>12	>12	>12
	SI Value	1	1	1	1	1
Terrestrial habitat	Category		Moderate	Moderate	Good	
	SI Value	0	0.67	0.67	1	0
Percentage of pond surface occupied by aquatic vegetation (March – May)	Category		6-10%	<1%	1-5%	
	SI Value	0	0.4	0.3	0.35	0
Product		FALSE	0.000646416	0.1	0.011783625	FALSE
HSI Score		FALSE	0.47979002	0.393442689	0.641398428	FALSE
HSI Suitability		N/A	Poor	Poor	Average	N/A

Habitat Suitability Factors:		Pond Number and Grid Reference				
		11	12	13	14	15a
		TL 27041 27736	TL 27105 27743	TL 25663 27809	TL 26509 28801	TL 27423 27715
					No access	Dry
Map location	Category	Zone A	Zone A	Zone A	Zone A	Zone A
	SI Value	1	1	1	1	1
Pond area in m ²	Category	350m2	200m2	<50m2		<50m2
	SI Value	0.7	0.4	0.05	FALSE	0.05
Permanence / Desiccation	Category	Sometimes Dries	Sometimes Dries	Sometimes Dries		Dries Annually
	SI Value	0.5	0.5	0.5	FALSE	0.1
Water quality	Category	Poor	Poor	Poor		Poor
	SI Value	0.33	0.33	0.33	FALSE	0.33
Percentage perimeter shade to at least 1m from shore	Category	96-100%	96-100%	96-100%		96-100%
	SI Value	0.2	0.2	0.2	FALSE	0.2
Waterfowl impact (excluding moorhen)	Category	Absent	Absent	Absent		Absent
	SI Value	1	1	1	0	1
Fish presence	Category	Absent	Absent	Absent		Absent
	SI Value	1	1	1	0	1
Number of ponds within 1km not separated by barriers	Category	>12	>12	8	>12	>12
	SI Value	1	1	0.89	1	1
Terrestrial habitat	Category	Moderate	Moderate	Good		Moderate
	SI Value	0.67	0.67	1	0	0.67
Percentage of pond surface occupied by aquatic vegetation (March – May)	Category	<1%	<1%	1-5%		<1%
	SI Value	0.3	0.3	0.35	0	0.3
Product		0.0046431	0.0026532	0.000513975	FALSE	0.00006633
HSI Score		0.584360435	0.55255689	0.46891508	FALSE	0.382094688
HSI Suitability		Below Average	Below Average	Poor	N/A	Poor

Habitat Suitability Factors:		Pond Number and Grid Reference	
		15b	16
		TL 27467 27709	TL 27308 27133
			Dry
Map location	Category	Zone A	Zone A
	SI Value	1	1
Pond area in m ²	Category	125m2	<50m2
	SI Value	0.25	0.05
Permanence / Desiccation	Category	Dries Annually	Dries Annually
	SI Value	0.1	0.1
Water quality	Category	Moderate	Bad
	SI Value	0.67	0.01
Percentage perimeter shade to at least 1m from shore	Category	0-60%	96-100%
	SI Value	1	0.2
Waterfowl impact (excluding moorhen)	Category	Absent	Absent
	SI Value	1	1
Fish presence	Category	Possible	Absent
	SI Value	0.67	1
Number of ponds within 1km not separated by barriers	Category	>12	7
	SI Value	1	0.85
Terrestrial habitat	Category	Moderate	Moderate
	SI Value	0.67	0.67
Percentage of pond surface occupied by aquatic vegetation (March – May)	Category	1-5%	<1%
	SI Value	0.35	0.3
Product		0.002631676	1.7085E-06
HSI Score		0.552106991	0.265009534
HSI Suitability		Below Average	Poor

Disclaimer: The HSI Calculator is a tool to provide a general assessment of great crested newt *Triturus cristatus* habitat suitability in accordance with Oldham et al., 2000 and Brady, 2010. It is the responsibility of the user to check the accuracy of the outputs. The copyright holder accepts no responsibility for repercussions (financial and/or legal) resulting from inaccurate or incorrect outputs.

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Sample ID: ADAS-4993 Condition on Receipt: Medium Sediment Volume: Passed
Client Identifier: P13 (Tilekin Wood), 0993 NE Stevenage Description: pond water samples in preservative
Date of Receipt: 22/05/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	24/05/2023
Degradation Control [§]	Within Limits	Real Time PCR	24/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	24/05/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:



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Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 25/05/2023 Date of issue: 25/05/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

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Sample ID: ADAS-5118 Condition on Receipt: Good Volume: Passed
Client Identifier: Pond 12, 993 Description: pond water samples in preservative
Date of Receipt: 22/05/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	24/05/2023
Degradation Control [§]	Within Limits	Real Time PCR	24/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	24/05/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:



Signed:



Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 25/05/2023 Date of issue: 25/05/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

Client: Matthew Dale,
CSA Environmental



ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

Tel: 01159 229249
Email: Helen.Rees@adas.co.uk

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Sample ID: ADAS-5297 Condition on Receipt: Low Sediment Volume: Passed
Client Identifier: P1 Description: pond water samples in preservative
Date of Receipt: 15/05/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	17/05/2023
Degradation Control [§]	Within Limits	Real Time PCR	17/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	17/05/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:



Signed:



Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 19/05/2023 Date of issue: 19/05/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

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[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

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Sample ID: ADAS-5485 Condition on Receipt: Good Volume: Passed
Client Identifier: P17 Description: pond water samples in preservative
Date of Receipt: 15/05/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	18/05/2023
Degradation Control [§]	Within Limits	Real Time PCR	18/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	18/05/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:



Signed:



Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 19/05/2023 Date of issue: 19/05/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

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On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

Appendix 9.10

Invertebrates

Land at North East Stevenage, Hertfordshire (TL263277).

Invertebrate Scoping Survey 2023 [Project No. 0993]

Written by: Scotty Dodd MSc MCIEEM MRES

11 Knowles Meadow, Hill Brow, Liss, Hampshire. GU33 7QW

August 2023

Quality Control

The information and data which has been prepared and provided is true and has been prepared and provided in accordance with the *Code of Professional Conduct issued by the Chartered Institute of Ecology and Environmental Management (CIEEM)*. We confirm that the opinions expressed are our true and professional bona fide opinions.

		Date
Survey Ecologist	Scotty Dodd MSc MCIEEM MRES	Survey date/s: 14 th May & 24 th June 2023
Report Author	Scotty Dodd MSc MCIEEM MRES	Submission date: 14 th August 2023

The contents of this report were correct at the time of the site visit. The report is provided for the sole use of the named client and is confidential.

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Summary

Two scoping visits were made to a large land parcel off Mendip Way, North East Stevenage, Hertfordshire (TL263277) by Invertebrate Ecologist Scotty Dodd MSc MCIEEM MRES on behalf of CSA Environmental. The remit for the visit was to assess the potential for important invertebrate assemblages and notable and S41 invertebrates.

Survey date/s: 14th May & 24th June 2023

Species total: 253 invertebrate species identified.

European Protected Species or Wildlife & Countryside Act species:

None

UKBAP / SPI (NERC S41) species:

1 species – Small Heath *Coenonympha pamphilus*

Notable species – 8 species

Order	Family	Species	Common Name	Status	SATs
Lepidoptera (butterflies)	Nymphalidae	<i>Coenonympha pamphilus</i>	Small Heath	S41 Priority Species; VU	F112
Coleoptera	Cantharidae	<i>Rhagonycha lutea</i>	a soldier beetle	NS	
Coleoptera	Carabidae	<i>Brachinus crepitans</i>	Bombardier Beetle	NS	F111
Coleoptera	Chrysomelidae	<i>Cassida nobilis</i>	a tortoise beetle	NS	
Hemiptera: Heteroptera	Lygaeidae	<i>Aphanus rolandri</i>	a ground bug	[Na]	
Hymenoptera: Aculeata	Apidae	<i>Nomada fucata</i>	a nomad bee	[Na]	F002
Hymenoptera: Aculeata	Formicidae	<i>Lasius brunneus</i>	Brown Tree Ant	[Na]	A211
Hymenoptera: Aculeata	Halictidae	<i>Lasioglossum malachurum</i>	a solitary bee	[Nb]	F002

Pantheon analysis:

No Specific Assemblage Types found to be in Favourable condition by SSSI standards.

Recommendations:

There is the potential for net loss to biodiversity connected to the proposed development without some form of avoidance, mitigation and/or compensation.

Invertebrate assemblages associated with woodland / hedgerow / scrub edge habitats at the site are at particular risk along with species associated with relict calcareous grassland habitats and resources

1. Introduction

- 1.1 Two scoping visits were made to a large agricultural land parcel off Mendip Way, Stevenage, Hertfordshire (TL263277) by Invertebrate Ecologist Scotty Dodd MSc MCIEEM MRES on behalf of CSA Environmental. The remit for the visit was to assess the potential for important invertebrate assemblages and notable and S41 invertebrates'
- 1.2 This report provides the scoping survey's findings along with any required recommendations for further survey, mitigation options and further ecological enhancements. A list of invertebrate species observed during the visit is appended.

2. Methods

- 2.1 The site was visited on the 14th May & 24th June 2023 by Invertebrate Ecologist Scotty Dodd MSc MCIEEM MRES.
- 2.2 Weather conditions were bright and sunny with optimal temperatures. Approximately four hours were spent surveying the site during each visit.
- 2.3 A general walkover survey of the site was undertaken to visually identify features and habitats with the potential to support scarce or protected invertebrates. Features of interest were sampled for invertebrates using heavy duty calico sweep net, beating tray, suction sampler, butterfly net for spot-netting at resources of interest and hand searching targeted food-plants / features. Visual observations of mobile insects were also noted.
- 2.4 The species list is analysed using Pantheon. Pantheon is a database tool developed by Natural England and the Centre for Ecology & Hydrology to analyse invertebrate sample data and assess assemblage data for favourable versus unfavourable condition by SSSI standards. Hence, if an assemblage or suite of assemblages are found to be favourable this would indicate that the site is likely to be of significant importance for invertebrates. Further information on Pantheon is available here: <http://www.brc.ac.uk/pantheon/about/pantheon>

3. Results

- 3.1 No invertebrate species protected under Schedule 5 (Section 9) of the Wildlife & Countryside Act (as amended) 1981 were recorded during the scoping survey visit and there is very limited potential for any such species to be present at the site.
- 3.2 There are currently 943 Species of Principle Importance (SPI) (covering all taxonomic groups) included on the S41 list. The S41 list is intended to provide guidance to decision-makers, e.g. those representing public bodies and local/regional authorities, in implementing their duty under Section 40 of the NERC Act to '*...have regard to the conservation of biodiversity in England when*

carrying out their normal functions'. A single UK Biodiversity Action Plan (UK BAP) priority species and Species of Principle Importance (SPI) covered under The Natural Environment and Rural Communities Act 2006 Section 41 (NERC S41) was recorded – Small Heath *Coenonympha pamphilus*.

3.3 The scoping visit recorded eight species with a conservation designation. One S41 (Research Only) species (Small Heath) and a further seven species that are considered to be Nationally Scarce (NS). In addition, 22 Local species were recorded, including several records of significance for the Vice County. NS species without parenthesis have been recently reviewed using IUCN criteria. Those species within parenthesis (i.e. Na & Nb species) are yet to be reviewed using the new criteria and the NS status may be downgraded; this is qualified in the discussion section for each species:

Order	Family	Species	Common Name	Status	SATs
Lepidoptera (butterflies)	Nymphalidae	<i>Coenonympha pamphilus</i>	Small Heath	S41 Priority Species; VU	F112
Coleoptera	Cantharidae	<i>Rhagonycha lutea</i>	a soldier beetle	NS	
Coleoptera	Carabidae	<i>Brachinus crepitans</i>	Bombardier Beetle	NS	F111
Coleoptera	Chrysomelidae	<i>Cassida nobilis</i>	a tortoise beetle	NS	
Hemiptera: Heteroptera	Lygaeidae	<i>Aphanus rolandri</i>	a ground bug	[Na]	
Hymenoptera: Aculeata	Apidae	<i>Nomada fucata</i>	a nomad bee	[Na]	F002
Hymenoptera: Aculeata	Formicidae	<i>Lasius brunneus</i>	Brown Tree Ant	[Na]	A211
Hymenoptera: Aculeata	Halictidae	<i>Lasioglossum malachurum</i>	a solitary bee	[Nb]	F002

3.4 A total of 253 invertebrate species were recorded during the survey. This is a typically average number of species spread over two visits in early summer with limited habitat diversity. Species with conservation statuses, or species considered to be localised in their distribution were poorly represented.

3.5 A full list of invertebrates recorded is appended.

3.6 Pantheon analysis: Largely common and widespread species of invertebrates were found to be directly associated with the Specific Assemblage Types (SATs) generated. The results returned for all detected SATs is Unfavourable condition, by SSSI standards. Pantheon analysis table below:

Broad biotope	Habitat	SAT	No. Sp.	Rep.	SQI	Code	Condition
tree-associated	decaying wood	bark & sapwood decay	10	2	100	A212	Unfavourable (10 species, 19 required)
open habitats	short sward & bare ground	open short sward	9	4	133	F112	Unfavourable (9 species, 13 required)
open habitats		rich flower resource	9	4	100	F002	Unfavourable (9 species, 15 required)
open habitats		scrub edge	8	4	100	F001	Unfavourable (8 species, 11 required)
tree-associated	decaying wood	heartwood decay	2	1	100	A211	Unfavourable (2 species, 6 required)
open habitats		scrub-heath & moorland	2	<1	100	F003	Unfavourable (2 species, 9 required)
open habitats	short sward & bare ground	bare sand & chalk	1	<1	400	F111	Unfavourable (1 species, 19 required)
tree-associated	decaying wood	epiphyte fauna	1	5	100	A215	Unfavourable (1 species, 3 required)

Table 1: Pantheon analysis showing Specific Assemblage Types (SATs) detected, number of species (No.Sp.) recorded that are assigned to the SAT and percentage representation of all species assigned to the SAT (% Rep.).

4. Discussion and Recommendations

Species Recorded

- 4.1 A total of 253 invertebrate species were recorded during the survey.
- 4.2 Eight of the species recorded have a conservation designation, representing 3% of the overall list. This is a low percentage and is representative of survey effort, time of year and limited habitats at the site.
- 4.3 The following species with a conservation designation were recorded:

Order	Family	Species	Common Name	Status	SATs
Lepidoptera (butterflies)	Nymphalidae	<i>Coenonympha pamphilus</i>	Small Heath	S41 Priority Species; VU	F112
Coleoptera	Cantharidae	<i>Rhagonycha lutea</i>	a soldier beetle	NS	
Coleoptera	Carabidae	<i>Brachinus crepitans</i>	Bombardier Beetle	NS	F111
Coleoptera	Chrysomelidae	<i>Cassida nobilis</i>	a tortoise beetle	NS	
Hemiptera: Heteroptera	Lygaeidae	<i>Aphanus rolandri</i>	a ground bug	[Na]	
Hymenoptera: Aculeata	Apidae	<i>Nomada fucata</i>	a nomad bee	[Na]	F002
Hymenoptera: Aculeata	Formicidae	<i>Lasius brunneus</i>	Brown Tree Ant	[Na]	A211
Hymenoptera: Aculeata	Halictidae	<i>Lasioglossum malachurum</i>	a solitary bee	[Nb]	F002

- 4.4 The Small Heath *Coenonympha pamphilus* is a widespread grassland species that is not uncommon in southern England. In Hertfordshire the species is widespread and has increased its range in recent years. However, a 40% drop in abundance was observed between 2015 & 2019 (<https://www.hertsmiddx-butterflies.org.uk/> - Accessed 13/08/2023). This species is regarded as an S41 Priority Species and IUCN VU (Vulnerable).
- 4.5 The soldier beetle *Rhagonycha lutea* (NS) is largely south-east restricted with widely scattered and very localised records elsewhere. In Hertfordshire this species is regarded as local (James, 2018). It is a predatory arboreal specialist associated with woodlands, scrub and scrub edge habitats, especially in chalky districts.
- 4.6 The Bombardier Beetle *Brachinus crepitans* (NS) is a southern restricted species, traditionally with a strong coastal bias to its distribution. In Hertfordshire this species is very localised but thought to be increasing in chalk and gravel districts (James, 2018; D.Asaw pers. comm. 2023). A predator of the larvae of other carabid beetles in warm, open habitats.
- 4.7 The tortoise beetle *Cassida nobilis* (NS) is a widely scattered but generally scarce, southern species. In Hertfordshire it is extremely rarely recorded, this representing the fourth record for the Vice County (James, 2018) and the first record for a significant number of years, having been last recorded in 1994 at Ridlins Mire, Stevenage by Brian Eversham. A highly polyphagous species feeding on a range of plants in the Amaranthaceae family.

-
- 4.8 The distinctive ground bug *Aphanus rolandri* [Na] is a local species which is rarely common; largely confined to southern and eastern England as far north as Leicestershire (VC55), although rare in the west and absent from Wales. In Hertfordshire this species has been previously recorded but is likely to be scarce within the Vice County. Reported to be associated with plants in the family Fumariaceae but may be polyphagous. Generally, in open, dry and sheltered sites but occasionally found in woodland.
- 4.9 The nomad bee *Nomada fucata* [Na] is a formerly rare species that has become widespread and common in the south in recent decades. It is a cleptoparasite of the mining bee *Andrena flavipes* and generally found wherever the ground-nesting host is present. This species will likely be downgraded to Least Concern (LC) when the group is reviewed.
- 4.10 The mining bee *Lasioglossum malachurum* [Nb] was formerly a scarce and very local species but, since about 1990, it has been extending its range in England and is common to locally abundant in many sites in the southern counties. This species will likely be downgraded to Least Concern (LC) when the group is reviewed.
- 4.11 *Lasius brunneus* is known from central and southern England but appears to have increased its range in recent years or has been more widely recorded. An arboreal saproxylic species associated with a range of trees where it tends tree dwelling aphids. This species will likely be downgraded to Least Concern (LC) when the group is reviewed.
- 4.12 In summary, a small number of the designated species recorded have shown recent or historic range expansions, particularly within the aculeate Hymenoptera (bees, wasps & ants). This is likely in response to a warming climate extending opportunities for southern restricted edge of range species.
- 4.13 In addition, 22 Local species were recorded, the spider *Trachyzelotes pedestris* represents a locally important record at a county level. *Trachyzelotes pedestris* was first recorded for the county as recently as 2021 at Broxbourne gravel pits (TL3706) by David Carr. This record represents the second record for the Vice County and a significant northern range extension within the county. The apionid weevil *Protapion ononidis* is associated with restharrow (*Ononis* spp.) and is regarded as a rarity in the Vice County, being given 'Hertfordshire Rare' status by James (2018). Both the weevil *Kalcapion pallipes* and the flea beetle *Hermaeophaga mercurialis* feed upon Dog's Mercury *Mercurialis perennis*, both are considered to be localised within the Vice County.

Pantheon Output

- 4.14 The Pantheon output indicates that although a diverse range of habitats and resources of value to invertebrates are present at the site these are not of particularly exceptional quality or are otherwise limited. This ties in with the surveyor's view of the site, where resources, such as certain host plants, were limited to narrow arable field edges, which themselves varied in quality.

SATs for resources associated with decaying wood were reasonably well represented and reflect the scattered woodland resources on-site, which are inter-connected by native hedgerows with scattered mature trees present. The same resources of woodland edge and hedgerows also influenced the quality of the SAT scrub edge.

Conclusions

- 4.15 The preliminary results, based upon a two early summer visits, would suggest that the retention of woodland and hedgerow resources is important. These habitats provide sheltered wood / scrub edge and microclimates whilst also providing a continuity of dead wood resources. Retention and future maintenance of these habitats and resources would maintain the SATs for decaying wood [bark & sapwood decay (A212), heartwood decay (A211) & epiphyte fauna (A215)] as well as the scrub edge SAT F001.
- 4.16 Additionally, calcicolous plants growing on chalky soil offered opportunities for polyphagous invertebrate species unlikely to be found in areas of ranker vegetation dominated by coarse grasses and similar.
- 4.17 There is a small, overgrown chalk quarry on the southern edge of Nine Acre Spring wood that has potential to be improved for invertebrates. This offers an opportunity for mitigation by clearing brambles and removing shading vegetation to expose the bare chalk substrate and allow plants to colonise, such as Restharrow *Ononis repens* which grows on the quarry edge headland. This would provide resources for the SATs open short sward (F112) and rich flower resource (F002). As herb-rich grassland with finer grasses develops, resources for the S41 Small Heath butterfly would be provided.
- 4.18 There is the potential for net loss to biodiversity connected to the proposed development without some form of avoidance, mitigation and/or compensation. Invertebrate assemblages associated with woodland / hedgerow / scrub edge habitats at the site are at particular risk along with species associated with relict calcareous grassland habitats and resources.

5. References & Bibliography

- Drake, C.M., Lott, D.A., Alexander, K.N.A. & Webb, J. 2007. **Surveying terrestrial and freshwater invertebrates for conservation evaluation. Natural England Research Report NERR005.** Peterborough: Natural England.
- Fry, R. & Lonsdale, D. (eds.) (1991). **Habitat conservation for insects – a neglected green issue.** Amateur Entomological Society.
- James, T. J. (2018). **Beetles of Hertfordshire.** St. Albans: Hertfordshire Natural History Society.
- Kirby, P. 2001. **Habitat management for invertebrates: A practical handbook.** Bedfordshire: Royal Society for the Protection of Birds.

<http://www.brc.ac.uk/pantheon/> - Accessed 11/08/2023

<https://www.hertsmiddx-butterflies.org.uk/> - Accessed 13/08/2023

[Hertfordshire & Middlesex Moth Group \(hertsmothgroup.org.uk\)](http://Hertfordshire%20%26amp%20Middlesex%20Moth%20Group%20(hertsmothgroup.org.uk)) - Accessed 13/08/2023

<https://srs.britishspiders.org.uk/> - Accessed 13/08/2023

6. Appendix 1: Species List

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Arachnida: Acari	Eriophyidae	<i>Aceria aceriscampestris</i>	a mite gall causer	Common		tree-associated		Predatory
Arachnida: Araneae	Agelenidae	<i>Agelena labyrinthica</i>	Labyrinth Spider	Common	F001	open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Amaurobiidae	<i>Amaurobius fenestralis</i>	a spider	Common		tree-associated	decaying wood	Predatory
Arachnida: Araneae	Araneidae	<i>Agalenatea redii</i>	a spider	Local	F003	open habitats		Predatory
Arachnida: Araneae	Araneidae	<i>Araneus diadematus</i>	Garden Spider	Common		ubiquitous		Predatory
Arachnida: Araneae	Araneidae	<i>Araniella cucurbitina sensu stricto</i>	Cucumber Spider	Common		ubiquitous		Predatory
Arachnida: Araneae	Araneidae	<i>Mangora acalypha</i>	a spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Araneidae	<i>Nuctenea umbratica</i>	Walnut Spider	Common		tree-associated	arboreal; decaying wood	Predatory
Arachnida: Araneae	Araneidae	<i>Zilla diodia</i>	a spider	Local		tree-associated	arboreal	Predatory
Arachnida: Araneae	Clubionidae	<i>Clubiona comta</i>	a spider	Common		tree-associated	arboreal	Predatory

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Arachnida: Araneae	Clubionidae	<i>Clubiona reclusa</i>	a spider	Common		wetland	acid & sedge peats	Predatory
Arachnida: Araneae	Dictynidae	<i>Dictyna arundinacea</i>	a spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Dictynidae	<i>Dictyna uncinata</i>	a spider	Common		tree-associated	arboreal	Predatory
Arachnida: Araneae	Dictynidae	<i>Lathys humilis</i>	a spider	Local		tree-associated	arboreal	Predatory
Arachnida: Araneae	Gnaphosidae	<i>Micaria micans</i>	a spider	Common		open habitats		Predatory
Arachnida: Araneae	Gnaphosidae	<i>Trachyzelotes pedestris</i>	a spider	Local		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Linyphiidae	<i>Microlinyphia pusilla</i>	a spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Linyphiidae	<i>Nerienne peltata</i>	a spider	Common		tree-associated	arboreal	Predatory
Arachnida: Araneae	Lycosidae	<i>Pardosa pullata</i>	a spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Lycosidae	<i>Pardosa saltans</i>	a spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Miturgidae	<i>Cheiracanthium erraticum</i>	a spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Philodromidae	<i>Tibellus oblongus</i>	a spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Pisauridae	<i>Pisaura mirabilis</i>	Nursery-web Spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Tetragnathidae	<i>Metellina menzei</i>	a spider	Common		ubiquitous		Predatory

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Arachnida: Araneae	Tetragnathidae	<i>Tetragnatha extensa</i>	a spider	Common		wetland	acid & sedge peats	Predatory
Arachnida: Araneae	Tetragnathidae	<i>Tetragnatha montana</i>	a spider	Common		wetland	acid & sedge peats	Predatory
Arachnida: Araneae	Theridiidae	<i>Anelosimus vittatus</i>	a spider	Common		tree-associated	arboreal	Predatory
Arachnida: Araneae	Theridiidae	<i>Enoplognatha ovata sensu stricto</i>	a spider	Common		ubiquitous		Predatory
Arachnida: Araneae	Theridiidae	<i>Neottiura bimaculata</i>	a spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Theridiidae	<i>Paidiscura pallens</i>	a spider	Common		tree-associated	arboreal	Predatory
Arachnida: Araneae	Theridiidae	<i>Theridion varians</i>	a spider	Common		tree-associated	arboreal	Predatory
Arachnida: Araneae	Thomisidae	<i>Diaea dorsata</i>	a spider	Common		tree-associated	arboreal	Predatory
Arachnida: Araneae	Thomisidae	<i>Misumena vatia</i>	a spider	Common		open habitats	tall sward & scrub	Predatory
Arachnida: Araneae	Thomisidae	<i>Xysticus cristatus</i>	a spider	Common		open habitats		Predatory
Coleoptera	Byrrhidae	<i>Byrrhus pilula</i>	a pill beetle	Common		open habitats	short sward & bare ground	Saprophagous
Coleoptera	Byturidae	<i>Byturus tomentosus</i>	a raspberry beetle	Common		open habitats	tall sward & scrub	Rubus

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Coleoptera	Cantharidae	<i>Cantharis cryptica</i>	a soldier beetle	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Cantharidae	<i>Cantharis flavilabris</i> (=nigra auctt.) <i>black scutellum</i>	a soldier beetle	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Cantharidae	<i>Cantharis livida</i>	a soldier beetle	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Cantharidae	<i>Cantharis rufa</i>	a soldier beetle	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Cantharidae	<i>Cantharis rustica</i>	a soldier beetle	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Cantharidae	<i>Malthinus flaveolus</i>	a soldier beetle	Common	A212	tree-associated	decaying wood	Saproxyllic
Coleoptera	Cantharidae	<i>Malthinus seriepunctatus</i>	a soldier beetle	Local	A212	tree-associated	decaying wood	Saproxyllic
Coleoptera	Cantharidae	<i>Malthodes marginatus</i>	a soldier beetle	Common	A212	tree-associated	decaying wood	Saproxyllic
Coleoptera	Cantharidae	<i>Rhagonycha lutea</i>	a soldier beetle	NS		tree-associated	arboreal	Predatory
Coleoptera	Cantharidae	<i>Rhagonycha nigriventris</i>	a soldier beetle	Common				Predatory
Coleoptera	Carabidae	<i>Abax parallelepipedus</i>	a ground beetle	Common		shaded woodland floor	shaded woodland floor	Predatory
Coleoptera	Carabidae	<i>Brachinus crepitans</i>	Bombardier Beetle	NS	F111	open habitats	short sward & bare ground	Predatory

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Coleoptera	Carabidae	<i>Harpalus affinis</i>	a ground beetle	Common		open habitats	short sward & bare ground	Herbivore
Coleoptera	Carabidae	<i>Harpalus rufipes</i>	a ground beetle	Common	F003	open habitats	tall sward & scrub	Herbivore
Coleoptera	Carabidae	<i>Microlestes minutulus</i>	a ground beetle	Common		open habitats	short sward & bare ground	Predatory
Coleoptera	Carabidae	<i>Pterostichus madidus</i>	a ground beetle	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Cerambycidae	<i>Grammoptera ruficornis</i>	a longhorn beetle	Common	A212	tree-associated	decaying wood	Saproxyllic
Coleoptera	Cerambycidae	<i>Pseudovadonia livida</i>	a longhorn beetle	Common		open habitats	tall sward & scrub	Herbivore
Coleoptera	Cerambycidae	<i>Rutpela maculata</i>	a longhorn beetle	Common	A212	tree-associated	decaying wood	Saproxyllic
Coleoptera	Chrysomelidae	<i>Altica lythri</i>	a flea beetle	Common		open habitats	tall sward & scrub	Epilobium
Coleoptera	Chrysomelidae	<i>Aphthona euphorbiae</i>	a flea beetle	Common		open habitats	tall sward & scrub	Polyphagous
Coleoptera	Chrysomelidae	<i>Bruchidius varius</i>	a seed beetle	Common		open habitats	tall sward & scrub	Trifolium
Coleoptera	Chrysomelidae	<i>Bruchus rufimanus</i>	a seed beetle	Common		open habitats	tall sward & scrub	Lathyrus, Vicia

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Coleoptera	Chrysomelidae	<i>Cassida nobilis</i>	a tortoise beetle	NS		open habitats	tall sward & scrub	Polyphagous
Coleoptera	Chrysomelidae	<i>Hermaeophaga mercurialis</i>	a flea beetle	Local		tree-associated	shaded woodland floor	Mercurialis perennis
Coleoptera	Chrysomelidae	<i>Longitarsus melanocephalus</i>	a flea beetle	Common		open habitats	tall sward & scrub	Plantago
Coleoptera	Coccinellidae	<i>Adalia decempunctata</i>	10 spot Ladybird	Common		tree-associated	arboreal	Predatory
Coleoptera	Coccinellidae	<i>Coccinella septempunctata</i>	7 spot Ladybird	Common		ubiquitous		Predatory
Coleoptera	Coccinellidae	<i>Harmonia axyridis</i>	Harlequin Ladybird	Common		ubiquitous		Predatory
Coleoptera	Coccinellidae	<i>Propylea quattuordecimpunctata</i>	14 spot Ladybird	Common		ubiquitous		Predatory
Coleoptera	Coccinellidae	<i>Psyllobora vigintiduopunctata</i>	22 spot Ladybird	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Coccinellidae	<i>Rhyzobius litura</i>	a ladybird	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Coccinellidae	<i>Tytthaspis sedecimpunctata</i>	16 spot Ladybird	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Dermestidae	<i>Anthrenus verbasci</i>	a carpet beetle	Common		open habitats		Nectivore
Coleoptera	Elateridae	<i>Agriotes acuminatus</i>	a click beetle	Common		open habitats	tall sward & scrub	Herbivore

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Coleoptera	Elateridae	<i>Agriotes sputator</i>	a click beetle	Common		open habitats	tall sward & scrub	Herbivore
Coleoptera	Elateridae	<i>Athous haemorrhoidalis</i>	a click beetle	Common		open habitats	tall sward & scrub	Herbivore
Coleoptera	Elateridae	<i>Dalopius marginatus</i>	a click beetle	Common		open habitats	tall sward & scrub	Herbivore
Coleoptera	Helophoridae	<i>Helophorus grandis</i>	a water beetle	Common		wetland	marshland	Aquatic predator
Coleoptera	Kateretidae	<i>Brachypterus glaber</i>	a pollen beetle	Common		ubiquitous		Urtica
Coleoptera	Malachiidae	<i>Cordylepherus viridis</i>	a malachite beetle	Common	F112	open habitats	short sward & bare ground	Nectivore
Coleoptera	Malachiidae	<i>Malachius bipustulatus</i>	Malachite Beetle	Common	A212	tree-associated	decaying wood	Nectivore
Coleoptera	Melyridae	<i>Sphinginus lobatus</i>	a melyrid beetle	Local	A212	tree-associated	decaying wood	Quercus
Coleoptera	Nitidulidae	<i>Meligethes aeneus</i>	a pollen beetle	Common		ubiquitous		Nectivore
Coleoptera	Oedemeridae	<i>Oedemera lurida</i>	Sage Green Flower Beetle	Common		open habitats	tall sward & scrub	Nectivore
Coleoptera	Oedemeridae	<i>Oedemera nobilis</i>	Thick-legged Flower Beetle	Common		open habitats	tall sward & scrub	Nectivore
Coleoptera	Phalacridae	<i>Olibrus liquidus</i>	a phalacrid beetle	Common		open habitats		Nectivore

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Coleoptera	Scraptiidae	<i>Anaspis fasciata</i>	a flower beetle	Common	A212	tree-associated	decaying wood	Saproxyllic
Coleoptera	Staphylinidae	<i>Anotylus inustus</i>	a rove beetle	Common		open habitats	short sward & bare ground	Coprophagous
Coleoptera	Staphylinidae	<i>Stenus aceris</i>	a rove beetle	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Staphylinidae	<i>Stenus flavipes</i>	a rove beetle	Common		tree-associated; wetland	shaded woodland floor; wet woodland	Predatory
Coleoptera	Staphylinidae	<i>Tachyporus hypnorum</i>	a rove beetle	Common		open habitats	tall sward & scrub	Predatory
Coleoptera	Tenebrionidae	<i>Nalassus laevioctostriatus</i>	a darkling beetle	Common		open habitats; tree-associated	arboreal; decaying wood; tall sward & scrub; upland	Ascomycota
Coleoptera (weevils)	Apionidae	<i>Apion frumentarium</i>	a weevil	Common		open habitats	tall sward & scrub	Rumex
Coleoptera (weevils)	Apionidae	<i>Ceratapion onopordi</i>	a weevil	Common		open habitats	tall sward & scrub	Cirsium etc

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Coleoptera (weevils)	Apionidae	<i>Kalcapion pallipes</i>	a weevil	Local		tree-associated	shaded woodland floor	Mercurialis perennis
Coleoptera (weevils)	Apionidae	<i>Protapion assimile</i>	a weevil	Common		open habitats	tall sward & scrub	Trifolium
Coleoptera (weevils)	Apionidae	<i>Protapion fulvipes</i>	a weevil	Common		open habitats	tall sward & scrub	Trifolium
Coleoptera (weevils)	Apionidae	<i>Protapion ononidis</i>	a weevil	Local	F112	open habitats	short sward & bare ground	Ononis repens
Coleoptera (weevils)	Curculionidae	<i>Ceutorhynchus obstrictus</i> (=assimilis auctt.)	a weevil	Common		open habitats		Brassicas
Coleoptera (weevils)	Curculionidae	<i>Curculio glandium</i>	a weevil	Common		tree-associated	arboreal	Quercus
Coleoptera (weevils)	Curculionidae	<i>Larinus carlinae</i>	a weevil	Common		open habitats		Cirsium etc
Coleoptera (weevils)	Curculionidae	<i>Mecinus pascuorum</i>	a weevil	Common		open habitats	tall sward & scrub	Plantago
Coleoptera (weevils)	Curculionidae	<i>Nedys quadrimaculatus</i>	a weevil	Common		open habitats	tall sward & scrub	Urtica dioica
Coleoptera (weevils)	Curculionidae	<i>Parethelcus pollinarius</i>	a weevil	Common		open habitats	tall sward & scrub	Urtica dioica
Coleoptera (weevils)	Curculionidae	<i>Phyllobius pomaceus</i>	a weevil	Common		open habitats	tall sward & scrub	Urtica
Coleoptera (weevils)	Curculionidae	<i>Phyllobius pyri</i>	a weevil	Common		tree-associated	arboreal	Polyphagous

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Coleoptera (weevils)	Curculionidae	<i>Phyllobius roboretanus</i>	a weevil	Common		open habitats	tall sward & scrub	Polyphagous
Coleoptera (weevils)	Curculionidae	<i>Sitona lineatus</i>	a weevil	Common		open habitats	tall sward & scrub	Vicia etc
Coleoptera (weevils)	Curculionidae	<i>Trichosiromus troglodytes</i>	a weevil	Common		open habitats	tall sward & scrub	Plantago
Coleoptera (weevils)	Rhynchitidae	<i>Tatianaerhynchites aequatus</i>	a weevil	Common		tree-associated		Crataegus etc
Dermaptera	Forficulidae	<i>Forficula auricularia</i>	Common Earwig	Common		ubiquitous		
Diptera	Agromyzidae	<i>Phytomyza chaerophylli</i>	a leaf mining fly	Common		open habitats		Umbellifers
Diptera	Agromyzidae	<i>Phytomyza ilicis</i>	a leaf mining fly	Common		tree-associated		Ilex
Diptera	Asilidae	<i>Dioctria baumhaueri</i>	a robber fly	Local	F001	open habitats	tall sward & scrub	Predatory
Diptera	Asilidae	<i>Dioctria rufipes</i>	a robber fly	Local	F001	open habitats	tall sward & scrub	Predatory
Diptera	Bibionidae	<i>Dilophus febrilis</i>	a bibionid fly	Common		open habitats	tall sward & scrub	Herbivore
Diptera	Bombyliidae	<i>Bombylius major</i>	Common Bee-fly	Common		open habitats	tall sward & scrub	Andrena parasite
Diptera	Calliphoridae	<i>Lucilia sericata</i>	Common Greenbottle	Common		ubiquitous		Saprophagous
Diptera	Cecidomyiidae	<i>Dasineura fraxini</i>	a gall midge	Common		tree-associated		Fraxinus

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Diptera	Conopidae	<i>Sicus ferrugineus</i>	a parasitic fly	Local		open habitats	short sward & bare ground	Bombus parasite
Diptera	Empididae	<i>Empis tessellata</i>	a dance fly	Common		open habitats	tall sward & scrub	Predatory
Diptera	Empididae	<i>Empis trigramma</i>	a dance fly	Common		open habitats	tall sward & scrub	Predatory
Diptera	Empididae	<i>Rhamphomyia tarsata</i>	a dance fly	Common		tree-associated	shaded woodland floor	Predatory
Diptera	Limoniidae	<i>Limonia nigropunctata</i>	a crane fly	Local		tree-associated	shaded woodland floor	Saprophagous
Diptera	Limoniidae	<i>Limonia phragmitidis</i>	a crane fly	Common		tree-associated	shaded woodland floor	Saprophagous
Diptera	Opomyzidae	<i>Geomyza tripunctata</i>	a picture-winged fly	Common		open habitats; tree-associated; wetland	shaded woodland floor; tall sward & scrub	Poaceae
Diptera	Rhagionidae	<i>Rhagio tringarius</i>	a snipe fly	Common		open habitats; wetland	tall sward & scrub	Saprophagous
Diptera	Sarcophagidae	<i>Sarcophaga carnaria</i>	a flesh fly	Common		ubiquitous		Lumbricidae

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Diptera	Scathophagidae	<i>Scathophaga stercoraria</i>	Yellow Dung Fly	Common		open habitats	tall sward & scrub	Coprophagus & Predatory
Diptera	Stratiomyidae	<i>Pachygaster atra</i>	a soldierfly	Common		tree-associated	shaded woodland floor	Saprophagous
Diptera	Syrphidae	<i>Epistrophe eligans</i>	a hoverfly	Common		tree-associated	arboreal	Nectivore
Diptera	Syrphidae	<i>Episyrphus balteatus</i>	a hoverfly	Common		open habitats	tall sward & scrub	Nectivore
Diptera	Syrphidae	<i>Eristalis arbustorum</i>	a hoverfly	Common		wetland	acid & sedge peats	Nectivore
Diptera	Syrphidae	<i>Eristalis pertinax</i>	a hoverfly	Common		wetland	acid & sedge peats	Nectivore
Diptera	Syrphidae	<i>Eristalis tenax</i>	a hoverfly	Common		wetland	rich flower resource	Nectivore
Diptera	Syrphidae	<i>Myathropa florea</i>	a hoverfly	Common	A211	tree-associated	decaying wood	Nectivore
Diptera	Syrphidae	<i>Sphaerophoria scripta</i>	a hoverfly	Common		open habitats	tall sward & scrub	Nectivore
Diptera	Syrphidae	<i>Syrphus ribesii</i>	a hoverfly	Common		open habitats		Nectivore
Diptera	Syrphidae	<i>Xanthogramma pedissequum sensu stricto</i>	a hoverfly	Common		open habitats		Nectivore

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Diptera	Tabanidae	<i>Haematopota pluvialis</i>	a horsefly	Common		wetland	acid & sedge peats	Mammalia
Diptera	Tephritidae	<i>Chaetostomella cylindrica</i>	a picture-winged fly	Common		open habitats	short sward & bare ground; tall sward & scrub	Centaurea nigra
Diptera	Tephritidae	<i>Urophora quadrifasciata</i>	a picture-winged fly	Local		open habitats	short sward & bare ground; tall sward & scrub	Centaurea nigra
Diptera	Tipulidae	<i>Nephrotoma appendiculata</i>	a crane fly	Common		open habitats	tall sward & scrub	Herbivore
Diptera	Tipulidae	<i>Nephrotoma flavescens</i>	a crane fly	Common		open habitats	tall sward & scrub	Herbivore
Entomobryomorpha	Entomobryidae	<i>Orchesella cincta</i>	a springtail	Common				
Hemiptera	Cydnidae	<i>Legnotus limbosus</i>	a shieldbug	Common	F112	open habitats	short sward & bare ground	Galium
Hemiptera: Auchenorrhyncha	Aphrophoridae	<i>Philaenus spumarius</i>	a leafhopper	Common		ubiquitous		Polyphagous
Hemiptera: Auchenorrhyncha	Cicadellidae	<i>Oncopsis flavicollis</i>	a leafhopper	Common		tree-associated	arboreal	Betula

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Hemiptera: Auchenorrhyncha	Cicadellidae	<i>Speudotettix subfuscus</i>	a leafhopper	Common	F001	open habitats	tall sward & scrub	Quercus
Hemiptera: Auchenorrhyncha	Cixiidae	<i>Tachycixius pilosus</i>	a leafhopper	Common		tree-associated		
Hemiptera: Auchenorrhyncha	Psyllidae	<i>Psyllopsis fraxini</i>	a psyllid bug	Common		tree-associated		Fraxinus
Hemiptera: Heteroptera	Anthocoridae	<i>Anthocoris confusus</i>	a predatory bug	Common		tree-associated	arboreal	Predatory
Hemiptera: Heteroptera	Anthocoridae	<i>Anthocoris nemoralis</i>	a predatory bug	Common		tree-associated	arboreal	Predatory
Hemiptera: Heteroptera	Anthocoridae	<i>Anthocoris nemorum</i>	a predatory bug	Common		ubiquitous		Predatory
Hemiptera: Heteroptera	Coreidae	<i>Coreus marginatus</i>	a squashbug	Common		open habitats	tall sward & scrub	Rumex
Hemiptera: Heteroptera	Lygaeidae	<i>Aphanus rolandri</i>	a ground bug	[Na]		open habitats	short sward & bare ground	Herbivore
Hemiptera: Heteroptera	Lygaeidae	<i>Heterogaster urticae</i>	a ground bug	Common		open habitats	tall sward & scrub	Urtica dioica
Hemiptera: Heteroptera	Lygaeidae	<i>Kleidocerys resedae</i>	a ground bug	Common		tree-associated	arboreal	Betula
Hemiptera: Heteroptera	Lygaeidae	<i>Megalonotus emarginatus</i>	a ground bug	Local		open habitats	short sward & bare ground	Herbivore

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Hemiptera: Heteroptera	Lygaeidae	<i>Metopoplax ditomoides</i>	a ground bug	Common		open habitats	short sward & bare ground	Herbivore
Hemiptera: Heteroptera	Lygaeidae	<i>Nysius senecionis</i>	a ground bug	Common		open habitats	short sward & bare ground	Herbivore
Hemiptera: Heteroptera	Lygaeidae	<i>Scolopostethus affinis</i>	a ground bug	Common		open habitats	short sward & bare ground	Urtica
Hemiptera: Heteroptera	Lygaeidae	<i>Taphropeltus contractus</i>	a ground bug	Common		open habitats	short sward & bare ground	Herbivore
Hemiptera: Heteroptera	Miridae	<i>Acetropis (Acetropis) gimmerthalii</i>	a plant bug	Common		open habitats	tall sward & scrub	Herbivore
Hemiptera: Heteroptera	Miridae	<i>Amblytulus nasutus</i>	a plant bug	Common		open habitats	tall sward & scrub	Herbivore
Hemiptera: Heteroptera	Miridae	<i>Campyloneura virgula</i>	a plant bug	Common		tree-associated	arboreal	Predatory
Hemiptera: Heteroptera	Miridae	<i>Capsus ater</i>	a plant bug	Common		open habitats	tall sward & scrub	Poaceae
Hemiptera: Heteroptera	Miridae	<i>Closterotomus norwegicus</i>	a plant bug	Common		open habitats	tall sward & scrub	Polyphagous

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Hemiptera: Heteroptera	Miridae	<i>Deraeocoris</i> (<i>Deraeocoris</i>) <i>flavilinea</i>	a plant bug	Common		tree-associated		Acer
Hemiptera: Heteroptera	Miridae	<i>Deraeocoris</i> (<i>Deraeocoris</i>) <i>ruber</i>	a plant bug	Common		open habitats	tall sward & scrub	Polyphagous
Hemiptera: Heteroptera	Miridae	<i>Dicyphus</i> (<i>Brachyceroea</i>) <i>annulatus</i>	a plant bug	Common	F112	open habitats	short sward & bare ground	Ononis repens
Hemiptera: Heteroptera	Miridae	<i>Halticus luteicollis</i>	a plant bug	Local	F112	open habitats	short sward & bare ground	Galium
Hemiptera: Heteroptera	Miridae	<i>Harpocera thoracica</i>	a plant bug	Common		tree-associated	arboreal	Quercus
Hemiptera: Heteroptera	Miridae	<i>Heterotoma planicornis</i>	a plant bug	Common		open habitats	tall sward & scrub	Urtica
Hemiptera: Heteroptera	Miridae	<i>Leptopterna dolabrata</i>	a plant bug	Common		open habitats	tall sward & scrub	Poaceae
Hemiptera: Heteroptera	Miridae	<i>Liocoris tripustulatus</i>	a plant bug	Common		open habitats	tall sward & scrub	Urtica dioica
Hemiptera: Heteroptera	Miridae	<i>Lygocoris</i> (<i>Lygocoris</i>) <i>pabulinus</i>	a plant bug	Common		open habitats	tall sward & scrub	Urtica
Hemiptera: Heteroptera	Miridae	<i>Macrotylus</i> (<i>Alloeonycha</i>) <i>paykulli</i>	a plant bug	Common	F112	open habitats	short sward & bare ground	Ononis repens

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Hemiptera: Heteroptera	Miridae	<i>Megaloceroea recticornis</i>	a plant bug	Common		open habitats	tall sward & scrub	Poaceae
Hemiptera: Heteroptera	Miridae	<i>Phylus (Phylus) coryli</i>	a plant bug	Common		tree- associated	arboreal	Corylus
Hemiptera: Heteroptera	Miridae	<i>Plagiognathus (Plagiognathus) arbustorum</i>	a plant bug	Common		open habitats	tall sward & scrub	Urtica
Hemiptera: Heteroptera	Miridae	<i>Plagiognathus (Plagiognathus) chrysanthemi</i>	a plant bug	Common		open habitats	short sward & bare ground	Asteraceae
Hemiptera: Heteroptera	Miridae	<i>Polymerus (Polymerus) nigrita</i>	a plant bug	Common		open habitats	tall sward & scrub	Galium
Hemiptera: Heteroptera	Miridae	<i>Psallus (Psallus) flavellus</i>	a plant bug	Common		tree- associated	arboreal	Fraxinus
Hemiptera: Heteroptera	Miridae	<i>Psallus (Psallus) varians</i>	a plant bug	Common		tree- associated	arboreal	Quercus
Hemiptera: Heteroptera	Miridae	<i>Rhabdomiris striatellus</i>	a plant bug	Common		tree- associated	arboreal	Quercus
Hemiptera: Heteroptera	Miridae	<i>Stenodema (Stenodema) laevigata</i>	a plant bug	Common		open habitats	tall sward & scrub	Poaceae
Hemiptera: Heteroptera	Miridae	<i>Stenotus binotatus</i>	a plant bug	Common		open habitats	tall sward & scrub	Poaceae
Hemiptera: Heteroptera	Nabidae	<i>Himacerus (Aptus) mirmicoides</i>	a nabid bug	Common		open habitats	tall sward & scrub	Predatory
Hemiptera: Heteroptera	Nabidae	<i>Nabis (Nabis) rugosus</i>	a nabid bug	Common		open habitats	tall sward & scrub	Predatory

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Hemiptera: Heteroptera	Pentatomidae	<i>Aelia acuminata</i>	a shieldbug	Local		open habitats	tall sward & scrub	Poaceae
Hemiptera: Heteroptera	Pentatomidae	<i>Eysarcoris venustissimus</i>	a shieldbug	Common	F001	open habitats	tall sward & scrub	Stachys sylvatica
Hemiptera: Heteroptera	Pentatomidae	<i>Palomena prasina</i>	a shieldbug	Common		open habitats	tall sward & scrub	Polyphagous
Hemiptera: Heteroptera	Pentatomidae	<i>Pentatoma rufipes</i>	a shieldbug	Common		tree-associated	arboreal	Quercus
Hemiptera: Heteroptera	Pentatomidae	<i>Podops inuncta</i>	a shieldbug	Common	F112	open habitats	short sward & bare ground	Poaceae
Hemiptera: Heteroptera	Piesmatidae	<i>Piesma maculatum</i>	a beet bug	Common		open habitats	short sward & bare ground	Amaranthaceae
Hemiptera: Heteroptera	Tingidae	<i>Physatocheila dumetorum</i>	a lace bug	Common	A215	tree-associated	arboreal; decaying wood	Herbivore
Hymenoptera: Aculeata	Andrenidae	<i>Andrena flavipes</i>	a solitary bee	Common	F002	open habitats	short sward & bare ground	Nectivore
Hymenoptera: Aculeata	Andrenidae	<i>Andrena labialis</i>	a solitary bee	Local	F002	open habitats	short sward & bare ground	Nectivore

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Hymenoptera: Aculeata	Apidae	<i>Apis mellifera</i>	Honey Bee	Common	F002	open habitats		Nectivore
Hymenoptera: Aculeata	Apidae	<i>Bombus pascuorum</i>	a bumblebee	Common	F002	open habitats	tall sward & scrub	Nectivore
Hymenoptera: Aculeata	Apidae	<i>Bombus sylvestris</i>	a bumblebee	Common	F002	open habitats; tree-associated	shaded woodland floor	Bombus parasitoid
Hymenoptera: Aculeata	Apidae	<i>Bombus terrestris</i>	a bumblebee	Common	F002	open habitats	tall sward & scrub	Nectivore
Hymenoptera: Aculeata	Apidae	<i>Nomada fucata</i>	a nomad bee	[Na]	F002	open habitats	short sward & bare ground	Andrena flavipes cleptoparasite
Hymenoptera: Aculeata	Bethylidae	<i>Bethylus boops</i>	a solitary wasp	Common				
Hymenoptera: Aculeata	Formicidae	<i>Lasius brunneus</i>	Brown Tree Ant	[Na]	A211	tree-associated	decaying wood	Saproxylc
Hymenoptera: Aculeata	Formicidae	<i>Lasius niger</i>	an ant	Common		open habitats	short sward & bare ground	
Hymenoptera: Aculeata	Formicidae	<i>Lasius platythorax</i>	an ant	Common		open habitats	short sward & bare ground	

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Hymenoptera: Aculeata	Formicidae	<i>Myrmica ruginodis</i>	an ant	Common		tree-associated	shaded woodland floor	Arthropoda, Plantae
Hymenoptera: Aculeata	Formicidae	<i>Myrmica scabrinodis</i>	an ant	Common		open habitats	tall sward & scrub	
Hymenoptera: Aculeata	Formicidae	<i>Temnothorax nylanderii</i>	an ant	Local	A212	tree-associated	decaying wood	Saproxylis
Hymenoptera: Aculeata	Halictidae	<i>Lasioglossum malachurum</i>	a solitary bee	[Nb]	F002	open habitats	short sward & bare ground	Nectivore
Hymenoptera: Aculeata	Halictidae	<i>Lasioglossum villosulum</i>	a solitary bee	Common	F002	open habitats	short sward & bare ground	Nectivore
Hymenoptera: Aculeata	Megachilidae	<i>Osmia caerulea</i>	a solitary bee	Common	F002	open habitats	tall sward & scrub	Nectivore
Hymenoptera: Aculeata	Vespidae	<i>Vespula vulgaris</i>	Common Wasp	Common		open habitats	tall sward & scrub	Predatory
Hymenoptera: Parasitica	Ichneumonidae	<i>Gelis areator</i>	a parasitic wasp	Common		open habitats		Arachnida
Hymenoptera: Symphyta	Cephidae	<i>Cephus spinipes</i>	a sawfly	Common		open habitats		Poaceae
Hymenoptera: Symphyta	Tenthredinidae	<i>Hoplocampa crataegi</i>	a sawfly	Common		open habitats		Crataegus
Hymenoptera: Symphyta	Tenthredinidae	<i>Macrophya punctum album</i>	a sawfly	Common		open habitats		Ligustrum

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Hymenoptera: Symphyta	Tenthredinidae	<i>Tenthredo maculata</i>	a sawfly	Common		open habitats		Poaceae
Isopoda	Armadillidiidae	<i>Armadillidium vulgare</i>	Pill Woodlouse	Common		ubiquitous		DOM
Isopoda	Oniscidae	<i>Oniscus asellus</i>	Shining Woodlouse	Common		ubiquitous		DOM
Isopoda	Philosciidae	<i>Philoscia muscorum</i>	Striped Woodlouse	Common		ubiquitous		DOM
Isopoda	Porcellionidae	<i>Porcellio scaber</i>	Rough Woodlouse	Common		ubiquitous		DOM
Lepidoptera (butterflies)	Hesperiidae	<i>Ochlodes sylvanus</i>	Large Skipper	Common		open habitats		Poaceae
Lepidoptera (butterflies)	Lycaenidae	<i>Polyommatus icarus</i>	Common Blue	Common		open habitats	short sward & bare ground	Lotus etc
Lepidoptera (butterflies)	Nymphalidae	<i>Aglais io</i>	Peacock	Common		open habitats	tall sward & scrub	Humulus lupulus, Urtica
Lepidoptera (butterflies)	Nymphalidae	<i>Coenonympha pamphilus</i>	Small Heath	S41 Priority Species; VU	F112	open habitats	short sward & bare ground	Poaceae
Lepidoptera (butterflies)	Nymphalidae	<i>Maniola jurtina</i>	Meadow Brown	Common		open habitats	tall sward & scrub	Poaceae
Lepidoptera (butterflies)	Nymphalidae	<i>Melanargia galathea</i>	Marbled White	Common		open habitats	tall sward & scrub	Poaceae
Lepidoptera (butterflies)	Nymphalidae	<i>Pararge aegeria</i>	Speckled Wood	Common	F001	open habitats	tall sward & scrub	Poaceae

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Lepidoptera (butterflies)	Nymphalidae	<i>Vanessa atalanta</i>	Red Admiral	Common		ubiquitous		Humulus lupulus, Urtica
Lepidoptera (butterflies)	Pieridae	<i>Gonepteryx rhamni</i>	Brimstone	Common		tree-associated		Frangula alnus, Rhamnus cathartica
Lepidoptera (butterflies)	Pieridae	<i>Pieris brassicae</i>	Large White	Common		open habitats		Brassicas
Lepidoptera (butterflies)	Pieridae	<i>Pieris rapae</i>	Small White	Common		open habitats		Brassicas
Lepidoptera (macro moths)	Geometridae	<i>Camptogramma bilineata</i>	Yellow Shell	Common		open habitats	tall sward & scrub	Rumex, Stellaria media
Lepidoptera (micro moths)	Adelidae	<i>Adela reaumurella</i>	a micro moth	Common		tree-associated	shaded woodland floor	
Lepidoptera (micro moths)	Adelidae	<i>Nematopogon swammerdamella</i>	a micro moth	Common		tree-associated	shaded woodland floor	
Lepidoptera (micro moths)	Crambidae	<i>Crambus lathoniellus</i>	a micro moth	Common		open habitats		Poaceae
Lepidoptera (micro moths)	Glyphipterigidae	<i>Glyphipterix simplicella</i>	a micro moth	Common		open habitats	tall sward & scrub	Poaceae
Lepidoptera (micro moths)	Gracillariidae	<i>Acrocercops brongniardella</i>	a micro moth	Local		tree-associated	arboreal	Quercus
Lepidoptera (micro moths)	Nepticulidae	<i>Stigmella aurella</i>	a micro moth	Common		open habitats	tall sward & scrub	Rubus
Lepidoptera (micro moths)	Psychidae	<i>Psyche casta</i>	a micro moth	Common		open habitats	tall sward & scrub	Lichens, Poaceae

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Lepidoptera (micro moths)	Pterophoridae	<i>Marasmarcha lunaedactyla</i>	Crescent Plume	Local		open habitats	short sward & bare ground	Ononis
Lepidoptera (micro moths)	Pyalidae	<i>Homoeosoma sinuella</i>	a micro moth	Common		open habitats		Plantago
Orthoptera	Phaneropteridae	<i>Leptophyes punctatissima</i>	Speckled Bush-cricket	Common	F001	open habitats	tall sward & scrub	Omnivore
Orthoptera	Tettigoniidae	<i>Pholidoptera griseoptera</i>	Dark Bush-cricket	Common	F001	open habitats	tall sward & scrub	Omnivore
Psocoptera	Ectopsocidae	<i>Ectopsocus petersi</i>	a bark fly	Common		tree-associated		Herbivore
Psocoptera	Mesopsocidae	<i>Mesopsocus immunis</i>	a bark fly	Common		tree-associated		Herbivore
Psocoptera	Psocidae	<i>Loensia variegata</i>	a bark fly	Common		tree-associated		Herbivore
Psocoptera	Stenopsocidae	<i>Graphopsocus cruciatus</i>	a bark fly	Common		tree-associated		Herbivore
Pulmonata	Helicidae	<i>Cornu aspersum</i>	Garden Snail	Common		open habitats	tall sward & scrub	Herbivore
Pulmonata	Hygromiidae	<i>Monacha (Monacha) cantiana</i>	Kentish Snail	Common		open habitats	tall sward & scrub	Herbivore
Pulmonata	Oxychilidae	<i>Oxychilus (Oxychilus) alliarius</i>	Garlic Snail	Common		conifer or broadleaved	woodland habitat	Herbivore

Order	Family	Species	Common Name	Status	SATs	Broad biotope	Habitat	Associations
Pulmonata	Patulidae	<i>Discus (Gonyodiscus) rotundatus</i>	Disc Snail	Common		shaded woodland floor	shaded woodland floor	Herbivore
Raphidioptera	Raphidiidae	<i>Phaeostigma notata</i>	a snakefly	Local	A212	tree-associated	decaying wood	Quercus

Appendix 9.11

Biodiversity Net Gain

Biodiversity gain plan

Submit a biodiversity gain plan to show how your development will achieve biodiversity net gain.

When to use this form

A biodiversity gain plan shows how a development will achieve 10% biodiversity net gain (BNG). Submit this form to your local planning authority after they approve your planning application.

Unless your development is exempt, you cannot start the development until the LPA approves your biodiversity gain plan and biodiversity metric calculation tool.

1. Submission details

1.1 Date

For example, 3/11/2023

TBC

1.2 Planning application reference number

TBC

1.3 Local planning authority (LPA)

North Hertfordshire Council

1.4 Development site address

If the site does not have an address, enter the OS grid reference.

North East Stevenage

1.5 Describe the development

Tell us about the proposed development and any changes of use (250 words).

Mixed use (residential) development

2. Developer details

2.1 Applicant name

Edward Keymer (Agent)

2.2 Company name

Picture Estates Limited

2.3 Address

2.4 Email address

2.5 Telephone number

2.6 Declaration

By signing this declaration, you confirm that the information you give is complete and correct. Any opinions are your genuine opinions.

2.7 Signature

2.8 Date

TBC

3. Responsible person details

Tell us about who is responsible for completing the biodiversity gain plan. For example, a consultancy ecologist or planning agent.

3.1 Name

Jamie Woollam

3.2 Company name

CSA Environmental

3.3 Address

3.4 Email address

3.5 Telephone number

3.6 Declaration

By signing this declaration, you confirm that the information you give is complete and correct. Any opinions are your genuine opinions.

3.7 Signature

3.8 Date

-

4. Biodiversity net gain strategy

4.1 Is the relevant date for the pre-development biodiversity value the same date as the planning application?

- ☒ Yes
☐ No

4.2 If no, what earlier date did you agree with the LPA?

4.3 How have you met the guidance on ‘what counts towards your BNG’?

[Find out what you can count towards a development’s BNG](#)

The development includes a range of habitats within public open space, drainage features and structural landscape across the site, including neutral grassland, mixed scrub, woodland and ponds

4.4 How will you avoid or minimise impacts to habitats?

Tell us about the steps you’ve taken on site, including to avoid or minimise the impact on irreplaceable habitats.

Ancient woodland buffer planting is proposed along with protective fencing during and after construction.

4.5 Did you use your local nature recovery strategy to inform the strategic significance of habitats?

This includes other specified strategies if you do not have a local nature recovery strategy.

- ☐ Yes
☒ No

4.6 How will you achieve the target net gain percentage?

- ☒ On-site
☐ Off-site
☐ Both

4.7 Are any of your on-site enhancements considered ‘significant’?

[Find out what counts as a significant on-site enhancement.](#)

- ☒ Yes
☐ No

4.8 If yes, tell us about the significant on-site enhancements

Include the appropriate planning condition or how you've secured the habitat.

Neutral grassland, mixed scrub, urban and rural trees, ponds, woodland and hedgerow planting

4.9 How many off-site biodiversity units do you need to meet 10% net gain?

0

4.10 Explain why you're using off-site biodiversity units

Only answer this question if you're planning to use off-site biodiversity units (250 words).

n/a

4.11 Explain why you're planning to use statutory biodiversity credits

Only answer this question if you're planning to use statutory biodiversity credits (250 words).

n/a

4.12 Do you have a habitat management and monitoring plan?

☒ Yes

☐ No

4.13 Have you used the statutory biodiversity metric tool?

☒ Yes

☐ No

4.14 Biodiversity metric calculation

Send your biodiversity metric calculation to the LPA and enter the file name.

0993_20250411_Statutory Metric_UPDATE

4.15 Condition assessments

Send your condition assessments to the LPA and enter the file name.

0993_Condition Assessments

4.16 Pre-development habitat survey report and map

Send your baseline habitat survey report and map to the LPA. Enter the file name.

0993_140_B_Habitats Plan

4.17 Post-development habitat map or landscape plan

Send your post-development habitat survey report and map to the LPA. Enter the file name.

0993_154_Proposed Habitats Plan_

4.18 Have you included an approved habitat degradation in the baseline?

If yes, include the relevant consenting body and reference number.

☐ Yes

☒ No

Consenting body

Reference number

5. Irreplaceable habitats

5.1 Does the development impact any irreplaceable habitats?

If yes, tell us if you've submitted an approved compensation plan.

☒ Yes

☐ No

5.2 Have you submitted an approved compensation plan?

☐ Yes

☒ No

6. On-site habitat enhancements

Answer this section if your development includes on-site habitat enhancements.

6.1 Survey date

For example, 3/11/2023

Multiple visits: 13 March 2023 to 12 December 2024

6.2 Survey constraints

For example, access issues, weather, or seasonal constraints.

See ES Chapter. "6.63 There were no specific limitations to the desk study or field surveys, which were conducted at an optimum time of year and in good conditions. Limitations to further detailed field survey work are addressed in the relevant appendix/appendices. Update site visits in 2024 allowed for review of previous survey findings from 2023 to ensure these remain applicable and accurate to inform the assessment set out herein."

6.3 Total pre-development biodiversity value

Enter the number from the headline results in your statutory biodiversity metric calculation.

Number of area habitat biodiversity units

138.06

Number of hedgerow biodiversity units

24.18

Number of watercourse biodiversity units

0

6.4 Total post-development biodiversity value

Enter the number from the headline results in your statutory biodiversity metric calculation.

Number of area habitat biodiversity units

173.85

Number of hedgerow biodiversity units

33.66

Number of watercourse biodiversity units

0

6.5 Total net change in biodiversity units

Enter the number from the headline results in your statutory biodiversity metric calculation.

Area habitat biodiversity units

35.79

Area habitat biodiversity units % change

25.93

Hedgerow biodiversity units

9.48

Hedgerow biodiversity units % change

39.19

Watercourse biodiversity units

0

Watercourse biodiversity units % change

0

6.6 Will you register and allocate any biodiversity units from your site to other developments?

If yes or provisionally, give details.

☐ Yes

☒ No

6.7 Give details

Tell us about the amount of biodiversity units and the development location (250 words).

n/a

7. Off-site habitat enhancements

Answer this section if your development includes off-site habitat enhancements.

7.1 Tell us about the off-site habitat enhancements

Include whether you're delivering the off-site enhancements or buying biodiversity units.

-

7.2 Biodiversity gain site register reference number

-

7.3 How have you secured the off-site habitat enhancements?

Tell us about any responsible bodies and whether you've used an S106 or conservation covenant.

-

7.4 Total baseline biodiversity value

Enter the number from the headline results in your statutory biodiversity metric calculation.

Number of area habitat biodiversity units

-

Number of hedgerow biodiversity units

-

Number of watercourse biodiversity units

-

7.5 Total biodiversity value post-intervention

Enter the number from the headline results in your statutory biodiversity metric calculation.

Number of area habitat biodiversity units

-

Number of hedgerow biodiversity units

-

Number of watercourse biodiversity units

-

7.6 Total net change in biodiversity units

Enter the number from the headline results in your statutory biodiversity metric calculation.

Area habitat biodiversity units

-

Area habitat biodiversity units % change

-

Hedgerow biodiversity units

-

Hedgerow biodiversity units % change

-

Watercourse biodiversity units

-

Watercourse biodiversity units % change

-

8. Statutory biodiversity credits

Answer this section if you need to use statutory biodiversity credits.

8.1 Do you need to use statutory biodiversity credits?

☐ Yes

☒ No

8.2 How many statutory biodiversity credits do you need?

Tell us the unit shortfall by tier, including the spatial risk multiplier. Enter the number from the headline results in your statutory biodiversity metric calculation.

A1

-

A2

-

A3

-

A4

-

A5

-

H

-

W

-

8.3 What evidence is there that no units are available through the market?

Send a message from at least 3 habitat providers, or a search result from online registers.

-

8.4 Proof of purchase

Send proof of purchase and enter the reference number.

-

9. Trading summary

9.1 Distinctiveness group

Tell us if you met the BNG trading rules on habitat compensation for each distinctiveness group. If you did not meet the trading rules, tell us if you agreed bespoke habitat compensation.

Check the rules on habitat compensation in the [statutory biodiversity metric user guide](#).

Very high

No additional area habitat units required to meet target.

High

No additional area habitat units required to meet target.

Medium

No additional area habitat units required to meet target.

Low

No additional area habitat units required to meet target.

10. Sharing data (optional)

10.1 Can we share your ecological survey data with the Local Environmental Records Centre or other bodies?

☒ Yes

☐ No

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)					
UK Habitat Classification (UKHab) Habitat Type(s)					
Grassland - Modified grassland					
Habitat Description					
F4 comprises two distinct areas of amenity grassland at the time of survey - short mown and long-sward. Grassland forms part of Mendip Way Park recreational area frequented by dog walkers.					
F2 comprises modified grassland enclosed by stock-proof hedgerows. Used for periodic cattle grazing.					
ukhab – UK Habitat Classification					
Site name and location	North-east Stevenage	On-site or off-site			On-site
		Survey reference (if relating to a wider survey)			
Limitations (if applicable)		Habitat parcel reference			
		F2	F4 (short mown)	F4 (long sward)	
		Grid reference			
Condition Assessment Criteria		TL 26072 28110	TL 25808 27546	TL 25911 27590	
		Criterion passed (Yes or No)			Notes (such as justification)
A	There are 6-8 vascular plant species per m² present, including at least 2 forbs (this may include those listed in Footnote 1). Note - this criterion is essential for achieving Moderate or Good condition. Where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, or there are 9 or more of these characteristic species per m² (excluding those listed in Footnote 1), please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland. Where a grassland is classed as medium, high, or very high distinctiveness, please use the relevant condition sheet.	N	Y	Y	All 5 quadrats of F4 (short mown) comprised 7 or 8 species per m, mean = 7.6 F4 (long sward) quadrats comprised 4,8,6,8,7 species per m, mean = 6.6 F2 = quadrats comprise 4,5,4,6,4 species per m, mean=4.6
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for vertebrates and invertebrates to live and breed.	N	N	N	F4 (short mown) - sward height is consistent and uniform <5cm F4 (long sward) and F2- sward height is consistently long >30cm
C	Some scattered scrub (including bramble <i>Rubus fruticosus</i> agg.) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of scrub with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Y	Y	Y	F4 (short sward) = no scrub. F4 (long sward) = occasional salix sp. and bramble but well below 20% of total area F2 = no scrub recorded
D	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	Y	Y	Y	F4 = no physical damage. Walkers generally use paved pathways. F2 = no physical damage, grazing is low intensity
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens) ² .	N	N	N	F4 and F2 = cover of bare ground = 0%
F	Cover of bracken <i>Pteridium aquilinum</i> is less than 20%.	Y	Y	Y	No bracken
G	There is an absence of invasive non-native plant species ³ (as listed on Schedule 9 of WCA ⁴).	Y	Y	Y	None present
Essential criterion achieved (Yes or No)		N	Y	Y	
Number of criteria passed		4	5	5	
Condition Assessment Result (out of 7)	Condition Assessment Score	Score Achieved x/√			
Passes 6 or 7 criteria including passing	Good (3)	x	x	x	
Passes 4 or 5 criteria including passing	Moderate (2)	x	✓	✓	
Passes 3 or fewer criteria;	Poor (1)	✓	x	x	
Suggested enhancement interventions to improve condition score					
Footnotes					
Footnote 1 – Creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, curled dock <i>Rumex crispus</i>, broad-leaved dock <i>Rumex obtusifolius</i>, common nettle <i>Urtica dioica</i>, creeping buttercup <i>Ranunculus repens</i>, greater plantain <i>Plantago major</i>, white clover <i>Trifolium repens</i> and cow parsley <i>Anthriscus sylvestris</i>. Footnote 2 – For example, this could include small, scattered areas of bare ground allowing establishment of new species, or localised patches where not exceeding 10% cover. Footnote 3 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement. Footnote 4 – Wildlife and Countryside Act 1981 (as amended).					

Condition Sheet: SCRUB Habitat Type				
UK Habitat Classification (UKHab) Habitat Type				
Heathland and shrub - Blackthorn scrub Heathland and shrub - Gorse scrub Heathland and shrub - Hawthorn scrub Heathland and shrub - Hazel scrub Heathland and shrub - Mixed scrub Heathland and shrub - Dunes with sea buckthorn (H2160) Heathland and shrub - Willow scrub				
Habitat Description				
For Dunes with sea buckthorn see: Dunes with sea-buckthorn (Dunes with Hippophae rhamnoides) - Special Areas of Conservation (jncc.gov.uk) For other scrub types see: ukhab - UK Habitat Classification				
Site name and location	North-east Stevenage	On-site or off-site		On-site
		Survey reference (if relating to a wider survey)		
Limitations (if applicable)		Habitat parcel reference		
		Scrub within F1	Scrub within F4	
Condition Assessment Criteria		Grid reference		Notes (such as justification)
		TL 25928 28063	TL 25831 27532	
A	The scrub is a good representation of the habitat type it has been identified as, based on its UKHab description (where in its natural range). The appearance and composition of the vegetation closely matches the characteristics of the specific scrub type. At least 80% of scrub is native, and there are at least three native woody species ¹ , with no single species comprising more than 75% of the cover (except hazel <i>Corylus avellana</i> , common juniper <i>Juniperus communis</i> , sea buckthorn <i>Hippophae rhamnoides</i> or box <i>Buxus sempervirens</i> , which can be up to 100% cover).	Yes	Yes	
		No	No	
B	Seedlings, saplings, young shrubs and mature (or ancient or veteran ²) shrubs are all present.	No	No	
C	There is an absence of invasive non-native plant species ³ (as listed on Schedule 9 of WCA ⁴) and species indicative of sub-optimal condition ⁵ make up less than 5% of ground cover.	Yes	Yes	
D	The scrub has a well-developed edge with scattered scrub and tall grassland and or forbs present between the scrub and adjacent habitat.	No	No	
E	There are clearings, glades or rides present within the scrub, providing sheltered edges.	No	No	
Number of criteria passed		2	2	
Condition Assessment Result (out of 5)	Condition Assessment Score	Score Achieved x/✓		
Passes 5 criteria	Good (3)	x	x	
Passes 3 or 4 criteria	Moderate (2)	✓	✓	
Passes 2 or fewer criteria	Poor (1)	x	x	
Suggested enhancement interventions to improve condition score				
Footnotes				
Footnote 1 – Native woody species as defined and listed in the Hedgerow Survey Handbook: DEFRA (2007) <i>Hedgerow Survey Handbook: A standard procedure for local surveys in the UK</i> . 2nd ed. [online]. Defra, London. PB1195. Available from: Hedgerow Survey Handbook (publishing.service.gov.uk). Footnote 2 - See gov.uk standing advice on ancient and veteran species. Available from: Keepers of time: ancient and native woodland and trees policy in England (publishing.service.gov.uk) Ancient woodland, ancient trees and veteran trees: advice for making planning decisions - GOV.UK (www.gov.uk) Footnote 3 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement. Footnote 4 – Wildlife and Countryside Act 1981 (as amended). Footnote 5 - Species indicative of sub-optimal condition for this habitat type may include: non-native conifers, tree-of-heaven <i>Alnus altissima</i> , holm oak <i>Quercus ilex</i> , European turkey oak <i>Quercus cerris</i> , cherry laurel <i>Prunus laurocerasus</i> , snowberry <i>Symphoricarpos</i> spp., shallon <i>Gaultheria shallon</i> , American skunk cabbage <i>Lysichiton americanus</i> , buddleia <i>Buddleja</i> spp., cotoneaster <i>Cotoneaster</i> spp., Spanish bluebell <i>Hyacinthoides hispanica</i> and hybrid bluebells <i>Hyacinthoides x massartiana</i> . There may be additional relevant species local to the region and or site.				

Condition sheet: HEDGEROW Habitat Types

Habitat Type

Native hedgerow

Habitat Description

See the Biodiversity Metric 4.0 User Guide Section 9.

Site name and location

North-east Stevenage

On-site or off-site

On-site

Limitations (if applicable)

Survey reference (if relating to a wider survey)

Condition Assessment Criteria

A series of ten attributes, representing key physical characteristics are used for this assessment. This assessment is based on the Hedgerow Survey Handbook¹ and Favourable Conservation Status document². For further clarification please refer to the Hedgerow Survey Handbook. Each attribute is assigned to one of five functional groups (A – E) and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the 'favourable condition' criteria.

Hedgerow favourable condition attributes

Attributes and functional groupings (A, B, C, D and E)	Criteria - the minimum requirements for 'favourable condition'	Criteria description	Habitat parcel reference																		Notes (such as justification)
			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	
			Grid reference																		
			TL 25964	TL 26031	TL 26026	TL 25994	TL 26150	TL 26036	TL 26300	TL 26481	TL 26386	TL 26276	TL 26489	TL 26619	TL 26622	TL 26632	TL 26729	TL 26843	TL 27166	TL 27166	
			28076	28106	28303	28055	28157	27974	28046	28228	28069	27596	27567	27681	27414	27406	27490	27373	27425	27549	

Core groups - applicable to all hedgerow types

Criterion passed (Yes or No)

A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of the shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length	This is the vertical gapness of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length; and No canopy gaps >5 m	This is the horizontal 'gapness' of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall 'gapness' but are not subject to the >5 m criterion (as this is the typical size of a gate).	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Pass	Pass	Fail	Fail	Pass	
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >60% of length - Measured from outer edge of hedgerow; and - Is present on one side of the hedgerow (at least).	This is the level of disturbance (including wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1 m in width and must be present along at least one side of the hedgerow. This criterion recognises the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
C2.	Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground.	The indicator species used are nettles <i>Urtica</i> spp., clovers <i>Galium aparine</i> and docks <i>Rumex</i> spp. Their presence, either singly or together, does not exceed the 20% cover threshold.	Fail	Pass	Pass	Fail	Fail	Pass	Pass	Fail	Pass	Fail	Pass	Fail	Fail	Fail	Pass	Pass	Pass	
D1.	Invasive and neophyte species	>50% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA ³) and recently introduced species.	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on archaeophytes and neophytes see the JNCC website ⁴ , as well as the BSBI website ⁵ where the Online Atlas of the British and Irish Flora ⁶ contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website ⁷ .	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities.	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (e.g., excessive hedgerow cutting).	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	

Additional group - applicable to hedgerows with trees only

E1.	Tree class	There is more than one age-class (or morphology) of tree present (for example: young, mature, veteran and/or ancient ⁸), and there is on average at least one mature, ancient or veteran tree present per 20 - 50m of hedgerow.	This criterion addresses if there are a range of age-classes or morphologies which allow for replacement of trees and provide opportunities for different species.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The hedgerow condition assessment generates a weighting (score) ranging from 1 - 3, which is used within the metric. The scores for each are set out in the tables below.

Condition categories for hedgerows without trees

Category	Category Requirements	Metric Score
Good	No more than 2 failures in total; AND No more than 1 failure in any functional group.	3
Moderate	No more than 4 failures in total; AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 and C2 = Moderate condition).	2
Poor	Fails a total of more than 4 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 and B2 = Poor condition).	1

Condition categories for hedgerows with trees

Category	Category Requirements	Metric score
Good	No more than 2 failures in total; AND No more than 1 failure in any functional group.	3
Moderate	No more than 5 failures in total; AND Does not fail both attributes in more than one functional group (e.g., fails attributes A1, A2, B1, C2 and E1 = Moderate condition).	2
Poor	Fails a total of more than 5 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 and B2 = Poor condition).	1

Suggested enhancement interventions to improve condition score

Score achieved:	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Footnotes

Footnote 1 – DEFRA (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. [online] Available on: <http://hds.defra.gov.uk/>

Footnote 2 – STALEY, J.T. ET AL. (2020) Definition of Favourable Conservation Status for Hedgerows. [online] Available on: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/862943/Definition_of_Favourable_Conservation_Status_for_Hedgerows_-_RP2343.pdf

Footnote 3 – Wildlife and Countryside Act 1981 (as amended).

Footnote 4 – CHEFFINCS, C. V. ET AL. (2005) The Vascular Plant Red Data List for Great Britain. Species Status 7: 1-116. [online] Available on: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/862943/Definition_of_Favourable_Conservation_Status_for_Hedgerows_-_RP2343.pdf

Footnote 5 – BOTANICAL SOCIETY OF BRITAIN AND IRELAND (BSBI). Definitions: wild, native or alien? [online] Available on: <https://www.bsbi.org.uk/definitions/wild-native-or-alien/>

Footnote 6 – BSBI and Biological Records Centre (BRC) (2022) Online Atlas of the British and Irish Flora. [online] Available on: <https://www.bsbi.org.uk/online-atlas-of-the-british-and-irish-flora/>

Footnote 7 – GB NON-NATIVE SPECIES SECRETARIAT (GBNNS) (2022) Available on: <https://www.gbnns.org/>

Footnote 8 – See gov.uk standing advice on ancient and veteran trees. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/862943/Definition_of_Favourable_Conservation_Status_for_Hedgerows_-_RP2343.pdf

and https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/862943/Definition_of_Favourable_Conservation_Status_for_Hedgerows_-_RP2343.pdf

Ancient woodland, ancient trees and veteran trees: advice for making planning decisions - GOV.UK (www.gov.uk)

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