APPLIED ECOLOGY

Land at Lodge Farm, Horsford

Ecology Report

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1 Introduction

Background

1.1 Applied Ecology Ltd (AEL) was commissioned by Endurance Estates, in June 2024, to carry out a range of ecology surveys on an area of land at Lodge Farm, Horsford, Norfolk ("the Site"). A plan showing the location of the Site is provided in **Figure 1.1**.

1.2 The surveys are required to assess the implications of future development within the Site, to inform emerging development design and masterplanning, and ultimately to support a planning application. This report provides details of work completed over the 2024-2025 survey period including a desk-top review of existing biological data, and surveys for habitats, bat activity, wintering and breeding birds and great crested newt.

Legislation and Planning Policy

Legislation

1.3 The Wildlife and Countryside Act 1981 (as amended) provides the main legal framework for nature conservation and species protection in the UK. The Site of Special Scientific Interest (SSSI) is the main statutory nature conservation designation in the UK. Such sites are notable for their plants, or animals, or habitats, their geology or landforms, or a combination of these. Natural England is the key statutory agency in England for advising Government, and for acting as the Government's agent in the delivery of statutory nature conservation designations.

1.4 Designation of a SSSI is a legal process, by which sites are notified under the Wildlife and Countryside Act 1981. The 1981 Act makes provision for the protection of sites from the effects of changes in land management, and owners and occupiers receive formal notification specifying why the land is of special scientific interest and listing any operations likely to damage the special interest.

1.5 The Countryside and Rights of Way Act 2000, and The Natural Environment and Rural Communities (NERC) Act 2006, provide supplementary protected species legislation. Specific protection for badgers *Meles meles* is provided by the Protection of Badgers Act 1992.

Habitats and Species of Principal Importance in England

1.6 The Natural Environment and Rural Communities (NERC) Act came into force on 1 October 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list has been drawn up in consultation with Natural England, as required by the Act.

1.7 The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England, when conducting their normal functions.

Habitats of Principal Importance

1.8 Fifty-six habitats of principal importance are included on the S41 list. These are all the habitats in England that were identified as requiring action in the UK Biodiversity Action Plan (UK BAP) and continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework. They include terrestrial habitats such as upland hay meadows to lowland mixed deciduous woodland, and freshwater and marine habitats such as ponds and sub-tidal sands and gravels.

Species of Principal Importance

1.9 There are 943 species of principal importance included on the S41 list. These are the species found in England which were identified as requiring action under the UK BAP and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. In addition, the hen harrier *Circus cyaneus* has also been included on the list because without continued conservation action it is unlikely that the hen harrier population will increase from its current very low levels in England.

1.10 In accordance with Section 41(4) the Secretary of State will, in consultation with Natural England, keep this list under review and will publish a revised list if necessary.

National Planning Policy Framework

1.11 The National Planning Policy Framework (NPPF) was first published in March 2012 (and replaced previous planning policy guidance (PPS 9) on biodiversity). The latest revision was published in December 2024, with paragraphs 193-195 stating the following in relation to habitats and biodiversity:

1.12 *"193. When determining planning applications, local planning authorities should apply the following principles:*

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) 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;

c) 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; and

d) 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.

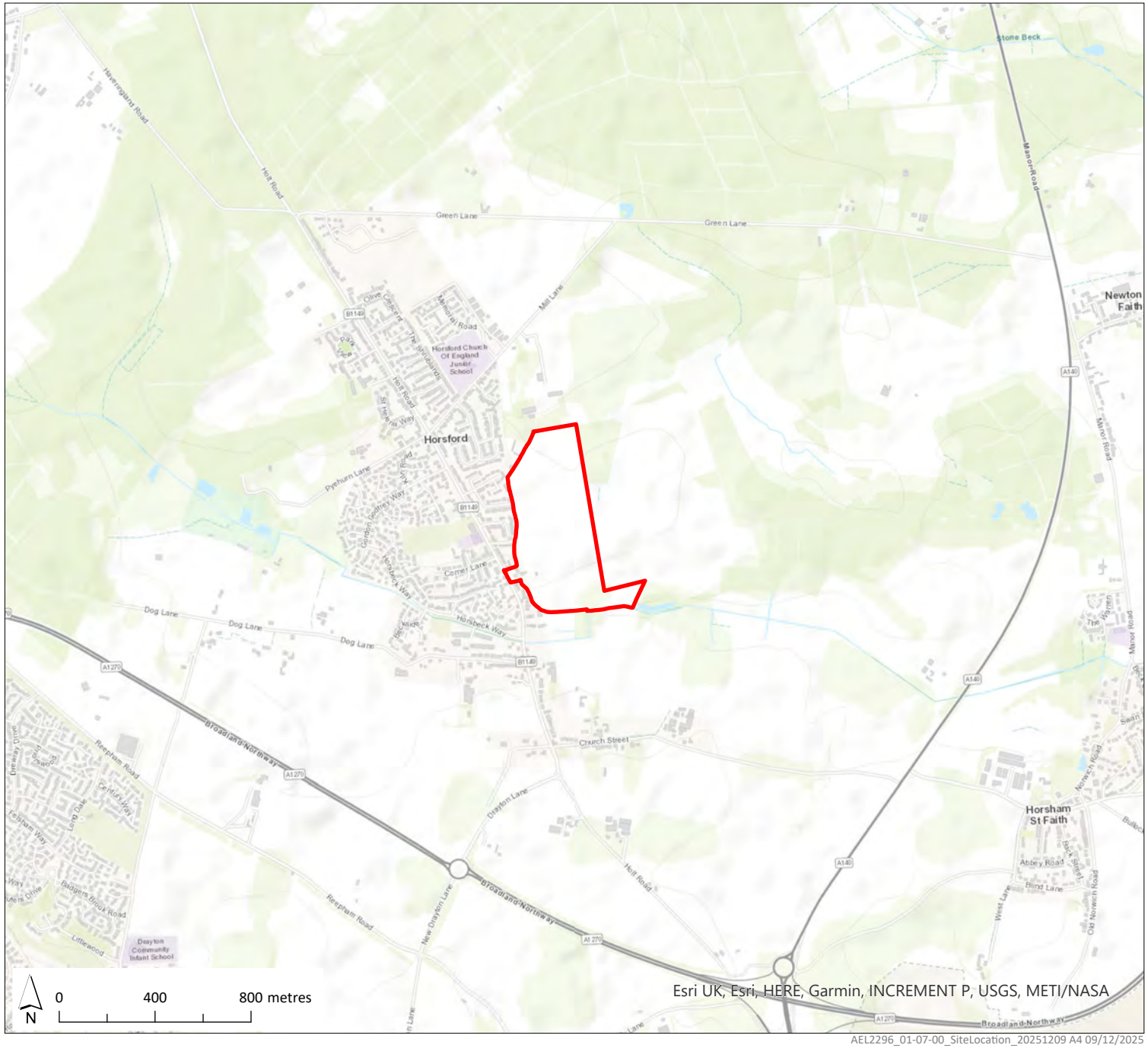
1.13 *194. The following should be given the same protection as habitats sites:*

a) potential Special Protection Areas and possible Special Areas of Conservation;

b) listed or proposed Ramsar sites; and

c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

1.14 *195. The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site."*



AEL2296_01-07-00_SiteLocation_20251209 A4 09/12/2025

Lodge Farm
Horsford

Site location

Site boundary

Figure 1.1

Map Scale @ A4: 1:24,000

Surveyed by: n/a	
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2 Existing Information

Sources of Data

2.1 The Norfolk Biodiversity Information Service (NBIS) was commissioned by AE to complete a biological records search for the Site and its surrounds (Data Package A2, ref. NB/E01848 dated 17.10.2024). This included details of statutory and non-statutory wildlife sites, together with species data within a 2km search radius, and extended to a 6km radius for bat data.

2.2 Further information for statutory wildlife sites and ancient woodland was obtained from government's MAGIC online mapping tool (https://magic.defra.gov.uk).

Designated Wildlife Sites

2.3 The Site is not covered by any wildlife site designation.

Statutory wildlife sites

2.4 The locations of statutory wildlife sites and ancient woodland in relation to the Site are shown by **Figure 2.1**. The closest statutory Site of Special Scientific Interest (SSSI) is the **River Wensum Site of Special Scientific Interest** (SSSI) which is located 3.1 km to the south at its closest point and is also designated as a **Special Area of Conservation** (SAC) due to its importance in a European context. The next closest SSSI is **Swannington Upgate Common SSSI**, which is 4.4 km to the northwest.

Non-statutory wildlife sites

2.5 The closest non-statutory County Wildlife Site (CWS) is **Black Park & The Thicket CWS** (ref. 1395) which is large area of oak dominated acid woodland located 315 m to the east. **Pyehurn Lane Woodland CWS** is located 675 m to the northwest.

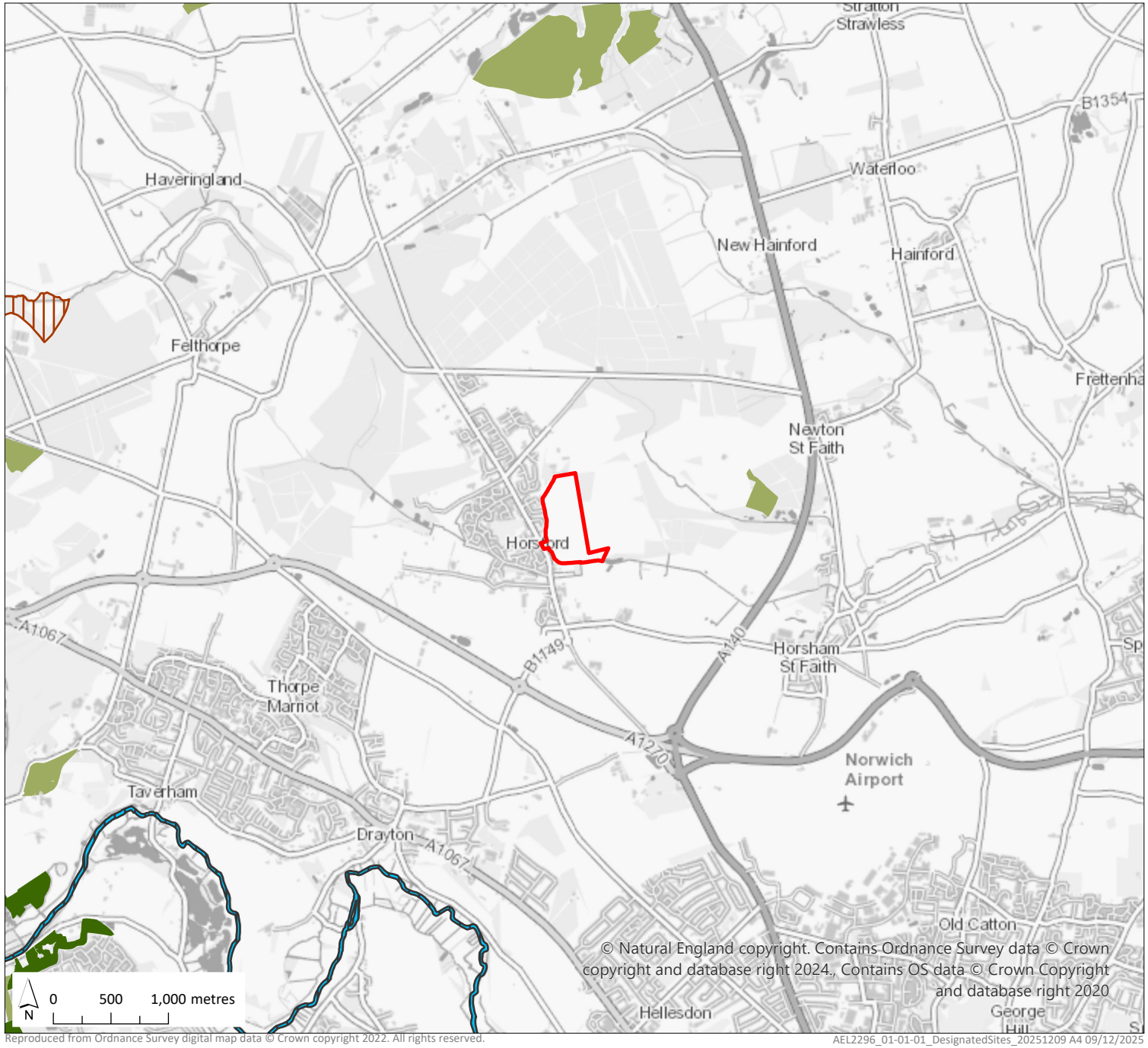
Protected and Notable Species Records

2.6 In total, 8,364 records (2,666 entries) of 347 different taxa were provided by the NBIS. Most of these records were of no particular relevance to the Site given their association with specific habitat types (not present on the Site) or due to their separation from the Site. The species records considered to be most relevant to the Site can be summarised as follows:

- A few **uncommon plant species** typically associated with arable land and disturbed ground such as common cudweed *Filago germanica*, small cudweed *Logfia minima*, corn spurrey *Spergula arvensis*, and small-flowered catchfly *Silene gallica*. A single 2016 record of the alien and invasive plant Japanese knotweed *Fallopia japonica* was provided for the 1 km grid square coincident with the Site.
- A large number of **bird records** were provided by the NBIS, including numerous records within the 1 km grid square coincident with the Site. Among the species were a mix of declining urban edge, farmland, hedgerow and scrub nesters, such as lapwing *Vanellus vanellus*, skylark *Alauda arvensis,* yellowhammer *Emberiza citrinella*, bullfinch *Pyrrhula pyrrhula* and song thrush *Turdus philomelos* could be present on-Site as breeding species. A more specialist group of birds associated with semi-natural and plantation woodland, woodland clearings, open sandy ground and heath, such as crossbill *Loxia curvirostra*, woodlark *Lullula arborea* and nightjar

Caprimulgus europaeus, have been recorded locally but are unlikely to make significant use of the Site due to the lack of high-quality habitat. Records of other bird species of no significance to the Site were also provided and are characterised by a range of species that would be expected to occur as non-breeding individuals or as passage migrants only.

- A range of notable **butterfly** and **moth** records, albeit with most butterfly records dating from the early 1900's and not reflecting species declines and current distributions.
- A large number of **bat records** from the local area with most data probably generated from the Norwich NDR surveys. Species include common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Nathusius's pipistrelle *Pipistrellus nathusii*, brown long-eared *Plecotus auritus*, Daubenton's bat *Myosotis daubentonii*, Leisler's bat *Nyctalus leisleri*, natterer's bat *Myosotis nattereri*, noctule *Nyctalus noctula*, serotine *Eptesicus serotinus*, and whiskered / Brandt's bat *Myosotis mystacinus / brandtii*, and barbastelle *Barbastella barbastellus* (closest record from 2016 and 950 m to the south).
- Scattered **reptile** and **amphibian** records, with the closest record of **great crested newt** *Triturus cristatus* dating from 2006 from a garden pond 360 m to the southwest of the Site.
- Numerous recent records of **hedgehog** *Erinaceus europaeus* from in and around Horsford and surrounds.



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Lodge Farm
Horsford

Statutory designated sites and ancient woodland

- Site boundary
- River Wensum SSSI
- Swannington Upgate Common SSSI
- Special Area of Conservation (SAC)
- Ancient & Semi-Natural Woodland
- Ancient Replanted Woodland

Figure 2.1

Map Scale @ A4: 1:50,000

Surveyed by: n/a	
Survey date: n/a	
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3 Habitats and Plants

Approach

3.1 A Phase 1 habitat survey of the Site was undertaken on 18 July 2024 by AE Ecologist Rob Hutchinson MCIEEM[1] in dry and fine weather conditions. The methodology followed the JNCC (2016)[2] by which all habitats present within the Site were classified and mapped according to standard categories. The habitats present were also converted to their UK Habitat Classification (UKHab, 2023)[3] or Statutory Biodiversity Metric ("the Metric") equivalents. Supplementary information was recorded using the relevant Metric habitat condition assessment sheets, and a record was made of the dominant plant species and their abundance using the DAFOR[4] scale.

3.2 The locations of individual trees are indicative and tree numbers, locations and condition will need to be reviewed against detailed tree survey information, if available.

3.3 The habitat map was subsequently digitised using a Geographical Information System (ArcGIS Pro).

Survey Findings

Overview

3.4 The Phase 1 habitat map is shown in **Figure 3.1**, and a breakdown of the habitats present and their areas is provided in **Table 3.1**. A selection of habitat survey photographs can be found in **Figure 3.2**.

Table 3.1: Breakdown of habitats and hedgerows present within the Site.

Habitat type	Area (ha)	Metric habitat type	Metric condition
Amenity grassland	0.47	Modified grassland	poor
Arable	19.65	Cereal and non-cereal crops	n/a
Buildings	0.07	Developed land; sealed surface	n/a
Hard-standing	0.72	Developed land; sealed surface	n/a
Continuous bracken	0.04	Bracken	n/a
Improved grassland	3.01	Modified grassland	poor
Semi-improved grassland	0.54	Other neutral grassland	poor
Tall ruderal	0.25	Tall forbs	poor
Total area (ha)	**24.75**		
Hedgerow type	**Length (m)**	**Metric hedgerow type**	**Metric condition**
Species-rich hedge with trees	790	Species-rich native hedgerow with trees	poor and good
Species-poor intact hedge	412	Native hedgerow	poor
Total length (m)	**1,202**		

[1] Rob is a Principal Ecologist and holds a Level 5 Field Identification Skills Certificate (FISC) for plant identification from the Botanical Society of Britain & Ireland, and Natural England survey licences for great crested newt (Level 2), bats (Level 1) and dormouse.
[2] JNCC (2016) *Handbook for Phase 1 Habitat Survey – A technique for Environmental Audit*. JNCC, Peterborough.
[3] UKHab (2023) *UK Habitat Classification Version 2.0* (at https://www.ukhab.org)
[4] DAFOR: whereby species occurrence may be classified as being **d**ominant, **a**bundant, **f**requent, **o**ccasional, or **r**are.

Arable land

3.5 The Site was dominated by two fields of arable land with the northern field supporting a cereal crop of barley and the southern field a crop of sugar beet. A range of common arable weeds were recorded in association with the cultivated field margins including common field-speedwell *Veronica persica*, fat-hen *Chenopodium album*, scarlet pimpernel *Anagallis arvensis*, small nettle *Urtica urens*, creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, groundsel *Senecio vulgaris*, barren brome *Anisantha sterilis*, great brome *Anisantha diandra*, charlock *Sinapis arvensis*, common couch *Elytrigia repens*, wild oat *Avena fatua*, and a few plants of common fiddleneck *Amsinckia micrantha*.

3.6 A small area of flooded arable land was present in the northeast corner of the north barley field and was associated failed crops with abundant weeds and damp ground plants such as floating sweet-grass *Glyceria fluitans*, redshank *Persicaria maculosa*, scentless mayweed *Tripleurospermum inodorum*, annual meadow-grass *Poa annua*, and marsh cudweed *Gnaphalium uliginosum*.

Grassland and other open habitats

3.7 A narrow field of **improved pasture** was present along the southern boundary of the Site. The sward, which was only lightly sheep-grazed and possessed a varied structure, was dominated by Yorkshire-fog *Holcus lanatus* and perennial rye-grass *Lolium perenne*, together with some patches of nettle *Urtica dioica*. Other species presence included cock's-foot *Dactylis glomerata*, common couch *Elytrigia repens*, soft brome *Bromus hordeaceus*, common bent *Agrostis capillaris*, false oat-grass *Arrhenatherum elatius*, red fescue *Festuca rubra* and a small quantity of bracken *Pteridium aquilinum* spreading in from the boundaries.

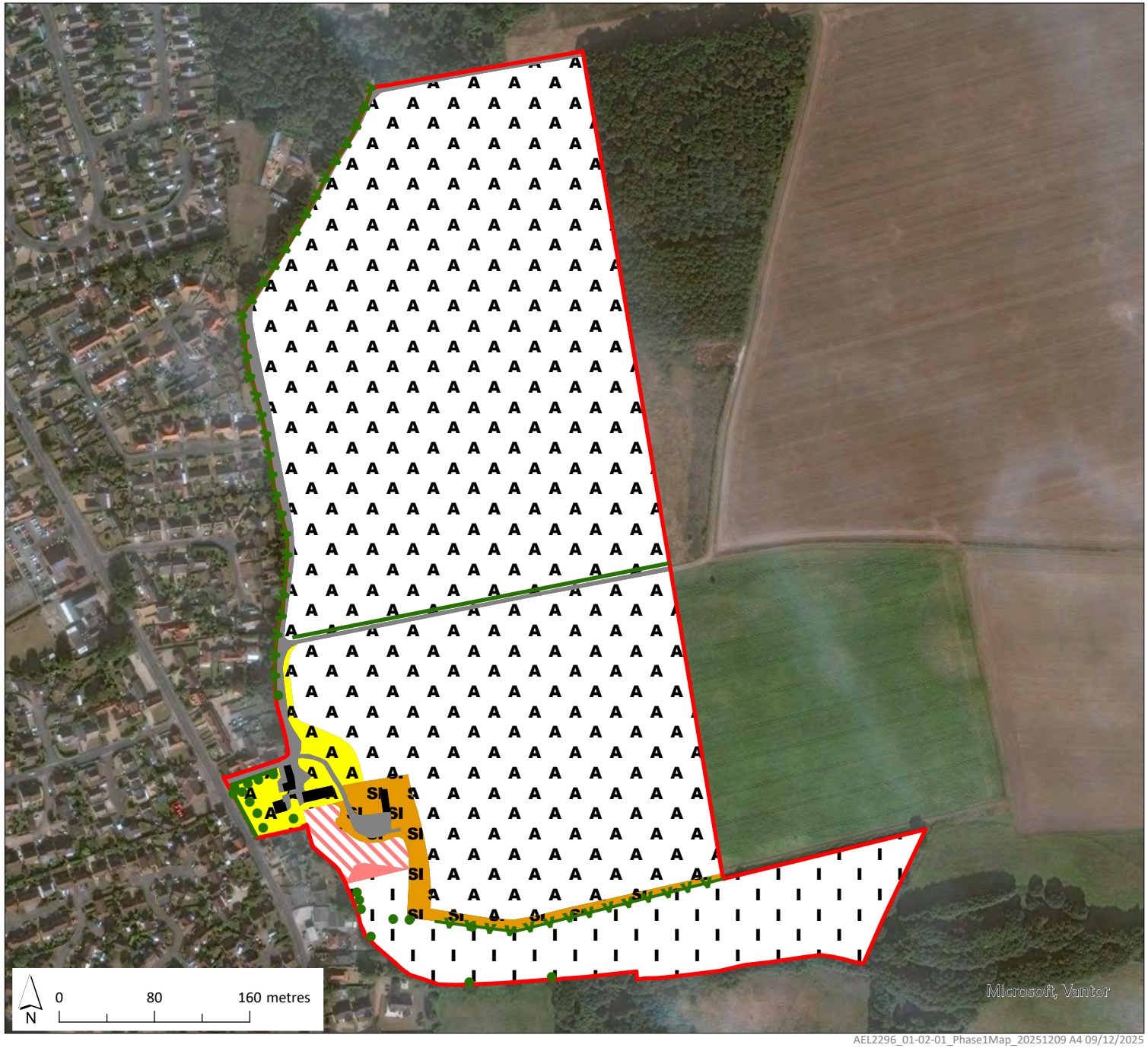
3.8 Rank areas of **species-poor semi-improved grassland** were present in neglected parts of the Site and were typically dominated by false oat-grass, with tall ruderals and often some bramble *Rubus* agg. Areas of regularly mown **amenity grassland** associated with gardens and around buildings were characterised by a short and uniform sward dominated by perennial rye-grass, and other typical lawn grasses and forbs.

Hedgerows and trees

3.9 **Species-rich hedgerows with trees** were present along the western boundary of the Site and between the southern arable field and the pasture. The western hedgerow was an overgrown and varied hedge with numerous trees and a varied mix of woody species which included hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, field maple *Acer campestris*, oak *Quercus robur*, blackthorn *Prunus spinosa*, crab apple *Malus sylvestris*, silver birch *Betula pendula* and damson *Prunus domestica* ssp. *insititia*. The southern hedgerow was a managed hedge of hawthorn, field maple, elder *Sambucus nigra*, ash *Fraxinus excelsior*, spindle *Euonymus europaeus*, dogwood *Cornus sanguinea*, and common gorse *Ulex europaeus*, with occasional standard oak trees. The hedge had a wide spreading base due to suckering blackthorn and bracken growth on its southern side.

3.10 The hedgerow between the two arable fields and around the residential property garden were **species-poor hedgerows** with evidence of some new shrub planting and lacking significant standard trees.

3.11 A number of **individual trees** were present within the Site including a number of large and suspected veteran oak and ash in and around the permanent pasture in the southwest corner of the Site.



Lodge Farm
Horsford

Phase 1 habitat map

- Site boundary
- amenity grassland
- arable
- buildings
- continuous bracken
- hard-standing
- improved grassland
- tall ruderal
- SI semi-improved grassland
- species-poor intact hedge
- species-rich hedge with trees
- Individual tree (indicative location)

Figure 3.1

Map Scale @ A4: 1:4,830

Surveyed by: RJH	
Survey date: 18.07.2024	
Drawn by: DB	
Checked by: DP	
Status: Final	

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Figure 3.2: Selection of habitat survey photographs.



a) North arable field (barley crop)



b) species poor hedge and track separating the north and south arable fields



c) South arable field (sugar beet crop)



d) veteran trees and improved grassland along southern boundary



e) Amenity grassland around barns to the west



f) Species rich hedge with trees along western boundary

4 Fauna

Badger

4.1 A watching brief for the presence of badger *Meles meles* setts and field evidence has been maintained throughout the survey work reported below.

4.2 No badger setts or obvious field evidence of badger has been seen within the Site.

Great Crested Newt

Survey Approach

4.3 Ordnance Survey (OS) mapping map was checked and online aerial photos inspected to identify any ponds within 250 m of the Site that could potentially support breeding populations of the legally protected amphibian great crested newt *Triturus cristatus* (GCN).

4.4 There are no ponds or standing water habitats within the Site, but three off-Site standing waterbodies are shown on OS mapping to occur within 250 m of the Site as shown by **Figure 4.1**.

4.5 One of these ponds (Pond 1) occurs on the north-east corner of Diamond Jubilee Plantation which adjoins the north-east edge of the Site, and two closely located larger linear waterbodies occur next to the south-east corner of the Site (Ponds 2 and 3).

4.6 The three off-site ponds were investigated by a GCN licenced surveyor from AE on 22 May 2025. Pond 1 within the plantation woodland was a dry depression that held no standing water or an y evidence that it was a permanent waterbody. Ponds 2 and 3 to the south held water and were both subject to an eDNA GCN presence/absence survey using an ADAS eDNA test kits and ADAS water sampling protocol.

4.7 The samples stored in a cold box before being returned by courier to the ADAS laboratory for analysis.

Survey Findings

4.8 Ponds 2 and 3 both returned negative results for GCN.

Evaluation

4.9 Great crested newts are considered likely to be absent from the Site on the basis of the survey findings and a lack of any closely located off-Site ponds that have good habitat connectivity to the Site.

Reptiles

4.10 The Site does not support rank ungrazed or unmanaged grassland habitat that offers optimal conditions for reptiles to persist. All of the narrow grassland field margins are regularly cut and the sheep grazed improved grassland to the south was considered to be too heavily grazed to offer suitable habitat for reptiles.



Lodge Farm
Horsford

Waterbodies within 250 m

- Site boundary
- 250m buffer site boundary
- ponds (no.)

Figure 4.1

Map Scale @ A4: 1:7,500

Surveyed by: n/a	
Survey date: n/a	
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Status: Final	

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Bats

Survey Approach

Roosting bats

Buildings

4.11 A preliminary bat roost assessment (PRA) of the three agricultural buildings within the Site was completed on 12 August 2024 by Dr Duncan Painter CEnv MCIEEM[5]. The three buildings have central grid references of:

- Barn 1 TG 19483 16042
- Barn 2 TG 19426 16046
- Barn 3 TG 19403 16059

4.12 A single occupied residential dwelling and outbuilding that occur to the west of the barns was not subject to PRA assessment.

4.13 Locations of the three barns are shown in **Appendix A**.

4.14 The PRA of the three barns involved an internal and external inspection of the buildings using a high-powered torch, endoscope and binoculars to search for bats and evidence of bats and to note the presence of potential roost features (PRFs) e.g. gaps, crevices or holes in the built fabric that could support crevice roosting bats.

4.15 A sample of any bat droppings present was retained to allow bat species identification by DNA analysis.

4.16 The suitability of the buildings was assessed and classified according to the categories and descriptions defined by Collins (2023)[6], as summarised in **Table 4.1**.

Table 4.1: Guidelines for assessing the potential suitability of roosting habitats in structures.

Potential suitability	Description of roosting habitat
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground/ underground levels).
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and unsuitable features on occasion.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of year. 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 number of bats (i.e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site, but could be used by individual hibernating bats).
Moderate	A structure with one or more potential roost sites that could be used 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, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).

[5] Duncan holds three separate licences pertaining to bat survey: WML - CL18; WML - CL21; and WML - CL32 and has been a registered bat roost volunteer visitor for Natural England (WML -CL15). Holds a class licences in relation to badger (WML - CL35) and great crested newt (WML - CL09 & WML - CL33), hazel dormouse (WML - CL10A), and native crayfish (WML - CL11). Trained in the use of thermal camera operation and analysis by Dr Kayleigh Fawcett Williams.

[6] Collins, J. (ed.) (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn).* The Bat Conservation Trust, London.

Potential suitability	Description of roosting habitat
High	A structure 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. These structures have the potential to support high conservations roosts, e.g. maternity or classic cool/stable hibernation site.

Trees

4.17 To date, none of the trees within the Site have been subject to PRA inspection.

Bat activity

Automated bat activity survey

4.18 The Site is located on the eastern side of the village of Horsford in Norfolk and comprises predominantly arable landscape that is of low value as a foraging resource for bats.

4.19 An automated bat activity survey of the Site was completed on 18th July 2024 to assess the use of the habitat types present by bats and provide an insight into the bat species assemblage operating within the Site.

4.20 A total of 14 bat detectors (11 Anabat Express detectors set up on 2m high tripods, and three Wildlife Acoustics SM4 FS detectors with SMM-U2 microphones set-up in hedgerows 2m off the ground) were deployed across the Site to sample the range of habitat types present. The bat detectors were programmed to record bat calls from 30 minutes before sunset until 30 minutes after sunrise the following morning (19th July).

4.21 The following habitat types were covered by the 14 detector locations:

- Open arable land (x3 locations)
- Woodland edge (x2 location)
- Species poor hedgerow (x3 locations)
- Species rich hedgerow with trees (x3)
- Mature tree line (x1)
- Amenity grassland (x1)
- Semi-improved neutral grassland (x1)

4.22 The survey locations are shown by **Figure 4.2**.

4.23 Survey locations 1, 2 and 3 were subject to long-term automated bat detector survey in July 2024 (summer), September 2024 (autumn) and May 2025 (spring).

- Summer (five consecutive nights) 18-22 July 2024
- Autumn (five consecutive nights) 30 September – 4 October 2024
- Spring (six consecutive nights) 22-27 May 2025

Vantage Point Survey

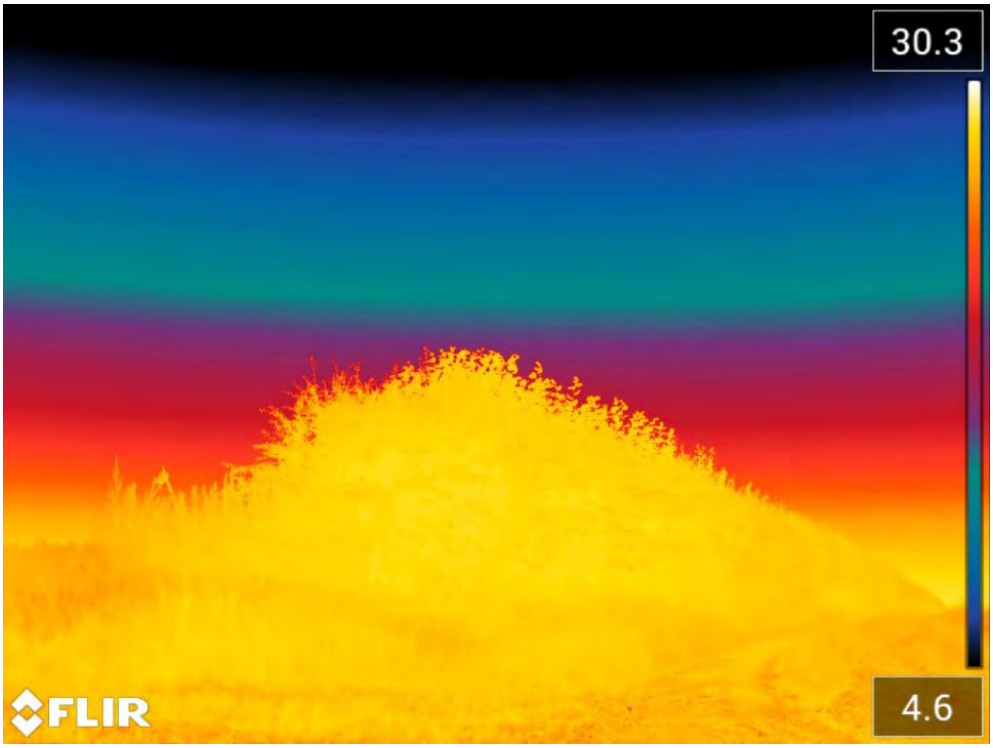
4.24 Two vantage point (VP) survey locations chosen to provide insight into bat commuting activity along two potentially important bat commuting routes – the two east-west oriented hedges that cross the Site and connect the existing residential development to the west, to off-Site woodland to the east.

The two VP locations were subject to survey on three nights: 18 July 2024 (summer); 30 September 2024 (autumn) and 22 May 2025 (spring).

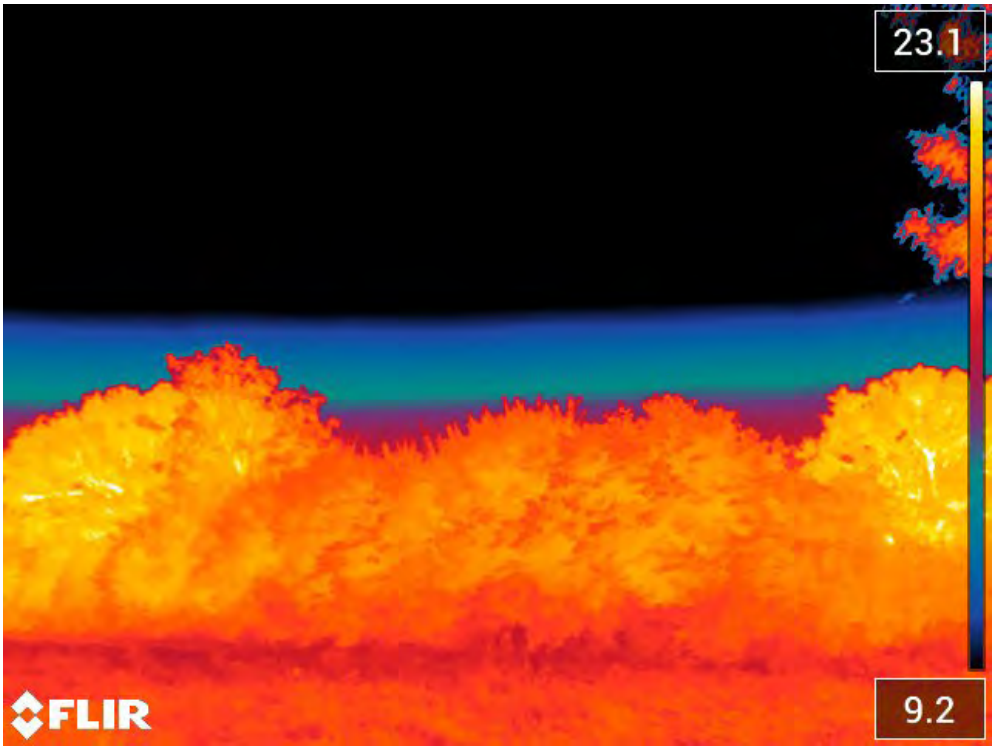
4.25 At each VP a single bat surveyor from AE was stationed to record bat activity along and near to the hedge. Each surveyor was equipped with a hand-held Elekon Batlogger M electronic bat detector with earphones and a tripod mounted FLIR thermal video camera set to record JPEG video footage from 15 minutes before sunset until 90 minutes after sunset. From circa 30 minutes after sunset, when it became too dark to see bats, the surveyors used the live thermal camera image on the viewing screen on the back of the camera to record bat activity.

4.26 All bats seen and heard were noted, and thermal camera video footage played back the following day on PC to verify bat sightings as necessary.

4.27 The two cameras deployed were FLIR T1020 and T540 – fields of view and bat in flight detection distances are shown below.



North VP – FLIR T1020 thermal camera (1024x768 pixel resolution) with 45 degrees lens = bat in flight detection distance of 104 m.



South VP – FLIR T540 thermal camera (464x348 pixel resolution) with 42 degrees lens = bat in flight detection distance of 51 m.

Bat roost emergence survey

4.28 The three agricultural buildings were assessed as possessing low (Barn 1 and 3) and high (Barn 2) bat roost suitability, and have been subject to repeat bat roost emergence surveys on 28 May, 10 July, 13 August and 16 September 2025.

4.29 The bat roost emergence surveys were planned and set-up by DP using the following equipment during each survey.

- Hand-held Pettersson D230 electronic bat detectors with ear-phones set in frequency division mode (x2-3);
- Time synchronised tripod mounted Anabat Express electronic bat detectors (x5 – x16); and
- Tripod mounted FLIR thermal video cameras (x3 – x7).

4.30 The survey set-up and thermal camera fields of view are provided in **Appendix A**.

4.31 The tripod-mounted Anabat Express electronic bat detectors were set-up around and within the buildings to record bat calls from the start to the end of each survey.

4.32 The thermal cameras were set to record radiometric video data at 30 frames per second and were used by the surveyors to provide a live view of the building throughout the survey via connected lap-top computer screen. The cameras were set up to record from 15 minutes before sunset to the end for the survey at 90 minutes after sunset. The unmanned thermal cameras were set up to record from 30-20 minutes before sunset until 90+ minutes after sunset. Video footage was checked the following day by DP against bat sightings and bat call recordings using FLIR Tools+ software. The cameras allowed accurate bat roost locations to be identified as 100% visual acuity was possible throughout each survey.

4.33 Following completion of the third bat roost emergence survey, a 17-night automated bat detector survey of the interior of Barn 2 was completed using an Anabat Ranger (full spectrum) electronic

bat detector set up centrally inside the barn next to the south facing wall (2m off the ground) with the microphone oriented towards the ridge to record bat calls from 30 minutes before sunset to 30 minutes after sunrise between 9 and 25th September 2025.

4.34 The surveys were completed during the main 2025 bat activity period at a time when bats were active and not in torpor and weather conditions were suitable for bats to be active throughout each survey[7].

Bat Call Analysis

4.1 Bat call data recorded by the electronic bat detectors used in the automated and vantage point surveys were analysed on a desktop computer by an AE ecologist[8] using Kaleidoscope Pro bat analysis software in accordance with bat call parameters described by Russ (2012)[9].

4.2 Bat calls have been identified to species level, but it should be noted that, in the case of *Myotis* species, identification via sound analysis can only be considered reasonably likely and a not a prescriptive confirmation. The confirmation of *Myotis*, species outside their currently known geographic distribution, or rare vagrants to the British Isles, within a Site can only be confirmed by a bat in the hand or other strong supporting information. In addition, it should be noted that the occurrence of the UK's third most common bat species, brown long-eared bat *Plecotus auritus*, is also likely to be significantly underestimated on any site, due to the very quiet calls of the bat or a lack of calls while flying altogether.

[7] 28 May 2025: average air temperature 14.5^{0}C (start) 13.0^{0}C (end), gentle breeze, no rain, 10% cloud cover (start).
10 July 2025: average air temperature 19.8^{0}C (start) 18.0^{0}C (end), light air, no rain, 5% cloud cover (start).
12 August 2025: average air temperature 24.8^{0}C (start) 22.3^{0}C (end), gentle breeze, no rain, 100% cloud cover (start
9 September 2025: average air temperature 20.0^{0}C (start) 18.7^{0}C (end), gentle breeze, no rain, 15% cloud cover (start).
[8] Holds a Batability Certificate of Bat Acoustics Analysis Technician Level Grade C.
[9] Russ, J. (2012) British Bat Calls 3 A Guide to Species Identification. Pelagic Publishing.

Survey Findings

Roosting bats

Barn 1

4.3 Barn 1 was a concrete blockwork building with a pitched gable ended roof covered in unlined asbestos cement sheets with a single sliding timber doorway opening at its southern end. The external walls were clad in concrete interlocking tiles.



Barn 1 south and west elevations



Barn 1 interior

4.4 The building was devoid of any evidence of bats (externally and internally). Potential roost features (PRFs) included: gaps between external concrete cladding tiles and gaps associated with the asbestos cement sheet capping tiles at the two gable ends.

4.5 **The barn was considered to be a building of low bat roost suitability**.

4.6 No bats emerged from the exterior or interior of the building during the bat roost emergence survey conducted on 28th May 2025, indicating the likely absence of roosting bats from the building.

Barn 2

4.7 Barn 2 was a large historic brick building with a brick extension on its western end and a brick lean-to running the full length of the south side of the building. The roof was covered in clay pantiles over a traditional 1F felt. Internally the building was in use for storage and was a dark and unilluminated space.



Barn 2 – south and east facing elevations



Barn 2 – interior

4.8 Bat droppings were present as scattered individual droppings across the entire floor and on stored items across the entire interior of the building along with a number (circa 50) mixed-aged discarded moth and butterfly wings – most notably below the ridge at the eastern end of the building. While the total number of droppings present was in the several hundreds there were no accumulations in any one location to indicate the presence of a large roost with most droppings appearing to have been those produced by individual bats in flight. A significant proportion of the droppings inside the barn (circa 70%) were old and crumbled and were of a size and form consistent with those produced by a brown long—eared bat *Plecotus auritus*.

4.9 A sample of droppings from inside the barn was analysed by Ecotype Genetics and confirmed the presence of droppings produced by four bat species inside the building: common pipistrelle

Pipistrellus pipistellus, soprano pipistrelle *P. pygmaeus*, brown long-eared and barbastelle *Barbastella barbastellus*.

4.10 The PRA survey indicated that Barn 2 is a confirmed roost of high bat roost suitability.

4.11 The bat roost emergence surveys of Barn 2 confirmed the following:

- 28 July 2025 - common pipistrelle bat (x1) emerged from day roost on south facing wall @ 31 minutes after sunset;
- 12 August 2025 – brown long-eared bat (x1) emerged from ridge day roost in the centre of the barn @ 33 minutes after sunset;
- 9 September 2025 – brown long-eared bats (x2) emerged from ridge day roost at the west end of barn @ 26 minutes after sunset; natterers bat (x1) emerged from south facing internal wall @ 85 minutes after sunset.

4.12 The first bat call times after sunset recorded by the automated bat detector survey inside Barn 2 in September 2025 indicated the likely day roosting use of the barn by common pipistrelle bat on nine of the 17 nights, brown long-eared on two of the 17 nights, and natterers on eight of the nights. Calls from the same three bat species were recorded on most nights inside the barn at different times across the night, with a single set of barbastelle calls also recorded on one night (202 minutes after sunset) indicating a bat visiting the barn as opposed to roosting inside it. No calls of soprano pipistrelle were recorded.

4.13 In summary Barn 2 has been confirmed to support the days roosts of one common pipistrelle; two brown long-eared bats; and one natterers bat.

Barn 3

4.14 Barn 3 comprised a brick-built agricultural building made up of three adjoining buildings with a pitched roofed four-bay cart-lodge at the northern end and two adjoining pitched roofed sections to the south. The building had a pitched gable ended clay pantile roof over a breathable felt. The barn was derelict, empty and completely open without windows and doors along its eastern elevation.

4.15 The building was devoid of bat evidence (externally and internally) but possessed potential roost features in the form of gaps under pantiles and associated lead flashings.



Barn 3 east elevation



Barn 3 – cart lodge section interior

4.16 **The barn was considered to be a building of low bat roost suitability**.

4.17 No bats emerged from the building during the bat roost emergence survey conducted on 28 July 2025.

Bat activity

Vantage point survey

4.18 The vantage point survey recorded only occasional foraging activity by individual common pipistrelle bats in the air space close to the two hedgerows being surveyed. No evidence that either hedge formed part of an important bat flyway / commuting route was seen during any of the three survey occasions in spring, summer or autumn.

Automated bat activity survey

4.19 The results of the automated bat detector survey of the Site conducted from dusk until dawn on 18 July 2024 recorded a total of seven bat species between the 14 detectors with all detectors recording bat activity. The three detectors located within the open arable fields recorded very little activity compared to the detectors located elsewhere the same night. The greatest number of bat calls were recorded by the detector located next to the off-site woodland to the north of the Site. A summary of the survey results is provided by **Figure 4.3** and demonstrates that the hedgerows, tree lines and woodland were of higher value to bats compared with the open arable land areas.

4.20 A summary of the bat species recorded by the three long term automated bat detector locations is provided in **Table 4.2** and confirms a **total of eight bat species making use of the air space within / over the Site** over the three-season survey. This included the presence of a nationally rare bat species barbastelle that was recorded regularly across all seasons in relatively low call file abundance, and the very occasionally recorded presence of serotine at two locations in the summer. Brown long-eared bat was recorded rarely but is likely to have been under-recorded on account of its quiet or no calling behaviour.

4.21 As recorded by the single overnight 14 bat detector survey in July 2024, the woodland edge location to the north of the Site consistently recorded the greatest total number of bat call files over the three season long terms automated bat detector survey comparted to the two hedgerow locations.

Table 4.2: Total number of bat call files recorded by three static automated bat detectors over three consecutive seasons in the north, centre and south of the Site 2024-2025

	Location 1 (woodland edge)			Location 2 (species poor hedge)			Location 3 (species rich hedge with trees)		
Bat Species	***Spring 2025***	***Summer 2024***	***Autumn 2024***	***Spring 2025***	***Summer 2024***	***Autumn 2024***	***Spring 2025***	***Summer 2024***	***Autumn 2024***
Common pipistrelle	2,636	4,561	2,487	224	498	162	98	311	384
Soprano pipistrelle	129	42	648	21	242	4	12	15	33
Noctule	18	27	12	5	13	2	15	18	22
Serotine	-	2	-	-	-	-	-	2	-
Daubenton's	7	8	1	11	4	10	15)	6	9
Natterers	-	1	-	7	0	-	5	-	-
Myotis sp.	-	-	-	13	-	-	-	-	-

Barbastelle	6	1	29	1	1	2	4	-	4
Brown long-eared	3	-	-	3	-	-	-	-	-
Total	2,799	4,642	3,177	289	758	180	156	352	452

Evaluation

4.22 The bat assemblage has been assessed in accordance with current UK bat mitigation guidelines[10] to be of **regional importance**, scoring 16 out of a possible 28 points for a bat assemblage in south-eastern England/East Anglia.

[10] Reason, P. F. & Wray, S. (2023) *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats.* Version 1.1. CIEEM, Ampfield.



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Lodge Farm
Horsford

Bat activity setup

- Site boundary
- Long term detector location (no.)
- Anabat Express detector deployed for a single night (18 July 2024)
- Surveyor vantage points

Figure 4.2

Map Scale @ A4: 1:4,830

Surveyed by: AE	
Survey date: n/a	
Drawn by: DB	
Checked by: DP	
Status: Final	

APPLIED ECOLOGY



Lodge Farm
Horsford

Summer overnight automated bat activity survey

Site boundary

Common pipistrelle
Soprano pipistrelle
Brown long-eared
Nyctalus spp.
Barbastelle
Myotis spp.
Serotine

590
270
73

Figure 4.3

Map Scale @ A4: 1:6,000

Surveyed by: AE
Survey date: 18.07.2024
Drawn by: DB
Checked by: DP
Status: Final

APPLIED ECOLOGY

Wintering Birds

Survey Approach

4.23 A five-visit winter birds survey of the Site was completed over the period October 2024–February 2025 by Ben Green, an experienced ornithologist.

4.24 A transect route was devised to adequately cover all accessible parts of the Site as shown by **Figure 4.4**.

4.25 Survey visits took place on 31 October, 28 November and 12 December 2024, 25 January and 21 February 2025, during generally fine and dry weather conditions. Each transect survey started within an hour of sunrise to coincide with the peak period of bird activity and took up to two hours to complete.

4.26 During each survey, the positions and, where relevant, age, sex and behaviour of individual birds were recorded on large-scale field maps, using a new map on each visit. Birds detected by sight and sound were recorded, however, species flying over the Site were not transcribed onto the field map unless it was clear the birds were feeding over the Site or were flying to or had originated on or near the Site. Every effort was made, using the surveyor's judgement and the survey recording methodology, to record any individual bird once only.

4.27 The primary focus of the survey was on notable gatherings of key species, particularly those of elevated conservation concern, that might indicate the Site had elevated value for wintering bird species. Such species groups included:

- Waders – arable land can support large roosting or foraging flocks, particularly of golden plover *Pluvialis apricaria* and the red-listed lapwing *Vanellus vanellus*.
- Thrushes – large flocks of winter thrushes, principally redwing *Turdus iliacus* and fieldfare *Turdus pilaris*.
- Finches and buntings – large mixed flocks of these species, often including red-listed species such as linnet *Linaria cannabina*, yellowhammer *Emberiza citrinella* and corn bunting *Emberiza calandra*, can be attracted to areas of winter stubble or game cover.
- Other red-listed farmland specialists or notable species – species such as grey partridge *Perdix perdix* and skylark *Alauda arvensis*, or raptors, owls, wildfowl, etc.

Survey Findings

4.28 The survey recorded a total of 34 bird species using the Site. These are summarised in **Table 4.3**.

Table 4.2: Birds recorded during breeding birds survey and estimated breeding populations.

Species	UK BoCC & Schedule 1 status	Count					Maximum count	Notes of key species
		31 Oct	28 Nov	12 Dec	25 Jan	21 Feb		
Blackbird *Turdus merula*	Green	7	3	10	4	3	10	
Blue tit *Cyanistes caeruleus*	Green	17	6	14	9	14	17	
Buzzard *Buteo buteo*	Green	0	0	1	1	0	1	
Carrion crow *Corvus corone*	Green	2	0	3	2	3	3	

Species	UK BoCC & Schedule 1 status	Count					Maximum count	Notes of key species
		31 Oct	28 Nov	12 Dec	25 Jan	21 Feb		
Chaffinch *Fringilla coelebs*	Green	4	4	6	3	2	6	
Chiffchaff *Phylloscopus collybita*	Green	0	0	0	0	1	1	
Coal tit *Periparus ater*	Green	1	0	1	0	0	1	
Common gull *Larus canus*	Amber‡	0	0	0	1	0	1	Single bird in January.
Dunnock *Prunella modularis*	Green	5	4	5	5	3	5	
Goldcrest *Regulus regulus*	Green	1	2	1	1	1	2	
Goldfinch *Carduelis carduelis*	Green	11	29	1	3	3	29	
Great spotted woodpecker *Dendrocopos major*	Green	1	0	0	0	0	1	
Great tit *Parus major*	Green	1	2	6	3	4	6	
Grey wagtail *Motacilla cinerea*	Amber	0	1	0	0	0	1	Single bird overflying the Site in November.
Jackdaw *Corvus monedula*	Green	1	0	0	0	0	1	
Jay *Garrulus glandarius*	Green	2	1	3	0	0	3	
Kestrel *Falco tinnunculus*	Amber	0	1	1	0	0	1	Single hunting bird on two visits.
Linnet *Linaria cannabina*	Red	1	8	0	7	6	8	Small numbers present on most visits, typically in fields and overflying the Site.
Long-tailed tit *Aegithalos caudatus*	Green	2	10	0	3	0	10	
Magpie *Pica pica*	Green	2	2	0	0	3	3	
Meadow pipit *Anthus pratensis*	Amber	1	2	4	8	0	8	Small numbers on most visits, peaking in January.
Pheasant *Phasianus colchicus*	Green	0	3	0	1	0	3	
Pied wagtail *Motacilla alba*	Green	0	3	0	0	1	3	
Redwing *Turdus iliacus*	Red*	4	26	0	1	0	26	Variable numbers, peaking with a single flock of 26 birds in November.
Robin *Erithacus rubecula*	Green	4	4	2	9	6	9	
Rook *Corvus frugilegus*	Amber‡	4	3	0	0	9	9	Small numbers. Common resident species.
Siskin *Carduelis spinus*	Green	0	1	0	53	1	53	
Skylark *Alauda arvensis*	Red	2	8	0	2	8	8	Numbers most apparent during passage periods (November and February).

Species	UK BoCC & Schedule 1 status	Count					Maximum count	Notes of key species
		31 Oct	28 Nov	12 Dec	25 Jan	21 Feb		
Song thrush *Turdus philomelos*	Amber	1	0	1	1	0	1	Single birds in boundary habitats in the south of the Site.
Starling *Sturnus vulgaris*	Red	0	0	0	2	2	2	Very small numbers in January and February.
Treecreeper *Certhia familiaris*	Green	0	0	0	2	0	2	
Woodpigeon *Columba palumbus*	Amber†	111	40	90	19	13	111	Flocks present on each visit, usually foraging in fields.
Wren *Troglodytes troglodytes*	Amber†	3	3	5	7	2	7	Small numbers present in boundary habitats. Common resident species.
Yellowhammer *Emberiza citrinella*	Red	1	1	1	0	1	1	Single birds present on four visits.

* Red-listed due to scarcity of breeding population only – common winter visitor.

† Amber-listed due to large size and European importance of the large British breeding population.

‡ Amber-listed due to European Red-list status, but a common species in Britain.

ǂ Amber-listed due to the European importance of the large British wintering population.

4.29 The wintering assemblage was unexceptional, with a small range of species of elevated conservation concern in generally small numbers. No large flocks of winter thrushes, finches or buntings were present.

4.30 Many species were recorded primarily within boundary or adjacent off-site habitats. Within the arable fields that dominates the Site, the range of species recorded was lower, but included most of the woodpigeons *Columba palumbus*, meadow pipits *Anthus pratensis*, linnets *Linaria cannabina*, redwings *Turdus iliacus*, skylarks *Alauda arvensis* and yellowhammers *Emberiza citrinella* recorded.

Evaluation

4.31 Standard procedures for assessing the value of bird communities have been established by Fuller (1980)[11]. Recording the number of species on a site can provide a simple measure of species diversity from which to confer a level of conservation importance. For wintering birds, the standard qualifying levels provided by Fuller (1980) are as follows:

- National Importance, 115+ species;
- Regional Importance, 85–114 species;
- County Importance, 55–84 species;
- Local Importance, 25–49 species.

4.32 Even allowing for the high mobility of birds and the likelihood of species additional to those recorded by the survey using the Site, the Site is unlikely to support a wintering population of any more than Local importance with respect to the diversity of its wintering bird assemblage.

[11] Fuller, R.J. (1980). *A Method for Assessing the Ornithological Interest of Sites for Conservation*. Biological Conservation, 17: 229–239.

4.33 The Site did not possess any value in terms of its breeding or wintering bird population size or species rarity according to the criteria set out by Fuller.



AEL2296_01-05-00_BBStransect_20251111 A4 10/12/2025

Lodge Farm, Horsford

Bird survey transect route

Site boundary

Transect route

Figure 4.4

Map Scale @ A4: 1:4,800

Surveyed by: n/a	
Survey date: n/a	
Drawn by: RD	
Checked by: DP	
Status: Final	

APPLIED ECOLOGY

Breeding Birds

Survey Approach

4.34 A three-visit transect-based territory mapping breeding bird survey was completed over the period April–May 2025 by Richard Dale MCIEEM. Two nocturnal Site visits completed as part of bat activity surveys were made by AE ecologists during the bird breeding season. The survey combined aspects of the Breeding Birds Survey (BBS) and Common Bird Census (CBC)[12] and was informed by best practice guidance published by the Bird Survey and Assessment Steering Group.[13]

4.35 In this instance, three visits were completed, rather than six, as the Site comprised relatively uniform habitats with limited scope for a particularly diverse or important breeding bird assemblage to be present. As such, three visits, plus two after dark bat activity surveys completed during the bird breeding season, were considered adequate to accurately assess the diversity and distribution of the bird assemblage present.

4.36 The survey visits took place on 10 April, 1 May and 22 May 2025 during generally fine and dry weather conditions. Each transect survey started within an hour of sunrise to coincide with the peak period of bird activity and took up to two hours to complete.

4.37 A transect route was devised to adequately cover all accessible parts of the Site as shown by **Figure 4.4**.

4.38 During each survey, the positions, age, sex, and behaviour of individual birds were recorded on large-scale field maps with a new map used on each visit. Depending on the behaviour observed, species were allocated levels of breeding confirmation using slightly adapted BTO guidelines[14] as summarised in **Table 4.4**.

4.39 All adult birds detected by sight and/or sound were recorded, although species flying over the Site were omitted unless it was clear the birds were feeding over the Site or were flying to or had originated on or near the Site. Every effort was made to ensure that individual birds were only recorded once, and where possible, repeated records and clusters of registrations were used to map approximate breeding territories and assess species breeding density and abundance.

4.40 Notes of any nocturnal species or other notable birds were also made during dusk bat activity surveys of the Site completed in 2024 and 2025.

Table 4.3: Breeding status of bird species and evidence.

Breeding status	Breeding evidence
Non-breeder	• Suspected to be on migration. • Summering non-breeder. • Not nesting within Site boundary (but potentially close by).
Possible breeding	• Species observed in suitable nesting habitat or singing male present.
Probable breeding	• Pair in suitable breeding habitat. • Permanent territory presumed through registration of territorial behaviour (song etc.) on at least two different days a week or more apart at the same place or many individuals on one day.

[12] Gilbert, G., Gibbons, D.W. & Evans, J. (1998). *Bird Monitoring Methods: a manual of techniques for key UK species*. RSPB, Sandy.
[13] www.birdsurveyguidelines.org – accessed 27/04/2025.
[14] www.bto.org/volunteer-surveys/birdatlas/methods/breeding-evidence

Breeding status	Breeding evidence
	• Courtship and display. • Visiting probable nest site. • Agitated behaviour or anxiety calls from adults, suggesting presence of nest or young nearby. • Nest-building or excavating nest-hole.
Confirmed breeding	• Distraction display of feigning injury. • Used nest of eggshells found (occupied or laid during period of survey). • Recently fledged young (nidicolous species) or downy young (nidifugous species) • Adults entering or leaving nest site in circumstances indicating occupied nest, or adults seen incubating. • Adult carrying faecal sac or food for young. • Nest containing eggs. • Nest with young seen or heard.

Survey Findings

4.41 The survey recorded a total of 23 species using the Site, as summarised in **Table 4.5**. These comprised three red-listed species and six amber-listed species of elevated conservation concern (although two of the Amber-listed species are abundant species which are listed due to the large size of the UK population and their consequent importance in a European context).

Table 4.4: Breeding birds survey results.

Species	UK BoCC status	Count			Max. count (and estimated territories / pairs)	Breeding status	Notes on occurrence of red/amber-listed BoCCs and Schedule 1 species
		3 Apr	6 May	21 May			
Blackbird *Turdus merula*	Green	4	3	6	6 (3–4)	Probable	
Blue tit *Cyanistes caeruleus*	Green	–	3	6	6 (2–3)	Probable	
Buzzard *Buteo buteo*	Green	–	–	1	1 (0–1)	Possible	
Carrion crow *Corvus corone*	Green	1	–	2	2 (0–1)	Possible	
Chaffinch *Fringilla coelebs*	Green	1	–	1	1 (1)	Probable	
Chiffchaff *Phylloscopus collybita*	Green	1	1	–	1 (1)	Probable	
Collared dove *Streptopelia decaocto*	Green	–	2	–	2 (0–1)	Possible	
Dunnock *Prunella modularis*	Amber	2	4	2	4 (3–4)	Probable	Several territories in hedgerows in the south of the Site.
Great tit *Parus major*	Green	2	1	1	2 (1–2)	Probable	
Green woodpecker *Picus viridis*	Green	–	1	–	1 (0–1)	Possible	
Jackdaw *Corvus monedula*	Green	–	4	2	4 (0–2)	Possible	

Species	UK BoCC status	Count			Max. count (and estimated territories / pairs)	Breeding status	Notes on occurrence of red/amber-listed BoCCs and Schedule 1 species
		3 Apr	6 May	21 May			
Linnet *Linaria cannabina*	Red	7	9	6	9 (3–5)	Probable (off-site)	A small colony was present immediately adjacent to the Site's eastern boundary in an area of scrub and bracken.
Pheasant *Phasianus colchicus*	Green	–	1	–	1 (0–1)	Possible	
Pied wagtail *Motacilla alba*	Green	1	1	–	1 (0–1)	Possible	
Robin *Erithacus rubecula*	Green	2	2	4	4 (3–4)	Probable	
Skylark *Alauda arvensis*	Red	4	5	3	5 (2–3)	Probable	Two territories in the southern arable field, only one of which was wholly within the Site boundary. A third singing male in the northern male not seen after first visit.
Song thrush *Turdus philomelos*	Amber	1	1	1	1 (1)	Probable	One territory in the south of the Site – most of the territory likely to be in off-site woodland.
Stock dove *Columba oenas*	Amber	1	–	–	1 (0–1)	Possible	A single bird on first visit only.
Whitethroat *Sylvia communis*	Amber	–	2	2	2 (2)	Probable	Two territories in the southern part of the Site.
Woodpigeon *Columba palumbus*	Amber*	5	3	3	5 (2–3)	Probable	Small numbers on each visit.
Wren *Troglodytes troglodytes*	Amber*	5	3	6	6 (5–6)	Probable	Common breeder in hedgerows in the south of the Site.
Yellowhammer *Emberiza citrinella*	Red	1	3	1	3 (1–3)	Probable	At least one territory, with other probably overlapping part of the Site, all in the southern part.

* Amber-listed due to large size and European importance of UK population.

Species assemblage

4.42 The species recorded during the survey represent an unremarkable assemblage of mostly commonplace hedgerow species with a small range of farmland specialists of elevated conservation concern. The latter group comprised the following:

- Skylark – two territories wholly or in part within the arable field in the south of the Site (a third singing male was present on the first visit in the northern field, but once the oilseed rape crop here matured no skylarks (or other birds) were recorded within this field).

- Yellowhammer – small numbers on each visit, indicative of up to three territories overlapping with the Site, though possibly none entirely within the Site.
- Linnet – a small breeding colony was present, actually just outside the eastern Site boundary, but included here due to its proximity to the Site and likely use of the Site for foraging by these birds.

4.43 In addition to the species recorded during the bird survey visits, two nocturnal species, little owl *Athene noctua* nesting in the barn in the south-west of the Site, and tawny owl *Strix aluco*, were recorded during nocturnal visits to the Site.

4.44 A small number of additional species were recorded in flight over the Site but apparently not associated with it. These were herring gull *Larus argentatus*, black-headed gull *Chroicocephalus ridibundus* and rook *Corvus frugilegus*.

4.45 A range of birds were also recorded using habitats, particularly gardens and woodland, directly adjacent to the Site. In addition to those recorded within the Site, these included blackcap *Sylvia atricapilla*, house sparrow, starling, and, just outside the Site's south-eastern boundary on 22 May, a singing cuckoo *Cuculus canorus* (this latter species is highly mobile and best assessed as part of the Site's breeding bird assemblage due to the presence of dunnock *Prunella modularis*, a regular host species.

4.46 During bat roost emergence surveys swifts *Apus apus* were recorded at dusk over the existing residential development of Horsford to the west indicating the presence of a breeding colony of this species within the village.

Bird density and distribution

4.47 The relative density of all birds recorded within the Site during during the breeding birds survey is shown in **Figure 4.5**. This indicates two particularly obvious areas of elevated density, one in the south-west associated with a residential garden, and one in the east, relating to a breeding colony of linnet just outside the Site boundary. Elsewhere, that the higher densities of birds were strongly associated with boundary habitats, particularly the hedgerows in the south of the Site.

4.48 The arable fields were of limited value other than to skylarks, with the northern oilseed rape field being particularly devoid of registrations.

Evaluation

4.49 Standard procedures for assessing the value of bird communities have been established by Fuller (1980)[15]. Recording the number of species on a site can provide a simple measure of species diversity from which to confer a level of conservation importance. For breeding birds, the standard qualifying levels provided by Fuller (1980) are as follows:

- National Importance, 85+ species;
- Regional Importance, 70–84 species;
- County Importance, 50–69 species;
- Local Importance, 25–49 species.

4.50 A total of 25 species were recorded at the Site during the survey. Allowing for the presence of additional species, such as wide ranging species that might use the Site as part of a much larger

[15] Fuller, R.J. (1980). *A Method for Assessing the Ornithological Interest of Sites for Conservation*. Biological Conservation, 17: 229–239.

territory, particularly raptors such as sparrowhawk *Accipiter nisus* and kestrel *Falco tinnunculus*, the breeding assemblage at the Site is considered likely to be in the range of 22–27 species in a given year and therefore of no more than Local importance according to Fuller's criteria for the diversity of the breeding assemblage.

4.51 The Site did not possess any value in terms of its breeding bird population size or species rarity according to the criteria set out by Fuller.



AEL2296_01-04-00_BBSresults_20251111 A4 10/12/2025

Lodge Farm
Horsford

Breeding birds survey results
Relative density

Site boundary

Sparse

Dense

Relative density of all birds recorded, n=139

Figure 4.5

Map Scale @ A4: 1:4,800

Surveyed by: RD	
Survey date: April–May 2025	
Drawn by: RD	
Checked by: DP	
Status: Final	

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5 Development Implications and Recommendations

Development Implications

Protected sites

5.1 The Site is not covered by any statutory or non-statutory wildlife site designation, but occurs within a Site of Special Scientific Interest (SSSI) impact risk zone (IRZ) around local SSSIs. Six development types are considered by Natural England to represent a potential threat to local SSSIs as follows:

- **Infrastructure:** Airports, helipads and other aviation proposals.
- **Residential:** Residential development of 50 units or more.
- **Rural Residential:** Any residential development of 50 or more units outside existing settlements/urban areas.
- **Air Pollution:** Any industrial/agricultural development that could cause AIR POLLUTION (including: industrial processes, livestock & poultry units with a floorspace > 500m², slurry lagoons > 750m² & manure stores > 3,500 tonnes).
- **Combustion:** General combustion processes >50MW energy input. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/combustion.
- **Discharge:** Any discharge of water or liquid waste of more than 20m³/day that is discharged to ground (i.e. to seep away) or to surface water, such as a beck or stream.

5.2 The Site is located within a SSSI Impact Risk Zone (IRZ) where residential developments of 50 units or more are considered a potential risk. It is also within the catchment of a European site (the River Wensum SAC) that is identified as being vulnerable to nutrient impacts (so called 'Nutrient Neutrality') and in a location where an increase in recreational pressure due to development is likely to have significant negative effects on the qualifying features of nearby European sites. Given these potential concerns, Natural England advise that a Habitat Regulations Assessment (HRA) informed by nutrient budget calculations, and an Appropriate Assessment are prepared to assess these issues, respectively.

5.3 It is of note however that a mechanism to offset potential impacts on European sites due to recreational pressure is already established (at least for sites allocated in Local Plans). This is set out in the Norfolk Green Infrastructure and Recreational impact Avoidance and Mitigation Strategy (March 2021)16 and is based on RAMS delivery through proportionate and development funded tariffs.

Habitats

5.4 The Site was dominated by arable land of very limited biodiversity and ecological value that does not represent a particular design constraint.

[16] Places Services (2021) *Norfolk Green Infrastructure and Recreational impact Avoidance and Mitigation Strategy. Habitats Regulations Assessment Strategy Document*. March 2021.

5.5 Mature trees, most notably those with veteran or approaching veteran status and species rich hedgerows should be regarded as high value habitat that should be retained, protected and enhanced as part of development planning.

Fauna

5.6 The Site supports a bat assemblage that is of regional importance and a building (Barn 2) that supports the day roosts of small numbers of three bat species. The bat assemblage that makes use of the habitats within the Site includes a number of rare and light averse species. No evidence was recorded to indicate that the two hedgerows that cross the Site form an important bat commuting route or flyway.

5.7 The wintering and breeding bird assemblage was found to be unremarkable and of local importance only with small number of red list farmland birds of conservation concern located within or very close to the site including: skylark (up to three territories); yellowhammer (three territories) and linnet (up to five territories).

Recommendations

Development planning

5.8 Mature and veteran trees and species rich hedgerows should be retained and protected as part of development planning.

5.9 Development stand-offs of at least 15 m wide should be respected between off-site woodland and species rich hedgerows.

5.10 Retained woodland and boundary hedges should be retained as dark unilluminated habitats at night.

Habitat management

5.11 The improved grassland field to the south of the Site should continue to be grazed or regularly cut to prevent it becoming more attractive habitat for reptile species.

Follow-up survey

5.12 It is recommended that winter roosting use of Barn 2 is surveyed by the use of automated bat detector survey over the reminder of the 2025-2026 winter period.

5.13 If any tree needs to be removed to facilitate the development it should be subject to a preliminary bat roost assessment.

Appendix A

Bat survey set-up



Key

Tripod mounted time synchronised Anabat Express electronic bat detector - arrow shows direction of microphone

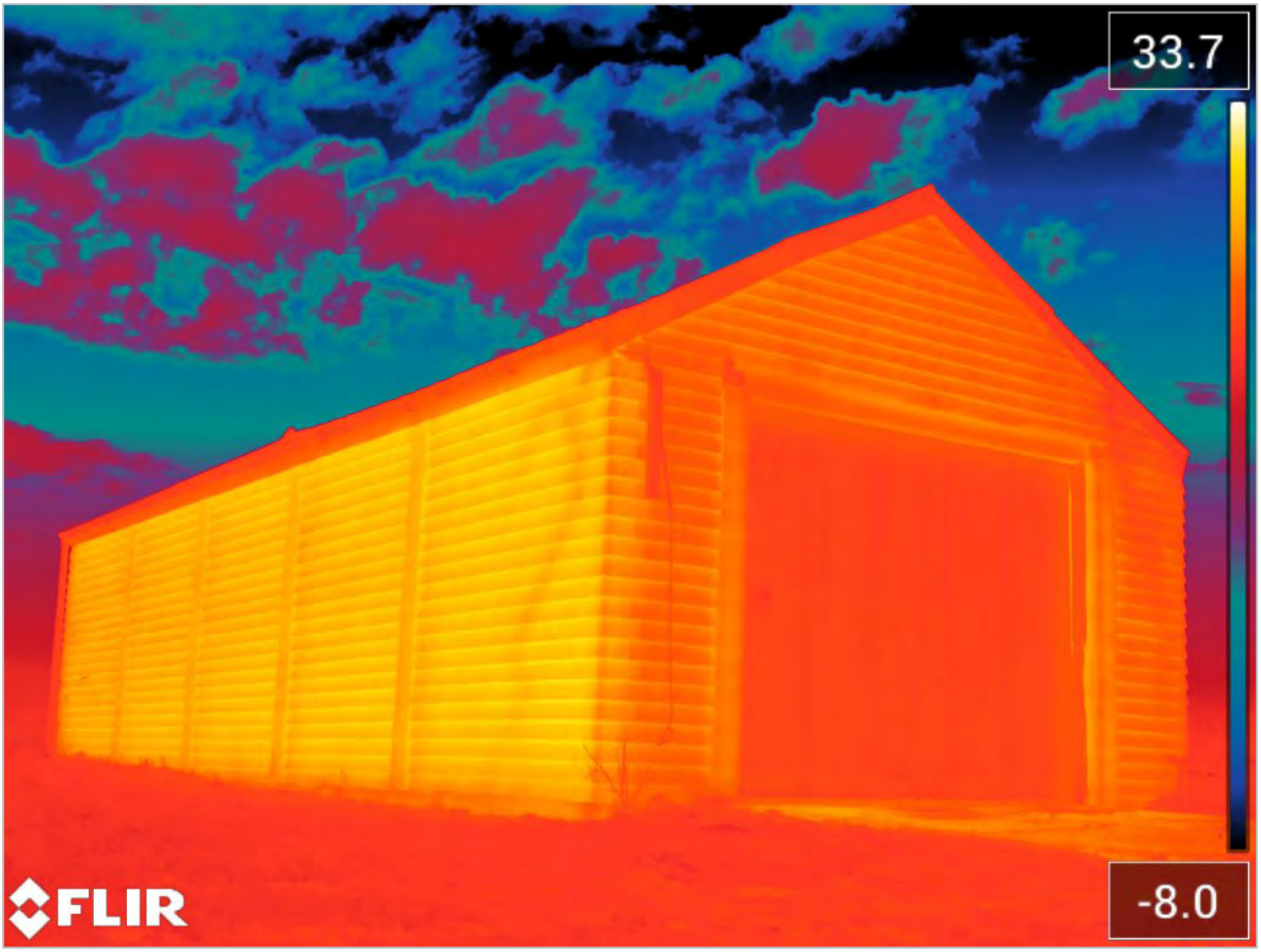
Bat surveyor equipped with hand-held Pettersson D230 electonic bat detector with ear phones

Tripod mounted FLIR thermal camera - camera fields of view and bat in flight detection distances reported separately

Barn 1: surveyed 28 May 2025
Barn 2: surveyed 10 July, 12 August & 9 September 2025
Barn 3: surveyed 10 July 2025
NS: not surveyed

Bat roost emergence survey set up May-September 2025

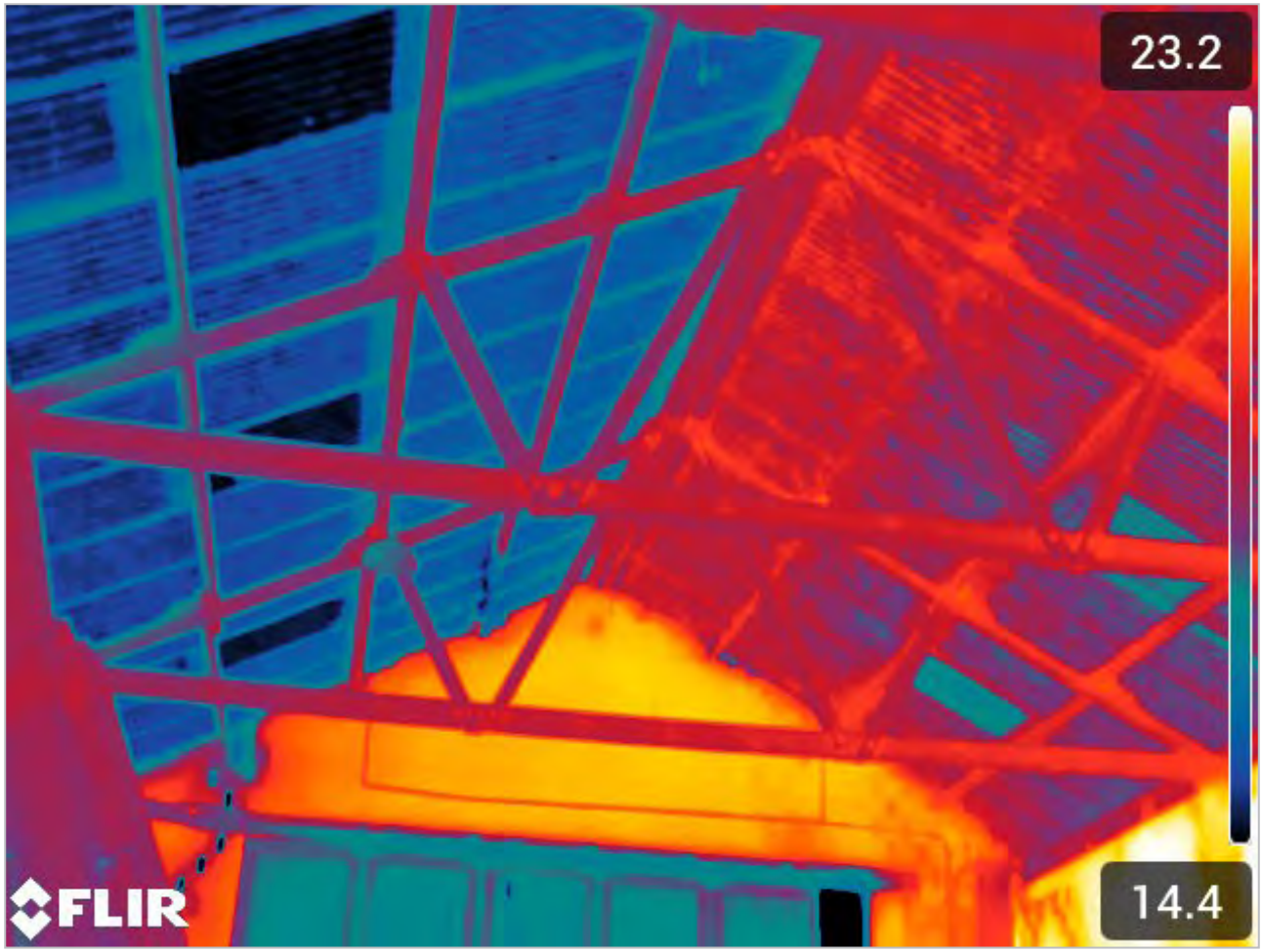
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FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 30 m from furthest point of building

Lodge Farm, Horsford
FLIR T540 field of view 1

APPLIED ECOLOGY



FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 16 m from furthest point of building

Lodge Farm, Horsford
FLIR T540 field of view 2

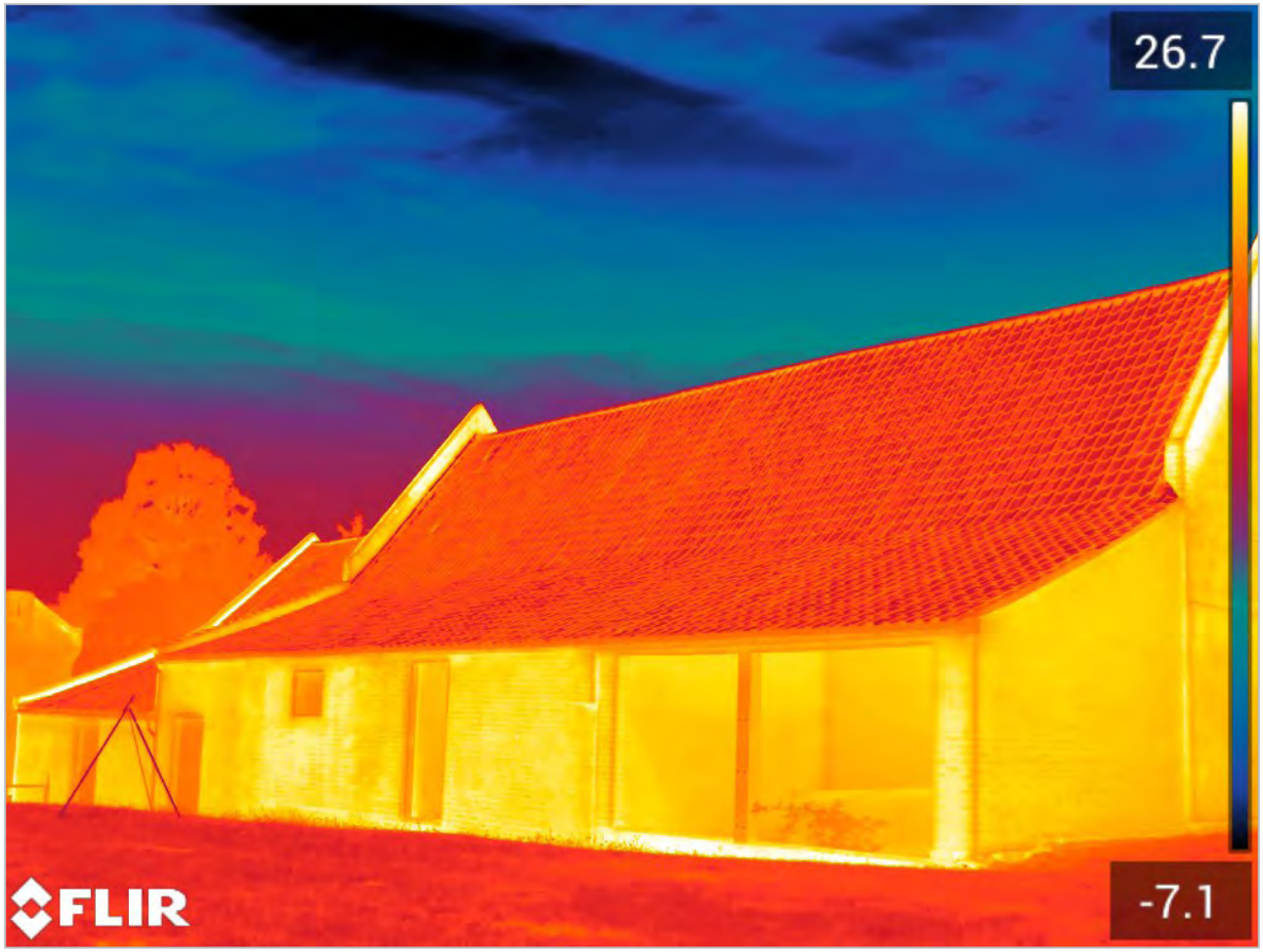
APPLIED ECOLOGY



FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 26 m from furthest point of building

Lodge Farm, Horsford
FLIR T540 field of view 3

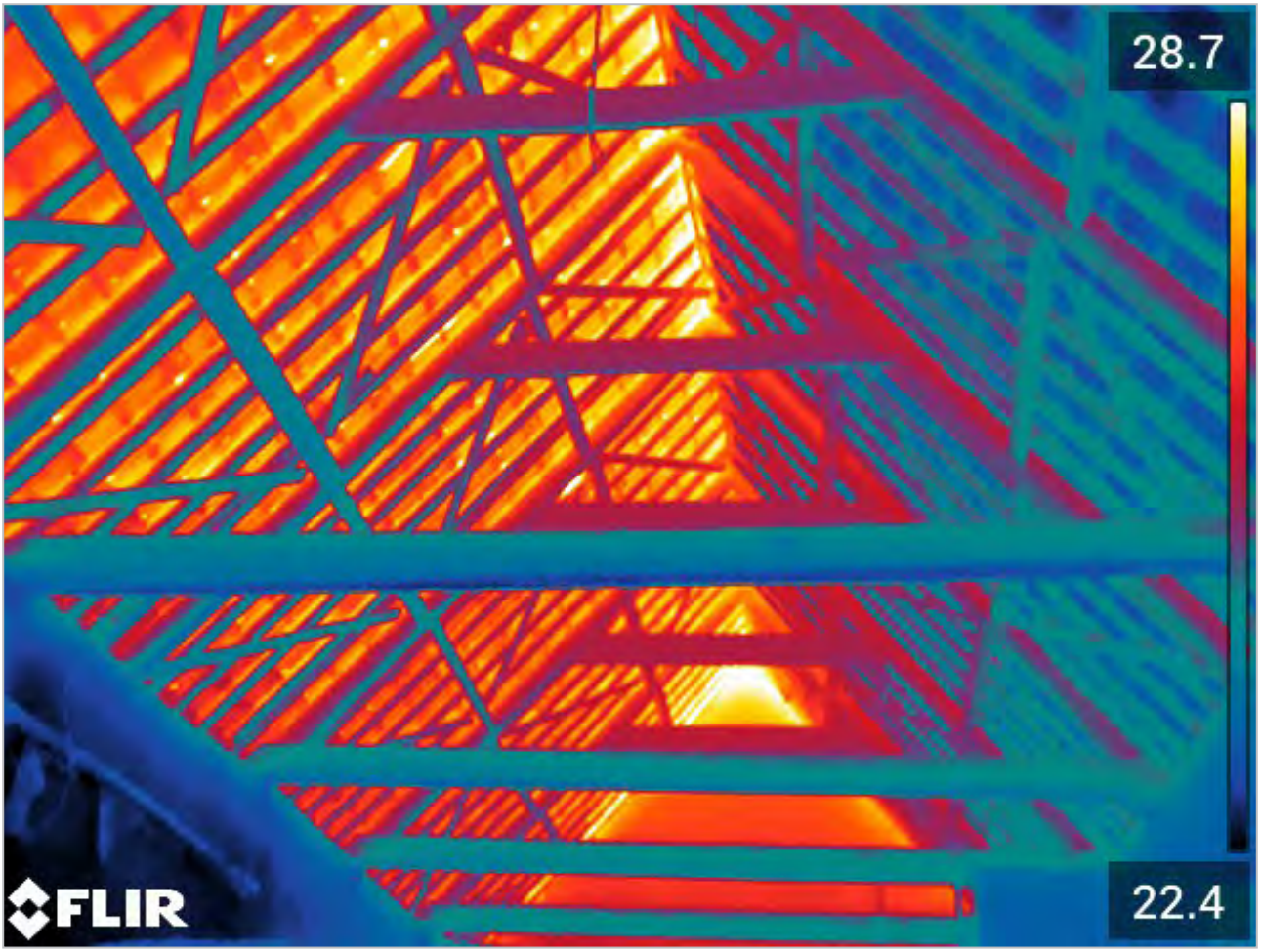
APPLIED ECOLOGY



FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 53 m from furthest point of building

Lodge Farm, Horsford
FLIR T1020 field of view 4

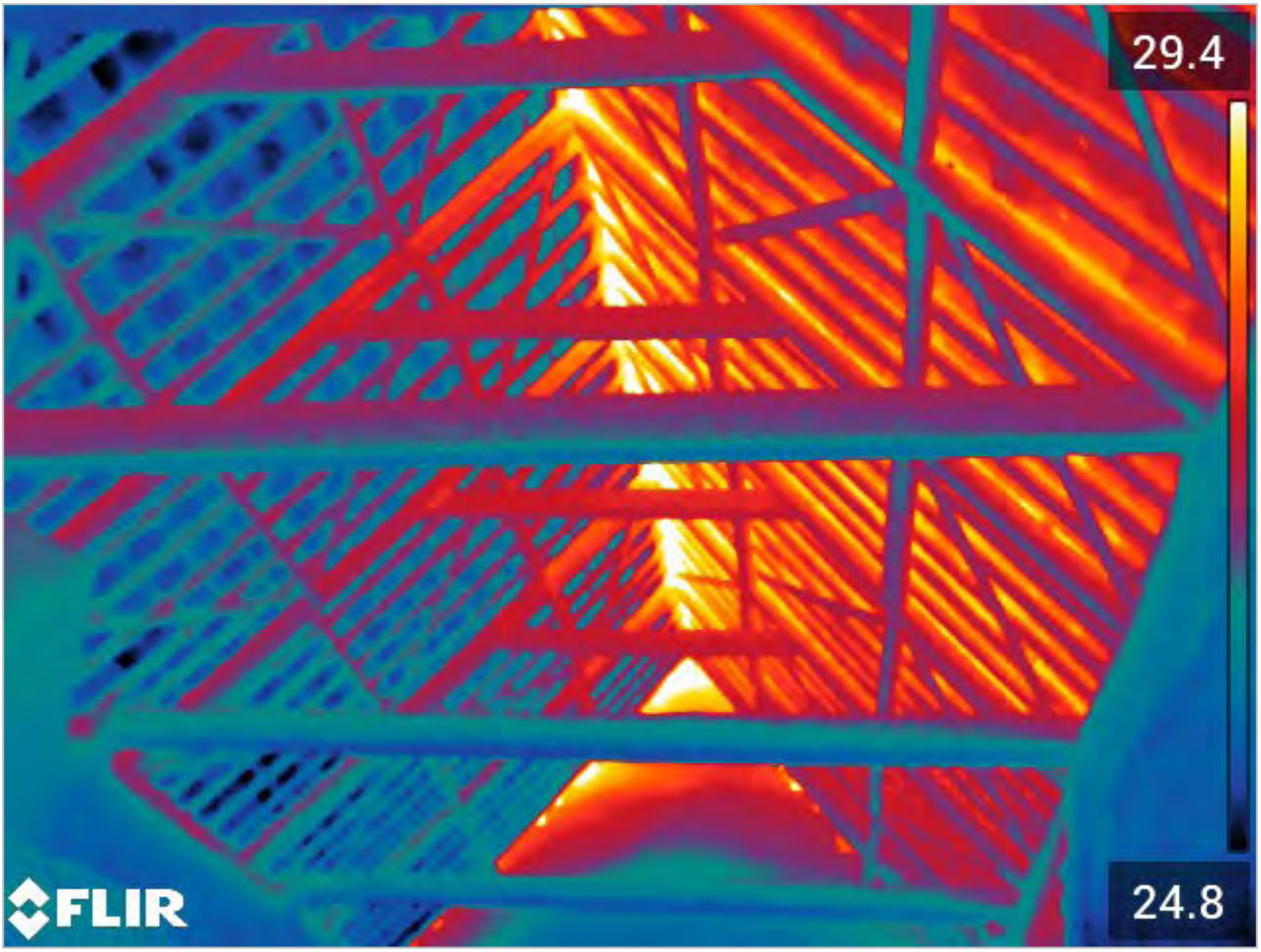
APPLIED ECOLOGY



FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 27 m from furthest point of building

Lodge Farm, Horsford
FLIR T540 field of view 5

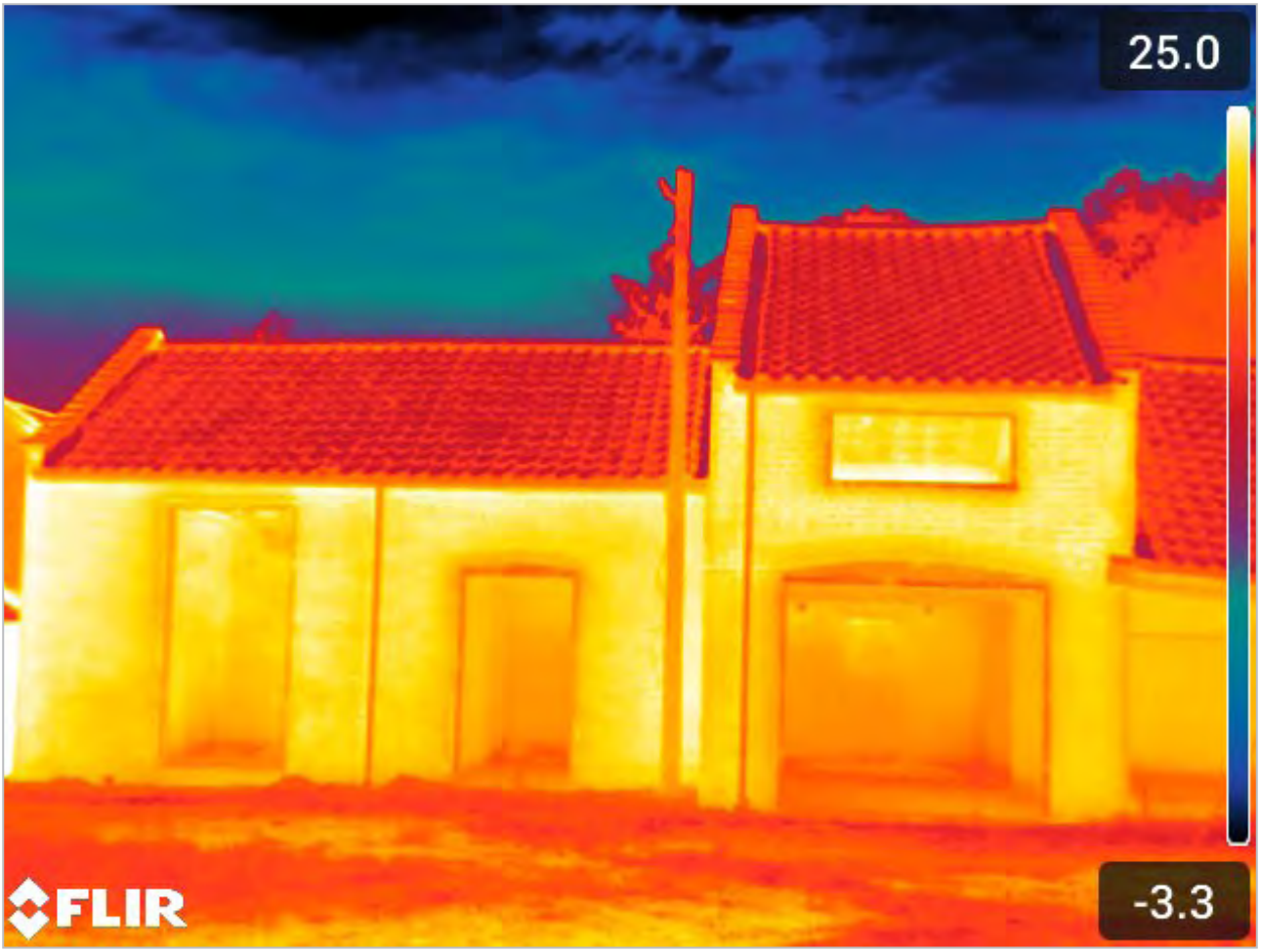
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FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 27 m from furthest point of building

Lodge Farm, Horsford
FLIR T540 field of view 6

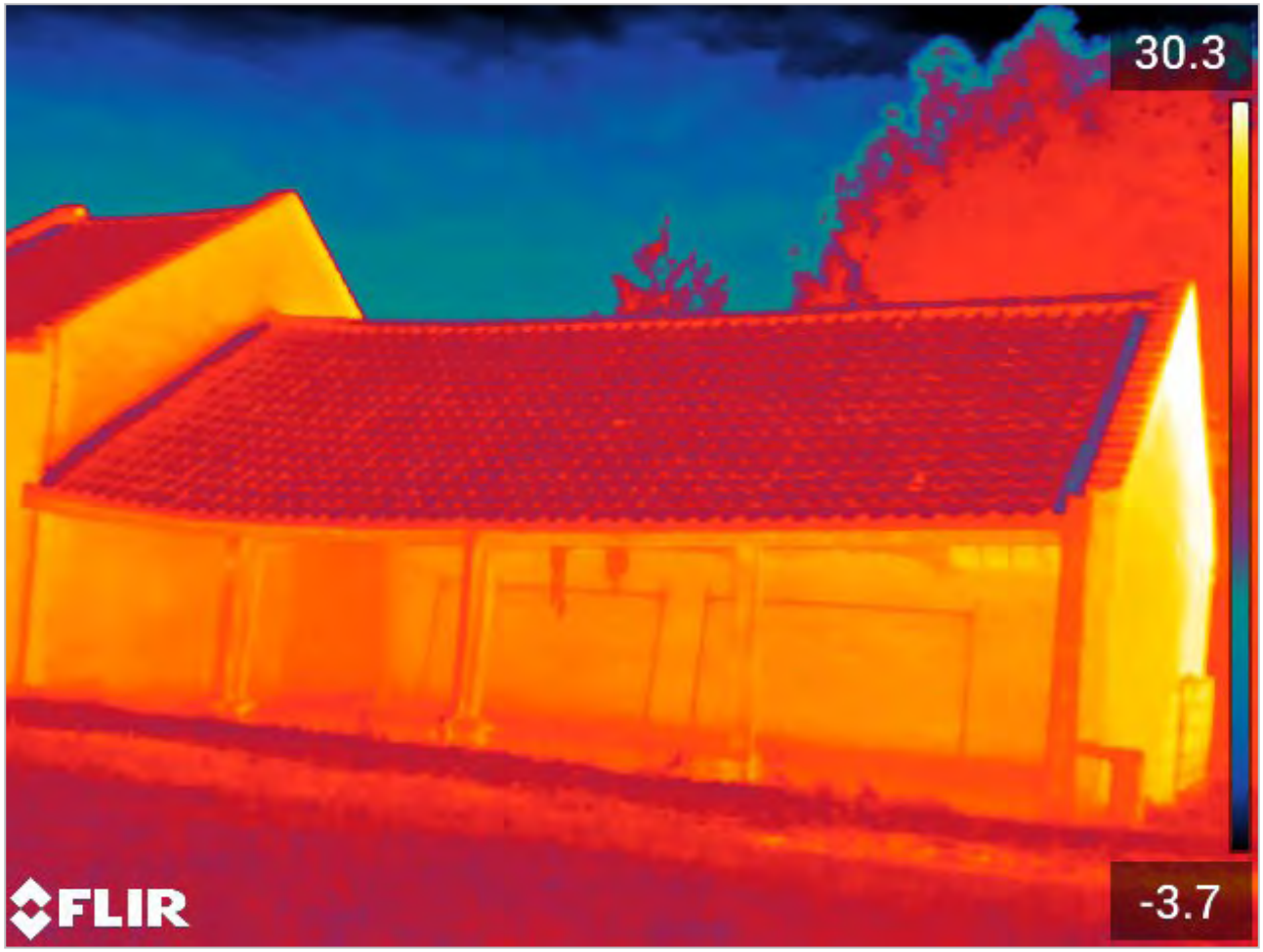
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FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 18 m from furthest point of building

Lodge Farm, Horsford
FLIR T540 field of view 7

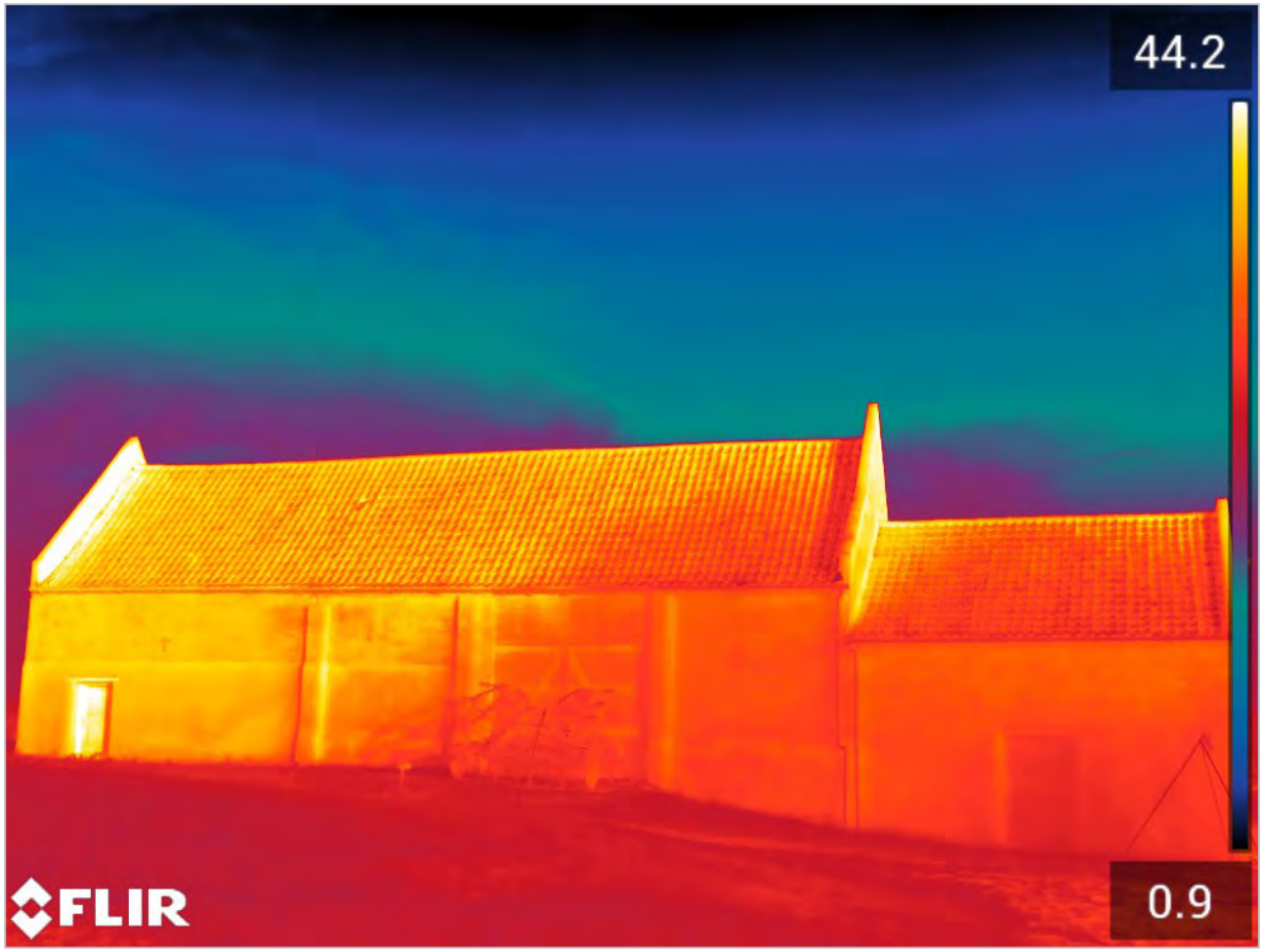
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FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 21 m from furthest point of building

Lodge Farm, Horsford
FLIR T540 field of view 8

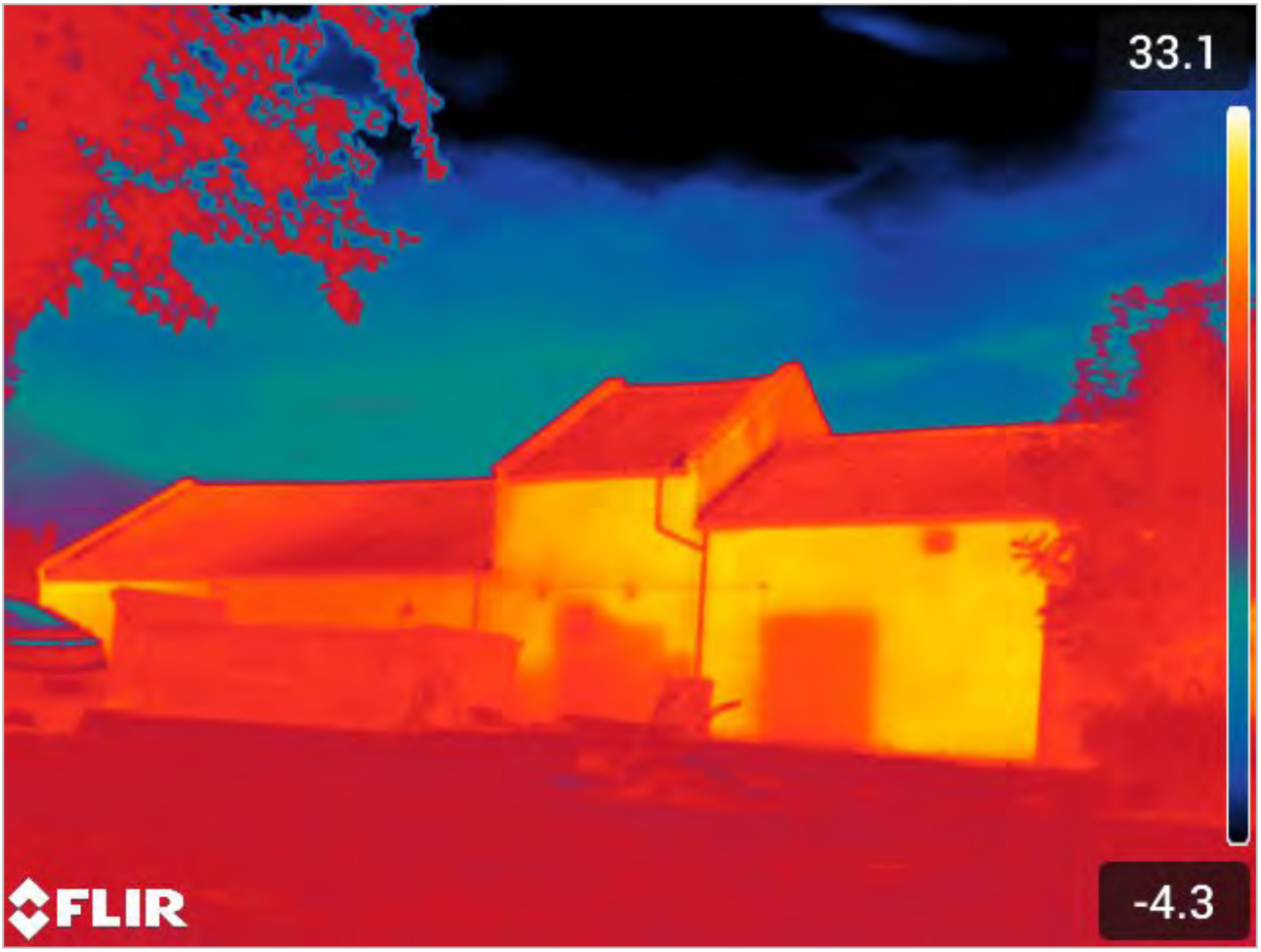
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FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 44 m from furthest point of building

Lodge Farm, Horsford
FLIR T1020 field of view 9

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FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 31 m from furthest point of building

Lodge Farm, Horsford
FLIR T540 field of view 10

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