Technical Appendix 5.2: Preliminary Ecological Appraisal Report

Kirknewton Solar & BESS EIA Report

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Table of Contents

Tables in Text

Photos in Text

Annexes

Annex E Field survey target notes

1.0 Introduction

This Preliminary Ecological Appraisal (PEA) is prepared on behalf of Trio Power Limited (the Applicant) who is seeking planning permission for a Battery Energy Storage System (BESS) and Solar development at a site located near Kirknewton, West Lothian, Scotland, EH27 8DQ, (Grid reference: NT 10783 65217). (Hereafter referred to as 'the Site').

This report has been prepared to inform the design / planning process and should be viewed as a basis for discussion to determine next steps. Alone, it does not contain sufficient detail as would be required for submission to a local planning authority for full planning permission, however it does provide guidance and recommendations for the next steps.

1.1 Site Description

The Site is comprised predominantly of cropland, and grassland used for agriculture, with livestock grazing in areas to the north-east of the Site. Native hedgerows and lines of mature broadleaved trees border grassland and cropland areas. There are areas of ancient woodland present in the centre, north-east and north-west of the Site, as well as several ditches and watercourses including a small, modified stream within the east of the Site (**Figure 1: UK Habitat Baseline Survey**).

No statutory designated sites are located within the Site boundary; however, several are located within the wider search areas (see **Figure 2: Statutory Designated sites**). The immediate surroundings are comprised of similar habitats and land use types, with several ancient woodland sites listed in the Ancient Woodland Inventory (AWI) and Kirknewton estate Local Biodiversity Site within a radius of 2 km from the Site boundary (**Figure 3: Non-statutory designated sites**).

2.0 Details of the Proposed Development

2.1 Purpose of this Report

This report presents the findings of the PEA. The report seeks to:

- establish baseline conditions and determine the importance of ecological features present (or those that could be present), as far as is possible;
- to identify potential ecological constraints to the Proposed Development and make initial recommendations to avoid potentially significant effects on important ecological features, where possible;
- to identify potential requirements for mitigation, where possible, including mitigation measures that will be required and those that may be required (depending on results of further surveys or final scheme design);
- to establish any requirements for more detailed surveys; and
- to identify opportunities for biodiversity enhancements as part of the project.

2.2 Evidence of Technical Competence and Experience

The PEA survey was undertaken by Rowan Smith, Beth Hanlon and Olivia Aveyard. Olivia Aveyard and Euan MacRae compiled the PEA report.

Euan MacRae is a Project Ecologist at SLR and Qualifying member of CIEEM with three years' ecological consultancy experience. During this time, Euan has undertaken baseline data collection for a wide variety of power sector and built environment developments throughout Scotland.

Beth Hanlon is a senior ecologist at SLR and has seven years' experience working in ecology. During her time in consultancy, she has worked on a variety of projects and has experience in protected species surveys for a range of terrestrial fauna and flora. Her expertise covers botanical, habitat, and protected species field skills, habitat management and restoration, Biodiversity Net Gain (BNG) assessments, data analysis, and technical report writing.

Rowan Smith is a senior ecologist at SLR with six years' experience in the environmental sector. She has extensive experience in surveying for protected species and habitats including freshwater pearl mussel, otter and beaver surveys, terrestrial mammals (red squirrel and pine marten), water quality (including macroinvertebrate analysis), quantitative fish assessments and fish habitat assessments. Projects undertaken have a broad scope and ranged over terrestrial, freshwater and marine environments.

Olivia Aveyard is a Graduate Ecologist at SLR and Qualifying member of CIEEM with just over a year's ecological consultancy experience. During this time, Olivia has contributed to a number of reports for a variety of power sector and built environment developments throughout Scotland.

2.3 Relevant Legislation and Policy

A summary of relevant legislation[1] and policy text is included in **0C.**

3.0 Methodology

3.1 Baseline Data Collection

3.1.1 Desk Study

A desk study was carried out to identify statutorily nationally and internationally recognised sites within 10 km of the Site which are designated for their nature conservation interest (including Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar wetlands, and National Nature Reserves (NNRs). This distance is extended in the case of SPAs within 20 km which support goose or swan qualifying features.

Any Local Nature Reserves (LNRs), AWI and non-statutory ecological sites within 2 km of the Site were also identified.

A data request was sent to The Wildlife Information Centre (TWIC) on the 14 April 2025 for records of protected and notable species within 2 km of the Site boundary. For the purposes of ensuring that information is up to date and relevant, only records from the last 15 years were considered. "Notable species" include those listed in the Scottish Biodiversity list (SBL)[2]; The West Lothian Council Local Biodiversity Action Plan (LBAP)[3] and the Birds of Conservation Concern (BOCC) list developed by the Birds of Conservation Concern partnership:[4]

[1] SLR is not a legal practice, and the summary is provided as a reference only.

[2] NatureScot, 2020. Scottish Biodiversity List (SBL). Available at: https://web.archive.org/web/20240422023328/https://www.nature.scot/doc/scottish-biodiversity-list

[3] West Lothian Council, 2025. Working Together for Nature, A Biodiversity Action Plan for West Lothian. 2025-35. Available at: https://www.westlothian.gov.uk/article/75251/Local-Biodiversity-Action-Plan

[4] Birds of Conservation Concern Partnership, 2021. Birds of Conservation Concern 5 (BoCC5). Available at: https://www.bto.org/sites/default/files/publications/bocc-5-a5-4pp-single-pages.pdf

- The Scottish biodiversity list is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland.
- The West Lothian Biodiversity action plan was published in 2025 and sets out a 10-year action plan aiming to prevent further biodiversity loss and mitigate the impacts of climate change across West Lothian. The plan identifies key species and habitats in need of protection and restoration, setting management plans for habitat restoration, and ensures the community across West Lothian benefits from the ecosystem services. The LBAP sets a list of priority species defined as '*species found in West Lothian on the Scottish Biodiversity List that are labelled 'conservation action needed', or 'avoid negative impacts'*. The TWIC data search identifies 19 LBAP species found within 2 km of the site within the last 15 years.
- The Birds of Conservation concern list categorises 246 bird species that are regularly found within the United Kingdom according to population trends and their European/ global conservation status into three categories: Red; Amber and Green with those on the Red list considered to be the most under threat.

Additional data for protected, notable and invasive species within 2 km of the Site (within the last 15 years) was obtained from the National Biodiversity Network Atlas (NBN)[5]. Note that only records available for commercial use have been reported, with the data owner(s) cited or acknowledged as required[6].

Potential ecological constraints have been identified through a desk-based review of the above and other relevant online resources, as summarised in **Table 3-1**.

Table 3-1 Sources of Existing Ecological Data

Source	Baseline Information Provided
NatureScot Sitelink web-based application[7] and the Multi Agency Geographic Information for the Countryside (MAGIC) web-based mapping tool[8]	Statutory designated nature conservation sites within 10km (non-avian) and 20 km (relating to geese) of the Site boundary.
Spatial Hub online tool[9]	Non-statutory designated nature conservation sites within 2 km of the Site boundary
AWI of Scotland[10]	Ancient[11] and long-established woodland of plantation origin[12] (LEPO) within 2 km of the Site boundary.
Aerial imagery (Google Earth[13] and Bing Maps[14])	Habitats and features of nature conservation interest both within and surrounding the Site.

[5]NBN Atlas, Available at: https://docs.nbnatlas.org/

[6] https://docs.nbnatlas.org/data-licenses/

[7] https://sitelink.nature.scot/map

[8] https://magic.defra.gov.uk/

[9] https://data.spatialhub.scot/

[10] https://www.data.gov.uk/dataset/c2f57ed9-5601-4864-af5f-a6e73e977f54/ancient-woodland-inventory-scotland

[11] Ancient woodland is interpreted as semi-natural woodland that has been continuously wooded since year 1750 (category 1a) or 1860 (category 2a) to present day.

[12] Long-established woodland refers to plantation woodland that has been present since year 1750 (category 1b) or 1860 (category 2b). Many of these sites have developed semi-natural characteristics, and some may be as rich as ancient woodland.

[13] https://earth.google.com/web

[14] https://www.bing.com/maps/

Source	Baseline Information Provided
Ordnance Survey 1st and 2nd edition mapping	Habitats and features of nature conservation interest both within and surrounding the Site.
Carbon and Peatland 2016 Map of Scotland[15]	Distribution of carbon-rich and peat soil across Scotland and associated values (soil class). This mapping is for initial desk assessment and considered for indicative purposes only. It is not to be relied upon in the absence of peat survey data.

3.1.2 Field Survey(s)

3.1.2.1 UK Habitat survey

An initial walkover survey of the Site was conducted on the 7 and 8 April 2025, with subsequent visits on the 24 June and 16 August 2025.

During the walkover survey, habitats on Site were mapped in accordance with the UK Habitat Classification (UKHab) methodology[16]. The Survey Area comprised of a buffer of 50 m from the Site boundary, which was extended to 200 m for watercourses (i.e. the Survey Area). The UKHab system comprises a principal hierarchy (the Primary Habitats) which involves the identification of broad habitats and Priority habitats, as well as the use of non-hierarchical Secondary codes.

The methodology was extended to include searches for features of interest, such as notable or protected species of flora and fauna, as well as habitats capable of supporting such species.

In addition, invasive non-native species (INNS) of plant were searched for. Invasive non-native species are defined as those species which occur outside of their natural range and have an adverse effect on native fauna/ flora. Such species include but are not limited to: Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandulifera* and giant hogweed *Heracleum mantegazzianum*. In Scotland the law on INNS is amended via the Natural Environment (Scotland) Act 2012, which means it is an offence to plant, or otherwise cause to grow, a plant in the wild at a location outside its native range.

The reporting assessment follows guidelines set out by the Chartered Institute of Ecology and Environmental Management (CIEEM)[17]

3.1.2.2 Protected Species Survey

Dedicated protected species surveys were undertaken concurrently for terrestrial mammals, and riparian species on 7 and 8 April 2025, with subsequent visits on the 24 June, 16 August 2025 and 3 September. Survey methods for otter, water vole, GCN, and badger are summarised below. However, an assessment of habitat suitability and an active search of evidence for other protected species, including red squirrel, pine marten, reptiles, and amphibians was also conducted.

Badger

[15] https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/

[16] UKHab Ltd, 2023, Uk habitat classification version 2.0. Available at: https://ukhab.org/ (Accessed 01/09/2025)

[17] CIEEM 2017, Guidelines for preliminary ecological appraisal. Chartered institute of Ecology and environmental management. Available at: https://cieem.net/wp-content/uploads/2019/02/Guidelines-for-Preliminary-Ecological-Appraisal-Jan2018-1.pdf (Accessed 01/09/2025.)

The survey comprised a search for setts and other signs of badger activity, e.g. latrines, dung pits, pathways, snagged hair and signs of foraging in line with NatureScot guidance [18]. Where setts were identified within the Survey Area, each sett entrance was mapped and photographed with sett entrances then grouped and classified as a main sett, annex sett, subsidiary sett or outlier sett.

Otter

An otter field signs survey was undertaken of all watercourses to identify otter spraints, feeding remains, footprints, slides, resting places and potential holt / natal den sites, and included a 20 m riparian zone where suitable habitat was present. Throughout the survey, overhanging banks, cavities, bankside vegetation and riparian features, such as boulders and mud, were searched for the following signs of otter use, broadly in accordance with the approach described by NatureScot[19] and Chanin[20].

Water Vole

A water vole field signs survey was conducted on all suitable watercourses to identify latrines, burrows, feeding stations, paths / runs at the waters edge, and footprints. The search was undertaken in the riparian zone and up to 20 m away from the water's edge for evidence of water voles. Cognisance was taken to the 'Water Vole Mitigation Handbook'[21] with additional reference to the 'Water Vole Conservation Handbook'[22].

It should be noted that any single field sign recorded in isolation, especially when ambiguous (e.g., a burrow or footprints) would not be definitive in confirming species presence/absence.

GCN

A Habitat Suitability Index (HSI) assessment of standing water bodies within a 500 m radius of the Site[23]. This was reduced to 250 m where barriers to movement was evidence between ponds and the Site.

Ponds were not accessible or not suitable for Environmental DNA (eDNA) therefore further survey work was not carried out.

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[18] NatureScot, 2020b. Planning and development: standing advice and guidance documents. Available at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-standing-advice-and-guidance-documents [Last accessed 22/07/2025]

[19] NatureScot, 2024. Standing advice for planning consultations – Otters . Available at: www.nature.scot: https://www.nature.scot/doc/standing-advice-planning-consultations-otters [Last accessed 17/07/2025]

[20] Chanin, 2003. Conserving Natura 2000 Rivers Monitoring Series no. 10. Monitoring the Otter. Peterborough: English Nature. Available at: cieem.net: https://cieem.net/resource/monitoring-the-otter/ [Last accessed 17/07/2025]

[21] Dean, M., Strachan, R., Gow, D., Andrews, R., Matthews, F., & Chanin, P. (2016). Watervole mitigation handbook. Mammal Society Mitigation Guidance Series. The Mammal Society.

[22] Strachan, R., Moorhouse, T., & Gelling, M. (2011). Water vole conservation handbook. Wildlife Conservation Research Unit.

[23] Oldham RS, Keeble J, Swan MJS and Jeffcote M (2000) Evaluating the suitability of habitat for the great crested newt (Triturus cristatus). Herpetological Journal. 10: 143-155. Available at: https://www.thebhs.org/publications/the-herpetological-journal/volume-10-number-4-october-2000/1617-03-evaluating-the-suitability-of-habitat-for-the-great-crested-newt-triturus-cristatus/file

3.1.2.3 GLTA survey

A Ground Level Tree Assessment (GLTA) was carried out on the 16 August 2025 for trees on Site and within a 20 m buffer of the Proposed Development infrastructure (i.e. the Survey Area) which had damage/ decay features (e.g. hazard beams, lifting bark, knot holes) with the potential to support roosting bats. Additionally, physical evidence of presence was searched for (e.g., bat corpses, droppings, feeding remains, scratch marks, and urine and grease staining). The GLTA also included an assessment of buildings and structures with features with the potential to support roosting bats (e.g. raised slates, gaps under flashing, cracks and crevices in stonework.)

Methodology followed Bat Conservation Trust (BCT) guidelines[24] which sets out the criteria below for classifying Potential Roost Features (PRFs) according to their level of suitability for individual or multiple bats:

- PRF-I – Roost feature is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
- PRF-M – Roost feature is suitable for multiple bats and may therefore be used by a maternity colony.

The need for further survey work (e.g. aerial tree inspections, presence/likely absence surveys) was determined following the iterative process outlined in the BCT guidelines.

Some of the trees within the Survey Area had PRFs which were accessible from ground level and these were inspected by a licensed and experienced ecologist following BCT guidelines, using an endoscope at the time of the GLTA survey. Further PRF inspections of features at height had not yet been carried out at the time of this report.

3.1.3 Limitations

3.1.3.1 Desk Study

Desk study data is unlikely to be exhaustive, especially in respect of species, and is intended mainly to set a context for the study. It is therefore possible that important habitats or protected species not identified during the data search do in fact occur within the vicinity of the Site. Interpretation of maps and aerial photography has been conducted in good faith, using recent imagery, but it has not been possible to verify the accuracy of any statements relating to land use and habitat context outside of the field Survey Area.

3.1.3.2 Field Surveys

A section of the watercourse in the north-west of the Survey Area at Ordnance Survey National Grid Reference (OS NGR): NT 10105 65151, could not be accessed due to dense vegetation. The watercourse was assessed as far as possible from the roadside and appears to be unsuitable for otter holts. There is the potential for water vole to use this watercourse as the banksides could be suitable for burrows, however, as per NatureScot guidance[25], provided a 10 m exclusion zone can be maintained around the watercourse during works, no further survey for water vole is required. As a precautionary measure, general good practice and mitigation as per NatureScot guidance should be followed. This can be found in **Section 6.2** of this report.

[24] (Collins, J (ed) 2023). Bat conservation trust (BCT). Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th edition. Available at: https://www.bats.org.uk/resources/guidance-for-professionals/bat-surveys-for-professional-ecologists-good-practice-guidelines-4th-edition [Last accessed 05/08/2025.]

[25] NatureScot, 2024. Standing advice for planning consultations - Water Voles. Available at: Standing advice for planning consultations - Water Voles | NatureScot [Last accessed 05/08/2025]

Several trees in the west of the Survey Area at OS NGR: NT 09884 64915, could not be assessed for PRFs due to safety concerns as there were cows with young calves in the field containing the trees. These trees are, however, outside the Site boundary therefore depending on the type of works that are to be undertaken nearby and whether a sufficient no disturbance buffer can be maintained (see **Table 6-1** and section **6.1.4**) , further survey may not be required for these trees.

Pond 1 is 155 m to the south-east of the Site. Surveys were not granted access to this pond therefore surveys were unable to take place.

4.0 Results

4.1 Desk Study

4.1.1 Statutory Designated Sites

The data search for statutory designated sites of nature conservation interest returned five sites of international importance (SAC, Ramsar), two sites of European importance (SPA) and six sites of national importance (SSSI) within 10 km of the Site, extended to 20 km for statutory designated sites with goose and/or swan qualifying interests. Details of each are provided in **4-1**Table 4-1 and illustrated in **Drawing 1**.

Table 4-1 Statutory Designated Sites with Nature Conservation Interest within 10km (Extended to 20 km for Sites with Goose or Swan Interest)

Site Name	Designation	Relevant Qualifying / Notified Ecological Features	Distance (km) and Direction from Site Boundary[26]
Linhouse Valley	SSSI	• Lowland acid grassland; • Lowland neutral grassland; • Upland mixed ash woodland; and • Valley fen	2.6 km W
Calderwood	SSSI	• Upland oak woodland; and • Valley fen	3.1 km NW
Balerno Common	SSSI	• Bryophyte assemblage; • Mesotrophic loch; • Raised bog; and • Transition open fen	4.7 km SE
North Esk Valley	SSSI	• Lowland acid grassland; and • Valley fen	7.4 km SE
Hermand Birchwood	SSSI	• Upland birch woodland	7.7 km SE
Habbies Howe-Logan Burn	SSSI	• Bryophyte assemblage; and • Lichen assemblage	7.7 km SE
Cobbinshaw Moss	SSSI	• Intermediate bog (blanket)	8.8 km SE
Craigengar	SSSI	• Blanket bog; • Marsh saxifrage *Saxifraga hirculus*; • Spring-head, rill and flush; and • Subalpine dry heath	8.9 km S

[26] Measured from the nearest point “as the crow flies”.

Site Name	Designation	Relevant Qualifying / Notified Ecological Features	Distance (km) and Direction from Site Boundary[26]
Tailend moss	SSSI	• Raised bog	9.3 km NW
River Tweed	SAC	• Atlantic salmon *Salmo salar*; • Brook lamprey *Lampetra planeri*; • Otter *Lutra lutra*; • River lamprey *Lampetra fluviatilis*; • Rivers with floating vegetation often dominated by water-crowfoot; and • Sea lamprey *Petromyzon marinus*	9.8 km SE
Westwater	SPA	• Pink-footed goose *Anser brachyrhynchus*, non-breeding	11.8 km S
	Ramsar	• Waterfowl assemblage, non-breeding (not functionally linked at this distance)	
Firth of Forth	SPA	• Pink-footed goose, non-breeding	13.9 km N
	Ramsar	• A further 27 qualifying features are notified, however they are not considered to be functionally linked at this distance from the Site.	

4.1.2 Non-statutory Designated Sites

A total of four Non-Statutory Designated Sites were identified within 2 km of the Site:

- Leyden Road Verge proposed Local Biodiversity Site (pLBS);
- Kirknewton Estate Local Biodiversity Site (LBS);
- Greenburn and Gogar Burn to Hatton Bridge LBS; and
- Water of Leith – Inveror to Glenbrook and Cock Burn LBS.

In addition, four areas of woodland listed under the AWI border the boundary of the Site. Two of these woodlands intersect the Site. In total, 18 areas of ancient woodland were identified within 2 km of the Site (see **Table 4-2**below.)

Non-statutory designated sites within 2 km of the Site boundary are shown in **Figure 3: Non-statutory designated sites.**

Table 4-2 Ancient Woodland Inventory (AWI) Sites

Site Name (Woodland ID)	Woodland type	Distance / direction from Site
Unnamed woodland (ID: 34214)	LEPO	Intersected by Site and borders southern boundary
Unnamed woodland (ID: 34210)	LEPO	Intersected by Site and borders eastern boundary
Overton Wood/Green Burn Wood	LEPO	Borders northern boundary of Site
Selm Muir Wood	LEPO	Borders north-western boundary of Site
Unnamed woodland (ID: 34215)	LEPO	107m E
Jubilee Wood	LEPO	0.6 km NE
Unnamed woodland (ID: 34199)	LEPO	0.9 km NE
Unnamed woodland (ID: 33461)	Ancient (of semi-natural origin)	1 km NNW
Unnamed woodland (ID: 34196)	LEPO	1.1 km NE
Unnamed woodland (ID: 34218)	LEPO	1.1 km E
Unnamed woodland (ID: 34200)	LEPO	1.4 km NE
Kaimes Wood	LEPO	1.48 km NE
The Dean	LEPO	1.54 km NE
Unnamed woodland (ID: 34194)	Ancient (of semi-natural origin)	1.64 km SE
Unnamed woodland (ID: 34198)	LEPO	1.7 km NE
Unnamed woodland (ID: 34190)	Ancient (of semi-natural origin)	1.75 km NE
Unnamed woodland (ID: 34221)	LEPO	1.8 km SE
Unnamed woodland (ID: 34191)	Ancient (of semi-natural origin)	1.8 km NE

4.1.3 Protected and Notable Species Records

The LERC data search returned numerous records of protected and notable species occurring within 2 km of the Site within the last 15 years. These records have been included in full in **0** and are summarised below.

4.1.3.1 Plants

The TWIC data search returned records of three flowering plant species and two species of lichen which are included on the SBL[Error! Bookmark not defined.]:

- Fodder Burnet *Poterium sanguisorba subsp. Balearica*;
- Greater Celandine *Chelidonium majus*; and
- Salad Burnet *Poterium sanguisorba*

The search also returned records of nine species of non-native invasive flowering plants:

- Hollyberry Cotoneaster *Cotoneaster bullatus* ,
- Cotoneaster *Cotoneaster horizontalis*
- Himalayan Cotoneaster *Cotoneaster simonsii*
- Giant Hogweed *Heracleum mantegazzianum*
- Japanese Rose *Rosa rugosa*
- Montbretia *Crocosmia x crocosmiiflora*
- *Rhododendron ponticum*
- Shallon *Gaultheria shallon* and,
- Variegated Yellow Archangel *Lamiastrum galeobdolon subsp. argentatum*

4.1.3.2 Invertebrates

The TWIC data search returned records of three species of butterfly which are included on the SBL:

- Small Pearl-bordered fritillary *Boloria selene;*
- Small Heath *Coenonympha pamphilus;* and
- Wall *Lasiommata megera*; and

4.1.3.3 Amphibians and Reptiles

The TWIC data search returned records of two nationally important species of amphibian within 2 km of the Site within the past 15 years, the common frog, *Rana temporaria*, and the common toad, *Bufo bufo*. These are both fully protected under the WCA (as amended in Scotland).

4.1.3.4 Birds

The TWIC data search returned records of four species of bird which are included within Annex I of the Birds Directive:

- Golden plover, *Pluvialis apricaria*;
- Merlin, *Falco columbarius*;
- Short-eared owl, *Asio flammeus*;
- Whooper swan, *Cygnus cygnus*;

And seven species which are included within Schedule 1 of the WCA (as amended in Scotland):

- Barn Owl, *Tyto alba*;
- Brambling, *Fringilla montifringilla*;
- Crossbill*, Loxia curvirostra*;
- Fieldfare, *Turdus pilaris*;

- Goldeneye*, Bucephala clangula*;
- Redwing*, Turdus iliacus*;
- Pink Footed Goose *Anser brachyrhynchus*

And several other birds of national and/or local importance that are Red or Amber-listed, SBL species and/or LBAP priority species.

4.1.3.5 Mammals

The TWIC data search returned records of five nationally important species of mammal within 2 km of the Site within the last 15 years.

Badger

The TWIC data search returned 13 records of badger, *Meles meles,* within 2 km of the Site within the last 15 years. Badgers are protected under the Protection of Badgers Act 1992.

Otter

The TWIC data search returned 1 record of otter, *Lutra lutra,* within 2 km of the Site within the last 15 years.

Water Vole

The TWIC data search returned no records of water vole, *Arvicola terrestris,* within 2 km of the site within the last 15 years.

Other Mammals

The TWIC data search returned observations of two other nationally important species of mammal, the hedgehog, *Erinaceus europaeus*, which is fully protected under the WCA (as amended in Scotland), and the brown hare, *Lepus europaeus*, which is listed under the SBL.

Bats

The TWIC data search returned no records of bat, *Chiroptera*, within 2 km of the Site within the last 15 years.

4.1.4 Carbon-Rich Soils

Review of the Carbon and Peatland 2016 Map of Scotland indicates that the entirety of the Site occurs on non-peaty soils.

4.2 Field Survey

Please consider the results described following the field surveys alongside **Figure 1: UK Habitat Baseline Survey**, which presents the results of the habitat survey as well as the location of Target Notes (TNs) as referred to in the below section.

4.2.1 Habitats and Flora

4.2.1.1 *Arrhenatherum* neutral grassland (g3c5)

This habitat is present within the northwestern part of the Site and is associated with the watercourse in this area which borders the mixed woodland along the north-western edge of the Site; here, the habitat is dominated by false oat grass, *Arrhenatherum elatius*, with flowering plants such as creeping thistle, *Cirsium arvense*, meadowsweet, *Filipendula ulmaria,* and marsh wound wort, *Stachys palustris,* (**Photo 1**). This habitat also occurs within a small area in the eastern part of the Site, surrounding the derelict building (TN 74).

Photo 1: Neutral grassland within the northwest of the Site

4.2.1.2 Other neutral grassland (g3c)

Thin strips of neutral grassland occur along the borders to the fields within the western half of the Site. This habitat is dominated by forbs such as dead nettle, *Lamium purpureum*, scentless mayweed, *Tripleurospermum inodorum,* redshank *Persicaria maculosa* and pineapple weed, *Matricaria discoidea*, with grasses such as common bent, *Agrostis capillaris,* and meadow foxtail, *Alopecurus pratensis*.

4.2.1.3 Modified grassland (g4)

Modified grassland is one of the dominant habitats on the Site and fields containing this habitat type are present throughout. Species include cock's foot, *Dactylus glomerata*, perennial ryegrass, *Lolium perenne,* and bulbous buttercup, *Ranunculus bulbosus,* amongst other grass and herb species. Some areas, such as the fields along the northern and western boundaries of the Site are grazed by livestock and the sward is short and generally species poor. Some of the fields within the eastern half of the Site appear to have been previously managed for crops. In the spring, these areas were generally species poor (2-4 species per m^2 and were characterised by short grasses, with taller stems of up to 15 cm and bare earth forming 10-20% of the surface (**Photo 2**). When the Site was revisited in July, for the GLTA survey, there appeared to be a greater variety of species in these fields, with the field in the centre of the eastern half of the Site containing a mix of red shank, white clover, *Trifolium repens,* vetch, *Vicia sativa,* and fairy flax, *Linum catharticum* (**Photo 3**).

Photo 2: Field of modified grassland within the southeast of the Site during spring.

Photo 3: Field of modified grassland within the centre of the eastern half of the site during summer

4.2.1.4 Broadleaved and mixed woodland (w1)

Broadleaved and mixed woodland is present throughout the Site as thin strips and lines of trees bordering field margins and along the northern, eastern and southern boundaries of the Site. Within the west of the Site, along the edges of the crop fields, the treelines are dominated by hawthorn, *Crataegus monogyna,* with some beech, *Fagus sylvatica*, alder, *Alnus glutinosa,* and rowan, *Sorbus aucuparia.* The strip of broadleaved and mixed woodland between the two crop fields in the east of the Site is dominated by mature beech trees. There are also several individual trees scattered throughout this part of the Site, most of which are semi-mature beech trees. Along the north-eastern edge of the Site is a larger area of broadleaved and mixed woodland containing mature Scot's pine, *Pinus sylvestris,* and birch, *Betula*. sp., willow, *Salix sp.*, sycamore, *Acer pseudoplatanus*, ash, *Fraxinus excelsior*, European larch, *Larix decidua*, holly, *Ilex aquifolium,* and beech trees.

Photo 4: Hawthorn trees along field margins to the west of the Site

4.2.1.5 Other coniferous woodland (w2c)

To the South of the entrance to the Site at OS NGR NT 10319 64907; there is an area of coniferous woodland dominated by densely planted spruce trees with occasional Scots pine, bramble, *Rubus fruticosus,* and elder, *Sambucus nigra*, scrub (**Photo 5**). Another area of coniferous woodland with a similar species composition is present along the eastern border of the Site.

Photo 5: Coniferous woodland near the entrance to the Site

4.2.1.6 Other Broadleaved Woodland (w1g)

A linear section of other broadleaved woodland is present bordering an existing watercourse within the east of the Site (**Photo 6**). This woodland section presents as the field boundary between two areas of cropland, and also borders the southern boundary of the Site. Canopy species are dominated by mature beech with a largely uniform height of 12-14 m. Understorey vegetation is categorised by tussocky grass species representative of neutral grassland (g3c) discussion above or bare ground.

Photo 6 Other Broadleaved Woodland within the east of the Site

4.2.1.7 Other Woodland; Mixed (w1h)

This habitat is not present within the Site boundary however it borders the Site at the north-east and north-west boundaries. These areas are mapped as AWI woodland (Overton Wood / Green Burn Wood and Selm Muir Wood, respectively).

Overton Wood / Green Burn Wood is considered secondary woodland and is characterised by an abundance of Scots pine, with lower canopy broadleaf species present including sycamore, birch, ash, hawthorn, willow, larch, holly, and beech.

Selm Muir Wood is largely mixed woodland, however, features a line of planted beech trees bordering the Site. Additional species include rowan, birch, willow, Scots pine, spruce sp, with gorse bramble scrub in fringe areas.

4.2.1.8 Arable and horticulture (c1)

Cereal crops are the other dominant habitat type within the Site and there are several large fields within both the eastern and western halves of the Site. During the spring, these fields were ploughed (**Photo 7**). In the summer the crops had grown, with barley and wheat forming the main crops.

Photo 7: Ploughed crop field within the southeast of the Site

4.2.1.9 Other standing water (r1g)

There is a large, mostly dry ditch which runs through the mixed broadleaved woodland in the south-east of the Site. The banks are steep and tall (**Photo 8**).

There is a small area of standing water in the north-west of the Site but this was not surveyed as it could not be accessed during the field surveys.

Photo 8: Large ditch in the southeast of the Site

There is a small area of potential standing water in the north-west of the Site (P3**, Figure 4: Location of ponds**), and inferred from desk study data. When surveyed this area was dry. It is not visible on aerial mapping therefore is likely ephemeral and dry for most of the year.

Along a watercourse within the east of the site, at the field boundary, there is an area of poor drainage dominated by soft rush *Juncus effusus*. This habitat contained no visible standing water and is more consistent with area of poor drainage / flush associated with the adjacent watercourse (P2**, Figure 4: Location of ponds**).

4.2.1.10 Other rivers and streams (r2b)

A small watercourse runs through east of the Site. It has a low flow, a stone and silt channel bed, some pooling and a 5 cm depth. The banks are grassy leading to the woodland in the south, and there is a culvert over the field crossings. Along the watercourse is an area of poor drainage dominated by soft rush *Juncus effusus*. This is mapped as Pond 2 in **Figure 4: Location of ponds.**

There is another watercourse which runs along the northwestern border of the Site, however this could not be accessed fully due to dense vegetation blocking access for the surveyors.

Photo 9: Small watercourse within the east of the Site

Other native hedgerow (H2a6)

This habitat type is present bordering the Leyden Road, which runs through the centre of the Site. Hawthorn is the dominant species, with rowan and ash also present.

Photo 10: Hawthorn hedgerow along the road in the centre of the Site

4.2.1.11 Gorse scrub (h3e)

Gorse scrub occurs within the north-west of the Site, surrounding the crop fields. Gorse *Ulex europeous is* the dominant species, with creeping thistle, meadow vetchling *Lathyrus pratensis*, redshank, bent, Yorkshire fog *Holcus lanatus*, creeping buttercup, cocks foot, broadleaved dock *Rumex obtusifolius*, perennial ryegrass, sow thistle *Sonchus oleraceus* and meadowsweet occurring within the understory.

4.2.1.12 Notable Flora

No protected or notable species of plants were recorded during the field survey.

4.2.1.13 Ground Water Dependent Terrestrial Ecosystems (GWDTEs)

No habitats with potential for GWDTEs were recorded during the field survey.

4.2.1.14 Invasive Non-Native Species

No invasive non-native species of plants were recorded within the Site Boundary however *Rhododendron* was recorded within the woodland bordering the south of the Site (TN78). This was present in several large areas scattered within the woodland and did not appear to have received management. The closest area was 30 m south of the Site Boundary.

4.2.2 Protected Species

4.2.2.1 Mammals

Badger

There is suitable habitat on Site for badger populations and evidence of badger activity was recorded within the Site. Full results and discussion relating to surveys are provided within a dedicated Protected Species Survey Report[27].

Otter

The watercourses within the Site are small, with low flows and would generally be expected to be of low suitability for holt creation, although they may be used for foraging and commuting through the area. Full results and discussion relating to surveys are provided within a dedicated Protected Species Survey Report[28].

Water Vole

There is limited suitable habitat on Site for water vole populations. The watercourse which runs through the centre of the eastern Site boundary is small and slow flowing and the tall vegetation would provide cover from predators. However, shallow water levels reduce the suitability of this habitat for water vole, therefore categorised as sub-optimal. Potential water vole feeding evidence was recorded alongside a small mammal trail in the grass however no evidence was identified on the second survey visit. Several small mammal burrows were recorded along the dry ditches and the watercourse within the Site although given the quality of the habitat nearby, it is unlikely that these field signs were made by water vole and no other evidence was recorded nearby. It should be noted that any single field sign recorded in isolation, especially when ambiguous (e.g. a burrow or footprints) would not be definitive in confirming presence.

The large ditch in the south-east of the Site was mostly dry during both visits to the Site in spring and summer and the ditch within the north-east of the Site also contains very little water. In addition, the ditch bordering the north-west of the Site was highly overgrown and choked with vegetation, containing very little water. As such, these water bodies are considered unsuitable for water vole.

Bats

There is suitable habitat for roosting, commuting and foraging bats within the Site. Of greatest value is the woodland habitats bordering the Site containing mature and semi mature trees suitable for roosting bats. Linear habitats such as watercourses, ditches and lines of trees / hedgerows also provide commuting and foraging habitat. In addition, the

[27] SLR Consulting (2025) Kirknewton Solar and Battery Energy Storage System: Confidential Protect Species Survey and Monitoring Report.

[28] SLR Consulting (2025) Kirknewton Solar and Battery Energy Storage System: Confidential Protect Species Survey and Monitoring Report.

Site's open, arable and grassland habitats are likely to provide some value for foraging and commuting bats utilising the Site.

A Preliminary Roost Appraisal (PRA) was conducted on a derelict single storey structure within the east of the Site (TN 74). The building was of stone build and was lacking a roof structure and several walls. The structure was assessed to be of **negligible** suitability for hibernating bats due to temperature instability. It was considered to have **low** suitability for summer opportunistic roosting due to the presence of occasional gaps within stonework.

A Ground Level Tree Assessment (GLTA) was conducted on trees within 30 m of the Site boundary. During the field survey, 66 trees with PRFs were recorded throughout the Site including knot holes, tear-outs, dead limbs, and cavities in the trunk (TNs 16-77, 79-83). Trees with PRFs included multiple mature beech trees, most of which had many small features suitable for individual bats and some with large features which may be suitable for multiple bats. A total of 17 trees with PRFs were recorded during the GLTA. Of the features identified, six trees were classed as **PRF-M**, with the potential to be used by multiple bats or a maternity colony. The remainder of the features assessed were classed as **PRF-I** (suitable for individual roosting bats) or required further assessment. No other evidence of bats was observed by the surveyor.

Other Mammals

Brown hare *Lepus europaeus* were sighted within the crop fields in the west of the Site (TNs 7-8). Grey squirrel, *Sciurus carolinensis*, were confirmed to be on Site with three live sightings during the survey (TNs 9-11). Feeding signs (TNs 12-14) and a potential drey (TN 15) were also recorded, but these cannot be assigned to either red or grey squirrels, however given the grey sightings and the geographical location of the Site, it is considered likely that any drey would be from a grey squirrel.

4.2.2.2 Invertebrates

No protected species of invertebrates were recorded during the field survey. An area of dead wood (TN 1) may provide invertebrate habitat., however agricultural lands within the Site do not offer significant habitat suitability for invertebrates due to management regimes and low species diversity. Neutral grassland around field boundaries may offer greater diversity of plant species which may support invertebrate populations however agricultural practices likely involve chemical pesticide use. As such, the Site is not considered to support significant invertebrate populations.

4.2.2.3 Amphibians including Great Crested Newt

No amphibians were recorded during the PEA survey. The wet grassland alongside the watercourse in the east of the Site, the mixed woodland and the field margins offer some suitability for amphibians. There are four ponds within 500 m of the Site, including an area of standing water / poor drainage (named Pond 2 for the purposes of this assessment) along the watercourse in the east of the Site. The ponds within and nearby the Site are likely to be of poor water quality due to the surrounding agricultural land. The locations of the ponds are shown on **Figure 4: Location of ponds.**

Pond 4 is within a housing estate, 405 m to the east of the Site and contains emergent vegetation. There is an area of broadleaved woodland to the north of the pond and at the time that the pond was surveyed, in early April, the vegetation on the banks and within the area immediately surrounding the pond was short grass which may be mown/ managed. (**Error! Reference source not found.**See **Table 6-5, 0**). The ponds within and nearby the Site are likely to be of poor water quality due to the surrounding agricultural land. The locations of the ponds are shown on **Figure 4: Location of ponds.**

Pond 2 in the east of the Site and Pond 3 in the north-west of the Site appear to be dry for most or all of the year as they are not visible on aerial imagery. Pond 2 was surveyed and contained no visible standing water and is more consistent with area of poor drainage / flush rather than a pond and is unlikely to be suitable for breeding GCN. Pond 3 was dry therefore not suitable for breeding amphibians.

Pond 1 is 155 m to the south-east of the Site. Surveys were not granted access to this pond therefore surveys were unable to take place.

As surveys were not undertaken within Pond 1, the presence of GCN cannot be ruled out. GCN populations are considered to be **Regional Ecological Importance**, in line with their EPS status and SBL priorities.

4.2.2.4 Reptiles

The Site has limited suitability for reptiles although there are potentially suitable areas of rougher grassland along the field edges. Two potential hibernacula were noted during the field survey, a pile of dead branches (TN 1) and piles of rubble from ruined buildings (TN2). No reptiles were observed by the surveyor.

4.2.2.5 Birds

No incidental records of protected species of birds were observed during the field survey. The habitats on Site are considered to be generally suitable for some species of breeding birds such as woodland and farmland passerines. This is discussed separately in the baseline ornithology report[29].

In addition, the crop fields on Site are suitable for foraging and loafing pink-footed goose, which are a qualifying feature of the Westwater SPA/Ramsar and the Firth of Forth SPA/Ramsar sites. Records of this species were identified by the desk study which returned 5 records within 2 km of the Site within the last 15 years.

5.0 Ecological Constraints and Opportunities

5.1 Statutory Designated Sites

Under the Habitats Regulations, the potential of any ‘likely significant effect’ on a European site by a Proposed Development should be determined by ‘appropriate assessment’ as part of Habitats Regulations Appraisal (HRA). This process is likely to be a requirement for the Proposed Development to determine the nature of any likely significant effects upon the nearby Firth of forth and Westwater SPA and Ramsar sites. Both of these European sites are designated for pink-footed goose and this species may use the crop fields on Site for foraging.

5.2 Non-Statutory Designated Sites

5.2.1 AWI Sites

Four areas of plantation origin (LEPO) woodland listed under the AWI border the Site. One of these woodlands, unnamed woodland (ID: 34214) is intersected by Site adjacent to the existing Leydon Road site and borders southern boundary, and unnamed woodland (ID: 34210) is intersected by the Site and borders the eastern boundary. Overton Wood/Green Burn Wood and Selm Muir Wood also border the Site in the north and north-west,

[29] SLR consulting, 2025. Baseline ornithology report. Breeding bird surveys 2025. Kirknewton Solar and Battery Energy Storage system.

respectively. Provided that the Proposed Development design does not involve the felling of any of these areas of woodland and that a suitable root protection zone can be established and maintained throughout works, this is not considered to be a significant constraint to the Proposed Development. Further information on root protection zones can be found in **Section** Trees, woodland and hedgerows**6.1.4.**

5.2.2 Local Biodiversity Sites

The Site does not overlap any local biodiversity sites however there may be functional connectivity to those within close proximity to the Site (Leyden Road Verge), or with hydrological connectivity (Greenburn and Gogar Burn to Hatton Bridge LBS and Water of Leith – Inveror to Glenbrook and Cock Burn LBS). Good practice mitigation measures in regards to storage of materials, biosecurity and pollution prevention methods, will be required to ensure negative impacts to these sites are avoided.

5.3 Habitats

The Site is primarily composed of farmland associated habitats including crop fields and modified grassland with some neutral grassland. No farmland or grassland habitats occurring within the Site have been identified as priority habitats within the LBAP.

Freshwater habitats including ponds, rivers and eutrophic standing waters are listed as priority habitats in the LBAP, therefore there is the potential that these habitats may pose a constraint to the Proposed Development. Further details of recommendations can be found in **Section 6.2.**

Woodland habitats are also included in the LBAP and have the potential to be a constraint to the Proposed Development. Further details of recommendations can be found in **Section 6.1.4**

All habitats occurring within the Site are likely to be widespread throughout the local area. No notable flora was identified during the UKHab survey.

5.4 Protected Species

5.4.1 Great crested newt

Great crested newt (henceforth referred to as ‘GCN’) are a European protected species under the Conservation (Natural Habitats, &c.) Regulations 1994 and are protected under the Wildlife and countryside act 1981 (as amended in Scotland). GCN are listed in the SBL and are priority species under the LBAP.

Three ponds with potential suitability for GCN were identified within 250 m of the Site; Pond 4 in **Figure 4: Location of ponds** does not contain any standing water and as such is not considered to be suitable for breeding GCN. A HSI assessment has not been carried out for Pond 1 and Pond 3 due to access issues. Pond 4 is over 250 m away from the Proposed Development. Given that the housing estate in which Pond 4 is situated would likely prevent GCN from dispersing into the wider environment, no further assessment for GCN is required for this pond and it is unlikely to be a constraint to the Proposed Development.

5.4.2 Breeding birds

The potential constraints and opportunities associated with birds across the Site is discussed in the ornithology baseline report (**Technical Appendix 5.5** of the EIA Report).

5.4.3 Badger

Badgers and their setts are protected under the Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011.

There is suitable habitat to construct setts within the woodland and grassland areas within the Site and surveys recorded evidence of badger activity on Site. Full results of badger activity identified during the PEA, and subsequent activity monitoring, is provided in **Confidentia**l **Technical Appendix 5.3** of the EIA report.

Due to the potential presence of badger setts within the Site, it is likely that a badger licence from NatureScot and Species Protection Plan may be required if an appropriate no-disturbance buffer cannot be maintained between works and any setts with confirmed badger activity. Further recommendations can be found in **Section 6.1.1** of this report6.0.

5.4.4 Otter and water vole

Otter are a European protected species under the Conservation (Natural Habitats, &c.) Regulations 1994. Both Otter and water vole are protected under the Wildlife and countryside act 1981 (as amended in Scotland); are listed in the SBL and are priority species under the LBAP.

All watercourses within Survey Area, had sub-optimal suitability for otter and water vole. These watercourses comprised dry or mostly dry arable drainage ditches and a small watercourse in the centre of the Site which was shallow.

However evidence of otter activity was recorded within the Survey Area. In order to maintain species protection and confidentiality, relevant stakeholders can consider the full results and discussion relating to otter surveys, as provided within **Confidential Technical Appendix 5.3: Protected Species Survey Report** contained within the EIA report.

No definitive evidence of use by water vole was recorded during the surveys. As such, this species is not considered to be a potential constraint to the Proposed Development at this stage.

5.4.5 Bats

Bats are a European Protected Species and as such individual bats and their roosts are protected by law. All 9 species of bat occurring in Scotland are listed under the SBL and the following bat species are priority species under the LBAP: Common pipistrelle bat *Pipistrellus pipistrellus*; Soprano pipistrelle bat *Pipistrellus pygmaeus;* Natterer's bat *Myotis nattereri* Noctule bat *Nyctalus noctule;* Daubenton's bat *Myotis daubentoniid* and Brown long-eared bat *Plecotus auritus.*

Trees with PRFs were identified throughout the Survey Area and the habitats on Site are considered likely to be suitable for foraging and commuting bats. Further recommendations with regards to bats can be found in **Section 6.1.2** of this report.

5.4.6 Other mammals

Brown hare are listed under the LBAP and SBL and are present on Site. To reduce the risk of adverse effects resulting from the Proposed Development on this species, the good practice guidelines outlined in **Section 6.2** should be adhered to. Brown hare should also be considered in any biodiversity mitigation/ enhancement measures proposed as part of the Proposed Development.

5.4.7 Enhancement Opportunities

Detailed development plans were not available at the time of writing. These will be provided in an Outline Biodiversity Enhancement Management plan (OBEMP) within **Technical**

Appendix 5.6 of the EIA. The recommendations listed below to provide nature conservation enhancements, as required under national (NFP4) planning policy, are very generic. The list below is not exhaustive and may change depending on the detailed design of the development and any protected or notable species confirmed to be present following further survey work.

The following enhancement measures to improve the quality of habitats on Site for wildlife could be considered:

- Bat / bird boxes could be included on trees/ within suitable habitat throughout the Site.
- Native, species-rich hedgerows could be planted and existing hedgerows enhanced to improve habitats for nesting bird species and offer additional foraging habitats for bats and shelter for brown hare which are present on Site.
- Field margins could be planted with wildflower meadow seeds to create more biodiverse areas that are particularly attractive to bees and butterflies.
- Remaining areas of cropland / grassland could be enhanced to provide foraging habitat for birds, bats, brown hare and other mammals.
- Bee bricks and bug hotels and/or brash/log piles could be incorporated into the Site design to provide spaces for wildlife. Several of each feature could be placed at a variety of aspects / sun exposure to suit different invertebrate species requirements.

6.0 Conclusions and Recommendations

Given some of the field signs and activity recorded during the surveys, careful consideration of constraints should be given throughout the design process. While some areas, and potential for negative effects, may be avoided through mitigation by design, further consideration should be given to other more sensitive receptors.

6.1.1 Badger

An application for a licence from NatureScot will be required should disturbance of or exclusion/closure of any badger setts be necessary to lawfully permit works to proceed (that would otherwise be considered ‘interference’). Works within 30 m of a sett would require a licence and this buffer distance for licensing may need to be extended up to 100 m for more disturbing activities, such as piling.

Where an application for an exclusion licence is needed, a Badger Protection Plan (BPP) is recommended. The local authority and / or Nature Scot should be consulted as appropriate to confirm an adequate compensation plan.

6.1.2 Otter

In order to maintain species protection and confidentiality, relevant stakeholders can consider the full results and discussion relating to otter surveys, as provided within **Confidential Technical Appendix 5.3: Protected Species Survey Report** contained within the EIA report.

6.1.3 Bats

If works are required within the vicinity of trees that have potential roost features, which may result in the disturbance of any bats present due to associated levels of noise, vibration and dust, then further survey is required.

Table 6-1 below outlines the recommended protection zones for different Site activities (adapted from Shawyer, 2011[30]). If works are required within the vicinity of trees or buildings that have potential roost features, which may result in the disturbance of any bats present due to associated levels of noise, vibration and dust, then further survey is required.

Table 6-1 Recommended protection zones for different levels of disturbance

Predicted Level of Disturbance	Example Site Activities	Minimum Protection Zone
Low	> Pedestrian movement; > Storage of materials; > Fencing (via manual instillation); > Artificial lighting (not directed towards potential roost feature)	10m
Moderate	> General building and landscaping works – laying of concrete, bricks, roofing etc. using mechanised plant	15m
High	> Heavy construction works – ground levelling, pile driving (incl. pile driven fence posts), use of compacting roller etc. using heavy plant	30m

The Proposed Development design shall be reviewed to determine if a no-disturbance buffer can be maintained between the trees and the works area. If a no-disturbance buffer cannot be maintained, and there is therefore the potential for roosting bats to be impacted, then further assessment will be required. This may include aerial tree inspections, internal feature assessments and roost emergence/re-entry surveys will be required in accordance with BCT guidelines[24] . A suitably qualified ecologist (SQE) will need to be present on-Site during any clearance/construction activities in order to perform checks of trees and structures within the Site and no-disturbance buffer. The good practice mitigation measures detailed in **Section 6.2Error! Reference source not found.** shall be adhered to, in particular those related to a rtificial lighting which can disrupt bat commuting and foraging behaviour.

6.1.4 Trees, woodland and hedgerows

To protect hedgerow and woodland habitats within and adjacent to the Site, working methods will proceed in line with BS 5837 (BSI, 2012) '*Trees in relation to Design, Demolition and Construction*'. A suitable root protection area will be installed in advance of works commencing to protect the tree root system of all trees to be retained. This is normally calculated by multiplying the diameter of a tree (in metres) at breast height by 12, to a maximum radius of 15 m.

Temporary fencing will be used to clearly demarcate the edge of work areas as required to protect these habitats.

[30] Shawyer, C. R., 2011. Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice and Reporting. [Online] Available at: https://cieem.net/wp-content/uploads/2023/01/Barn-Owl-Survey-Methodology-Revised-2012Final.pdf -Note this reference relates to barn owl *(Tyto alba*) mitigation; however, the reasoning behind the size of disturbance buffers is considered applicable to bats also, and similar bat disturbance buffers have been accepted by NatureScot on other schemes.

6.1.5 Enhancements for Biodiversity

The biodiversity enhancements suggested in **Section 5.4.7** can be incorporated into the Proposed Development design in order to comply with NPF 4 and mitigate the impact on local wildlife and biodiversity. Further details would be provided within an OBEMP (**Technical Appendix 5.6**).

6.2 General good practice and mitigation

During the works the following good practice measures, endorsed by NatureScot are recommended[31]:

- Wherever possible, works should be undertaken during daylight hours, but avoiding the two hours from sunrise and the two hours before sunset (this can be reduced to one hour from November to February, inclusive, when daylight hours are limited);
- Cover/fence-off any excavations, or provide escape ramps at the end of the working day to avoid animals becoming trapped (if an animal does become trapped, advice should be sought immediately from NatureScot);
- Cap any temporarily exposed pipe systems out of work hours;
- Clean fuel/chemical spillages immediately with spill kits and dispose of waste materials correctly;
- Avoid unnecessary disturbance to habitats by minimising the extent of ground clearance, as far as possible;
- In order to avoid the introduction or spread of non-native invasive species, biosecurity measures should be included within the CEMP and a non-native invasive species management plan be developed; and,
- In order to prevent accidental pollution of watercourses and impacts on the aquatic environment within the site or areas downstream (with particulate matter or other pollutants such as fuel), best practice techniques should be employed. Measures will include safe storage of soils and hazardous materials, no direct discharges into rivers or streams, and pollution response plans.

Artificial lighting

Research has indicated that artificial lighting can have an adverse effect on the behaviour of nocturnal mammals including bats, badger and otter[32],[33]. A sensitive lighting scheme that aims to avoid disruption to mammal foraging and commuting behaviour and nesting bird activity will be adopted. It is understood there will be no operational lighting requirement. However, should lighting be required, the following measures are to be incorporated into the design and installation of temporary lighting during:

- Any lighting will be directional (using fittings such as hoods, cowls or shields to direct light downwards wherever possible and avoid unnecessary light spill);

[31] NatureScot, 2020, Planning and development: standing advice and guidance documents. (Online) Available at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-standing-advice-and-guidance-documents

[32] Institution of Lighting Professionals, 2020. Guidance Notes for the Reduction of Obtrusive Light. [Online]

Available at: https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2020/

[33] Institution of Lighting Professionals and BCT, 2023. Guidance Note 08/23: Bats and Artificial Lighting at Night. Bats and the Built Environment Series. Produced jointly by ILP and BCT. [Online] Available at: https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/

- LED Luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- A warm white spectrum (ideally <2700 Kelvin, max 4000 Kelvin) should be adopted to reduce the blue light component;
- Lighting will be positioned to avoid illuminating suitable foraging, commuting and nesting habitat within edge habitat adjacent to the Site and the Burn of Greens; and
- The times during which lighting is on should be limited to provide dark periods (e.g. between 23.00 and 05.00).

Annex A Drawings

Figure 1: UK Habitat Baseline Survey

310000 310500 311000 311500

665500 665000

405.065786.00001.0001.1 Habitat Survey

Secondary Codes
14 - Scattered Rushes
15 - Rushes Dominant
29 - Plantation
31 - Secondary Woodland
33 - Line of Trees
42 - Pond
50 - Ditch
101 - Cattle Grazed
102 - Sheep Grazed
117 - Laid Hedgerow
125 - Flower Forage Abundant
127 - Sward Type Mosaic
128 - Tall or Tussocky Sward
203 - Veteran Tree
503 - Wet
516 - Active Management
517 - Recent Management
518 - Neglected
532 - Scattered Grass
600 - Ploughed

B7: g4 102
B24: w2c
B25: w1h 31
WB1: r1g 50
B4: g4
B8: g4 15
WB2: r2b
B10: g4 102
B5: g4 102
B6: g3c5 128
T1: w1 203
B9: c1 600
B25: g4 517
B13: g4
B2: g4
T4: w1 203
T3: w1 203
T2: w1 203
B11: c1 600
B22: g3c5 125 128 503
B3: r1 42
B23: h3e
B21: h3e 532
B12: c1c 516
B1: w2c 29
B18: g3c 127
B20: g4 101
B15: c1c
B19: g4 101
B17: g3c 128 518
B14: w1g 14 29
Leyden Road

0 50 100 Metres

0 200 400 Metres

N

LEGEND

Site Boundary
Target Note
Individual Tree Location
Area Not Surveyed

Primary Habitat Classification

Rivers and Lakes - Standing Open Water and Canals
r1g - Other Standing Water

Rivers and Lakes - Rivers and Streams
r2b - Other Rivers and Streams

Heathland and Shrub - Hedgerows
h2a6 - Other Native Hedgerow

Woodland and Forest
w1 - Broadleaved Mixed and Yew Woodland

Cropland - Arable and Horticulture
c1 - Arable and Horticulture
c1c - Cereal Crops

Grassland - Neutral Grassland
g3c - Other Neutral Grassland
g3c5 - Arrhenatherum Neutral Grassland

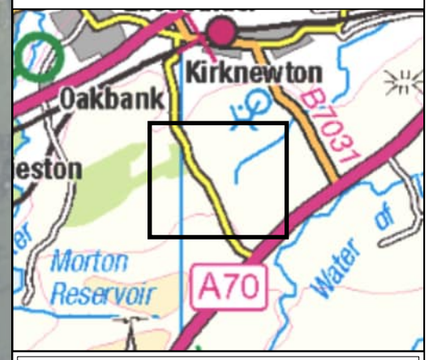
Grassland - Modified Grassland
g4 - Modified Grassland

Heathland and Shrub - Dense Scrub
h3e - Gorse Scrub

Rivers and Lakes - Standing Open Water and Canals
r1 - Standing Open Water and Canal

Woodland and Forest - Broadleaved Mixed and Yew Woodland
w1g - Other Woodland; Broadleaved
w1h - Other Woodland; Mixed

Woodland and Forest - Coniferous Woodland
w2c - Other Coniferous Woodland



trio

SLR

KIRKNEWTON SOLAR & BESS
PRELIMINARY ECOLOGICAL APPRAISAL
UK HABITAT BASELINE
FIGURE 1

Scale 1:6,000 @ A3
Date DECEMBER 2025

Figure 2: Statutory Designated sites

290000 300000 310000 320000 330000

680000 670000 660000

Firth of Forth Ramsar
Firth of Forth SPA
Tailend Moss SSSI
Calderwood SSSI
Linhouse Valley SSSI
Hermand Birchwood SSSI
Balerno Common SSSI
Habbies Howe - Logan Burn SSSI
Cobbinshaw Moss SSSI
North Esk Valley SSSI
Craigengar SSSI
Westwater Ramsar
Westwater SPA
River Tweed SAC

N

LEGEND

- Site Boundary

Study Area

- Site Boundary 10km Buffer
- Site Boundary 20km Buffer

Statutory Designations

- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar
- Site of Special Scientific Interest (SSSI)

Note: SSSI sites within 10 km and Ramsar, SPA, and SAC sites within 20 km of the site boundary are shown on the map.

0 5 10
Kilometres

trio

SLR

KIRKNEWTON SOLAR & BESS
PRELIMINARY ECOLOGICAL APPRAISAL
STATUTORY DESIGNATED SITES

FIGURE 2

Scale 1:165,000 @ A3
Date DECEMBER 2025

405.065786.00001.01 Breeding Bird Survey

Figure 3: Non-statutory designated sites

308000 309000 310000 311000 312000 313000

667000 666000 665000 664000

N

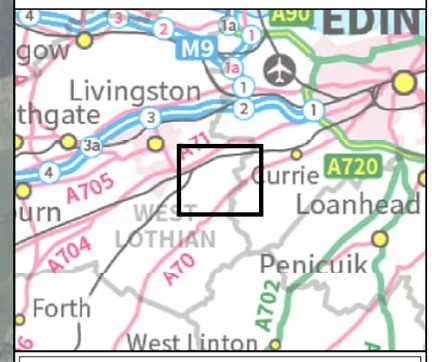
Greenburn and Gogar Burn LBS
34190 : Unnamed
33461 : Unnamed
34191 : Unnamed
34199 : Unnamed
34194 : Unnamed
34197 : The Dean
Kirknewton Estate LBS
34200 : Unnamed
34198 : Unnamed
34196 : Unnamed
34206 : Overton Wood/Green Burn Wood
34205 : Jubilee Wood
34204 : Kaimes Wood
Greenburn and Gogar Burn to Hatton Bridge LBS
Leyden Road Verge LBS
34210 : Unnamed
34215 : Unnamed
Water of Leith - Inveroe to Glenbrook & Cock Burn LBS
34218 : Unnamed
33470 : Selm Muir Wood
34214 : Unnamed
34221 : Unnamed

0 0.5 1
Kilometres

LEGEND

- Site Boundary
- Study Area (Site Boundary 2 km Buffer)
- Local Biodiversity Site (LBS)
- Ancient Woodland Inventory

Note
Only Ancient Woodland Inventory within 2 km are labelled with the Wood ID and Name of the feature.
Only Local Biodiversity Sites within 2 km are shown.



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SLR

KIRKNEWTON SOLAR & BESS
PRELIMINARY ECOLOGICAL APPRAISAL
NON-STATUTORY DESIGNATED SITES
FIGURE 3

Scale 1:20,000 @ A3
Date DECEMBER 2025

405.065786.00001.01 Breeding Bird Survey

Figure 4: Location of ponds

309000 309500 310000 310500 311000 311500 312000

666000 665500 665000 664500

N

P1 P2 P3 P4

Leyden Road

0 250 500

Metres

LEGEND

- Site Boundary
- Site Boundary 250 m Buffer
- Site Boundary 500 m Buffer
- Pond

trio

SLR

KIRKNEWTON SOLAR & BESS

PRELIMINARY ECOLOGICAL APPRAISAL

LOCATION OF PONDS

FIGURE 4

Scale 1:10,000 @ A3

Date DECEMBER 2025

405.065786.00001.01 Breeding Bird Survey

Annex B Protected Species Report

Annex C Relevant legislation and planning policy

A.1.1 Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)

Under the conservation (Natural Habitats, &c.) Regulations 1994 (The Habitats Regulations) (as amended in Scotland) it is an offence to deliberately capture, kill or disturb wild animals listed under Schedule 2 of the Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time). Otter, wildcat and all bat species are listed under Schedule 2 of the Habitat Regulations.

A.1.2 Wildlife and Countryside Act 1981 (as amended)

Under the Wildlife and Countryside Act 1981 (as amended in Scotland) it is an offence to intentionally or recklessly:

- Kill, injure or take and wild animal listed under Schedule 5 to the Act;
- Damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act; and
- Disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection.

Otter, water vole, pine marten, red squirrel, wildcat and all bat species are listed under Schedule 5 of the Act.

Water voles receive partial protection of their places of shelter only; this has long since been expected to change with water vole receiving full protection in future to align with their steep populations declines and increasing risk of extinction on mainland Great Britain.

A.1.3 Nature Conservation (Scotland) Act 2004 (as amended)

The Nature Conservation (Scotland) Act 2004 places duties on public bodies in relation to the conservation of biodiversity, increases protection of Sites of Special Scientific Interest (SSSI), amends legislation on Nature Conservation Orders, provides for Land Management Orders for SSSIs and associated land and strengthens wildlife enforcement legislation, among other requirements. It also amends the legislation for protected species, introducing new conditions to the ‘incidental results of a lawful operation’ defence for all wild birds and certain species of animal and plant.

The Act places a duty on every public body to further the conservation of biodiversity consistent with the proper exercise of their functions.

It also requires Scottish Ministers to designate one or more strategies for the conservation of biodiversity as the Scottish Biodiversity Strategy, and to publish lists of species of flora, fauna and habitats of principal importance. The lists of species of flora and fauna and habitats of principal importance in Scotland is known as the Scottish Biodiversity List (SBL).

A.1.4 The Wildlife and Natural Environment (Scotland) Act 2011 (as amended)

The Wildlife and Natural Environment (WANE) (Scotland) Act 2011 (as amended) makes changes to existing legislation covering specific wild fauna (e.g., birds, rabbits, hare etc), deer management, game management/licensing, species licensing, snaring, protection of badgers, muirburn, invasive non-native species, protected areas and enforcement/liability in relation to certain offences. In relation to bats, the WANE Act:

- Introduces the offence of ‘knowingly causing or permitting’ certain ‘acts’ within Sections 6, 7 and 15A as ‘offences’ under the W&C Act 1981;

- Permits derogation of disturbance and/or destruction of bat roosts by the appropriate authority for development purposes, subject to specific requirements of licensing; and furthermore
- Wildlife crime now requires to be documented in an annual report, as a result of Section 20 of the WANE Act, which inserted a new Section 26B into the W&C Act 1981. It prescribes that Ministers must lay a report every calendar year on offences which relate to wildlife, to include information on incidences and prosecutions during the year and on research and advice relevant to those offences.

A.1.5 The Birds Directive 2009

The European Union (EU) Directive on the Conservation of Wild Birds (2009/147/EC) was first adopted in 1979 and is the primary mechanism for delivering the EU's obligations under the Convention on Biological Diversity (CBD), and the Ramsar and Bonn Conventions. Collectively, the Birds and Habitats Directives require Member States to take action in order to protect all bird species and their habitats which includes the designation of Special Protection Areas (SPAs) in respect to species listed on Annex I of the Directive.

A.1.6 Protection of Badgers Act 1992 (as amended)

The Protection of Badgers Act 1992 (as amended in Scotland) makes it illegal to kill, injure or take a badger or to interfere with a badger sett intentionally or recklessly (i.e., damage/destroy a sett). Sett interference includes disturbing badgers whilst they are occupying a sett or obstructing access to it.

A.1.7 Animals and Wildlife (Penalties, Protections and Powers) (Scotland) Act 2020

The Animals and Wildlife (Penalties, Protections and Powers) (Scotland) Act 2020 increases the maximum available sentences in relation to a range of offences concerning animal health and welfare and wildlife; provides regulatory powers for the issuing of fixed penalty notices; and provides authorised persons with new powers regarding animals taken into their possession.

Note that the Scottish Government has passed legislation to maintain the same levels of legal protections of wildlife in Scotland post EU-exit3.

A.2 Relevant Planning Policy

A.2.1 National Planning Policy

National Planning Framework 4 (NPF4)

The National Planning Framework 4 (NPF4) was adopted by Scottish Ministers on 13 February 2023. In order to accord with the biodiversity provisions of NPF4, development proposals should demonstrate that they contribute to the enhancement of biodiversity. Of particular relevance to this project, Policy 3 of NPF4 states:

3a) Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible.

…

c) Development proposals for national or major development, or for development that requires an EIA will only be supported where it can be demonstrated that the proposal will

conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention. This will include future management. To inform this, best practice assessment methods should be used. Proposals within these categories will demonstrate how they have met all of the following criteria:

i. the proposal is based on an understanding of the existing characteristics of the site and its local, regional and national ecological context prior to development, including the presence of any irreplaceable habitats;

ii. wherever feasible, nature-based solutions have been integrated and made best use of;

iii. an assessment of potential negative effects which should be fully mitigated in line with the mitigation hierarchy prior to identifying enhancements;

iv. significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their long-term retention and monitoring should be included, wherever appropriate; and

v. local community benefits of the biodiversity and/or nature networks have been considered.

d) Any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be minimised through careful planning and design. This will take into account the need to reverse biodiversity loss, safeguard the ecosystem services that the natural environment provides, and build resilience by enhancing nature networks and maximising the potential for restoration..

Local Development Plan (LDP)

West Lothians Local development plan was set out in 2014 providing a 10-year spatial strategy for development to support economic growth, community regeneration whilst ensuring development is sustainable and the local environment is protected. The LDP has been prepared under the terms of The Town and Country Planning (Scotland) Act 1997 (as amended), the Climate Change (Scotland) Act 2009, the Environmental Assessment (Scotland) Act 2005, National Planning Framework 3 (NPF3) and Scottish Planning Policy 2014. Of particular relevance to this project, environmental policy 20 states:

Development that would affect a species protected by European or UK law will not be permitted unless:

a. there is an overriding public need and there is no satisfactory alternative;

b. a species protection plan has been submitted, which is based on survey result, and which includes detail of the status of the protected species on site and the possible adverse impact of development;

c. suitable mitigation is proposed and agreed; and

d. if it is established that European protected species are present, the development is not detrimental to the maintenance of European protected species at a favourable conservation status.

As of March 2025, the West Lothian council are in the process of preparing a new LDP (LDP2), setting new policies for land use and development for the next 10 years.

Annex D Desk study results

Table 6-2: Protected and notable species records

Scientific Name	Common Name	No. Records within 15 Yrs	Date of Last Record	Protection/Conservation Status
Amphibian				
Rana temporaria	Common Frog	8	05.07.17	WCA5
Bufo bufo	Common Toad	2	19.08.12	WCA5, SBL, LBAP
Birds				
Tyto alba	Barn Owl	1	2013	WCA1, SBL
Chroicocephalus ridibundus	Black-headed Gull	14	20.06.21	BoCC-Amb, SBL
Fringilla montifringilla	Brambling	2	2013	WCA1, SBL
Pyrrhula pyrrhula	Bullfinch	15	20.06.21	BoCC-Amb, SBL, LBAP
Larus canus	Common Gull	9	2013	BoCC-Amb
Actitis hypoleucos	Common Sandpiper	1	2013	BoCC-Amb
Loxia curvirostra	Crossbill	4	2013	WCA1
Cuculus canorus	Cuckoo	1	2013	BoCC-Red, SBL
Numenius arquata	Curlew	5	2013	BoCC-Red, SBL, LBAP
Cinclus cinclus	Dipper	1	2013	BoCC-Amb
Prunella modularis	Dunnock	22	20.06.21	BoCC-Amb
Turdus pilaris	Fieldfare	9	2013	WCA1, BoCC-Red
Bucephala clangula	Goldeneye	1	2013	WCA1, BoCC-Red
Pluvialis apricaria	Golden Plover	3	2013	BD1, SBL, LBAP
Larus marinus	Greater Black-backed Gull	2	20.06.21	BoCC-Amb
Chloris chloris	Greenfinch	14	07.05.21	BoCC-Red
Perdix perdix	Grey Partridge	3	2013	BoCC-Red, SBL, LBAP
Motacilla cinerea	Grey Wagtail	6	2013	BoCC-Amb
Larus argentatus	Herring Gull	11	2013	BoCC-Red, SBL
Delichon urbicum	House Martin	7	2013	BoCC-Red
Passer domesticus	House Sparrow	16	20.06.21	BoCC-Red, SBL, LBAP
Falco tinnunculus	Kestrel	19	20.06.19	BoCC-Amb, SBL, LBAP
Vanellus vanellus	Lapwing	10	2013	BoCC-Red, SBL, LBAP
Larus fuscus	Lesser Black-backed Gull	12	2013	BoCC-Amb
Acanthis cabaret	Lesser Redpoll	13	23.09.2014	SBL

Scientific Name	Common Name	No. Records within 15 Yrs	Date of Last Record	Protection/Conservation Status
Linaria cannabina	Linnet	10	2013	BoCC-Red, SBL, LBAP
Anas platyrhynchos	Mallard	12	2013	BoCC-Amb
Anthus pratensis	Meadow Pipit	10	2013	BoCC-Amb
Falco columbarius	Merlin	1	2013	BD1, WCA1, BoCC-Red, LBAP
Turdus viscivorus	Mistle Thrush	12	2013	BoCC-Red
Gallinula chloropus	Moorhen	3	2013	BoCC-Amb
Haematopus ostralegus	Oystercatcher	5	20.06.21	BoCC-Amb
Anser brachyrhynchus	Pink-footed Goose	5	2013	BoCC-Amb
Emberiza schoeniclus	Reed Bunting	10	2013	BoCC-Amb, SBL, LBAP
Turdus iliacus	Redwing	7	2013	WCA1, BoCC-Amb, SBL
Corvus frugilegus	Rook	18	07.05.21	BoCC-Amb
Acrocephalus schoenobaenus	Sedge Warbler	2	05.07.17	BoCC-Amb
Asio flammeus	Short-eared Owl	3	30.12.19	BD1, BoCC-Amb, SBL
Spinus spinus	Siskin	14	2013	SBL
Alauda arvensis	Skylark	11	2013	BoCC-Red, SBL, LBAP
Gallinago gallinago	Snipe	3	2013	BoCC-Amb
Turdus philomelos	Song Thrush	16	20.06.21	BoCC-Amb, SBL, LBAP
Accipiter nisus	Sparrowhawk	9	12.12.15	BoCC-Amb
Muscicapa striata	Spotted Flycatcher	5	2013	BoCC-Red, SBL, LBAP
Sturnus vulgaris	Starling	19	20.06.21	BoCC-Red, SBL
Columba oenas	Stock dove	9	2013	BoCC-Amb
Apus apus	Swift	7	20.06.21	BoCC-Red, SBL, LBAP
Strix aluco	Tawny Owl	4	2013	BoCC-Amb
Passer montanus	Tree Sparrow	7	20.06.21	BoCC-Red, SBL, LBAP
Oenanthe oenanthe	Wheatear	3	2013	BoCC-Amb
Curruca communis	Whitethroat	11	20.06.21	BoCC-Amb
Cygnus cygnus	Whooper Swan	1	2013	BD1, WCA1, BoCC-Amb, SBL

Scientific Name	Common Name	No. Records within 15 Yrs	Date of Last Record	Protection/Conservation Status
Phylloscopus trochilus	Willow Warbler	11	20.06.21	BoCC-Amb
Scolopax rusticola	Woodcock	3	2013	BoCC-Red, SBL
Columba palumbus	Woodpigeon	22	20.06.21	BoCC-Amb
Troglodytes troglodytes	Wren	22	20.06.21	BoCC-Amb
Emberiza citrinella	Yellowhammer	16	20.06.21	BoCC-Red, SBL, LBAP
Flowering Plant				
Cotoneaster bullatus	Cotoneaster, Hollyberry	2	24.11.23	INNS
Cotoneaster horizontalis	Cotoneaster	1	24.11.23	INNS
Cotoneaster simonsii	Cotoneaster, Himalayan	3	25.10.22	INNS
Poterium sanguisorba subsp. balearica	Fodder Burnet	1	10.06.16	SBL
Heracleum mantegazzianum	Giant Hogweed	2	10.06.16	INNS
Chelidonium majus	Greater Celandine	1	04.11.22	SBL
Rosa rugosa	Japanese Rose	7	24.11.23	INNS
Crocosmia x crocosmiiflora	Montbretia	6	24.11.23	INNS
Rhododendron ponticum	Rhododendron ponticum	10	24.11.23	INNS
Poterium sanguisorba	Salad Burnet	1	21.11.22	SBL
Gaultheria shallon	Shallon	2	23.05.21	INNS
Lamiastrum galeobdolon subsp. argentatum	Variegated Yellow Archangel	4	12.04.23	INNS
Insect – Butterfly				
Coenonympha pamphilus	Small Heath	2	18.07.20	SBL
Boloria selene	Small Pearl-bordered Fritillary	1	12.07.12	SBL
Lasiommata megera	Wall	1	20.08.23	SBL

Scientific Name	Common Name	No. Records within 15 Yrs	Date of Last Record	Protection/Conservation Status
Lichen				
Lecania cyrtella	Lecania cyrtella	4	19.08.12	SBL,
Sclerophora pallida	Sclerophora pallida	2	19.08.12	SBL, UKBAP
Reptile				
Zootoca vivipara	Common Lizard	2	17.06.21	WCA5, SBL
Terrestrial Mammal				
Meles meles	Badger	13	30.10.20	PBA, WCA6
Lepus europaeus	Brown Hare	2	19.09.20	SBL, LBAP
Sciurus carolinensis	Grey Squirrel	2	26.09.20	INNS
Erinaceus europaeus	Hedgehog	16	20.10.20	WCA6, SBL
Lutra lutra	Otter	1	14.03.16	WCA5, HR2, SBL, LBAP

Protection / conservation status:

WCA1 = Wildlife & Countryside Act 1981 (as amended in Scotland): Schedule 1

WCA5 = Wildlife & Countryside Act 1981 (as amended in Scotland): Schedule 5

WCA6 = Wildlife & Countryside Act 1981 (as amended in Scotland): Schedule 6

INNS= Invasive non-native species

HR2 = The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland): Schedule 2

SBL = Scottish Biodiversity List

BD1 = The Birds Directive 2009: Annex 1

BoCC-Amb = Birds of Conservation Concern 5: Amber List

BoCC-Red = Birds of Conservation Concern 5: Red List

UKBAP = UK Biodiversity Action Plan priority species

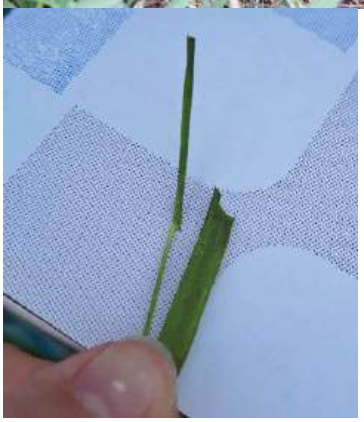
LBAP = Local Biodiversity Action Plan priority species

PBA = Protection of Badgers Act 1992

Annex E Field survey target notes

Table 6-3: UK Habitat survey results

TN (see Fig. 1)	Grid ref.	Description	Photo
1	NT 11017 65791	A pile of dead branches and twigs which may serve as a reptile hibernaculum.	
2	NT 10762 65213	A pile of stones from a ruined building which may serve as a reptile hibernaculum.	

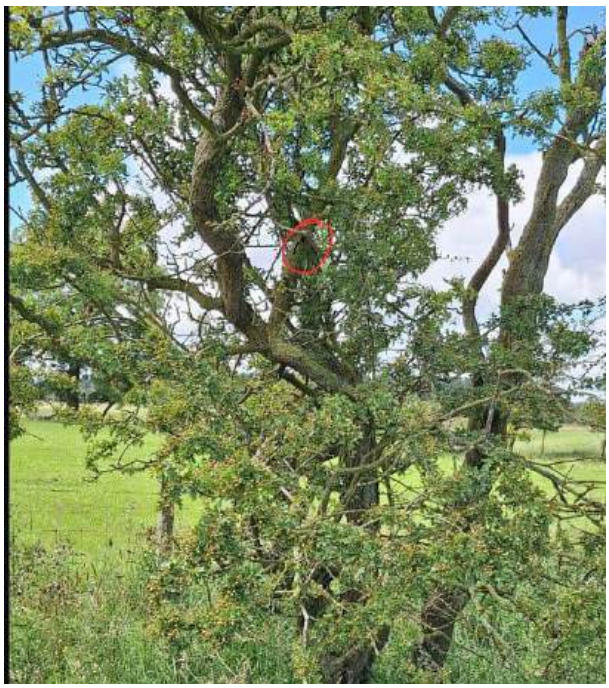
TN (see Fig. 1)	Grid ref.	Description	Photo
3	NT 10645 65112	A small mammal trail and potential water vole feeding sign adjacent to the watercourse in the centre of the Site.	 

TN (see Fig. 1)	Grid ref.	Description	Photo
4	NT 10767 65078	A small mammal burrow 5cm wide with no accompanying field signs.	
5	NT 10712 65444	A small mammal burrow 5cm wide with no accompanying field signs.	
6	NT 10709 65460	A small mammal burrow 5cm wide with no accompanying field signs.	
7	NT 10236 64605	Brown hare sighting (x2)	
8	NT 09960 64925	Brown hare sighting	

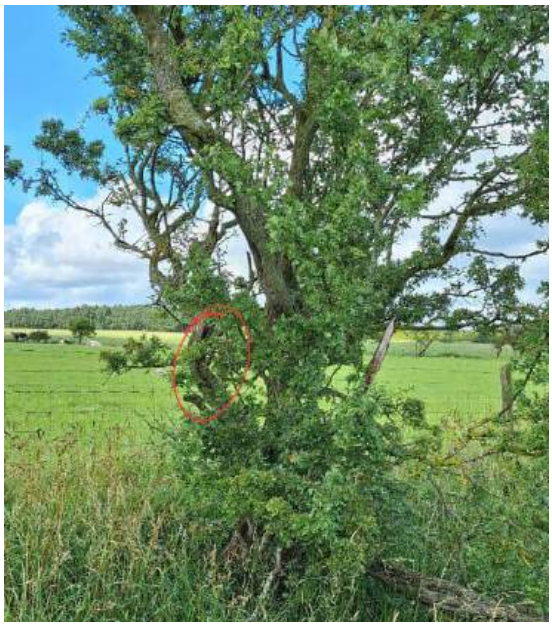
TN (see Fig. 1)	Grid ref.	Description	Photo
9	NT 10760 65576	A grey squirrel sighting.	No photo.
10	NT 11185 65299	A grey squirrel sighting.	No photo.
11	NT 11037 65017	A grey squirrel sighting.	No photo.
12	NT 10708 65501	A squirrel feeding sign.	
13	NT 11110 65656	A squirrel feeding sign.	

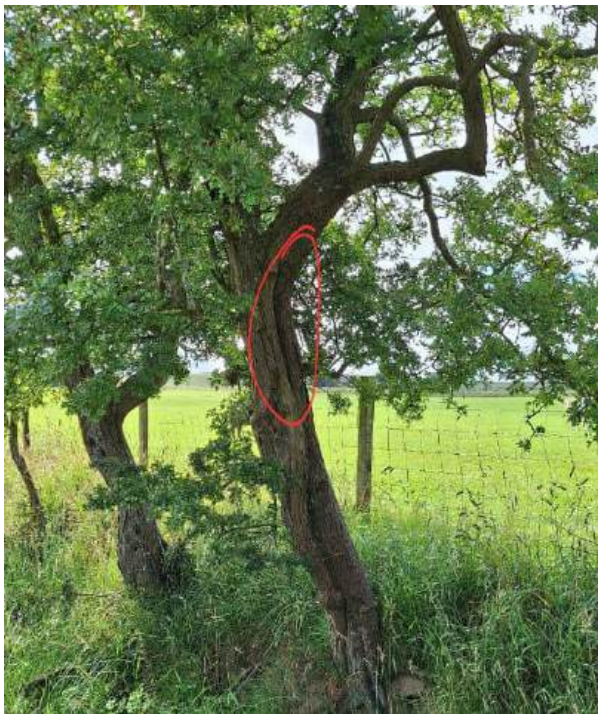
TN (see Fig. 1)	Grid ref.	Description	Photo
14	NT 11165 65550	Squirrel feeding signs.	
15	NT 10742 65551	A potential squirrel drey.	

Table 6-4: GLTA results

TN (see Fig 1.)	Grid ref.	Description	Photo
16	NT 09921 64907	Mature hawthorn tree with knot hole on eastern side of branch extending SE from trunk.	
17	NT 09928 64897	Mature hawthorn with several cracks on eastern side of trunk.	

TN (see Fig 1.)	Grid ref.	Description	Photo
18	NT 09927 64894	Hawthorn with rot hole on base of main trunk 0-0.5m above ground level on the east aspect of the tree. Hole appears to lead to void behind bark.	
19	NT 09927 64891	Hawthorn with split in base of trunk on the eastern aspect at 0.25m above ground level. May lead to internal cavity.	

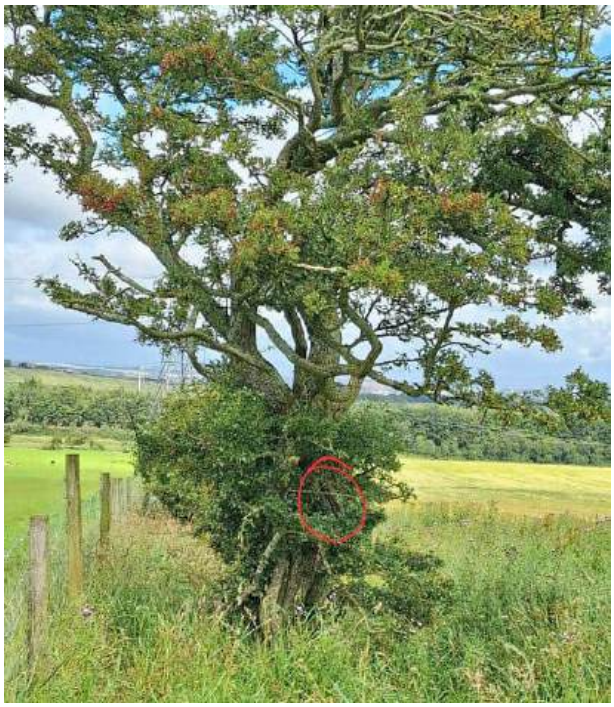
TN (see Fig 1.)	Grid ref.	Description	Photo
20	NT 09930 64886	Hawthorn with tear out on east side of limb extending south-west from trunk.	
21	NT 09934 64872	Hawthorn with split in tree trunk on its eastern aspect 0-1m above ground level. Extends up the trunk behind the bark of the tree.	

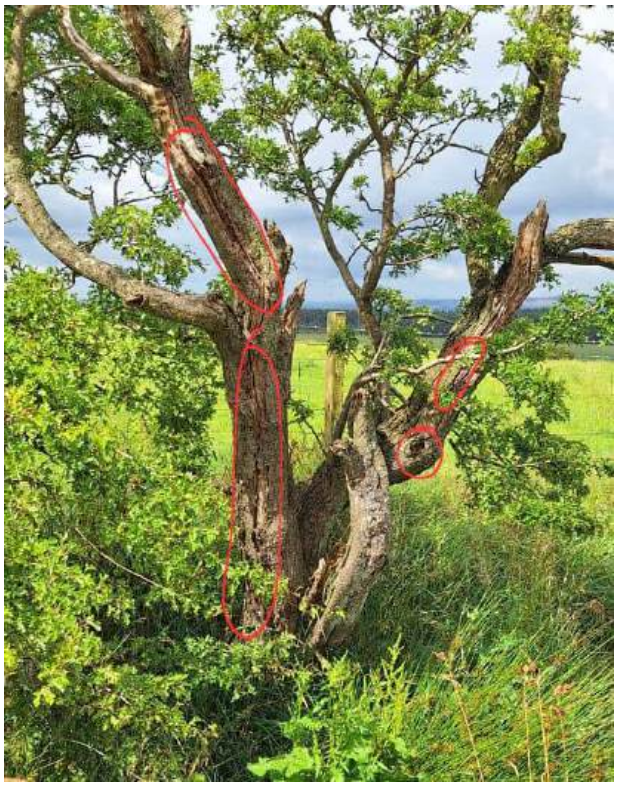
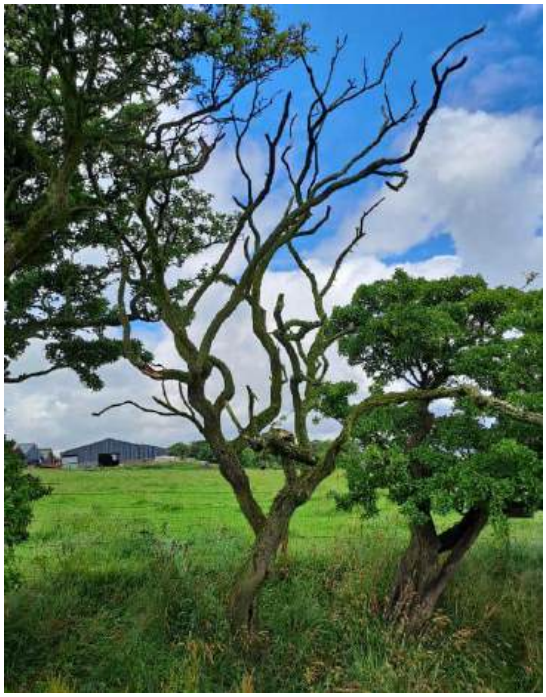
TN (see Fig 1.)	Grid ref.	Description	Photo
22	NT 09935 64871	Hawthorn with crack on east side of trunk. Possibly extends into trunk but ground level endoscope required.	

TN (see Fig 1.)	Grid ref.	Description	Photo
23	NT 09953 64814	Hawthorn with tear-out in a branch extending from the south aspect of the tree, approximately 1.5m above ground level. Fold in base of trunk on the eastern aspect has split and is possibly an internal hollow.	

TN (see Fig 1.)	Grid ref.	Description	Photo
24	NT 09966 64769	Hawthorn with tear out on SE side of trunk. May offer some potential but likely low suitability	
25	NT 09978 64734	Base of tree split on NE aspect potentially leading to hollow in tree.	

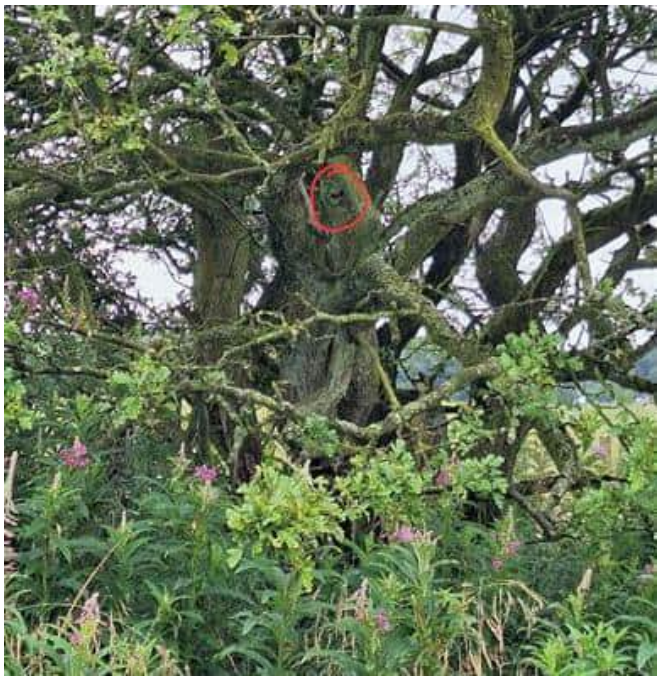
TN (see Fig 1.)	Grid ref.	Description	Photo
26	NT 09983 64720	Hawthorn with potential for a roosting feature in weld between two branches extending eastwards from the trunk.	
27	NT 09986 64716	Crack in heartwood on east aspect of tree 1m up, gap at base, possibly cavity behind. Further assessment required.	

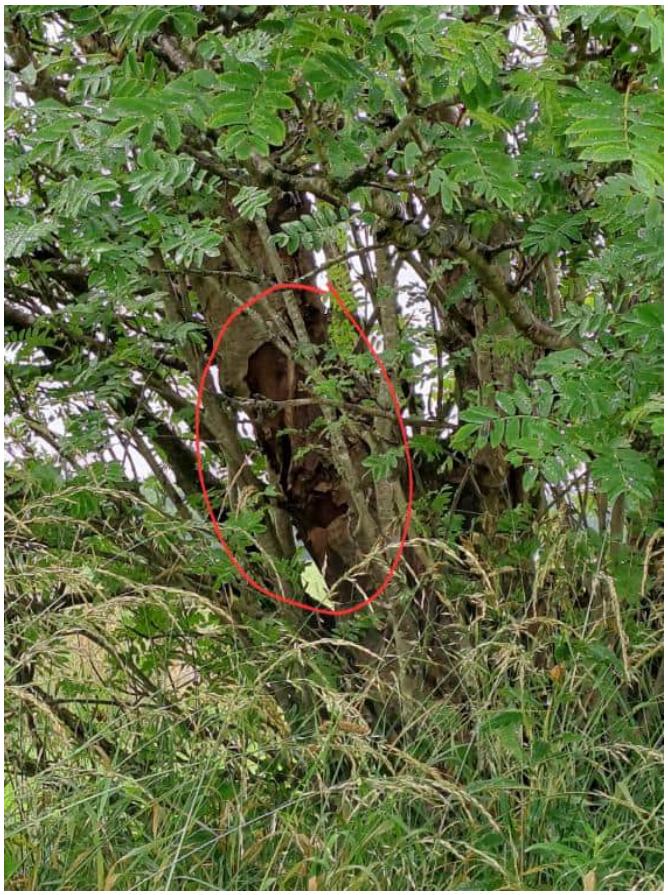
TN (see Fig 1.)	Grid ref.	Description	Photo
28	NT 10003 64659	Hawthorn with tear-out with two holes in the heartwood, could lead to internal cavity. 1.5m above ground level on the east aspect of the tree,	
29	NT 10032 64574	Hawthorn with crack on southern aspect of trunk, approximately 1m above ground level and lifting bark on underside of limb extending SE from trunk.	

TN (see Fig 1.)	Grid ref.	Description	Photo
30	NT 10160 64494	Half dead Hawthorn. Crack on south aspect running all the way up the trunk and to the top of southernmost limb. Cracks on NE extending limb and rot hole.	
31	NT 10182 64401	Hawthorn with crack in main trunk from ground level to up to 1m. Extends through to West aspect of tree. May also extend upwards internally.	

TN (see Fig 1.)	Grid ref.	Description	Photo
32	NT 10184 64393	Knothole on NE aspect, 1.5m above ground level.	
33	NT 10200 64276	Semi mature alder with multiple features including four tear-outs and damage and cracks on the trunk and limbs.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			 

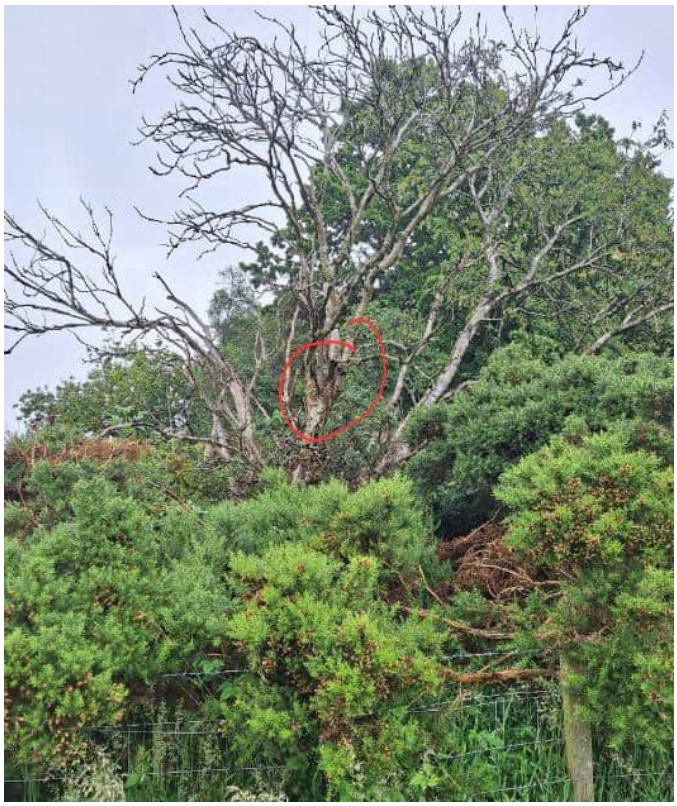
TN (see Fig 1.)	Grid ref.	Description	Photo
34	NT 10256 64275	Hawthorn with small knot hole on southern aspect of the pole extending southwards from the trunk.	

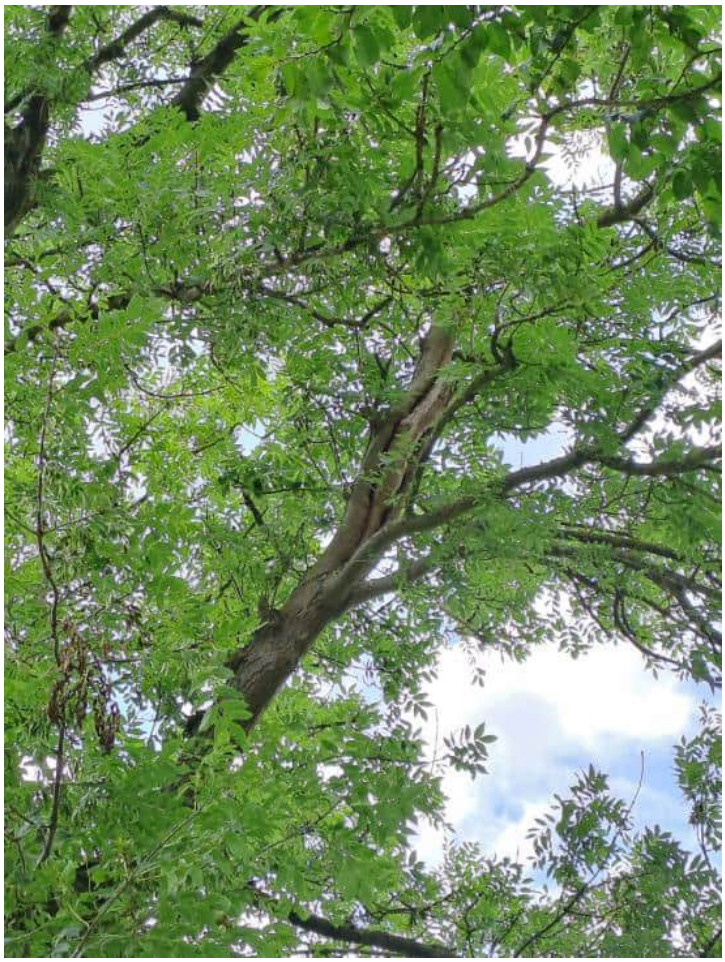
TN (see Fig 1.)	Grid ref.	Description	Photo
35	NT 10267 64278	Rowan tree with multiple stems. Lifting bark on east aspect of main trunk 1.5m above ground level.	

TN (see Fig 1.)	Grid ref.	Description	Photo
36	NT 10311 64291	Hawthorn with small knot-hole on south aspect of trunk. Tear-out on westernmost pole on eastern aspect.	

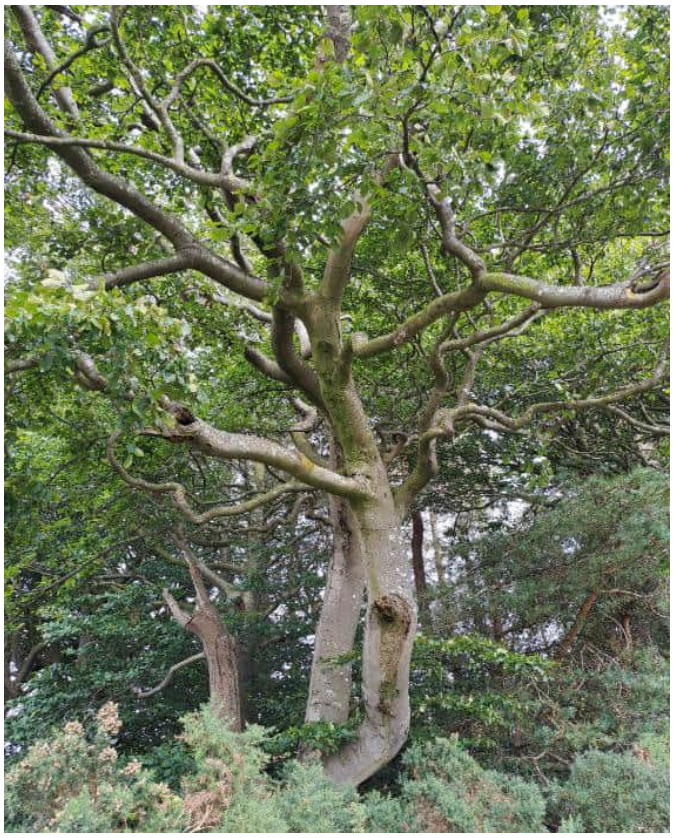
TN (see Fig 1.)	Grid ref.	Description	Photo
37	NT 10410 64316	Rowan with lifting bark on east side of trunk. Likely low suitability. Approximately 1m above ground level.	
38	NT 10451 64338	Ash with lifting bark on northeast side of one of the limbs, extending northeast from the trunk.	

TN (see Fig 1.)	Grid ref.	Description	Photo
39	NT 10420 64673	Ash tree with two potential bat features. Knot hole on southeast of trunk and tear-out on western aspect of trunk.	 

TN (see Fig 1.)	Grid ref.	Description	Photo
40	NT 10400 64715	Half dead rowan tree with multiple poles. lifting bark on main trunk of one pole. Likely low suitability, further assessment required. Limited access due to dense gorse and bramble scrub.	

TN (see Fig 1.)	Grid ref.	Description	Photo
41	NT 10352 64867	Ash tree with a crack in one of the branches which is possibly an old tear-out. Road is a hazard if PRF inspection to be carried out.	

TN (see Fig 1.)	Grid ref.	Description	Photo
42	NT 10307 64947	Hollow in north aspect of trunk at approximately 2m above ground level. Appears to extend up and down inside tree trunk.	
43	NT 10298 64971	Large hollow near base of tree trunk on southeastern aspect. Another hole on opposite side so goes right through trunk.	

TN (see Fig 1.)	Grid ref.	Description	Photo
44	NT 10293 64980	Beech with Tear-outs on West, east and north aspects of tree between 5 and 6m above ground level. Knot-hole on north aspect 4m above ground level. Road and dense scrub limiting access.	

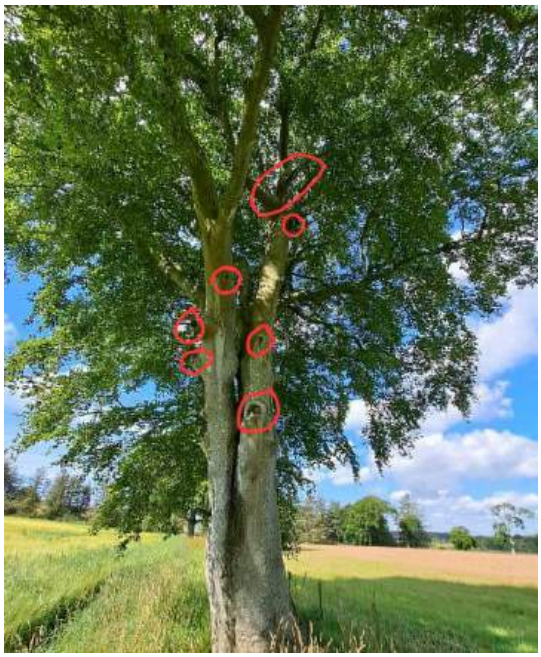
TN (see Fig 1.)	Grid ref.	Description	Photo
45	NT 10304 64990	Beech with large crack in trunk approximately 10m above ground level. On south-western aspect.	
46	NT 10312 64988	Tear out on branch extending northeast from trunk on northeast aspect. Approximately 4m above ground level. Knothole on north aspect on main pole extending from trunk. Approximately 10m above ground level.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			

47	NT 10311 65003	Beech tree with a knothole at 6m above ground level and large crack in limb at 8m, on northeastern aspect of tree. Large knothole which appears damp and is likely unsuitable on northwest aspect. Small knothole at 3m and a tear out at 4m above ground level on northwestern aspect.	 

TN (see Fig 1.)	Grid ref.	Description	Photo
			
48	NT 10318 64998	Beech tree with large hollow at 3m; Knothole at 4m; Large hollow at 5.5m and two knotholes at 6 and 6.5m above ground level on north aspect of trunk. Crack/ split on northwest aspect of trunk. Four cracks on northeast aspect of trunk and limb extending eastwards between 3 and 5m above ground level Another large hollow near the base of the tree.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			 

TN (see Fig 1.)	Grid ref.	Description	Photo
49	NT 10422 64973	Mature beech tree with multiple features over 4m above ground level including: 4 knotholes on the eastern aspect; 3 knotholes on the southern aspect; 1 knothole on the northern aspect; a tear-out on the southeastern aspect and a weld on the eastern aspect of the tree.	 

TN (see Fig 1.)	Grid ref.	Description	Photo
			
50	NT 10807 64960	Beech tree with two knotholes on northern aspect at 3m & 4m above ground level. Lowest knothole appears to extend upwards to at least 20cm. Large knot-hole on south aspect, 1m above ground level, extends upwards 70cm. Inspected with endoscope- no evidence but quite dry inside and suitable for PRF-M.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			
51	NT 10804 64978	Beech tree with small knothole on northeastern aspect of trunk, approximately 3m above ground level. Likely unsuitable but may offer some potential for individual bats. PRF.	

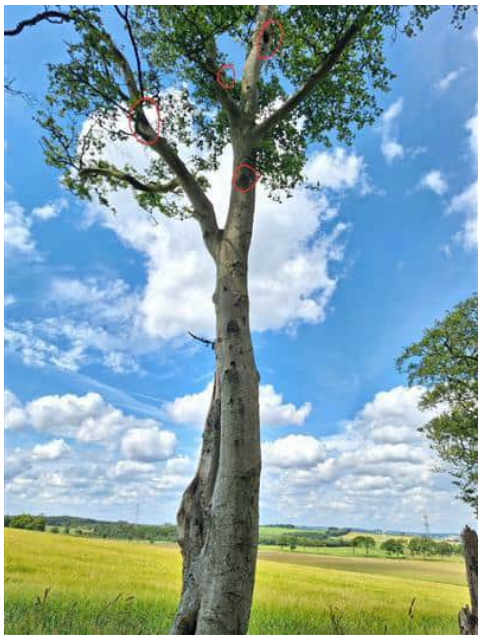
TN (see Fig 1.)	Grid ref.	Description	Photo
52	NT 10802 65009	Beech tree with one knothole on south-west aspect at 1.5m above ground level. Inspected with endoscope, extends up to 7cm. Reasonably dry inside. Lots of debris at bottom. could fit individual bats (PRF-I).	
53	NT 10787 65024	Beech tree with crack/ hollow on northern aspect of trunk at 1m above ground level (assessed using endoscope- unsuitable.) Two cracks at 1m and 2m above ground level and knotholes at 6.5m on limb and at 8.5m on main trunk on southeastern aspect.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			
54	NT 10794 64997	Beech tree with fluting on north aspect of main trunk at 6m above ground level. Two knot-holes on south aspect at 3m and 4m. Knothole at 1.5m inspected, no feature.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			 

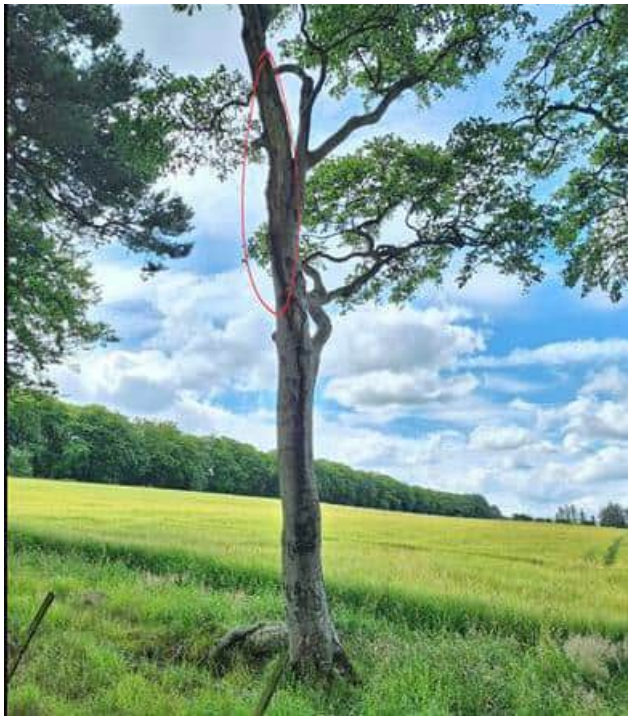
TN (see Fig 1.)	Grid ref.	Description	Photo
55	NT 10792 65000	Beech with lifting bark on western aspect at 6m above ground level. Knot hole on western aspect at 7m above ground level. Other crack/ split features high in the canopy which may not be possible to inspect due to height.	 

TN (see Fig 1.)	Grid ref.	Description	Photo
			

TN (see Fig 1.)	Grid ref.	Description	Photo
56	NT 10788 65014	Beech tree. Westernmost pole is completely dead and hollow inside with a large opening on the southeastern side. Could offer some potential but quite exposed. Two knotholes on eastern aspect of tree- one on main pole at 9m, other on south extending limb at 10m above ground level. Tear-out at 10.5m on middle pole (eastern aspect.) Tearout on south extending limb at 11m.	 

TN (see Fig 1.)	Grid ref.	Description	Photo
57	NT 10782 65031	Beech tree with two knotholes on northern aspect at 1.5m and 2.5m above ground level. Lowest knothole was endoscoped and is likely used as a birds nest with low suitability for bats.	
58	NT 10780 65041	Beech tree with two main poles splitting from trunk. Knothole on northern aspect at 3m above ground level. Three knot-holes on southern aspect at 4m, 5m and 6m above ground level.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			 

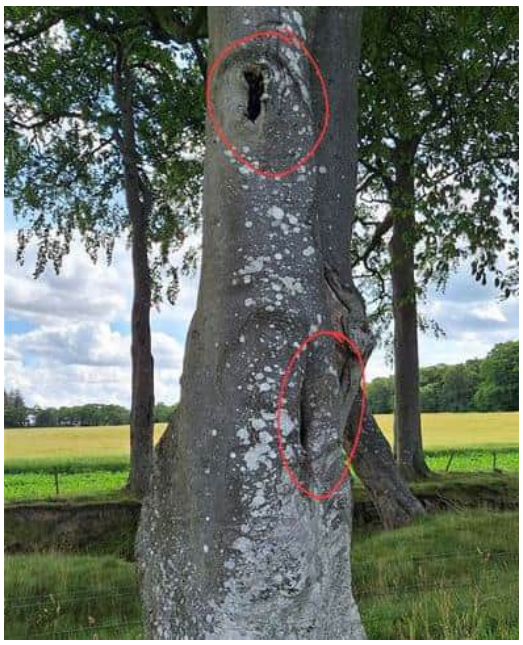
TN (see Fig 1.)	Grid ref.	Description	Photo
59	NT 10777 65054	Beech tree with tear-out on northeast aspect of main trunk at 8m above ground level.	
60	NT 10781 65068	Beech tree with large crack/ split on northeastern aspect of trunk at 3m above ground level. Knothole on southern aspect of trunk at 5m above ground level.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			
61	NT 10756 65088	Beech tree with two knotholes on northwestern aspect of trunk at 3m and 4m above ground level. Large hollow approximately 2m above ground level; 1 knothole at 10m; 2 Small holes at 8m; lifting bark and several other small features on eastern aspect. Tear-out at 6m and knot-hole at 6.5 m above ground level on northeastern aspect of trunk.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			 

TN (see Fig 1.)	Grid ref.	Description	Photo
62	NT 10759 65093	Beech very close to another beech. Large knothole is on southern aspect facing the other tree at 0.5-1m above ground level. Heartwood with insect holes exposed. Void extends 25cm up into tree and is fairly dry. Endoscoped- no evidence of bats but could offer PRF-M. Another knothole at approximately 2m above ground level. Endoscoped, no features.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			
63	NT 10755 65102	Beech tree with fluting/knot hole on western aspect, 1m above ground level. Tear-out on southwestern aspect of tree is partially healed but lots of heartwood exposed with cracks. Endoscoped, no bats but assessed as PRFM.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			
64	NT 10751 65106	Beech tree with knot hole on western aspect at 2.5m above ground level. Endoscoped and assessed as unsuitable for bats. Fluting on northwest aspect of trunk at 1.5m. Assessed using endoscope-PRF-I. Knot hole on southern aspect at 3.5m above ground level. Tear-out on northwestern aspect at 8.5m above ground level.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			 

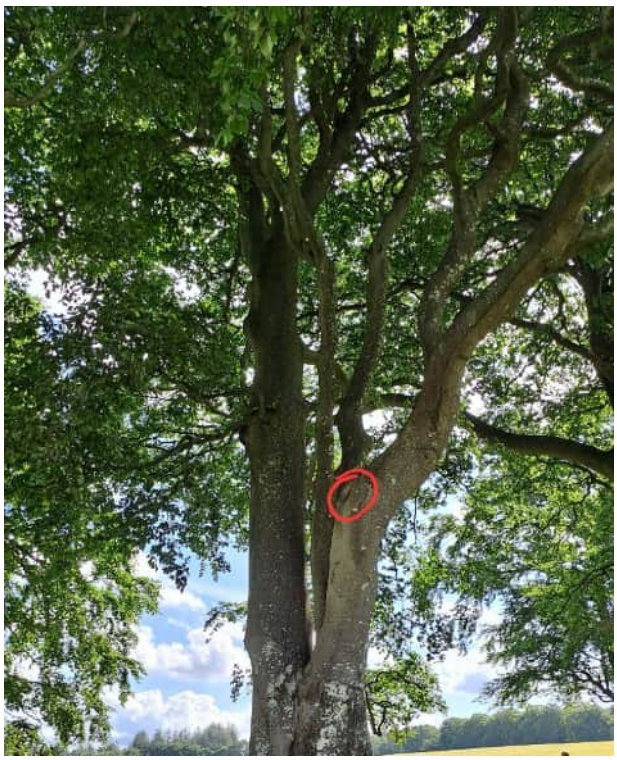
TN (see Fig 1.)	Grid ref.	Description	Photo
65	NT 10755 65112	Beech tree One trunk alive, one torn off with lots of insect holes and two hollows and other small features near the base of the tree. Large hollow on western aspect between 0.5 and 1m above ground level has been endoscoped – no evidence, assessed as PRF-M. Crack in branch on western aspect at 8m above ground level. Two knotholes on eastern aspect at 7m and 9m.	 

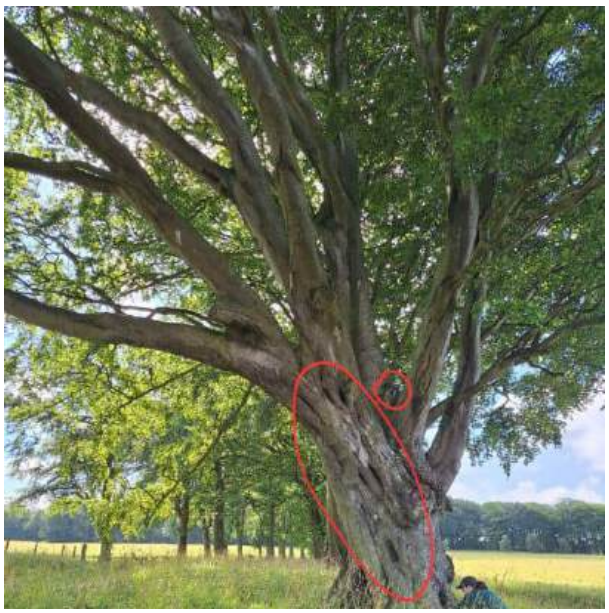
TN (see Fig 1.)	Grid ref.	Description	Photo
			
66	NT 10753 65115	Beech tree with knot hole on northern aspect approximately 6m above ground level. Knot hole on southwestern aspect of main beam approximately 2m above ground level assessed using endoscope- water inside- most likely unsuitable.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			
67	NT 10746 65119	Beech tree with top of trunk torn off and lying nearby. Internal cavity on northeastern aspect is exposed at the top so not protected from weather. Inspected with endoscope, no additional chambers that would be dry. PRF-I.	

TN (see Fig 1.)	Grid ref.	Description	Photo
68	NT 10746 65123	A mature beech tree 13m tall with a damaged limb on the east aspect and a cavity in the trunk 4m above the ground. Further assessment required for bats.	
69	NT 10744 65124	Beech tree with hole caused by rot on southeastern aspect of branch extending east from trunk. Knot hole on southeastern aspect of trunk at 1m above ground level assessed with endoscope -no evidence of bats and appears to have been previously used by birds, however could offer PRF-M.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			
70	NT 10737 65127	Beech tree with Knot-hole on southeastern aspect of trunk at 7m above ground level.	

TN (see Fig 1.)	Grid ref.	Description	Photo
71	NT 10737 65139	Beech tree with crack approximately 8m above ground level on northeastern aspect of main beam, 50cm in length. Further inspection required to determine suitability for roost feature.	
72	NT 10723 65145	Beech tree with knothole on the western aspect, 3.5m above ground level. Fluting also on western aspect at 2m-Inspected with endoscope- likely unsuitable for bats as doesn't extend into tree.	

TN (see Fig 1.)	Grid ref.	Description	Photo
73	NT 10719 65152	Mature beech tree. At least 8 cracks/ splits on northwest face of trunk between 1- 4m above ground level and at foot of main beam extending to the northeast. Three cracks on southeastern aspect between 1-3m above ground level. large hollow on western aspect of trunk assessed as PRF-M. Features at ground level assessed with endoscope.	 

TN (see Fig 1.)	Grid ref.	Description	Photo
74	NT 10745 65220	Ruined, single storey, stone building within the northeastern half of the Site. No roof and remaining walls very damaged. Lots of gaps and missing stones. Negligible suitability for hibernating bats and low suitability as a summer roost due to poor protection from weather and temperature instability.	
75	NT 10826 65343	Beech tree with tear-out on eastern aspect at 2m above ground level. Extends approximately 4cm up into the tree. Endoscoped- no evidence of bats, assessed as PRF-I. Tear-out on southeastern aspect at 7m above ground level requires further assessment.	

TN (see Fig 1.)	Grid ref.	Description	Photo
			
76	NT 10035 65164	Large line of mature Beech trees with multiple PRFs adjacent to small watercourse/high ruderal veg with good foraging for bats. (outside Site boundary)	

TN (see Fig 1.)	Grid ref.	Description	Photo
77	NT 10795 65663	Mixed woodland with Scot's pine, birch, willow, sycamore, ash, larch, holly and oak. Good foraging and commuting habitat for bats along woodland edge.	
77	NT 10795 65663	Mixed woodland with Scot's pine, birch, willow, sycamore, ash, larch, holly and oak. Good foraging and commuting habitat for bats along woodland edge.	
78	NT 11017 65007	Scattered *Rhododendron ponticum* within woodland habitat	No photo

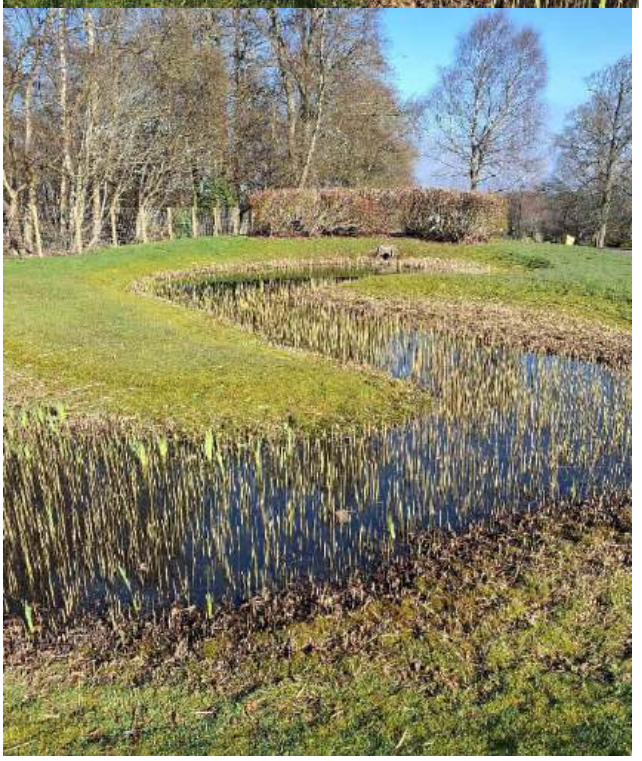
TN (see Fig 1.)	Grid ref.	Description	Photo
79	NT 10341 64925	Mature beech tree with a knot-hole and lifting bark on the south aspect of the trunk at 6m above ground level and a large hollow on the northeast aspect of the trunk extending from the base of the tree up to 3m. Additional knothole at 4m above ground level on northeast aspect. Ladder and endoscope/ climbing inspection required.	
80	NT 09947 65125	Mature beech with a knot hole on the southern aspect at 3m above ground level. Further inspection using an endoscope required to determine whether feature is suitable or not.	No photo
81	NT 10170 64466	Hawthorne with two cracks in one of the branches, approximately 1.5m above ground level. Further assessment is required to determine if the feature is suitable.	No photo
82	NT 10138 64592	Hawthorne with a knothole in the eastern aspect of the tree at approximately 2m above ground level. Further assessment is required to	No photo

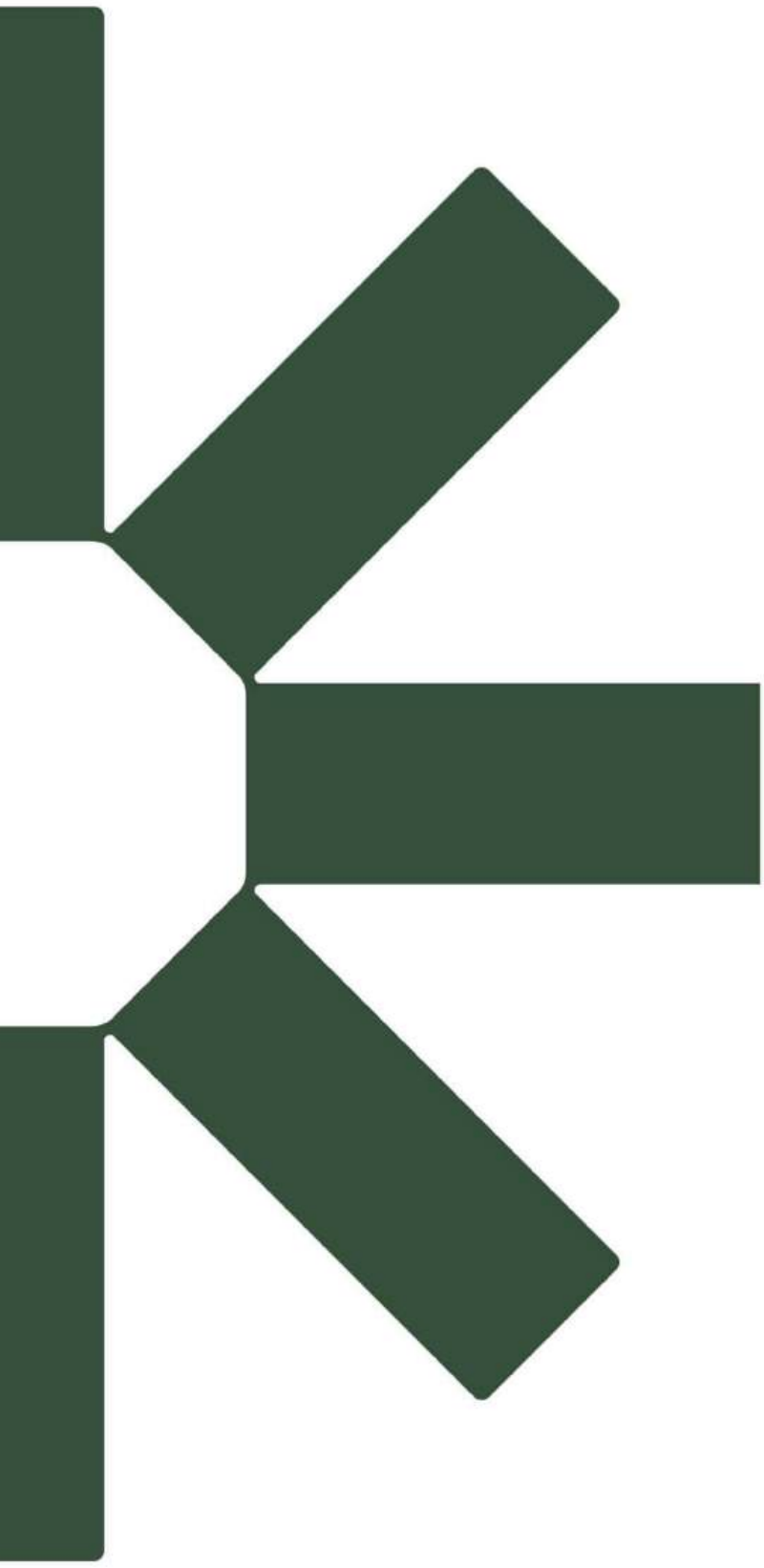
TN (see Fig 1.)	Grid ref.	Description	Photo
		determine whether feature is suitable.	
83	NT 09896 65115	Ash tree with a knothole on its western aspect at approximately 3m above ground level. Further assessment is required to determine whether feature is suitable.	No photo
77	NT 10795 65663	Mixed woodland with Scot's pine, birch, willow, sycamore, ash, larch, holly and oak. Good foraging and commuting habitat for bats along woodland edge.	
78	NT 11017 65007	Scattered *Rhododendron ponticum* within woodland habitat	No photo

TN (see Fig 1.)	Grid ref.	Description	Photo
79	NT 10341 64925	Mature beech tree with a knot-hole and lifting bark on the south aspect of the trunk at 6m above ground level and a large hollow on the northeast aspect of the trunk extending from the base of the tree up to 3m. Additional knothole at 4m above ground level on northeast aspect. Ladder and endoscope/ climbing inspection required.	
80	NT 09947 65125	Mature beech with a knot hole on the southern aspect at 3m above ground level. Further inspection using an endoscope required to determine whether feature is suitable or not.	No photo
81	NT 10170 64466	Hawthorne with two cracks in one of the branches, approximately 1.5m above ground level. Further assessment is required to determine if the feature is suitable.	No photo

Table 6-5: Assessment of ponds for GCN

TN (see Fig. 4)	Grid ref.	Description	Photo
P1	NT 11153 64934	Appears to be a small pond, 155m to the southeast of the site within an area of broadleaved woodland.	No access
P2	NT 10682 65135	A flush/ area of poor drainage dominated by soft rush along the watercourse in the east of the Site.	
P3	NT 09928 65062	Within the northwest of the Site, adjacent to a watercourse to the south and an area of mixed woodland to the north. Dry.	

TN (see Fig. 4)	Grid ref.	Description	Photo
P4	NT 11618 65162	Small- medium sized man-made pond within a housing estate, 405m to the east of the Site. Contains some emergent vegetation and short grasses on the banks. There is an area of broadleaved woodland to the north.	 



Making Sustainability Happen