

Preliminary Ecological Appraisal

March 2023

Ford Halewood
Speke Boulevard
Speke
Liverpool
L24 9LE

National Grid Ref: SJ452840



Ford Halewood, Speke Boulevard, Speke, Liverpool, L24 9LE
Preliminary Ecological Appraisal

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Prepared for	On-Site Energy Limited on behalf of GFT Energy Centre Limited
Prepared by	Tyrer Ecological Consultants Ltd

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This report aims to provide general advice on ecological constraints associated with any development of the site and includes recommendations for further survey; it is not intended that this report should be submitted with a planning application for development of the site, unless supported by the results of further surveys and a detailed assessment of the effects of the proposed development.

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Executive Summary

As part of two proposed full planning applications at Ford Halewood in Speke, Liverpool, (survey areas collectively termed as 'the Site' and 'application site' in this report) Tyrer Ecological Consultants Ltd were commissioned to carry out a Preliminary Ecological Appraisal (PEA) in February 2023.

The PEA was commissioned by On-Site Energy Limited on behalf of GFT Energy Centre Limited - the applicant.

The two planning applications can be summarised as follows:

- Full planning permission to construct a car park extension of 210 spaces and cover the existing car park (covering 375 spaces) and new extension with solar carports, bringing the total spaces to 585 spaces and includes all designated EV charging spaces.
- Full planning permission to build a solar PV array covering approximately 2.86 acres, with 2,560 solar panels, totalling 1,260 kWp.

Extensive findings, conclusions and recommendations are presented throughout the report; however, the reader should be aware of the following key recommendations.

Designated sites: A review of MAGIC maps identified that the Site is located within the SSSI Impact Risk Zone (IRZ) of the Mersey Estuary SSSI, SPA and Ramsar site. The IRZ system sets the criteria for development whereby a Local Authority (Knowsley Council) would be required to consult with Natural England regarding potential risks to protected sites posed by the proposed developments on Site. *It is considered that the proposed development meets one of the criteria (Solar schemes with footprint > 0.5ha) whereby the Local Authority would be required to consult with Natural England regarding potential risks to the Mersey Estuary posed by the proposed development on Site. To this end the competent authority, in this case Knowsley council, are likely to be legally required to carry out a Habitat Regulations Assessment (HRA) stage 1 screening assessment, which may advance to stage 2 appropriate assessment, where impact pathways warrant mitigation.*

Habitats: Construction of a solar farm generally requires very low levels of direct and permanent land take (typically less than 5% footprint on the ground). BRE (2014) guidance states that "as panels are raised above the ground on posts, over 95% of a site used for solar farm development is still accessible for plant growth and complementary activities such as conservation grazing". *Direct grassland habitat loss may occur in the south of the Site in species rich areas; this could be mitigated if the solar scheme in the east of the Site is accompanied by a Biodiversity Management Plan (BMP) to improve the grasslands habitat type to species rich grassland in favourable condition in accordance with the 'Biodiversity Net Gain: Good practice principles for development' (CIEEM et. al., 2019). A Biodiversity Management Plan (BMP) can be secured and delivered by planning condition.*

Flora: Loss of grassland in the south of the Site to accommodate new hardstanding has the potential to result in loss of orchids of locally rare significance and impact localised diverse areas of flora. *To mitigate the loss of orchids / small areas of species rich grassland, it is recommended all orchids that could be lost to the proposals are translocated from the southern grassland to the eastern grassland, which, it is proposed in section 8.4, then be subject to a future ongoing Biodiversity Management Plan (BMP) to improve the grasslands habitat type and condition in accordance with the 'Biodiversity Net Gain: Good practice principles for development' (CIEEM et. al., 2019). To translocate orchids usually large turfs are lifted using a digger, taking up the orchids and a large amount of the surrounding soil and vegetation from*

a donor area, and then moved immediately to a different location on the same site, termed a receptor area. The specifics should be outlined in a Method Statement, which could be subject to planning condition.

Birds: In relation to more common birds, all trees and woody / shrub vegetation and garden infrastructure provides viable nesting opportunities for smaller birds; as breeding birds are protected when breeding / when at the nest, timings implications are applicable to avoid disturbing or harming breeding birds and breaching legislation. *It is recommended that no removal of, or works to any building, trees, mature shrubs, garden infrastructure, that may be used by breeding birds, shall take place during the main bird breeding season (1st March to 31st August inclusive), unless a competent Ecologist has undertaken a careful, detailed check for active birds' nests immediately before any works and provided confirmation that no birds will be harmed and/or that there are appropriate measures in place to protect nesting bird interest on site. Appropriate measures - where/if active nests are located by the Ecologist then any works which may affect them would have to be delayed until the young have fledged and the nest has been abandoned naturally, this can be aided, for example, via implementation of appropriate buffer zone(s) around the nest site (typically 5-10 metres) in which no disturbance is permitted until the nest is no longer in use. This would have to be coordinated through the expert judgement of the professional ecologist and is typically species dependant.*

Herpetofauna & small mammals: In respect of amphibians, the combined desktop and field-based results suggest there is a negligible scale of risk associated with the proposals concerning great crested newts. No further surveys for great crested newts are recommended as part of this appraisal, however it is considered that Reasonable Avoidance Measures (RAM's) be implemented by planning condition to act as a sufficient safeguard for amphibians and other wildlife that may be present locally. *It is highly recommended therefore that a detailed and bespoke working Method Statement should be formulated and conditioned outlining key measures and working protocols to be in effect during the proposed work schedule / future management once plans have been confirmed. Any RAM's should be drafted by a suitably qualified Ecologist/Ecological clerk of works (ECoW) with strong experience of formulating such technical documents tailored to the Site and its surroundings. Upon gaining understanding of the details contained within the RAM's, the applicant and associated contractor team would be expected to comply with the measures recommended within it. Any RAM's would be subject to the approval of the local planning authority - following approval, adherence to the terms of the RAM's would be a requirement of the named authority and the applicant would be the liable party for any non-compliance, with the Ecologist/ECoW acting for and on behalf of the applicant. The applicant and all contractors would be aware that if at any stage great crested newts, or any other protected species are encountered during works, or at any other stage of the project, works would be required to immediately cease and the Ecologist/ECoW would be made aware as to provide further guidance, if an Ecologist is not already present.*

Enhancement: Enhancement ideas that consider the specific scale and nature of the proposals in accordance with the principles of 'Biodiversity Net Gain: Good practice principles for development' (CIEEM et. al., 2019), are presented in **Appendix IV**.

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1.0 Introduction & Scope

- 1.1 As part of two proposed full planning applications at Ford Halewood in Speke, Liverpool, (survey areas collectively termed as 'the Site' and 'application site' in this report) Tyrer Ecological Consultants Ltd were commissioned to carry out a Preliminary Ecological Appraisal (PEA) in February 2023.
- 1.2 The PEA was commissioned by On-Site Energy Limited on behalf of GFT Energy Centre Limited - the applicant.
- 1.3 The two planning applications can be summarised as follows:
- Full planning permission to construct a car park extension of 210 spaces and cover the existing car park (covering 375 spaces) and new extension with solar carports, bringing the total spaces to 585 spaces and includes all designated EV charging spaces.
 - Full planning permission to build a solar PV array covering approximately 2.86 acres, with 2,560 solar panels, totalling 1,260 kWp.
- 1.4 The two projects form part of an investment into implementing the production of electric drive units at the Ford Halewood site. The car park extension is required to increase the capacity of Ford employee vehicle parking, as the workforce grows alongside the scaling up of production of a new product.
- 1.5 See **Figure 1.1** for **General PV Layout**.

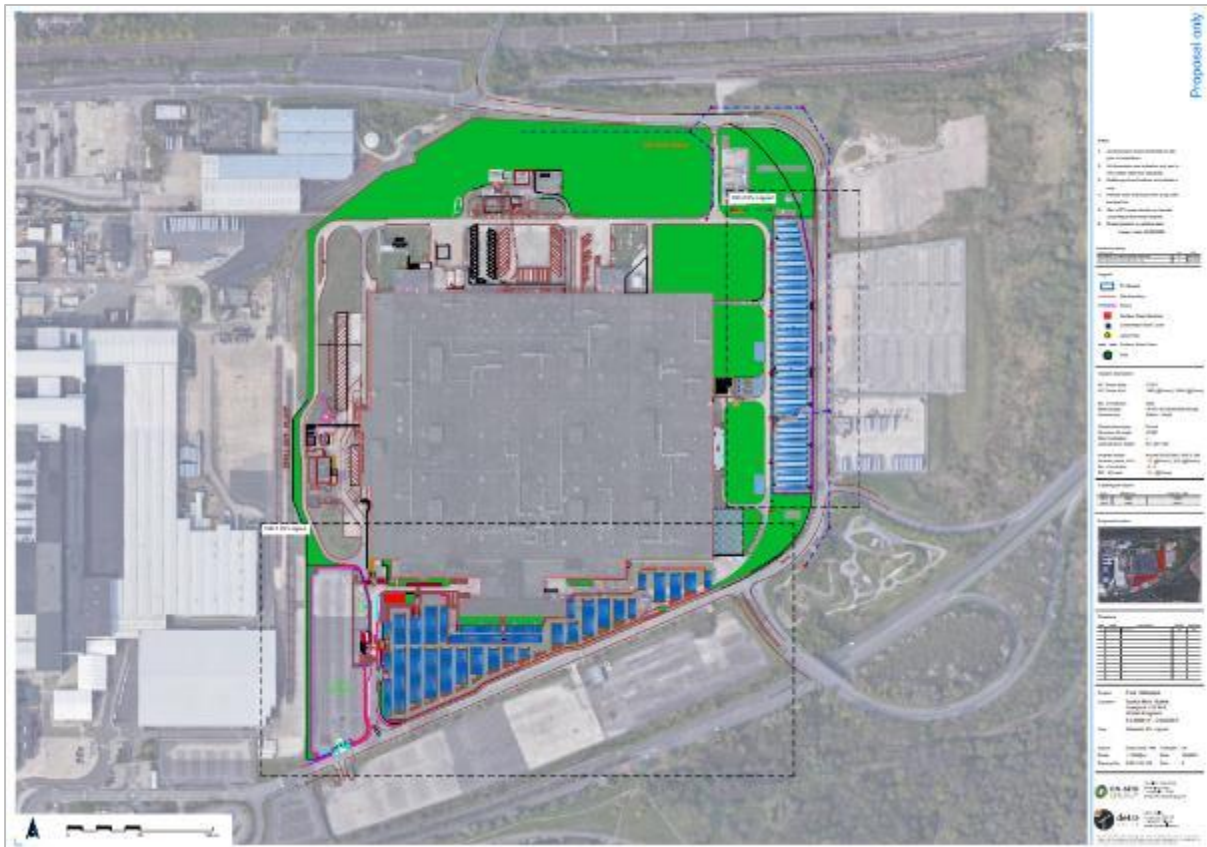


Figure 1.1 – General PV Layout (Drawing No. OSE1010-100 Rev 0)

- 1.6 As part of the Local Planning Authorities (LPA) planning policies and obligations to the Planning Framework, ecological surveys are generally required prior to planning permission being granted, particularly where protected/priority habitats or species are, or may be present, that could be affected by the proposals for which the application seeks consent.
- 1.7 The PEA was carried out in accordance with the '*Guidelines for Preliminary Ecological Appraisal, 2nd Edition*' (CIEEM, 2017) and all associated '*CIEEM Competencies for Species Survey (CSS)*', whilst this report has been presented in accordance with the British Standard 42020:2013 *Biodiversity. Code of practice for planning and development*.

Aims & Objectives

- 1.8 The appraisal aims to ascertain baseline nature of the Site and, where possible, obtain information on any priority wildlife habitats, or species, that may be present and if so determine if they will be affected by the proposals. The survey therefore includes the following objectives:
- Gather and present baseline ecological information (as necessary) within a suitable report,
 - Identify, measure and map habitats using UK Habitat Classification – Habitat Definitions Version 1.1 (2020),
 - Identify any likely ecological constraints associated with the proposals for the Site (i.e. the presence of protected/priority habitats or species that exist within the confines of the application boundary, or zone of influence (ZOI),
 - Identify measures likely to be required in line with the mitigation hierarchy (i.e. impact avoidance > minimisation > mitigation > compensation),
 - Identify additional survey requirements,
 - Aim to achieve no 'net loss',
 - Identify enhancement opportunities for biodiversity in line with national and local planning policy following 'Biodiversity Net Gain: Good practice principles for development' (CIEEM et. al., 2019),
 - Set out any requirements for post-development monitoring, management, or other commitments, and how they can be secured, where required.
- 1.9 As a functioning component of this specific ecological appraisal:
- Habitats were identified, measured and mapped using the UK Habitat Classification – Habitat Definitions Version 1.1 (2020);
 - Trees were subject to preliminary roost assessment (PRA) for Bats and scored against the bat roost suitability parameters defined in the Bat Conservation Trust - Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd ed. (2016) and British Standard 8596:2015 *Surveying for bats in trees and woodland*.
- 1.10 This report provides baseline information as derived from the diurnal appraisal process outlined above and recommends any necessary additional surveys, or work, where applicable, to provide a conclusive ecological impact assessment.

- 1.11 The Applicant should be aware that if during the appraisal:
- The application site/area was found to be suitable for any European Protected Species (EPS), otherwise protected, or priority habitats/communities/species, or,
 - Signs of use by particular protected species were found, or suspected, or,
 - Seasonal constraints significantly limit the gathering of ecological information to arrive at an accurate conclusion on which the planning application can proceed;
 - Then more detailed surveys may be recommended where necessary, to allow the ecologist to arrive at a conclusive impact assessment.
- 1.12 If protected species were subsequently found either during appraisal or during detailed further surveys and / or may be affected by the development proposals, then a European Protected Species Mitigation Licence (EPSML) may be required to proceed with the development.
- 1.13 Where more detailed surveys are recommended by the Ecologist, following ecological appraisal, then Local Planning Authorities (LPA's) on the advice of their ecological advisors, may not grant permission until such time that all relevant material information is gathered in accordance with their obligations to the legislature.
- 1.14 Protected/priority species omitted from this report have been discounted due to negating factors including obvious absence/isolation of suitable habitats, and/or distributional aspects negating the necessity to survey for them, and/or the proposed works were not considered to impact the species or encroach on areas where the species may be present.

2.0 Legislation & Policy

2.1 The legislature and guidance considered for the purposes of this report includes the following:

- Biodiversity Net Gain. Good practice principles for development,
- BS 42020:2013 Biodiversity – Code of Practice for Planning and Development,
- Conservation of Habitats and Species Regulations (amendment) (2019) (EU Exit),
- Countryside Rights of Way (CROW) Act (2000),
- Natural Environment and Rural Communities (NERC) Act (2006),
- The Hedgerow Regulations (1997),
- Town and Country Planning Act (1990),
- Wild Mammals Protection Act (1996),
- Wildlife and Countryside Act (WCA) (1981) (as amended).

2.2 These acts entail relevance to both protected and invasive species. The degree of protection offered to taxa provided within existing UK and EU legislature often varies depending on species/group, for example, some species may purely be protected during one of its life stages (e.g. common species of breeding bird whilst nesting/with eggs/young); some species may receive full protection (e.g. bats), whereas others may be protected solely on a national basis (e.g. grass snake).

2.3 **Table 2.1** contains appropriate legislature to each species/group specifically respective to the Site and provides the relevance of said legislation.

Table 2.1 - Relevant Legislation

Species/Group	Relevant Legislation	Level of Protection
Badger	Protection of Badgers Act (1992), Wildlife and Countryside Act (1981) (as amended)	Illegal to wilfully kill, injure or take a badger (or attempt to do so). Cruelly ill-eradicate a badger. Dig for a badger. Intentionally or recklessly damage or destroy a badger sett, or obstruct access to it. Cause a dog to enter a badger sett. Disturb a badger when it is occupying a sett.
Bats	CROW Act (2000) Conservation of Habitats and Species Regulations (2019) (EU Exit) Wildlife and Countryside Act (1981) (as amended)	All British bats and their roosts are afforded full protection from damage/destruction and bats may not be injured/killed/taken at any life stage. Once identified, roosts are protected whether the bat is in occupation or not.
Birds	CROW Act (2000) Wildlife and Countryside Act (1981) (as amended)	All wild birds (with only minor exceptions) and their nests whilst being built or containing eggs or dependant young are protected. Birds listed on Schedule 1 Wildlife & Countryside Act (1981) (as amended) are afforded a greater level of protection.

Great Crested Newt (GCN)	CRoW Act (2000) Conservation of Habitats and Species Regulations (2019) (EU Exit) Wildlife and Countryside Act (1981) (as amended)	Great Crested Newts (GCN's) are fully protected from disturbance, killing, injuring or possession at any life stage. Confirmed breeding ponds and resting places are afforded the same protection.
Invasive Plant Species	Wildlife and Countryside Act (1981) (as amended)	Species listed within Schedule 9 as invasive, including Japanese Knotweed (<i>Reynoutria japonica</i>) and Himalayan Balsam (<i>Impatiens glandulifera</i>), for example, carry notoriety regarding development. The Act makes it an offence for any person to grow or cause to grow in the wild any plants listed as invasive.
Reptiles	Conservation of Habitats and Species Regulations (2019) (EU Exit) - SL/SS Wildlife and Countryside Act (1981) (as amended) - SL/SS CRoW Act (2000)	All native reptile species have some degree of protection in the UK, through section 8(1) and (5) (specified in Schedule 5) of the Wildlife and Countryside Act 1981 (as amended). Sand lizard (SL) and smooth snake (SS) are species of principal importance however with greater protection(s).

Relevant Policy

- 2.4 Guidance for Local Authorities: Extract from Office of the Deputy Prime Minister - Circular 06/2005:

"It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision".

- 2.5 Paragraph 180 of the National Policy Planning Framework (as revised in July 2021) states:

180. When determining planning applications, local planning authorities should apply the following principles:

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

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and,

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

2.6 The Knowsley Local Plan Core Strategy (2016) stipulates:

“...the design of development will be expected to support and integrate biodiversity enhancements, flood risk mitigation, energy/resource efficiency and waste recycling requirements, to accord with Policy CS8: Green Infrastructure, Policy CS24: Managing Flood Risk and Policy CS26: Waste Management.

and in section 5.91:

“In some circumstances, adequate mitigation and/or compensation for biodiversity loss may be acceptable but incapable of being provided within the application site. In such cases where appropriate, priority will be given to equivalent off site opportunities for such mitigation or, as a last resort, compensation. Such opportunities shall be prioritised in the following order:

- Firstly sites in the immediate locality of and/or within any Core Biodiversity Area near to the application site,*
- Secondly, sites in a Nature Improvement Area identified within the borough,*
- Lastly, sites in a Nature Improvement Area identified outside the borough.*

3.0 Priority Habitats & Species

National Context

- 3.1 In the United Kingdom, legal protection and otherwise legislative recognition is afforded to particular habitats and species. Certain habitats and species are considered to hold nature conservation importance and are thus protected, due to factors such as their ecological functionality, connectivity, rarity, their vulnerability, environmental importance, or declining population / status. They are referred to as priority habitats and priority species.
- 3.2 The UK Biodiversity Action Plan (UKBAP) provided a statutory basis for lists of habitats and species of national conservation importance – now transposed under Section 41 (s.41) of the Natural Environment Rural Communities Act 2006 (NERC Act).
- 3.3 The following Section 41: Habitats of Principal Importance in England and: Species of Principal Importance in England are considered potentially relevant to the appraisal (non-extensive):

Habitats:

- Ancient & semi-natural woodland, Lowland mixed deciduous woodland, Species rich semi-improved grassland.

Species:

- Bats: brown long-eared (*Plecotus auritus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and common noctule (*Nyctalus noctula*),
- s.41 Bird species that include: house sparrow (*Passer domesticus*), grey partridge (*Perdix perdix*), herring gull (*Larus argentatus*), song thrush (*Turdus philomelos*), starling (*Sturnus vulgaris*), lapwing (*vanellus vanellus*), dunnoek (*Prunella modularis*), yellowhammer (*Emberiza citrinella*) for e.g.,
- Land mammals that include: hedgehog (*Erinaceus europaeus*) and brown hare (*Lepus europaeus*) for e.g.,
- Herpetofauna that include: great crested newt (GCN) (*Triturus cristatus*), common toad (*Bufo bufo*), common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*) for e.g.,
- Botanical species that includes purple ramping-fumitory (*Fumaria purpurea*), bluebell (*Hyacinthoides non-scripta*), cornflower (*Centaurea cyanus*) for e.g.

Regional Context

- 3.4 Local Biodiversity Action Plans (LBAP's) are a way of encouraging people to work together to deliver a program of continuing action for biodiversity at a local level. LBAPs also embrace the idea of 'local distinctiveness'; habitats and species which are not considered UK conservation priorities can be catered for by LBAPs if they are of particular local significance.
- 3.5 LBAP's set out practical steps that aim to help protect, enhance and improve biodiversity where possible, as well as promote biodiversity at a local level.
- 3.6 The North Merseyside Biodiversity Action Plan (NMBAP) lists key local habitats/species considered to be rare or declining in the area; some may be of national concern while others are significant at local level. The following local plans are considered of potential relevance to the survey.
- Dragonflies (*Odonata*);
 - Urban grasslands;
 - Urban green Infrastructure (10. Ecological Frameworks).

4.0 Methodology

Desktop Study

4.1 A desk study was undertaken to identify existing information on the presence of designated sites, protected and notable species and habitats within proximity as follows:

- Statutory designated sites for nature conservation within 5km; and,
- Non-statutory designated sites for nature conservation within 2km.

4.2 The following key sources were consulted:

- Natural England and Joint Nature Conservation Committee (JNCC) websites;
- The Multi Agency Geographic Information for the Countryside (MAGIC) website; and,
- A data search to include all protected species and designated sites within a 2.0km radius was sourced from Merseyside Biobank as the information gathered provides further, and often otherwise unobtainable, biodiversity information concerning protected species and their local distributions.

4.3 Reference was also made to Google Earth Pro and Ordnance Survey (OS) maps of the local area and online aerial images (www.google.co.uk/maps) in order to aid in determining any features of nature conservation interest in the wider area.

Field Survey

4.4 A daytime preliminary ecological appraisal was conducted on the 21st February 2023 in dry, clear, sunshine conditions (9°C), average wind 1/12 (Beaufort scale), cloud cover 25%, by the following qualified surveyor (**Table 4.1**).

Table 4.1 - Surveyor credentials

Name	Description of most relevant credentials
Mr. M. Pritchard ACIEEM (Senior Ecologist)	• Six years professional Ecological consultant experience & extensive training in cross habitat/species ecology; • Relevant Degree: FdSc (Countryside, Conservation & Recreational Management); • Licenced in Bats: (2020-5039-CLS-CLS) (Class 1) and accredited agent on the (Class 2) Natural England bat licence of Mrs. K. Wilding (CLS-14227); • Licenced for Great Crested Newt: CL08 (Great Crested Newt Survey Level 1) - 2018-34062-CLS-CLS (England); • Licensed for Sand Lizard & Natterjack Toad (2022-62891-SCI-SCI); • FISC Level - 3 (2019) (Botanical); • Trained in use of the MoRPH River assessment; • Trained in UK Habs / BNG condition assessment.

Floristic assessment

- 4.5 The survey followed the UK Habitat Classification Version 1.1 (Butcher, et.al., 2020) method with reference to the Joint Nature Conservation Committee (JNCC) Phase 1 Habitat Methodology standards (JNCC, 2010) and reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) Technical Guidance Series “*Guidelines for Preliminary Ecological Appraisal, 2nd Edition*” (CIEEM, 2017)
- 4.6 During a survey walkover botanical assemblages were assessed and the land was inspected for the presence of red-listed (Stroh *et al*, 2014; Hodgetts, 2011), s.41 and LBAP species alongside specially protected species as listed under Schedule 8 of the Wildlife and Countryside Act (WCA) (1981) (as amended) and / or Schedule 5 The Conservation of Habitats and Species (amendment) (EU exit) Regulations (2019). Species nomenclature follows Stace, C. (2019) – definitive English names.
- 4.7 Additional to attributing ecological value to red-listed / BAP species, in accordance with existing CIEEM guidance, a geographic frame of reference is also adopted. Plant species and habitats may be recognised for their ecological value on a geographical scale which is adopted on a site-to-site basis (see **Figure 4.1**).
- 4.8 The Site was also assessed in relation to the presence of invasive non-native species (INNS) as listed under Schedule 9 (Part II) of the Wildlife and Countryside Act (1981) (as amended). For botanical species list compiled, see **Appendix II**.

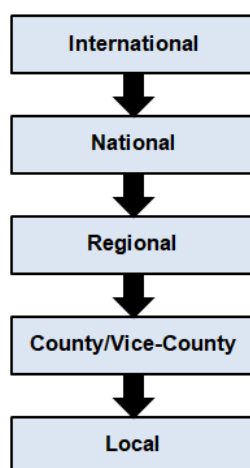


Figure 4.1 – Geographic Frame of Reference entailing degrees of conservation importance

Faunal assessment

- 4.9 During a site walkover the identification and/or evidence of priority fauna encountered was documented whilst in tandem the area was assessed for the potential to support the priority species in section 3.0. The walkover also aimed to identify any ephemeral pools or unmapped waterbodies.

Bats

- 4.10 No buildings were subject to preliminary roost assessment.
- 4.11 Trees were inspected for places that may be of value to bats and to determine if evidence of use was present; this typically involves a search for potential roost features along with an investigation of those features using a high-powered torch or close focus binoculars. Potential roost features can include woodpecker holes, rot holes, hazard beams, other vertical or

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horizontal cracks or splits in stems and branches, partially decayed lifted bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks with included bark, gaps between overlapping stems or branches, partially detached Ivy with stem diameters in excess of 50mm or bat/bird boxes.

- 4.12 Criteria for preliminary bat roost assessment are based upon the determinants given in the Bat Conservation Trust - Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd ed. (2016): (see **Figure 4.2**).

Table 4.1 Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement.

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions ^a and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation ^b). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential. ^c	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^a and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions ^a and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

^a For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.
^b Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.
^c This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

Figure 4.2 – Bat Conservation Trust (BCT) guidelines extract

- 4.13 Factors typically considered during the preliminary roost assessment include:

- Knowledge of bat species relevant to the site location and geographical range,
- Nature of the immediate / surrounding habitat in relation to foraging opportunities,
- Presence and conditions of loft spaces, upper floors, roof linings,
- Presence / absence of roost potential,
- Value and types of roost potential, if present (i.e. - maternity, hibernation, transition).

Birds

- 4.14 The Site was inspected for evidence of nesting and suitability for relevant avian species including breeding, passage, overwintering use. Bird species observed and heard were recorded, and a search was made for nest material, or areas suitable for nesting - this can take the form of searching structures, woody vegetation, semi-aquatic vegetation such as reeds and/or the ground.

- 4.15 Additional to the Site's capacity to support generally common species for breeding, the area was also subject to an assessment for wider capacity to support species with extra protection under Schedule 1 of the Wildlife & Countryside Act (WCA) (1981) (as amended) for example Barn owl (*Tyto alba*) and other Sch.1 (WCA) listed species.

Other terrestrial mammals

- 4.16 The walkover included a search for field signs of badger (*Meles meles*) which includes signs of activity such as prints, hairs, digging, setts, 'runs' leading to and from a sett and the existence of latrines or 'snuffle' holes where badgers have foraged in the ground.
- 4.17 The Site was also assessed for the suitability of European hedgehog and brown hare.

Herpetofauna

- 4.18 During desktop assessment a 250 metres radial search was undertaken from a site central grid reference in relation to the presence of ponds, ditches or other water bodies that may support great crested newts (GCN) for breeding. The information gathered would then be used to aid in establishing if more detailed surveys are required. The terrestrial value of the Site was also assessed in relation to amphibian species shelter, hibernation, foraging values.

NB: *English Nature's (now Natural England) Great Crested Newt Mitigation Guidelines (2001) states ponds within 500m of a proposed development site should be considered for their potential to support GCN, however, in some instances this distance may be reduced to 250m due to the presence of physical barriers and obstructions or based on the likely magnitude of impacts arising from the proposed development.*

- 4.19 Following current best practice considering the national roll out of District Level Licencing (DLL) across England and based on likely effects, a proportionate assessment of the water bodies range within 250m from Site has been applied. Where a development is anticipated to affect GCN the search can be extended up to 500m or more.
- 4.20 The Site and its surroundings were assessed for suitability for use by reptiles known to the county; during the survey particular attention was paid to features that could be used as basking areas (e.g. south-facing slopes), hibernation sites (e.g. banks, walls, leaf litter, piles of hardcore) and opportunities for foraging (e.g. rough grassland and scrub). Beebee & Griffiths (2000) state specific habitat preferences of common UK reptiles:
- common lizards use a variety of habitats from woodland glades to heaths, walls and pastures, as well as brownfield sites.
 - slow-worms use similar habitats to common lizards, and are often found in rank grassland, gardens and derelict land;
- 4.21 In assessment of a site for reptiles several important habitat characteristics are considered, outlined in **Table 4.2 below**, as derived from the *Reptile Habitat Management Handbook* (Edgar, 2010).

Table 4.2 – Important habitat characteristics for reptiles

1. Location (in respect of species range)	7. Connectivity to good quality habitat
2. Vegetation structure	8. Prey abundance
3. Insolation	9. Refuge opportunity
4. Aspect	10. Hibernation habitat potential
5. Topography	11. Disturbance regime
6. Surface geology	12. Egg-laying site potential

- 4.22 The results, conclusions and recommendations of this report are based on a number of factors i.e.
- Skills and experience of the surveyor,
 - Knowledge of flora and fauna relevant to the site location and geographical range,
 - Nature of the immediate and surrounding habitat in relation to shelter, foraging and commuting opportunities.
- 4.23 The results, conclusions and recommendations of this report have been assessed by Mrs. K. Wilding, Director of Tyrer Ecological Consultants Ltd, and her assessment concurs with the findings and recommendations of the surveyor and author Mr. Pritchard.

5.0 Limitations

- 5.1 A data search to include all protected species and designated sites within a 2.0km radius was sourced from Merseyside Biobank as the information gathered provides further, and often otherwise unobtainable, biodiversity information concerning protected species and their local distributions. The application site lies within a local record centre administrative boundary overlap with Cheshire RECORD (see **Figure 5.1**) though as the majority of the search radius is within Merseyside Biobank territory, only the commercial data from Merseyside Biobank has been sourced for this appraisal. Cheshire RECORD information would provide additional local wildlife site and species distribution information, though we consider enough information has been sourced to inform a robust desktop assessment in this case from the available sources, and consider the expenditure involved in sourcing a second commercial data search as excessive and disproportionate to the certainty the information would provide to the conclusions and recommendations in this report.



Figure 5.1 – Merseyside Biobank / Cheshire RECORD territory boundaries

- 5.2 This report does not contain a comprehensive list entailing the totality of botanical taxa on Site. Though the list in **Appendix II** represents the Site a PEA is not a concentrated effort to gather full botanical information. Many plant species are only evident at certain times of the year, in addition the presence of annuals/biannual species may not be present in February; consequently, it is possible some plant species may have gone undetected, and a precautionary approach has been considered in the conclusions and recommendations.
- 5.3 No access issues arose, and the surveyor was able to carry out a robust assessment of all areas proposed to be directly affected by development (i.e. construction related).
- 5.4 In considering the limitations given, no significant constraints were experienced that might adversely influence the results, conclusions, and recommendations of this report which have been provided in accordance with best practice guidance.

6.0 Desk Study Results

- 6.1 Ford Halewood is located in a built up setting approximately 9 miles to the southeast of Liverpool city centre. The Ford site covers around 71 acres and is located in an industrial estate that is majority owned by Jaguar Land Rover to the immediate west. To the north of the estate, the West Coast Mainline track runs across the length of the perimeter, beyond this runs the A562 Higher Road. To the South of the estate runs the A561 Speke Boulevard and beyond that lies Liverpool John Lennon Airport (approximately 2 miles away). To the East of the estate, the A561 Speke Boulevard merges into the A562 Higher Road and carries on east towards the Newstead Farm Interchange with the M57 north and the direction of Widnes to the extended north-east. To the West of the estate, adjacent to Jaguar Land Rover, runs a string of large industrial buildings on Renaissance Way. These industrial buildings run along both sides of Renaissance Way and are occupied by an automotive component supplier, several pharmaceutical companies and a distribution company, among others.
- 6.2 See **Figure 6.1** for Location of the Site within the context of the wider setting (OS Maps 2023).



Figure 6.1 – Location of the Site within the context of the wider setting (OS Maps 2023)

- 6.3 The application site is located on land to the south and east of the factory.
- 6.4 The land to the south comprises one half sealed hardstanding used as car parking, various minor grasslands of mixed value that are managed for amenity use, mixed scattered trees, introduced shrubs and non-native flower beds. The grasslands are dispersed by the presence of hardstanding roads and paths.
- 6.5 The land to the east is one large grassland managed for amenity purposes with a small number of scattered trees against the eastern boundary perimeter fence. Cars from the factory are occasionally parked on the grassland and localised areas have been changed to unsealed hardstanding and colonised by a thin layer of soil and pioneer forbs.

- 6.6 In the extending environment is ancient semi-natural woodland with lowland mixed deciduous woodland (Mill Wood) within 140 metres to the south-east and Crab Tree Rough within 190 metres east; both valuable local habitats and designated local wildlife sites (LWS). There is arable land to the extended north-east and south-east, the residential urbanisation of Halewood to the extended north x north-west, and residential urbanisation of Speke to the south. Further south is Liverpool airport, then the coastal environment of Oglet shore which precedes the River Mersey estuary an internationally important site for avian species (see **Table 6.1**).
- 6.7 The described surrounding environs present a fair variety of terrestrial and freshwater habitat types though inter-connectivity is limited due to the presence of busy roads, harsh lighting and built infrastructure presenting significant dispersal barriers. Notwithstanding the surrounding environment should be considered as being of high value to local biodiversity. The protected species most typically associated with the habitat types described are bats, namely the common pipistrelle bat, a species typically associated with roosting in urban environments.

NB: *Where quality habitat is present close to buildings then the percentage use of those buildings, by bats, increases given that roost opportunities are available and vice versa.*

Statutory designated sites

- 6.8 There are two statutory designated sites within 2.0 kilometres, see **Table 6.1**.

Table 6.1 – Statutory designation types and reasons for designation within 2.0 kilometres buffer

Site name	Designation type and distance
Millwood & Alder Wood	Local nature reserve (LNR) – 200 metres south-east
<u>Relevant interest features:</u> Habitats include broadleaf woodland including ancient semi-natural woodland, neutral grassland and ponds. Native bluebell and a notable butterfly assemblage, including purple hairstreak (<i>Favonius quercus</i>).	
Mersey Estuary	Site of Special Scientific Interest (SSSI), Special Area of Conservation (SPA) and Ramsar site – 1.66 kilometres south
<u>Relevant interest features:</u> The Mersey Estuary is an internationally important site for wildfowl and consists of large areas of intertidal sand and mudflats. The site also includes an area of reclaimed marshland, saltmarshes, brackish marshes and boulder clay cliffs with freshwater seepages. The Manchester Ship Canal forms part of the southern boundary of the site and separates a series of pools from the main estuary. These pools together with Hale Marsh are important roosting sites for wildfowl and waders at high tide. Throughout the winter the estuary supports large numbers of wildfowl and waders. The birds feed on the rich invertebrate fauna of the intertidal sediments as well as plants and seeds from the saltmarsh and adjacent agricultural land. The estuary is also a valuable staging post for migrating birds in spring and autumn. In 1980–81 the estuary had the highest monthly count of wildfowl of any British site; 57,700 birds. The most important species over the period 1978–83 were pintail <i>Anas acuta</i> (17% of the total western European population), teal <i>Anas crecca</i> (12%), shelduck <i>Tadorna tadorna</i> (7%) and wigeon <i>Anas penelope</i> (2%). In 1982–83 the estuary had the 16th highest monthly count of waders of any British site: 26,593 birds. The most important species over the period 1978–83 was dunlin <i>Calidris</i>	

alpina (1%). However, nationally important numbers of curlew *Numenius arquata*, redshank *Tringa totanus* and golden plover *Pluvialis apricaria* were also recorded.

Several areas of saltmarsh are present. These form important feeding and roosting sites for birds. Glasswort *Salicornia* spp. is widespread on the outer margins whilst sea poa *Puccinellia maritima* is dominant over the rest. Unlike the other saltmarshes in the estuary, Stanlow Banks has not been grazed by sheep or cattle, and consequently has a more diverse flora. Sea aster *Aster tripolium* and hastate orache *Atriplex prostrata* are widespread throughout this area. Sea plantain *Plantago maritima*, annual seablite *Suaeda maritima* and scurvy-grass *Cochlearia* spp. also occur.

In a number of areas, the salt-marsh grades into brackish marsh dominated by common reed *Phragmites australis* with sea arrow-grass *Triglochin maritima* and great reedmace *Typha latifolia* also present in some areas. On the sandy foreshore sea sandwort *Honkenya peploides* occurs with sea milkwort *Glaux maritima*. At the inner edge of the salt-marsh and along the strand line, mud rush *Juncus gerardi*, sand sedge *Carex arenaria* and curled dock *Rumex crispus* occur.

On the north side of the estuary, part of the coastline is formed by boulder clay cliffs. Portions of the cliff have become exposed by slumping, and in these areas a number of unusual species occur including yellow-wort *Blackstonia perfoliata* and bristly oxtongue *Picris echinoides*, both of which are at the northern limits of their distribution.

- 6.9 A review of MAGIC maps identified that the Site is located within the SSSI Impact Risk Zone (IRZ) of the Mersey Estuary SSSI, SPA and Ramsar site. The IRZ system sets the criteria for development whereby a Local Authority (Knowsley Council) would be required to consult with Natural England regarding potential risks to protected sites posed by the proposed developments on Site.
- 6.10 It is considered that the proposed development meets one of the criteria (Solar schemes with footprint > 0.5ha) whereby the Local Authority would be required to consult with Natural England regarding potential risks to the Mersey Estuary posed by the proposed development on Site.

NB: “It is important to note that the SSSI IRZs only indicate Natural England’s assessment of likely risk to the notified features of nationally designated sites. Where they indicate such a risk is unlikely, this does not mean that there are no potential impacts on biodiversity or the wider natural environment.”

Non-statutory designated sites

- 6.11 There are five non-statutory designated sites within 2.0 kilometres, see **Table 6.2**.

Table 6.2 – Non-statutory designation types (LWS) and reasons for designation within 2.0 kilometres buffer

LWS name & distance	Interest features
Mill Wood & Alder Wood Liverpool Local wildlife site (LWS) 140 metres south-east.	The Local Nature Reserve extends into both Knowsley and Halton but is all owned by Liverpool City Council. Mill Wood is one of only two Liverpool sites on the Ancient Woodland Inventory, while Alder Wood is of more recent origin. In between the two lies an area of mown, semi-improved grassland and scattered scrub with an area of unimproved grassland to the north of Mill Wood. Three ponds are found within Mill Wood. The Ram's Brook forms the northern boundary of Mill Wood. The canopy of Mill Wood is dominated by Pedunculate Oak and Sycamore with some Silver Birch and Wych Elm and an understorey of tree saplings, Honeysuckle, Bramble and Bracken. The ground flora is amongst the best in Liverpool and includes Bugle, Common Dog-violet, Dog's Mercury, Wood Anemone, Wood Millet, Wood-sedge, Wood-sorrel and Yellow Pimpernel. Alder Wood is predominantly Oak, Silver Birch and Alder. It has a dense understorey of Bramble and a limited ground flora which includes Remote Sedge. The presence of species associated with aquatic habitats, such as Water Mint, Water Figwort and Marsh Thistle indicate the hydrology of the site. The unimproved neutral grassland to the north of Mill Wood contains a good diversity of species including Black Knapweed, Bugle, Oxeye Daisy, Common Fleabane, Bee, Common Spotted and Southern Marsh Orchids, Field Woodrush, Wild Angelica, Heath Bedstraw and Hairy Sedge. The managed grassland is dominated by Perennial rye-grass but contains a number of more interesting species including Black Knapweed and Bird's-foot Trefoil. Various ponds and their margins support a good variety of aquatic and emergent plant species, including Marsh Marigold, Marsh Woundwort, Water Forget-me-not and Water-plantain. The site supports a good range of breeding grassland and woodland butterflies including the locally rare Purple Hairstreak. Pipistrelle and Noctule bats are seen regularly. Its breeding bird fauna is very similar to that of Stockton's Wood on the other side of Speke but also includes some species associated with farmland habitats including Grey Partridge and Reed Bunting, together with Grasshopper Warbler at one of its few regular sites in Liverpool. Kingfishers are seen regularly in winter.
Crab Tree Rough and Hop Yard Wood, north Liverpool Local wildlife site (LWS) 190 metres east.	Predominantly broadleaf woodland with ponds, neutral grasslands and areas of regeneration.
Ditton Brook Liverpool Local wildlife site (LWS) 1.64 kilometres north-east	An open water course providing good water vole habitats.

Ford Halewood, Speke Boulevard, Speke, Liverpool, L24 9LE
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Mersey Estuary SSSI, adjacent farmland and the Coastal Reserve Liverpool Local wildlife site (LWS) 1.66 kilometres south	This site comprises the saltmarshes and sand and mud flats of the Mersey Estuary, which lie within the Liverpool boundary. The Mersey Estuary is of international importance for their wintering ducks and waders, for which they are designated as a Site of Special Scientific Interest, Special Protection Area and Ramsar Site. It is Liverpool's only SSSI. The extent of the sand and mud flats within Liverpool and of saltmarsh along the shore at Oglet vary from year to year according to the vagaries of the Mersey channels. In recent years saltmarsh has eroded at Oglet Bay but built up at Garston and is establishing at Cressington; areas remain on Oglet Shore, Speke Hall and the Coastal Reserve. Different plant species dominate in different zones and sections but the saltmarsh as a whole supports a full range of species typical of the region including Annual Sea-blite, glassworts, Reflexed Saltmarsh-grass, Sea Beet, Sea-purslane, Sea Rush and Wild Celery. The eroding clay cliffs alongside the Mersey Way support an interesting flora, including Yellowwort and Bristly Oxtongue. The rubble, but now increasingly muddy, shoreline at Otterspool and Garston supports feeding and roosting waders. Inland of the SSSI boundary a complex mosaic of grassland, bracken, reed swamp, tall ruderal vegetation and wet woodland forms a narrow strip alongside the Mersey Way. Species of interest here include Common and Glaucous Sedge, False Fox-sedge, Tall Fescue and Yellow-wort. As well as Common Reed, sometimes large patches of swamp support Reed Sweetgrass, Fool's Water-cress, Gipsywort, Hemlock Water-dropwort and Sea Club-rush, along with a few scattered saltmarsh species. The main ornithological interest lies in the wintering waterfowl but the saltmarsh and arable fields and coastal reserve also support good numbers of wintering finches and other seed eating passerines. The overall patchwork of habitat supports a good variety of breeding birds, notably Grey Partridge, Skylark, Yellow Wagtail and Corn Bunting on the farmland, Sand Martin in the cliffs, Reed and Sedge Warbler in the reed swamp, and Grasshopper Warbler, Lesser Whitethroat and Linnet in scrub. The coastal reserve is predominantly grassland, comprised of a mix of sward density and height and an intimate mix of neutral semi-improved grassland, patches of acid grassland, recently cultivated wildflower meadow and marshy grassland, together with a number of damp scrapes, occasional scrub and a line of hedgerow. An area to the south has been planted and sown as part of mitigation works for losses to ground nesting and winter roosting habitats within the adjacent old airfield. The area to the north is predominantly rank grassland with Yorkshire fog, rough meadow grass, creeping bent, broad leaved dock, creeping buttercup, creeping thistle, common couch, false oat grass and a number of coarse grasses predominating. A hedge bank supports hawthorn, honeysuckle, hazel, blackthorn, dog rose and gorse. Damp and marshy areas support curled pondweed, bristle club-rush, compact rush, toad rush, water plantain, marsh cudweed, common spiked-rush, salt marsh rush, celery-leaved buttercup and sea club-rush. 143 species have been recorded in the Coastal Reserve alone. While variation in grassland quality and regular disturbance from dog walkers and vehicle issue, the site supports a healthy diversity of wintering, passage and breeding birds, with over 30 breeding birds recorded including grey partridge, pheasant, shelduck, lapwing, curlew, meadow pipit, wheatear, linnet, sedge warbler, grasshopper warbler, whitethroat and reed bunting.
Halewood Triangle Liverpool Local wildlife site (LWS) 1.67 kilometres north-west	A large site containing many different habitats including broadleaf woodland, wet and dry grasslands, ponds and ditches with breeding amphibians, all of which add to the site's interest.

6.12 Both planning applications are unlikely to directly or indirectly impact any Liverpool local wildlife site (LWS) during the construction phase by virtue of spatial separation.

6.13 Further study of MAGIC maps highlights the following important contextual protected species information:

- The desktop study revealed there are 2 results for Protected Species Mitigation licences granted within a 2.0km radius – they affect the same Site and are granted for impacts to a great crested newt breeding site (2016-2018) and common pipistrelle non-breeding site (2016-2021).

Biological records received from Merseyside Biobank

6.14 The 2km commercial data search highlighted the following important contextual species information within 2km of the Site.

Bat data

6.15 The data search provided an interesting record of a brown long-eared bat found deceased inside the factory in November 1988 which is now a specimen in Liverpool Museum. No other records exist at site level and only one other brown long-eared record is present at Oglet village to the extended south-west. There are records of common pipistrelle, soprano pipistrelle and 'bats' within 2km.

Bird data

6.16 Two records of species listed on Schedule 1 of the WCA were provided:

- 4 records of barn owl from the wider 2km the most notable one being at Liverpool airport in 1999.
- 2 records of kingfisher (*alcedo atthis*) at Netherley brook and Ditton brook to the north.

6.17 Nine records of LBAP birds were provided which include UKBAP species (see **Table 6.3**):

Table 6.3 – LBAP bird species within 2km

bird	Corn Bunting	<i>Emberiza calandra</i>	11	1994-2005	LBAP
	Grey Partridge	<i>Perdix perdix</i>	15	1975-2006	LBAP
	House Martin	<i>Delichon urbicum</i>	8	1975-2005	LBAP
	House Sparrow	<i>Passer domesticus</i>	17	1975-2005	LBAP
	Lapwing	<i>Vanellus vanellus</i>	11	1997-2007	LBAP
	Skylark	<i>Alauda arvensis</i>	11	1975-2002	LBAP
	Song Thrush	<i>Turdus philomelos</i>	14	1975-2007	LBAP
	Starling	<i>Sturnus vulgaris</i>	8	1975-2005	LBAP
	Swift	<i>Apus apus</i>	7	1975-2005	LBAP

Other terrestrial mammal data

6.18 No notable records of mammals were provided within the Site or immediate habitats to warrant any further interpretation / impact assessment.

Herpetofauna

6.19 Five notable species were flagged up by the data search:

Ford Halewood, Speke Boulevard, Speke, Liverpool, L24 9LE
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- 19 records of Great crested newt – the records range from 1985-2012 and are from the Halewood triangle LWS are at 1.67 km north-west.
- Additionally, there are many records of common toad, common frog (*Rana temporaria*) and smooth newt (*Lissotriton vulgaris*) showing these species as present within suitable habitat within 2km.
- x2 historic (1959) records of common lizard from 'Speke'.

7.0 Field Survey Results

7.1 Habitat survey

7.1.1 See **Table 7.1** (below) for baseline habitat information and descriptions; refer to **Appendix I** for any supporting imagery; scientific names for species named in **Table 7.1** are given in **Appendix II**.

7.1.2 Refer to **Appendix IV - UK Habitats Map** for the location of habitats & Target Notes (TN).

Table 7.1 – UK Habitat codes and descriptions with Target Notes

Habitat code	Description
g3c – other neutral grassland	Some areas of grassland in the south-west of the Site were found to be species rich with over 8 species present per m ² and several species located of regional and local importance including bee orchid, salad burnet, bee orchid, field madder, lesser hawkbit, oxeye daisy and knapweed. This grassland area is subject to regular mowing like the rest of the grasslands on Site.
g4 – modified grassland	Most grasslands on Site are pockets of modified grassland dominated by perennial rye, Yorkshire-fog, <i>Festuca</i> agg. and species indicative of improvement such as creeping buttercup, white clover and daisy, lacking the diversity and richness of species present in the g3c habitat. All grassland on Site is intensively managed and partially treated with herbicide particularly around grassy edges for the treatment of 'weeds'.
u1b5 - building	Security cabin in the west of the Site.
u1b6 – other developed land	Various compacted hardstanding is present forming access and roads.
u1 230 - gardens	Cultivated non-native flower beds and shrubs are established within borders around the factory in several places.
Trees	Scattered trees included birch, oak, cherry, alder and horse-chestnut.
Target Note	1 – A memorial garden is present in the south of the Site which is a mix of sealed and unsealed hardstanding, timber and cultivated flowers/shrubs.

7.2 Vegetation

Notable species

7.2.1 Two regionally important (RI) species and seven locally rare (LR) species were encountered during the appraisal, as follows:

- (RI) bristly ox-tongue *Picris echioides* – rarely distributed along the south-east and eastern boundaries below fence and just outside the perimeter fencing, always on disturbed/ephemeral ground.
- (RI) field madder *Sherardia arvensis* - within a localised area of the grassland in the south-west corner of the Site.
- (LR) lesser hawkbit *Leontodon saxatilis* – scattered through grassland in the south of the Site.
- (LR) dove's-foot crane's-bill *Geranium molle* – occasional throughout the grasslands on Site.
- (LR) pendulous sedge *Carex pendula* – one plant encountered in the grassland in the east of the Site.
- (LR) red bartsia *Odontites vernus* – within a localised area of the grassland in the south-west corner of the Site.
- (LR) salad burnet *Sanguisorba minor* - within a localised area of the grassland in the south-west corner of the Site.
- (LR) ivy-leaved speedwell *Veronica hederifolia* – small numbers of plant found around the grassy edges preceding hardstanding.
- (LR) bee orchid *Ophrys apifera* – <10 plants distributed in loose numbers within the grasslands in the south of the Site.

7.2.2 Grassland loss in the south of the Site has potential to impact the locally rare population of orchids present.

Invasive non-native species

7.2.3 No species listed as 'invasive' under Schedule 9 (Part II) of the Wildlife & Countryside Act (1981) (as amended) were identified upon assessment of the survey area.

7.3 Bats

- 7.3.1 None of the scattered trees distributed on Site were found to offer bat roost suitability.
- 7.3.2 Notwithstanding this, all existing trees within the Site provide important foraging and commuting habitat to local bats within what is an otherwise built up highly industrial setting, providing important ecological steppingstones and dark zones through/around the Site. Any tree loss could impact foraging and commuting bats.

7.4 Birds

- 7.4.1 In relation to WCA Sch.1 listed species such as barn owl the industrial buildings on Site are unlikely to be used for breeding or roosting based on the regular disturbance levels including during nocturnal hours; additionally, the grasslands that form the semi-natural habitats on Site are mown regularly / cropped short to a flat consistent sward, unlikely to offer any hunting value or hide small mammal prey. The high light levels and general busyness of the local road networks pose a collision risk to raptors and are hostile to raptors.
- 7.4.2 In relation to s.41 priority species and more common breeding birds, species such as herring gull, lapwing and song thrush may use the grasslands for foraging and rest but no ground-nesting species are likely to use the grasslands for breeding given the disturbance factors. The scattered trees and cultivated flower beds could be used by common species for nesting.
- 7.4.3 It is considered unlikely that any species associated with the Special Protection Area designation affiliated with the Mersey Estuary SSSI, SPA, Ramsar site would use the application site for any purpose.

7.5 Other terrestrial mammals

- 7.5.1 No field signs were located to suggest the presence of badgers including any setts, latrines, pathways, hairs, footprints or feeding signs such as snuffle holes and scratched trees/logs. The works are close to a local wildlife site with suitable badger habitat (deciduous woodland), however are unlikely to impact upon badgers based on development type and local distribution knowledge.
- 7.5.2 No field signs or sightings of hedgehog were encountered though this species is nocturnal and hides by day and may be present in the locale based on the habitat types and connectivity to wider more valuable habitat. No field signs or sightings of brown hare were encountered and the grasslands on Site are of negligible value, though the surrounding arable and grazing pasture to the 500m range is favourable for this species.

7.6 Herpetofauna

- 7.6.1 No ponds exist on Site that might provide breeding habitat to protected amphibians such as great crested newt. The grassland habitats on Site do not provide suitable terrestrial habitat types and are otherwise surrounded by busy roads; the proposals are unlikely to present any significant impacts upon the local great crested newt population by virtue of low impact development type and spatial separation from great crested newt habitat populations to the extended north, and isolation from suitable aquatic and breeding habitat.
- 7.6.2 The rare occurrence of more common herpetofauna such as common toad and common frog cannot be discounted despite the absence of any ponds given their more widespread, generalist distribution and there are localised areas of the grasslands on Site where such species could find low value foraging opportunities.

- 7.6.3 All semi-natural habitats on Site are generally flat and mown to a short sward, lacking the necessary topographical mosaics, variety and ecotones favoured by UK reptiles for basking, hunting, shelter and breeding. Reptiles are highly unlikely to be present or impacted upon.

8.0 Conclusions & Recommendations

Designated sites

- 8.1 A review of MAGIC maps identified that the Site is located within the SSSI Impact Risk Zone (IRZ) of the Mersey Estuary SSSI, SPA and Ramsar site. The IRZ system sets the criteria for development whereby a Local Authority (Knowsley Council) would be required to consult with Natural England regarding potential risks to protected sites posed by the proposed developments on Site.
- 8.2 It is considered that the proposed development meets one of the criteria (Solar schemes with footprint > 0.5ha) whereby the Local Authority would be required to consult with Natural England regarding potential risks to the Mersey Estuary posed by the proposed development on Site. To this end the competent authority, in this case Knowsley council, are likely to be legally required to carry out a Habitat Regulations Assessment (HRA) stage 1 screening assessment, which may advance to stage 2 appropriate assessment, where impact pathways warrant mitigation.

Habitats & Vegetation

- 8.3 There are no priority habitats on Site to warrant any specific protection measures, though all grasslands are ecologically desirable and grassland loss should be avoided where possible or mitigated for accordingly where impacts cannot be avoided.
- 8.4 Construction of a solar farm generally requires very low levels of direct and permanent land take (typically less than 5% footprint on the ground). BRE (2014) guidance states that “as panels are raised above the ground on posts, over 95% of a site used for solar farm development is still accessible for plant growth and complementary activities such as conservation grazing”. Direct grassland habitat loss may occur in the south of the Site in species rich areas; this could be mitigated if the solar scheme in the east of the Site is accompanied by a Biodiversity Management Plan (BMP) to improve the grasslands habitat type to species rich grassland in favourable condition in accordance with the ‘*Biodiversity Net Gain: Good practice principles for development*’ (CIEEM et. al., 2019). A Biodiversity Management Plan (BMP) can be secured and delivered by planning condition.
- 8.5 It is unclear if any tree loss will take place at this time; in the first instance it is recommended that any tree loss is minimised and that suitable re-planting of native fruit or seed-bearing species occurs in ecological desirable areas during landscaping, using species suitable for the area and local habitat types, where tree loss will occur. All retained tree root protection zones should be protected using fencing during the construction phase and enhanced through favourable maintenance during the operational phase.
- 8.6 Adjacent habitats including woodland to the east and south-east should be protected by perimeter security fencing erected around construction zones(s) prior to the commencement of works and should prevent the encroachment of construction related works beyond the Site boundary. Any long-term perimeter fencing should include mammal gates or short sections where the base of the fence is raised to maintain connectivity in the landscape for small mammals and other species, allowing them to benefit from the continued opportunities provided by access to Site.
- 8.7 In addition, standard environmental protection and pollution prevention measures should be adopted throughout the construction phase.
- 8.8 Loss of grassland in the south of the Site to accommodate new hardstanding has the potential to result in loss of orchids of locally rare significance and impact localised diverse areas of

flora. To mitigate the loss of orchids / small areas of species rich grassland, it is recommended all orchids that could be lost to the proposals are translocated from the southern grassland to the eastern grassland, which, as proposed in section 8.4, then be subject to a future ongoing Biodiversity Management Plan (BMP) to improve the grasslands habitat type and condition in accordance with the '*Biodiversity Net Gain: Good practice principles for development*' (CIEEM et. al., 2019). To translocate orchids usually large turfs are lifted using a digger, taking up the orchids and a large amount of the surrounding soil and vegetation from a donor area, and then moved immediately to a different location on the same site, termed a receptor area. The specifics should be outlined in a Method Statement, which could be subject to planning condition.

- 8.9 No invasive non-native species listed under Schedule 9 (Part II) of the Wildlife & Countryside Act (1981) were identified upon assessment of the Site to warrant any further measures.
- 8.10 Any landscaping should aim to use native woody species suitable for the area and local soil types as opposed to non-native exotic species of minimal biodiversity value.

Bats

- 8.11 Based upon the findings of the survey no trees offer bat roost suitability and no further surveys are recommended for bats, however it is recommended that trees are retained where feasible to maintain existing foraging and commuting habitat on Site.
- 8.12 The Site is currently subject to very low levels of illumination by night. Installation of harsh artificial lighting as part of any development that exceeds current levels could have a negative impact upon foraging/commuting bats in the landscape, particularly if increased light spillage occurs in areas of that are currently free from illumination. A bat-sensitive lighting plan is recommended as part of the scheme in order to avoid potential impacts to bats that may use the Site. Options to consider have been listed below, though the reader is referred to the Bat Conservation Lighting Guidelines for further information.

Appropriate luminaire specifications: Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires.

All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used. LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability. Lighting should be directed to where it is needed, and light spillage avoided. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Planting can also be used as a barrier or manmade features that are required within the build can be positioned so as to form a barrier.

Predicting where the light cone and light spill will occur: There are lighting design computer programs that are widely in use which produce an image of the site in question, showing how the area will be affected by light spill when all the factors of the lighting components listed above are taken into consideration. This should be a useful tool to inform the mitigation process.

Light levels: The light should be as low as guidelines permit. If lighting is not needed in any particular area, do not light. Numerous software programmes are currently available which can be used inform lighting plans, demonstrating how lighting decisions will illuminate a site.

Please refer to the 'Landscape and urban design for bats and biodiversity' (*Gunnell et. al.*, 2012, Bat Conservation Trust) Guidance Note 8 'Bats and Artificial Lighting' 2018, Bat Conservation Trust for further information.

- 8.13 The inclusion of various bat boxes would enhance opportunities for a variety of roosting bats – see **Appendix III**.

Birds

- 8.14 No impacts are likely to occur to any WCA Schedule 1 listed species and no further surveys or mitigation is recommended at this time in considering protected bird species.
- 8.15 In relation to more common birds, all trees and woody / shrub vegetation and garden infrastructure provides viable nesting opportunities for smaller birds; as breeding birds are protected when breeding / when at the nest, timings implications are applicable to avoid disturbing or harming breeding birds and breaching legislation.
- 8.16 It is recommended that no removal of, or works to any building, trees, mature shrubs, garden infrastructure, that may be used by breeding birds, shall take place during the main bird breeding season (1st March to 31st August inclusive), unless a competent Ecologist has undertaken a careful, detailed check for active birds' nests immediately before any works and provided confirmation that no birds will be harmed and/or that there are appropriate measures in place to protect nesting bird interest on site. Appropriate measures - where/if active nests are located by the Ecologist then any works which may affect them would have to be delayed until the young have fledged and the nest has been abandoned naturally, this can be aided, for example, via implementation of appropriate buffer zone(s) around the nest site (typically 5-10 metres) in which no disturbance is permitted until the nest is no longer in use. This would have to be coordinated through the expert judgement of the professional ecologist and is typically species dependant.

Point 3.24 of the British Standards Publication 42020:2013 defines a professional ecologist as: *"a person who has, through relevant education, training or experience, gained recognised qualifications and expertise in the field of ecology and environmental management."*

NB: *All wild birds (with only minor exceptions) and their nests whilst being built or containing eggs or dependant young are protected from destruction, damage and disturbance under the Wildlife & Countryside Act 1981 (as amended). It is a punishable offence to interfere in any way with an active nest.*

- 8.17 The RSPB briefing note on Solar Energy (2017) states "While solar energy technologies can impact upon birds and other wildlife, the RSPB considers that if deployed in suitable locations and appropriate mitigation measures are taken, solar energy technologies can be deployed in harmony with nature. In many cases, there may in fact be opportunities to enhance biodiversity on solar array sites". Whilst habitat loss and habitat manipulation will occur to grasslands at Ford Halewood, overall impacts are considered negligible and with suitable management and monitoring the proposals could benefit birds.
- 8.18 During operation, breeding bird disturbance will be minimal and limited to small-scale intermittent maintenance activities likely far less intrusive to that of the current regime on Site; net change of disturbance is considered neutral-positive.
- 8.19 The inclusion of various bird nest boxes would enhance opportunities for a variety of breeding birds – see **Appendix III**.

Other terrestrial mammals

- 8.20 The proposals pose negligible risks to Badgers and no specific further measures are recommended at this time outside of including mammal gates in security fencing or short sections where the base of the fence is raised to maintain connectivity in the landscape for small mammals and other species. Additionally, no impacts are anticipated or mitigation necessary in considering brown hares.
- 8.21 Whilst no records were supplied Hedgehog may use the site for shelter, foraging and commuting. As a construction scheme the proposals pose a risk of injury and death. A precautionary approach is recommended considering hedgehogs; if in the event any hedgehogs are encountered during the proposed works they should be left in situ unless they're at an immediate risk of harm – in which case, they should be moved to an area of like-for-like habitat off site away from harm. This could include gloved handling if necessary.
- 8.22 If and when future development transpires then, as a minimum, reasonable precautionary measures should be undertaken, particularly where excavations / trenches will be made:

Reasonable avoidance measures for the protection of hedgehogs:

- limit working hours to the daylight,
- carry out morning checks for the presence of hedgehogs and other small animals,
- provision of low angle sloping boards of approximately 300 mm wide within any excavations at the end of each working day, to facilitate a means of escape,
- excavations should be backfilled at the end of the working day, where possible,
- do not leave any bulky equipment / general construction aggregates around the development area, instead leave them on bare ground away from semi-natural habitats.

Herpetofauna

- 8.23 In respect of amphibians, the combined desktop and field-based results suggest there is a negligible scale of risk associated with the proposals concerning great crested newts.
- 8.24 No further surveys for great crested newts are recommended as part of this appraisal, however it is considered that Reasonable Avoidance Measures (RAM's) be implemented by planning condition to act as a sufficient safeguard for amphibians and other wildlife that may be present locally. It is highly recommended therefore that a detailed and bespoke working Method Statement should be formulated and conditioned outlining key measures and working protocols to be in effect during the proposed work schedule / future management once plans have been confirmed.
- 8.25 Any RAM's should be drafted by a suitably qualified Ecologist/Ecological clerk of works (ECoW) with strong experience of formulating such technical documents tailored to the Site and its surroundings. Upon gaining understanding of the details contained within the RAM's, the applicant and associated contractor team would be expected to comply with the measures recommended within it. Any RAM's would be subject to the approval of the local planning authority - following approval, adherence to the terms of the RAM's would be a requirement of the named authority and the applicant would be the liable party for any non-compliance, with the Ecologist/ECoW acting for and on behalf of the applicant. The applicant and all contractors would be aware that if at any stage great crested newts, or any other protected species are encountered during works, or at any other stage of the project, works would be required to immediately cease and the Ecologist/ECoW would be made aware as to provide further guidance, if an Ecologist is not already present.

- 8.26 If it is discovered great crested newts would be impacted by the proposals, a development licence (options include District level licence, traditional development mitigation licence, low impact class licence or other) informed by survey data and a suitable mitigation strategy may be required to legally proceed with the works. In some cases, a licence may not be necessary where risks can be avoided, minimised or mitigated for through reasonable avoidance measures (RAM's), if the consultant Ecologist, on the basis of survey information and specialist knowledge of the species concerned, considers that on balance the proposed activity is reasonably unlikely to result in an offence being committed.
- 8.27 In respect of reptiles the Site itself is unlikely to support reptiles, however in the interests of best practice, as a reasonable precaution concerning this group, any bespoke working Method Statement outlining reasonable avoidance measures (RAM's) and working protocols as an informant and safety measure for protected species should also consider the welfare of reptiles and include suitable reasonable avoidance measures.

Enhancement

- 8.28 Enhancement ideas that consider the specific scale and nature of the proposals in accordance with the principles of '*Biodiversity Net Gain: Good practice principles for development*' (CIEEM *et. al.*, 2019), are presented in **Appendix III**.

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Appendix I: Site Photographs



Plate 1 – Other neutral grassland (species rich locally) in the south of the Site



Plate 2 – Bee orchids in the neutral grassland south of the Site



Plate 3 – Memorial garden in centre of the Site south



Plate 4 – Modified grassland in the Site south



Plate 5 – Modified grassland in the Site south



Plate 6 – Modified grassland in the Site east



Plate 7 – Modified grassland in the Site east

Appendix II: Botanical Species List

Species nomenclature follows Stace, C (2019).

Any invasive non-native species are denoted by the acronym (INNS).

Scientific	Common
<i>Achillea millefolium</i>	Yarrow
<i>Aesculus hippocastanum</i>	Horse-chestnut
<i>Alnus sp.</i>	Alder
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass
<i>Bellis perennis</i>	Daisy
<i>Betula sp.</i>	Birch
<i>Calliergonella cuspidata</i>	Pointed Spear-moss
<i>Capsella bursa-pastoris</i>	Shepherd's-purse
<i>Cardamine flexuosa</i>	Wavy Bitter-cress
<i>Carex pendula</i>	Pendulous Sedge
<i>Centaurea nigra</i>	Common Knapweed
<i>Cerastium fontanum</i>	Common Mouse-ear
<i>Cerastium glomeratum</i>	Sticky Mouse-ear
<i>Cirsium vulgare</i>	Spear Thistle
<i>Epilobium sp.</i>	Willowherb
<i>Festuca rubra agg.</i>	Red Fescue
<i>Geranium molle</i>	Dove's-foot Crane's-bill
<i>Geranium versicolor</i>	Pencilled Cranes-bill
<i>Holcus lanatus</i>	Yorkshire-fog
<i>Hypochaeris radicata</i>	Cat's-ear
<i>Jacobaea vulgaris</i>	Common Ragwort
<i>Juncus inflexus</i>	Hard-rush
<i>Lamium album</i>	White Dead-nettle
<i>Leontodon saxatilis</i>	Lesser Hawkbit
<i>Leucanthemum vulgare</i>	Oxeye Daisy
<i>Leucobryum glaucum</i>	Pin cushion moss
<i>Lolium perenne</i>	Perennial Rye-grass
<i>Lotus corniculatus</i>	Birds-foot Trefoil
<i>Odontites verna</i>	Red Bartsia
<i>Ophrys apifera</i>	Bee Orchid
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Plantago major</i>	Greater Plantain
<i>Poa annua</i>	Annual Meadow-grass
<i>Poa pratensis</i>	Smooth Meadow-grass
<i>Poterium sanguisorba ssp. sanguisorba</i>	Salad Burnet
<i>Quercus sp.</i>	Oak
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Rhytidiadelphus squarrosus</i>	Springy Turf-moss
<i>Rumex acetosa</i>	Common Sorrel
<i>Rumex crispus</i>	Curled Dock
<i>Rumex obtusifolius</i>	Broad-leaved Dock
<i>Senecio vulgaris</i>	Groundsel
<i>Sherardia arvensis</i>	Field Madder
<i>Taraxacum officinale agg.</i>	Dandelion

Ford Halewood, Speke Boulevard, Speke, Liverpool, L24 9LE
Preliminary Ecological Appraisal

<i>Trifolium repens</i>	White Clover
<i>Veronica hederifolia</i>	Ivy-leaved Speedwell
<i>Veronica persica</i>	Common Field-speedwell

Appendix III: Biodiversity Enhancement: General Recommendations

Native Planting and/or Landscaping - recommended species

The below species have been assessed against the local soil and habitat types and are deemed suitable for the site. All plant material should comply with the minimum requirements in BS 3936-1: 1992 Specification for trees and shrubs and BS 3936-4: 2007 Specification for forest trees and BS 8545: 2014 Trees from Nursery to Independence in the Landscape. Any plant material, which in the opinion of the appointed Landscape Architect, does not meet the requirements of the Specification, or is unsuitable, or defective in any other way, will be rejected. The minimum specified sizes in the plant schedule will be strictly enforced. The contractor should replace all plants rejected at own cost.

	Common Name	Scientific Name	Planting Preference
Ferns	Male Fern	<i>Dryopteris filix-mas</i>	Semi-shade or shaded
	Soft Shield-fern	<i>Polystichum setiferum</i>	Semi-shade or shaded
	Maidenhair Fern	<i>Adiantum capillus-veneris</i>	Suitable for rockeries / walled gardens
	Royal Fern	<i>Osmunda regalis</i>	Full sun in moist-damp areas
Herbaceous plants	Bloody Crane's-bill	<i>Geranium sanguineum</i>	Dry soils - suitable for rockeries
	Columbine	<i>Aquilegia vulgaris</i>	Semi-shade or open areas
	English Bluebell	<i>Hyacinthoides non-scripta</i>	Moist soils in semi-shade or open areas
	Giant Bellflower	<i>Campanula latifolia</i>	Semi-shade or open areas
	Greater Knapweed	<i>Centaurea scabiosa</i>	Dry-moist soils. Suitable for borders
	Greater Woodrush	<i>Luzula sylvatica</i>	Moist soils in semi-shade or open areas
	Meadow Crane's-bill	<i>Geranium pratense</i>	Humid-moist soils. Suitable for borders
	Musk Mallow	<i>Malva moschata</i>	Dry-moist soils. Suitable for borders and rockeries
	Sea Campion	<i>Silene uniflora</i>	Dry soils - suitable for rockeries
	Stinking Hellebore	<i>Helleborus foetidus</i>	Semi-shade or open areas
Climbers	Honeysuckle	<i>Lonicera periclymenum</i>	Dry-moist soils
	Hops	<i>Humulus lupulus</i>	Dry-moist soils
	Ivy	<i>Hedera helix</i>	Dry-moist soils
	Sweet-briar	<i>Rosa rubiginosa</i>	Dry-moist soils
Woody Shrubs	Blackthorn	<i>Prunus spinosa</i>	-
	Dogwood	<i>Cornus sanguinea</i>	-
	Guelder Rose	<i>Viburnum opulus</i>	-
	Hawthorn	<i>Crataegus monogyna</i>	-
	Hazel	<i>Corylus avellana</i>	-
	Holly	<i>Ilex aquifolium</i>	-
Trees	Alder Buckthorn	<i>Frangula alnus</i>	-
	Osier	<i>Salix viminalis</i>	-
	Pedunculate Oak	<i>Quercus robur</i>	-
	Purple Willow	<i>Salix purpurea</i>	-
	Rowan	<i>Sorbus aucuparia</i>	-
	Silver Birch	<i>Betula pendula</i>	-
	Wild Cherry	<i>Prunus avium</i>	-
Aquatic/marginal plants	Common Water-crowfoot	<i>Ranunculus aquatilis</i>	Ponds
	Marsh Marigold	<i>Caltha palustris</i>	Marginal vegetation
	Ragged Robin	<i>Silene flos-cucculi</i>	Marginal vegetation
	Water Mint	<i>Mentha aquatica</i>	Marginal vegetation
	Water-violet	<i>Hottonia palustris</i>	Ponds
	White Water-lily	<i>Nymphaea alba</i>	Ponds

Enhancement for Bats



- Beaumaris woodstone bat box

This bat box is made entirely from Woodstone, a robust material comprising concrete and wood fibres. The Beaumaris box has a single narrow cavity which makes it suitable for crevice roosting bats such as the Common Pipistrelle, Soprano Pipistrelle, Nathusius' Pipistrelle, Brandt's bat and Whiskered bat. The interior of the box has a rough surface for bats to cling to and the front of the box features a subtle but attractive imprint of a bat in flight.

Suitable for attaching to external walls and available in two sizes: the Midi and the Maxi.

For more information see www.nhbs.com/beaumaris-woodstone-bat-box.



- Cardinal bat box

The Cardinal Bat Box incorporates three separate chambers with laddered entrance holes to each direction.

Nesting Birds



-2h Schwegler robin box

This traditional design has proved to be highly effective in attracting Robins as well as other small wood/garden species such as Black Redstart, Spotted Flycatcher and Wren. It is designed to be installed on the walls of houses, barns, garden sheds or other buildings and should be hung so that the entrance is to one side (at an angle of 90° to the wall). The front panel can be easily removed for cleaning.

This type of box should not be made conspicuous on a tree or bush because small predators can enter through the unprotected opening. By hanging on a wall, predators won't be able to reach the box. Alternatively hide the box in Ivy, honeysuckle or other climbing plants.

For more information - www.nhbs.com/2h-schwegler-robin-box

Enhancement for Invertebrates

- Custom Invertebrate hotels



e.g.

E.g. - www.amazon.co.uk/Large-Wooden-Insect-Hotel-House/

Alternatively, bug hotels can be created easily using raw materials on site.



Custom insect hotel using existing materials on site

- National Trust Bee Log

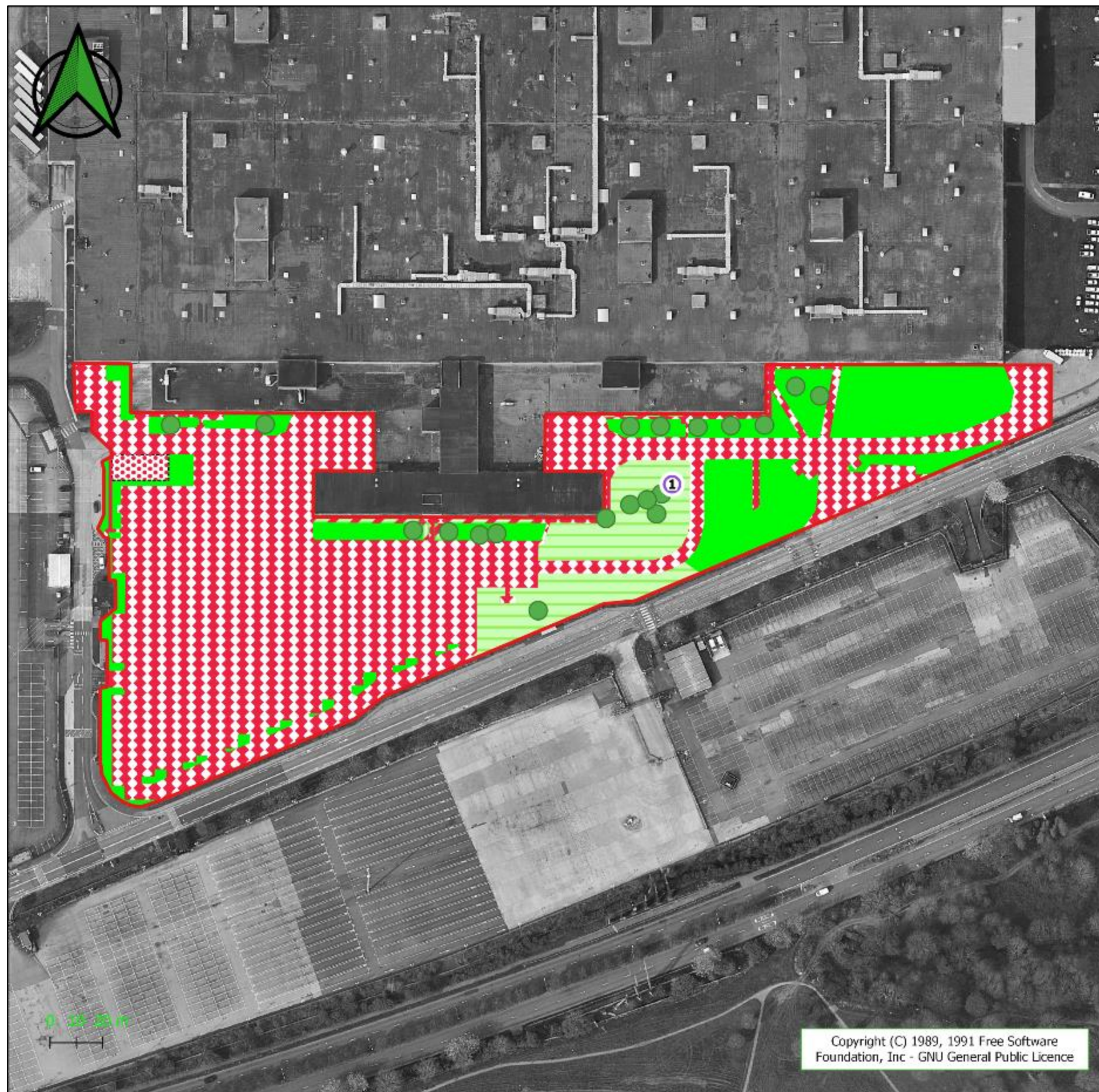
<https://shop.nationaltrust.org.uk/national-trust-bee-log-wicken-fen-collection>



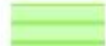
- Bee Bricks

Each Bee Brick contains cavities in which solitary bees can lay their eggs before sealing the entrance with mud and chewed-up vegetation. The offspring will emerge the following spring and the cycle will begin again. Each cavity goes part way into the brick, which is solid at the back. Bee Bricks should be placed in a warm sunny spot on a south-facing wall at a minimum height of 1m, with no vegetation obstructing the holes. It is highly recommended that bee-friendly plants should be located nearby so that the bees using the bricks have food, otherwise it is unlikely that the brick will be used. Available in a choice of four colours: white grey, dark grey, yellow and red.





UK Habitats Key

-  Site Boundary
-  Target Note
-  Trees
-  g3c - other neutral grassland
-  g4 - modified grassland
-  u1b5 - buildings
-  u1b6 - other developed land
-  u1 230 - garden

Ford Halewood - South

Survey Date: 21/02/2023
 Drawn: MJP
 Date Drawn: 13/03/2023
 Size: A3
 Scale: 1:1400:00

Tyrer Ecological Consultants Ltd
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 Email: enquiries@tyrer-ecologicalconsultants.co.uk
www.tyrer-ecologicalconsultants.co.uk



UK Habitats Key

- Site Boundary
- Trees
- g4 - modified grassland
- u1b - developed land. sealed surface
- u1b6 - other developed land

Ford Halewood - East

Survey Date: 21/02/2023
Drawn: MJP
Date Drawn: 13/03/2023
Size: A3
Scale: 1:1250:00

Tyrer Ecological Consultants Ltd
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