



Preliminary Ecological Assessment

Land at Wick's Farm East,

Ford Lane, Arundel, West Sussex.

The Ecology Partnership, Thorncroft Manor, Thorncroft Drive, Leatherhead, Surrey KT22 8JB

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LIABILITIES:

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living animals and plants are capable of migration/establishing and whilst such species may not have been located during the survey duration, their presence may be found on a site at a later date.

This report provides a snap shot of the species that were present at the time of the survey only and does not consider seasonal variation. Furthermore, where access is limited or the site supports habitats which are densely vegetated only dominant species may be recorded.

The recommendations contained within this document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to or during works.

1.0 Introduction

Background

- 1.1 The Ecology Partnership was commissioned by John Hall Consulting to undertake a preliminary ecological assessment (PEA) of land at Wicks Farm East, Ford, Arundel, West Sussex.
- 1.2 The key objectives of a PEA (CIEEM, 2017) are to:
- Identify the likely ecological constraints associated with a project;
 - Identify any mitigation measures likely to be required, following the 'Mitigation Hierarchy' (CIEEM, 2016; BSI 2013, Clause 5.2);
 - Identify any additional surveys that may be required to inform an Ecological Impact Assessment (EcIA); and
 - Identify the opportunities offered by a project to deliver ecological enhancement.
- 1.3 This report comprises the:
- Legislative and planning context (Section 1);
 - Assessment methodologies (Section 2);
 - Results (Section 3);
 - Implications for development (Section 4);
 - An impact assessment (Section 5);
 - Conclusions (Section 6).

Site Context and Status

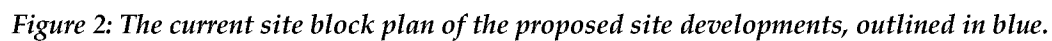
- 1.4 The site is north-west of Ford and is situated between Ford Lane to the south, and the railway line to the north (SU 99301 04223). The surrounding local area predominantly consists of agricultural and commercial buildings, as well as agricultural fields, pasture fields and small blocks of plantation woodland with connective treelines and hedgerows.
- 1.5 The site, its immediate surroundings and approximate red line boundary are shown in the Figure 1 below.



Figure 1: Approximate red line boundary of the site and immediate surroundings. Taken from Google Earth Pro, January 2021

Description of the Proposed Development

- 1.6 Current plans for the proposed site consist of the construction of a 12500m² glasshouse with a lagoon located to the north and an area of hard standing to the south. The arable field on which construction will take place will have an access path/road built to connect to the glasshouse development to the west, which is currently under construction. Figure 2 overleaf is a map of the current site plans.



1.7 The proposals were assessed against policy guidance provided by the National Planning Policy Framework (NPPF, 2019) as well as relevant planning policies from the Arun District Council. The 2011-2031 Local Plan was adopted in July 2018 the following policies have been identified as being relevant to development of the site and conservation of protected species:

- *Policy GI SP1: Green Infrastructure and development*
- *Policy ENV SP1: Natural Environment*
- *Policy ENV DM1: Designated Sites of biodiversity or geological importance*
- *Policy ENV DM3: Biodiversity Opportunity Areas*
- *Policy ENV DM4: Protection of trees*
- *Policy ENV DM5: Development and biodiversity*

1.8 This report addresses the site in relation to nature conservation and wildlife and indeed to the local planning requirements as well as national planning and nature conservation legislation.

1.9 The site was surveyed to assess its ecological value and to ensure compliance with national and local plan policies. The report has been produced with reference to current guidelines for preliminary ecological appraisal (CIEEM, 2017) and in accordance with BS 42020:2013 Biodiversity – Code of Practise for Planning and Development.

2.0 Methodology

Desktop Study

2.1 A desktop study search was completed using an internet-based mapping service (www.magic.gov.uk) for statutory designated sites and an internet-based aerial mapping service (www.maps.google.co.uk) was used to understand the habitats present in and around the survey area and habitat linkages and features (such as ponds, woodlands etc.) within the wider landscape. Biological records (up to 2km) were acquired from Sussex Biodiversity Record Centre (SxBRC).

Preliminary Ecological Appraisal

2.2 An extended preliminary ecological appraisal was undertaken on the 8th January 2021 by Chris Jennings BSc (Hons) MSc MCIEEM. The surveyor identified the habitats present, following the standard ‘Phase 1 habitat survey’ auditing method developed by the Joint Nature Conservancy Council (JNCC). The site was surveyed on foot and the existing habitats and land uses were recorded on an appropriately scaled map (JNCC 2010). In addition, the dominant plant species in each habitat were recorded. The potential for the site to support protected species was also assessed.

2.3 Plant species abundance was recorded using the DAFOR scale. Species abundance was assigned to one of the following categories; Dominant, Abundant, Frequent, Occasional or Rare.

Protected Species Assessments

- 2.4 Any evidence of protected species was recorded. Standard methods of search and measures of presence, or likely presence based on habitat suitability were used for bats in trees and buildings (Collins 2016), breeding birds¹, dormouse (Bright *et al.* 2006), great crested newt (ARG 2010), reptiles (Froglife 2015), badgers (Creswell *et al.* 1990) and water vole (Strachan *et al.* 2011).

Limitations

- 2.5 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no single investigation could ensure the complete characterisation and prediction of the natural environment. The site was visited over the period of one site visit, as such seasonal variations cannot be observed and potentially only a selection of all species that potentially occur within the site have been recorded. Therefore, the survey provides a general assessment of potential nature conservation value of the site and does not include a definitive plant species list.
- 2.6 The protected species assessment provides a preliminary view of the likelihood of protected species occurring on site, based on the suitability of the habitat and any direct evidence on site. It should not be taken as providing a full and definitive survey of any protected species group. The assessment is only valid for the time when the survey was carried out. Additional surveys may be recommended if, on the basis of this assessment it is considered reasonably likely that protected species may be present.

3.0 Results

Desktop Study

- 3.1 The site itself is not designated for its nature conservation value, however it is within a Site of Special Scientific Interest (SSSI) Impact Risk Zone (Figure 3) of Arundel Park SSSI. Of the listed development descriptions to be considered, it is thought that the proposed

¹<https://www.bio.org/our-science/projects/birdatlas/methods/breeding-evidence>

development would come under 'large non-residential development outside existing settlements/urban areas where footprint exceeds 1ha.'

- 3.2 The site is not situated within 2km of any designated sites although it does fall 1.3km south of South Downs National Park and the non-statutory designated Binstead Wood Complex Local Wildlife Site (LWS). The nearest designated sites are Arundel Park SSSI approximately 3.7km to the north east and Climping Beach SSSI and West Beach LNR located approximately 4.1km to the south east. Further afield Duncton and Bignor Escarpment Special Area of Conservation (SAC) and (SSSI) is located approximately 8.7km to the north-west of the site and Arun Valley Special Protection Area (SPA), SAC, Ramsar and SSSI located approximately 9.4km to the north-east of the site.

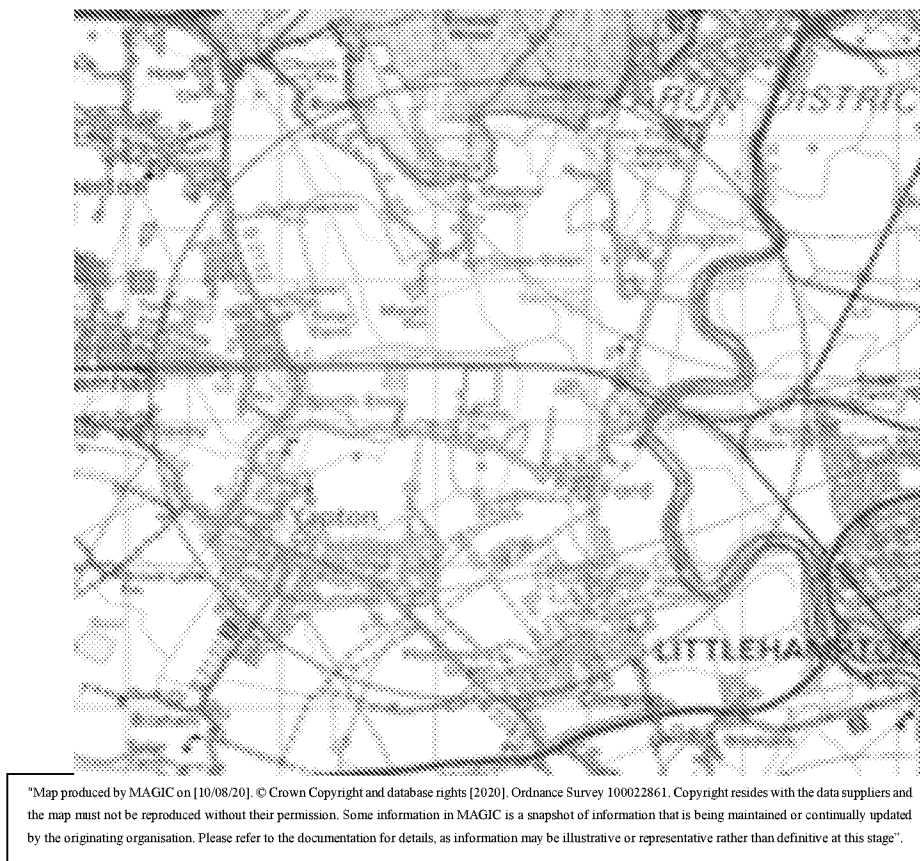


Figure 3: No designated sites within 2km of the red line boundary; Although the site does lie within a SSSI impact zone (light lilac line) and The South Downs National Park lies approximately 1.3km north of site (green line)

3.3 There are a number of Priority Habitats within 2km of the red line boundary, with the majority located to the north of the red line boundary (Figure 3):

- Coastal and floodplain grazing marsh (closest c. 157m east);
- Deciduous woodland (closest c. 544m north-east);
- Wood-pasture and parkland (closest c. 1.33km north);
- Ancient semi-natural woodland (closest c. 545m north-east);
- Ancient, replanted woodland (closest is Tottington Common c. 1.8km north).

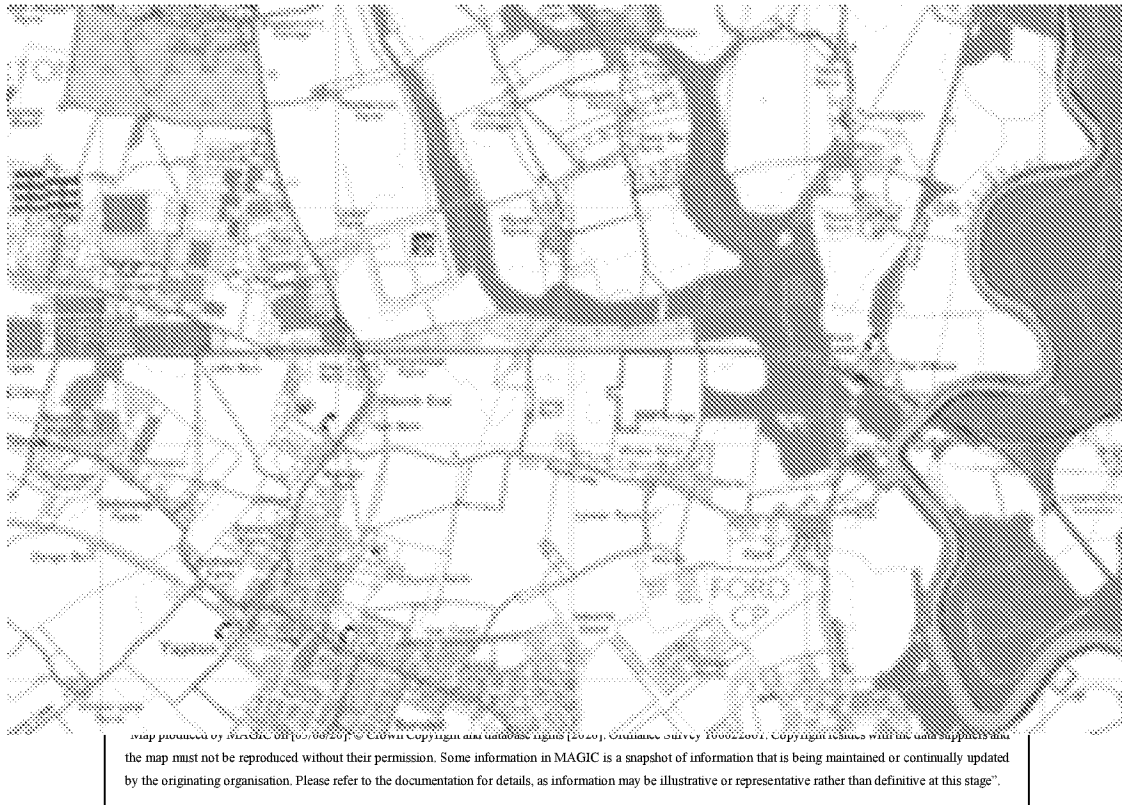


Figure 4: Priority habitats within 2km of the red line boundary; coastal and floodplain grazing marsh (blue), deciduous woodland (dull green), ancient semi-natural woodland (vertical hatchings) and wood-pasture and parkland (pale green with symbols).

3.7 A 2km records search was requested from the Sussex Wildlife Trust. The records closest to site, recorded within the last 10 years, and relevant to the habitats on site, have been included in Table 1 below.

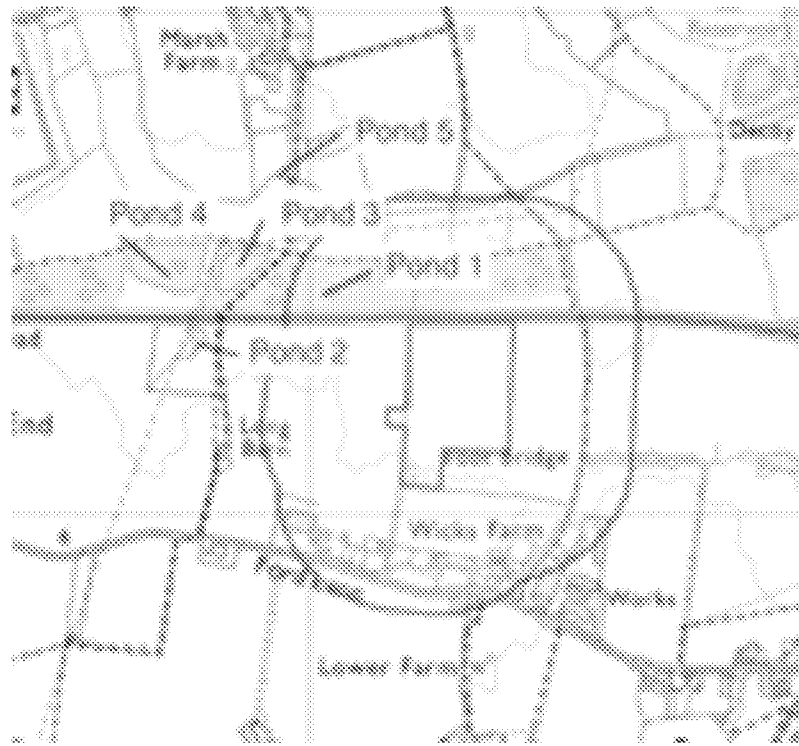
Table 1: Notable species records within 2km of the site in the last 10 years (note: only species which are habitats present on site are included below)

Species	Status	Distance from site	Date of record
Great crested newt <i>Triturus cristatus</i>	Habitats Directive Annex II & IV; Conservation (Natural Habitats, &c.) Regulations 2017 (Sch. 2); W&C Act 1981 (Sch. 5); NERC S41	Within 2km	01/06/2017
Common toad <i>Bufo bufo</i>	W&C Act 1981 (Sch. 5) Sec9.5a; NERC S41	1.3km north	03/09/2018
European water vole <i>Arvicola amphibius</i>	WCA Sch5 s9.4a/s9.4b/s9.4c, NERC S41	971m east	24/05/2016
West European Hedgehog <i>Erinaceus europaeus</i>	W&C Act 1981 (Sch.1), NERC S41	428m south-west	06/09/2018
Hazel dormouse <i>Muscardinus avellanarius</i>	Habitats Directive Annex IV; Conservation (Natural Habitats, &c.) Regulations 2017 (Sch. 2); W&C Act 1981 (Sch. 5); NERC S41	1.4km north	06/10/2019
Slow worm <i>Anguis fragilis</i>	W&C Act 1981 (Sch. 5) Sec9.1 and 9.5a; NERC S41	1.7km north	September 2018
Adder <i>Vipera berus</i>	As above	1.1km north	25/07/2017
Grass snake <i>Natrix natrix</i>	As above	500m east	21/07/2018
Common lizard <i>Zootoca vivipara</i>	As above	1.3km south	August - September 2018
Western Barbastelle <i>Barbastella barbastellus</i>	Habitats Directive Annex II, IV; Habitat Regeulations Sch2, WCA Sch5 s9.4b/s9.4c/s9.5a, NERC S41	900m north	18/08/2018
Serotine <i>Eptesicus serotinus</i>	Habitats Directive Annex IV; Habitat regulations Sch2; W&C Act (Sch.5)	895m south	28/08/2018
Myotis species <i>Myotis</i> sp	Habitats Directive Annex II & IV; Habitat regulations Sch2; W&C Act (Sch.5); NERC S41	918m north	19/08/2018
Alcathoe Bat <i>Myotis alcathoe</i>	Habitat Regeulations Sch2, WCA Sch5 s9.4b/s9.4c/s9.5a	1.7km	31/07/2016
Daubenton's bat <i>Myotis daubentonii</i>	Habitats Directive Annex IV; Habitat regulations Sch2; W&C Act (Sch.5)	905m north	19/08/2018
Whiskered/Brandt's bat	As above	870m north	

<i>Myotis mystacinus/brandtii</i>			19/08/2018
Natterer's bat <i>Myotis nattereri</i>	As above	911m north	19/08/2018
Noctule <i>Nyctalus noctula</i>	Habitats Directive Annex IV; Habitat regulations Sch2; W&C Act (Sch.5); NERC S41	910m north	19/08/2018
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	As above	1km south-east	30/05/2017
Common pipistrelle <i>Pipistrellus pipistrellus</i>	As above	892m north	28/06/2020
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	As above	896m north	28/08/2018
Brown Long-eared <i>Plecotus auritus</i>	As above	911m north	18/08/2018
Red Kite <i>Milvus milvus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; Convention on Migratory Species Appendix 2	907m north	26/07/2019
Marsh Harrier <i>Circus aeruginosus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; Convention on Migratory Species Appendix 2	Within 2km	29/10/2019
Hen Harrier <i>Circus cyaneus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; Convention on Migratory Species Appendix 2; NERC Act (2006) Section 41	Within 2km	29/10/2019
Kestrel <i>Falco tinnunculus</i>	Wildlife and Countryside Act (1981 as amended); Bern Convention Appendix 2; Convention on Migratory Species Appendix 2	Within 2km	26/07/2019
Peregrine <i>Falco peregrinus</i>	Wildlife and Countryside Act (1981 as amended); Birds Directive Annex 1	Within 2km	29/10/2019
Hobby <i>Falco subbuteo</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	17/08/2019
Merlin <i>Falco columbarius</i>	Wildlife and Countryside Act (1981 as amended); Birds Directive Annex 1; Red List BoCC	930m north	25/03/2019
Barn Owl <i>Tyto alba</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	892m north	30/06/2020
Cuckoo <i>Cuculus canorus</i>	NERC Act (2006); BoCC Red List	1.2km north	05/05/2019

Kingfisher <i>Alcedo atthis</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1	1km north-east	28/08/2019
Little Egret <i>Egretta garzetta</i>	Birds Directive Annex 1	Within 2km	01/08/2014
Skylark <i>Alauda arvensis</i>	NERC Act (2006) Section 41; Birds Directive Annex 2.2	Within 2km	28/07/2019
Redwing <i>Turdus iliacus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Birds Directive Annex 2.2; Red List BoCC	Within 2km	29/12/2019
Lapwing <i>Vanellus vanellus</i>	Birds Directive Annex 2.2; Convention on Migratory Species Appendix 2; NERC Act (2006) Section 41	Within 1km	29/06/2019
Snipe <i>Gallinago gallinago</i>	Birds Directive Annex 2.1; Convention on Migratory Species Appendix 2	958m north-west	22/05/2014
Curlew <i>Numenius arquata</i>	Birds Directive Annex 2.2; Convention on Migratory Species Appendix 2; NERC Act (2006) Section 41	Within 2km	19/07/2019
Turtle Dove <i>Streptopelia turtur</i>	Birds Directive Annex 2.2; NERC Act (2006) Section 41	Within 2km	17/06/2016
Cetti's Warbler <i>Cettia cetti</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	19/07/2019
Firecrest <i>Regulus ignicapillus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	21/07/2019
Black Redstart <i>Phoenicurus ochruros</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Red List BoCC	1.5km south-west	13/04/2015
Linnet <i>Linaria cannabina</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km	06/06/2017
Bullfinch <i>Pyrrhula pyrrhula</i>	NERC Act (2006) Section 41; Amber List BoCC	Within 2km	06/06/2017
Yellowhammer <i>Emberiza citronella</i>	NERC Act (2006) Section 41; Red List BoCC	1.3km west	14/05/2018
Reed Bunting <i>Emberiza schoeniclus</i>	Wildlife and Countryside Act (1981 as amended); Amber List BoCC; UK BAP	Within 2km	14/05/2018

3.4 Although no ponds are present within the red-line boundary of the site, online mapping and aerial photographs show one pond (pond 1) within 250m of the site and 4 others (pond 2-5) just beyond the 250m radius (Figure 5). Whilst the majority of ponds around the site are located to the north of the railway line which extends immediately to the north of the site, this railway line is not considered to pose a significant barrier to dispersal of species, as does not possess multiple tracks.



"Map produced by MAGIC on [03/08/20]. © Crown Copyright and database rights [2020]. Ordnance Survey 100022861. Copyright resides with the data suppliers and the map must not be reproduced without their permission. Some information in MAGIC is a snapshot of information that is being maintained or continually updated by the originating organisation. Please refer to the documentation for details, as information may be illustrative or representative rather than definitive at this stage".

Figure 5: Ponds within, and just outside of, a 250m radius (yellow area) of the red line boundary, labelled Pond 1-5 for ease of reference

- 3.5 There were no European Protected Species licences granted, great crested newt licence returns, or eDNA survey records within 2km of the red line boundary, according to MAGIC mapping.

Phase 1 Habitat Survey

- 3.6 The site was predominantly an arable field, with small sections of semi-improved grassland lining the northern, southern and western margins of the field, as seen in Figure 1 above. The western margin also featured a tree line and tall scrub. Immediately outside the southern boundary consisted of a small copse of plantation broadleaved woodland. A detailed Phase 1 Habitat Map is attached in Appendix 1, and a full species list is provided in Appendix 2.

Arable

- 3.7 The site was dominated by arable land with much of the site freshly planted with an emerging crop.

Semi-improved grassland/tall ruderal vegetation

- 3.8 A thin strip of semi-improved grassland ran along the length of the northern, southern and western site margins. The field margins were dominated by false-oat grass but also featured grasses such as tall fescue, perennial rye grass and cock's foot. Herb species found in these grasslands included ground ivy, common nettle, willowherb, cleavers and yarrow.

Dense Scrub

- 3.9 Patches of dense scrub were present along the northern field margin of the site. These patches contained bramble and mature hawthorn.

Hedgerows and Tree lines

- 3.10 A defunct hedgerow with mature trees ran along the western boundary of the site. Mature tree species noted included beech, ash, pine sp., hawthorn, whitebeam and poplar sp.. Other shrub species along this hedgerow included bramble, dogwood, as well as non-native shrubs Wilson's honeysuckle and bamboo.
- 3.11 A hedgerow regulation assessment was undertaken along the western boundary.
- 3.12 The southern boundary contained a small tree line that developed into a small copse of plantation broadleaved woodland containing semi-mature holly, hawthorn, silver birch and ash. Due to the woodland having been planted, the trees were evenly spaced apart and the habitat lacked any significant understory or connectivity throughout the woodland.

Target Notes ²

Target Note 1: Reptile habitat potential

- 3.13 In the south-western corner of the site is a pile of rubble made up of large concrete slabs. This feature may have some suitability to provide refuge for a range of wildlife species.

Hedgerow Assessment

- 3.14 Hedgerow 1 has been assessed against the Hedgerow Regulations (1997) criteria in Table 2 below.

Table 2: Hedgerow Regulations assessment of the qualifying on-site hedgerows

Hedge number	Number of lengths sampled	Mean number of woody species	Adjacent to public right of way	≥ 1 standard tree/50m	Rare trees	Bank	Ditch	≥ 3 woodland field layer species	Gaps <10%	Connectivity score	Parallel hedge	IMPORTANT
1	2	3	x	✓	x	x	x	x	x	0	x	NO

- 3.15 The hedge was not considered to be important under the regulations as it had too high of a percentage of gaps in a 30m length to qualify as such and lacked any connectivity to the local landscape. The hedgerow was considered defunct.

Protected Species

Bats

- 3.16 With no buildings on site gauging potential bat roost potential was restricted to trees. The only trees present on site were restricted to the site boundaries. The majority of trees within the site were considered to have negligible potential to support roosting bats due

² The location of the Target Notes can be seen within the habitat map in Appendix 1.

- to the lack of bat roosting features such as cavities, split limbs or woodpecker holes seen from ground level. Several trees on the western boundary were considered to have low potential for roosting bats due to dense ivy cover.
- 3.17 The managed poor semi-improved grassland and arable land which dominated the site were considered to provide poor opportunities for foraging and commuting bats. Sections of boundary habitat such as hedgerow, tree line and plantation woodland could provide some level of foraging and commuting habitat, although this is fragmented particularly along the northern and western field boundaries. The site overall is deemed to be sub-optimal for foraging and commuting bats.

Badgers

- 3.18 No setts or any other field signs of badgers, such as latrines, mammal trails or snuffle holes were found during the survey.

Reptiles

- 3.19 Potential for common reptile species were present along the site boundaries. The defunct hedgerow, unmanaged field margins, with grassland, tall ruderal vegetation and scrub all provide suitable habitat for common reptile species. The arable land contained sparse vegetation at ground height and did not offer the structure typical of habitat used by reptile species, due to a lack of cover from predators and a lack of basking opportunities due to the long length of the vegetation present. The south-western corner of the site featured a sizeable rubble pile this may provide suitable refuge and some basking opportunities for reptile species.

Hazel Dormice

- 3.20 Hedgerows and defunct tree lines and scrub were located on the edges of the site. It should be noted however that these habitats are fragmented with breaks within these features as well as a lack of suitable habitat linkage to optimum dormouse habitats such as native broadleaved woodlands. These small, fragmented features, were considered to be of negligible value to dormice.

Great Crested Newts (GCN)

- 3.21 Only one pond was present within 250m of the site boundary. It was not possible to access pond 1 (Figure 5) on the day of survey. Therefore, survey effort previously collected by the Ecology Partnership has been considered. Based on evidence from previous reports on Wicks Farm (2018) and a planning application at the nearby Binsted Farm (2020) by the Ecology Partnership, it is assumed pond 1 is non-existent due to previous surveys being unable to locate it within the woodland to the north of the site when accessed. In addition, eDNA samples taken at pond 5 in 2020 by the Ecology Partnership as part of planning application (WA/62/20/PL). The result was negative, along with negative results on two waterbodies located further to the west. Pond 5 lies in close proximity to pond 1, therefore it would be considered that if pond 1 was present and it contained GCN they would also be likely to be using pond 5 in addition. The negative eDNA results indicate likely absence of the species within the local area.
- 3.22 The habitats on site were considered to be sub-optimal for GCN. The highly managed nature of the site as an arable field made much of the site sub-optimal for great crested newts, with any suitable habitat limited to the site boundaries within the hedgerow, rubble pile, scrub and strips of unmanaged grassland.

Other Species

- 3.23 Birds are likely to use the tree line and defunct hedgerow for foraging and breeding. Ground nesting birds may also use the arable field for nesting, refuge and foraging.
- 3.24 A ditch network was present approximately 200m to the east of the application site. It is considered that this habitat may contain suitable habitat for protected species such as water vole or European eel, although it is not considered that development site contains suitable habitat for these species.

4.0 Discussion

- 4.1 The following paragraphs consider the effects of the development on designated sites, priority habitats and protected and priority species. Where the desk study and Phase 1 survey provide sufficient evidence for an assessment of effects on any of these groups

to be taken through planning, these are detailed below, the need for additional surveys and when and how these should be completed are summarised, if required.

Effects on designated sites and priority habitats

- 4.2 The site does not fall within 2km of any statutory designated sites, so development is not considered to be constrained by any such sites. Although there are no direct or indirect impacts on designated sites predicted as part of the development as the site has been highlighted as being within a SSSI impact zone Natural England should be consulted to establish whether the final proposals are predicted to impact on designated sites within the local area and establish whether any required mitigation can be resolved.
- 4.3 At this stage it is not considered that there would be any adverse impacts on designated sites within the local area. This would meet the requirements of *Policy ENV DM1: Designated Site of biodiversity or geological importance*.
- 4.4 There are parcels of Priority Habitat within 2km of the red line boundary: Deciduous Woodland Priority Habitat and Coastal and Floodplain Grazing Marsh Priority Habitat. It is not predicted that there will be any negative direct or indirect impacts on these habitats as well as ancient woodland due to the distance of these habitats from the red line boundary. Boundary treelines and hedgerows with added enhancements to retain and improve existing green links with the wider landscape should be designed into the scheme to ensure that connectivity remains across the local landscape. This would also satisfy *Policy ENV DM4: Protection of trees* laid out in the Arun District Council 2011-2031 Local Plan.
- 4.5 It is recommended that if any abstraction limits are agreed with the Environment Agency with regards to use of water from local waterbodies such as the ditch present 200m to the east of site, they are set so that water is left flowing within target waterbodies therefore protecting freshwater habitats and associated wildlife within the local area.

Effect on on-site habitats

- 4.6 The habitats present on site are largely common and widespread throughout the local area and the UK and are considered to be of site value only. The dominant habitat on site was recorded as arable land and as such had limited scope for wildlife species due to its heavily managed nature.
- 4.7 The habitats on the site boundaries including defunct hedgerow, woodland edges, scrub, tall ruderal and grassland habitats, are of greatest interest and are of local value. Although limited in extent, they are considered to have ecological potential for several protected species, namely bats, reptiles and nesting birds.
- 4.8 The proposed plan to create access between the proposed glasshouse and the adjacent glasshouse site which is currently under construction to the west of the site would involve clearing a section of the defunct hedgerow along the western margin of the site. This clearing should be carried out in accordance with the following protected species procedures outlined in paragraphs 4.21 and 4.33. It is not considered that the loss of a section of this hedgerow would be significant as the habitat is considered to be of value at site level only.
- 4.9 As part of *Policy G1 SP1, Green Infrastructure* should be considered at an early stage of design. Figure 6 is taken from the *Green Infrastructure Network Map* for the area of Ford. Currently, the proposals show a large portion of the eastern side of the arable field is available post development for ecological enhancement. The area to the east of the greenhouse and lagoon should be enhanced through planting of wildflower and grassland mixes. This will ensure that the requirements of *Policy G1 SP1 Green Infrastructure and Development* and *Policy ENV DM3: Biodiversity Opportunity Areas* are met.

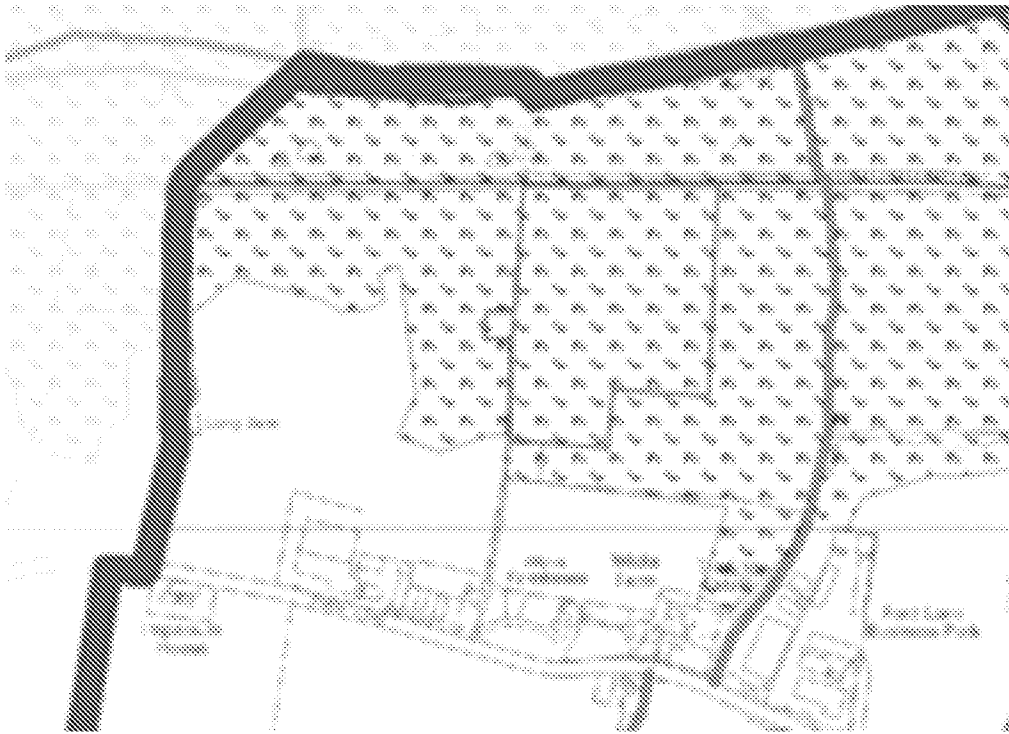


Figure 6 Extract from Ford Green Infrastructure Network Map – Area in green symbols is highlighted as areas that are suitable for ecological enhancement.

- 4.10 The development should aim to achieve an overall biodiversity gain and enhancement recommendations are laid out in section 4. The site was assessed for its potential to support a range of protected species and these are discussed individually below. Recommendations for further survey work, mitigation and suitable ecological enhancements are in line with the points laid out in Policy ENV DM5: Development and biodiversity.

Protected Species

Badgers

- 4.10 No evidence of use of the site by badgers were recorded on site such as setts, latrines or potential snuffle holes and signs of foraging. For this reason, the site is not considered to be constrained by badgers. The local landscape provides good opportunities for commuting and foraging badgers.

- 4.11 It is recommended that any excavations and trenches associated with construction are either covered at night or supplemented with a means of escape for any badgers that may fall into the excavation whilst foraging. Any open pipes or conduits laid should be blocked off each night to prevent badgers from entering them. If possible, construction work should only take place between dawn and dusk with no late evening work to reduce possible disturbance.
- 4.12 It is always recommended that badger update surveys are undertaken across the site prior to any development works or if there is a lapse in time between the survey and development as badgers may move onto the site in the intervening period.

Bats

Tree Survey

- 4.13 The low potential trees, with ivy covered stems on the western boundary do not need further activity survey work (Table 3), however they should be felled sensitively using soft felling techniques if removed. If a bat roost feature or a confirmed bat roost is discovered during works, works should stop immediately and a suitably qualified ecologist contacted to advise on how to proceed.

Table 3: BCT guidelines, demonstrating the number and type of surveys required depending on the classification of the tree for bat roost potential

Bat Roost Potential	Recommended surveys
Low	No further surveys required
Moderate	Two separate survey visits.
High	Three separate survey visits.

Foraging and Commuting Bats

- 4.14 Using The Bat Conservation Trusts document *Bat Surveys Good Practice Guidelines 3rd Edition*, 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' and Table 8.3 'Guidelines on the number of bat activity surveys recommended to achieve a reasonable survey effort in relation to habitat suitability' the

recommended survey effort is as follows. As stated within section 8.2.7 of the latest survey guidelines (2016), the following points need to be taken into account with regard to planning activity surveys:

- Likelihood of bats being present;
- Likely species concerned;
- Numbers of individuals;
- Type of habitat affected;
- Predicted impacts of the proposed development on bats;
- Type and scale of proposed development.

4.15 With regards to the impact on foraging and commuting bats, the construction of a green house and associated reservoir are considered likely to have minimal impact on foraging and commuting bats as the vast majority of suitable habitat is to be retained allowing connectivity for bats across the landscape. Additional planting as part of the application could improve connectivity for bats across the local landscape. It is however considered that if artificial light is to be used to grow plants during the night resulting in significant light spill onto adjacent habitats in use by bats such as hedgerows and woodland blocks then further activity survey and additional mitigation through planting and or shielding light spill maybe required. Planting tree lined edges around the glasshouses, would provide net gain, but also reduce light spill from such developments.

4.16 Any proposed lighting scheme as part of the development will have to consider bats in the surrounding area as well as site. All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Many species of bats are known to sample the light levels before emerging from their roost; only emerging for their night's hunting when the light intensity outside reaches a critical level after sunset. Artificial lighting can restrict and alter this natural behaviour, and if a roost site is illuminated it can restrict and shorten the time bats spend foraging at night or completely discourage bats from using an area at all. This needs to be considered, with a sympathetic lighting scheme for the development. Recommendations include:

- No potential bat roost should be illuminated by artificial lighting, lighting should be positioned to point away from any roosting site, leaving the entrance and exit points in darkness, this should consider the bat potential trees identified;
 - Lighting should only be installed if there is a significant need;
 - Light levels should be kept low where possible;
 - Lighting should be avoided near treelines or hedgerows, with light angled away from these areas, bats use linear features such as treelines to commute across the landscape to forage; and
 - Lights should have focussed luminance on their target area, preventing light spill and pollution into other areas of the site and local area.
 - Additional shielding such as use of blinds should be used to restrict light spill from any artificial night-time light used within the greenhouse.
- 4.17 The tree lines, hedgerows and areas of scrub, which have been identified surrounding the fields on-site, and fields within the adjacent land should be retained and enhanced to maintain linkages between the two sites for foraging and commuting bats.
- 4.18 To enhance the local bat population and provide roosting opportunities, it is recommended that boxes should be hung on mature trees or buildings around the site. Recommended boxes should be constructed of woodcrete or a similar material to ensure the long life of bat boxes installed onsite.
- 4.19 Further enhancements for bats in the local area can be achieved through the use of native tree and shrub planting and landscaping within the development (see general enhancements below).

Reptiles

- 4.20 Suitable habitat within the redline boundary is very limited in extent and is restricted to the existing field margins. The majority of suitable habitat for reptiles is to be retained as part of proposals. It is noted that a section of the defunct hedgerow and associated grassland will be lost along the western margin of the site for access to the neighbouring glasshouse development. The majority of this habitat will be retained; however, it is

recommended that this habitat is removed in a sensitive manner under ecological watching brief.

4.21 It is recommended that habitat manipulation techniques are used to encourage reptiles away from the new access route. This will be achieved by use of a two phased cut. Prior to development the footprint of development and any additional works areas will need to be cut in a sensitive manner using a two-phase cut undertaken under ecological watching brief. Vegetation removal works will follow the following specification:

- Vegetation removal works are to be carried out using hand tools only or a raised fixed flail on the rear of a non-tracked vehicle;
- Works will proceed in a linear progression, beginning in the north of the site and working towards the south east, to encourage reptiles to disperse into retained habitat
- Any trees and shrubs are to be checked thoroughly for the presence of birds' nests, observing the tree from within the canopy where possible.
- Vegetation will be strimmed down using the following method in suitable weather conditions (avoiding rain/wet conditions) under ecological supervision:

- 1 Day 1: Strim to 200mm
- 2 Day 2: No works to vegetation to allow any reptiles present to vacate the site
- 3 Day 3: Strim to ground level
- 4 Day 4: No works to vegetation to allow any remaining reptiles present to vacate the site
- 5 Day 5: End of sensitive clearance process

4.22 Once cut it is recommended that habitat is maintained at a short sward.

4.23 It is assumed the pile of concrete rubble is to be removed as part of the hard standing construction. If this is the case, then it should be done under ecological watching brief outside of reptile hibernation season of March – October as reptiles are legally protected under the Wildlife and Countryside Act (1981). Where removal cannot be conducted by hand it is advised that an excavator with tooth bucket should be used to move large

- sections of concrete in a slow and sensitive manner. This process cannot be done by hand.
- 4.24 There will be no additional negative impact during operational phase on reptile species, often associated with a residential development. As such a further survey is not required.
- 4.25 It is considered that if this process is undertaken then reptile species will not be harmed as part of works and any population present on site will persist post development. The scheme has scope to increase the habitat available for reptiles including the creation of banks around the reservoir and green house access road. Banked habitat are used by reptiles for maximising basking, especially if south facing.

Hazel Dormice

- 4.26 It is considered possible that hazel dormice are present within the local area, although the potential for the habitat present on site to support dormice is considered negligible.
- 4.27 Access will be built to the approved glasshouse scheme to the west of the site. The removal of this small section of defunct hedgerow is not considered significant with regards to dormice. The hedgerow has poor connectivity and has significant gaps along its length. As such it is not considered suitable habitat for the species and no further recommendations are made.
- 4.28 With scope for additional planting to enhance the site for wildlife it is recommended that additional connectivity around the site is improved as part of enhancements for this site. This will benefit a wide range of wildlife including dormice if present within the local landscape.
- 4.29 It is recommended that the following species are planted to establish new hedgerow and scrub habitats on site:
- Hazel
 - Honeysuckle
 - Rowan
 - Spindle

- Ash
- Hawthorn
- Oak
- Wayfaring Tree; and
- Sycamore

Water Vole

- 4.30 With the presence of water voles in the local area as recorded in the data search, the area of suitable habitat of standing water in the south-east of the field should not be affected by any drainage or abstraction plans for the lagoon. If further works affecting this body of water are to be carried out, they should be carried out under an ecological watching brief.
- 4.31 Although no suitable habitat for water vole is present on site, a ditch is present to the west of site. If this waterbody is used for a drainage or abstraction scheme, it is recommended that a water vole survey is undertaken to establish whether the species are present and to inform any specific mitigation. If water abstraction is to be undertaken to stock the new reservoir, the amount of water taken should be limited to ensure that water levels within the stream and ditch network are sufficient to support water voles and other wildlife species.

Great Crested Newt (GCN)

- 4.32 Pond 1 is assumed to be non-existent due to previous surveys being unable to locate it. In addition, eDNA taken from nearby pond 5 gave a negative result for presence of GCNs. Therefore, it is not considered that this species are present within the immediate surrounds of the site. Furthermore, there are no records of GCN licences within 2km on magic maps and biological records do not indicate their presence within the immediate area. The only suitable habitat for GCNs on site is limited to field margins, and as such it is considered unlikely that the site is in active use by the species. No further survey work is recommended, however if a great crested newt is recorded during works, works must stop and a suitably qualified ecologist consulted on how to proceed.

Other Species

- 4.33 Breeding birds are likely to use the hedgerow, scrub and mature trees on site as nesting habitat. The arable field may provide suitable conditions for ground nesting birds, if vegetation provides suitable cover during the nesting season. The UK breeding season for most bird species takes place between March and September. Any removal of nesting bird habitat should be completed outside of this period or immediately after a nesting bird check by a suitably qualified ecologist. If an active nest is identified, works in the vicinity of the nest must cease until the birds have fledged the nest.
- 4.34 In addition, the presence of ground nesting birds that could be present nesting on the arable field means it would be advisable to carry out works outside of the bird breeding season of March-September.
- 4.35 With much of the nesting bird habitat on site to be retained and the opportunity to enhance retained areas of greenspace to provide better quality habitat for ground nesting birds, the requirement of a breeding bird survey is not considered necessary.

General Ecological Enhancements

- 4.36 A number of enhancements can be made to the final development to help reduce potential ecological impacts. It is important to utilise native species of local provenance in landscaping schemes to enhance the ecological value of a development. These enhancements will also help the development to fall in line with *Policy ENV DM5: Development and biodiversity* in the Arun District Council local plan.
- 4.37 The mature trees should be maintained and incorporated into the design of the potential development as these provide valuable habitat for species such as birds, invertebrates and some mammals including bats.
- 4.38 It is recommended that additional native species are planted within new hedgerow, in particular in any sparse areas and gaps as is present on the western and northern boundaries. Species of benefit to the site would be hazel, beech, sweet chestnut, wild cherry, field rose, hornbeam, field maple and dogwood. These native species will enhance the existing hedgerows and add food sources at various times of year for local

- wildlife. New hedgerow planting will increase connectivity across the landscape and should be planted so that existing areas of hedgerow woodland and scrub. In order to boost berry crops within existing hedgerows and ensure thick nesting cover is available, it is recommended that where permissions allow, hedgerows be trimmed on a two- or three-year rotation, rather than annually. Flailing of hedgerows should be avoided, as this practice can damage woody material. For heavy hedges, a circular saw is preferable.
- 4.39 Bamboo and Wilson's honeysuckle found within the hedgerow are non-native shrubs and should therefore be removed to reduce competition on the native species and improve the species composition of the hedgerow.
- 4.40 Bird boxes may be hung on retained mature trees to increase the number of breeding opportunities throughout the site. This should be made of woodcrete or similar to ensure they are long lasting, and a variety of boxes should be used to attract a varied bird assemblage.
- 4.41 Creation of swales and/or SUDs as part of the development can further enhance the site and ensure the development falls in line with the local plan *Policy W DM3: Sustainable Urban Drainage Systems*. These waterbodies should be linked to the wider landscape through the protection and enhancement of tree lines and associated grassland strips. Wetlands and ponds, swales or ditches can be planted to enhance invertebrate species on the site and provide breeding opportunities for amphibian and reptile species. These should be planted with species of ecological value:
- Water mint – (*Mentha aquatica*);
 - Common reed – (*Phragmites australis*);
 - Soft rush – (*Juncus effuses*);
 - Water plantain - (*Alisma plantago-aquatica*);
 - Meadowsweet – (*Filipendula ulmaria*);
 - Yellow flag iris - (*Iris pseudacorus*).
- 4.42 The above can also be considered if possible, with regards to the new lagoon. If the lagoon does not require a liner it can be enhanced for wildlife. If the lagoon does need a liner to hold water, then the water features should be fenced off to prevent wildlife

from becoming trapped within the waterbody and a means of escape for wildlife such as textured walkway must be installed.

4.43 The incorporation of the recommended enhancements to the design of the site will greatly enhance the site for local wildlife. Log piles can be incorporated into the design to encourage invertebrates, as well as hedgehogs and amphibian and reptile species.

4.44 It is considered that the use of wildflower edges, the creation and enhancement of hedgerows, the use of wildlife friendly planting within SUDs schemes (ponds and swales) and the creation of an additional wildlife habitat, that the biodiversity value of the site will be enhanced post development. Currently a large proportion of the site is of limited ecological value due its arable status, which is considered to be a monoculture of limited ecological interest.

5.0 Impact assessment

5.1 This section of the report forms an EcIA (Ecological Impact Assessment) and is designed to quantify and evaluate the potential impacts of the development on habitats and species present on site, or within the local area.

Methodology

5.2 The approach to this assessment accords with guidance presented within the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM 2018).

5.3 The zone of influence of the development is defined as:

- The project red line, for effects on habitats and species;
- Adjacent habitat, considered by species, for mobile species with territories or foraging ranges that may overlap the site.

5.4 The types of features considered in the assessment of effects, to meet legislative and policy requirements, are:

- Designated sites (European, national and local);
- Protected species;
- Habitats and species of principal importance (Section 41 list);
- Hedgerows, where not of principal importance; and

- Habitats, where not of principal importance, that may function as wildlife corridors or stepping stones.

5.5 Impact assessment is required for each feature determined as important and not for other features. CIEEM (2018) advises that each impact assessment should consider if possible the different stages of a development (construction, operation and decommissioning) and that it should be characterised by the following:

- Positive or negative – whether the impact leads to an adverse, beneficial or neutral effect;
- Extent – the spatial area over which the impact occurs;
- Magnitude – change in for example the amount of habitat or the size of population;
- Duration – both in relation to the life cycle of the ecological feature and of the life of the project;
- Frequency and timing – for example the number of disturbance incidents to birds and their timing in relation to the breeding cycle; and
- Reversibility – if and at what timescale recovery is possible.

5.6 In essence, an EcIA assesses the activities associated with a proposed scheme that are likely to generate changes, within identified zone of influences, on identified ecological features and receptors. The proposals are subsequently reviewed, and iteration undertaken to include enhancements and mitigation to reduce negative impacts.

Assessment

Baseline Ecological Conditions

5.7 The site does not lie within 2km of any statutory or non-statutory designated sites of national, European or local importance. No perceived negative impacts on designated sites have been predicted although the site does fall within a SSSI impact zone. As such Natural England should be consulted with regards to the development. None of the priority habitats present locally are found within the site boundary.

5.8 The hedgerow, tree line, woodland edge habitat and marginal vegetation on site could act as wildlife corridors, to varying extent. The remaining habitats on-site comprised a

mosaic of arable land, poor semi-improved grassland and tall ruderal habitats, scrubland bare earth, which are common and widespread and of no interest above site level.

5.9 In terms of protected species, the site was considered to have **potential** to support the following:

- Roosting bats – within trees;
- Foraging and commuting bats – hedgerows;
- Nesting birds – arable land and hedgerows;
- Dormice;
- Reptile species;
- Commuting and foraging badgers;
- Water voles.

Impact Assessment and Mitigation

Table 4: Assessment of effects from the proposal after mitigation and compensation

Feature	Scale of Importance	Mitigation/Compensation Required	Residual Effect
Hedgerow (Not species rich)	Local	Retention and buffering of hedgerow on site, with existing hedgerows enhanced, only a very small loss of existing habitat. Planting of new hedgerow	Not significant
Dormice	Local	There is negligible potential for dormice to be present within the defunct hedgerow on site. If a dormouse or an active nest is discovered during works, then works must cease and Natural England contacted on how to proceed. Enhancement planting would enhance the site for dormice.	Not significant
Roosting bats	Local	Low potential tree if to be removed should be done so using soft felling techniques Trees within the boundaries of the site should be protected from artificial light from the development	Not currently known. Not significant if trees for removal do

			not contain bat roosting features.
Commuting and foraging bats	Local	Sensitive lighting scheme and the retention of the trees and hedgerows on site that may act as potential foraging and commuting routes. If significant impact from nighttime light is predicted additional survey work and mitigation maybe required. Enhancement of hedgerows and site boundaries. This will improve the functionality of the existing hedge as a wildlife corridor for a multitude of species including bats.	Unknown / Not Significant
Reptiles	Local	Habitat manipulation and sensitive clearance techniques to any reptiles encourage reptiles present to retained habitat under ecological watching brief. Very small-scale clearance of suitable habitat to be undertaken Enhancement of retained ground to provide increased reptile habitat on site post development. New grassland areas to provide additional habitat	Not significant
Nesting Birds	Local	Mitigating direct harm to nests by removal of any hedgerow, trees or arable habitat outside of nesting bird season or after a check by a suitably qualified ecologist. Compensation in the form of the installation of bird boxes.	Not Significant
Commuting and foraging badgers	Local	Safety measures enforced on site during works to mitigate any possibility of accidental harm to badgers through interaction with open excavations and underground services.	Not Significant
Water voles	Off site / local	Ditch off site should be protected from works and buffered. Water abstraction should consider off site ditch habitats	Not Significant

Cumulative impacts

- 5.10 It is considered that any planning application within the local area should have ecological mitigation and enhancement designed into the scheme to satisfy planning policy. Abstraction limits to any other similar planning applications should be agreed under licence with the Environment Agency to ensure that water is flowing through natural water sources within the local area and do not have a cumulative negative impact on water resources and subsequently on protected habitats and wildlife species. With the proposed development containing scope to ecologically enhance the site post development, it is considered that the site will not have negative cumulative impacts with other sites.

6.0 Conclusions

- 6.1 The site was dominated by arable land with semi-improved grassland field margins. These habitats were considered to offer very limited ecological value as they are heavily managed. Overall the habitats are of limited interest, with the boundary and buffer habitats of greatest interest for biodiversity on site and in the local area.
- 6.2 The surrounding tree line, scrub, woodland edges and associated marginal vegetation are considered to be of site level interest. As such, it has been recommended to maintain and enhance these features as part of any development scheme. The grassy buffer around much of the arable land provides some value at site level to local wildlife, with particular emphasis on the reptile populations.
- 6.3 The hedgerow, mature trees and scrub habitats are considered to provide suitable habitat for breeding birds. These habitats also provide landscape some level of connectivity, which would allow bats, birds, amphibians, reptiles and mammals to move across the landscape and provide good opportunities for foraging. Any works on these habitats should be carried out as advised above. With advice sought ahead of clearance from an ecologist with regards to breeding birds. The clearance of the small section of tree line to the west to allow a new access into site should be done under ecological watching brief. There is negligible potential for dormice to be present within the hedgerow. Despite this, the clearance should be done so in a sensitive manner with

- hand tools to ensure the preservation of the favourable conservation status of the species in the local area if they are present. If a dormouse or dormouse nest is discovered during work, then works should stop and Natural England consulted on how best to proceed. Operationally no negative impacts on dormice are perceived.
- 6.4 Some low potential bat roost trees were identified. It is considered that these trees will be retained as part of proposals however, if they are to be removed then recommendations for soft felling should be undertaken prior to removal. A sensitive lighting scheme must be designed for the site to limit the impacts of artificial light. If artificial lighting within the greenhouse are to be significant further mitigation and or survey maybe required.
- 6.5 A sensitive clearance and habitat manipulation approach has been recommended within this report with regards to reptiles. This should be undertaken when reptile species are active and must tie in with any mitigation for nesting birds.
- 6.6 Water voles are not believed to be present at this site due to the absence of any suitable habitat within the site boundary, although maybe present within the ditch networks within the local area.
- 6.7 No field signs of badgers currently using the site or badger setts were found. The site is not considered to be constrained by badgers.
- 6.8 It is considered unlikely that great crested newts are present within the local area and no further recommendations are made.
- 6.9 The site has potential for ground nesting bird habitat. The recommendations on how to protect active nests, if they are found, must be adhered to.
- 6.10 Potential ecological enhancements that can be implemented into development plans have been recommended within the report. Recommendations include use of native species within hedgerows and the installation of bat and bird boxes on site. These enhancements would provide an increase in biodiversity interest to the site post development, and allow the site to conform to the relevant local planning policies described.

7.0 References

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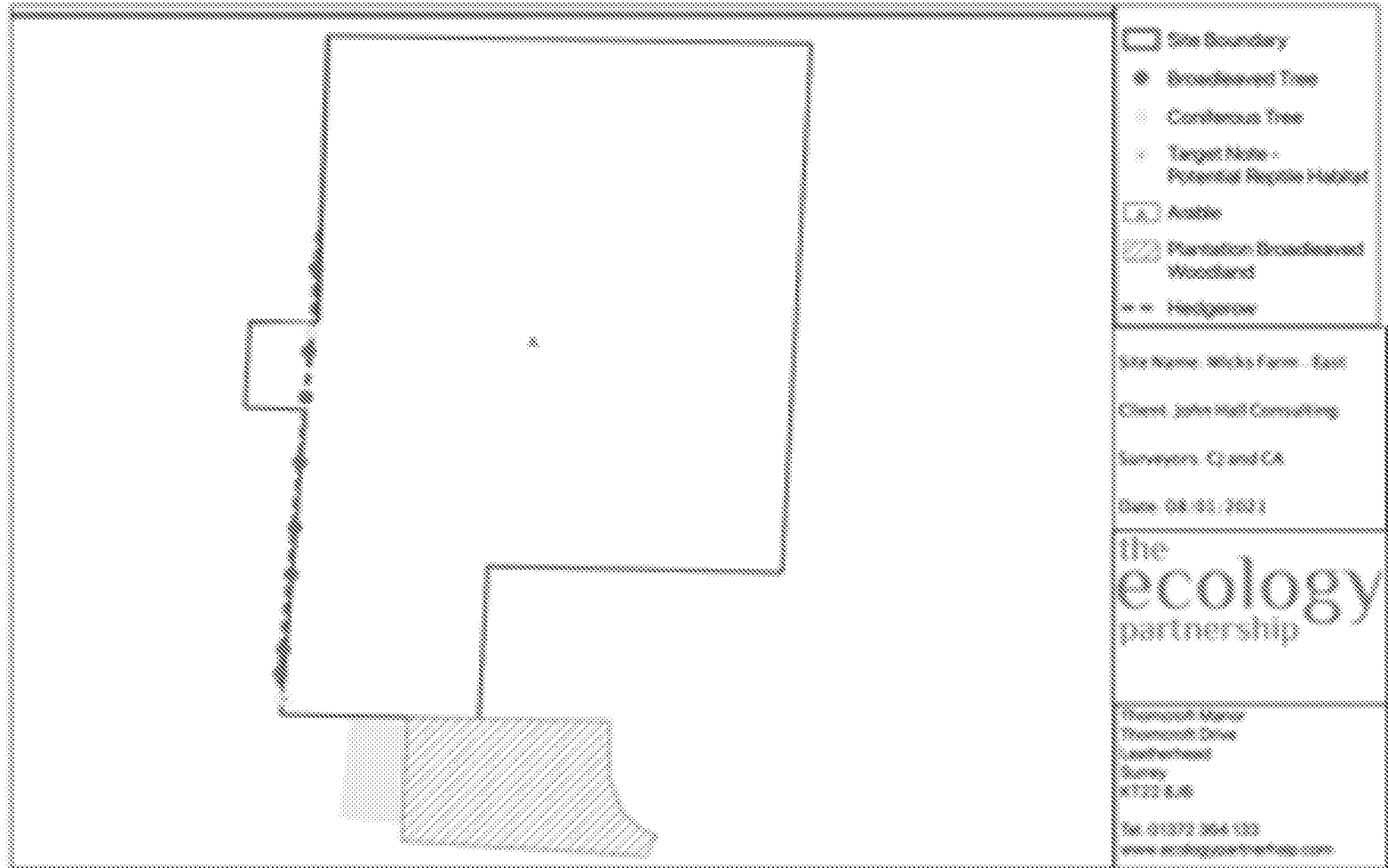
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Internet resources:



Arun District Council: www.arun.gov.uk

Appendix 1: Habitat Map

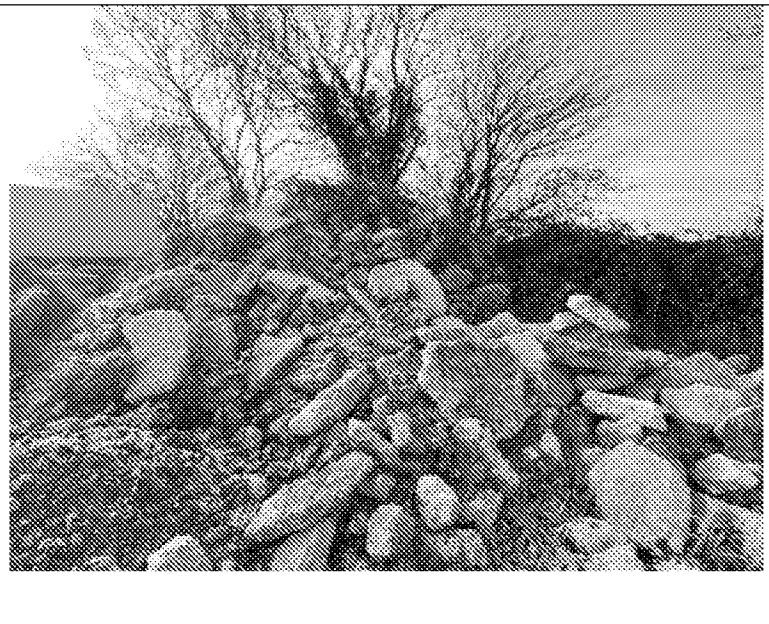


Appendix 2: Species list for the site

Common name	Latin name	DAFOR score
Semi-improved Grassland / Tall ruderal		
False oat grass	<i>Arrhenatherum elatius</i>	D
Common nettle	<i>Urtica dioica</i>	F
Perennial ryegrass	<i>Lolium perenne</i>	F
Ground Ivy	<i>Glechoma hederacea</i>	F
Cleavers	<i>Galium aparine</i>	F
Yarrow	<i>Achillea millefolium</i>	F
Bramble	<i>Rubus fruticosus</i>	F
Tall fescue	<i>Festuca arundinacea</i>	O
Cock's Foot	<i>Dactylus glomerata</i>	R
Dense Scrub		
Bramble	<i>Rubus fruticosus</i>	D
Hawthorn	<i>Crataegus monogyna</i>	F
Ground Ivy	<i>Glechoma hederacea</i>	F
Hedgerow/Tree Line		
Hawthorn	<i>Crataegus monogyna</i>	D
Bramble	<i>Rubus fruticosus</i>	F
Ash	<i>Fraxinus excelsior</i>	O
Bamboo	<i>Bambusoideae Spp.</i>	O
Whitebeam	<i>Sorbus aria</i>	O
Dogwood	<i>Cornus sanguinea</i>	R
Pine	<i>Pinus Spp.</i>	R
Beech	<i>Fagus sylvatica</i>	R
Poplar	<i>Populus Spp.</i>	R
Wilson's honeysuckle	<i>Lonicera nitida</i>	R
Plantation Woodland		
Hawthorn	<i>Crataegus monogyna</i>	D
Silver Birch	<i>Betula pendula</i>	F
Holly	<i>Ilex Spp.</i>	O
Ash	<i>Fraxinus excelsior</i>	O

Appendix 3: Photographs

Photo 1: Northern arable field margin with scrub patches. A railway line separates the margin from the tree line. Photograph taken from the east, looking west.	
Photo 2: Plantation deciduous woodland to the south of the site. Absence of a significant understory.	
Photo 3: Western margin tree line and defunct hedgerow. Photo taken from the south, looking north.	

Photo 4: Approximate location of the access point to neighboring glasshouse. Section of western margin tree line and scrub to be removed.	
Photo 5: One example of bamboo, an invasive species, located along the western tree line.	
Photo 6: Rubble Pile in the south-west corner of the site. Potential reptile habitat.	

Appendix 4: Biological Records

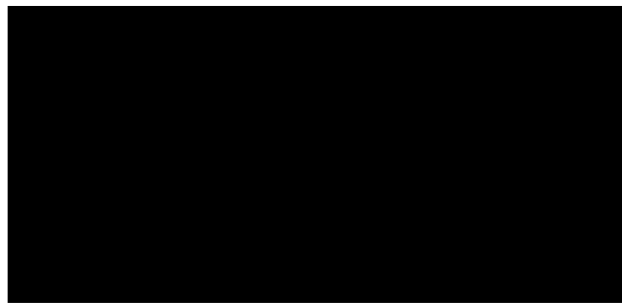
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21/01/2021