



Preliminary Ecological Appraisal

**Land at Worcester Close,
Gravesend,
Kent.**

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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. 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 that 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 Frankhams to undertake a Preliminary Ecological Appraisal (PEA) of Land at Worcester Close, Gravesend, DA13 9LA (Figure 1).
- 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); and
 - Conclusions (Section 6).

Site Context

- 1.4 The site (TQ 63641 70233) is approximately 0.13ha and includes an area of grassland with scattered trees, a hardstanding path and small area of scrub. The site is largely surrounded by areas of residential housing, with a medical practice directly to the north of the site.



*Figure 1: Approximate location of the red-line boundary
Google Earth Satellite (05/09/2022)*

Description of Proposed Development

- 1.5 The proposals on site are for the creation of approximately eight units within the red line boundary, which will involve some tree removal.

Planning Policies

- 1.6 The site was surveyed to assess its ecological value and to ensure the proposals were compliant with relevant planning policy and legislation. Policy guidance is provided by the National Planning Policy Framework (NPPF 2021) as well as policies from Gravesham Borough Council. The Gravesham Local Plan Core Strategy was adopted in September 2014 and contains a policy relating to ecology which is relevant to the site. This is the **CS12: Green Infrastructure**.
- 1.7 The Environment Bill received Royal Assent on 9th November 2021 and is now enacted as the Environment Act 2021. Part 6 (Nature and Biodiversity) and Schedule 14 of the Environment Act 2021 insert a new section 90A and Schedule 7A into the Town and Country Planning Act 1990 (TCPA), which contain the provisions requiring mandatory biodiversity net gain for development granted planning permission pursuant to the TCPA. These provisions are not yet in force, but, once they are brought into effect through implementing legislation, will require developments to provide a

biodiversity value post-development that exceeds the predevelopment biodiversity value of the onsite habitats by at least 10%. These provisions are not expected to come into force until November 2023 for new planning applications.

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 Practice for Planning and Development.

2.0 METHODOLOGY

Desktop Study

2.1 A desktop study was completed using an internet-based mapping service (www.magic.gov.uk) for statutory designated sites and an internet-based aerial mapping service (maps.google.co.uk) was used to understand the habitats present in and around the survey area and habitat linkages and features (ponds, woodlands, etc.) within the wider landscape.

2.2 Records of protected and notable species within 2km of the site were requested from Kent and Medway Biological Records Centre (KMBRC). Information on the presence of non-statutory designated sites was also obtained from KMBRC. Records were screened for relevance and age with only those from the last decade and of species that could occur on site considered further.

Phase 1 Habitat Survey

2.3 A site survey was undertaken on 12th August 2022 by The Ecology Partnership ecologist Kieran McGranaghan BSc (Hons) PGDip QCIEEM. The surveyors 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.

- 2.4 Plant species abundance was recorded using the DAFOR scale and species abundance was assigned to one of the following categories in Table 1.

Table 1: DAFOR Scale Lettering

DAFOR Category	Letter
Dominant	D
Abundant	A
Frequent	F
Occasional	O
Rare	R

Additional Protected Species Assessments

- 2.5 Any evidence of additional 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 (Collins 2016), breeding birds (BTO 2020), hazel dormice (Bright *et al.* 2006), great crested newts (ARG 2010), reptiles (Froglife 2015), badgers (Creswell *et al.* 1990) and water voles (Strachan *et al.* 2011).

Limitations

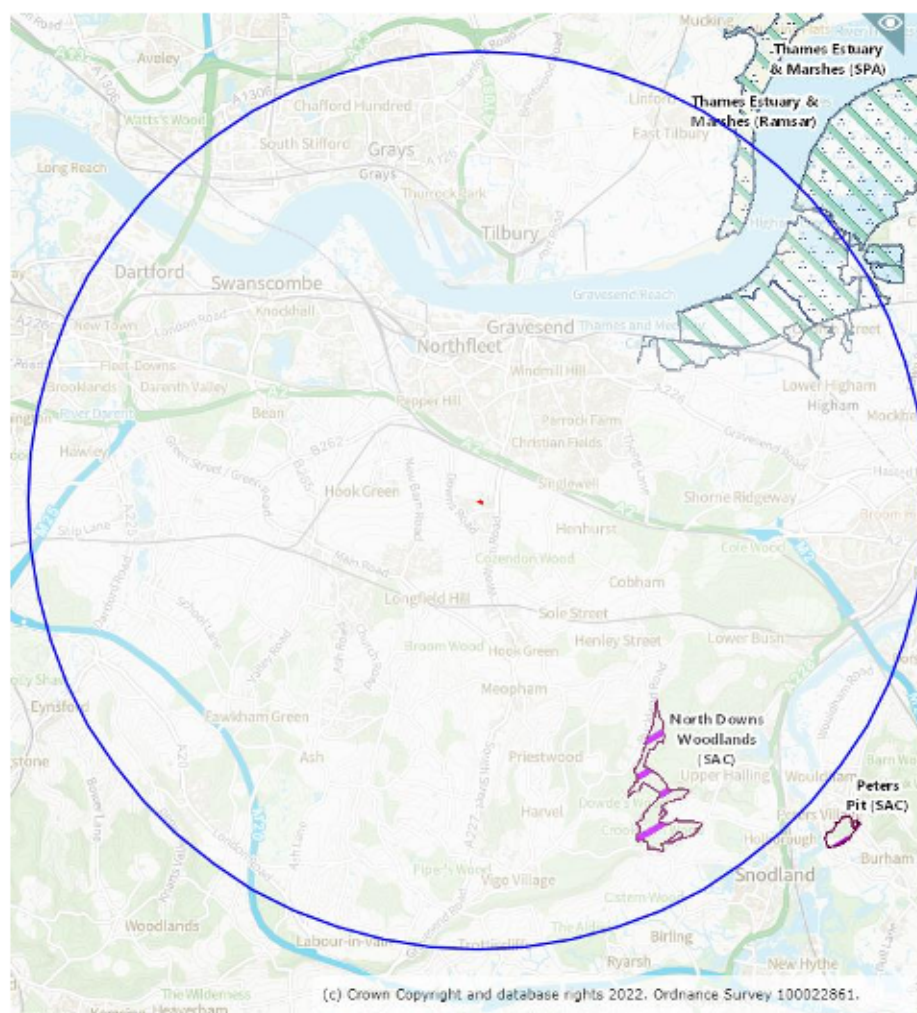
- 2.6 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no single investigation could ensure the complete characterisation and prediction of the natural environment. The site was visited over the period of one site visit, as such seasonal variations 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.
- 2.7 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 There are three internationally designated areas within 10km of the site (Figure 2), these are:

- Thames Estuary & Marshes Ramsar approximately 4.7km northeast; designated as its habitats support internationally important numbers of wintering waterfowl, and the saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates.
- North Downs Woodlands Special Area of Conservation (SAC) approximately 5.9km southeast; designated for its Annex 1 habitats which include 9130 *Asperulo-Fagetum* beech forests and 91J0 *Taxus baccata* woods of the British Isles. The area also supports 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites).
- Thames Estuary & Marshes Special Protection Area (SPA) approximately 6.1km northeast. Designated as its habitats support internationally important numbers of Annex 1 birds including: hen harrier, pied avocet, ringed plover, grey plover, red knot, dunlin, black-tailed godwit and common redshank.



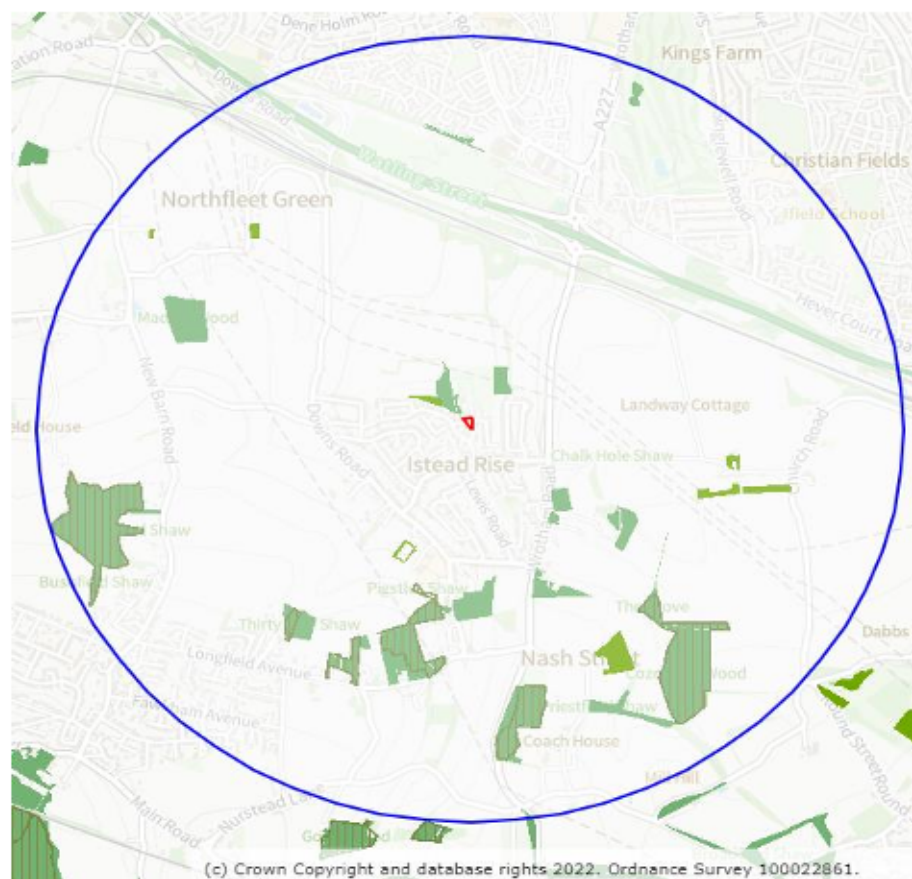
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Figure 2: Internationally designated areas within 10km (blue circle) of the site (red).

3.2 There are no statutory designated areas within 2km of the site. However, the site does fall within the impact risk zones (IRZ) for several Sites of Special Scientific Interest (SSSIs) further afield such as Shorne and Ashenbank Woods SSSI approximately 3.1km east. Listed potential impacts for a development in this location include

- Airports, helipads and other aviation proposals.
- Livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t.
- General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

- Any discharge of water or liquid waste of more than 20m³/day to ground (ie to seep away) or to surface water, such as a beck or stream.
- 3.3 There are two units of the non-statutory designated area, GR15- Grassland and Scrub, Instead Rise Local Wildlife Site (LWS), within a 1km radius of the site, with the closest parcel being approximately 540m southeast of the site.
- 3.4 There are several units of priority habitat within 2km of the site (Figure 3). The closest of each type is listed below:
- Deciduous woodland within the site;
 - Traditional orchards approximately 120m northwest; and
 - Ancient and semi-natural woodland (Walnut Wood) approximately 825m south.



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Figure 3: Priority habitat within 2km of the site. Areas of priority deciduous woodland (dark green), traditional orchard (middle green) and ancient and semi-natural woodland (green hatches) within 2km (blue circle) of the site (red).

- 3.5 No waterbodies were identified within a 500m radius of the site using MagicMaps and Google Satellite Imagery.
- 3.6 There was also one European Protected Species Licence needed within a 2km radius of the site, this was for brown long-eared bats in 2018 approximately 1.6km southwest of the site.
- 3.7 A 2km radius data search was requested from KMBRC. Notable protected species from this search are outlined below (Table 2). Only records from within the last ten years and those closest to site have been included.

Table 2: Biological Records from HERC within 1km of the site from the past 10 years¹

Species	Status	Distance from site	Date of record
Common Lizard <i>Zootoca vivipara</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41	1.3km north	16/06/2018
Eurasian Badger <i>Meles meles</i>	Protection of Badgers Act (1992)	Within 2km	02/08/2016
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	1.49km east	14/10/2014
Brown long-eared bat <i>Plecotus auritus</i>	Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	1.6km west	25/09/2012
Kestrel <i>Falco tinnunculus</i>	Wildlife and Countryside Act (1981 as amended); Bern Convention Appendix 2; Convention on Migratory Species Appendix 2	Within 2km	18/08/2018
Hobby <i>Falco subbuteo</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	20/04/2013
Cuckoo <i>Cuculus canorus</i>	NERC Act (2006); BoCC Red List	Within 2km	30/04/2013
Fieldfare <i>Turdus pilaris</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Birds Directive Annex 2.2; Red List BoCC	1km northeast	02/03/2018

¹ *Additional species are present within the biological records but may be older than 10 years or outside our search radius. Some species have not been included due to the likelihood of presence on site due to habitat types.

Redwing <i>Turdus iliacus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Birds Directive Annex 2.2; Red List BoCC	1km northeast	02/03/2018
Turtle Dove <i>Streptopelia turtur</i>	Birds Directive Annex 2.2; NERC Act (2006) Section 41	Within 2km	25/05/2013
Nightingale <i>Luscinia megarhynchos</i>	Red List BoCC	Within 2km	30/04/2013
Linnet <i>Linaria cannabina</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km	30/04/2013
Yellowhammer <i>Emberiza citrinella</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km	24/07/2016

Phase 1 Habitat Survey

3.8 The site consists of largely an area of amenity grassland, with multiple scattered trees with other habitats identified including a hardstanding pathway and small patch of scattered scrub.

3.9 The habitat map is presented in **Appendix 1**. Only species of note have been listed within this section, the full species list can be found within **Appendix 3**.

Amenity grassland

3.8 A short sward amenity grassland dominated the site. Perennial ryegrass was abundant within this habitat, with cock's-foot and wall barley appearing frequently.

Scattered Scrub

3.10 A small area of scattered scrub was located in the northwest corner of the site. Bramble appeared abundantly within this habitat with common nettle and young ash appearing frequently.

Scattered Trees

3.11 A number of mature trees were scattered throughout the site, with species identified including oak, apple, silver birch, ash, elder, Norway maple and sycamore.

Protected Species

Roosting Bats

3.12 None of the scattered mature trees within the site were considered to support higher than 'negligible' roosting bat potential due to the lack of visible roosting features or due to their limited size and age.

Commuting and Foraging Bats

- 3.13 The amenity grassland and the hardstanding habitats, which dominate the site, were considered to be of limited interest for foraging bats due to the limited structure and species composition within these habitats. The mature scattered trees were considered to offer the majority of the potential for commuting and foraging potential for bats on the site.

Badgers and Small Mammals

- 3.14 No evidence of badger activity such as setts, snuffle holes or latrines were identified within or near to the site, where access was possible. Whilst it was considered highly unlikely that badgers are present on the site, badgers may be using the site for foraging and commuting purposes. Furthermore, other mammals such as foxes are likely to be foraging and commuting over the site.

Great Crested Newts

- 3.15 No ponds were located on or within 500m of the site. The amenity grassland which dominated the site was considered to be suboptimal for the species due to its short sward height which does not offer protection from predation. Overall, it was considered that due to the lack of ponds near the site as well as the highly unsuitable nature of the habitats on site that its highly unlikely that the species are present on or using the site. As such, GCNs are not considered further in this assessment.

Reptiles

- 3.16 The majority of the site was not suitable for reptiles with the grassland subject to regular management and short sward height. This grassland is considered to be sub-optimal for the species due to its short sward height which does not provide protection for the species against predation. Only the small area of scattered scrub in the northeast corner of the site was considered to provide any commuting and foreign potential for the species. Only common lizards have been recorded within a 2km radius of the site, with the closest being approximately 1.3km north of the site.
- 3.17 Overall, it was considered that due to the highly unsuitable nature of the habitats on site and as there are only a minimal number of records of reptiles, which are all also at a considerable distance from the site, that its highly unlikely that the species are present on or using the site. As such, reptiles are not considered further in this assessment.

Nesting Birds

- 3.18 Nesting and foraging birds would likely utilise the mature trees and scattered scrub on site.

Other species

- 3.19 The site is considered suitable for hedgehogs, although no direct evidence was recorded and it is considered that hedgehogs would not be reliant on the habitat within the site, given the surrounding habitat.
- 3.20 Due to a lack of suitable habitat, the site was not considered suitable for other protected species, such as dormice, water voles and otters.

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.
- 4.2 Provisional recommendations are also given for means to achieve net biodiversity gain, following the principle (CIEEM et al. 2016) of following the mitigation hierarchy of; avoidance, minimisation of loss, compensation on site and biodiversity offset.

Effects on designated sites

- 4.3 There are three internationally designated areas within 10km of the site, with the closest being Thames Estuary & Marshes Ramsar approximately 4.7km northeast. Due to the distance from the designated area, and the fact that the site itself does not contain any wetland habitat, the site would not be functionally linked to the Thames Estuary & Marshes Ramsar. With regards to the other two internationally designated areas, due to the distances of these to the red line boundary, the small scale of the site and the habitats present, the site is not functionally linked to the other off site habitats. Overall, it is considered highly unlikely that the proposals would have any major direct impacts on the integrity of any internationally designated areas.

- 4.4 However, as the proposals are resulting in a net increase of approximately eight residential units, a net increase in recreational impact over these areas could occur. It is stated within The Gravesham Local Plan Core Strategy that with regards to the Thames Estuary and Marshes SPA and Ramsar sites that a decline in the internationally important number of birds has occurred, with interim findings currently linking it to an increase in recreational activity which are causing disturbance to the birds.
- 4.5 The Strategic Access Management and Monitoring Strategy (SAMMS) prepared for the North Kent Environmental Planning Group by Footprint Ecology set out a strategy for resolving the additional disturbances to the area's wintering and migrating birds. Bird Wise North Kent implemented further mitigating measures. As the proposals are for a development resulting in a net increase of residential dwellings (in total 8) within 6km of the SPA / Ramsar site, developers are required to contribute per dwelling of £275.88 per dwelling (confirmation of actual amount should be made with the LPA).
- 4.6 It is considered that as impacts resulting from recreational pressure are mitigated through the SAMMS funding, no additional impacts are considered and a project level HRA would not be required.
- 4.7 With regard to North Downs Woodlands SAC and the natural habitats and/or species for which the site has been designated (Qualifying Features), were H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco Brometalia*); Dry grasslands and scrublands on chalk or limestone H9130. *Asperulo-Fagetum* beech forests; Beech forests on neutral to rich soils H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland*.
- 4.8 North Downs Woodlands SAC has a list of conservation objectives set out by Natural England, which are in place to ensure the integrity of the qualifying features are protected. The conservation objectives are listed below.
- 'Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;*
- The extent and distribution of the qualifying natural habitats;
 - The structure and function (including typical species) of the qualifying natural habitats, and

- The supporting processes on which the qualifying natural habitats rely.

4.9 North Downs Woodlands SAC lies approximately 5.9km southeast of the site. At this distance, no major direct impacts are predicted, and it is also considered that no significant indirect impacts, such as an increase in recreational pressure, is likely to occur. This is due to the distance between the site and the conservation area, the ongoing management of the site which already incorporates recreational activity as well as the small increase of only eight units proposed on the site. Overall, no significant impacts are predicted to occur on North Downs Woodlands SAC as a result of the proposals.

4.10 Whilst there are no statutory areas within 2km of the site, the site does fall within the impact risk zones (IRZ) for the surrounding SSSI. Listed potential impacts for a development in this location do not include residential development. As the proposals are for the creation of approximately eight residential units, the proposals do not fall within the listed categories that are likely to cause harm to the surrounding sites. As such, it is considered that no further mitigation is required in regards to the surrounding SSSI designations.

4.11 There are two units of the non-statutory designated area, GR15- Grassland and Scrub, Instead Rise LWS, within a 1km radius of the site, with the closest parcel being approximately 540m southeast of the site. At this distance, no significant direct impacts are predicted to occur on this designated area as a result of the proposals. The LWS is not well connected to the site and is located to the east of the A227. Furthermore, this habitat appears to be on private land, it is considered that the increase of units would not lead to an increase in recreational activity over these designated areas. As such, no significant impacts are predicted on non-statutory sites within the local area as a result of the proposals.

Effects on priority habitats

4.12 There are a number of priority habitats within the wider landscape, which are all habitats of principle importance for the conservation of biodiversity under Section 41 of the NERC Act 2006. The closest is a unit of deciduous woodland within the western boundary of the site. It is however thought that this is a misclassification of the habitats on site with this habitat not existing within the red line boundary. Therefore, as these

habitats are not present on site, nor do they lie adjacent to the redline boundary. As such, no direct impacts or habitat loss or isolation is predicted from the development.

- 4.13 It is considered that the proposals are unlikely to have any significant adverse impacts on priority habitats within the local area, and as such would adhere to local policies.

Effect on on-site habitats

- 4.14 The habitats on site offer limited opportunities for wildlife due to the regular management of the grounds of the site, mainly repetitive mowing to keep the grassland short. The habitats are widespread and common throughout the local area and the UK as a whole.

- 4.8 It is thought that most ecologically important habitats on site are the mature scattered trees which are still only considered to be of site level importance due to their small size and isolation from other habitats. It is therefore considered that their removal would not be of ecological importance and can be easily compensated for with the provisions of tree planting within the development.

- 4.15 It is considered unlikely that the site will achieve biological net gain without significant enhancements or alterations to the proposals. This is primarily due to the large loss of grassland and mature trees, with no considerable replacement habitat proposed.

Effects on Protected Species

Bats

- 4.16 All of the trees on site were considered to support 'negligible' roosting bat potential, and as such can be removed without further consideration for this species.
- 4.17 The Bat Conservation Trust survey guidelines (Collins 2016) states that in 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"*. It is important that proportionality is employed when recommending further survey work for bat species on a proposed development site. As stated within section 8.2.7. of these guidelines (Collins 2016), the following points need to be taken into account with regard to planning activity surveys:

- Likelihood of bats being present;

- Likely species concerned;
 - Number of individuals;
 - Type of habitat affected;
 - Predicted impacts of the proposed development on bats;
 - Type and scale of proposed development.
- 4.9 Considering the above, the low suitability of habitats on site, urban nature of the surrounding area and high level of street lighting around the site, transect surveys are not thought to be required.
- 4.10 A sensitive lighting scheme will be required to protect the foraging and commuting potential of any proposed bat suitable habitat, and enhancements should be made to foraging and commuting bats within the proposals. Enhancements for bats are detailed later in the report.
- 4.18 Any proposed lighting scheme as part of the proposals will have to consider bats in the surrounding area as well as the site. All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Bats are known to be affected by light levels, which can affect both their roosting and foraging behaviour. This needs to be considered with a sympathetic lighting scheme, with special consideration any retained scattered trees. Recommendations include:
- Installing lighting only if there is a significant need;
 - Using LED luminaries due to their lower intensity, sharp cut-off and good colour rendition – any lights with UV elements or metal halide lights should not be used;
 - Lights with peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone 2012);
 - Lights with an upward light ratio of 0% and good optical control;
 - Careful consideration of column height to avoid light spill;
 - Any external security lights should use motion-sensors and short (1-minute) timers.
- 4.19 If these methods are followed, no significant residual impacts are predicted on bats on site or within the local area, and as such would adhere to local policies.

Badgers and small mammals

- 4.20 Best practice guidelines are recommended to be followed, to help ensure no individuals are harmed during the construction phase of the project.
- 4.21 Best practice guidelines 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.
- 4.22 If these methods are followed, no significant residual impacts are predicted on badgers on site or within the local area. These steps will also help ensure no harm comes to other small mammals such as rabbits, especially foxes which are more adapted to urban environment.

Birds

- 4.11 The scattered scrub and scattered trees have the potential to support nesting birds. All birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 (as amended). If any of these features are to be removed as part of the proposals, this should be undertaken outside of the breeding bird season (March-September inclusive) or immediately after a nesting bird check by a suitably qualified ecologist. If active nests are identified, works in the vicinity of the nest must cease until the birds have fledged the nest. If this method is followed, no significant residual impacts are predicted on nesting birds within the local area.
- 4.12 If all of these recommendations are followed, it is believed that the proposals will adhere to local and national planning policies by taking all necessary steps to ensure no harm to protected species occurs as a result of the development.

Ecological Enhancements

- 4.13 Artificial bat, house sparrow and swift nest site can be built into the development. Nest boxes should be installed in order to provide new nesting opportunities for birds and to achieve ecological enhancements in line with policies set out by the Local Planning Authority. These will be inserted into the building and become integral with the

design. Such boxes include the following below. Either of these models can be used within the building (Figure 4):

- Schwegler Sparrow Terrace (ISP) should be inserted into the wall structure or inserted on to the wall.
- Woodstone Build-in House Sparrow Nest Box.



Figure 4: Schwegler sparrow terrace above with the Woodstone Build in House box below.

4.14 Green roofs should be incorporated within the scheme. They provide opportunities for a range of invertebrates and bird species as well as floral species. Green roofs are also installed for sustainable drainage purposes, countering climate change, improving building performance as well as amenity value, alongside health and wellbeing.

4.15 Areas of green roof will be planted with a wildflower mix. A recommended wildflower mix would include species such as agrimony (*Agrimonia eupatoria*), kidney vetch (*Anthyllis vulneraria*), common knapweed (*Centaurea nigra*), wild basil

(*Clinopodium vulgare*), Viper's bugloss (*Echium vulgare*), lady's bedstraw (*Galium verum*), perforate St John's wort (*Hypericum perforatum*), wild candytuft (*Iberis amara*), field scabious (*Knautia arvensis*), rough hawkbit (*Leontodon hispidus*), oxeye daisy (*Leucanthemum vulgare*), common toadflax (*Linaria vulgaris*) birdsfoot trefoil (*Lotus corniculatus*), musk mallow (*Malva moschata*), wild marjoram (*Origanum vulgare*), hoary plantain (*Plantago media*), cowslip (*Primula veris*), wild mignonette (*Reseda lutea*), wild clary (*Salvia verbenaca*), small scabious (*Scabiosa columbaria*), bladder campion (*Silene vulgaris*), dark mullein (*Verbascum nigrum*).

4.16 Green roofs can include further enhancements, such as open sections of sand for burrowing invertebrates, dead wood piles (for species such as stag beetles), areas of stones and rubble to provide differing microclimates on the roof itself. This creates new niches within the green roof structure. Invertebrate boxes can be established on the green roof to provide additional features of interest.

4.17 Sedum mats can also be planted on roofs, providing instant greening of buildings. The sedum mats can include the following species:

- *Sedum album*, which forms a thick mat and supports white cluster flowers;
- *Sedum spurium*, which forms a low mat with fleshy purple leaves;
- *Sedum reflexum*; which forms a dense mat of blue foliage with yellow flowers;
- *Sedum acre*, a low creeping succulent plant;
- *Sedum anglicum*, a small succulent in different shades of pink;
- *Sedum kamtschaticum*, a tough sedum and drought resistant with dark green leaves;
- *Sedum hispanicum*, a low sedum with silver blue leaves.

4.18 New tree planting should also be incorporated to take place within the site, this will be key in mitigating the impacts for the tree removal set to occur on site. These should include native species of value to wildlife such as oak (*Quercus robur*), hazel (*Coryllus avellana*), holly (*Ilex aquifolium*), wild cherry (*Prunus avium*) and apple (*Malus* sp.). New shrub and herb planting could also take place within the site to help mitigate any potential indirect impacts, recommended native species include bilberry (*Vaccinium myrtillus*), spindle (*Euonymus europaeus*), buckthorn (*Rhamnus cathartica*), foxglove (*Digitalis purpurea*), wood sage (*Teucrium scorodonia*), betony (*Stachys officinalis*) and sweet woodruff (*Galium odoratum*). Furthermore, planting species such as box (e.g.

dwarf sweet box *Sarococca hookeriana*), various herbs and cotoneaster species would also provide additional food sources for local wildlife.

4.19 Newly formed areas of amenity grassland post-development could be supplemented by integrating a variety of native plant species. Patches of bare soil can be sown with wildflower seed mixes to increase the biodiversity of the site and also offer aspects of aesthetic appeal. A suitable species mixture can include the following:

- Yarrow - *Achillea millefolium*
- Common Knapweed *Centaurea nigra*
- Lady's Bedstraw - *Galium verum*
- Oxeye Daisy - *Leucanthemum vulgare*
- Birdsfoot Trefoil - *Lotus corniculatus*
- Ribwort Plantain - *Plantago lanceolata*
- Hoary Plantain - *Plantago media*
- Cowslip - *Primula veris*
- Selfheal - *Prunella vulgaris*
- Meadow Buttercup - *Ranunculus acris*
- Yellow Rattle - *Rhinanthus minor*
- Common Sorrel - *Rumex acetosa*
- Wild Red Clover - *Trifolium pratense*

4.20 It is considered unlikely that the development could result in a net gain in biodiversity units without off-site enhancements, unless significant enhancements are made to the site, or the plans are altered.

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). In essence, an EcIA assesses the activities associated with a proposed scheme that are likely to generate changes within identified zones of influence, on identified ecological

features and receptors. The proposals are subsequently reviewed and mitigation and compensation measures are outlined which help to reduce negative impacts.

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

- The project red-line, for effect on habitats and species;
- Adjacent habitat, considered by species, for mobile species with territories or foraging ranges that may overlap the site;
- Up to 1km for national statutory and non-statutory designations; and,
- Up to 15km for international statutory designations.

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

Impact Assessment and Mitigation 5.6 Table 3 below summarises the impacts and required mitigation for each receptor as previously detailed in the discussion.

Table 3: Assessment of effects from the proposal after mitigation and compensation

Feature	Scale of Importance	Mitigation/Compensation Required	Residual Effect
Internationally Designated Sites	International	Financial contributions towards the provision of alternative greenspace, contributions to visitor control mechanisms and/or management of the SPAs, to ensure that detrimental impacts on the integrity of the SPAs/Ramsar sites are avoided, the value of which will be decided by the local planning authority.	Not significant
Statutory Designated Sites	National	None required – all a considerable distance from the site, with no related habitats will being lost through this scheme and wider landscape connectivity is to be maintained	Not significant

Non-Statutory Designated Sites	National	None required – given the scale of the proposed works.	Not significant
Bats (foraging and commuting)	Undetermined	The site provides limited foraging and commuting opportunities. Sensitive lighting scheme to be implemented on any retained or proposed suitable habitat.	Not significant
Nesting Birds	Local	Mitigating direct harm to nests by removal of any suitable nesting 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
Badgers and small mammals	Local	Precautionary method of works during construction to ensure that commuting and foraging badgers are protected.	Not significant
Other Species	N/A	The site does not support suitable habitats for reptiles, water voles, GCN or otters and it is considered unlikely that dormice would be present within the site.	Not significant

6.0 CONCLUSIONS

6.1 The site does not lie within or adjacent to any statutory sites. Financial contributions are however required in regard to Thames Estuary & Marshes Ramsar and SPA due to the increase in residential units proposed within the site to mitigate the potential impacts resulting from recreational activity over these areas. The value of which will be determined by the local planning authority.

6.2 Whilst no evidence of badger activity was identified on or near the site, it is believed that other mammals, such as foxes, may commute and forage over the site. As such, precautionary methods of work have been recommended to be followed to help ensure that no small mammals are harmed during the construction phase of the development.

6.3 A sensitive lighting scheme is recommended along any retained or proposed features with commuting and foraging potential for bats.

6.4 The trees to be removed on site were considered to have 'negligible' potential for roosting bats.

- 6.5 Birds may use the trees and scrub habitats on site to nest within. Any works to these features should therefore be undertaken outside of bird nesting season (March – September inclusive) or after a nesting bird check by a qualified ecologist.
- 6.6 The site does not support suitable habitat for reptiles, GCN, water voles, or otters and no evidence of badger activity was recorded within the site. As such, no further surveys for these species are required.
- 6.7 Recommendations for enhancements have been made within this report, aimed at improving the ecological value of the site and providing a net gain in biodiversity post-development.

7.0 REFERENCES

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Internet resources:

Google Maps: www.google.co.uk/maps

Magic Interactive Map: www.magic.gov.uk

Appendix 1: Habitat Map

Land at Worcester Close,
Gravesend Phase 1 Habitat Map

Key

- RLB
- Scattered Trees
- ▨ Scattered Scrub
- A Amenity Grassland
- Hardstanding

Site: Land at Worcester Close, Gravesend,
Client: Frankhams
Surveyors: KM
Survey Date: 12th August 2022
Base Map: Google Earth Satellite Imagery-
September 2022

the
ecology
partnership

The Ecology Partnership Ltd
Thorncroft Manor, Thorncroft Drive,
Leatherhead, KT22 8JB
W: www.ecologypartnership.com
E: info@ecologypartnership.com
T: 01372 364133

Appendix 2: Site Photographs

Photograph 1: Photo showing the dominance of short sward amenity grassland and scattered trees on site.



Photograph 2: Photo showing the dominance of short sward amenity grassland and scattered trees on site.



Photograph 3: Photo of part of the scattered scrub on site.



Appendix 3: Species List

DAFOR Scale	Meaning	Percentage Cover of habitat
D	Dominant	51-100%
A	Abundant	31-50%
F	Frequent	16-30%
O	Occasional	6-15%
R	Rare	1-5%
LD	Locally Dominant	51-100% of a specific area

Common name	Latin name	DAFOR score
Scattered Trees		
Oak	<i>Quercus robur</i>	O
Apple	<i>Malus domestica</i>	O
Silver birch	<i>Betula pendula</i>	O
Ash	<i>Fraxinus excelsior</i>	O
Elder	<i>Sambucus nigra</i>	O
Norway maple	<i>Acer platanoides</i>	O
Sycamore	<i>Acer pseudoplatanus</i>	O
Amenity Grassland		
Perennial Ryegrass	<i>Lolium perenne</i>	A
Cock's Foot	<i>Dactylis glomerata</i>	F
Wall barley	<i>Hordeum murinum</i>	F
Greater plantain	<i>Plantago major</i>	O
Red Fescue	<i>Festuca rubra</i>	O
Dandelion	<i>Taraxacum</i>	O
Smooth Hawksbeard	<i>Crepis capillaris</i>	O
Ribwort Plantain	<i>Plantago lanceolata</i>	R
Field bindweed	<i>Convolvulus arvensis</i>	R
Common mallow	<i>Malva sylvestris</i>	R
Broad-leaved dock	<i>Rumex obtusifolius</i>	R
Sycamore sapling	<i>Acer pseudoplatanus</i>	R
Yarrow	<i>Achillea millefolium</i>	R
Scattered scrub		
Bramble	<i>Rubus fruticosus</i>	A
Common nettle	<i>Urtica dioica</i>	F
Young ash	<i>Fraxinus excelsior</i>	F

Broad-leaved dock	<i>Rumex obtusifolius</i>	O
Dandelion	<i>Taraxacum</i>	O
Smooth sow thistle	<i>Sonchus oleraceus</i>	O
Green alkanet	<i>Pentaglottis sempervirens</i>	O
Dove's-foot crane's-bill	<i>Geranium molle</i>	O
Young oak	<i>Quercus robur</i>	R
Dog rose	<i>Rosa canina</i>	R

The Ecology Partnership Ltd

Thorncroft Manor

Thorncroft Drive

Leatherhead

KT22 8JB

Tel: 01372 364 133

www.ecologypartnership.com

Approved: Alexia Tamblyn MA (Oxon) MSc CEcol CEnv MCIEEM FRGS

Date: 08/09/2022