
Preliminary Ecological Appraisal

Marsh Cottage, The Marsh, Wortham

for

Craig Charnley

22 February 2023



Client

Craig Charnley

Planning authority

Mid Suffolk District Council

Time limit of reliance

Please note that the reported surveys were conducted on the date(s) stated in the report and that it represents site conditions at the time of the visit. The findings and recommended mitigation are based on these conditions. If site conditions change materially after the site survey, the original report cannot be relied upon and will need to be updated. Ecological reports and surveys can typically be relied on for 18 to 24 months from the date of survey.

Surveys supporting European Protected Species Mitigation Licence applications must be within the current or most recent survey season for bats (May to September), or within two survey seasons for great crested newts (March to June).


Document	Preliminary Ecological Appraisal
Version	1.0
Date	22 February 2023
Reference number	3038
Author	Ebonie Lambo-Hills M.Sc, B.Sc (Hons), Natural England licences (Bat survey level 1, Great crested newt level 1)
Reviewer	Nathan Duszynski M.Sc, B.Sc (Hons), ACIEEM, Natural England licences (Bat survey level 2, Great crested newt level 1)
<i>Signed disclosure</i>	
<i>The information, data, advice and opinions provided in this report which I have provided is true and has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. I confirm that the opinions expressed are my true and professional bona fide opinions.</i>	
<i>Nathan Duszynski, ACIEEM</i>	
Greenlight Environmental Consultancy Limited Diss Business Hub Hopper Way Diss Norfolk IP22 4GT www.greenlightco.co.uk	

Table of Contents

SUMMARY	4
1. METHOD	6
2. SITE CONTEXT	6
3. DESCRIPTION OF THE DEVELOPMENT	8
4. PROTECTED SITES	8
5. HABITATS	10
6. PROTECTED AND NOTABLE SPECIES	15
7. DISCUSSION AND CONCLUSIONS	27
8. BIBLIOGRAPHY	31

APPENDIX A	METHODS
APPENDIX B	MAP OF PROTECTED SITES WITHIN 2KM
APPENDIX C	PROTECTED SITES CITATIONS
APPENDIX D	LEGISLATION
APPENDIX E	PLANT SPECIES RECORDED ON SITE
APPENDIX F	EXAMPLES OF BAT AND BIRD BOXES
APPENDIX G	EXAMPLES OF HEDGEHOG FRIENDLY FENCING
APPENDIX H	NATIVE SPECIES SUITABLE FOR PLANTING AND SOWING
APPENDIX I	BEE BRICKS
APPENDIX J	PROPOSED PLANS

SUMMARY

- Greenlight Environmental Consultancy Ltd. has been commissioned to carry out a Preliminary Ecological Appraisal for a proposed development at Marsh Cottage, The Marsh, Wortham, Diss, Suffolk, IP22 1PN (grid reference: TM 08813 77344).
- This report outlines the habitat features on site, the likelihood of protected species being present and any potential effects of the proposed development on such species.
- The ecology report is required in support of a planning application for the demolition of the existing structures on site, and construction of residential dwellings on similar footprints.
- The survey and assessment were completed by independent, qualified and experienced ecologists with Natural England survey licences for the relevant protected species.
- The findings of the assessment are that the habitats on the site are of **low** ecological value and that there are no significant ecological constraints that would prevent the proposed works.
- **Further surveys/licences are required for great crested newts and bats prior to works commencing to inform an ecological impact assessment and appropriate mitigation strategy, or for great crested newts to offset any adverse impacts via financial contributions.**
- If the following mitigation and enhancements are incorporated into the proposed layout, there will be a net gain for biodiversity, as is encouraged by the National Planning Policy Framework.

Protected habitats/species	Status	Potential effect	Recommended mitigation and enhancements
Protected sites	Two statutory and five non-statutory protected sites within 2km.	No significant impacts on protected sites and their qualifying features.	None required.
Protected habitats and habitats subject to conservation designations	Modified grassland, will be removed as part of the proposed works. No Priority Habitats will be affected.	Low scale of habitat loss predicted for wildlife.	<u>Mitigation</u> Soft landscaping scheme to include the planting of new native species-rich hedgerows and trees around the site. Construction work to be carried out in accordance with BSI (2012), BS 5837:2012, to protect trees and their root protection areas.
Bats	Moderate bat roosting potential in building one (dwelling). Low value commuting and foraging habitat on site.	Potential disturbance of bat roosts if present in building. Low scale loss and potential light disturbance of commuting and foraging habitats on site.	<u>Further surveys required</u> At least two activity surveys to be undertaken on building one (dwelling) between May-September, with one conducted between May-August. The outcome of the surveys will inform a detailed mitigation strategy and whether an EPS Mitigation Licence will be required from Natural England.

Protected habitats/species	Status	Potential effect	Recommended mitigation and enhancements
			<p><u>Mitigation</u></p> <p>Any lighting schemes will comply with Bat Conservation Trust and CIE 150:2003 guidance.</p>
Breeding birds	<p>Nesting habitats for hedgerow, tree and building nesting birds present on site, including potential breeding habitat for Red and Amber listed species.</p> <p>No suitable barn owl foraging habitat on site.</p>	<p>Low scale loss of nesting habitat on site.</p> <p>Potential disturbance to breeding birds.</p>	<p><u>Mitigation</u></p> <p>Works to any hedgerow, trees and buildings on site to be conducted outside bird nesting season or under watching brief of ecologist if during nesting season.</p> <p><u>Enhancement</u></p> <p>Installation of one integrated swift box and one sparrow terrace on new buildings.</p>
Great crested newts	<p>Unsuitable terrestrial habitats on site.</p> <p>Six ponds within 250m of the site, assessed as below average to good suitability.</p> <p>Site falls within Amber risk zone for district level licensing.</p> <p>19 GCN records within 2km, with closest located 150m north.</p>	<p>Potential harm to GCN if present on site during works.</p> <p>Loss of GCN terrestrial habitat not considered significant to a local population of GCN, if present.</p> <p>No impacts on potential GCN aquatic habitat.</p>	<p><u>Further steps required</u></p> <p>This can be in the form of either:</p> <ul style="list-style-type: none"> • Further GCN surveys (presence/likely absence surveys conducted between mid-March and mid-June, or eDNA surveys conducted between mid-April and June). The outcome of the surveys will inform a detailed mitigation strategy and whether an EPS Mitigation Licence will be required from Natural England. • Applying to join a District Level Licensing scheme to determine the required level of financial contribution to GCN mitigation, which can be completed at any time of year.
Other animals	N/A	Potential harm to animals.	<p><u>Mitigation</u></p> <p>If fencing is required, this will be porous and provide openings for hedgehogs.</p> <p>Rough sawn planks will be placed inside any open excavations.</p> <p>Construction materials will be stored off the ground on pallets and waste materials in skips.</p> <p><u>Enhancement</u></p> <p>Installation of one bee brick on new dwelling.</p>

1. METHOD

- 1.1. A walkover of the site was conducted on 7th February 2023 by Ebonie Lambo-Hills – an independent, qualified and experienced ecologist. Survey conditions were as follows: 8°C, 3mph wind, sunny intervals and dry.
- 1.2. All survey methods were carried out in accordance with the most up to date good practice guidance for the relevant protected species. Please refer to Appendix A for the full methodology and species breakdown.
- 1.3. The habitats on and directly adjacent the site were considered unsuitable for the following protected species, with no evidence or signs of use observed. No further surveys or mitigation for these species are detailed in this report:
 - Water vole *Arvicola amphibius*
 - Otter *Lutra lutra*
 - White-clawed crayfish *Austropotamobius pallipes*
 - Reptiles (slow-worm *Anguis fragilis*, common lizard *Zootoca vivipara*, grass snake *Natrix Ghabenton* and adder *Vipera berus*)
 - Badger *Meles meles* (setts)
 - Hazel dormouse *Muscardinus avellanarius*
 - Natterjack toad *Epidalea calanita*

2. SITE CONTEXT

Location

- 2.1. The general location of the site is shown in Figure 1 below.
- 2.2. The site is situated on the eastern edge of the village of Wortham, with the A143 located approximately 0.1km south. The closest town is Diss, located approximately 3.4km northeast of the site.
- 2.3. The site is enclosed by residential dwellings to the north and south, the common to the east, and an arable field to the west. The wider surroundings are comprised of a mixture of residential dwellings, grasslands, blocks of woodland and arable fields lined with mature trees and hedgerows.

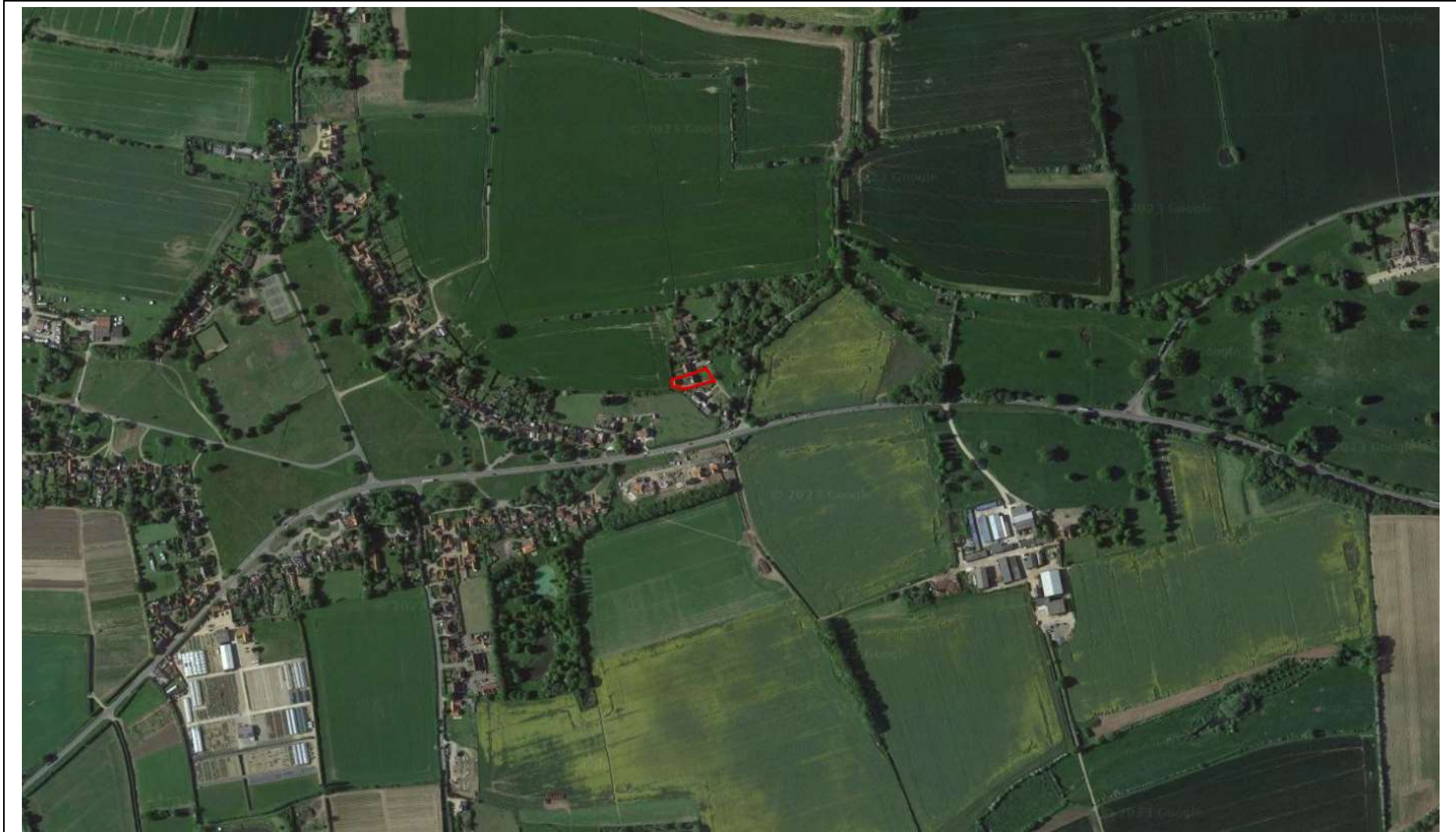


Figure 1
Satellite image of site surroundings, site indicated by red line.
Image © Google, date accessed 14/02/23

3. DESCRIPTION OF THE DEVELOPMENT

- 3.1. The proposals are for the demolition of the existing structures, and construction of residential dwellings on similar footprints. Please refer to Appendix K for the proposed plans.

4. PROTECTED SITES

Statutory

- 4.1. There are two statutory protected sites located within 2km – two Sites of Special Scientific Interest (“SSSI”). Please refer to Appendix C for the full citation.

- i. Wortham Ling SSSI, approximately 1.6km north.

“Wortham Ling is important for its lowland dry heath and acid grassland communities which have developed on a sandy, glaciofluvial drift deposit. Although the site is isolated from the Brecklands, lying as it does within a predominantly boulder clay area, the vegetation has close similarities with the Breck grass-heaths.”

- ii. Burgate Wood SSSI, approximately 1.6km south.

“Burgate Wood is a particularly good example of the type of oak-hornbeam woodland characteristic of this part of north Suffolk. It is ancient, with a coppice-with-standards structure and continues to support entirely semi-natural stands. Many giant coppiced stools are present which indicate its great antiquity. The ground flora is diverse and includes several species that are indicators of ancient woodland, including one rarity.”

- 4.2. The proposed development falls outside of all SSSI Impact Risk Zones relating to rural residential developments.

Non-statutory

- 4.3. There are five non-statutory protected sites located within 2km – five County Wildlife Sites (“CWS”). Please refer to Appendix C for the full citations.

- i. The Marsh CWS, adjacent eastern boundary.

“The Marsh is an area of Common land situated to the east of Wortham village and comprises a mosaic of low-lying wet areas interspersed with drier grassland and patches of scrub.”

- ii. Wortham Long Green CWS, approximately 0.2km southwest.

“Wortham Long Green is situated in the centre of the village and is crossed by a minor road which links Wortham with Redgrave. Whilst parts of the Green are kept short for recreational

use, including the football pitch, other areas remain as unimproved grassland (Priority habitat) which is valued for its flora.”

- iii. Burgate Great Green CWS, approximately 1.1km southwest.

“Burgate Great Green is a large common comprised of mainly unimproved acidic grassland (Priority habitat) with wet winter flushes and some areas of neutral grassland.”

- iv. Gittin Wood CWS, approximately 1.6km southwest.

“Listed in English Nature’s Ancient Woodland Inventory, Gittin Wood is one of several medieval woods situated in this part of Mid Suffolk.”

- v. Hall Farm CWS, approximately 1.9km north.

“Hall Farm Meadow is situated south of Wortham Ling, close to the River Waveney. Enclosed by ditches on two sides, it is a low-lying site that remains wet throughout the year. The north-western corner of the meadow is dominated by lesser pond sedge.”

5. HABITATS

Desktop review

- 5.1. Priority Habitats to occur within 2km (identified using MAGIC – managed by Natural England), include Lowland Dry Acid Grassland, Purple Moor Grass and Rush Pasture, Lowland Heathland, Lowland Fens, Deciduous Woodland, and Woodpasture and Parkland BAP Priority Habitat. The closest of which, is Lowland Fen located approximately adjacent east of the site.

Field study

- 5.2. The habitats on the site are of **low** ecological value, being mainly modified grassland managed as lawn and hedgerows (Priority Habitat) on the site peripheries.
- 5.3. Priority Habitats, as listed under the NERC Act 2006 Section 41 Habitats of Principal Importance found on site include: Hedgerows.
- 5.4. Figure 2 provides a map of the habitats present on the site. NERC Act 2006 Section 41 habitats have been identified where relevant. A full list of plant species recorded on site is attached in Appendix E.

Modified grassland (UK Habitat Classification g4; secondary code: 11 scattered trees, 66 frequently mown & 230 garden)

- 5.5. The site is dominated by modified grassland, which is managed as lawn. Species include: annual meadow grass *Poa annua*, chickweed *Stellaria media*, cock's-foot *Dactylis glomerata*, creeping buttercup *Ranunculus repens*, daisy *Bellis perennis*, dandelion *Taraxacum officinale*, dove's-foot cranesbill *Geranium 10aub*, ground ivy *Glechoma hederacea*, perennial ryegrass *Lolium perenne*, white clover *Trifolium repens* and Yorkshire fog *holcus lanatus*. Within the modified grassland, there are three scattered trees, species include: ash *Fraxinus excelsior*, cherry *Prunus avium* and corkscrew willow *Salix matsudana*.

Hedgerow (UK Habitat Classification h2a) – Priority Habitat

- 5.6. Partly along the northern periphery, there is a species poor hedgerow which is approximately 1.8m in height and 1m in width. Hedgerow species include: beech *Fagus sylvatica*, blackthorn *Prunus spinosa*, bramble *Rubus fruticosus*, and elder *Sambucus nigra*. This hedgerow does not qualify as “important” under The Hedgerow Regulations 1997, lacking the required number of native woody species or associated features.

Other hedgerow (UK Habitat Classification h2b)

- 5.7. The site features a cherry laurel *Prunus laurocerasus* hedgerow along the southern periphery.

Buildings (UK Habitat Classification u1b5)

- 5.8. There is a residential dwelling, cart lodge and several sheds used as associated storage located on site. Please refer to the bat section detailed below for further information.

Other developed land (UK Habitat Classification u1b6)

- 5.9. The site features gravel hardstanding along the southern third of the site, and a patio along the west aspect of the dwelling.

Built linear features (UK Habitat Classification u1e)

- 5.10. There is a post and rail fence along the western boundary and partly along the northern periphery.



Figure 2

Habitats on site.

Image © QGIS, date accessed 14/02/23



Photo 1, modified grassland, building one and hedgerow, looking west.



Photo 2, other hedgerow, hardstanding, building one and fence, looking east.



Photo 3, building two and hardstanding, looking northwest.



Photo 4, modified grassland with scattered trees, building two, three and four, looking west.

6. PROTECTED AND NOTABLE SPECIES

Desktop review

Data search

- 6.1. The biodiversity data search within 2km of the site indicated 815 records from 195 species.
- 6.2. Records of note within 2km and relevant to the proposed development works are:
 - 16 barn owl *Tyto alba* records, with the most recent from 2021.
 - Nine skylark *Alauda arvensis* records, with the most recent from 2011.
 - 10 swift *Apus apus* records, with the most recent from 2019.
 - 19 GCN *Triturus cristatus* records, with the most recent from 2022. The closest record is located approximately 150m north.
 - 28 hedgehog *Erinaceus europaeus* records, with the most recent from 2021.
 - 112 bat records, with the most recent from 2019, including common pipistrelles *Pipistrellus pipistrellus*, soprano pipistrelles *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus*, serotines *Eptesicus serotinus*, noctules *Nyctalus 15aubent*, Leisler's *Nyctalus leisleri*, Daubenton's *Myotis 15aubentoniid*, Natterer's *Myotis nattereri*, barbastelles *Barbastella barbastellus* and other unidentified bat species.

Protected species licences

- 6.3. A 2km search on <http://www.magic.gov.uk/> indicated no records of granted European Protected Species ("EPS") Mitigation Licences.

Bats

- 6.4. There are four buildings located on site, as indicated in Figure 3 and photos 5-9. Please note buildings 2-4 were not assessed, as the buildings will be unaffected by the proposed works.



Figure 3

Location and numbering of buildings located on site.

Image © QGIS, date accessed 14/02/23

Building one – Dwelling

- 6.5. The dwelling is a timber framed, rendered building with PVC windows and doors. The building features a clay pantile roof, with a dormer window on the west aspect, which is surrounded by lead flashing. There are timber soffit boxes on the north and south aspects, with timber fascia boards and open eaves on the east and west aspects.
- 6.6. Internally the building features modern timber trusses, a ridge beam and bitumen lining, which features several tears. The loft space is approximately 1.5m at apex and spans the length of the building (approximately 12m). There is a thin layer of fiberglass insulation throughout.
- 6.7. Roosting opportunities are present under raised roof tiles, lifted lead flashing, between timbers and brickwork and within the loft space. Although no bats were visible, approximately 50 droppings, consistent in size, structure and appearance with pipistrelle *Pipistrelle sp.* and brown long-eared *Plecotus auritus* were present near to the northern gable end within the loft space.
- 6.8. The dwelling is assessed as **moderate** summer, but **negligible** hibernation roost suitability for bats due to its location, roosting features and signs of bats. Please note, the building is occupied

during winter months and features central heating, which would create fluctuations in temperature and humidity.



Photo 5, north and east aspect of building one, looking southwest.



Photo 6, south and west aspect of building one, looking northeast.



Photo 7, internal view of building one, looking north.



Photo 8, cluster of bat droppings present within loft space and highlighted in red.



Photo 9, gaps at eaves highlighted in red on the west aspect of building one.

Trees

- 6.9. The trees around the site boundary were assessed for bat roosting potential and were considered unsuitable due to their age and lack of features.

Foraging and commuting links

- 6.10. The site itself provides **low** value foraging habitat for bats along the boundary hedgerows, with bats mainly using nearby woodlands for foraging.
- 6.11. The landscape immediately adjacent to the site is considered of **low** to **moderate** value for foraging and commuting bats, with linked gardens, the common, hedgerows and treelines providing links to the wider landscape. Residential dwellings adjacent the site and within Wortham have the potential to provide roosting opportunities for bats.

Birds

- 6.12. Birds in the UK are classified into three categories of conservation importance – red, amber and green. Factors such as global threat level, population decline, breeding population decline and contraction of breeding range are taken into account to determine classification.
- 6.13. The following bird species were observed during the site visit:

Red listed:

Fieldfare	<i>Turdus pilaris</i>
House sparrow	<i>Passer domesticus</i>
Mistle thrush	<i>Turdus viscivorus</i>
Starling	<i>Sturnus vulgaris</i>

Amber listed:

Black-headed gull	<i>Chroicocephalus ridibundus</i>
Rook	<i>Corvus frugilegus</i>
Woodpigeon	<i>Columba palumbus</i>

Green listed:

Blackbird	<i>Turdus merula</i>
Blue tit	<i>Cyanistes caeruleus</i>
Collard dove	<i>Streptopelia decaocto</i>
Goldfinch	<i>Carduelis carduelis</i>
Great tit	<i>Parus major</i>
Magpie	<i>Pica pica</i>
Robin	<i>Erithacus rubecula</i>

Introduced:

Pheasant	<i>Phasianus colchicus</i>
----------	----------------------------

- 6.14. The site provides suitable nesting habitats for hedgerow, tree and building nesting species.
- 6.15. The site provides potential breeding habitat for the following Red listed species: house sparrow *Passer domesticus*.
- 6.16. The site provides potential breeding habitat for the following Amber listed species: dunnoek *Prunella modularis* and woodpigeon.
- 6.17. No signs of barn owl were found on the site and no foraging habitat is present.

Great crested newts

- 6.18. There are no ponds within the survey site and six further ponds within 250m, which for the size of the development and nature of terrestrial habitat on the site, is a sufficient distance to consider for assessment (Figure 4). GCN are most likely to occupy good quality terrestrial habitat within 250m of a breeding pond (English Nature, 2001).
- 6.19. The terrestrial habitats on the site are considered predominantly unsuitable for GCN, consisting of modified grassland and hardstanding, with suboptimal hedgerows.
- 6.20. Terrestrial habitats adjacent the site include a mixture of unsuitable (arable fields and residential dwellings with associated gardens and hardstanding) and suitable (hedgerows, grassland and scrub) GCN foraging, commuting and hibernating habitats.
- 6.21. Ponds 1-6 were assessed as **below average to good** suitability for GCN (Table 1).

- 6.22. The Marsh CWS (adjacent the proposed development) features several ditches along the periphery and through the site, which could offer further suitable GCN, feeding, foraging and breeding habitat.
- 6.23. Although pond six has been identified as three separate ponds by MAGIC, the pond has been connected to the north and features a channel connecting all three waterbodies and thus classified as one pond.
- 6.24. The site falls within the Amber risk zone for GCN district level licensing, which is classified as “containing main population centres for GCN and comprise important connecting habitat that aids natural dispersal” (Natural England, 2021).
- 6.25. The A143 to the south acts as a habitat barrier and ecologically separates the site from ponds in the local vicinity.

Pond	1	2	3	4	5	6
Geographic location	Zone A	Zone A	Zone A	Zone A	Zone A	Zone A
	1.00	1.00	1.00	1.00	1.00	1.00
Pond surface area (m ²)	<50m ²	<50m ²	100m ²	100m ²	100m ²	1,700m ²
	0.05	0.05	0.20	0.20	0.20	0.85
Desiccation rate	Never	>3years out of 10	>3years out of 10	>3years out of 10	Never	Never
	0.90	0.50	0.50	0.50	0.90	0.90
Water quality/invert density	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
	0.67	0.67	0.67	0.67	0.67	0.67
Shoreline shade (%)	30%	0%	10%	50%	50%	30%
	1.00	1.00	0.60	1.00	1.00	1.00
Waterfowl impacts	Minor	Minor	Minor	Minor	Minor	Minor
	0.67	0.67	0.67	0.67	0.67	0.67
Fish impacts	Absent	Absent	Absent	Absent	Absent	Possible
	1.00	1.00	1.00	1.00	1.00	0.67
Ponds within 1km	13+	13+	13+	13+	13+	13+
	1.00	1.00	1.00	1.00	1.00	1.00
Terrestrial habitat quality	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
	0.67	0.67	0.67	0.67	0.67	0.67
Macrophyte cover (%)	70%	10%	30%	0%	0%	10%
	1.00	0.40	0.60	0.30	0.30	0.40
his Score	Average	Below average	Average	Average	Average	Good
	0.65	0.56	0.67	0.62	0.66	0.76

Table 1, HSI score for ponds within 250m of the proposed site.



Photo 10, pond one, looking west.

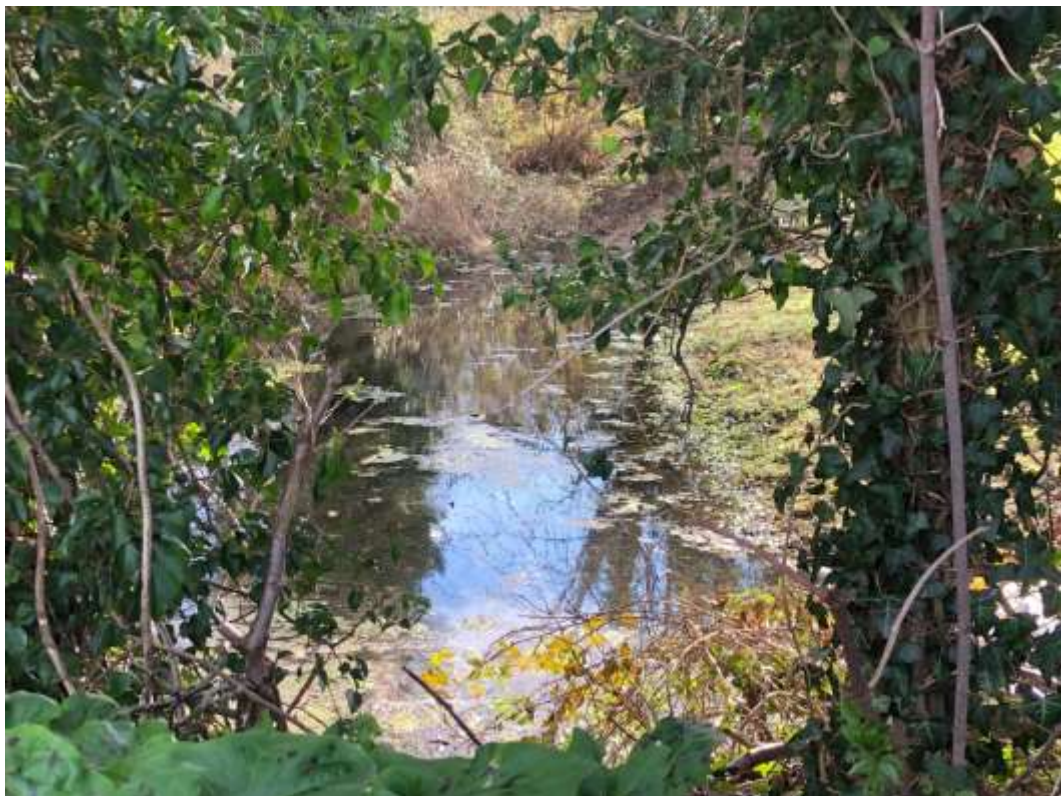


Photo 11, pond three, looking south.



Photo 12, pond four, looking south.



Photo 13, pond five, looking south.



Photo 14, spring fed ditch within the Marsh CWS, looking south.



Photo 15, pond six, looking south.

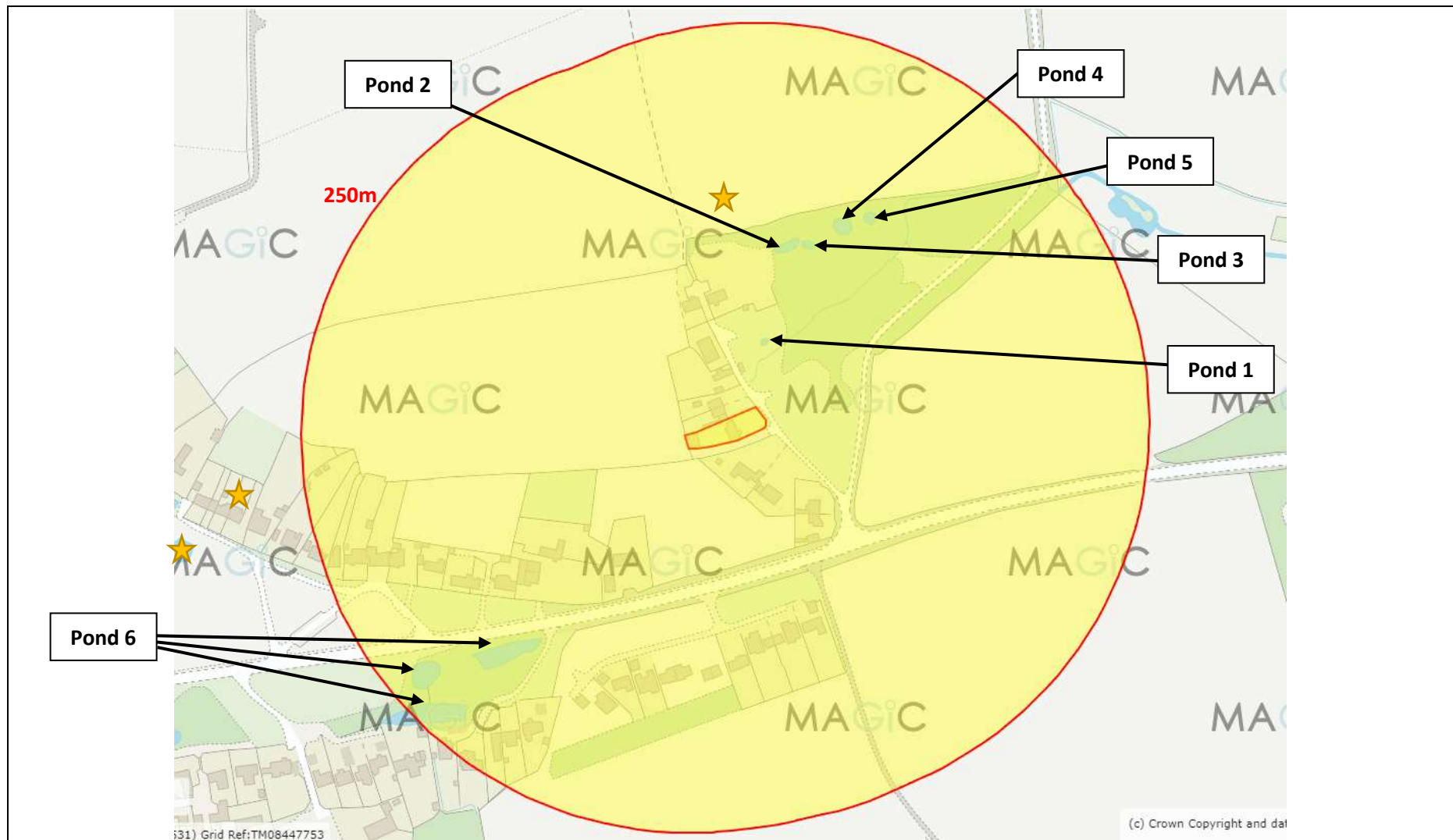


Figure 4
Ponds within 250m of the proposed site. *Yellow stars indicate GCN records.
Image © MAGiC, date accessed 09/02/23.

Other animals

- 6.26. The site is considered predominantly unsuitable for stag beetles *Lucanus cervus*, with no dead wood located on site.
- 6.27. The ornamental planting and hedgerows on site offer suitable habitat for a range of pollinator species.

7. DISCUSSION AND CONCLUSIONS

Protected sites

- 7.1. The development footprint falls outside all identified protected sites (statutory and non-statutory). There are two statutory protected sites and five non-statutory protected sites located within 2km of the site.
- The closest statutory protected site (Wortham Ling SSSI) is located approximately 1.6km north and designated for its lowland dry heathland and acidic grassland communities.
 - The closest non-statutory protected site (The Marsh CWS), is located adjacent the eastern boundary of the site and designated for its dry mixture of wet low lying and drier grassland and scrub.
- 7.2. The proposed development falls outside of any SSSI Impact Risk Zones relating to residential developments.
- 7.3. The proposed development is expected to have no effects on statutory or non-statutory protected sites or their qualifying features, owing to its relatively small scale and limited predicted impacts beyond the area of works.

Habitats

- 7.4. The proposed works will require the clearance of vegetated habitats on site, including ≈0.03ha of modified grassland and the removal of several scattered trees. No priority habitats will be affected by the proposed development. This is expected to result in a low scale loss of nesting habitat for hedgerow and tree nesting birds, and a low scale loss of foraging features for bats. Please refer to the bat section below for predicted impacts on buildings with potential bat roosts.
- 7.5. As a precautionary measure, the following mitigation will be implemented to avoid impacts on habitats from the proposed works:
- i. A soft landscaping scheme to include the planting of new native species-rich (≥5 species), hedgerows and trees around the site (see Appendix H for suggested species).
 - ii. Construction works carried out in accordance with British Standards Institution (2012), BS 5837:2012, Trees in relation to design, demolition and construction – recommendations, to protect trees which are to be retained and their root protection areas.

Bats

- 7.6. The proposed works will require the demolition of all the building on site, which has the potential to materially modify or destroy potential bat roosting locations, if present.
- 7.7. The following surveys/mitigation are required to determine if any bat species are present, the nature of their use of the buildings and any roosting locations:
 - i. At least two bat activity surveys to be conducted on building one (dwelling) between May and September. Please note, at least one survey must be conducted between May and August.
 - ii. If bats are found to be present and roosting within any buildings, further activity surveys and a European Protected Species Mitigation Licence may be required for the development.
 - iii. Any lighting schemes will follow guidance from the Bat Conservation Trust and CIE 150:2003. Warm-white (long wavelength) lights with UV filters will be fitted as close to the ground as possible. Lighting units will be angled below 70° and equipped with movement sensors, baffles, hoods, louvres and horizontal cut off units at 90°.
- 7.8. The outcomes of further activity surveys will inform the detailed recommended mitigation for bats. We consider that the proposed development will be able to accommodate this in the form of alternative roosting opportunities, as required.
- 7.9. Building Regulations state that the energy efficiency of buildings must be improved where possible and that contractors must assess the condensation risk within the roof space and make appropriate provisions in line with BS 5250:2011. This British Standard states that both High Resistance (bitumen type 1F) and Low Resistance (non-bitumen coated roofing membranes (NBCRM)) underlays are acceptable as long as appropriate ventilation is provided. As NBCRM are proven to entangle bats through regular contact, which also compromises the integrity of the membrane, the Bat Conservation Trust recommend only NBCRM that have passed the snagging propensity test (must be supplied/installed with the necessary certification) or traditional type 1F bitumen are used.

Birds

- 7.10. The proposed works are expected to result in a low scale loss of bird nesting habitat through the demolition of all the building and clearance of vegetation, including several scattered trees.
- 7.11. Any works affecting bird nesting habitat such as management of hedgerows, trees or buildings would ideally need to be conducted outside the main nesting season, which lasts from March to August. If work is planned during the bird nesting season, then a precautionary check of all habitats will be conducted by a qualified ecologist immediately prior to starting any work. If any

nesting birds are found, an appropriate protection zone from the nest will be required and will be maintained until the young have fledged.

7.12. As enhancements, the following will be implemented:

- i. One integrated swift box (Swift Block – Appendix F).
- ii. One sparrow terrace (1SP Schwegler Sparrow Terrace– Appendix F).

7.13. Natural England and Local Planning Authorities (“LPA”) have recognised a significant decline in swift populations across the country, and are actively endorsing integrated swift boxes to provide a net gain in biodiversity, as is encouraged by NPPF 2021.

Great crested newts

7.14. The proposed works are expected to result in a low scale loss of terrestrial habitat through the clearance of ≈0.03ha of modified grassland, with aquatic habitats unaffected.

7.15. Taking a worst-case scenario of 0.01-0.1ha of land being lost or damaged within 100m of a breeding pond, the risk assessment calculation (set out in the GCN method statement template provided by Natural England) indicates an “*offence likely*”, although goes on to state:

“This generic risk assessment will over- or under-estimate some risks because it cannot take into account site-specific details. In particular, the exact location of the development in relation to resting places, dispersal areas and barriers should be critically examined.”

7.16. As GCN have been recorded to the northeast and southwest of the proposed development (Figure 4), it is highly likely GCN may commute across the site to reach ponds in the local vicinity. Therefore, further steps are required to inform the planning application. This can be in the form of the following methods:

- i. Further GCN surveys:
 - a. Presence/likely absence surveys on ponds within 250m of the site which contain sufficient levels of water during the GCN breeding season (can only be conducted between mid-March and mid-June). Please note, a number of visits are required in the peak season (mid-April to mid-May).
 - b. eDNA surveys on ponds within 250m of the site which contain sufficient levels of water during the GCN breeding season (can only be conducted between mid-April and June).
 - c. The outcomes of the presence/likely absence or eDNA surveys will inform a detailed mitigation strategy for GCN and whether a district level license or EPS Mitigation Licence will be required from Natural England for the proposed development to proceed.

- ii. Apply to join a district level licensing (“DLL”) scheme (can be completed all year round). Please note, all ponds will be assumed to contain GCN unless presence/likely absence surveys or eDNA tests have confirmed likely absence.

Other animals

7.17. The surrounding habitat of the site is considered suitable for hedgehogs. To maintain potential hedgehog routes within the site and between the site and further habitats, any fencing installed will be porous and provide access openings for hedgehogs (see Appendix G for examples).

7.18. General mitigation to protect wildlife during the construction period are as follows:

- Any excavations will have a rough sawn plank placed inside to act as a ramp to allow any animals that have fallen in to escape. The excavations will be checked each morning works are scheduled for, to remove any animals trapped.
- Construction materials will be stored off the ground on pallets and waste materials in skips, to prevent providing shelter for animals and subsequent harm when materials are moved.

7.19. As enhancements, the following will be implemented:

- i. Installation of one bee brick, installed on new dwelling (Bee Brick – Figure I)

8. BIBLIOGRAPHY

- Baker, J., Beebee, T., Buckley, J. Gent, T., Orchard, D. (2011). *Amphibian Habitat Management Handbook*. Amphibian and Reptile Conservation: Bournemouth
- Barn Owl Trust (2012). *Barn Owl Conservation Handbook*. Pelagic Publishing: Exeter.
- Butcher, B., Carey, P., Edmonds, R., Norton, L., Treweek, J. (2020). *The UK Habitat Classification User Manual Version 1.1* at <http://www.ukhab.org/>
- Bright, P., Morris, P., Mitchell-Jones, T. (2006). *The dormouse conservation handbook*. English Nature
- British Standard BS 42020:2013 *Biodiversity - Code of Practice for planning and development*.
- British Standards Institution (2012). BS 5837:2012, *Trees in relation to design, demolition and construction – Recommendations*.
- CIEEM (2017). *Guidelines for Preliminary Ecological Appraisal*.
- Collins, J. (Ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.)*. The Bat Conservation Trust, London.
- Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R., Lock, L. Musgrove, A., Noble, D., Stroud, D., Richard, G. (2015). *Birds of conservation concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man*. *British Birds* 108, 708-746.
- Edgar, P., Foster, J., Baker, J. (2010). *Reptile Habitat Management Handbook*. Amphibian and Reptile Conservation: Bournemouth
- English Nature (2001). *Great Crested Newt Mitigation Guidelines*. Peterborough.
- Gent, A.H. and Gibson, S.D. eds. (1998). *Herpetofauna Workers' Manual*. Peterborough, Joint Nature Conservation Committee.
- Griffiths, R.A., Raper, S.J., Brady, L.D. (1996). *Evaluation of a standard method for surveying common frogs (Rana temporaria) and newts (Triturus cristatus, T. helveticus, and T. vulgaris)*. Joint Nature Conservation Committee Report No. 259.
- International Commission on Illumination (2003). CIE 150:2003, *Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations*.
- Langton, T., Beckett, C., Foster, J. (2001). *GCN Conservation handbook*. Froglife.
- McLean, I.F.G., JNCC (Drafted by) on behalf of the Inter-agency Translocations Working Group (2003). *A Habitats Translocation Policy for Britain*.
- Mitchell-Jones (2004). *Bat mitigation guidelines*. English Nature: Peterborough
- Natural England (2021). *GCN Risk Zones*. Available: <https://naturalengland-defra.opendata.arcgis.com/search?q=GCN%20risk%20zone>.
- Oldham, R.S., Keeble, J., Swan, M.J.S., Jeffcote, M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)*. *Herpetological Journal* 10 (4), 143-155.
- Pearce, G.E. (2011). *Badger behaviour, conservation and rehabilitation*. Pelagic Publishing: Exeter.
- Sewell, D., Griffiths, R.A., Beebee, T.J.C., Foster, J., Wilkinson, J.W. (2013). *Survey protocols for the British herpetofauna*. ARC, DICE University of Kent and University of Sussex.
- Stone, E.L. (2013). *Bats and lighting: Overview of current evidence and mitigation*. University of Bristol.
- Strachan R., Moorhouse T., Gelling, M. (2011). *Water Vole Conservation Handbook Third Edition*. University of Oxford: Abingdon

Appendix A

Methods

Desktop Review

A desktop review of published data, such as records of protected sites and species, OS maps and satellite images has been carried out. A data search was carried out with the Suffolk Biodiversity Information Service ("SBIS").

A field survey visit was conducted to confirm the findings of the desktop review and to record habitats and species located on site.

Equipment available for use during the survey were binoculars, ladders, torches, endoscope and a digital camera.

Habitats

The habitats on site have been defined using the UK Habitat Classification (Butcher *et al.*, 2020). Natural Environment and Rural Communities (NERC) Act (2006) habitats listed under section 41 have been identified where appropriate.

Bats

An assessment of the habitats on and surrounding the site for bat interest was made, in accordance with latest bat survey guidelines (Collins, 2016).

The building on site was assessed for its potential to support roosting bats and involved a thorough internal and external search of all suitable cavities, holes and crevices. All suitable areas, including objects, ledges and floors were inspected for the following signs:

- Bat droppings
- Stains around roosting places and entrance points
- Urine marks
- Prey remains
- Areas devoid of cobwebs
- Live or dead bats
- Suitable cracks and crevices for bats to enter

In exposed conditions, the signs of bat usage such as droppings and urine marks can be obliterated by heavy rain.

An evaluation system was applied to the building(s) using the following criteria:

- **Negligible roost suitability for bats.** These buildings have no potential roosting features for bats, or very few or minor features in an isolated or unsuitable location such that the presence of a bat roost is considered highly unlikely. Such buildings usually fall into two main types: generally, well maintained without cracks and crevices, no gaps between bargeboard or soffit and wall, or without an attic space; or those which contain some or all of the above features, but are both draughty and thick in cobwebs

or contain strong odours such as solvents, diesel etc. It must be borne in mind that a building from this latter group can become suitable for bats following refurbishment. This often happens to houses once the attic space has been cleaned and under-felted prior to timber treatment. When no suitable habitats for bats are found, no further surveys or European Protected Species (“EPS”) mitigation licence are required.

- **Low roost suitability for bats.** Buildings in this category have one or more potential roost sites that could be used by individual bat opportunistically. These buildings do not however provide suitable conditions (such as space, shelter, temperature, humidity, or light and noise disturbance) to be used on a regular basis by a large number of bats. Structures with low roost suitability for bats will require **one dusk emergence or one dawn re-entry survey** conducted between May and August to assess their current use by bats.
- **Moderate roost suitability for bats.** These buildings contain one or more potential roosting sites which could be regularly used by bats owing to their size, shelter, protection and conditions. These buildings are however unlikely to support a roost of high conservation status (maternity roost or hibernation roost). Structures with moderate roost suitability for bats will require two surveys, **one dusk emergence and one dawn re-entry survey** conducted between May and September with at least one of the surveys undertaken between May and August, to assess their current use by bats.
- **High roost suitability for bats.** This group includes buildings with one or more potential roost sites which are obviously suitable for use by a larger number of bats on a regular basis and potentially for longer periods of time owing to their size, shelter, protection and conditions. These buildings may support a roost of high conservation status (maternity roost or hibernation roost) and will require three activity surveys to assess their current use by bats. The surveys should include at least **one dusk emergence and** at least **one dawn re-entry survey** (the third survey can either be at dusk or dawn) and should be conducted between May and September with at least two of surveys undertaken between May and August.

Trees on and around the site were assessed for their suitability to support roosting bats. The assessment involved a ground level inspection of the exterior of the trees to search for features offering roosting potential to bats such as split limbs, woodpecker holes, cavities, lifted bark and dense thick-stemmed ivy.

An evaluation system was applied to the trees using the following criteria:

- **Negligible roost suitability for bats.** Trees unlikely to be used by roosting bats.
- **Low roost suitability for bats.** A tree of sufficient size and age to contain Potential Roosting Features (“PRFs”), but with none seen from the ground or features seen with only very limited roosting potential.
- **Moderate roost suitability for bats.** A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.

- **High roost suitability for bats.** A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection and surrounding habitat.

The habitats on and around the site were assessed for their commuting and foraging potential for bats. An evaluation system was applied to the commuting and foraging potential using the following criteria.

- **Negligible commuting and foraging potential for bats.** Habitat features unlikely to be used by commuting or foraging bats.
- **Low commuting and foraging potential for bats.** Habitats that could be used by a small number of commuting or foraging bats such as, a gappy hedgerow, unvegetated stream or lone trees, but are isolated and not well connected to the surrounding landscape.
- **Moderate commuting and foraging potential for bats.** Habitats that are continuous and connected to the wider landscape such as, lines of trees, scrub, linked back gardens, grasslands and water features.
- **High commuting and foraging potential for bats.** Habitats that are continuous and connected to the wider landscape such as, river valleys, watercourses, hedgerows, lines of trees, deciduous woodland, and grazed parkland. These habitats are likely to be used regularly by commuting or foraging bats and are likely to be close to, or connected to, known roosts.

Birds

The site and its surrounding habitats were assessed for their potential to support breeding birds. Bird nesting habitat could include grassland, hedgerows, scrub, trees and buildings.

Bird species noted during the site visit were recorded. Trees, buildings and grassland were checked for use by barn owls, swifts and skylarks.

Great crested newts

Habitats on and near the site were assessed for their suitability for great crested newts ("GCN").

Water features on and near the site were assessed for their suitability for occupation by GCN, according to a Habitat Suitability Index ("HSI"). The HSI is a theoretical index of a waterbody's suitability to support a breeding population of GCN and is calculated from a series of ten variables recorded on site, as detailed in Table 2.

Indices	Name	Description
SI1	Geographic Location	Lowland England or upland England, Scotland and Wales
SI2	Pond area	To the nearest 50m ²
SI3	Permanence	Number of years' pond dry out of ten
SI4	Water quality	Measured by invertebrate diversity
SI5	Shade	Percentage shading of pond edge at least 1m from shore
SI6	Fowl	Level of waterfowl use
SI7	Fish	Level of fish population
SI8	Pond count	Number of ponds within 1km divided by 3.14
SI9	Terrestrial habitat	Quality of surrounding terrestrial habitat
SI10	Macrophytes	Percentage extent of macrophyte cover on pond surface

Table 2, HSI indices.

The HSI score is the geometric mean of the ten suitability indices calculated:

$$HSI = (SI1 \times SI2 \times SI3 \times SI4 \times SI5 \times SI6 \times SI7 \times SI8 \times SI9 \times SI10)^{1/10}$$

Once calculated, the HSI score for a waterbody can be categorised as follows:

Excellent (>0.8)

Good (0.7 – 0.79)

Average (0.6 – 0.69)

Below Average (0.5 – 0.59)

Water voles, otters and white-clawed crayfish

Water features on and adjacent to the site were assessed for use by water vole, otter and white-clawed crayfish. Otters in England typically use areas of fresh water and streams and ditches for moving between habitats. Otter holts are usually located underneath tree roots, in tunnels. Field signs of presence include spraints on prominent features such as bridges, tree bases or boulders, and footprints.

Water voles inhabit burrows in the banks of ponds, ditches, streams and rivers. Field signs include droppings left in latrine spots, burrow entrances or feeding remains.

White-clawed crayfish inhabit streams and rivers with a moderate flow rate, and lakes. Clear, well-oxygenated water is preferred. Typical habitat features include crevices in rocks, gaps between stones, submerged plants and tree roots.

Reptiles

The habitats on the site and within the proposed area of works were assessed for suitability for reptiles.

Reptiles rely on conditions that allow them to maintain their body temperature through basking. They require access to direct sunlight, shelter from the elements, sufficiently large populations of prey species and hibernation sites.

Reptiles typically favour a habitat mosaic with a diverse vegetation structure, which could include grassland, scrub and woodland.

Badgers

An inspection of all habitats with the potential to support badger *Meles meles* sett construction and foraging activities on the application site was undertaken. Any incidental observations of badger signs were also recorded. The survey comprised searching for evidence of badger activity in the form of setts, droppings, pathways, snuffle holes, hair and footprints.

Dormice

Dormice habitats include deciduous woodland, hedgerows and scrub. Dormice are found mainly in the south of England, including Kent and Sussex, with sporadic populations elsewhere. An assessment of the suitability of site habitats for occupation by dormice was made.

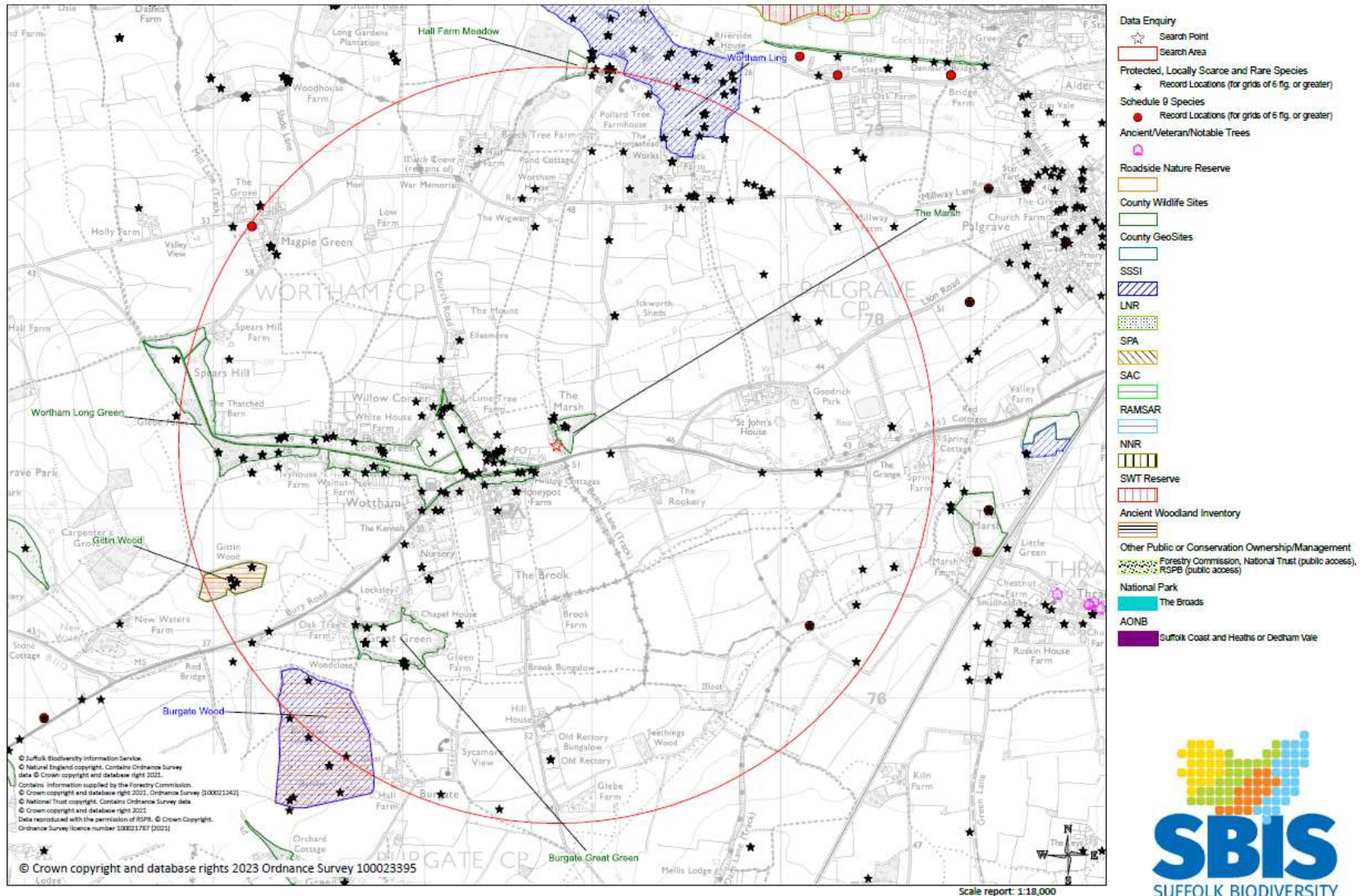
Other protected species

Particular regard was made to the nature of the proposed development and the potential of impact upon any other protected species, species which are nationally or locally scarce, or species subject to other conservation designations such as Red Data Book or Priority S41 species, from the development work, should these be present in the area.

Constraints

The field survey was conducted outside of the optimal survey period for flowering plants. Although the habitats recorded on site are unlikely to change to those described in this report, flora biodiversity is likely to be under recorded.

Appendix B
Map of protected sites within 2km



Greenlight (Marsh Cottage, The Marsh, Wortham TM08812 77343) 2km Data Enquiry

Date: 20/01/2023 | Drawn by: Andy Mercer

Appendix C

Protected sites citations

SSSI citations

COUNTY: SUFFOLK

SITE NAME: WORTHAM LING

DISTRICT: MID SUFFOLK

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981.

Local Planning Authority: Suffolk County Council, Mid Suffolk District Council

National Grid Reference: TM 093795

Area: 51.3 (ha.) 126.7 (ac.)

Ordnance Survey Sheet 1:50,000: 144

1:10,000: TM 07 NE, 08 SE

Date Notified (Under 1949 Act): –

Date of Last Revision: –

Date Notified (Under 1981 Act): 1990

Date of Last Revision: –

Other Information:

East Suffolk Common Land Unit 42. Site managed as a Nature Reserve by the Suffolk Wildlife Trust

Description and Reasons for Notification:

Wortham Ling is important for its lowland dry heath and acid grassland communities which have developed on a sandy, glaciofluvial drift deposit. Although the site is isolated from the Brecklands, lying as it does within a predominantly boulder clay area, the vegetation has close similarities with the Breck grass-heaths.

The heathland community is characterised by an abundance of heather *Calluna vulgaris* which is present in the full range of age-classes, from the classic 'pioneer' to 'degenerate' phases. Associated grasses are generally sparse here but include sheep's fescue *Festuca ovina*, common bent-grass *Agrostis capillaris* and occasionally wavy hair-grass *Deschampsia flexuosa*. In the open areas within the stands of heather the ground is occupied by carpets of mosses, mainly *Polytrichum spp.*, and lichens, particularly *Cladonia spp.* which are present in good numbers.

The site's other major plant community is the dry acid grassland which is dominated by a sward of sheep's fescue with only scattered clumps of heather. Characteristic species here include abundant sheep's sorrel *Rumex acetosella* with frequent heather bedstraw *Galium saxatile*, lady's bedstraw *G. Verum*, cat's-ear *Hypochoeris radicata*, ragwort *Senecio jacobea* and yarrow *Achillea millefolium*. Typical associates are mouse-ear hawkweed *Hieracium pilosella*, ribwort plantain *Plant lanceolata*, harebell *Campanula rotundifolia* and bird's-foot-trefoil *Lotus corniculatus* together with common storks-bill *Erodium cicutarium*, buck's-horn plantain *P. coronopus* and wild thyme *Thymus praecox* in some areas. The moss lichen flora is also a significant element here, especially where intense rabbit grazing maintains a very short, open vegetation.

Additional habitat variety is provided by damper areas supporting a dense growth of purple moor-grass *Molinia caerulea*, several ponds, ditches and hollows. There are also places where the vegetation indicates more base-rich soils and these are characterised by a mesotrophic sward with Yorkshire fog *Holcus lanatus*, oat-grass *Arrhenatherum elatius*, quaking grass *Briza media*, hardheads *Centaurea nigra*, devil's-bit scabious *Succisa pratensis*, purging flax *Linum catharticum* and stemless thistle *Cirsium acaule*. The site is fringed with mixed scrub and clumps of European gorse *Ulex europaeus* occur throughout.

The site supports a good population of the grayling *Hipparchia semele*, a characteristic butterfly of open heathlands.

COUNTY: SUFFOLK SITE NAME: BURGATE WOOD

DISTRICT: MID SUFFOLK

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: MID SUFFOLK DISTRICT COUNCIL

National Grid Reference: TM 076757 Area: 30.5 (ha.) 75.36 (ac.)

Ordnance Survey Sheet 1:50,000: 144 1:10,000: TM 07 NE

Date Notified (Under 1949 Act): N/A Date of Last Revision: N/A

Date Notified (Under 1981 Act): 1987 Date of Last Revision: N/A

Other Information:

A new site.

Reasons for Notification:

Burgate Wood is a particularly good example of the type of oak-hornbeam woodland characteristic of this part of north Suffolk. It is ancient, with a coppice-with-standards structure and continues to support entirely semi-natural stands. Many giant coppiced stools are present which indicate its great antiquity. The ground flora is diverse and includes several species that are indicators of ancient woodland, including one rarity.

Pedunculate oak-hornbeam woodland occupies the central plateau in the wood. Hornbeam *Carpinus betulus* is present as coppice with Ash *Fraxinus excelsior* and Hazel *Corylus avellana*. Some Field Maple *Acer campestre* occurs on the edge of the plateau and standard trees are of Oak *Quercus robur* and Ash. Mixed oak-hazel-ash woodland is present on a number of shallow valley sides that radiate from the central area with wet ash-maple woodland on the more calcareous boulder clays in the valley bottoms. Dogwood *Cornus sanguinea*, Guelder Rose *Viburnum opulus* and Spindle-tree *Euonymus europaeus* are characteristic of the calcareous soils.

The ground flora contains much Dog's Mercury *Mercurialis perennis* with frequent Primrose *Primula vulgaris*, Enchanter's Nightshade *Circaea lutetiana*, Sanicle *Sanicula europaea* and Water Avens *Geum rivale*. A number of uncommon species are present including Herb Paris *Paris quadrifolia*, Yellow Archangel *Lamium galeobdolon*, Hairy Woodrush *Luzula pilosa* and the rare Lungwort *Pulmonaria officinalis*. The acidic sands on the central plateau are dominated by Bracken with Honeysuckle *Lonicera periclymenum* and Wood Sorrel *Oxalis acetosella*. Wide rides are present and they have a distinctive flora including Tufted Hair-grass *Deschampsia cespitosa*, Meadowsweet *Filipendula ulmaria*, Yellow Pimpernel *Lysimachia nemorum* and Creeping Buttercup *Ranunculus repens*.

A moated site is present and a massive woodbank and ditch surrounds much of the wood.

County Wildlife Sites citations

CWS Number	Name	Description	Area (ha)
Mid Suffolk 135	GITTIN WOOD	Listed in English Nature's Ancient Woodland Inventory, Gittin Wood is one of several medieval woods situated in this part of Mid Suffolk. The woodland boundary is marked by a ditch and bank which is thought to be medieval in origin and is enclosed by a hedge of blackthorn, field maple, elder and hawthorn. Tall mature oaks and neglected ash coppice form the tree canopy over a large proportion of the wood. One section however is dominated by mature sycamore of which some have been coppiced in the past. Sycamore is regenerating freely in this area. Hazel coppice with lesser amounts of blackthorn, form a dense understorey in patches throughout the wood. Beneath the tree canopy, particularly along the wide rides which cross the wood, the field layer supports a species-rich woodland plant community. Primrose, early-purple orchid, bluebell, wood anemone, violet, bugle, ramsons and wild strawberry form a dense carpet which is a wonderful sight in the Spring. Gittin Wood is used extensively for pheasant rearing, an area in the western half of the wood has been cleared and a pheasant pen erected.	4.69
Mid Suffolk 136	WORTHAM LONG GREEN	"Wortham Long Green is situated in the centre of the village and is crossed by a minor road which links Wortham with Redgrave. Whilst parts of the Green are kept short for recreational use, including the football pitch, other areas remain as unimproved grassland (Priority habitat) which is valued for its flora.	
Mid Suffolk 137	THE MARSH	An area of acidic grassland at the eastern end of the green is particularly valuable, supporting a range of plants typically associated with this habitat including sheep's-fescue, mouse-ear hawkweed and heath bedstraw. Mat-grass, a rare and declining Suffolk grass of dry, infertile, acid soils, is also found here. The rest of the site comprises neutral grassland with scattered patches of scrub and ponds, providing further diversity and habitat opportunities for a range of species. The ponds are a valuable part of the green, many supporting great crested newt."	40.16
Mid Suffolk 138	HALL FARM MEADOW	The Marsh is an area of Common land situated to the east of Wortham village and comprises a mosaic of low-lying wet areas interspersed with drier grassland and patches of scrub. The scrub, of species such as hawthorn, goat willow, dog-rose and bramble, is found across the site and provides structural diversity and opportunities for nesting birds, invertebrates and amphibians. The grassland community supports a range of flowering	2.04

		plants, including southern marsh-orchid, lady's-smock, water avens and water mint in the wetter areas, whilst the dry areas contain a range of common meadow species such as cowslip, bird's-foot trefoil and selfheal. Of particular botanical interest is the presence of adder's-tongue fern, a scarce plant in Suffolk and a good indicator of unimproved grassland, which is a priority habitat.	
Mid Suffolk 36	BURGATE GREAT GREEN	Hall Farm Meadow is situated south of Wortham Ling, close to the River Waveney. Enclosed by ditches on two sides, it is a low-lying site that remains wet throughout the year. The north-western corner of the meadow is dominated by lesser pond sedge. It is likely that this area will provide valuable shelter for wintering birds, for example snipe. The remainder of the site consists of species-diverse grassland which supports a wide range of wetland plants. Invertebrates, particularly butterflies are attracted to the numerous wild flowers, for example knapweed, marsh thistle and self heal. In addition, small quantities of scarce species are present, for example fen bedstraw, meadow thistle and early marsh-orchid. The latter two species are particularly rare in Suffolk, many of their former localities having been destroyed by agricultural improvement works. Hall Farm Meadow, which is only lightly grazed by cattle is becoming rather overgrown. A more intensive grazing regime is required to conserve the botanical diversity of this valuable site.	1.19

Appendix D Legislation

European Protected Species

The Ramsar Convention (1971) on Wetlands of International Importance especially as Waterfowl Habitat seeks to promote the conservation and wise use of wetlands, particularly those which support internationally significant numbers of water birds. This is achieved through the designation of Ramsar Sites.

The European Community Council Directive on the Conservation of Wild Birds (79/409/EEC) sets out general rules for the conservation of all naturally occurring wild birds, their nests, eggs and habitats. It requires member states to designate Special Protection Areas (SPAs) for protection of certain species.

The main piece of legislation relating to nature conservation in Great Britain is **The Wildlife and Countryside Act 1981 (as amended)**. This Act is supplemented by provision in **The Countryside and Rights of Way (CROW) Act 2000** and **The Natural Environment and Rural Communities Act 2006 (in England and Wales)**. This act provides varying degrees of protection for the listed species of flora and fauna, including comprehensive protection of wild birds, their nests and eggs.

The Countryside and Rights of Way Act 2000 strengthens the protection given to SSSIs. It revises the procedures for the notification of SSSIs and for the consenting of operations which may damage the special interest of a SSSI. Local authorities have a duty to take steps, consistent with the proper exercise of their functions, to further the conservation and enhancement of SSSIs. The act also strengthens the existing provisions of the Wildlife and Countryside Act 1981 for the enforcement of wildlife legislation, including a new offence of "recklessly" destroying or damaging the habitats of certain protected species.

UK wildlife is also protected under **The Conservation (Natural Habitats &c.) Regulations 1994** (which were issued under the European Communities Act 1972), through inclusion on Schedule 2. In 2017, these Regulations, together with subsequent amendments, were consolidated into **The Conservation of Habitats and Species Regulations 2017**.

The Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites. The Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 5. However, these actions can be made lawful through the granting of licenses by the appropriate authorities. Licenses may be granted for a number of purposes but only after the appropriate authority is satisfied that there are no satisfactory alternatives and that such actions will have no detrimental effect on wild population of the species concerned.

The Protection of Badgers Act 1992 consolidates previous badger legislation by providing comprehensive protection for badgers and their setts, with a requirement that any authorised sett disturbance or destruction be carried out under licence.

The Hedgerows Regulations 1997 aim to protect important hedgerows in the countryside. They make it illegal to remove most countryside hedges without first notifying the local planning authority, and provide protection for 'important hedgerows'.

County Wildlife Site is a non-statutory designation used to identify high quality wildlife habitats in a county context. Local Authorities have a responsibility as part of their planning function to take account of sites of substantial nature conservation value and to consider them alongside other material planning considerations. The location of County Wildlife Sites will be included in Local Plans and Development Documents.

National Planning Policy - National Planning Policy Framework (NPPF)

Section 15 of the National Planning Policy Framework 2021 (NPPF): Conserving and enhancing the natural environment states that 'planning policies and decisions should contribute to and enhance the natural and local environment by ... minimising impacts on and providing net gains for biodiversity.'

Office of The Deputy Prime Minister ("ODPM") Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their impact within the planning system.

Paragraph 98 of Circular 06/2005 states that 'the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat'.

Implications of legislation and policies

Without this ecological assessment, the potential developer would be unable to demonstrate due diligence in his responsibilities. Furthermore, the local planning authority would not have been provided with sufficient information for a planning decision to be made. This could result in non-determination or refusal of the application.

With legal responsibilities and planning implications, it is essential that any ecological assessment of a potential development site, including the area of this report, must determine the possible presence or absence of any protected species as part of any planning development consideration.

Where mitigation or compensation measures are required to ensure that no significant impacts will result on biodiversity from the development, the proposed measures may be secured through planning conditions or by EPS Mitigation Licences from Natural England.

Bats

All bat species in Britain are protected under the Wildlife and Countryside Act 1981 through inclusion on Schedule 5. They are also protected under the Conservation (Natural Habitats &c.) Regulations 1994 (which were issued under the European Communities Act 1972), through inclusion on Schedule 2. On 30th November 2017, these Regulations, together with subsequent amendments, were consolidated into the Conservation of Habitats and Species Regulations 2017.

European protected animal species (“EPS”) and their breeding sites or resting places are protected under Regulation 42. It is an offence for anyone to deliberately capture, injure or kill any such animal or to deliberately take or destroy their eggs. It is an offence to damage or destroy a breeding or resting place of such an animal. It is also an offence to have in one's possession or control, any live or dead European protected species.

The threshold above which a person will commit the offence of deliberately disturbing a wild animal of a European protected species has been raised. A person will commit an offence only if he deliberately disturbs such animals in a way as to be likely significantly to affect (a) the ability of any significant groups of animals of that species to survive, breed, or rear or nurture their young, or (b) the local distribution of abundance of that species. The existing offences under the Wildlife and Countryside Act (1981) as amended which cover obstruction of places used for shelter or protection (for example, a bat roost), disturbance and sale still apply to European protected species.

This legislation provides defences so that necessary operations may be carried out in places used by bats, provided the appropriate Statutory Nature Conservation Organisation (in England this is Natural England) is notified and allowed a reasonable time to advise on whether the proposed operation should be carried out and, if so, the approach to be used. The UK is a signatory to the Agreement on the Conservation of Bats in Europe, set up under the Bonn Convention. The Fundamental Obligations of Article III of this Agreement require the protection of all bats and their habitats, including the identification and protection from damage or disturbance of important feeding areas for bats.

Barn Owls

The Habitats Regulations (1994), as amended, states that a person commits an offence in the case of Barn Owl only if this species is disturbed in the breeding season. This applies equally to all those bird species listed under Schedule 1.

Breeding Birds

It is an offence to kill, injure or take any wild bird; take, damage or destroy the nest of any wild bird while that nest is in use or being built (even of "pest" species); take or destroy the eggs of any wild bird.

Great Crested Newts

Great crested newts are protected under both English and European law. It is an offence to kill, injure, disturb or take great crested newts or to damage or destroy their places of shelter, whether the animals are present or not.

Water Vole

The water vole received limited legal protection in April 1998 through its inclusion in Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) for some offences. Legal protection makes it an offence to:

- intentionally kill, injure or take (capture) a water vole;

- possess or control a dead or live water vole, or any part of a water vole;
- intentionally or recklessly damage or destroy access to any structure or place which water voles use for shelter or protection or disturb Water Voles while they are using such a place;
- sell, offer for sale or advertise for sale live or dead Water Voles

Water voles, their breeding sites and resting places are protected by law. In most cases, work can be planned to avoid harming water voles. If works cannot avoid disturbing them or damaging their habitats, you may be able to get a licence from Natural England.

Otters

Otters are protected under Section 9 of the Wildlife and Countryside Act 1981 (as amended) and revised by the Countryside and Rights of Way Act 2004, making it an offence to:

- intentionally kill, injure or take an otter;
- possess or control any (live or dead) otter, or any part of or anything derived from an otter;
- intentionally or recklessly damage or destroy or obstruct access to any structure or place used for shelter or protection by an otter;
- intentionally or recklessly disturb an otter while it is occupying a structure or place for that purpose;
- to sell, offer for sale, possess or transport for the purpose of sale any (live or dead) otter or part or derivative of an otter;
- to advertise for buying and selling such things.

Furthermore, otters are included on Schedule 2 of the Conservation (Habitats &c.) Regulations (1994), making it an offence to:

- deliberately to capture or kill a wild animal of a European protected species;
- deliberately to disturb any such animal;
- deliberately to take or destroy the eggs of such an animal; or
- damage or destroy a breeding site or resting place of such an animal.

Otters are also listed as a priority species on the UK and Biodiversity Action Plans.

White-Clawed Crayfish

This crayfish is listed under Annex II of the habitats directive and areas are designated as Special Areas of Conservation to protect this species. Outside of this a licence is required to capture this species. It is listed as a priority species under the Biodiversity Action Plan and is a Species of Principal Importance under section 41 of the NERC Act 2006.

Reptiles

Reptiles such as common lizard, slowworm, grass snake or adder are protected under Section 9 of the Wildlife & Countryside Act (1981) as amended. The legislation makes it illegal to deliberately or recklessly kill or injure

any native reptile. This protection therefore requires that reasonable effort be made to avoid harm to reptiles during developments on land occupied by reptiles.

Badger

The Wildlife and Countryside Act (1981) and its subsequent amendment in 1985 made it an offence to take, kill, injure or ill-treat a badger. The badger gained further protection under the auspices of The Protection of Badgers Act (1992) which consolidates all former protective legislation in relation to badgers, except their inclusion on Schedule 6 of the Wildlife and Countryside Act 1981.

Under the 1992 Act, the badger sett is protected against obstruction, destruction, and damage; furthermore, the animal's access to and from the sett must not be impeded. It should be noted that the concept/definition of the sett extends beyond the main sett to include annexe, subsidiary and outlying setts. However, although the badger and its sett are protected (including access to the sett), the wider habitat and foraging ground is not.

Dormice

Dormice are protected from being killed, injured, captured or disturbed and their resting and breeding places should not be damaged or destroyed.

Natural England Licensing - EPS Mitigation Licensing

Licences can be obtained from the Wildlife Management and Licensing Service at Natural England to allow certain activities that would otherwise constitute an offence, for the purposes of development (e.g. destruction of a bat roost, loss of great crested newt aquatic and terrestrial habitat, etc).

Appendix E

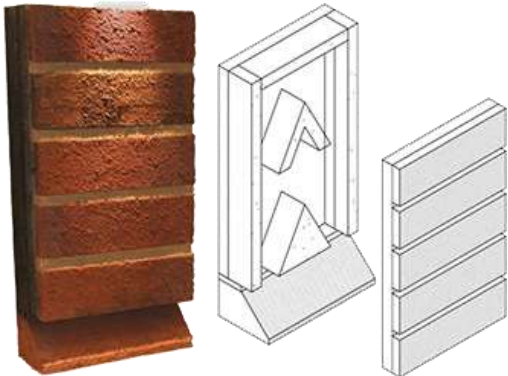



Plant species recorded on site

English name	Scientific name
Annual meadow grass	<i>Poa annua</i>
Ash	<i>Fraxinus excelsior</i>
Beech	<i>Fagus sylvatica</i>
Blackthorn	<i>Prunus spinosa</i>
Bramble	<i>Rubus fruticosus</i>
Bristly oxtongue	<i>Helminthotheca echioides</i>
Cherry	<i>Prunus avium</i>
Cherry laurel	<i>Prunus laurocerasus</i>
Chickweed	<i>Stellaria media</i>
Cleavers	<i>Galium aparine</i>
Cock's-foot	<i>Dactylis glomerata</i>
Corkscrew willow	<i>Salix matsudana</i>
Cordyline	<i>Cordyline sp.</i>
Creeping buttercup	<i>Ranunculus repens</i>
Daffodil	<i>Narcissus sp.</i>
Daisy	<i>Bellis perennis</i>
Dandelion	<i>Taraxacum officinale</i>
Dove's-foot cranesbill	<i>Geranium molle</i>
Elder	<i>Sambucus nigra</i>
Ground ivy	<i>Glechoma hederacea</i>
Groundsel	<i>Senecio vulgaris</i>
Hawkweed	<i>Hieracium sp.</i>
Herb-robert	<i>Geranium robertianum</i>
Ivy	<i>Hedera helix</i>
Jasmine	<i>Jasminum sp.</i>
Lavender	<i>Lavandula sp.</i>
Nettle	<i>Urtica dioica</i>
Pampas grass	<i>Cortaderia selloana</i>
Perennial ryegrass	<i>Lolium perenne</i>
Red dead-nettle	<i>Lamium purpureum</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Rosemary	<i>Salvia rosmarinus</i>
Spurge	<i>Euphorbia sp.</i>
Strawberry	<i>Fragaria × ananassa</i>
Thyme	<i>Thymus vulgaris</i>
White clover	<i>Trifolium repens</i>
Yorkshire fog	<i>Holcus lanatus</i>

Appendix F

Examples of bat and bird boxes

(images sourced from www.nhbs.com, www.habibat.co.uk and www.manthorpe.co.uk)

<p style="text-align: center;">Integrated bat box Habibat Bat Box</p> 	<p style="text-align: center;">Integrated bat box Bat Block</p> 
<p style="text-align: center;">Standalone bat box 2F Schwegler Bat Box (General purpose)</p> 	<p style="text-align: center;">Standalone bat box 1FF Schwegler Bat Box with built-in wooden rear panel</p> 

Recommendations for installing bat boxes:

(Sourced from Bat Conservation Trust www.bct.org)

Ideally, several boxes should be put up facing in different directions to provide a range of conditions.

Locate boxes:

- Where bats are known to feed close to hedges and treelines (some bats use a treeline or hedgerow for navigation, putting boxes near these features may help the bats find the box).
- On trees: boxes should be placed on the trunk of a mature tree, where there is a clear flight line/accessible entrance.
- On buildings: boxes should be placed as close to the eaves as possible.
- As high as possible (ideally, at least 3 to 4m above the ground, where safe installation is possible).
- In sunny places, sheltered from strong winds (usually between south-west and south-east).

Make sure the boxes are secured.

Boxes can be installed on trees using adjustable ties to avoid damaging the trees. Otherwise, timber screw bolts or nails can be used. Aluminium alloy nails are less likely to damage saws and chipping machinery.

Bats need time to find and explore new homes, and it may be several months or even years before boxes have residents. Once bats find a place they want to live they can return over and over again. Droppings on the landing area, urine stains around the lower parts of the box and chittering noises from inside on warm afternoons and evenings are signs of occupation.

<p>Small bird nesting box 1B Schwegler Nest Box</p> 	<p>Small bird nesting box 2H Schwegler Robin Box</p> 
<p>Integrated swift box Swift Block</p> 	<p>Integrated swift box Manthorpe Swift Brick</p> 
<p>Integrated sparrow terrace 1SP Schwegler Sparrow Terrace</p> 	<p>Integrated sparrow terrace Terraced Sparrow Box</p> 

Recommendations for installing bird boxes:

(Sourced from British Trust for Ornithology www.bto.org and Manthorpe www.manthorpe.co.uk)

The highest priority when siting a nest box must be to provide a safe and comfortable environment in which birds can nest successfully.

Tips for putting up a nest box:

- Boxes should be sited 1-3m from the ground, ideally on tree trunks but can be placed on the side of a shed or wall. Avoid areas where foliage obscures the entrance hole.
- Don't place boxes too close to another nest box of the same type, as this may promote aggressive behaviour between neighbours.
- Shelter your nest box from prevailing wind, rain and strong sunlight. The box should face between north and east, and angled vertically or slightly downwards to prevent rain entering.
- Make sure cats cannot get into the box.
- Keep nest box away from bird feeders.
- Use galvanized or stainless steel screws or nails. If fixing boxes to trees, galvanised wire can be used to tie the box to the trunk or hang it from a branch. Make sure to regularly inspect these fittings (every two or three years) to ensure the box remains securely attached.



Tips for putting up house sparrow terraces and swift bricks/boxes:

- Locate ≥ 5 m high on the gable wall of the property and above the level of the insulation zone.
- Where possible, install in locations that are unlikely to receive large amounts of direct sunlight during the hottest times of the day, ideal places include below the overhang of the verge and barge board.

Appendix G

Examples of hedgehog friendly fencing

(images sourced from www.quercusfencing.com and www.jackson-fencing.co.uk)

Quercus Fencing	Jacksons-Fencing
Hedgehog friendly oak woven fencing panels	Hedgehog friendly gravel board for use with slotted posts
	

Recommendations for installing hedgehog friendly fencing:

(Sourced from Hedgehog Street www.hedgehogstreet.org)

A hedgehog friendly fence should have a gap measuring at least 13cm by 13cm in the gravel board. These gaps allow any hedgehog to pass through but are too small for nearly all pets.

At least one hedgehog friendly fence panel should be located on each side of your garden, to provide unimpeded access.

Almost all fencing materials can be made hedgehog friendly, but may require DIY adaptations. Please note that some concrete gravel boards contain metal rods running along the length of the boards to provide strength and rigidity, and cannot be cut. To overcome this, a gap can be left between the gravel board and post to provide the required gap.

Appendix H

Native species suitable for planting and sowing

Plants should be obtained from specialist nurseries and preferably be of local genetic stock.

Key: (f) – fruit and berry species; (e) – evergreen species; (se) semi-evergreen species; (d) – deciduous species

Trees	
Alder (d)	<i>Alnus glutinosa</i>
Apples (f; d)	<i>Malus spp.</i> (local varieties)
Ash (d)	<i>Fraxinus excelsior</i>
Beech (d)	<i>Fagus sylvatica</i>
Bird cherry (f; d)	<i>Prunus padus</i>
Elder (f; d)	<i>Sambucus nigra</i>
Elm (d)	<i>Ulmus procera</i>
Field maple (d)	<i>Acer campestre</i>
Pedunculate oak (d)	<i>Quercus robur</i>
Rowan (f; d)	<i>Sorbus aucuparia</i>
Pears (f; d)	<i>Pyrus spp.</i>
Silver birch (d)	<i>Betula pendula</i>
Small-leaved lime (d)	<i>Tilia cordata</i>
White willow (d)	<i>Salix alba</i>
Wild cherry (f; d)	<i>Prunus avium</i>
Walnut (d)	<i>Juglans regia</i>

Shrubs	
Blackthorn (f; d)	<i>Prunus spinosa</i>
Buckthorn (f; d)	<i>Rhamnus catharticus</i>
Crab apple (f; d)	<i>Malus sylvestris</i>
Dog rose (f; d)	<i>Rosa canina</i>
Dogwood (f; d)	<i>Cornus sanguinea</i>
Field maple (d)	<i>Acer campestre</i>
Guelder-rose (f; d)	<i>Viburnum opulus</i>
Hawthorn (f; d)	<i>Crataegus monogyna</i>
Hazel (d)	<i>Corylus avellana</i>
Holly (e)	<i>Ilex aquifolium</i>
Honeysuckle (f; d)	<i>Lonicera periclymenum</i>
Spindle (f; d)	<i>Euonymus europaeus</i>
Wild privet (f; se)	<i>Ligustrum vulgare</i>
Yew (f; e)	<i>Taxus baccata</i>

Flowering plants	
Bird's-foot trefoil	<i>Lotus corniculatus</i>
Black knapweed	<i>Centaurea nigra</i>
Common cat's-ear	<i>Hypochoeris radicata</i>
Common sorrel	<i>Rumex acetosa</i>
Common vetch	<i>Vicia sativa</i>
Cowslip	<i>Primula veris</i>
Field scabious	<i>Knautia arvensis</i>
Foxglove	<i>Digitalis purpurea</i>
Lady's bedstraw	<i>Galium verum</i>
Meadow buttercup	<i>Ranunculus acris</i>
Meadow vetchling	<i>Lathyrus pratensis</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>
Primrose	<i>Primula vulgaris</i>
Red clover	<i>Trifolium pratense</i>
Selfheal	<i>Prunella vulgaris</i>
Sweet violet	<i>Viola odorata</i>
Wild daffodil	<i>Narcissus pseudonarcissus</i>
Yarrow	<i>Achillea millefolium</i>

Grasses	
Common bent	<i>Agrostis capillaris</i>
Crested dog's-tail	<i>Cynosurus cristatus</i>
Meadow fescue	<i>Festuca pratensis</i>
Red fescue	<i>Festuca rubra</i>
Rough meadow-grass	<i>Poa trivialis</i>
Small timothy	<i>Phleum bertolonii</i>
Smooth meadow-grass	<i>Poa pratensis</i>
Sweet vernal-grass	<i>Anthoxanthum odoratum</i>
Yellow oat-grass	<i>Trisetum flavescens</i>

Appendix I Bee Bricks



Bee Post



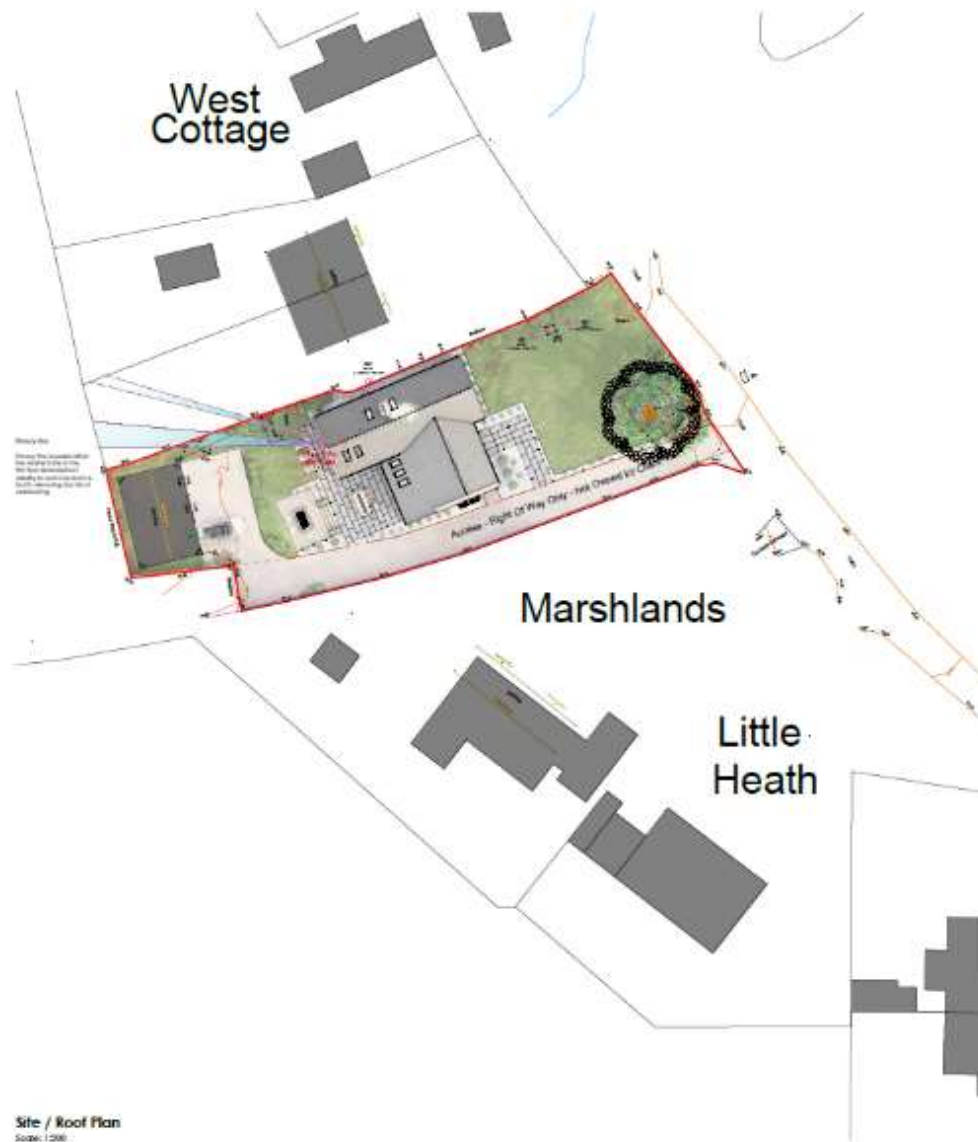
Bee Brick

Recommended bee brick installation

(Sourced from nhbs, <https://www.nhbs.com>)

- Bee bricks will be installed on a south facing sunny spot of an external wall of the residential dwelling, at a minimum height of 1m. No vegetation should be obstructing the holes.
- Bee posts will be positioned south facing in a sun exposed spot, with no vegetation covering the fascia. The posts must be set in a concrete base at a minimum of 30mm, similar to installing a fencepost.

Appendix J Proposed plans



AI
 Proposed Development of Site
 Other Controlled Land
 Highways
 Flood Risk Zone (Water / Soil)
 Flood Risk Zone (Surface Water)
 Special Protection Areas
 Woodlands / Deciduous Broadleaf Woodland
 SSSI
 Build Zone
 Scale: 1:200

AGORA ARCHITECTS
 AGORA ARCHITECTS
 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000, 1002, 1004, 1006, 1008, 1010, 1012, 1014, 1016, 1018, 1020, 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040, 1042, 1044, 1046, 1048, 1050, 1052, 1054, 1056, 1058, 1060, 1062, 1064, 1066, 1068, 1070, 1072, 1074, 1076, 1078, 1080, 1082, 1084, 1086, 1088, 1090, 1092, 1094, 1096, 1098, 1100, 1102, 1104, 1106, 1108, 1110, 1112, 1114, 1116, 1118, 1120, 1122, 1124, 1126, 1128, 1130, 1132, 1134, 1136, 1138, 1140, 1142, 1144, 1146, 1148, 1150, 1152, 1154, 1156, 1158, 1160, 1162, 1164, 1166, 1168, 1170, 1172, 1174, 1176, 1178, 1180, 1182, 1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 1510, 1512, 1514, 1516, 1518, 1520, 1522, 1524, 1526, 1528, 1530, 1532, 1534, 1536, 1538, 1540, 1542, 1544, 1546, 1548, 1550, 1552, 1554, 1556, 1558, 1560, 1562, 1564, 1566, 1568, 1570, 1572, 1574, 1576, 1578, 1580, 1582, 1584, 1586, 1588, 1590, 1592, 1594, 1596, 1598, 1600, 1602, 1604, 1606, 1608, 1610, 1612, 1614, 1616, 1618, 1620, 1622, 1624, 1626, 1628, 1630, 1632, 1634, 1636, 1638, 1640, 1642, 1644, 1646, 1648, 1650, 1652, 1654, 1656, 1658, 1660, 1662, 1664, 1666, 1668, 1670, 1672, 1674, 1676, 1678, 1680, 1682, 1684, 1686, 1688, 1690, 1692, 1694, 1696, 1698, 1700, 1702, 1704, 1706, 1708, 1710, 1712, 1714, 1716, 1718, 1720, 1722, 1724, 1726, 1728, 1730, 1732, 1734, 1736, 1738, 1740, 1742, 1744, 1746, 1748, 1750, 1752, 1754, 1756, 1758, 1760, 1762, 1764, 1766, 1768, 1770, 1772, 1774, 1776, 1778, 1780, 1782, 1784, 1786, 1788, 1790, 1792, 1794, 1796, 1798, 1800, 1802, 1804, 1806, 1808, 1810, 1812, 1814, 1816, 1818, 1820, 1822, 1824, 1826, 1828, 1830, 1832, 1834, 1836, 1838, 1840, 1842, 1844, 1846, 1848, 1850, 1852, 1854, 1856, 1858, 1860, 1862, 1864, 1866, 1868, 1870, 1872, 1874, 1876, 1878, 1880, 1882, 1884, 1886, 1888, 1890, 1892, 1894, 1896, 1898, 1900, 1902, 1904, 1906, 1908, 1910, 1912, 1914, 1916, 1918, 1920, 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, 1940, 1942, 1944, 1946, 1948, 1950, 1952, 1954, 1956, 1958, 1960, 1962, 1964, 1966, 1968, 1970, 1972, 1974, 1976, 1978, 1980, 1982, 1984, 1986, 1988, 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030, 2032, 2034, 2036, 2038, 2040, 2042, 2044, 2046, 2048, 2050, 2052, 2054, 2056, 2058, 2060, 2062, 2064, 2066, 2068, 2070, 2072, 2074, 2076, 2078, 2080, 2082, 2084, 2086, 2088, 2090, 2092, 2094, 2096, 2098, 2100, 2102, 2104, 2106, 2108, 2110, 2112, 2114, 2116, 2118, 2120, 2122, 2124, 2126, 2128, 2130, 2132, 2134, 2136, 2138, 2140, 2142, 2144, 2146, 2148, 2150, 2152, 2154, 2156, 2158, 2160, 2162, 2164, 2166, 2168, 2170, 2172, 2174, 2176, 2178, 2180, 2182, 2184, 2186, 2188, 2190, 2192, 2194, 2196, 2198, 2200, 2202, 2204, 2206, 2208, 2210, 2212, 2214, 2216, 2218, 2220, 2222, 2224, 2226, 2228, 2230, 2232, 2234, 2236, 2238, 2240, 2242, 2244, 2246, 2248, 2250, 2252, 2254, 2256, 2258, 2260, 2262, 2264, 2266, 2268, 2270, 2272, 2274, 2276, 2278, 2280, 2282, 2284, 2286, 2288, 2290, 2292, 2294, 2296, 2298, 2300, 2302, 2304, 2306, 2308, 2310, 2312, 2314, 2316, 2318, 2320, 2322, 2324, 2326, 2328, 2330, 2332, 2334, 2336, 2338, 2340, 2342, 2344, 2346, 2348, 2350, 2352, 2354, 2356, 2358, 2360, 2362, 2364, 2366, 2368, 2370, 2372, 2374, 2376, 2378, 2380, 2382, 2384, 2386, 2388, 2390, 2392, 2394, 2396, 2398, 2400, 2402, 2404, 2406, 2408, 2410, 2412, 2414, 2416, 2418, 2420, 2422, 2424, 2426, 2428, 2430, 2432, 2434, 2436, 2438, 2440, 2442, 2444, 2446, 2448, 2450, 2452, 2454, 2456, 2458, 2460, 2462, 2464, 2466, 2468, 2470, 2472, 2474, 2476, 2478, 2480, 2482, 2484, 2486, 2488, 2490, 2492, 2494, 2496, 2498, 2500, 2502, 2504, 2506, 2508, 2510, 2512, 2514, 2516, 2518, 2520, 2522, 2524, 2526, 2528, 2530, 2532, 2534, 2536, 2538, 2540, 2542, 2544, 2546, 2548, 2550, 2552, 2554, 2556, 2558, 2560, 2562, 2564, 2566, 2568, 2570, 2572, 2574, 2576, 2578, 2580, 2582, 2584, 2586, 2588, 2590, 2592, 2594, 2596, 2598, 2600, 2602, 2604, 2606, 2608, 2610, 2612, 2614, 2616, 2618, 2620, 2622, 2624, 2626, 2628, 2630, 2632, 2634, 2636, 2638, 2640, 2642, 2644, 2646, 2648, 2650, 2652, 2654, 2656, 2658, 2660, 2662, 2664, 2666, 2668, 2670, 2672, 2674, 2676, 2678, 2680, 2682, 2684, 2686, 2688, 2690, 2692, 2694, 2696, 2698, 2700, 2702, 2704, 2706, 2708, 2710, 2712, 2714, 2716, 2718, 2720, 2722, 2724, 2726, 2728, 2730, 2732, 2734, 2736, 2738, 2740, 2742, 2744, 2746, 2748, 2750, 2752, 2754, 2756, 2758, 2760, 2762, 2764, 2766, 2768, 2770, 2772, 2774, 2776, 2778, 2780, 2782, 2784, 2786, 2788, 2790, 2792, 2794, 2796, 2798, 2800, 2802, 2804, 2806, 2808, 2810, 2812, 2814, 2816, 2818, 2820, 2822, 2824, 2826, 2828, 2830, 2832, 2834, 2836, 2838, 2840, 2842, 2844, 2846, 2848, 2850, 2852, 2854, 2856, 2858, 2860, 2862, 2864, 2866, 2868, 2870, 2872, 2874, 2876, 2878, 2880, 2882, 2884, 2886, 2888, 2890, 2892, 2894, 2896, 2898, 2900, 2902, 2904, 2906, 2908, 2910, 2912, 2914, 2916, 2918, 2920, 2922, 2924, 2926, 2928, 2930, 2932, 2934, 2936, 2938, 2940, 2942, 2944, 2946, 2948, 2950, 2952, 2954, 2956, 2958, 2960, 2962, 2964, 2966, 2968, 2970, 2972, 2974, 2976, 2978, 2980, 2982, 2984, 2986, 2988, 2990, 2992, 2994, 2996, 2998, 3000, 3002, 3004, 3006, 3008, 3010, 3012, 3014, 3016, 3018, 3020, 3022, 3024, 3026, 3028, 3030, 3032, 3034, 3036, 3038, 3040, 3042, 3044, 3046, 3048, 3050, 3052, 3054, 3056, 3058, 3060, 3062, 3064, 3066, 3068, 3070, 3072, 3074, 3076, 3078, 3080, 3082, 3084, 3086, 3088, 3090, 3092, 3094, 3096, 3098, 3100, 3102, 3104, 3106, 3108, 3110, 3112, 3114, 3116, 3118, 3120, 3122, 3124, 3126, 3128, 3130, 3132, 3134, 3136, 3138, 3140, 3142, 3144, 3146, 3148, 3150, 3152, 3154, 3156, 3158, 3160, 3162, 3164, 3166, 3168, 3170, 3172, 3174, 3176, 3178, 3180, 3182, 3184, 3186, 3188, 3190, 3192, 3194, 3196, 3198, 3200, 3202, 3204, 3206, 3208, 3210, 3212, 3214, 3216, 3218, 3220, 3222, 3224, 3226, 3228, 3230, 3232, 3234, 3236, 3238, 3240, 3242, 3244, 3246, 3248, 3250, 3252, 3254, 3256, 3258, 3260, 3262, 3264, 3266, 3268, 3270, 3272, 3274, 3276, 3278, 3280, 3282, 3284, 3286, 3288, 3290, 3292, 3294, 3296, 3298, 3300, 3302, 3304, 3306, 3308, 3310, 3312, 3314, 3316, 3318, 3320, 3322, 3324, 3326, 3328, 3330, 3332, 3334, 3336, 3338, 3340, 3342, 3344, 3346, 3348, 3350, 3352, 3354, 3356, 3358, 3360, 3362, 3364, 3366, 3368, 3370, 3372, 3374, 3376, 3378, 3380, 3382, 3384, 3386, 3388, 3390, 3392, 3394, 3396, 3398, 3400, 3402, 3404, 3406, 3408, 3410, 3412, 3414, 3416, 3418, 3420, 3422, 3424, 3426, 3428, 3430, 3432, 3434, 3436, 3438, 3440, 3442, 3444, 3446, 3448, 3450, 3452, 3454, 3456, 3458, 3460, 3462, 3464, 3466, 3468, 3470, 3472, 3474, 3476, 3478, 3480, 3482, 3484, 3486, 3488, 3490, 3492, 3494, 3496, 3498, 3500, 3502, 3504, 3506, 3508, 3510, 3512, 3514, 3516, 3518, 3520, 3522, 3524, 3526, 3528, 3530, 3532, 3534, 3536, 3538, 3540, 3542, 3544, 3546, 3548, 3550, 3552, 3554, 3556, 3558, 3560, 3562, 3564, 3566, 3568, 3570, 3572, 3574, 3576, 3578, 3580, 3582, 3584, 3586, 3588, 3590, 3592, 3594, 3596, 3598, 3600, 3602, 3604, 3606, 3608, 3610, 3612, 3614, 3616, 3618, 3620, 3622, 3624, 3626, 3628, 3630, 3632, 3634, 3636, 3638, 3640, 3642, 3644, 3646, 3648, 3650, 3652, 3654, 3656, 3658, 3660, 3662, 3664, 3666, 3668, 3670, 3672, 3674, 3676, 3678, 3680, 3682, 3684, 3686, 3688, 3690, 3692, 3694, 3696, 3698, 3700, 3702, 3704, 3706, 3708, 3710, 3712, 3714, 3716, 3718, 3720, 3722, 3724, 3726, 3728, 3730, 3732, 3734, 3736, 3738, 3740, 3742, 3744, 3746, 3748, 3750, 3752, 3754, 3756, 3758, 3760, 3762, 3764, 3766, 3768, 3770, 3772, 3774, 3776, 3778, 3780, 3782, 3784, 3786, 3788, 3790, 3792, 3794, 3796, 3798, 3800, 3802, 3804, 3806, 3808, 3810, 3812, 3814, 3816, 3818, 3820, 3822, 3824, 3826, 3828, 3830, 3832, 3834, 3836, 3838, 3840, 3842, 3844, 3846, 3848, 3850, 3852, 3854, 3856, 3858, 3860, 3862, 3864, 3866, 3868, 3870, 3872, 3874, 3876, 3878, 3880, 3882, 3884, 3886, 3888, 3890, 3892, 3894, 3896, 3898, 3900, 3902, 3904, 3906, 3908, 3910, 3912, 3914, 3916, 3918, 3920, 3922, 3924, 3926, 3928, 3930, 3932, 3934, 3936, 3938, 3940, 3942, 3944, 3946, 3948, 3950, 3952, 3954, 3956, 3958, 3960, 3962, 3964, 3966, 3968, 3970, 3972, 3974, 3976, 3978, 3980, 3982, 3984, 3986, 3988, 3990, 3992, 3994, 3996, 3998, 4000, 4002, 4004, 4006, 4008, 4010, 4012, 4014, 4016, 4018, 4020, 4022, 4024, 4026, 4028, 4030, 4032, 4034, 4036, 4038, 4040, 4042, 4044, 4046, 4048, 4050, 4052, 4054, 4056, 4058, 4060, 4062, 4064, 4066, 4068, 4070, 4072, 4074, 4076, 4078, 4080, 4082, 4084, 4086, 4088, 4090, 4092, 4094, 4096, 4098, 4100, 4102, 4104, 4106, 4108, 4110, 4112, 4114, 4116, 4118, 4120, 4122, 4124, 4126, 4128, 4130, 4132, 4134, 4136, 4138, 4140, 4142, 4144, 4146, 4148, 4150, 4152, 4154, 4156, 4158, 4160, 4162, 4164, 4166, 41