

WILD FRONTIER ECOLOGY

Garden of Eden, Morston



Ecology Report

July 2021

Report produced by	Submitted to
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The data which we have prepared and provided are accurate, and have been prepared and provided in accordance with the CIEEM's Code of Professional Conduct. We confirm that any opinions expressed are our best and professional bona fide opinions.

This report conforms to the British Standard 42020:2013 Biodiversity - Code of practice for planning and development.

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1. Non-Technical Summary

Wild Frontier Ecology Ltd. (WFE) was commissioned to undertake a Protected Species assessment of a chalet type holiday cottage at Garden of Eden in Morston, Norfolk. The proposal is to demolish the cottage and replace it with a substantially larger dwelling with annex and large storage shed.

A site survey and visual inspection of the buildings was undertaken on 26th October 2020. The site comprises a single dwelling set in the centre of a large garden with scattered trees, and a number of small outbuildings around the edge. The main chalet is single-storey and of brick construction, timber clad on the east and west sides, with a timber porch and a flint cobble chimney on the southern end. The roof is felted and lined with board. The only potential bat roost feature identified was a crack in the exterior of the chimney on the south elevation of the building, in which a small number of potential bat droppings (of indeterminate age) were identified.

Two nocturnal bat roost activity surveys were undertaken in the active season of 2021: a dusk emergence survey and a dawn return survey. No bats were recorded using the identified potential roost feature on either survey. Upon thorough examination following the dawn survey, significant spider webbing and a lack of any evidence of use (e.g. droppings) associated with the potential roost feature indicate an absence of bat roosts.

These survey results are considered valid for approximately one year. If works are to take place after this time, a re-evaluation of the potential roost feature will be required.

The site is in close proximity to the North Norfolk Coast SSSI/Ramsar/SPA/SAC and several designated sites. However, given the small scale of works proposed, there is limited potential for other protected or conservation-valued species and habitats to be impacted by the works.

Best practice mitigation is proposed, and enhancements have been advised to ensure a positive impact for local biodiversity.

2. Background

Wild Frontier Ecology Ltd. (WFE) was commissioned to undertake a Protected Species survey of the property Garden of Eden in Morston (approximately centred on National Grid Reference: TG 0072 4394) as shown by the red outline in Figure 1.

The proposal is to demolish the existing building and replace it with a more extensive property including a garage, annex and swimming pool (Figures 2 & 3).

Figure 1. Site Location

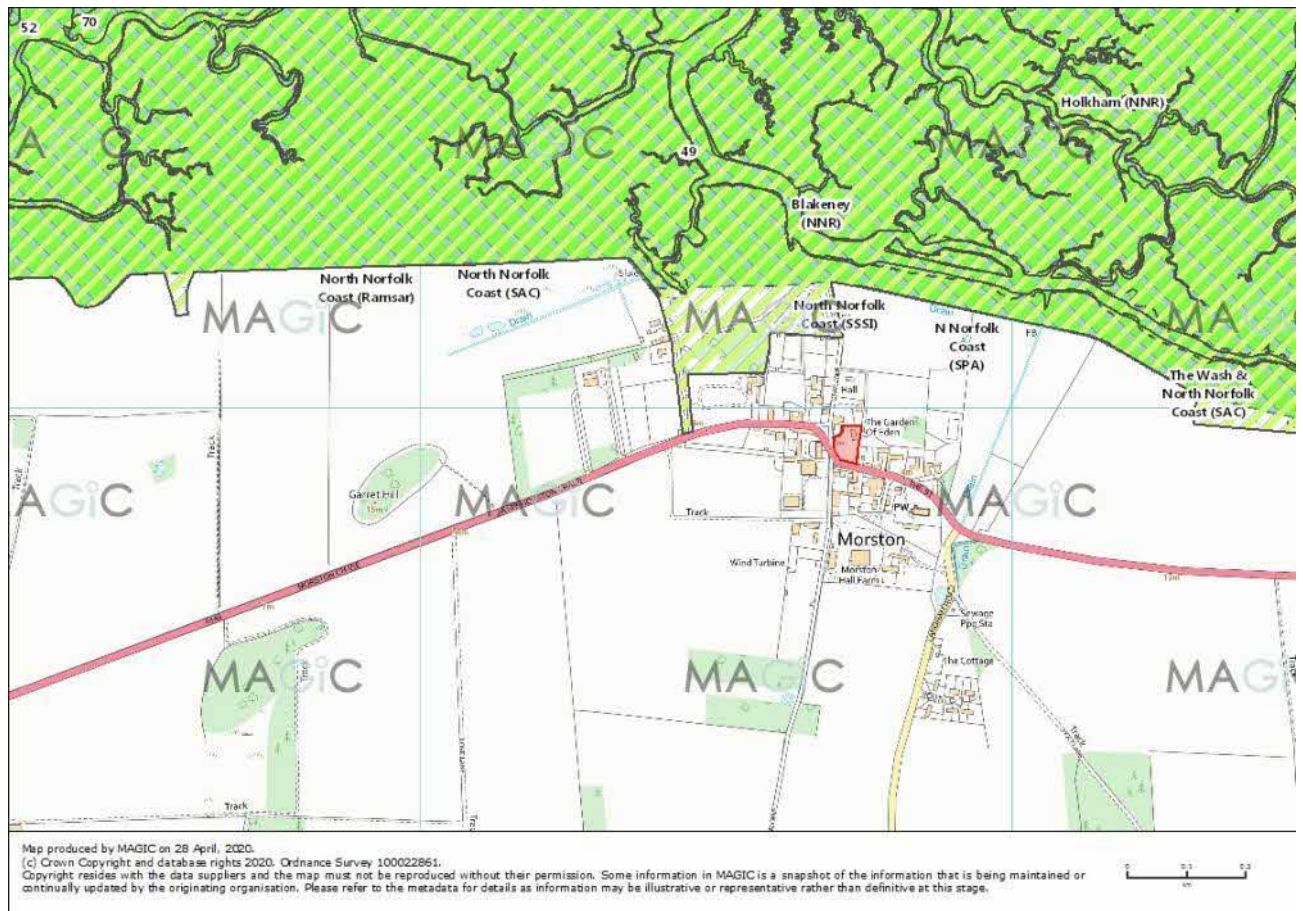


Figure 2. Existing Site Layout - as supplied by client



Figure 3: Proposed site plans - as supplied by client



2.2 Objectives

The purpose of this report is to describe the habitats, protected species potential, any designated nature conservation sites, and any other ecological issues within the potential zone of influence of the proposed development. This will inform an assessment of potential impacts on valued ecological receptors. Where appropriate, advice is provided on avoidance, mitigation, or compensatory measures needed to address the expected risks.

This report is to be used in support of an application for planning permission.

3. Relevant Legislation and Policy

3.1. Statutory and Non-statutory Site Designations

3.1.1. International (European) Site Designations

The European Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) as amended directs the designation of important wildlife sites through the European Community as Special Areas of Conservation (SACs), and gives statutory protection to habitats and species listed in the Directive as being threatened or of community interest. Sites identified as candidate SAC (cSAC) are provided with the same level of protection as SAC.

Annex I of 92/43/EEC as amended lists habitat types which are regarded as being of European importance. Included within these are a number of 'priority habitat types' which are habitats regarded as being in danger of disappearance and whose natural range falls broadly within the European Union. This European law had been transposed into UK legislation by The Conservation (Natural Habitats) &c Regulations 1994, now replaced by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

Habitats of European-wide importance for birds are listed under the EC Wild Birds Directive (79/409/EEC) as amended. Habitats designated under this Directive are notified as Special Protection Areas (SPAs) and are identified for holding populations > 1% of the reference population as defined in Appendix 4 of the SPA review of bird species listed in Annex 1 of the same Council Directive. Sites identified as potential SPA (pSPA) are provided with the same level of protection as SPA.

Wetlands of International Importance are designated under the Ramsar Convention.

3.1.2. National (UK) Site Designations

National ecological designations, such as Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) are also afforded statutory protection. SSSIs are notified and protected under the jurisdiction of the Wildlife and Countryside Act 1981 (WCA 1981) as amended. SSSIs are notified based on specific criteria, including the general condition and rarity of the site and of the species or habitats supported by it.

3.1.3. Non-Statutory County Site Designations

Local authorities may designate certain areas as being of local conservation interest. The criteria for inclusion may vary between areas. Most individual counties have a similar scheme; within Norfolk such sites are designated as County Wildlife Sites (CWS). Designation of such sites does not itself confer statutory protection, but they are a material consideration when planning applications are being determined.

3.2. Species Designation and Protection

3.2.1. Bats

All bat species are listed under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Bats and their roosts also receive protection from disturbance from by the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000). This protection extends to both the species and roost sites. It is an offence to kill, injure, capture, possess or otherwise disturb

bats. Bat roosts are protected at all times of the year (making it an offence to damage, destroy or obstruct access to bat roosts), regardless of whether bats are present at the time.

3.2.2. Badgers

The Protection of Badgers Act 1992 makes it unlawful to knowingly kill, capture, disturb or injure an individual badger *Meles meles*, or to intentionally damage, destroy or obstruct an area used for breeding, resting or sheltering by badgers (i.e. a sett).

3.2.3. Riparian Mammals

The water vole *Arvicola amphibius* is protected in accordance with Schedule 5 of the WCA 1981. It is an offence to intentionally damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection, or to disturb water voles whilst they are using such a place. It is also an offence to kill, injure, capture or possess water voles.

Otters *Lutra lutra* are protected in accordance with Schedule 5 of the WCA 1981. The otter is protected under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. It is an offence to intentionally kill, injure or take an otter from the wild, or to intentionally or recklessly damage, destroy or obstruct access to any habitat used by otters or to disturb the otters which make use of those habitats.

3.2.4. Birds

All bird species are protected under the Wildlife and Countryside Act 1981 as amended. This prevents killing or injuring any bird or damaging or destroying nests and eggs. Certain species (including barn owl *Tyto alba*) are also listed under Schedule 1 of the Wildlife and Countryside Act 1981, which prohibits intentionally or recklessly disturbing the species at, on or near an 'active' nest.

The British Trust for Ornithology (BTO) lists Birds of Conservation Concern (BoCC), which fall into three categories: Red-listed - species of high concern; Amber-listed - species of medium concern; and Green-listed - species of lower concern¹. Species are placed on these lists based, among other criteria, on the percentage decline of breeding or wintering populations in recent years. These lists do not indicate rarity for the species concerned, and many listed species are currently common and widespread.

3.2.5. Reptiles

All native reptiles are listed on Schedule 5 of the Wildlife and Countryside Act 1981, and are afforded protection under Sections 9(1) and 9(5). For the reptile species occurring in Norfolk (adder *Vipera berus*, grass snake *Natrix helvetica*, slow-worm *Anguis fragilis* and common lizard *Zootoca vivipara*), this protection prohibits deliberate or reckless killing and injury but does not include habitat protection.

3.2.6. Great Crested Newts

¹ Eaton M. et al (2015). Birds of Conservation Concern 4. The Population Status of Birds in the UK, Channel Islands and Isle of Man. *British Birds* 108: 708-746.

The great crested newt *Triturus cristatus* is fully protected in accordance with both national and international legislation. The species is listed under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The species is also protected by Sections 9(4) and 9(5) of the Wildlife and Countryside Act 1981 as amended. It is an offence to knowingly or recklessly kill, injure, disturb, handle or sell the animal, and this protection is afforded to all life stages. It is unlawful to deliberately or recklessly damage, destroy, or obstruct the access to any structure or place used for shelter or protection; this includes both the terrestrial and aquatic components of its habitat.

3.2.7. White clawed crayfish

White clawed crayfish are listed on Schedule 5 of the Wildlife and Countryside Act 1981 but only receive protection under Sections 9(1) and 9(5). This makes it an offence to take or sell white-clawed crayfish. Section 9 applies to all stages in their life cycle.

3.2.8. Plants

Schedule 8 of the WCA 1981 lists plant species which are afforded special protection. It is an offence to pick, uproot or destroy any species listed on Schedule 8 without prior authorisation, and all plants are protected from unauthorised uprooting (i.e. without the landowner's permission) under Schedule 13 of the WCA 1981.

A Vascular Plant Red List for England² provides a measure of the current state of England's flora measured against standardised IUCN criteria. Any taxon that is threatened - Critically Endangered (CR), Endangered (EN), Vulnerable (VU) - or Near Threatened (NT) does not have statutory protection but should be regarded as a priority for conservation in England. It should be noted that 'threat' is not synonymous with 'rarity'; some of the species concerned remain relatively common and widespread.

It is an offence to plant or cause to spread in the wild of certain plant species under Schedule 9 of the Wildlife and Countryside Act 1981. Plant species relevant to the East of England are as follows:

Himalayan Balsam *Impatiens glandulifera*
 Variegated yellow archangel *Lamiastrum galeobdolon* ssp *argentatum*
 Virginia creeper *Parthenocissus quinquefolia*
 False acacia *Robinia pseudoacacia*
 Water fern *Azolla filiculoides*
 Giant Hogweed *Heracleum mantegazzianum*
 Knotweed species including Japanese knotweed *Fallopia japonica*
 Parrot's feather *Myriophyllum aquaticum*
 Floating pennywort *Hydrocotyle ranunculoides*
 Rhododendron *Rhododendron ponticum*
 Giant rhubarb *Gunnera tinctoria*
 New Zealand Pigmyweed *Crassula helmsii*
 Waterweeds *Elodea* spp.

All waste containing Japanese knotweed comes under the control of Part II of the Environmental Protection Act 1990 and is classified as controlled waste.

² Stroh P.A., Leach S.J., August T.A., Walker K.J., Pearman D.A., Rumsey F.J., Harrower C.A., Fay M.F., Martin J.P., Pankhurst T., Preston C.D. & Taylor I. (2014). A Vascular Plant Red List for England. Botanical Society of Britain and Ireland, Bristol.

3.3. Priority Species and Habitats

Other priority species and habitats which are a consideration under the National Planning Policy Framework (NPPF) 2019, placing responsibility on Local Planning Authorities to aim to conserve and enhance biodiversity and to encourage biodiversity in and around developments. There is a general biodiversity duty in the Natural Environment and Rural Communities (NERC) Act 2006 (Section 40) which requires every public body in the exercising of its functions to ‘have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity’. Biodiversity, as covered by the Section 40 duty, includes all biodiversity, not just the Habitats and Species of Principal Importance.

Section 41 of the NERC Act lists a number of species and habitats as being Species/Habitats of Principal Importance. These are species/habitats in England (commonly known as Priority Habitats/ Species) which had been identified as requiring action under the UK BAP, and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. The protection of either Priority Species or Habitats is not statutory, but “specific consideration”³ should be afforded by Local Planning Authorities when dealing with them in relation to planning and development control. Also, there is an expectation that public bodies would refer to the Section 41 list when complying with the Section 40 duty.

Widespread Priority Habitats in East Anglia include:

- Arable field margins
- Traditional orchards
- Hedgerows
- Eutrophic standing waters
- Ponds
- Rivers
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland meadows
- Lowland fen
- Coastal and floodplain grazing marsh
- Reedbeds
- Lowland mixed deciduous woodland
- Wet woodland
- Wood-pasture and parkland

Widespread Priority Species in East Anglia (which have no specific legal protection) include:

- Common toad *Bufo bufo*
- Hedgehog *Erinaceus europaeus*
- Brown hare *Lepus europaeus*
- Harvest mouse *Micromys minutus*
- Small heath butterfly *Coenonympha pamphilus*
- Wall butterfly *Lasiommata megera*
- Cinnabar moth *Tyria jacobaeae*

³ JNCC (2015) UK BAP priority species and habitats

<http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>

Many red-listed bird species are also Priority Species.

3.4. Local Species and Habitat Designations

The Norfolk Biodiversity Partnership (NBP) has published Habitat and Species Action Plans for selected species occurring within Norfolk. Each Action Plan lists current actions and defines objectives and targets.

The NBP has also published Biodiversity Supplementary Planning Guidance⁴ for Norfolk. This document sets out the key considerations relating to wildlife and biodiversity that should be taken into account for all Norfolk development proposals.

3.5. Policy

The overarching policy guidance for biodiversity is included within the National Planning Policy Framework (NPPF⁵). Section 15 of this document (Conserving and Enhancing the Natural Environment) outlines the approach that Local Authorities should adopt when considering ecological issues within the planning framework, including the principles of the Mitigation Hierarchy. This espouses that in addressing impacts on valued features, avoidance should be the first option considered, followed by mitigation (minimising negative impacts). Where avoidance and mitigation are not possible, compensation for loss of features can be used as a last resort. Paragraphs 170, 174 and 175 of the NPPF give policy support to the provision of measurable net gains in biodiversity. Paragraph 174 specifies that plans should identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including locally designated sites (such as CWS). It also promotes the conservation, restoration and enhancement of priority habitats and ecological networks and the protection and recovery of priority species.

⁴ <http://www.norfolkbiodiversity.org/assets/Uploads/Planning-guidelines2.pdf>

⁵ MHCLG (2019). National Planning Policy Framework. UK Government.

4. Survey Methods

4.1 Desk Study

The Multi Agency Geographic Information for the Countryside (MAGIC) website⁶, which is managed by Natural England, was reviewed to identify any internationally or nationally designated nature conservation sites (Special Protection Areas, Special Areas of Conservation, Ramsar sites, National Nature Reserves and Sites of Special Scientific Interest) within 2 kilometres (km) of the proposed development site. Information on any identified sites was obtained from the websites of the Joint Nature Conservation Committee⁷ and Natural England⁸.

Google Earth and/or Bing Maps aerial photographs, along with Ordnance Survey 1:25,000 maps were used to examine the local landscape (e.g., identify nearby ponds, woodland, hedgerows, etc.).

4.2 Field Survey

4.2.1 Building Inspection

The preliminary roost assessment was undertaken on 26th October 2020 by Mary Goddard BSc MSc (Natural England great crested newt survey licence number 2018-34046-CLS-CLS, Natural England bat survey licence number 2019-43829-CLS-CLS). The weather during the survey was wet with 95% cloud cover and low wind.

The chalet was investigated for evidence of bat use and bat roosting potential. The search for bat roosts was not only for bats in situ, but also for the more likely droppings, urine and body oil stains and accumulations of feeding remains (insect parts). Torches, ladder, binoculars and a digital endoscope were all on-hand for use. Signs of building use by barn owls and other birds were also searched for including nesting sites, feathers, droppings and pellets.

A brief site walkover was undertaken with a general evaluation of potential habitats for any protected or valued species. Photographs were taken to record key features/views.

4.2.2 Nocturnal Surveys

Surveys were undertaken in accordance with the Bat Conservation Trust (BCT) guidance⁹. The first nocturnal survey was a dusk emergence survey, completed on 11/05/21 by M. Goddard, positioned on site just south of the building. The second survey was a dawn return survey, completed on 08/06/21 by M. Goddard, assisted by a Pulsar Helion thermal imaging camera covering the potential roost feature whilst it was too dark to see by eye, positioned just south of the building.

The surveyor monitored the exterior of the building with recording devices (AnaBat SD1 and AnaBat Express detectors) to detect any bats emerging from (at dusk) or returning to (at dawn) the building. The dusk monitoring position was effective from 15 minutes before sunset and held for 80 minutes post-sunset, until it was too dark to see. The

⁶ www.magic.gov.uk

⁷ jncc.defra.gov.uk

⁸ www.naturalengland.org.uk

dawn monitoring position covered the potential roost feature from 90 minutes before sunrise until 15 minutes post-sunrise.

On 11/05/21, sunset was at 20:40 and the conditions were good: cloud cover was estimated at 30%, there was no precipitation, there was a light breeze and the temperature started at 13.5°C at the beginning of the survey, falling to 10.5°C by the end of the survey. On 08/06/21, sunrise was at 04:31 and conditions were good: cloud cover was 85%, there was no precipitation, there was a light breeze and the temperature at the beginning of the survey was 13.5°C, rising to 15°C by the end of the survey.

Data analysis of the recordings was carried out using AnaLookW. The sonograms were analysed by M. Goddard using species filters for sorting, and checking identifications by comparing shapes and measurements (peak call frequency, call frequency range, mode pulse interval, and slope) to reference measurements and/or sonograms provided by Russ⁹, Sowler¹⁰ and WFE's in-house call reference library.

⁹ Russ, J. (2012); *British Bat Calls: A Guide to Species Identification*, Pelagic Press, Exeter.

¹⁰ Sowler, S. (2010); *Difficult Sonograms and Social Calls - Advanced AnaBat Analysis*, Alana Ecology Workshop, Bury St. Edmunds.

5. Results

5.1 Desk Study

5.1.1 Local Landscape Description

The site is located in the centre of the village of Morston, north of the A149 and within 0.5km of the North Norfolk Coast Ramsar/ SAC/ SPA salt marshes. To the south the landscape is largely flat and occupied by arable farming.

5.1.2 Information on Designated Sites

North Norfolk Coast SPA, SAC, SSSI and Ramsar site lies 0.2km to the north of the landholding, and the boundary of the Wash and North Norfolk Coast SAC is just beyond at an approximate distance of 0.27km from the site.

The SPA is designated for internationally important bird assemblages including key breeding and wintering species (wildfowl, waders, terns and marsh harrier *Circus aeruginosus*). The SACs are noted for coastal and marine habitats. Key species for which sites are designated include otter (both SACs), great crested newt and petalwort *Petalophyllum ralfsii* (North Norfolk Coast), and grey seal *Halichoerus grypus* and common seal *Phoca vitulina* (Wash and North Norfolk Coast).

The Ramsar sites are listed for many of the species previously mentioned. The North Norfolk Coast Ramsar site is also noted for natterjack toad *Epidalea calamita*, ten nationally important plant species, and a diverse assemblage of invertebrates. The North Norfolk Coast SSSI is noted for a variety of coastal habitats and associated plant communities and bird populations, natterjack toad and otter.

There are four SSSIs within 2km of the site, and two National Nature Reserves (NNR) noted for their geology and for habitats that support breeding colonies of priority bird species.

There is one County Wildlife Site (Morston Marshes) within 1km.

The statutory sites located within 2km of the proposed development are listed below in Table 1:

Table 1: Statutory Sites

Site Name	Site Type/ Number	Distance from Site	Comments
North Norfolk Coast	Ramsar, SAC, SPA, SSSI	0.2km N	The area consists primarily of intertidal sands and muds, saltmarshes, shingle banks and sand dunes, and its range of habitats make it especially valuable for migratory birds and wintering waterfowl, Contains Annex I marine features and Annex II species
Holkham	NNR	1.9km W	Incorporated in Morston and North Norfolk SSSI

Blakeney	NNR	1.9km W	Incorporated in Morston and North Norfolk SSSI
Morston Cliffs	SSSI	1.6km W	The only interglacial raised-beach deposit in East Anglia
Wiveton Down	SSSI	0.8km E	A wide range of features, most of which have exposures, unusual in such close proximity particularly in southern England.
Stiffkey Valley	SSSI	1.8km W	A wetland habitat supporting nationally important populations of breeding avocet <i>Recurvirostra avosetta</i> and other wetland birds.
Cockthorpe Common	SSSI	1.9km W	Unimproved chalk downland – rare in Norfolk
Morston Marshes	CWS #1112	0.2km NW	The site comprises an area of high-level salt marsh surrounding an offshoot of Morston Creek, grading to dry neutral grassland and dense scrub.

5.2 Site Surveys

5.2.1 Building Inspection

The main dwelling was assessed; the only other buildings on site were two sheds and a dog kennel which did not warrant inspections or assessment.

The chalet was constructed in the 1950s and is in good condition. It is currently used as a holiday home. It is single-storey with gable walls of brick construction; the east and west elevations are timber clad (see Photo 18, Appendix 1). The west elevation also has a timber entrance porch (Photo 2) while the southern gable end also has a cobble clad chimney (Photo 8). The roof is covered in bitumastic felt with a wood lining. The cladding is in good condition and tight fitting (Photo 3) and the brickwork is sound. There are ventilation bricks with small holes at the gables (Photo 5) and the timber soffit boxes show some signs of rot (Photo 16). The windows are timber framed and in good condition.

A small number of droppings (of indeterminate age) which may have been associated with bats were observed (using an endoscope) inside a crevice in the exterior of the chimney where it meets the roof (Photo 9). Overall, the property was appraised as having moderate potential for bats in accordance with the aforementioned BCT guidelines.

Inside, the property has timber clad walls and a single roof void that runs the length of the property, lined with wooden boards (Photo 4). The roof void was very cobwebby, particularly around the vents, (Photo 5) making it unlikely that bats had used it recently. There were signs that the space had been used by nesting birds (Photo 6), with remains of house sparrow *Passer domesticus* nests and intact house martin *Delichon urbicum* cups, plus the skeleton of a chick and numerous droppings (Photo 7).

5.2.2 Surrounding Habitats

The property sits in the centre of the plot and is surrounded by a garden that is predominantly lawn with some fruit trees and sycamore *Acer pseudoplatanus* (Photo 10). The south and western boundary is a brick and cobble wall (Photo 1 and 17). The other two boundaries are fence and hedgerow. The access is via a gate in the wall on the western side, on a restricted byway that leads to the marshes. The A149 runs to the south of the site and there are other properties immediately to the north and east.

Outside the property is largely amenity grassland comprising perennial rye grass *Lolium perenne*, daisy *Bellis perennis*, chickweed *Stellaria media* and springy turf moss *Rhytidiadelphus squarrosus* (Photos 10 and 15) with five mature sycamores, one of which is to be felled. This was also assessed for bat roosts and was found to be of negligible potential (Photos 11 and 12). Other trees on site are fruit bearing species such as pear, plum and apple (Photo 13). These will all provide nesting potential for birds and foraging potential for small animals. There were also a couple of scrubby areas including a rubble pile and some bramble *Rubus* spp. and buddleia *Buddleja* spp. that may also provide refuge potential for amphibians and small mammals.

An annotated image detailing the habitats is shown in Figure 4 below.

5.2.3 Dusk Emergence Survey 11/05/21

The first bat recorded during the survey was a noctule *Nyctalus noctula*, foraging high over the site just before sunset. The first bat recorded within the site boundary was a common pipistrelle *Pipistrellus pipistrellus*, observed foraging around the garden of the property at 20:56. Common and soprano pipistrelles *Pipistrellus pygmaeus* were observed making multiple passes around the house and garden throughout the remainder of the survey, exhibiting foraging behaviour. No bats were witnessed emerging from (or showing interest in) the potential roost feature in the chimney.

5.2.4 Dawn Return Survey 08/06/21

During the dawn survey, common pipistrelles were recorded foraging around the site from the beginning of the survey at 03:00 until approximately 15 minutes before sunrise. In addition, at least one soprano pipistrelle (03:41) and one Nathusius' pipistrelle *Pipistrellus nathusii* (03:02) registration were recorded by the bat detectors. No bats were observed entering the potential roost feature in the chimney or showing an interest in the feature.

On completion of the dawn return survey, a thorough inspection of the potential roost feature was completed by M. Goddard, using a ladder for access and a torch and endoscope to investigate the feature. The search was for bats in situ and signs of use, including any bat droppings which could be collected for DNA analysis. Spider webbing was evident across the niche (Photo 19), indicating a lack of recent use by bats (or other small mammals or birds). The interior of the niche showed no signs of use, with a complete lack of any discernible bat droppings, only some detritus in the bottom of the niche.

Figure 4: Habitats map



5.3 Constraints and Limitations of Survey

There were no significant constraints to the survey.

5.4 Further Survey Requirements

The data from the bat surveys carried out in the 2021 will be valid for approximately one year. If works to the building commence after this time, then an updated assessment of the potential roost feature will be required.

6. Impact Assessment

6.1 Potential Impacts on Ecological Receptors

This impact assessment is made with reference to the CIEEM EcIA Guidelines¹¹.

Throughout, italicised words are used in the technical sense defined within the CIEEM guidance. This refers to the geographical context of the impact or effect. Hence, the following geographical frame of reference will be used to describe the ecological impacts and effects, or adapted to suit local circumstances:

- International and European
- National
- Regional
- County (or metropolitan, vice-county or other local authority-wide area where relevant)
- District*
- Local

*District level is not listed in the EcIA guidance, but is included within WFE reports as it is a useful and readily identifiable geographic unit.

The local/parish geographical context for the proposal site is defined here as the civil parish of Morston, in which the site is situated. The district context is North Norfolk, the county is Norfolk and the region is East Anglia.

The EcIA guidelines espouse a quantification of impact/effect magnitude where possible. Where this is not available or uncertain, impact magnitude categories and criteria are defined based on Byron (2000)¹². These categories are often also used as shorthand to summarise magnitude.

- Major negative - that which has a harmful effect on the integrity of a conservation site or the conservation status of a population of a species within a defined geographical area; e.g., fundamentally reduces the capacity to support wildlife for the entirety of a conservation site, or compromises the persistence of a species' population at a defined locality.
- Intermediate negative - that which has no adverse effect on the integrity of a conservation site or the conservation status of a species' population, but does have an important adverse effect in terms of achieving certain ecological objectives; e.g., sustaining target habitat conditions and levels of wildlife for a conservation site, or maintaining population growth for a species.
- Minor negative - some minor detrimental effect is evident, but not to the extent of the above.

¹¹ CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester

¹² Byron H. (2000) Biodiversity Impact - Biodiversity and environmental impact assessment: a good practice guide for road schemes. The RSPB, WWF-UK, English Nature and the Wildlife Trusts, Sandy

- Neutral - that which has no predictable effect.

6.2 Duration of Impact

Impacts are described as short, medium or long-term, and as either permanent or temporary.

6.3 Impact Reversibility

Reversibility is judged per the CIEEM Guidelines for Ecological Impact Assessment description: “An irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.”

6.4 Impact Significance

The CIEEM Guidelines for Ecological Impact Assessment provide a working definition of ‘significant effects’ which includes the statements:

“For the purpose of EclA, ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general.” and “In broad terms, significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution).”

In this assessment, a significant effect is not attributed to any impact on a receptor which is predicted to occur at no greater than minor negative magnitude. Similarly any effect, regardless of magnitude, is not regarded as significant if its geographic scale of importance is lower than a local level.

6.5 Predicted Unmitigated Impacts of Development

6.5.1 Physical land take

The new house is proposed to be considerably larger than the existing chalet but the effect on valued habitats will be negligible.

6.5.2. Change of land use

The development will involve the replacement of the existing dwelling. No major modifications to the existing gardens are proposed. There will be no significant change in land use.

6.5.2. Construction Activities

The activity, noise and other general disturbance from, movements of construction machinery and personnel could disturb animal species using the site or immediately adjacent areas. Impacts need to be viewed in the context of the village of Morston. There will already be a level of human disturbance from the existing property and adjacent dwellings.

6.5.3. Operational Activities

Once work has been undertaken there will be no change from the pre-existing site activity. The present occupants will continue to inhabit the dwelling so there will be no change in population.

6.6 Designated Sites

The closest designated sites are the North Norfolk Coast Ramsar 0.2km to the north, Morston Marshes CWS less than 1km to the north-west and Wiveton Down SSSI less than 1km to the east.

Habitats on the proposed development site are entirely different to those within the designated sites, so there is no realistic potential for occurrences of the species for which the designated sites are listed occurring on this proposal site.

Given the small scale of work proposed and the separation distances between the proposed development site and the designated sites, there is no realistic potential for anything other than a neutral impact to other local designated nature conservation sites.

6.7 Habitats

The main habitats affected by the development would be an area of amenity grassland, some fruit trees and one mature sycamore. These are considered to be of minor ecological value in their own right. Their loss is expected to have a minor negative impact at the local scale. Mitigation is advised.

6.8 Protected Species

6.8.1 Bats

Given the negative results of the nocturnal bat surveys conducted during the 2021 survey season, the existing chalet on site is considered extremely unlikely to support roosting bats at this time. The demolition of the existing building is therefore predicted to have a neutral impact on roosting bats, if undertaken within the next year.

Because bats are small and highly mobile animals that make use of a wide range of roosting opportunities, there is a risk of the potential roost feature in the chalet chimney becoming occupied in the future. The further assessment advised (should works commence more than a year from the 2021 surveys taking place) would identify any newly established roosting activity.

A new and insensitive lighting plan on the site could have a minor negative impact on local bat populations that use the site and immediately surrounding area for foraging and commuting. Mitigation measures are advised below to reduce the risk of impacts from night-lighting of the site.

6.8.2 Breeding Birds

Old birds' nests, most likely house sparrow, were present in the roof void, with artificial house martin nest cups installed on the front elevation. Other common bird species will occur within the garden and on adjacent land holdings.

Any loss of the nesting habitat currently on site would be likely to have a minor negative impact on local breeding bird populations, given the abundance of alternative nesting habitat in the nearby area. Nonetheless, destruction of active birds' nests through vegetation removal during breeding season must be avoided to prevent a legal

offence. Mitigation measures are advised, below, and will ensure that no active bird nests (of any species) are disturbed or destroyed during the construction phase of the development, and that replacement nesting opportunities are provided on the developed site.

6.8.3 Great Crested Newt

There are no suitable waterbodies in the immediate vicinity of the works and habitats within the development footprint are not optimal for this species. Given the small scale of the proposed works and the suboptimal nature of the habitats due to be impacted by the development, neutral impacts to any local population of great crested newts are near certain. Best practice measures are advised as a precaution.

6.8.4 Reptiles

Reptile species such as common lizard are known to occur in the Morston area, and it is feasible that individuals could occasionally occur on site. However, habitats within the works area are suboptimal for reptile species as the lawn is short mown with few refuges. Given the small scale of proposed works, neutral impacts to any local population of reptiles are considered probable. Best practice measures are advised as a precaution.

6.8.5 Badgers

There were no signs of badgers found on site. It is considered unlikely that badgers may occasionally occur within the proposed works area. Given the small scale of proposed works, neutral impacts to any local population of badgers are considered probable. Best practice measures are advised as a precaution.

6.8.6 Priority Species and Habitats

The application site holds no Priority Habitats. Priority Species such as hedgehog and common toad could conceivably forage or take refuge on site. Without mitigation, such animals could be negatively impacted by the construction works. Mitigation and standard best-practice measures are advised (see below) to ensure that the risks posed by these works to small terrestrial animals is minimised. Without mitigation, minor negative impacts to terrestrial species are possible.

7. Mitigation Advice

7.1 General Principles

The Mitigation Hierarchy is a key principle, with the sequential strategies given in order. This is interpreted by WFE, as it applies to built development, in Table 2, below.

Table 2. Mitigation Hierarchy

Action and sequential number	Description
1. Avoidance	The first stage is to seek options that avoid impacts/effects on ecological receptors, for example through adjusting the development footprint to avoid valued/sensitive features, or confining works to certain times of the year or the day when a receptor would not be impacted.
2. Mitigation	Where potential adverse impacts cannot be avoided, the next stage is to use measures aimed at reducing/ameliorating the magnitude and/or likelihood of impacts/effects, such as through the design of the project or specific working practices.
3. Compensation	Where significant residual adverse impacts cannot be satisfactorily avoided or mitigated, the next stage is to use appropriate measures which subsequently offset, repair, reinstate or compensate for the predicted impact/effect.
Enhancement	The final stage of the Mitigation Hierarchy is distinct in that it does not seek to solely address adverse impacts; it goes over and above requirements for avoidance, mitigation and compensation. In accordance with the NPPF, developments should achieve net gains in biodiversity even if adverse impacts are not anticipated. Enhancement measures are those which seek to provide net benefits for biodiversity, and are advised wherever appropriate; this may include enhancements for receptors which are otherwise expected to experience adverse impacts.

7.2 Habitats

New planting (such as within the gardens on the developed site) will use native species or species of high wildlife value. Domestic fruit trees or any of the following species would be suitable:

Bird cherry *Prunus padus*
 Common pear *Pyrus communis*
 Crab apple *Malus sylvestris*
 Hazel *Corylus avellana*
 Holly *Ilex aquifolium*
 Hornbeam *Carpinus betulus*
 Oak *Quercus robur*
 Rowan *Sorbus aucuparia*
 Silver birch *Betula pendula*

Small-leaved lime *Tilia cordata*
Wayfaring tree *Viburnum lantana*
Whitebeam *Sorbus aria*
Wild service tree *Sorbus torminalis*

7.3 Breeding Birds

The nesting habitat provided by the existing chalet for house sparrows and house martins will be replaced with nest boxes targeting these species installed on the new building. Suggested locations are indicated in Figure 5, below.

Building demolition and any vegetation clearance will be undertaken outside of the bird nesting season which runs from 1st March to 1st September. If works to building and or trimming of trees and shrubs is undertaken within the nesting bird season, then a check will first be undertaken by a suitably qualified ecologist to ensure no active nests are present in the affected buildings or shrubs. If any active nests are discovered they will be allowed to reach a natural conclusion without disturbance, interference or destruction.

7.4 Bats

Artificial lighting on the developed site has the potential to negatively impact foraging bats and other nocturnal wildlife such as invertebrates, badgers and hedgehogs. Any use of night-lighting will need to be carefully considered. Lighting will only be used where absolutely necessary; there will be a commitment to keep lighting levels at the site as low as possible. Any exterior lights such as security lighting will use Passive Infra-Red sensor (PIR) or other motion-activated lighting with short timers (<1 minute), rather than lighting which remains on throughout the night. All exterior lights will use LEDs and will be fitted with hoods/cowls to limit light spills. Lights will be placed on the site in a configuration which focuses light inwards rather than illuminating the surrounding area. Any exterior lights will be installed away from bat boxes in the new dwelling.

7.5 Hedgehog and Other Terrestrial Species

7.5.1 Construction Methods

- All building materials and waste materials will be stored above the ground, such as on pallets or in skips respectively. This measure will ensure that such materials do not provide a sheltering opportunity, attractive to invertebrates, amphibians and other small mammals.
- Excavations will not be left open overnight, or else will be fitted with egress boards sloped at a shallow angle (<40°). Preferably all excavations will be covered overnight to prevent animals from falling in.
- Works will be restricted to daylight hours only to prevent disturbance or accidental harm to nocturnal animals such as badgers and hedgehogs. Ideally night lighting of the site will be minimised to reduce disturbance to other nocturnal animals such as bats and moths. Amphibians typically forage terrestrially at night, so restricting works to occur in daylight hours will minimise the chances of these species encountering the works.
- Existing piles of debris and vegetation will be cleared by hand to ensure no direct harm to terrestrial species sheltering within.

7.5.2 Permanent mitigation measures

- Any new close-board boundary fences or walls will have small gaps at ground level to allow access by small terrestrial mammals both onto and throughout the site. Gaps will be approximately 13cm wide by 13cm tall to allow access for animals such as hedgehogs.

7.6 Regard for Article 12(1) of the Habitats Directive

The results of the completed surveys indicate that the proposed works are unlikely to result in the destruction of a bat resting place or places (i.e. a roost) such as would be considered an offence under Article 12(1) of the Habitats Directive and its UK enactment, the Conservation of Habitats and Species Regulations 2017. However, bats are small and highly mobile animals that make use of a wide range of roosting opportunities, sometimes very infrequently. In the unlikely event that a bat is unexpectedly discovered during works, all work must cease immediately an appropriately qualified ecologist must be contacted for advice.

8. Enhancements

To maximise potential for use of the site by species of conservation concern, new bird boxes targeting species of conservation concern such as house sparrow, house martin and swift *Apus apus* will be installed on the new buildings. Bird nest boxes are best situated facing east or west, with suggested locations presented in Figure 5, below.

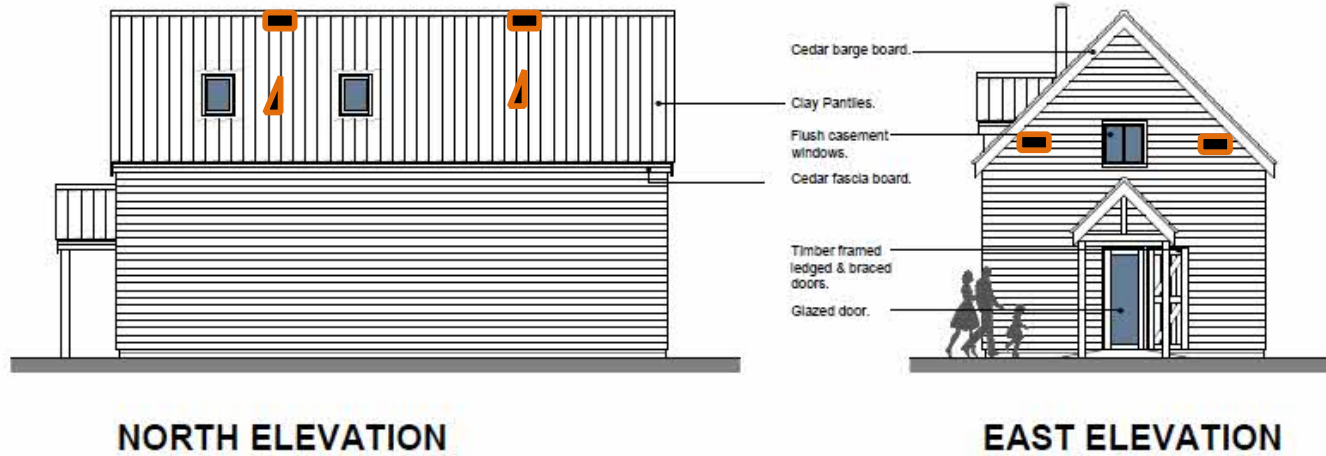
Enhanced roosting opportunities for bats will be incorporated into the fabric of the new buildings (see Figures 5a-d for advised locations). The wooden cladding proposed on the new annex and boathouse will be installed with four small (20mm by 40mm) access points on each, for bats to gain access behind the boarding. A bitumen 1F type felt with hessian matrix will be used as a lining material (and not a breathable membrane, which could result in loose fibres entangling bats), or the underlying brick surface will be left bare.

The proposed pantile roofs will also be lined with bitumen 1F felt, with two bat-accessible ridge tiles created on the boathouse roof and two on the annex roof, with at least four bat-accessible ridge tiles to be included in the roof of the main dwelling (see Figures 5a-d for locations). Ridge tiles are made accessible by leaving out a small amount of mortar to create a 20mm by 40mm gap for bats to get under the ridge tiles (see Photo 20 for an example), where mortar is left out to create small hollow spaces under adjacent ridge tiles. Four “lifted” pantiles will be installed on each new roof to allow bats access under the pantiles. Tiles are “lifted” slightly at the free corner by being propped up approximately 20mm, e.g. using a piece of batten or mortar.







The addition of further planting of shrubs and flowering plants within the garden would enhance the overall ecological value of this area. It is advised that ‘pollinator friendly’ flowers, those with available nectar and pollen, are selected for the garden. A list of pollinator friendly plants is available from the Royal Horticultural Society, and many garden centres or plant suppliers will mark out pollinator-friendly plants such as with a bee symbol.

In order to encourage invertebrates at the site (which will in turn encourage birds and bats and other wildlife), an invertebrate box (or ‘bug-box’) will be installed on the new building. There is a wide variety of commercially available bug boxes which would be suitable for use at the site, for example the various bee “bricks” and “blocks” of woodcrete, woodstone or concrete construction, which can be integrated into the construction of external walls.

Figure 5a. Enhancements feature locations for proposed annex



Key: (not to scale)

-  Swift nest box
-  Bee brick
-  Bat access point (ridge/cladding)
-  Bat access point (pantile)
-  Sparrow nest terrace
-  House martin nest cup

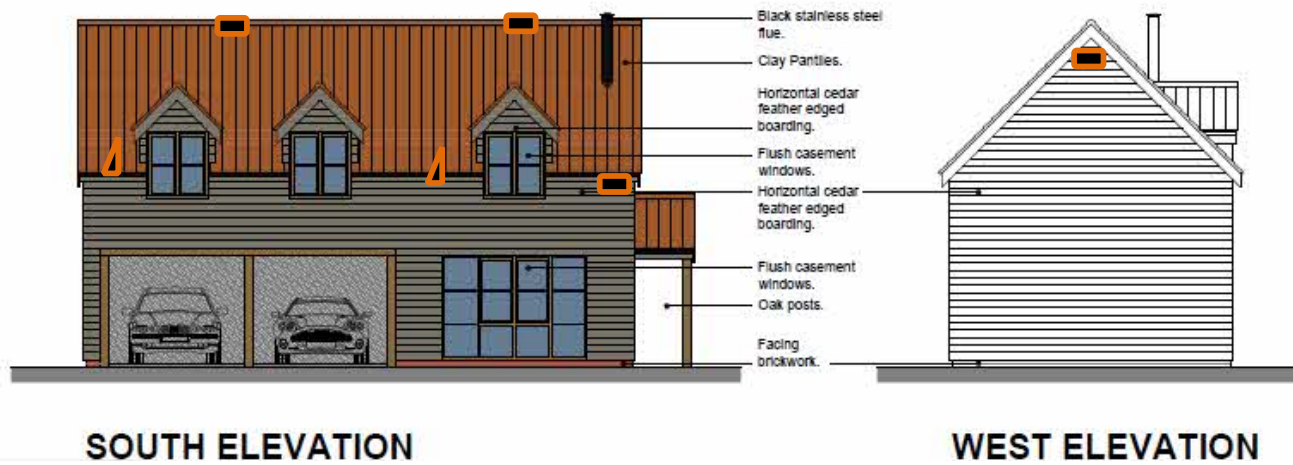


Figure 5b. Enhancements feature locations for proposed boathouse

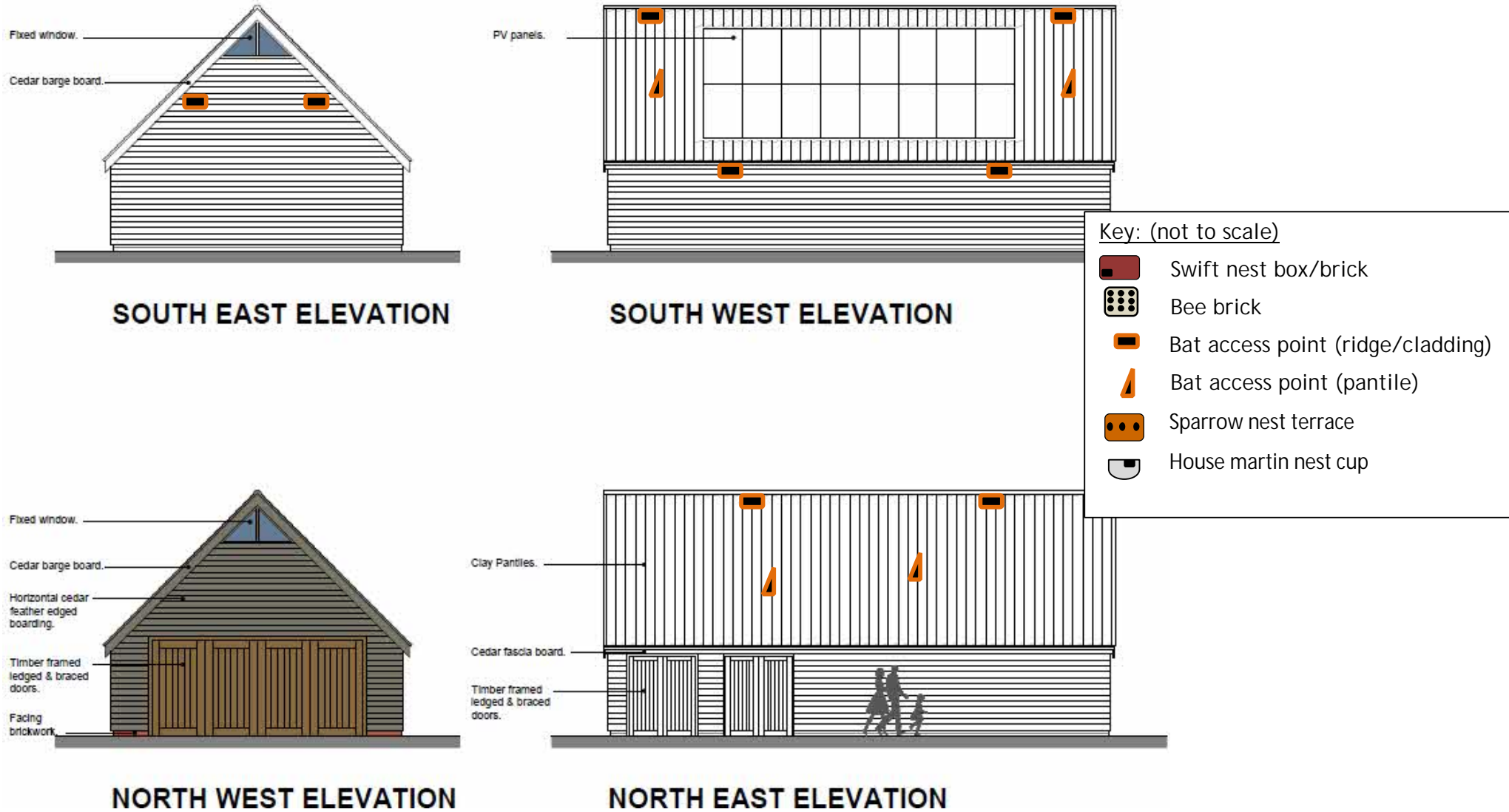


Figure 5c. Enhancements feature locations for proposed new dwelling (north, south and east elevations)

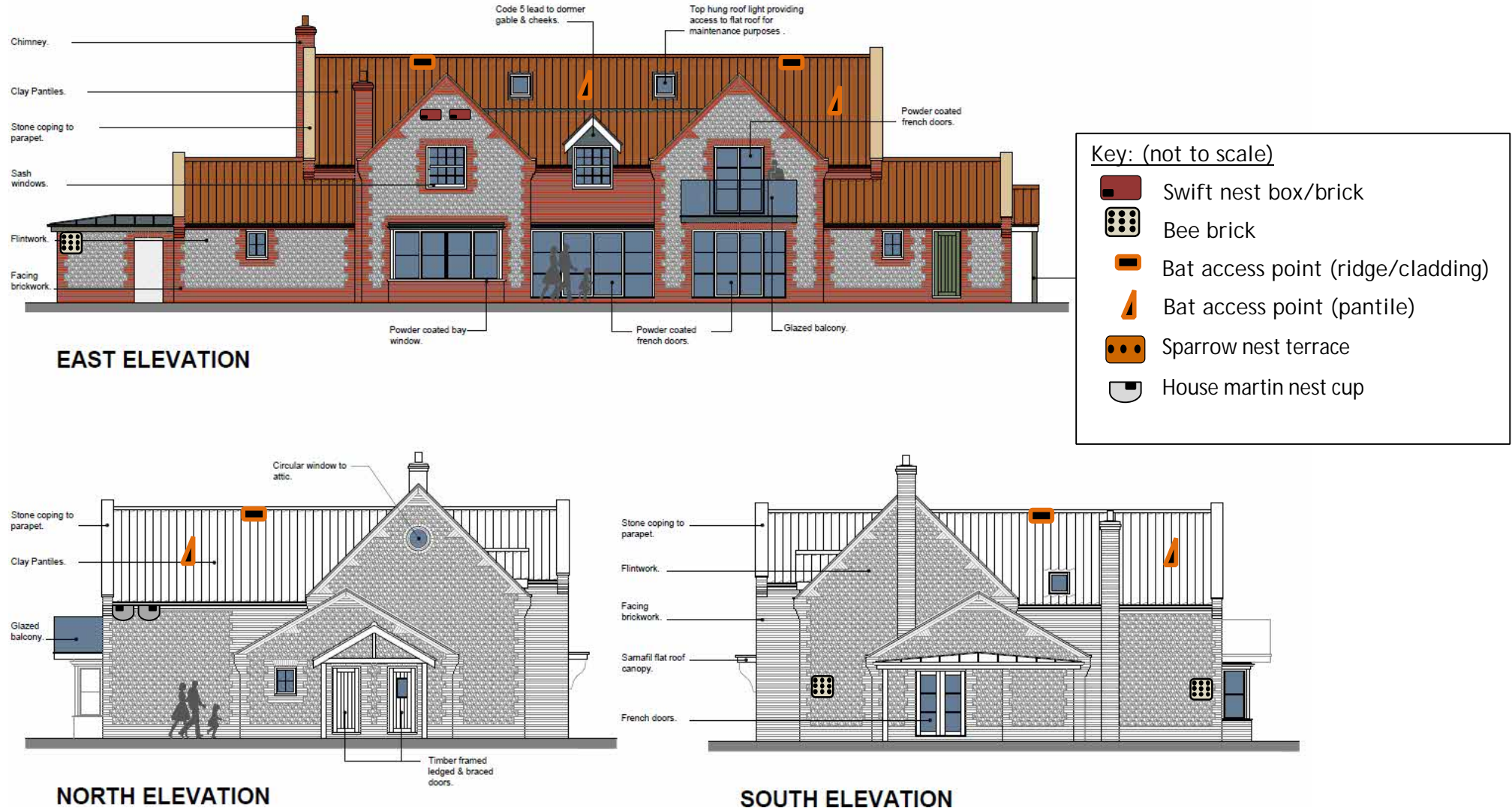








Figure 5d. Enhancements feature locations for proposed new dwelling (west elevation)



WEST ELEVATION

Key: (not to scale)

-  Swift nest box/brick
-  Bee brick
-  Bat access point (ridge/cladding)
-  Bat access point (pantile)
-  Sparrow nest terrace
-  House martin nest cup

9. Conclusion

The site at Garden of Eden in Morston was subject to an initial site visit (including a visual inspection of the existing building) and subsequent nocturnal bat surveys. The assessment concludes that:

- Survey results indicate an absence of bat roosts, with further assessment only required if the building demolition is to take place more than a year after the assessment was completed.
- There is no credible potential for impacts on local designated sites or county wildlife sites.
- There is no concern for impacts on habitats.
- Minor but potentially illegal impacts on nesting birds are conceivable but can be avoided by appropriate timing of works, or a check prior to commencement of works.
- Minor impacts to small terrestrial animals such reptiles, and other Priority Species including common toads and hedgehogs are considered possible, but the risks can be minimised by following the best practice measures advised.

Advice for mitigation and enhancements has been given. If enhancements are implemented then positive impacts for some species can be anticipated in the medium to long term. In particular, installation of the suggested bird and bat boxes/features will provide increased nesting and roosting habitat for local wildlife, in-line with the NPPF policy supporting net gain in biodiversity.

Appendix 1. Photographs

Photo 1. View of site from south west



Photo 2. Porch on west side of dwelling



Photo 3. Example of cladding on west and east elevation



Photo 4. Roof void of building showing wood lining



Photo 5. Example of cobwebbed air vents to north and south



Photo 6. Example of bird nest (possibly house sparrow)



Photo 7. Chimney as viewed from inside the roof void.



Photo 8. South elevation showing cobble-clad chimney



Photo 9. Potential roost feature between soffit and chimney. The crevice contained <10 potential bat droppings



Photo 10: View to the north of the site



Photo 11: Mature trees in the west of the site



Photo 12: Sycamore scheduled for felling



Photo 13: Orchard



Photo 14: View across the north of site



Photo 15: Example of sward



Photo 16: Rotten soffit



Photo 17: Access track



Photo 18: General view of chalet



Photo 19. Spider webbing in and around the potential roost feature on 08/06/21



Photo 20. Example of a bat-accessible ridge tile on a pantile roof

