Appendix 2 Preliminary Species Survey Methodologies

Terrestrial Invertebrates

There are approximately 400 species of terrestrial invertebrate which are Species of Principal Importance within the UK (see Table 4).

Ecological ranges and requirements can vary greatly for different invertebrates from a micro to macro scale. Habitats need to provide resources to support the entire lifecycle within a species' range e.g. some butterflies require a matrix of grasses and flowers for developing larvae and nectar-filled flowers to feed the adults. A diverse variety of terrestrial invertebrates are found in areas that contain ecotones. These are defined as "a region of transition between two biological communities" i.e. a woodland edge, where a grassland meets a hedgerow or other mosaics of habitats. Other indicators for potentially important invertebrate sites include those with less common habitats, such as heathland or dead wood.

The preliminary survey will identify if there are suitable matrices of habitats, ecological ecotones and/or connectivity to suitable habitats within the wider landscape to support a diverse range of terrestrial invertebrates.

The survey was carried out within the Sites boundaries.

Great Crested Newts (GCN)

Great Crested Newts (GCN) *Triturus cristatus* require aquatic habitats for breeding and terrestrial habitats for foraging, sheltering and hibernation. Breeding occurs in the Spring (typically between March and June) with much of the newt's lifecycle spent within the terrestrial habitats. Juvenile newts normally take 2 to 4 years to reach sexual maturity and so spend most of their time in terrestrial habitats.

GCN are known to travel up to 500 m from breeding ponds and require terrestrial habitats which allow them to shelter from excessive heat, dryness, and predators whilst foraging for prey species. GCN hibernate during the winter months underground or under a structure that protects against frost, flooding, and predators; typically logs, vegetation piles, rocks/stone, etc. Optimal habitats generally include grassland, scrub, woodland, hedgerows, and waste-ground with some green connections to ponds, within approximately 500 m.

Natural England provides a risk matrix that uses the distance of ponds from a site and the area of a proposed development site to determine if an offence is likely. The distance bands used in the matrix are:

- Pond Onsite
- Land within 100 m from ponds
- Land within 100-250 m from ponds
- Land >250 m from ponds

Aerial and OS mapping will be used to identify the presence and location of ponds within 500 m of the Site. Natural England's risk matrix will then be used to identify if an offence is likely and in what distance to the Site. For the purpose of this exercise, all ponds identified are assumed to be breeding ponds.

Any ponds within the distance bands in which an offence is likely, and for which there is access, will be subject to a Habitat Suitability Index (HSI) assessment.

The assessment involves putting parameters about the pond's habitats (size of the pond, percentage of vegetation cover, water quality, etc. into a calculator to get an HSI value. The calculated HSI for a pond provides a score between 0 and 1. The pond's HSI can then be

compared to the ranges of pond suitability, as shown in Table 5. An inference can then be made between the HSI of the pond and the likelihood of great crested newt presence.

Table 5 – Habitat Suitability Scores

HSI Score	Classification
<0.5	Poor
0.5-0.59	Below Average
0.6-0.69	Average
0.7-0.79	Good
>0.8	Excellent

Reptiles

There are four relatively widespread native species of reptiles in Britain, namely adder *Vipera berus*, grass snake *Natrix natrix*, slow worm *Anguis fragilis,* and common lizard *Zootoca vivipara*. All of these species are protected from intentional killing or injury (but their habitat is not specially protected).

These species can be found in a broad range of habitats including grassland, open woodland, grassy scrub and, in the case of grass snakes, wetland. Reptiles require open areas to bask, sheltered areas to hide from excessive heat and predators and protected areas for hibernation. A typical habitat considered suitable for reptiles will be comprised of a matrix of structures that allow for some or all the reptile's requirements i.e. grassland with patches of scrub.

The habitats within the Site's boundaries were assessed for their suitability to support reptiles.

Nesting Birds

All birds and their active nests are protected in the UK (including feral pigeon). Some species are included on Schedule 1 of the WCA 1981 and are afforded greater protection.

Birds will create nests in a variety of habitats depending on the species. Most require sheltered areas such as vegetation or voids and crevices within man-made structures. Others will nest on flat surfaces, whilst some prefer specific habitats such as barn swallow *Hirundo rustica* or barn owl *Tyto alba*.

The habitats within the Site's boundaries were investigated for the presence of active or old nests. An appraisal was also made of the suitability of habitats to support nesting birds and which species or group are most likely to be found within the Sites habitats.

Bats

A preliminary survey for bats identifies if there are habitats and/or structures present within the Site which have suitable features that can be used for roosting, foraging and/or commuting bats. An assessment was made as to whether a roost will be directly or indirectly impacted by a development.

Preliminary Roost Appraisal

A Preliminary Roost Appraisal (PRA) for bats was undertaken in accordance with the Bat Conservation Trust's bat survey guidelines. The PRA was undertaken on all buildings and trees within the Sites boundaries.

The PRA identified the type and number features within the structures which are suitable for use by roosting bats. A suitable feature will be a sheltered void or crevice in which individual bats can roost or in which several bats can gather. The structures have been categorised in accordance with the criteria set out within the guidelines and recreated in Table 6 for reference.

Table 6 – Bat Roost Suitability Categories

Suitability Categorisation	Description of Roosting habitat
Negligible	Negligible habitat features on-site likely to be used roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions, and/or suitable surrounding habitat to be used regularly or by larger numbers of bats (i.e. unlikely be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat, but unlikely to support a roost of high conservation status.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat. Likely to be used as maternity or hibernation roosts.

Evidence such as bats in situ, droppings, and staining from urine or oils from the bat's fur, has also be searched for during the preliminary survey. However, bats can roost in areas inaccessible during a preliminary survey such as between roof tiles of lining and so this evidence may not always be found.

The number of further surveys and timings (if required) are based on the categorization of the suitability of a structure to support roosting bats.

Foraging and Commuting

In accordance with the guidelines, the Site's habitats were evaluated for the suitability to be used for foraging and commuting bats. The categorisations are based on the criteria set out in the guidance and recreated in Table 7.

Table 7 – Bat Foraging and Commuting Suitability Categories

Suitability Categorisation	Commuting and Foraging Habitats
Negligible	Negligible habitat features on-site likely to be used by commuting or foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	Continuous habitat connected with the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland, or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses, and grazed parkland. Site is close to and connected to known roosts.

The preliminary bat surveys were carried out within the Sites boundaries, except in instances where neighbouring structures will be adversely affected by the proposed development. In which case these structures were also assessed where access was possible.

Water vole and Otters

Water voles and otters require riverine habitats to support breeding, foraging, and sheltering.

The water vole lives along rivers, streams, and ditches, around ponds and lakes, and in marshes, reedbeds and areas of wet moorland. The Otter requires clean rivers, with an abundant source of food and plenty of vegetation to hide their secluded holts.

Evidence of water vole will be investigated and include the presence of burrows along the banks, feeding remains and droppings. The survey area included the length of the suitable habitat within the Site's boundaries and up to 50 m outside of the boundaries if access was possible.

Evidence of otter will include the presence of holts, footprints, or spraints. The survey area included the length of the river within the Site's boundaries and up to 50 m beyond if access was available.

Dormice

Dormice live in deciduous woodland, hedgerows, and dense scrub, and spends most of the spring and summer up in the branches, rarely coming down to the ground. It eats buds, hazelnuts, berries, and insects. Hazel dormice build nests out of grasses, stripped honeysuckle bark and fresh hazel leaves, in which the female will give birth to up to seven young. They hibernate during the winter months, either on the ground (under logs, leaves, in grass tussocks and at the base of trees) or just beneath the ground where the temperature is more constant.

The habitats within the Site's boundaries and connectivity to suitable habitats in the wider landscape have been evaluated to determine the suitability of the Site to support dormice.

Badgers

Badgers are found across the UK, with the highest numbers in southern England. The ideal badger habitat is a mixture of woodland and open country.

The species lives in a network of underground burrows and tunnels known as a sett. Each badger territory will include a main sett and several smaller outlying setts. The main sett is the group's headquarters, where they spend most of their time and rear their young. Outlying setts are smaller and provide a safe place to retreat to if needed when badgers are out foraging. Setts tend to be located in the shelter of woodland, with the badgers emerging at night to forage in fields and meadows.

Though not as common as urban foxes, badgers can also survive in towns and cities, providing there is suitable cover in which to dig their setts and nearby gardens and parks where they can hunt for food.

The presence of setts has been investigated during the survey within the Site and up to 30 m from the Site's boundaries (where access was available). In addition, evidence of badgers has been searched for including foraging holes, latrines, scratch posts and hairs.

Hedgehogs

Hedgehogs are known to travel around one mile every night through parks and garden foraging for food and looking for mates. Grassland, hedgerows, and shrub are considered to provide suitable foraging habitat. Compost, log piles, and hedgerows are suitable for nesting and hibernating hedgehogs.

The habitats within the Site's boundaries and connectivity to suitable habitats in the wider landscape have been assessed for their suitability to support hedgehogs.

Appendix 3 Photographs

Photo 1 – Ruins of Former Building

Photo 2 - Recently Erected Metal Barn

Photo 3 – Recently Laid Hardstanding

Photo 4 – Cleared Area in Preparation for the Construction of the Access Road

Photo 5 – Cleared Vegetation

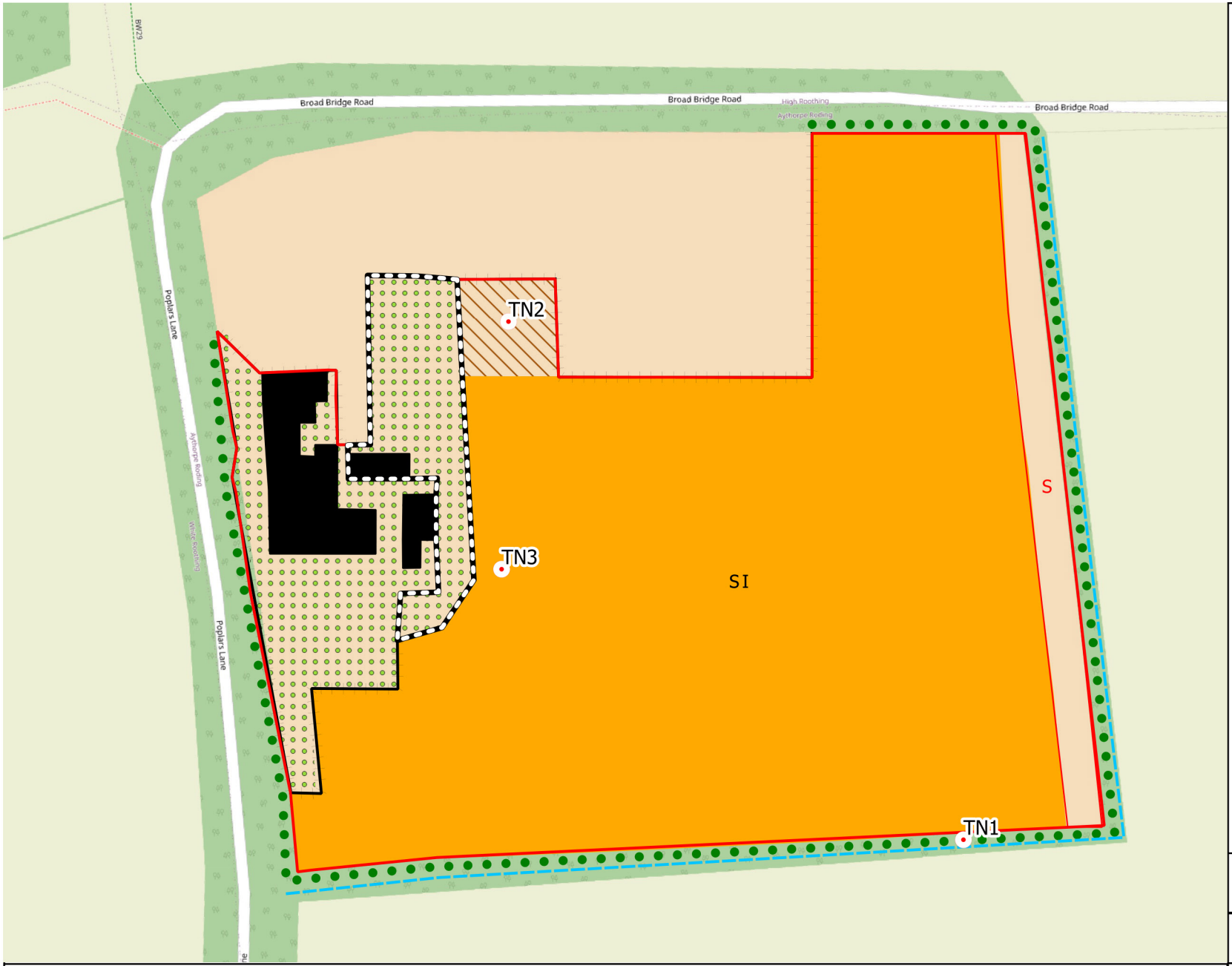
[redacted]

Photo 7 - Earth Bund along Eastern Boundary

Photo 8 – Fresh Bedding Outside a Sett Entrance

Appendix 4 – Map and Target Notes

Target Note Number	Description
[redacted]	
TN2	Tall ruderal vegetation growing in area which was formerly a community vegetable garden.
TN3	Cleared vegetation.



Poplars Farm, Aythorpe Roding

Client: Nick Horn

Target notes

Boundaries
- Site Boundary
- Development Boundary

Habitats
- Buildings
- Hardstanding/Bareground
- SI Species Poor Grassland
- Tall Ruderal
- S Earth Bund

Linear Features
- Dry Ditch
- Fence
- Treeline

Reference: 021

Date: 21/04/2020

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