PRELIMINARY ECOLOGICAL APPRAISAL

THE LEYS, ADDERBURY
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5648 FE PEA 01
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1 Summary

1.1 On 19th May 2017 FEC Group Ltd undertook a Preliminary Ecological Appraisal of the land at The Leys, Adderbury, North Oxfordshire (grid reference SP467352), hereafter referred to as 'the Site'. This was undertaken to determine the presence of any important habitats or species which might be impacted on by the proposed development.

1.2 The study found one statutory site within 2km of the Site, located approximately 0.8km north-east, in the form Adderbury Lakes Local Nature Reserve (LNR) located (grid reference: SP478355). No statutory sites were found within 2.0km of the Site.

1.3 The Site measures approximately 0.84ha and consists of two detached residential buildings, a large garden with a tennis court, a garage and a shed. The garden is bordered by fencing and contains numerous scattered trees.

1.4 There were twelve habitats found on the Site: amenity grassland, bare ground, building, dense continuous scrub, hard standing, intact species-poor hedgerow, introduced shrub and ornamental planting, mixed plantation, scrub, scattered trees, species poor semi-improved grassland, tall ruderal. These habitats are relatively common in the local area. No rare plants were found and all species recorded are common and widespread.

1.5 Most of the twelve habitats present are considered to be unlikely to support important animal species. Three taxonomic groups of 'important' species may need to be further considered in the Site's development, namely bats, nesting birds and Great Crested Newts.

1.6 No setts or other evidence of Badger presence were found onsite at the time of survey. However, a few potential snuffle holes were found within the mixed plantation towards the east end of the Site and towards the centre of the Site, nearby the tennis court though these were not fresh. There is also potential foraging and commuting habitat onsite and within the immediate surroundings for Badger in the form of species poor semi-improved grassland, hedgerow, scrub, mixed plantation and broadleaved woodland. It is therefore considered that any presence of badger onsite may be for foraging and commuting purposes only on an irregular basis.

1.7 Most of the trees within the Site boundary are considered to have low to negligible bat roosting potential. However a number of trees were found to have low to moderate bat roosting potential. Although no signs of bat presence were found some of the trees onsite held features denoting bat roosting potential including woodpecker holes, peeling bark, cracks in branches and ivy cladding. The results of the assessment are set out in Table 2 and should be viewed in conjunction with Appendix A.

1.8 An external daytime inspection of all the buildings present onsite revealed them to hold negligible to moderate potential for supporting roosting bats. The residential buildings and garage located at the west end of the Site in particular were found to hold moderate roosting potential for bats. An internal inspection of the buildings onsite was not carried out at the time of the survey. It is therefore recommended that an internal inspection be carried out by a licensed ecologist of the buildings onsite that are deemed as having low to moderate bat roosting

potential. The results of the external daytime inspection are set out in Table 3 and should be viewed in conjunction with Appendix A.

1.9 The Site could be of moderate foraging and commuting value to bats. Although there is habitat of similar and greater value within the surrounding and wider landscape, it is considered likely that local populations will use the Site for foraging and commuting purposes in conjunction with this habitat.

1.10 The site was found unlikely to support specially protected species of bird. However, common garden birds may be found on site, and there is potential for birds to nest within the buildings, trees, hedgerow and scrub onsite. Additionally Blackbird, Blue tit, Great tit, Robin, Wren, Chaffinch, Pheasant and Woodpigeon were seen on site, which are of low conservation concern.

1.11 There is suitable terrestrial habitat for Great Crested Newt onsite and within the surrounding landscape. There are no ponds present onsite however four waterbodies were found to be present within 500m of the Site. Only two of the four ponds were granted access permission and were assessed as being of good suitability to support Great Crested Newts. As such, the presence of Great Crested Newts cannot be reasonably ruled out.

1.12 There was some suitable terrestrial habitat and potential refugia for reptiles and amphibians on the Site in the form of scrub, log piles, compost heaps, stone walls, tall ruderal, hedgerows and species poor semi-improved grassland with a long sward height of c.10cm-15cm. However the Site lacked suitable water features and basking areas; and with the presence of equal and greater habitat within the surrounding landscape including water courses, standing water, woodland edge rough grassland and a golf course, the presence of reptiles and common amphibians is considered to be unlikely.

1.13 It is concluded that the only perceivable ecological value of the Site appears to be for bats, nesting birds and Great Crested Newts.

1.14 No evidence of badger was found onsite except for a few snuffle holes and large mammal trails. It's considered that badgers may be using the Site for foraging and commuting purposes on an irregular basis. As such, no further badger surveys are being recommended.

1.15 Development of the Site could potentially lead to the loss of bat roosting sites and harm to bats (a European protected species). It is therefore recommended that nocturnal surveys be undertaken in order to determine whether bats are using the trees deemed as having low to moderate value for roosting purposes and, if so, what appropriate mitigation measures should be taken if the proposed development were to proceed.

1.16 It is recommended that an internal daytime inspection be undertaken on the buildings onsite deemed from the external inspection as having low to moderate bat roosting potential. If potential or evidence of bats are found further nocturnal surveys will be required in order to determine whether bats are using the buildings for roosting purposes and, if so, what appropriate mitigation measures should be taken if the proposed development were to proceed.

1.17 The Site may be used by foraging and/or commuting bats, given the presence of suitable habitat including species poor semi-improved grassland, scattered trees and woodland habitat, and the

amount of suitable habitat of equal and greater value within the immediate environs. It is recommended that as much of these habitats are retained as possible, in particular the scattered trees and woodland habitat. If any trees are removed for the development, it is recommended that suitable compensatory habitat is provided to mitigate for loss of foraging habitat or commuting corridors.

1.18 The proposed lighting scheme should consist of downward-pointing lights to avoid disturbance to any foraging or commuting bats. This is of particular importance near or on green space and near vegetation such as hedgerow or trees. These sensitive lighting measures will also reduce disturbance of birds.

1.19 Development of the Site could also lead to the disturbance of or harm to nesting birds. Since all in-use bird nests and their contents are protected from damage or destruction, any tree and hedgerow removal should be undertaken outside the bird nesting period: 1st March to 31st August inclusive. If this time frame cannot be avoided, a close inspection of the trees and hedgerows to be removed should be undertaken at least 24 hours prior to clearance. In order to prevent disturbance or harm to individuals, work should not be carried out within a minimum of 5.0m of any in-use nest, although this distance could be more depending on the sensitivity of the species.

1.20 Although no evidence or potential for reptiles or common amphibians was found during the survey, both these as well as small mammals could potentially be present onsite. As such, care should be taken at all times during removal of vegetation and topsoil stripping, in order to avoid harm to individuals. Any small mammals, reptiles and common amphibians disturbed or uncovered, should either be caught by hand and relocated to a safe area, or left to vacate the work site in their own time. All works during vegetation removal and topsoil stripping will need to be supervised by a suitably qualified ecologist. Suitable refugia, for example roots, logs, compost piles or rubble piles, will be dismantled carefully by hand or excavated (roots), under the supervision of a suitably qualified ecologist.

1.21 If excavations are to be undertaken, it should be noted that open trenches could potentially trap wildlife, especially if these fill up with water. Escape routes should therefore be provided if trenches cannot be infilled immediately. These can be in the form of branches or boards placed in the trench, with their upper ends above ground level and touching the sides and sloping ends left in the bottom of the trench.

1.22 Nearby ponds and ditches should also be protected from run-off and pollution during any works by following established guidance (for example the Environment Agency's Pollution Prevention Guidance).

1.23 The National Planning Policy Framework states that as part of moving towards sustainable development the planning system should minimise impacts on biodiversity and provide net gains in biodiversity where possible. Biodiversity on this site would benefit from considerate design of the proposed development. The green infrastructure of the landscape can be protected by retaining linear features such as hedgerows and ditches onsite and nearby. This can help prevent fragmentation of habitats in the landscape, thereby facilitating dispersal and enabling foraging and other important behaviours. Opportunities for wildlife can also be created by incorporating native planting into a proposed development, including native hedgerow species,

native trees and wildflower meadows. These can have value as nesting sites, foraging habitat, cover and opportunities for pollinators such as bees. Incorporation of features such as stone walls with rough surfaces and gaps can provide places of refuge to smaller fauna.

1.24 Taking all the evidence into account, it is considered that the proposed development of the land at The Leys, Adderbury is unlikely to impact significantly on wildlife if the appropriate further surveys and mitigation measures are carried out, and will not lead to a significant loss of habitat in the area.

2 Introduction

2.1 Background and survey objectives

2.1.1 On 19th May 2017 FEC Group Ltd undertook a Preliminary Ecological Appraisal of the land at The Leys, Adderbury, North Oxfordshire (grid reference SP467352), hereafter referred to as 'the Site'.

2.1.2 This was undertaken to determine the presence of any important habitats or species which might be impacted on by the proposed development of the Site.

2.1.3 A desk study was carried out to ascertain the presence of nature conservation designations and important habitats within a 2.0km radius of the Site.

2.2 Site description

2.2.1 The Site measures approximately 0.84ha and consists of two detached residential buildings, a large garden with a tennis court, a garage and a shed. The garden is bordered by fencing and contains numerous scattered trees.

2.2.2 The Site is bound by The Leys to the west and a single public track and dismantled railway to the north. Built up residential and recreational development is located to the north, west and south-west in the form of the village of Adderbury. To the east and south east are pastoral and arable fields as well as a sewage works. Sor Brook, which eventually meets with and joins The River Cherwell, is located approximately 86m to the east. A site location plan is presented in **Figure 1**.

2.2.3 A total of twelve habitats were identified on the Site. Most of the site comprised species poor semi-improved grassland with sections of ornamental planting. A high number of scattered trees strewn throughout the Site and lined the single public track. Areas of scrub and tall ruderal were concentrated around the edges of the main garden and tennis court especially along the southern and eastern boundaries. Most of the buildings were concentrated at the west end of the Site including two detached residential buildings and a garage, along with areas of improved grassland, hard standing, further ornamental planting and scattered trees. A wooden shed was located adjacent to the tennis court along the southern boundary towards the centre of the Site. Other habitats included intact species-poor hedge with trees, intact species-poor hedge and defunct species-poor hedge. These habitats are relatively common in the local area. No rare plants were found and all species recorded were common and widespread.

2.2.4 The Site was accessed from The Leys, along the single public track bounding the north of the Site.

2.3 Proposed works

2.3.1 It is understood that the proposed works consist of a small scale residential development.

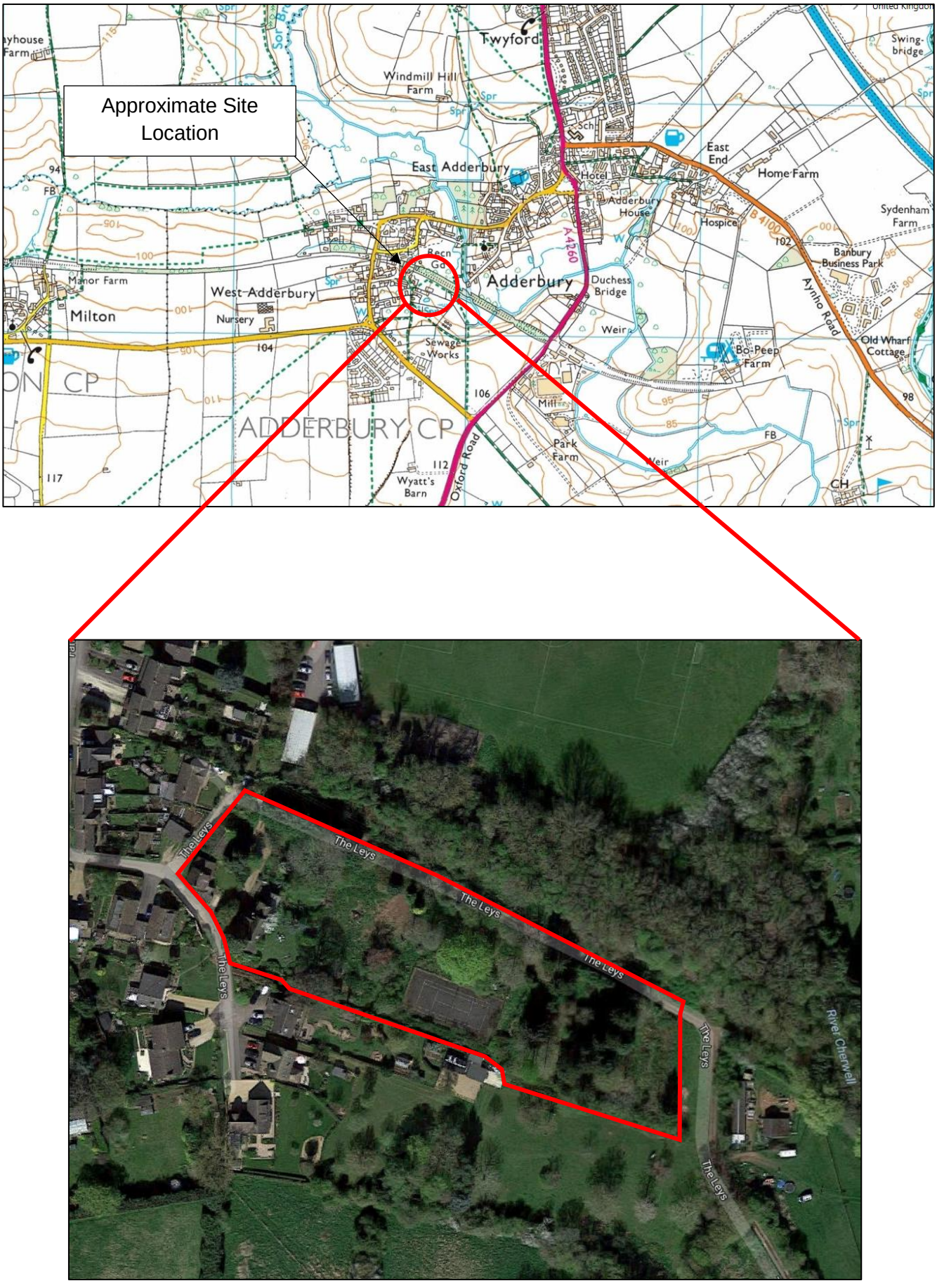

Figure 1. Site Location Plan

3 Methodology

3.1 The CIEEM *Guidelines for Preliminary Ecological Appraisal* (2013) were followed throughout the appraisal process.

3.2 Desk study

3.2.1 A desk study was undertaken to determine the presence of designated sites and important habitats within a 2.0km radius of the Site; as well as the presence of any ponds within 500m. This involved assimilating and reviewing data provided by statutory and non-statutory organisations.

3.2.2 The consultees for the desk study included:

- The government website MAGIC (Multi-Agency Geographic Information for the Countryside) *www.magic.gov.uk*
- Google Earth Pro

3.3 Habitat survey

3.3.1 A habitat survey was carried out across the whole of the survey site. This was conducted using standard JNCC (2010) techniques and methodologies for Phase 1 Habitat Surveys.

3.3.2 The Preliminary Ecological Appraisal site visit took place on 19th May 2017. The weather conditions on the day of the site visit were: temperature 12°C, cloud cover 70-100%, wind force 1-2 (Beaufort Scale) and light rain later in the afternoon.

3.4 Protected species survey

3.4.1 During the surveys the potential for protected and important species was assessed. This included European Protected Species, nationally protected species and Local Biodiversity Action Plan Species.

3.4.2 Badger

3.4.2.1 Badgers are generally nocturnal and evidence of their presence in an area often comes from field signs rather than sightings of the animals. Useful field signs include:

- Setts (main, outlying, annex or subsidiary)
- Tufts of hair caught on barbed wire fences
- Conspicuous Badger paths
- Footprints
- Dung-pits – small excavated pits in which droppings are deposited
- ‘Snuffle holes’ – small scrapes where Badgers have searched for insects and plant tubers

- Day nests – bundles of grass and other vegetation where Badgers may sleep above ground
- Scratch marks on trees (usually near sett)

3.4.2.2 Daytime surveys looking for field signs can be carried out at any time of the year and should be non-intrusive.

- Main setts: These usually have a large number of holes with large spoil heaps and the sett generally looks well-used. They usually have well-used paths to and from the sett and between sett entrances. Although normally the breeding sett is in continual use, it is possible to find a main sett that has become disused because of excessive digging or for some other reason, in which case it is recorded as a disused main sett.
- Annex setts: These are always close to a main sett, usually less than 150m away, and are usually connected to the main sett by one or more obvious, well-worn paths. They consist of several holes, but are not necessarily in use all the time, even if the main sett is very active.
- Subsidiary setts: These often these have only a few holes, are usually at least 50m from a main sett and do not have an obvious path connecting them with another sett. They are not continuously active.
- Outlying setts: These usually only have one or two holes, often have little spoil outside the hole, have no obvious path connecting them with another sett and are only used sporadically. When not in use by badgers, they are often taken over by foxes or even rabbits. However, they can still be recognised as badger setts by the shape of the tunnel, which is at least 250mm in diameter and rounded or flattened oval in shape.

3.4.2.3 A search for evidence of Badger presence on the Site was undertaken as part of the survey.

3.4.3 Bats

3.4.3.1 In order to assess bat occupation of a particular site, the Bat Conservation Trust (2012) recommends that information gathered from a desk study and from a daytime site walkover is used to inform the type and extent of future bat survey work, which would potentially include nocturnal surveys.

3.4.3.2 The diurnal walkover provides an opportunity to identify potential for bat presence within structures such as buildings and trees and/or to check for signs of occupancy, such as droppings, scratch marks, feeding remains, carcasses, or even animals in residence. Nocturnal surveys (if required) allow numbers and species of bats to be confirmed. The latter are also used to determine the presence or absence of bats, where signs of bat activity are indeterminate or absent but potential for roosting is considered to be medium to high.

3.4.3.3 Roosting places vary depending on the species. Pipistrelles usually inhabit narrow cracks or cavities around the outside of buildings, but they will roost in similar niches inside larger barns. Typical sites include soffit spaces, gaps behind fascia boards and end rafters, crevices around the ends of projecting purlins, under warped or lifted roof and ridge tiles, or in gaps in stone and brickwork where mortar has dropped out.

3.4.3.4 Larger species such as Brown Long-eared, Myotis and Lesser Horseshoe bats like to roost in the roof voids of buildings and can often be found hanging singly or in small groups from ridge boards or roof timbers, especially where these butt up against gable walls or chimney breasts. They particularly favour older structures with timber frames. Here they squeeze into tight crevices making them difficult to observe.

3.4.3.5 Some species, such as Nathusius' Pipistrelle, may hibernate deep within hollow trees. Others, such as Noctules and Barbastelles, will also roost in trees in the summer months using features such as cracks, loose bark, old woodpecker holes and rotten tree cavities.

3.4.3.6 Diurnal walkovers can be carried out at any time of the year, but nocturnal surveys should only be undertaken when bats are out of hibernation and in their summer roosts. The recommended period is from April to September inclusive, with May to August optimum, and a minimum of two or three surveys are required. The season can be extended into October, although particularly cold weather will render this inadvisable.

3.4.3.7 Trees were inspected for any gaps in the bark, patches of exfoliating bark, fissures, splits, cracks and cavities, including woodpecker holes and rot holes that might provide potential roosting and/or hibernation places.

3.4.3.8 The Site was also assessed for value to foraging and commuting bats.

3.4.4 Birds

3.4.4.1 Most resident and migrant birds breed in the spring and summer, although Woodpigeons and Collared Doves nest throughout the year and as a result could potentially be on eggs in almost any month.

3.4.4.2 In season, signs of breeding include singing males, display and copulation, birds gathering nesting materials, adults carrying food, calling chicks, etc.

3.4.4.3 These signs were watched for during the survey, along with a general site walkover to identify the presence of foraging birds.

3.4.5 Hazel Dormouse

3.4.5.1 Hazel Dormice are nocturnal and hibernate over winter, being active between late April and late October. They feed mainly on nuts but also flowers, fruits, insects and pollen. They are typically found in deciduous woodland, species-rich hedgerows and scrub; with Hazel, Oak, Bramble and Honeysuckle being of particular importance to this species. They are distributed primarily in southern England and Wales, and in the UK tend to be more closely associated with old coppice woodland.

3.4.5.2 Dormice are 'successional feeders', which means that they require different foods as the seasons progress during their active period. In spring they will feed on the flowers of Oak, Hawthorn, Sycamore and Willow; moving on to the later flowering shrubs such as Honeysuckle and Bramble. During the summer they exploit sources such as caterpillars, aphids and wasp galls; then they build up their fat stores for hibernation by eating fruits, berries and nuts such as blackberries and hazelnuts.

3.4.5.3 This species is highly arboreal and so requires easy movement between trees. It is however also important that the tree canopy does not cast too much shade and suppress understorey fruiting. Dense understorey thickets, particularly including Hazel, are ideal, with scrub and sprawling hedgerows also often supporting Dormouse populations.

3.4.5.4 Preferred nesting sites include hollow tree branches, squirrel dreys and old bird nests. They may also use nesting boxes. Nests tend to be grapefruit size, spherical in shape and woven from strips of bark (usually Honeysuckle) and leaves, with no obvious entrance hole. Dormice breed once or twice a year.

3.4.5.5 Dormice hibernate at ground level, in a nest of leaves and grass.

3.4.5.6 Field signs include:

- Gnawed hazel nuts
- Nests
- Honeysuckle with stripped bark
- Droppings

3.4.5.7 A Hazel nut which has been gnawed by a Dormouse will have a characteristically smooth round cut to the inside of the opening and tiny radiating teeth marks on the outside.

3.4.5.8 A search for suitable habitat and signs of Dormouse presence was conducted during the survey.

3.4.6 Great Crested Newt

3.4.6.1 A survey for Great Crested Newts may be required when background information on distribution suggests that they may be present. More detailed indicators are:

- Any historical records of Great Crested Newts on the Site or in the general area.
- A pond on or near the Site (within around 250m), even if it holds water only seasonally.
- Sites with suitable refuges (such as piles of logs or rubble), or extensive suitable habitat such as tall sward grassland, scrub, woodland or hedgerows within 250m of a pond.

3.4.6.2 Primary requirements for aquatic habitat include:

- Small to medium ponds, or small ponds in clusters. Great Crested Newts tend to avoid very small ponds and larger lakes.
- Supporting aquatic vegetation for egg-laying.
- Periodic drying can be of benefit, as it reduces abundance of predators such as dragonfly larvae and fish.
- A healthy invertebrate fauna as a food source for larvae, and other amphibian spawn and larvae and invertebrates for adult newts.
- Several suitable breeding ponds in close proximity can be beneficial.

3.4.6.3 Primary requirements for terrestrial habitat include:

- Permanent areas of refuge habitat for shelter in extreme weather conditions i.e. drought and freezing; e.g. rough / tussocky grassland, scrub, and woodland for shade.
- Underground crevices, tree root systems, mammal burrows, rubble piles and old stone walls for hibernation.
- Daytime refuges e.g. thick ground cover, fallen tree trunks, mammal burrows, piles of sticks.
- Foraging opportunities, where invertebrates are abundant e.g. grassland and woodland.
- Dispersal opportunities, such as allowing movement between hibernation sites and breeding ponds e.g. sufficient ground cover. Barriers to dispersal include roads with high levels of traffic, urban areas, large / fast-flowing rivers and large expanses of arable land.

3.4.6.4 A search for suitable terrestrial habitat on the Site was conducted.

3.4.7 Otter

3.4.7.1 Otters are nocturnal and are active all year round. They are large with an adult male reaching up to 1.2m from nose to tail and weighing about 10kg. Feeding mainly on fish and amphibians, Otters live by undisturbed waters where there is plenty of cover, mostly by freshwater lakes, rivers and quiet small streams as well as some coasts.

3.4.7.2 An Otter may use over 40km of river and needs many resting places throughout this range. A female otter will give birth to 1 to 3 cubs in a natal holt, which is often away from the main river and must be completely undisturbed. Field signs include:

- Prints in soft mud
- Spraints (faeces)
- Holts

3.4.7.3 There is no suitable habitat for Otter presence on the Site.

3.4.8 Reptiles

3.4.8.1 More common reptiles which may be encountered in rural areas include Grass Snake, Slow-worm and Common Lizard.

3.4.8.2 During the winter months, from mid-October to late February or early March, they are in hibernation, usually deep in underground hibernacula, such as holes and cracks in the ground, among rocks or the roots of large trees, down animal burrows, or in piles of rubble or stone.

3.4.8.3 In the spring and summer they live above ground in well-vegetated places, with Grass Snakes often near or in water. Being cold-blooded all reptiles need to bask and can often be found in open places.

3.4.8.4 There are very few signs of reptile presence, but these include:

- Shed skin (snakes)

- Eggs (only from Grass Snake and Common Lizard as other native reptiles give birth to live young)

3.4.8.5 Potential refugia and suitable habitat on the Site were looked for as part of the survey.

3.4.9 Water Vole

3.4.9.1 The Water Vole is the largest of the British voles. It lives in a series of holes or burrows at the water's edge and can be found along the banks of ditches, streams, rivers, lakes and canals.

3.4.9.2 Although Water Voles live in colonies, the breeding females are territorial, each defining their contiguous territory with latrines during the breeding season. This lasts from March to October.

3.4.9.3 The Water Vole is herbivorous, feeding primarily on the lush aerial stems and leaves of waterside plants. Its activity is normally confined to the area within two metres of the watercourse, the bankside vegetation in this area not only essential for food, but also for cover from predators.

3.4.9.4 Water Vole activity can be assessed by looking for the following signs:

- Burrows
- Faeces and latrines
- Feeding stations
- Runs
- Paw prints in areas of soft mud
- Feeding 'lawns'
- Predator field signs

3.4.9.5 There are no suitable watercourses on the Site for Water Vole presence.

3.5 Constraints and limitations

3.5.1 There were no constraints as the survey was carried out at an optimal time of year, the weather conditions were good and the entire site was accessible.

3.5.2 The aim of this survey and report is not to produce a comprehensive list of plant and animal species for the Site, because any ecological survey has limitations caused by factors that affect species presence (such as time of year, weather and behaviour). However, the results of the survey allow an assessment of the significance of potential impacts from the proposed development and evaluation of the need for appropriate further surveys and mitigation measures.

4 Results

4.1 Desk study

4.1.1 Designated statutory sites

4.1.1.1 Nearby designated statutory sites such as Local Nature Reserves (LNR) and non-statutory sites such as green belts can be of significance as they may provide areas of quality habitat which can harbour important populations of protected species. These populations may be dependent on the ability of individuals to move out into the surrounding landscape, often using green corridors such as hedgerows, in order to forage, to find a mate or to find new territories. Therefore this desk study considers designated sites within 2.0km of the Site, although whether these sites are of significance in regards to the survey site depends on a number of factors. The desk study also considers whether these important sites are likely to be physically affected themselves by the development, for example through run-off and pollution, or through damage to tree canopies or rooting areas.

4.1.1.2 The study found one statutory site within 2km of the Site, located approximately 0.8km north-east, in the form Adderbury Lakes Local Nature Reserve (LNR) located (grid reference: SP478355). The LNR consists of a collection of ornamental lakes that contain a wide diversity of insects, birds, mammals and plant life. The LNR also has extensive tree cover with some trees dating back to the early 1800's. The site is considered to be a sufficient distance from the survey site and therefore unlikely to be physically affected by the development of the survey site.

4.1.2 Designated non-statutory sites

4.1.2.1 The study found no non-statutory sites within 2km of the Site.

4.1.3 Priority habitats

4.1.3.1 In 2013 Natural England published a new priority habitats' inventory for England, addressing problems with the original Biodiversity Action Plan priority habitat inventories. These habitats, which were formerly identified as requiring action in the UK Biodiversity Action Plan, are recognised to be of 'principle importance' for the conservation of biological diversity in England under section 41 of the Natural Environment and Rural Communities Act 2006. The Priority Habitat Inventory is a spatial dataset that describes the geographical extent and location of Natural Environment and Rural Communities Act (2006) Section 41 habitats of principal importance.

4.1.3.2 An investigation into which of these important habitats may be present on or adjacent to the Site was undertaken. These habitats are summarised below and are also presented in more detail in Table 1. Priority habitats shown to be present on the Site include Priority Habitat Inventory Deciduous Woodland. There are also multiple areas of Priority Habitat Inventory Deciduous Woodland located nearby the Site, the nearest is located adjacent to the Site and bounds the northern boundary of the Site. An area of Priority Habitat Inventory Traditional Orchard is located approximately 0.4km to the west of the Site.

There is also a large area of Priority Habitat Inventory Coastal and Floodplain Grazing Marsh in association with Sor Brook located approximately 0.4km to the north-west; and Priority Habitat Inventory Wood Pasture and Parkland with further Deciduous Woodland located approximately 0.6km to the north-east of the Site. Impacts of the proposed development on this habitat should be minimised, through measures such as preventing harmful run-off into and pollution of surrounding areas during any works by following established guidance (for example the Environment Agency's Pollution Prevention Guidance).

Table 1. Summary of Priority Habitats that are in close proximity to the Site

Priority Habitat Inventory	Distance from Project Site (km)	Description
Deciduous Woodland	0km	Comprises the majority of the Site except for where there are buildings, amenity grassland and sections of hard standing, and measures approximately 0.59ha.
Deciduous Woodland	0km	Bounds the length of the northern boundary where the single public track separates the two areas of Deciduous Woodland. This area measures approximately 0.69ha and is in association with the dismantled railway.
Traditional Orchard	0.4km West	An area of Priority Habitat Inventory Traditional Orchard measuring approximately 0.15ha in area.
Coastal and Floodplain Grazing Marsh	0.4km North-West	Environment Agency Flood Zone 3; measures approximately 5.2ha in area.
Woodpasture and Parkland BAP Priority Habitat	0.6km North-East	Woodpasture and Parkland BAP Priority Habitat located to north-east of the Site; measures approximately 9.5ha in area.

4.1.4 Ponds

4.1.4.1 There are three ponds present within a 500m radius of the Site.

4.1.5 Surrounding landscape and habitat connectivity

4.1.5.1 Maps and satellite imagery were referenced to get an impression of the context of the Site. Habitat connectivity from the Site appears to be poor to average. The Site is bound to the immediate south and east by pastoral fields and woodland copses. Sor Brook, which eventually merges and becomes the River Cherwell, flows from the north and travels past the Site to the immediate east. The north of the Site is also bound by a dismantled railway and associated woodland corridor. A large area of built up development with its associated trees, hedgerows and urban green spaces arches from

the west to the north-east in a linear fashion, forming the villages of Adderbury and Twyford. A small business park is also located to the south-east of the Site along the A4260. Open countryside comprising a mosaic of arable and pastoral fields, along with a few areas of standing water, are found to the east, south-east and south with bordering treelines, hedgerows and a few interconnecting woodland copses. However this area is intersected by a main, busy road (A4260) which may act as a physical barrier and hinder the dispersal of any animals. Other physical barriers include Milton Road, which merges and becomes Berry Hill Road, located to the south-west of the Site; along with Aynho Road and Twyford Road which both project from the A4260 and are located to the north-east of the Site. Further afield, also to the north-east, is the M40.

4.2 Habitat survey

4.2.1 Habitat descriptions

4.2.1.1 The following habitats were recorded across the Site:

- Amenity grassland
- Bare Ground
- Building
- Dense continuous scrub
- Hard standing
- Intact species-poor hedgerow
- Introduced shrub and ornamental planting
- Mixed plantation
- Scattered scrub
- Scattered trees
- Species poor semi-improved grassland
- Tall ruderal

4.2.1.2 These habitats are described below and are shown on the habitat survey map (Appendix A). Photos of these habitats can be found in Plate 1.

4.2.1.3 Amenity grassland: Areas of amenity grassland were located towards the west end of the Site, encompassing the residential buildings. The grass appeared to be recently and regularly managed with a sward height of c.2cm-5cm. Species included grasses which were dominant, but also common speedwell, creeping buttercup, mouse eared chickweed and dandelion. This habitat had low ecological value.

4.2.1.4 Bare ground: A couple of areas of bare ground were present towards the centre of the Site with the majority being located adjacent to the single public track along the northern site boundary. These areas of bare ground appeared to have resulted from the overshadowing of trees which had been felled in recent times. Both areas showed signs of being colonised by grasses and also ephemerals, and short perennials such as common nettle, broad leaved dock and dandelion. This habitat had low ecological value.

4.2.1.5 Building: Multiple buildings were present onsite, including two detached residential buildings located at the western end of the Site and a wooden shed located towards the

centre of the Site. The detached residential buildings located at the west end of the Site consist of one larger, triple storey building constructed of stone and brick with clay tile roofing (B1), and one smaller, double storey building consisting of a similar construction with a thatched roof (B2). A double garage/storage building was located adjacent to the smaller residential building measuring approximately 3-4m tall (B3). The building was single storey and was constructed of stone, with timber frame and doors, and corrugated, grey asbestos roofing. There was also a small, single storey storage shed located adjacent to this which measured approximately 1.5m tall and was constructed out of timber and corrugated metal sheet roofing (B4). A single storey shed was located towards the centre of the Site (B5). The shed measured approximately 3m high and was constructed out of timber with felt roofing. The detached residential buildings and double garage/storage building are considered to be of moderate ecological value whilst the single storey storage building and wooden shed are considered to be of low ecological value.

4.2.1.6 Dense continuous scrub: There was dense continuous scrub located along the eastern boundary at the East end of the Site and towards the west end of the Site along a wall which separated the buildings and amenity grassland from the rest of the garden. The scrub habitat measured between 1m-3m in height and width, and consisted of previously managed bushes and young trees that had now become outgrown. Species mainly comprised bramble, some associated tall ruderal such as common nettle, cleavers and broadleaved dock, ornamental plants and also young planted and self-seeded trees including fruit trees and Ash. This habitat was of low ecological value but could provide shelter, refuge, nesting opportunities and limited foraging for animals including birds and small mammals.

4.2.1.7 Hard standing: Areas of hard standing were located at the west end of the Site in the consisting of garden stone slab paving and decorative aggregate which formed the patio, paving and driveway. A tennis court comprised of tarmac with approximately 3m high metal fencing was located towards the centre of the Site. A concrete track which allows access to the driveway bounds the length of the northern site boundary. The areas of hardstanding showed signs of being colonised by encroaching scrub and tall ruderal, as well as by a number of ephemerals, short perennials and moss. Species included grasses, moss, cleavers, mouse eared chickweed, green alkanet, dandelion, jack in the hedge, lords and ladies, forget me not, herb's Robert, along with self-sown and planted ornamental plants including lambs ear, bluebell and daffodil. The tennis court also contained self-sown saplings, tall ruderal and scattered scrub along the perimeter where vegetation from the surrounding garden has begun to encroach. Species included ash, field maple, buddleia, hawthorn, bramble and domestic rose. The ground layer comprised creeping thistle, wild strawberry, granny's nightcap, common nettle, ivy, cleavers, dandelion, common speedwell and grasses. Overall this habitat had low ecological value.

4.2.1.8 Intact species-poor hedgerow: Three intact, species poor hedgerows are present onsite, located towards the west end of the Site and to the south west adjacent to the southern boundary. These hedgerows are summarised below:

4.2.1.9 **H1** was located at the most western end of the Site of the Site and acted to separate Building 1 from Building 2. The hedgerow consisted of a privet type hedge plant that appeared to have been managed in the past but had now become outgrown due to a lack of management. The hedgerow varied in height, measuring between approximately 1.5m to 3m high and approximately 2-3m wide. Ornamental species were present at either end in which the hedge faded out to. The ground layer consisted of ivy, herb Robert, periwinkle and dandelion. A gate permitting access between the two buildings divided the hedgerow in half. This hedgerow was considered to be of low ecological value.

4.2.1.10 **H2** was located along the southern boundary at the south west end of the Site. The hedgerow had become outgrown due to lack of management and measured approximately 3m-4m tall and 3m-4m wide. Species present included leylandii which was dominant, holly and elder. A mature birch tree was also located at the western end of the hedge. The ground layer consisted of common nettle and ivy. This hedgerow was considered to be of low ecological value.

4.2.1.11 **H3** was located nearby H2 at the south west end of the Site and consisted of an elder hedge. The hedgerow had become outgrown due to lack of management although the surround ground layer appeared to have been recently strimmed back. The hedgerow measured 2m-3m tall and 2m-3m wide. The ground layer consisted of ivy, common nettle, creeping thistle, cleavers and common speedwell. Some deadwood and vegetation compost were also present which might provide potential refugia for herptiles. This hedgerow was considered to be of low ecological value.

4.2.1.12 Introduced shrub and ornamental planting: Concentrated towards the western end of the Site, areas of ornamental planting could be found surrounding the areas of amenity grassland and also around the buildings forming part of the gardens, and also around the areas of hardstanding as decorative planting. The habitat looked to be somewhat managed though with areas slightly more outgrown than others. Species included native examples such as beech, herb Robert, forget me not, meadow buttercup, fern and lambs ear, along with numerous introduced shrub and forb species. Amongst the introduced shrub was cotoneaster, a species listed under Schedule 9 of the Countryside and Wildlife Act 1981 (as amended).

4.2.1.13 Mixed plantation: The majority of the Site consisted of mixed plantation habitat – a continuation of the broadleaved woodland habitat which spans across the majority of the section of dismantled railway located adjacent to the north of the Site, and also sparsely covers the area of a few adjoining fields to the south and south east. The area of mixed plantation spanned from approximately the centre of the site, adjacent to the tennis court, to the east end of the Site with increasing concentration; and also lined the length of the single public track. Ages varied from self-seeded saplings to felled veterans with the majority being mature specimens. Species included conifers, ornamental species such as red oak, silver birch, ash, hazel and maple. The ground layer became somewhat sparse as the canopy became denser. Species present included elder, ivy, ground ivy, herb Robert, cleavers, green alkanet, bluebell and grasses. This habitat had low to moderate ecological value.

4.2.1.14 Scattered scrub: Scattered scrub was present throughout the Site but mainly found along the southern boundary and around the perimeter of the tennis court. Species included bramble, rosehip, ornamental species including box, rose and buddleia, self-seeded saplings including ash and elder, and also some tall ruderal such as common nettle, cleavers and broadleaved dock. This habitat had low ecological value.

4.2.1.15 Scattered trees: Scattered trees were mainly found towards the west end of the Site scattered around the buildings and within the more managed areas of the Site. The majority of specimens in this habitat were mature in age although there were a few veteran trees. A few scattered trees looked to have been felled in recent times including one large specimen which looked to have been a veteran. Species included ornamental species, conifers, yew, ash and oak. Some of the trees were identified as having potential roosting features for bats. These are described in more detail in Table 2 and the trees locations can be viewed in Appendix A. This habitat had low to moderate ecological value.

4.2.1.16 Species poor semi-improved grassland: In addition to mixed plantation, a large proportion of the Site also consisted of species poor semi-improved grassland. This habitat appears to have been left unmanaged for some time, although the habitat appeared to have been more regularly maintained towards the west end of the Site, and there were signs of animal grazing throughout. A small section towards the south west end of the Site looked to have been recently strimmed in addition with some tall ruderal. The overall sward height thus varied, measuring between c.10cm – 15cm. The sward and structure of the grassland was uneven in areas where the grass receded due to areas of the Site with a denser tree canopy, had undergone recent management (concentrated towards the west end of the Site) and increased in areas where the ground is slightly boggier towards the eastern end of the Site, taking on characteristics of marshy grassland. This habitat was dominated by grasses but also included examples of hard rush (eastern end of the Site) and forb species including white clover, spear thistle, common speedwell, creeping buttercup, meadow buttercup, forget me not, dandelion, wild strawberry, common sorrel, broad leaved dock and cleavers. One specimen of common spotted orchid was found within the species poor semi-improved grassland habitat at the edge of the mixed plantation, adjacent to Building 5 (B5). This species is common and widespread, being found throughout the UK except for the south west of England and northern Scotland. Overall this habitat had low to moderate ecological value.

4.2.1.17 Tall ruderal: There was tall ruderal present mainly in association with the areas of scrub habitat along the eastern and southern boundary, around the perimeter of the tennis court and also towards the west end of the Site along a wall which separated the buildings and amenity grassland from the rest of the garden. There was also a small area in association with target note 18. A few areas of tall ruderal located towards the south west end, adjacent H3 and H4, of the Site looked to have been recently strimmed. Vegetation measured between 25cm – 1m and included species such as common nettle, broadleaved dock, cleavers, creeping thistle, cows parsley and tall robust grasses. This habitat had low ecological value.

4.2.2 Flora

4.2.2.1 The botanical composition of habitat is typical and all species recorded are common and widespread. No rare vascular plants were found. One specimen of common spotted orchid was found within the species poor semi-improved grassland habitat at the edge of the mixed plantation. This species is common and widespread, being found throughout the UK except for the south west of England and northern Scotland. It should be noted that cotoneaster was found near the south west corner of the Site. This is an invasive species listed under Schedule 9 of the Countryside and Wildlife Act 1981 (as amended) and should be removed in a controlled manner as to prevent it from spreading.

4.2.2.2 A full list of species noted is given with scientific names in Appendix B.

Plate 1. Habitat survey photographic record

Photograph 1. Amenity grassland

Photograph 2. Bare ground

Photograph 3. Building

Photograph 4. Dense continuous scrub

Photograph 5. Hard standing

Photograph 6. Intact species-poor hedgerow

Photograph 7. Introduced shrub and ornamental planting

Photograph 8. Mixed plantation

Photograph 9. Scattered scrub

Photograph 10. Scattered trees

Photograph 11. Species poor semi-improved grassland

Photograph 12. Tall ruderal

4.3 Protected species survey

4.3.1 Badger

4.3.1.1 No setts or other evidence of Badger presence were found at the time of survey, e.g. latrines, tracks. A few potential snuffle holes were found within the mixed plantation towards the east end of the Site and towards the centre of the Site, nearby the tennis court, however these did not appear to be fresh with one containing a large amount of leaf litter and another occupied by a bumblebee. The species poor semi-improved grassland habitat, scrub habitat and mixed plantation which lead onto broadleaved woodland to the north and north east provide potential foraging and commuting habitat for Badgers. A couple of large mammal trails were found adjacent to the tennis court at opposite ends, one of which was in close proximity of one of the snuffle holes. No setts or other evidence of badger were found during the survey, e.g. latrine or spoil heaps, and it is considered that any presence of badger may be for foraging and commuting purposes only.

4.3.2 Bats (EPS)*

4.3.2.1 A ground level assessment was carried out on all of the trees on Site for their potential to support roosting bats. Although no signs of bat presence were found some of the trees onsite held features denoting bat roosting potential including woodpecker holes, peeling bark, cracks in branches and ivy cladding. The results of the assessment are set out in Table 2 and should be viewed in conjunction with Appendix A.

Table 2. Ground Level Tree Assessment

Tree No.	Description	Potential features	Category
T1	Mature Yew	Multiple knots holes in branch on south elevation approximately 3m up. Splits and cracks on end of branch approximately 4m up on southern elevation. Light ivy cladding from 2-7m.	1- Low to moderate bat potential
T2	Mature/Veteran Apple	Five woodpecker holes on east and south aspects approximately 4m, 5m and 6m up. Large cavity on south aspect leading through to north aspect.	2- Moderate bat potential
T3	Mature Conifer	Light ivy cladding up to 6m.	3- Low bat potential
T4	Mature Conifer	Woodpecker holes approximately 6m up on south aspect. Peeling bark on	2- Moderate bat potential

* European Protected Species

		south aspect of north-western limb approximately 7m up. Woodpecker hole on north east aspect approximately 4m-5m up.	
T5	Mature Oak	Mature oak located in close proximity to Site on adjacent residential property to immediate south. Large cracked branch on north west aspect approximately 8m-10m up.	2- Moderate bat potential

4.3.2.2 An external daytime inspection was carried out on all of the buildings present onsite located near the centre and at the west end of the Site. This was undertaken to check for evidence of bat presence, e.g. droppings, staining and insect remains, and to identify any potential roosting features, e.g. access points. Although no signs of bat presence were found most of the buildings held features denoting bat roosting potential including gaps beneath tiles, woodpecker holes, peeling bark, cracks in branches and ivy cladding. The results of the assessment are set out in Table 3 and should be viewed in conjunction with Appendix A.

Table 3. External Daytime Inspection

Building No.	**Description**	**Potential features**	**Category**
B1	Three storey residential building with a cross gabled roof featuring multiple pitched roofs, valleys and dormers. Constructed of stone and brick with clay tile roofing.	Gaps present on east aspect of main residential building; beneath some of the ridge tiles and dislodged roof tiles, and also potentially on the corner of the right dormer window. Gaps present at north gable end of building in the eaves of small stone and brick extension, along with a large vertical crack and multiple crevices on the west aspect. There is also a small open window permitting access into this part of the building on the north aspect. Interior of small extension appears to be heavily cobwebbed however.	2- Moderate bat potential
B2	Two storey residential building with a cross gable roof and flat roof	Numerous crevices and gaps present at north gable end of building within the stonework and	2- Moderate bat potential

	extension. Constructed of stone with thatched roofing.	also at the apex and in the eaves of the thatched roof. Crevice present in wall located above the window on the west aspect. Gaps present in eaves of thatched roof on east aspect. A few gaps are also present in extension on south aspect where roof adjoins the wall approximately 7m up.	
B3	Single storey garage/storage building with a gable roof. Constructed of stone and timber with corrugated, grey asbestos roofing. Height approximately 3m-4m	North and west aspects of building are heavily clad in ivy (any gaps present beneath not visible). A notable gap is present along the top of the doorway located on the west aspect. The walls on the west and south aspects also contain numerous crevices however most are covered with moderate cobwebbing.	3- Moderate bat potential
B4	Small storage shed approximately 1.5m in height. Constructed of timber and corrugated metal roofing.	Heavily clad in vegetation on north, south and east aspects. Long linear gap present in eaves of roof on west aspect.	4- Negligible bat potential
B5	Single storey shed/small cabin with gable roof. Approximately 2m-3m in height. Constructed of timber with glass panelling and felt roofing.	No obvious gaps in shed exterior suitable for bats except for one small gap on east aspect of building where there is a bowed wooden panel. Interior inspection revealed the inside to contain moderate to heavy cobwebbing in corners and along the walls. No signs of bat presence e.g. individuals, droppings, discarded feeding remains.	3- Low bat potential

4.3.2.3 The Site could be of moderate foraging and commuting value to bats. The mixed plantation, scattered trees, scrub and open areas of species poor semi-improved grassland may provide good sources of foraging habitat; while the vegetation encompassing the north, east and south-east of the Site provide commuting corridors that act as important links to the wider landscape. Within the wider landscape is greater

quality foraging and commuting habitat within the nearby vicinity and wider landscape including the corridor of broadleaved woodland in association with the dismantled railway to the north, the tree-lined River Cherwell to the east, and the scattered trees and hedgerows to the south and south east which connect to fields containing rough grassland, woodland copses and areas of standing water. However, despite this local populations will likely use the site for foraging and commuting purposes in conjunction with the surrounding and wider landscape. (Development works will therefore impact upon local populations of bats using the Site directly and also the adjacent woodland habitat to the north, and the hedgerow and tree lined pasture field to the south).

4.3.3 Birds

4.3.3.1 Eight bird species were heard or observed either on or flying over the Site: Blackbird, Blue tit, Great tit, Robin, Wren, Chaffinch, Pheasant and Woodpigeon.

4.3.3.2 Most of these species are on the RSPB green list, except for pheasant which currently has no status, meaning that nationally they are of least conservation concern.

4.3.3.3 There is potential for birds to nest within the buildings, trees, hedgerow and scrub onsite. During the survey visit a female sparrow was seen landing on Building 2 carrying food in her beak. There was also an old bird box located on the east aspect of building one though it was not clear whether it was currently occupied. Apart from this no nests (active/inactive) or birds displaying nesting behaviour were observed within the Site boundary during the survey.

4.3.4 Great Crested Newt (EPS)

4.3.4.1 There is suitable terrestrial habitat for Great Crested Newt on the Site in the form of scrub, tall ruderal, hedgerows, species poor semi-improved grassland with a long sward height of c.10cm-15cm. These provide potential foraging habitat and cover, however these habitats are not extensive. Potential refugia were present in the form of log piles, old stone walls and decaying tree stumps. There is good connectivity and cover to the Site in the form of woodland, rough grassland, hedgerows and a few small woodland copses. Wildlife barriers which may act to hinder the Great Crested Newt migration are located to the north-west, west and south-west where there is built up residential development in the form of Adderbury village. Further significant barriers are located to the east and include the River Cherwell and, beyond this, a busy main road, the A4260.

4.3.4.2 There are no ponds on the Site; however three ponds were identified within 500m (as shown on government website MAGIC and Google Earth Pro) and a further pond discovered during the survey visit. Due to access limitations only two of the ponds were assessed for its suitability to support great crested newt using the Habitat Suitability Index (see **Appendix D**). The ponds that were assessed scored as having 'good' suitability for supporting Great Crested Newt.

4.3.4.3 Although no ponds are onsite and there are physical barriers present within the wider landscape, including main roads and built up residential development, the presence of suitable terrestrial habitat for Great Crested Newts onsite, good level of connectivity within the wider landscape, and the presence of ponds within 500m of the Site means that the presence of Great Crested Newts cannot be reasonably ruled out.

4.3.5 Hazel Dormouse (EPS)

4.3.5.1 The Site falls within the known range for the national dormouse population. There is some moderately suitable habitat present on the Site in the form of hedgerow, scrub and woodland including a few plant species of value to this species such as hazel, ash and bramble however these habitats are not by any means extensive. There is habitat of similar and greater quality within the surrounding environs and wider landscape, including continuous deciduous woodland, established hedgerows and treelines.

4.3.5.2 Wildlife barriers which may act to hinder the dispersal of individuals are present in the form of built up residential development located to the north-west, west and south-west. To the east, there is also the River Cherwell along with a main busy road, the A4260, beyond this.

4.3.5.3 There is also habitat within the surrounding landscape which is of similar or greater quality, e.g. deciduous woodland, and so the Site is considered unlikely to provide a significant resource for this species. Overall, although there is some suitable habitat onsite, the presence of habitat of similar and greater quality within the surrounding landscape means that the presence of hazel dormouse is considered unlikely.

4.3.6 Invertebrates

4.3.6.1 Although there is moderate plant species diversity on the Site owing to the species poor semi-improved grassland it is concluded that there is moderate potential for invertebrate assemblages, in particular those species listed as a priority in the UK Biodiversity Action Plan and/or Local Biodiversity Action Plan.

4.3.7 Otter (EPS)

4.3.7.1 No evidence of Otter presence was found.

4.3.8 Reptiles and common amphibians (some EPS)

4.3.8.1 There was some suitable habitat for reptiles or common amphibians on the Site in the form of scrub, tall ruderal, hedgerows, species poor semi-improved grassland with a long sward height of c.10cm-15cm. These provide potential foraging habitat and cover, however these habitats are not extensive. Potential refugia were present onsite in the form of log piles and compost heaps. However there were not many opportunities for basking and no suitable water features or wetland habitat were present onsite. There is good connectivity to the Site in the form of woodland, rough grassland, hedgerows, and a river network in the form of Sor Brook and the River Cherwell. However, wildlife barriers which may act to hinder the dispersal of individuals are located to the north-west, west and south-west where there is built up residential development in the form of Adderbury village and a busy main road, the A4260, to the east.

4.3.8.2 Overall, despite there being good connectivity within the landscape, and some suitable terrestrial habitat onsite, the lack of basking opportunities and suitable water features, and the presence of physical barriers means the presence of reptiles and common amphibians is considered unlikely.

4.3.9 Water Vole

4.3.9.1 No evidence of Otter presence was found.

4.3.10 Other species

4.3.10.1 No other important or protected species were observed during the survey.

5 Conclusions and Recommendations

5.1 Site evaluation

5.1.1 The Site is concluded to be of low to medium wildlife value.

5.1.2 None of the twelve habitats recorded at the Site are considered rare or important and they are generally common throughout the local area. None are Biodiversity Action Plan habitats, and the plant communities present are regarded as common and are under no conservation threat.

5.1.3 Most of the twelve habitats present are considered unlikely to support important animal species. Three taxonomic groups of 'important' species may need to be further considered in the Site's development, namely bats, nesting birds and Great Crested Newts.

5.1.4 No setts or other evidence of Badger presence were found onsite at the time of survey. However, a few potential snuffle holes were found within the mixed plantation towards the east end of the Site and towards the centre of the Site, nearby the tennis court though these were not fresh. There is also potential foraging and commuting habitat onsite and within the immediate surroundings for Badger in the form of species poor semi-improved grassland, hedgerow, scrub, mixed plantation and broadleaved woodland. It is therefore considered that any presence of badger onsite may be for foraging and commuting purposes only on an irregular basis.

5.1.5 Most of the trees within the Site boundary are considered to have low to negligible bat roosting potential. However a number of trees were found to have low to moderate bat roosting potential. Although no signs of bat presence were found some of the trees onsite held features denoting bat roosting potential including woodpecker holes, peeling bark, cracks in branches and ivy cladding. The results of the assessment are set out in Table 2 and should be viewed in conjunction with Appendix A.

5.1.6 An external daytime inspection of all the buildings present onsite revealed them to hold negligible to moderate potential for supporting roosting bats. The residential buildings and garage located at the west end of the Site in particular were found to hold moderate roosting potential for bats. An internal inspection of the buildings onsite was not carried out at the time of the survey. It is therefore recommended that an internal inspection be carried out by a licensed ecologist of the buildings onsite that are deemed as having low to moderate bat roosting potential. The results of the external daytime inspection are set out in Table 3 and should be viewed in conjunction with Appendix A.

5.1.7 The Site could be of moderate foraging and commuting value to bats. Although there is habitat of similar and greater value within the surrounding and wider landscape, it is considered likely that local populations will use the Site for foraging and commuting purposes in conjunction with this habitat.

5.1.8 The site was found unlikely to support specially protected species of bird. However, common garden birds may be found onsite, and there is potential for birds to nest within the buildings, trees, hedgerow and scrub onsite. Additionally, Blackbird, Blue tit, Great tit, Robin, Wren,

Chaffinch, Pheasant and Woodpigeon were seen on site, all of which are on the RSPB green list and are therefore of low conservation concern.

5.1.9 There is suitable terrestrial habitat for Great Crested Newt onsite and within the surrounding landscape. There are no ponds present onsite however four waterbodies were found to be present within 500m of the Site. Only two of the four ponds were granted access permission and were assessed as being of good suitability to support Great Crested Newts. As such, the presence of Great Crested Newts cannot be reasonably ruled out.

5.1.10 There was some suitable terrestrial habitat and potential refugia for reptiles and amphibians on the Site in the form of scrub, log piles, compost heaps, stone walls, tall ruderal, hedgerows and species poor semi-improved grassland with a long sward height of c.10cm-15cm. However the Site lacked suitable water features and basking areas; and with the presence of equal and greater habitat within the surrounding landscape including water courses, standing water, woodland edge rough grassland and a golf course, the presence of reptiles and common amphibians is considered to be unlikely.

5.1.11 The study found one statutory site within 2km of the Site, located approximately 0.8km north-east, in the form Adderbury Lakes Local Nature Reserve (LNR) located (grid reference: SP478355). No statutory sites were found within 2.0km of the Site.

5.1.12 It is concluded that the only perceivable ecological value of the Site appears to be for bats, nesting birds, reptiles and Great Crested Newts.

5.2 Possible impacts of proposed work and recommendations

5.2.1 Impacts can be permanent or temporary and can include:

- Loss of habitats
- Fragmentation and isolation of habitats
- Disturbance or harm to individuals of certain species

5.2.2 No evidence of badger was found onsite except for a few snuffle holes and large mammal trails. It's considered that badgers may be using the Site for foraging and commuting purposes on an irregular basis. As such, no further badger surveys are being recommended.

5.2.3 Development of the Site could potentially lead to the loss of bat roosting sites and harm to bats (a European protected species). It is therefore recommended that nocturnal surveys be undertaken in order to determine whether bats are using the trees deemed as having low to moderate value for roosting purposes and, if so, what appropriate mitigation measures should be taken if the proposed development were to proceed.

5.2.4 It is recommended that an internal daytime inspection be undertaken on the buildings onsite deemed from the external inspection as having low to moderate bat roosting potential. If potential or evidence of bats are found further nocturnal surveys will be required in order to determine whether bats are using the buildings for roosting purposes and, if so, what appropriate mitigation measures should be taken if the proposed development were to proceed.

5.2.5 The Site may be used by foraging and/or commuting bats, given the presence of suitable habitat including species poor semi-improved grassland, scattered trees and woodland habitat, and the amount of suitable habitat of equal and greater value within the immediate environs. It is recommended that as much of these habitats are retained as possible, in particular the scattered trees and woodland habitat. If any trees are removed for the development, it is recommended that suitable compensatory habitat is provided to mitigate for loss of foraging habitat or commuting corridors.

5.2.6 The proposed lighting scheme should consist of downward-pointing lights to avoid disturbance to any foraging or commuting bats. This is of particular importance near or on green space and near vegetation such as hedgerow or trees. These sensitive lighting measures will also reduce disturbance of birds.

5.2.7 Development of the Site could also lead to the disturbance of or harm to nesting birds. Since all in-use bird nests and their contents are protected from damage or destruction, any tree and hedgerow removal should be undertaken outside the bird nesting period: 1st March to 31st August inclusive. If this time frame cannot be avoided, a close inspection of the trees and hedgerows to be removed should be undertaken at least 24 hours prior to clearance. In order to prevent disturbance or harm to individuals, work should not be carried out within a minimum of 5.0m of any in-use nest, although this distance could be more depending on the sensitivity of the species.

5.2.8 Although no evidence or potential for reptiles or common amphibians was found during the survey, both these as well as small mammals could potentially be present onsite. As such, care should be taken at all times during removal of vegetation and topsoil stripping, in order to avoid harm to individuals. Any small mammals, reptiles and common amphibians disturbed or uncovered, should either be caught by hand and relocated to a safe area, or left to vacate the work site in their own time. All works during vegetation removal and topsoil stripping will need to be supervised by a suitably qualified ecologist. Suitable refugia, for example roots, logs, compost piles or rubble piles, will be dismantled carefully by hand or excavated (roots), under the supervision of a suitably qualified ecologist.

5.2.9 If excavations are to be undertaken, it should be noted that open trenches could potentially trap wildlife, especially if these fill up with water. Escape routes should therefore be provided if trenches cannot be infilled immediately. These can be in the form of branches or boards placed in the trench, with their upper ends above ground level and touching the sides and sloping ends left in the bottom of the trench.

5.2.10 Nearby ponds and ditches should also be protected from run-off and pollution during any works by following established guidance (for example the Environment Agency's Pollution Prevention Guidance).

5.2.11 The National Planning Policy Framework states that as part of moving towards sustainable development the planning system should minimise impacts on biodiversity and provide net gains in biodiversity where possible. Biodiversity on this site would benefit from considerate design of the proposed development. The green infrastructure of the landscape can be protected by retaining linear features such as hedgerows and ditches onsite and nearby. This can help prevent fragmentation of habitats in the landscape, thereby facilitating dispersal and enabling foraging and other important behaviours. Opportunities for wildlife can also be created by

incorporating native planting into a proposed development, including native hedgerow species, native trees and wildflower meadows. These can have value as nesting sites, foraging habitat, cover and opportunities for pollinators such as bees. Incorporation of features such as stone walls with rough surfaces and gaps can provide places of refuge to smaller fauna.

5.2.12 Taking all the evidence into account, it is considered that the proposed development of the land at The Leys, Adderbury is unlikely to impact significantly on wildlife if the appropriate further surveys and mitigation measures are carried out, and will not lead to a significant loss of habitat in the area.

5.3 Further surveys

5.3.1 It is recommended that an internal daytime inspection survey be carried out on the buildings onsite identified as having low to moderate bat roosting potential by a licensed bat worker. This will be in order to assess the buildings in more detail and to determine bat presence/absence. This will be required to take place prior to the determination of the planning application. In the event that the presence of roosting bats is confirmed either by direct observation or by secondary evidence (e.g. droppings) further nocturnal surveys will be required consisting of at least one dusk emergence and one separate dawn re-entry survey to be carried out during the optimal survey period May to September inclusive. All surveys will be completed in appropriate weather conditions conducive for bat activity. In the event that bats are found to be using the buildings onsite for roosting purposes, further nocturnal surveys may be required and survey efforts may be amended to meet Bat Conservation Trust survey guidelines. This will be addressed in the resulting bat survey report. All surveys will be required to take place predetermination of the planning application.

5.3.2 Further nocturnal surveys will be necessary to determine whether bats are present onsite and whether they are using the trees onsite for roosting purposes. This will include at least one dusk emergence and one separate dawn re-entry survey to be carried out during the optimal survey period May to September inclusive. All surveys will be completed in appropriate weather conditions conducive for bat activity. In the event that bats are found to be using the trees onsite for roosting purposes, further nocturnal surveys may be required and survey efforts may be amended to meet Bat Conservation Trust survey guidelines. This will be addressed in the resulting bat survey report. All surveys will be required to take place predetermination of the planning application.

5.3.3 Although it is unlikely that reptiles and common amphibians will be present, the habitat onsite is deemed to be highly suitable for reptiles. It is therefore advised that an additional ‘condition survey’ be undertaken as a precautionary method prior to the commencement of works. It is also advised that all vegetation removal and top soil tripping be carried out under the supervision of a qualified ecologist. In the unlikely event that a reptile or common amphibian is found it can then be translocated offsite to a nearby receptor site of suitable habitat.

5.3.4 Further Great Crested Newt surveys will be necessary to determine the likelihood of the species being impacted during the proposed development. Ponds can be surveyed March to June inclusive and at least two survey visits must take place between mid-April to mid-May. A minimum of four site visits will be required to determine presence / absence.

5.3.5 If any tree or hedgerow removal cannot be timed appropriately to avoid the bird nesting period (considered to be March to August inclusive), then nesting bird checks by an ecologist of the trees, hedgerows and/or scrub to be cleared or removed will be necessary. These checks should take place at least 24 hours prior to the commencement of any such clearance works.

5.3.6 No other surveys are considered necessary.

6 References and Further Reading

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Appendices

Appendix A Habitat survey map

Key

Target note

Boundary line

Intact species poor hedgerow

Mixed plantation & Scattered trees

Bare ground

Introduced shrub and ornamental planting

Dense continuous & scattered scrub

Marshy grassland

Hardstanding

Tall ruderal

SI — Species poor semi-improved grassland

A — Amenity grassland

B1 — Building

Appendix A *Continued…*

Target notes

1. Compost heap
2. Compost heap
3. Potential snuffle hole
4. Log pile
5. Large overgrown compost heap
6. Large mammal trail
7. Log and compost pile
8. Potential old snuffle hole
9. Common spotted orchid
10. Small vole nest underneath shed floorboards
11. Cotoneaster
12. Potential snuffle hole
13. Mammal trail
14. Log pile
15. Felled mature tree and dismantled bench with overgrown tall ruderal
16. Old bird box
17. Old, deteriorating outdoor furniture (potential artificial refugia)
18. Log piles and grass compost
19. Old stone wall
20. Active bee hive

Appendix B Species names

Below are lists of all species mentioned in this report:

Table B1. Animal species

Common name	Scientific name	
Badger, European	*Meles*	☐
Bat, typical	*Vespertilionidae*	☐
Blackbird	*Turdus merula*	☑
Blue tit	*Cyanistes caeruleus*	☑
Chaffinch	*Fringilla coelebs*	☑
Dormouse, Hazel	*Muscardinus avellanarius*	☐
Dove, Collared	*Streptopelia decaocto*	☐
Great tit	*Parus major*	☑
Lizard, Common	*Zootoca vivipara*	☐
Newt, Great Crested	*Triturus cristatus*	☐
Otter, European	*Lutra*	☐
Pheasant	*Phasianus colchicus*	☑
Robin	*Erithacus rubecula*	☑
Slow-worm	*Anguis fragilis*	☐
Snake, Grass	*Natrix*	☐
Vole, Water	*Arvicola amphibius*	☐
Woodpigeon	*Columba palumbus*	☑
Wren	*Troglodytes troglodytes*	☑

☑ = species observed on the Site, signs of species found, or potential for species identified.

Table B2. Plant species

Common name	***Scientific name***	
Apple	*Malus sylvestris*	☑
Ash, Common	*Fraxinus excelsior*	☑
Beech	*Fagus sylvatica*	☑
Bluebell	*Hyacinthoides non-scripta*	☑
Bramble	*Rubus fruticosa*	☑
Broadleaved dock	*Rumex obtusifolius*	☑
Buddleia	*Buddleja davidii*	☑
Buttercup, creeping	*Ranunculus repens*	☑
Cleavers	*Galium aparine*	☑
Common box	*Buxus sempervirens*	☑
Common hawthorn	*Crataegus monogyna*	☑
Common ivy	*Hedera helix*	☑
Common nettle	*Urtica dioica*	☑
Common periwinkle	*Littorina littorea*	☑
Common speedwell	*Veronica officinalis*	☑
Common spotted orchid	*Dactylorhiza fuchsia*	☑

Common name	*Scientific name*	
Conifer	*Pinophyta*	☑
Cotoneaster	*Cotoneaster horizontalis*	☑
Cow-parsley	*Anthriscus sylvestris*	☑
Cows parsley	*Anthriscus sylvestris*	☑
Creeping buttercup	*Ranunculus repens*	☑
Creeping thistle	*Cirsium arvense*	☑
Daffodil	*Narcissus pseudonarcissus*	☑
Dandelion	*Taraxacum officinale*	☑
Domestic rose	*Rosaceae sp.*	☑
Elder	*Sambucus nigra*	☑
English oak	*Quercus robur*	☑
Fern	*Athyrium filix-femina*	☑
Forget me not	*Galium aparine*	☑
Granny's nightcap	*Aquilegia vulgaris*	☑
Green alkanet	*Pentaglottis sempervirens*	☑
Ground ivy	*Glechoma hederacea*	☑
Hard rush	*Juncus Inflexus*	☑
Hawthorn	*Crataegus monogyna*	☑
Herb's Robert	*Geranium robertianum*	☑
Jack in the hedge	Alliaria petiolata	☑
Lambs ear	*Calystegia sepium*	☑
Lords and Ladies	*Arum maculatum*	☑
Maple, Field	*Acer campestre*	☑
Meadow buttercup	*Ranunculus Acris*	☑
Mouse eared chickweed	*Cerastium vulgatum*	☑
Nettle, Common	*Urtica dioica*	☑
Oat-grass, False	*Arrhenatherum elatius*	☑
Privet	*Ligustrum ovalifolium*	☑
Rosehip	*Rosa canina*	☑
Ryegrass, Perennial	*Lolium perenne*	☑
Spear thistle	*Cirsium vulgare*	☑
Sycamore	*Acer pseudoplatanus*	☑
White clover	*Trifolium repens*	☑
Wild strawberry	*Fragaria vesca*	☑
Yew	*Taxus baccata*	☑

☑ = species found on the Site.

Appendix C Relevant legislation

Below is relevant legislation relating to species discussed in this report:

i) Bats

In England, Scotland and Wales, all bat species are fully protected under the Wildlife and Countryside Act 1981 (WCA) (as amended), through inclusion in Schedule 5. In England and Wales this Act has been amended by the Countryside and Rights of Way Act 2000 (CRoW), which adds an extra offence, makes species offences arrestable, increases the time limits for some prosecutions and increases penalties.

All bats are also included in Schedule 2 of the Conservation (Natural Habitats, etc) Regulations 1994, (or Northern Ireland 1995) (the Habitats Regulations), which defines 'European protected species of animals'.

It is prohibited to do the following to bats:

- *Intentionally or deliberately kill, injure or capture (or take);*
- *Deliberately disturb (whether in a roost or not);*
- *Recklessly disturb roosting bats or obstruct access to their roosts;*
- *Damage or destroy roosts;*
- *Possess or transport a bat or any part of a part of a bat, unless acquired legally;*
- *Sell (or offer for sale) or exchange bats, or parts of bats.*

The word 'roost' is not used in the legislation, but is used here for simplicity. The actual wording is 'any structure or place which any wild animal…uses for shelter or protection' (WCA), or 'breeding site or resting place' (Habitats Regulations). As bats generally have both a winter and a summer roost, the legislation is clear that all roosts are protected whether bats are in residence at the time or not.

ii) Birds

In Britain, all wild birds, their nests and eggs are protected under the Wildlife & Countryside Act 1981. There are penalties for:

- *Killing, injuring or capturing them, or attempting any of these;*
- *Taking or damaging the nest whilst in use;*
- *Taking or destroying the eggs.*

iii) Great Crested Newts

Great Crested Newts are protected under Schedule 5 of the Wildlife & Countryside Act 1981 as amended, and Schedule 2 of the Conservation (Natural Habitats, etc) Regulations 1994 (Regulation 38).

As a result of their rarity across Europe, they are also protected under Annexes IIa and IVa of the Habitats and Species Directive, and under the Bern Convention (the Convention on the Conservation of European Wildlife and Natural Habitats).

It is prohibited to do the following to Great Crested Newts:

- *Intentionally capture, kill, or injure;*
- *Deliberately disturb them;*
- *Deliberately or recklessly disturb them in a place of shelter / protection;*
- *Deliberately or recklessly damage, destroy or obstruct access to a place of shelter / protection;*
- *Damage or destroy a breeding / resting place;*
- *Possession;*
- *Trade (i.e. sale, offer of sale, barter, exchange, transporting for sale, and advertising to sell or buy) of live or dead specimens, or any part of, or anything derived from them.*

iv) Reptiles and amphibians

All native species of reptile and amphibian are afforded some degree of protection under the Wildlife and Countryside Act 1981, section 9 (as amended).

Relating to Great Crested Newt, Natterjack Toad, Sand Lizard, Smooth Snake and all species of marine turtle, section 9 of the Wildlife and Countryside Act 1981 and Regulation 41 of the Conservation of Habitats and Species Regulations 2010 prohibit:

- *Intentional killing, injuring or taking;*
- *Trade (i.e. sale, barter, exchange, transporting for sale and advertising to sell or to buy) of live or dead specimens, or any part of, or anything derived from them;*
- *Deliberate disturbance; including disturbance which is likely: (i) to impair their ability to survive, to breed or reproduce or to rear or nurture their young; or (ii) to impair the ability to hibernate or migrate; or (iii) to affect significantly the local distribution or abundance of the species;*
- *Intentional disturbance whilst occupying a place used for shelter/protection and destruction of these places;*
- *Possession;*
- *Deliberate taking/destroying their eggs.*

Relating to the four widespread species of reptile (Common Lizard, Slow-worm, Grass Snake and Adder) sub-sections 9(1) and 9(5) prohibit:

- *Intentional killing and injuring;*
- *Trade (i.e. sale, offer of sale, barter, exchange, transporting for sale and advertising to sell or buy) of live or dead specimens, or any part of, or anything derived from them.*

The Wildlife and Countryside Act 1981 does not prohibit possession of these species of reptile.

Relating to the four widespread species of amphibian (Smooth Newt, Palmate Newt, Common Frog and Common Toad) sub-section 9(5) prohibits:

- *Trade (i.e. sale, offer of sale, barter, exchange, transporting for sale and advertising to sell or buy) of live or dead specimens, or any part of, or anything derived from them.*

Collection and keeping of these species of amphibian is not prohibited.

Appendix D Great Crested Newt HSI

i) Introduction

There are no ponds present on the Site. There were four ponds identified within 500m, however due to access limitations only two of the ponds were assessed for its suitability to support great crested newt. The ponds were checked for their suitability to support Great Crested Newt at the time of the survey (Pond A).

A Habitat Suitability Index (HSI) was carried out on 19th May 2017 on these two ponds in order to check their suitability.

The locations of the ponds are shown on the map below.

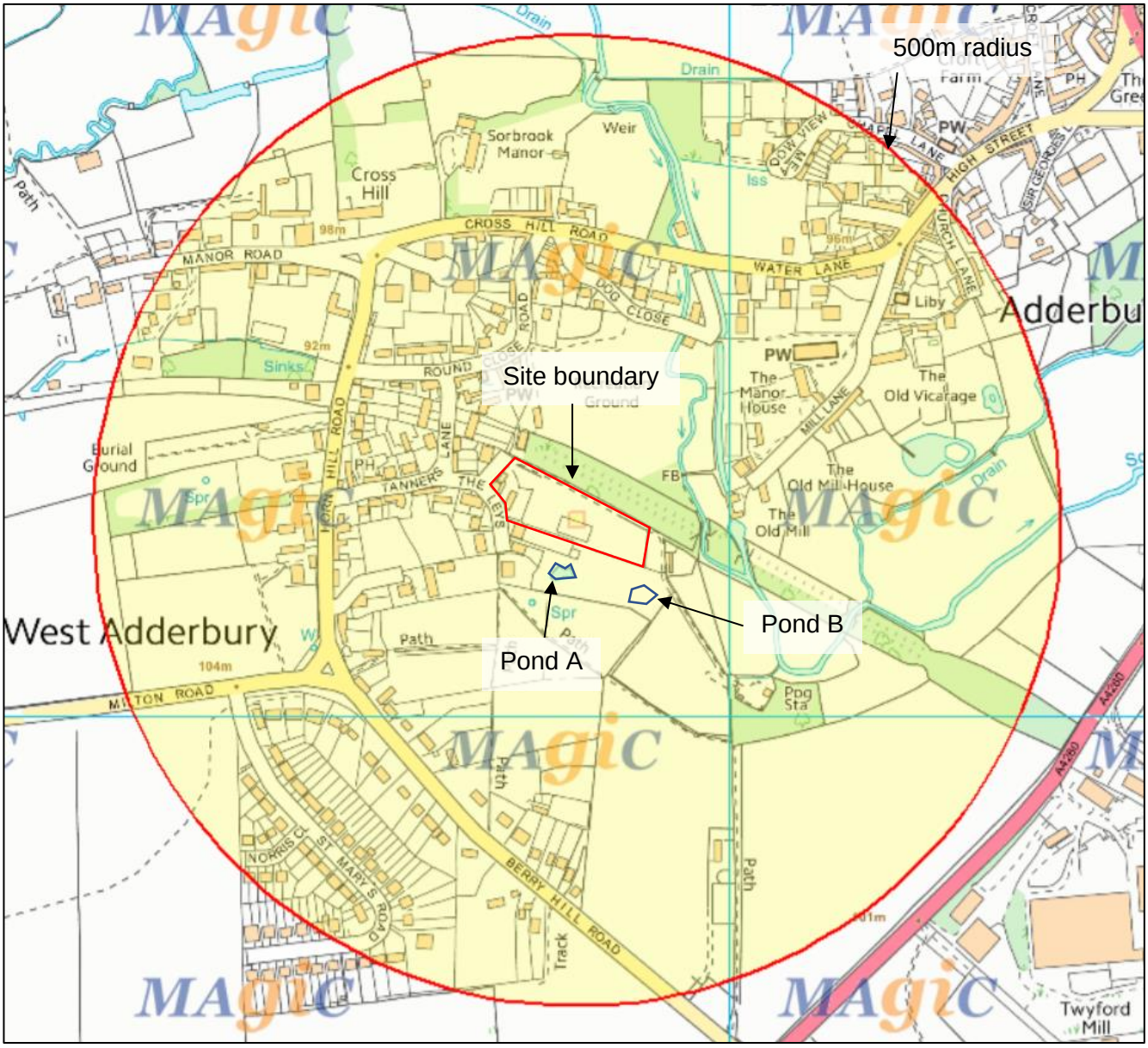

Figure D1. Map showing the locations of the surveyed ponds outlined in dark blue

ii) Methods

The guidelines set out by the Amphibian and Reptile Groups of the United Kingdom (ARG UK) Advice Note 5 for carrying out a Great Crested Newt Habitat Suitability Index were followed.

This consists of a list of factors to consider and a scoring system to conclude the level of suitability.

Data were gathered during a site visit and through the government MAGIC website.

iii) Results

Table D1. Pond A

Factor	Field Score	SI Score
1. Geographic Location	Zone A, location is optimal	1.00
2. Pond area	c.100m^2	0.50
3. Permanence	Sometimes dries	0.90
4. Water quality	Bad	0.67
5. Shade	50%	1.00
6. Waterfowl	Absent	0.67
7. Fish	Absent	0.67
8. Pond count	7 ponds within 1km*; 7 ÷ 3.14 = 2.23 ponds per km^2	1.00
9. Terrestrial habitat	Moderate	0.33
10. Macrophytes	50%	0.60
*not including those separated from pond by major barriers such as main roads and railways.		

HSI Score for Pond A:

$HSI = (SI_1 \times SI_2 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/10}$

Pond HSI = 0.70

Pond suitability: good

Table D2. Pond B

Factor	Field Score	SI Score
11. Geographic Location	Zone A, location is optimal	1.00
12. Pond area	c.100m^2	0.50
13. Permanence	Sometimes dries	1.00
14. Water quality	Bad	0.33
15. Shade	50%	1.00
16. Waterfowl	Absent	0.67
17. Fish	Absent	1.00
18. Pond count	7 ponds within 1km*; 7 ÷ 3.14 = 2.23 ponds per km^2	1.00
19. Terrestrial habitat	Moderate	0.33
20. Macrophytes	50%	0.70
*not including those separated from pond by major barriers such as main roads and railways.		

HSI Score for Pond B:

$HSI = (SI_1 \times SI_2 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/10}$

Pond HSI = 0.69

Pond suitability: average

Point of Contact:

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