



SB Rice Ltd

Claydon Marina

Preliminary Ecological Appraisal Report

856968

APRIL 2018

RSK



RSK GENERAL NOTES

Project No.: 856968

Title: Claydon Marina, Preliminary Ecological Assessment

Client: SB Rice Limited

Date: April 2018

Office: Deddington

Status: Final

Author Alice Clarke

Signature 

Date: 30/04/2018

Technical reviewer Simon Boulter

Signature 

Date: 25/04/2018

Project manager Alice Clarke

Signature 

Date: 30/04/2018

RSK ENVIRONMENT Ltd (RSK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

No part of this report may be copied or duplicated without the express permission of RSK and the party for whom it was prepared.

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK ENVIRONMENT Ltd.

EXECUTIVE SUMMARY

1. This report provides the results of a Preliminary Ecological Appraisal based on a Phase 1 Habitat Survey in March 2017 at the site of a proposed inland marina at Glebe Farm, Boddington Road, near Claydon in Banbury, Oxfordshire (Ordnance Survey Grid Reference SP 4641 5098).
2. The following habitats are present on the site; arable land, neutral grassland, hedges, scattered trees, scrub, and running water.
3. The majority of the site, and the vast majority of the area which will be affected by the development, is actively-ploughed agricultural land. Arable field margins and hedgerows on the site, and wet woodland and ponds adjacent to it are the subject of specific Biodiversity Action Plans (BAPs).
4. Six ponds were initially identified from a review of aerial imagery and Ordnance Survey mapping within 500m of the site. However, three of these are on the 500 m buffer and are segregated from the site by major barriers to newt movements. These were scoped out of further assessment. A Habitat Suitability Index survey revealed that the two ponds closest to the site were dry at the time of survey. Access was not granted to Pond 3. However, the immediate terrestrial habitat around the pond, and along the dismantled railway to the north of it, is much more suitable for GCN, than the proposed development site. The majority of the proposed marina site, being an actively ploughed/worked agricultural field, presents habitat of very low suitability for this species and, as such, it is considered highly unlikely that they are present.
5. Habitat suitable for nesting birds is present in the form of boundary features (hedges, trees, rough grassland) and agricultural crops. These are similar to surrounding habitats and land uses. As such, ample suitable, similar habitat exists for the common agricultural assemblage likely to use the site to displace into (if required). Some vegetation clearance and hedgerow removal is required as part of the development and will be done so in accordance with the Hedgerows Regulations (1997) and under the supervision of a watching brief, but the majority of boundary features (those most suitable for breeding birds) will be retained and available for use during construction and operation of the marina. Furthermore, current proposals indicate that the area will be enhanced through planting.
6. There is habitat suitable for common reptile species in the form of un-harvested, fertiliser-free conservation headland (Higher Level Stewardship agreement HF14), and field margins around the boundary of the site. In those discrete, localised areas where works are required in suitable habitats, works will be conducted under a watching brief following habitat manipulation using dissuasion techniques. The area will be searched by a suitably experienced ecologist for reptiles and amphibians before being strimmed from the centre outwards.
7. Signs of Badgers, including a large sett and several latrines, were identified along the northern boundary and in woodland adjacent to the site (outside the development area). Badgers will not be affected by the development and foraging areas are likely to be enhanced through the current proposals.

8. There are trees around the boundary of the site which are suitable for roosting bats. In addition, boundary features could be used by foraging and commuting bats (including the canal to the south of the site). However, these features will not be directly affected during works and this report discusses a method statement for sensitive lighting, which will be produced to ensure foraging and commuting routes, and one specific tree in particular, remain unlit. The creation of standing open water in the form of the marina, plus the separate waterbody to the east of the marina, will positively enhance the site for foraging bats. Trees being removed to facilitate the development have been assessed and have no potential to support roosting bats.
9. Signs of Otter were identified in the stream to the north of the site and along the canal to the south of the site, and there is suitable habitat for Otters and Water Voles along both watercourses. Neither species will be affected long-term by the development and are likely to benefit from enhancements included in the current proposals.

CONTENTS

CONTENTS.....	III
1 INTRODUCTION	1
1.1 Purpose of the Report	1
1.2 Ecological Context.....	1
1.3 Structure of this Report	1
2 METHODS.....	2
2.1 Background Data Search	2
2.2 Field Surveys.....	3
2.3 Botanical Survey.....	3
2.3.1 Phase 1 Habitat Survey.....	3
2.3.2 Invasive Plant Species	4
2.4 Surveys for Protected Animals	4
2.4.1 Introduction.....	4
2.4.2 Badgers	4
2.4.3 Bats	4
2.4.4 Birds	6
2.4.5 Great Crested Newts (GCN)	7
2.4.6 Common Reptiles.....	7
2.4.7 Otter.....	7
2.4.8 Water Vole.....	7
2.4.9 Other Species.....	8
3 RESULTS.....	9
3.1 Background Data Search	9
3.1.1 Biodiversity Action Plans	9
3.1.2 Designated Sites	9
3.1.3 Protected and Noteworthy Species.....	10
3.2 Habitats	11
3.2.1 Arable Land	11
3.2.2 Hedges	12
3.2.3 Rough Grassland.....	12
3.2.4 Scrub	12
3.2.5 Stream	12
3.3 Assessment for Protected Species	13
3.3.1 Badgers	13
3.3.2 Bats	13
3.3.3 Birds	14
3.3.4 Great Crested Newts (GCN)	14
3.3.5 Reptiles.....	14
3.3.6 Otter.....	15
3.3.7 Water Vole.....	15
3.3.8 Other Species.....	15
4 EVALUATION AND CONCLUSIONS.....	16
4.1 Designated Sites	16
4.1.1 Statutory sites.....	16

4.1.2	Non-statutory and other notable sites	16
4.2	Habitats and Species	16
4.2.1	Habitats	16
4.2.2	Species.....	16
4.2.3	Invasive Plant Species	17
4.3	Protected Animal Species	17
4.3.1	Badgers	17
4.3.2	Bats	17
4.3.3	Nesting Birds	18
4.3.4	GCN.....	18
4.3.5	Reptiles.....	19
4.3.6	Otter.....	19
4.3.7	Water Vole.....	20
4.3.8	Other Species.....	20
5	REFERENCES	21
6	FIGURES.....	22
	APPENDIX A - TARGET NOTES AND ANIMAL NOTES	26
	APPENDIX B – NOTEWORTHY SPECIES RECORDS	30
	APPENDIX C – ABBREVIATIONS	32

1 INTRODUCTION

1.1 Purpose of the Report

This report provides the results of a Preliminary Ecological Appraisal (PEA) including a Phase 1 Habitat Survey, Otter and Water Vole assessment, and a Habitat Suitability Index (HSI) of three ponds within 500m of the proposed site of an inland marina (Langton Architecture Drawing Number A05/010 G) at Glebe Farm, Boddington Road, near Claydon in Banbury, Oxfordshire (Ordnance Survey Grid Reference SP 4641 5098). The location of the site is shown in *Figure 1*. The survey was undertaken to inform the planning application for submission to Cherwell District Council.

1.2 Ecological Context

The site is rural in character; it is a single arable field bordered by hedges. Adjacent to the northern boundary are wet woodland and trees, while a stream borders the eastern side of the site for c. 170m. Areas of grassland are situated at the field margins. There are also parcels of un-harvested, fertiliser-free conservation headland (Higher Level Stewardship agreement HF14) in the agricultural field. Ecological interest is primarily around the edges of the site, and these areas are largely being retained by the development. The site is surrounded by other agricultural fields which are bordered by hedgerows and small parcels of woodland. Further afield is predominantly arable land with scattered villages, streams, and reservoirs.

1.3 Structure of this Report

The remainder of this report is structured as follows:

- *Section 2* describes the survey and assessment methods;
- *Section 3* presents the survey results;
- *Section 4* gives an evaluation of the results;
- *Section 5* lists the references;
- *Section 6* present the figures;
- *Appendix A* provides botanical and animal 'target notes' from the survey;
- *Appendix B* lists the notable species from the data search; and
- *Appendix C* explains the abbreviations used for protected species legislation.

2 METHODS

2.1 Background Data Search

A search was made in March 2017 for reference materials relating to the ecology of the Claydon Marina site, and a list of sources is given in *Table 1*.

Table 1. Data sources

Information Obtained	Available From
Protected and Noteworthy species-records	Northamptonshire Biodiversity Records Centre
Protected and Noteworthy species-records	Thames Valley Environmental Records Centre
Protected and Noteworthy species-records	Warwickshire Biological Records Centre
Designated site locations and citations	Natural England website
Designated site locations and citations	Northamptonshire Biodiversity Records Centre
Designated site locations and citations	Thames Valley Environmental Records Centre
Designated site locations and citations	Warwickshire Biological Records Centre
Designations and legal protection of noteworthy species	Joint Nature Conservation Committee (JNCC) website
Details of species and habitats listed on the LBAP (CTA map)	Local BAP website

A search was made for information on statutory designated sites (often internationally and nationally important sites for ecology) and non-statutory designated sites (often important in a local context) within 2 km of the site boundary. A search was also made for records of noteworthy species within the same 2 km area. Species included in the search parameters are:

- European protected species (listed on *Schedules 2 and 5 of The Conservation of Habitats and Species (Amendment) Regulations 2012*);
- nationally protected species under *Schedules 1, 5 and 8 of The Wildlife & Countryside Act 1981* and *The Protection of Badgers Act 1992*;
- species listed as Critically Endangered, Endangered or Vulnerable on the *IUCN 2001 Red List*
- all species listed on the RSPB *Birds of Conservation Concern 4* as Red or Amber;
- Nationally Rare or Nationally Scarce species;

- Notable invertebrates; and
- species of Principal Importance under *The Natural Environment and Rural Communities (NERC) Act (2006)* or are Priority Species under the Local Biodiversity Action Plan.

2.2 Field Surveys

Phase 1 surveys were undertaken on 16 March 2017 by RSK Principal Ecologist Jan Skuriat, assisted by Ecologist Alice Clarke. Otter, Water Vole and Great Crested Newt HSI surveys were undertaken on 27 April 2017 by Alice Clarke and Ecologist Joseph Dyson. A second survey for Water Vole was undertaken on 29 September by Alice Clarke. All surveyors are members of the Chartered Institute of Ecology and Environmental Management (CIEEM). Jan has over 15 years experience of ecological consultancy. He is experienced in undertaking preliminary ecological appraisals and holds Natural England licences for several species. Alice and Joseph each have four years' experience in consultancy and are suitably experienced in carrying out the surveys undertaken during the site assessment.

2.3 Botanical Survey

2.3.1 Phase 1 Habitat Survey

The botanical survey centred on the Phase 1 Habitat Survey approach (Joint Nature Conservation Committee 2010). This involves the following elements.

- Habitat mapping using a set of standard colour codes to indicate habitat types on a Phase 1 Habitat Map (*Figure 2*); and
- Description of features of ecological or nature conservation interest in notes relating to numbered locations on the Phase 1 Habitat Map, called target notes (provided in *Appendix A*).

Basic Phase 1 Habitat Survey methods are described in detail in Joint Nature Conservation Committee (2010). Limits to the achievable reliability of the method are discussed in Cherrill & McClean (1999).

Plant nomenclature in this report follows Stace (2010) for vascular plants. Plant names in text are given with scientific names first, followed by the English name in brackets.

Botanical surveys conducted in mid-March are unlikely to record as many plant species as surveys in summer, but the general character of the habitats can usually be assessed. The exception to this is determining if vernal woodland herbs are present in hedges (which may affect their status as Important) or the proportions of species present that may indicate species-rich grassland. In both of these situations further surveys at a suitable time of year would be necessary.

2.3.2 Invasive Plant Species

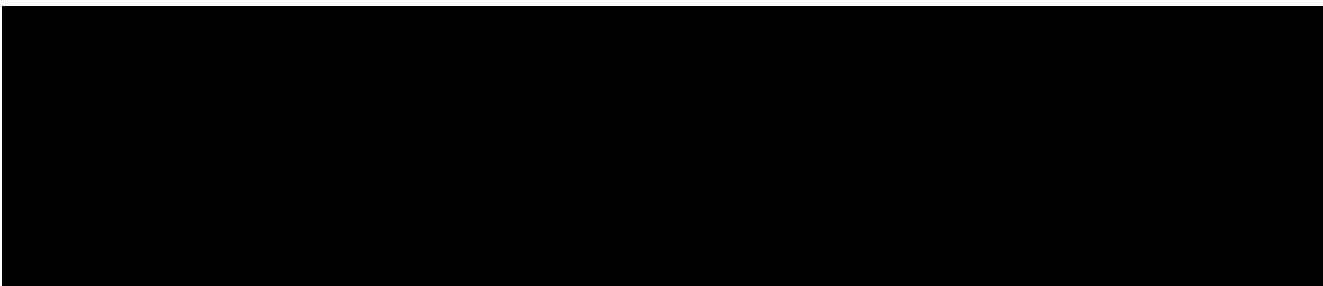
Phase 1 Habitat survey does not involve exhaustive surveying for any individual plant species. But if invasive plant species, e.g. *Fallopia japonica* (Japanese Knotweed), *Heracleum mantegazzianum* (Giant Hogweed) or *Impatiens glandulifera* (Indian Balsam), were seen during the normal course of the survey they were noted and reported.

2.4 Surveys for Protected Animals

2.4.1 Introduction

The site was assessed for its suitability for those protected animals that are likely to occur in the area. Taking into account the proposed works, the geographical location and the habitats at the sites, assessment was carried out for:

- Badgers;
- bats;
- breeding birds (including Barn Owl);
- GCN;
- commoner reptiles;
- Otters
- Water Voles



2.4.3 Bats

2.4.3.1 Roosting

Buildings and trees were noted if they featured characteristics that may be used by roosting bats. Where landowner access allowed, potential access points for bats were noted as well as crevices and voids, which could provide roosting opportunities.

The buildings and trees were assessed according to the following factors that influence the likelihood of bats roosting.

- Surrounding habitat: whether there are potential flight-lines and foraging areas for bats nearby.
- Condition: whether disrepair / tree rot has opened potential bat-access points.

- Potential bat-access points: whether there is flight and crawl access.
- Potential roosting locations: description of all bat-accessible voids, cracks and crevices.

The criteria shown in *Table 2* were used to categorise buildings and trees according to their potential to support roosting bats.

Table 2. Categorisation of roosting habitats (adapted from Collins, 2016).

Category	Description
Negligible potential	Negligible habitat features on site likely to be used by roosting bats.
Low potential	A structure or tree 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 on a regular basis or by larger numbers of bats.
Moderate potential	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, condition and surrounding habitat but unlikely to support a roost of high conservation status.
High potential	A structure or tree with one or more potential roost sites that are obviously suitable for 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.
Confirmed roost	Bats or evidence of bats recorded within the building or tree during the initial inspection surveys or during dusk/dawn surveys. A confirmed record (supplied by records centre/local bat group) would also apply.

2.4.3.2 Foraging and Commuting

Habitats were assessed for their suitability for foraging or commuting bats and categorised in accordance with *Table 3*. Areas of particular interest vary between species, but generally include sheltered areas and those habitats with good numbers of insects, such as woodland, scrub, hedges, watercourses, ponds, and more species-rich or rough grassland. For commuting, well-connected hedgerows, woodland edge, watercourses and other linear features are generally considered to be of high value.

Table 3. Categorisation of foraging and commuting habitats (adapted from Collins, 2016).

Category	Description
Negligible	Negligible habitat features on the 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 unvegetated stream, but isolated <i>i.e.</i> not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as lone tree (not in a parkland situation) or a patch of scrub.
Moderate	Continuous habitat connected to 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 regularly used 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.

2.4.4 Birds

2.4.4.1 Breeding Birds

The suitability of habitat for breeding birds was assessed. Incidental sightings of birds and old nests were recorded, but observations from an initial non-specific survey are of limited value.

2.4.4.2 Barn Owl

Trees and buildings were assessed for their suitability for nesting Barn Owls. Barn Owls require a nesting platform (preferably at height) that is relatively secluded and will use hollow trees, modern and traditional farm buildings, as well as specially designed boxes. Evidence of occupancy by Barn Owls includes distinctive numbers of droppings and regurgitated pellets. Sometimes remains of eggs, feathers, uneaten prey and even dead chicks can be found.

2.4.5 Great Crested Newts (GCN)

2.4.5.1 Terrestrial Habitats

The terrestrial habitats were assessed for their suitability for GCN (*Triturus cristatus*). Suitable habitat generally includes rough grassland and woodland where they can forage and hibernate, and good links (with cover from predators) between breeding ponds and terrestrial foraging and hibernation areas

2.4.6 Common Reptiles

The site was assessed for reptiles, with particular attention to features that provide basking areas (e.g. south-facing slopes), hibernation sites (e.g. banks, walls, piles of rotting vegetation) and opportunities for foraging (e.g. rough grassland and scrub).

The site was assessed for its suitability for the four commoner reptile species. Specific habitat requirements differ between species. Common Lizards (*Zootoca vivipara*) use a variety of habitats from woodland glades to walls and pastures, although one of their favoured habitats is rough grassland. Slow-worms (*Anguis fragilis*) use similar habitats to Common Lizards, and are often found in rank grassland, gardens and derelict land. Grass Snakes (*Natrix natrix*) have broadly similar requirements to Common Lizards with a greater reliance on ponds and wetlands, where they prey on Common Frogs (*Rana temporaria*). Adders (*Vipera berus*) use a range of fairly open habitats with some cover, but are most often found in dry heath (Beebee & Griffiths 2000).

2.4.7 Otter

2.4.7.1 Evidence of Otter

An initial assessment of watercourses, areas of wetland and adjacent habitat was made for their suitability for Otters. This included an assessment of water depth, water quality, vegetation and cover.

The survey then comprised a detailed search for signs of Otters including spraint (droppings), footprints, slides, paths, feeding evidence, holts (underground resting places) or couches (temporary resting places).

2.4.8 Water Vole

Habitat was assessed for Water Voles according to subjective criteria, which were then used to categorize habitat according to suitability for the species. The following habitat factors are taken into consideration:

- water quality;
- water-level regime;

- channel dimensions;
- bank type and material;
- vegetation for cover and food sources;
- shading;
- predation and competition; and
- habitat management.

Classification of habitat suitability was made as follows:

- *Excellent* – ideal or optimal habitat with good cover, food sources and other elements that would allow a population of Water Voles to thrive throughout the year.
- *Suitable* – habitat that has all the elements required for Water Voles certainly in the summer, and probably through most winters.
- *Marginal* – habitat that has some of the habitat features that are suitable for Water Vole, but with some constraints so that suitability throughout the year is not certain.
- *Unsuitable* – habitat lacking one or more crucial element for use by Water Voles. This category does not necessarily preclude the habitat being used by commuting Water Voles, but it would not be able to support a resident population.

2.4.8.1 Evidence of Water Vole

Survey for evidence of Water Vole activity followed standard methods adapted from Strachan (1998). All of the suitable habitat – in this case the canal and stream, were systematically and thoroughly searched for signs of the species. This involved an intensive search of the bankside and water-edge habitat, searching for Water Vole field signs including:

- burrows;
- feeding platforms and evidence of feeding;
- food remains;
- latrines; and
- footprints.

2.4.9 Other Species

Consideration was given to the site's suitability for Species of Principle Importance (SPoI) as listed on Local and National BAPs, and particularly those species for which there are records in the immediate vicinity.

3 RESULTS

3.1 Background Data Search

3.1.1 Biodiversity Action Plans

Habitats on and immediately abutting the site meet the HoPI types for Hedgerows, streams, and arable field margins.

Oxfordshire does not have a Local Biodiversity Action Plan, instead they have Conservation Target Areas (CTAs) where they aim to restore and enhance biodiversity at a landscape scale.

3.1.2 Designated Sites

3.1.2.1 Statutory Sites

There are no statutory designated sites within 2 km of the site boundary.

3.1.2.2 SSSI Impact Risk Zones

There are several SSSIs in the wider area. The site intersects SSSI Impact Risk Zones for several, but based on the trigger criteria for the Impact Risk Zones, Natural England will not need to be consulted due to the type of development proposed.

3.1.2.3 Non-statutory Sites

There are 21 non-statutory designated sites within 2 km of the site boundary, comprising 3 Local Wildlife Sites (LWS), 7 potential Local Wildlife Sites (pLWS) and 11 EcoSites. These sites are listed in *Table 4* in order of proximity to the site; short descriptions (when available) are given for the sites within 500m.

Table 4. Non-statutory sites within 2 km of the site boundary

Site Name	Designation	Approximate Distance (m)
North Claydon Disused Railway	LWS	On site / adjacent
This is a section of disused railway located in the very north of Oxfordshire. The site has areas of scrub habitat along with rough wet grassland.		
The Tunnel, Oxford Canal	EcoSite	30
The Canal is an important wildlife corridor with good stands of marginal vegetation, species-rich grassland pockets and bridges with associated flora and fauna. The Tunnel consists of parallel cuttings enclosing the canal and railway lines, with areas of species-rich grassland and dense scrub.		
Aston le Walls Railway Line	LWS	370
This section of disused railway provides a useful wildlife corridor, particularly for butterflies and birds, through this part of the County. It qualifies as a LWS due to its patches of species rich grassland that contained 9 neutral grassland indicator species in total.		

Site Name	Designation	Approximate Distance (m)
Hall Farm Wood	EcoSite & pLWS	410
A narrow belt of woodland running along the county boundary.		
The Tunnel, Oxford Canal	EcoSite	660
Disused Railway	pLWS	680
Stratford to Fenny Compton Disused Railway	EcoSite	680
Oxford Canal	pLWS	790
Leamington to Banbury Railway	EcoSite	1020
Wormleighton Reservoir	EcoSite & pLWS	1110
Leamington to Banbury Railway	EcoSite	1370
Canal Spoil Hill	EcoSite & pLWS	1450
509	pLWS	1490
Tunnel Bank Fenny Compton	EcoSite & LWS	1890
Granmore Hill Farm Fields	EcoSite & pLWS	1950
The Tunnel, Oxford Canal	EcoSite	1980

3.1.2.4 Other Notable Sites

There are no areas of ancient woodland within 2 km of the site boundary.

3.1.3 Protected and Noteworthy Species

At least 45 noteworthy species are recorded from places within 2 km of the site boundary. Of these, 3 are amphibians, 9 are birds, 17 are invertebrates, 6 are mammals (of these 2 are bats), 8 are plants, and 2 are reptiles. Species that are protected by law under *Schedules 2 and 5 of The Conservation of Habitats and Species (Amendment) Regulations 2012*, *The Wildlife and Countryside Act 1981* or *The Protection of Badgers Act 1992* and have been recorded in the search area are listed in the table below; a full species list is given in *Appendix B*.

Table 5. Protected species records within 2 km of the site boundary

Latin Name	Common Name	Designation	Within 100m	Within 2km
Amphibians				
<i>Bufo bufo</i>	Common Toad	WCA5.9.5	P	☒
<i>Rana temporaria</i>	Common Frog	WCA5.9.5	P	☒
<i>Triturus cristatus</i>	Great Crested Newt	EPS (Sch2), WCA5		☒
Birds				
<i>Milvus milvus</i>	Red Kite	WCA1.1		P
<i>Turdus pilaris</i>	Fieldfare	WCA1.1		P

Latin Name	Common Name	Designation	Within 100m	Within 2km
Invertebrate				
<i>Satyrium w-album</i>	White-letter Hairstreak	WCA5		☒
Mammals				
<i>Arvicola amphibius</i>	European Water Vole	WCA5	☒	☒
<i>Lutra lutra</i>	European Otter	EPS (Sch2), WCA5		☒
<i>Meles meles</i>	Eurasian Badger	BA		☒
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	EPS (Sch2), WCA5		☒
<i>Plecotus auritus</i>	Brown Long-eared Bat	EPS (Sch2), WCA5		☒
Plants				
<i>Malva setigera</i>	Rough Marsh-mallow	WCA8	P	☒
Reptiles				
<i>Natrix natrix</i>	Grass Snake	WCA5	P	☒
<i>Vipera berus</i>	Adder	WCA5	☒	☒

Note - **P** relates to records with 4 figure or tetrad grid references that could potentially be anywhere within a 1 km or 2 km square.

3.2 Habitats

The following habitats are present on the site:

- Arable land
- hedgerows
- rough grassland
- scrub
- stream

Detailed descriptions can be found below and shown on *Figure 2*. *Target Notes* are given in *Appendix A*.

The site is bordered to the south by a canal.

3.2.1 Arable Land

The majority (over 70%) of the site is used as arable land under crops in rotation. Some areas along the southern and eastern boundaries of the site have been

designated as un-harvested, fertiliser-free conservation headland under Higher Level Stewardship agreement HF14 (*Target Note 6*); this is ploughed and re-seeded each year and is rotational.

3.2.2 Hedges

Hedges are the main field boundary type and can be found at *Target Notes 1, 5, 7, 8, 10, and 11*. They feature a diverse range of species, and management ranges from being flailed annually to being completely unmanaged, or in one case (*Target Note 10*), recently-laid. They range from c.1.5 m tall and wide to 8m tall and 2m wide. The most dominant species are *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn), but other species include *Fraxinus excelsior* (Ash), *Quercus robur* (English oak), *Rosa canina* (Dog-rose), *Salix fragilis* (Crack willow), and *Sambucus nigra* (Elder). There are occasional trees in the hedgerows. The field layer features *Arum maculatum* (Lords-and-ladies), *Galium aparine* (Cleavers), *Heracleum sphondylium* (Hogweed), and *Urtica dioica* (Common Nettle), though there were many other herb species and grasses recorded during the survey. Infrequently there are places where grasses dominated, mainly *Arrhenatherum elatius* (False Oat-grass) but also *Elytrigia repens* (Common couch-grass) and *Dactylis glomerata* (Cock's-foot).

3.2.3 Rough Grassland

Rough grassland can be found at *Target Note 2*. This area features species indicative of it being heavily-grazed by rabbits, with a variety of coarse grasses and herb species. These include *Arrhenatherum elatius* (False oat-grass), *Agrostis stolonifera* (Creeping bent), *Geum urbanum* (Wood avens), *Geranium dissectum* (Cut-leaved crane's-bill), and *Myosotis arvensis* (Field forget-me-not). It is possible that the grassland contains more species than those recorded during the survey.

3.2.4 Scrub

Scrub can be found at *Target Note 3*; it is dominated by *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn) and *Rubus fruticosus* agg. (Bramble), and is growing over an *Urtica dioica* (Common Nettle) community. The field layer also includes tall herb species such as *Galium aparine* (Cleavers), *Glechoma hederacea* (Ground ivy), and *Heracleum sphondylium* (Hogweed), amongst others.

3.2.5 Stream

The unnamed stream at *Target Note 4* is up to 2.5 m wide and 0.3 m deep, and is moderately-flowing over cobbles and silt. The earth banks are 2 m deep. In places there are debris bars and silt accumulations with marginal vegetation on them, which include basal rosettes of *Epilobium hirsutum* (Great Willowherb), *Phalaris arundinacea* (Reed Canary-grass), and *Urtica dioica* (Common Nettle). One bank is shaded with an outgrown hedge; the other is grassy with a high proportion of tall herbs. Trees on the

banks include; *Crataegus monogyna* (Hawthorn), *Fraxinus excelsior* (Ash), and *Prunus spinosa* (Blackthorn), with an under-storey of *Rubus fruticosus* agg. (Bramble). Marginal species on the banks include *Angelica sylvestris* (Wild Angelica), *Apium nodiflorum* (Fool's Water-cress), *Carex cf. otrubae* (False Fox-sedge), and *Ficaria verna* (Lesser Celandine). There are also some grasses including *Arrhenatherum elatius* (False Oat-grass), and *Dactylis glomerata* (Cock's-foot).

3.3 Assessment for Protected Species

3.3.2 Bats

3.3.2.1 Roosting

There is a collection of buildings immediately adjacent to the site, including a brick house with corrugated roof, and a collection of sheds and out-houses. Buildings have not been fully inspected for their potential to support roosting bats as they are outside the site boundary and will not be directly affected by works.

At least two trees were identified from ground level as having moderate potential for bats (*Animal Note 3*), including one Ash tree which is adjacent to tree 10 shown on the Trees & Hedgerow Removal Plan (ADAMCM-1-1-002). Additional trees may also be suitable.

3.3.2.2 Foraging and Commuting

The site is mainly actively-worked arable land bordered by hedgerows, many of which are partially managed and contain occasional trees. The habitat as a whole would be best described as moderate foraging habitat. Habitats such as rough grassland are suitable for foraging bats, particularly those areas which are less-intensively managed. Adjacent habitats include arable land, a canal, wet woodland, ponds and scrub. Further away there are the villages of Claydon, Aston le Walls, Lower Boddington and Farnborough, all of which have merit for sustaining bat populations, with abundant trees and potential roost sites.

Common Pipistrelle Bats (*Pippistrellus pippistrellus*) and Brown Long-eared Bat (*Plecotus auritus*) have been recorded within 2 km of the site.

3.3.3 Birds

3.3.3.1 Breeding

Boundary features such as trees and hedges are suitable for nesting birds, as are grassland strips and arable crops. One species listed on Birds of Conservation Concern (British Trust for Ornithology, 2015), Yellowhammer (*Emberiza citronella*), was recorded on the site and is likely to breed there. As there is a range of habitats it is likely that several bird species nest on the site. However, the site is similar to surrounding fields in the landscape and there is no reason to believe that it would support anything other than the common agricultural bird assemblage using surrounding fields.

3.3.3.2 Barn Owl

No evidence of this species was recorded during the site walkover and there are no records of it within 2 km; therefore no further surveys will be necessary.

3.3.4 Great Crested Newts (GCN)

There are six ponds within 500 m of the site, and some of them may contain populations of GCN. However three of the ponds are on the edge of the 500 m buffer and are segregated from the site by major barriers to newt movements – such as the canal and streams - which must prevent access to the site by GCN. There are records of this species within 2 km of the site, and RSK ecologists returned to the site to carry out HSI assessments of the three ponds connected to the site by terrestrial habitat. Two of the ponds (the two closest) were completely dry at the time of survey. Access could not be obtained to visit the third pond (Pond 3)

The site contains terrestrial habitat that is suitable for GCN in the form of boundary features, particularly hedgerows and rough grassland. However, the majority of the site, being an actively worked/ploughed field, is of very low suitability to the species.

3.3.5 Reptiles

Boundary features of the site are suitable for reptiles, including rough grasslands and hedge bases. No reptiles were seen during the survey but records of reptiles are unlikely to be obtained by walk-through surveys.

There are records of Grass Snake and Adder on or within 2 km of the site.

3.3.6 Otter

A survey of the stream on the site and canal immediately adjacent revealed that Otter are present around the site; scat was found on the canal towpath about 50m east of the proposed entry point to the marina, and a footprint was identified on the bank of the stream along the eastern boundary of the site. Despite this, no Holts or places of rest were identified during the survey, although the habitat was suitable in places. There are records of Otter within 2 km of the site.

3.3.7 Water Vole

Surveys of the canal and stream indicate that the stream offers 'excellent' habitat and the canal offers 'suitable' habitat for Water Voles. No field signs of this species, including feeding remains, droppings, or burrows, were noted during the survey. There are records of Water Vole within 100 m of the site.

3.3.8 Other Species

There are a number of species recorded in the area that are listed as Species of Principle Importance under *The Natural Environment and Rural Communities (NERC) Act (2006)*. These include butterfly and moth species, two reptile species, and a number of mammals including Water Vole and Brown Long-eared bat.

4 EVALUATION AND CONCLUSIONS

4.1 Designated Sites

4.1.1 Statutory sites

There are no statutory designated sites within 2 km of the site boundary. Therefore statutory sites will not be affected by the proposed development.

4.1.2 Non-statutory and other notable sites

The North Claydon Disused Railway LWS is adjacent to the site boundary (but separated from the actual works boundary) and The Tunnel, Oxford Canal EcoSite is situated within 30 m of the site boundary. The proposed development will not directly affect either of these notable sites. However, regular reviews will take place throughout the development process. No further surveys to include these areas are proposed at this stage.

4.2 Habitats and Species

4.2.1 Habitats

Four of the hedgerows are species-rich, containing five or more woody species, and one is considered 'important' under the Hedgerows Regulations (1997). This 'important' hedge will not be affected by the development proposals. Some of the other habitats present or immediately adjacent are also covered by Biodiversity Action Plans; namely wet woodland, ponds, arable field margins, and the stream. The waterbodies and field margins on the site, or within 500m in the case of ponds, have been assessed in further detail for their potential for protected species, as discussed below.

A total of approximately 135 m of hedgerow, in two sections of 60 m and 75 m, will be removed to facilitate the development. One of the hedgerows at *Target Note 11* is species-rich (although not classed as 'Important') and contains ten semi-mature *Fraxinus excelsior* (Ash) trees which will also need to be removed. Hedgerow removal should be carried out in line with the Hedgerows Regulations (1997) and outside of the breeding bird season, as discussed below.

4.2.2 Species

No rare or protected plant species were recorded, though the species recorded do not represent a complete list of species likely to be present, as botanical surveys in March are sub-optimal. However, as the marina footprint is largely in an actively ploughed/worked agricultural field, it is unlikely that it would support such species.

4.2.3 Invasive Plant Species

No invasive species of plants were recorded on the site.

4.3 Protected Animal Species

4.3.1 Badgers

A large c.20 hole Badger sett was identified adjacent to the site, and the site currently provides some opportunities for foraging. Latrines and runs were also noted along the field margins. However, the sett is far enough away from proposed works that it will not be directly affected and it is highly unlikely that any resident animals will be disturbed. Foraging/commuting routes will not be obstructed by the proposed marina and lighting will be sensitively sighted to not illuminate the northern site boundary (to further reduce the potential for disturbance). In addition, the landscaping/planting around the marina site (replacing agricultural crops) may actually result in a limited enhancement for foraging animals.

As Badgers are highly mobile and can readily dig new setts, surveys are only valid for one year. Field signs should be regularly monitored and a detailed walkover survey should be conducted no more than 3 months prior to development or site clearance works commencing. All evidence of Badgers on the site and within 30 m will be carefully mapped to assess how this species will be affected by the development.

4.3.2 Bats

4.3.2.1 Roosting

The buildings adjacent to the site will not require further surveys as they will not be affected by the development.

Ten semi-mature *Fraxinus excelsior* (Ash) trees will be removed at the entrance to the marina from the canal. These were assessed for their potential to support roosting bats, but have no features which may provide roosting opportunities. An Ash tree adjacent to tree 10 shown on the Trees & Hedgerow Removal Plan (ADAMCM-1-1-002) has moderate potential to support roosting bats and, although it is not scheduled for removal, will need to remain unlit and protected from disturbance throughout construction and operation of the marina to prevent causing disturbance if it is used by bats. No other tree removal will be taking place, therefore no further tree surveys will be required.

4.3.2.2 Foraging and Commuting

The site as a whole is considered to have moderate suitability for foraging and commuting bats. The main areas of interest are the boundary features (hedgerows, grassland and canal to the south) which will be largely retained throughout construction

and operation of the marina. Some vegetation clearance will be required at entrances from the road and canal to facilitate the development but no mature trees will be affected. As such no further surveys are proposed for bats as no adverse impacts are predicted.

Current development plans indicate that the area will be enhanced for bats following construction. This will be achieved through landscaping/planting and the introduction of two new areas of standing open water (the marina and the waterbody to the east) which will provide foraging opportunities. A management plan including proposals for lighting will ensure that potential foraging and commuting routes around the site remain unlit.

4.3.3 Nesting Birds

The site provides a range of habitats that are likely to be used by breeding birds, especially around the boundary of the site (outside the footprint of the marina). A section approximately 60 m in length and 10 m at its widest point of hedgerow and scrub (Target Notes 2 and 3), and approximately 75 m of species-rich hedgerow including ten semi-mature *Fraxinus excelsior* (Ash) trees will need to be cleared to facilitate the development, but the majority of vegetation will be unaffected. Vegetation clearance works must be conducted in line with the Hedgerows Regulations (1997) and outside the breeding bird season (March to August inclusive). If vegetation removal within this timeframe is not possible then a watching brief by an ecologist would ensure that no breeding birds are present. If nests were found to be present during this time work would have to stop within a radius of 10 m, until the fledglings were no longer dependent on the nest.

The overall habitat will be enhanced for a number of bird species following construction. This will include planting/landscaping and the creation of a new waterbody to the east of the marina site.

4.3.4 GCN

There are terrestrial habitats suitable for GCN and three ponds accessible by newts within 500 m of the site. Habitat Suitability Index assessments of Ponds 1-3 (*Figure 3*) found that the two ponds (Ponds 1 and 2) adjacent to the site were dry and are therefore unsuitable for breeding GCN.

Access was not granted to the third pond (Pond 3) to determine its suitability for GCN. However, the terrestrial habitat in its immediate vicinity provides excellent opportunities for GCN, as does the disused railway to the north of the field supporting Pond 3 (and runs along the northern boundary of the development site). Therefore, even if newts did use Pond 3, despite some of the boundary habitats on the development site having limited suitability for GCN in their terrestrial phase, it is considered highly unlikely that newts would use it in preference to the disused railway line and land around Pond 3, which offer ideal terrestrial habitat. No further surveys are therefore proposed for ponds within 500m of this site as it is considered highly unlikely that GCN would use the development site, even if present in Pond 3. Therefore, no adverse impacts are predicted

A small proportion of the site consists of rough grassland or un-harvested, fertiliser-free conservation headland (Higher Level Stewardship agreement HF14), which could support terrestrial-phase amphibians. This habitat is due to be removed from 2018, when the entire area will be sown with crops. The overall habitat will be enhanced for these species following construction. This will include planting/landscaping and the creation of a new waterbody to the east of the marina site. This will have areas of planting and profiling which will be suitable for breeding amphibians

In acknowledgement of the suitability of small areas of site for terrestrial-phase amphibians, mitigation is proposed for the localised works being undertaken in these areas (which will cover reptiles too). This will include a search of any suitable habitat prior to any vegetation clearance. Once the affected area has been hand-searched, the habitat will be made unsuitable for amphibians and reptiles as a precaution, by strimming long grass from the centre in an outwards direction to allow any animals present to move to adjacent habitat. The habitat will be kept in an 'unsuitable' condition until the construction phase is complete, during which time enhancements will be made across the wider site for a variety of species, including amphibians. Any common reptiles and amphibian species will be moved to suitable areas in the north of the site which will not be affected by works.

4.3.5 Reptiles

Limited, discrete, habitat that is suitable for common reptiles was recorded at *Animal Note 6*, but there could be wide-ranging species such as Grass Snake anywhere along the network of hedges or margins of the site (which are largely unaffected by works).

As only a small proportion of suitable reptile habitat will be lost during the course of the development, and the site is to be enhanced following the construction of the marina under current proposals, it is not considered necessary to carry out further surveys for reptiles. However, precautionary mitigation measures for reptile species (as discussed in Section 4.3.4 above) will be implemented during construction.

4.3.6 Otter

It is likely that Otters use the area around the site for foraging purposes. However, with sensitively placed lighting, the development will not impede Otter movements or affect foraging opportunities/success.

Current development proposals are likely to improve the habitat for use by Otter (given the new areas of standing open water) and it is considered that there will be an overall benefit for this species.

No holts were identified close to the marina footprint. However, as suitable habitat exists, these areas should be checked immediately prior to construction to confirm if the areas are still not used as an Otters resting site

4.3.7 Water Vole

No evidence of Water Vole activity has been found on site to date. Following current guidelines, a two field visits were undertaken and have now confirmed likely absence of this species. The current evidence suggests that Water Voles will not be affected by the proposed development; the stream will be completely unaffected and only a small section of the canal will be breached to allow entry to the new marina. The most suitable habitat found along the banks of the canal is far enough from the proposed canal entrance that works would not affect this species.

Mitigation for Water Vole is not considered necessary . It is anticipated that any Water Voles in the wider area will benefit from ecological enhancements incorporated into the proposed waterbody to the east of the marina site.

4.3.8 Other Species

Further information will be collected during future visits to the site, but no specific visits will be undertaken. Any information collected will be incidental to other visits. However, as the area being affected is largely a worked/ploughed arable field, no significant findings are anticipated.

5 REFERENCES

Anon, (1983). Wildlife and Countryside Act 1981. HMSO, London.

Beebee, T.J.C. & Griffith, R.A. (2000). *Amphibians and reptiles*. HarperCollins, London.

Cherrill, A. & McClean, C. (1999). Between-observer variation in the application of a standard method of habitat mapping by environmental consultants in the UK. *Journal of Applied Ecology*, **36**, 989-1000.

Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London.

Defra (2001). The Hedgerows Regulations 1997: a guide to the law and good practice. HMSO, London.

JNCC. (2010). *Handbook for Phase 1 Habitat Survey (revised 2010 edition)*. JNCC, Peterborough.

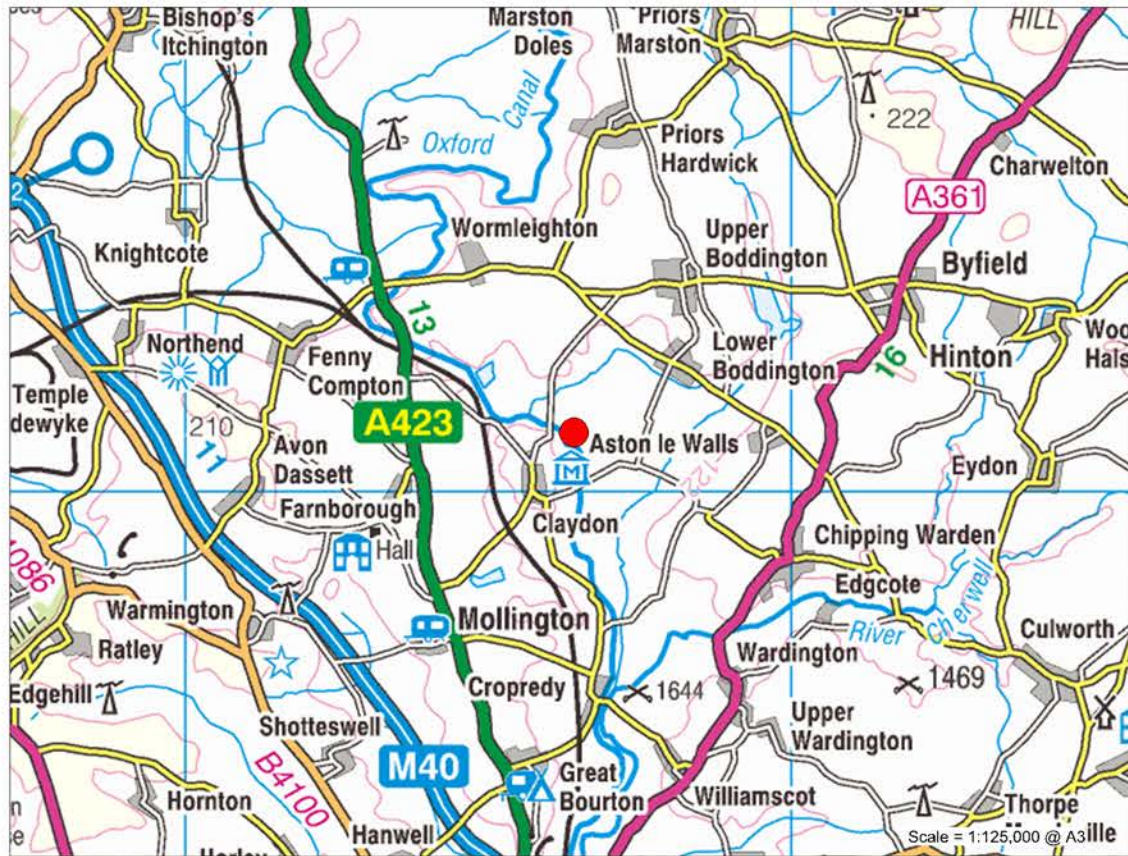
Stace CA (2010). *New Flora of the British Isles*. Cambridge University Press; 3rd Edition.


Strachan, R. (1998). *Water Vole Conservation Handbook*. Wildlife Conservation Research Unit, Oxford.

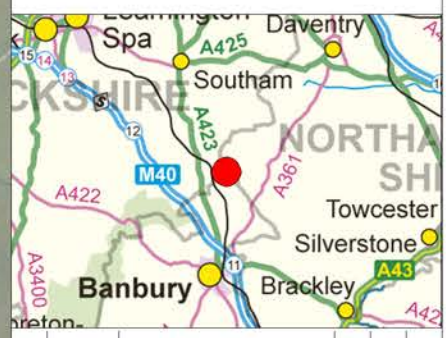
6 FIGURES

- Figure 1 Site Location Plan
- Figure 2 Phase 1 Habitat Survey Map
- Figure 3 Map of ponds within 500m

Figure 1. Site Location Plan



 Site Boundary



Rev	Date	Description	Drrn	Chk	App
00	13.04.17	856968	SP	RG	AC

Claydon Marina



Figure 1
Site Location Plan

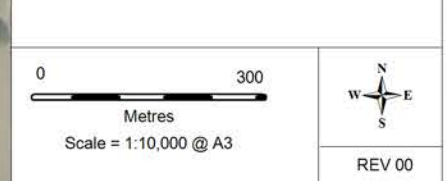


Figure 2. Phase 1 Habitat Survey



- Site boundary (June 2017)
- Broad-leaved semi-natural woodland
- Mixed plantation woodland
- x Scattered scrub
- Scattered broad-leaved tree
- Rough grassland
- Standing water
- Running water
- A Arable field
- Hedge
- Habitat boundary
- Botanical target note
- Animal target note



Rev	Date	Description	Drn	Chk	App
00	13.04.17	856968	SP	RG	AC

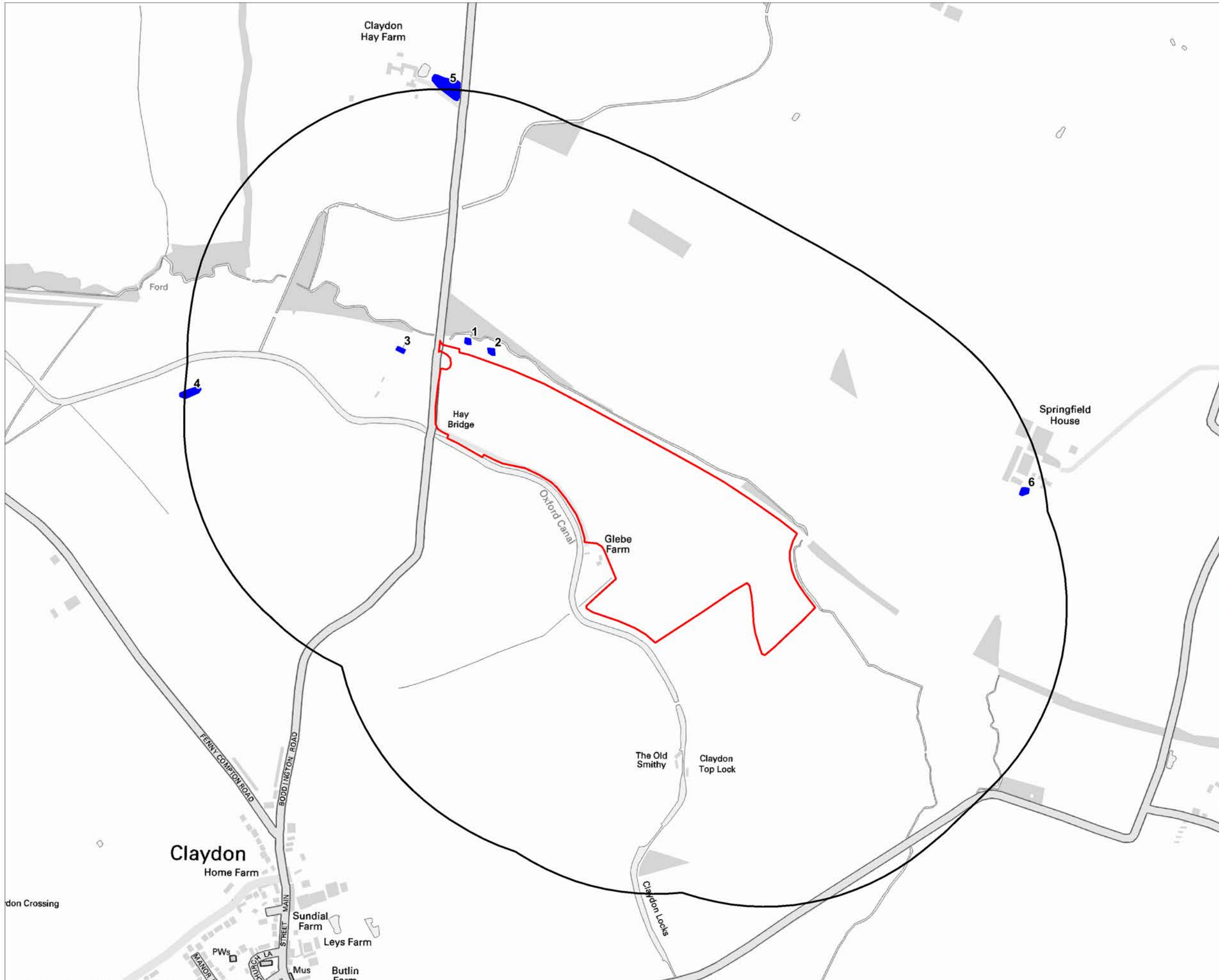
Claydon Marina

Figure 2
Phase 1 Habitat Survey

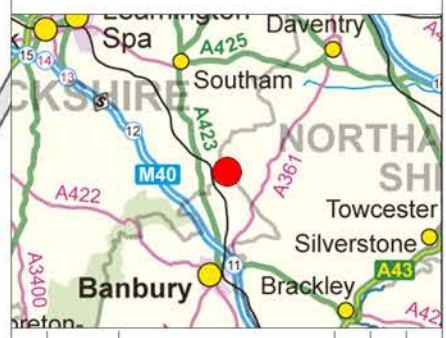
Scale = 1:3,000 @ A3

REV 00

Figure 3. Map of ponds within 500m.



- Site boundary
- 500m buffer
- Waterbody



Rev	Date	Description	Drn	Chk	App
00	10.04.17	856968	SP	RG	AC

Claydon Marina



Figure 3
Waterbodies within 500m

0 225

metres

Scale = 1:7,500 @ A3

REV 00

Contains Ordnance Survey data © Crown copyright and database right 2016

APPENDIX A - TARGET NOTES AND ANIMAL NOTES

Target Note 1. A field hedge 1.5 m high and 1.5 m wide, and is mostly comprised of *Crataegus monogyna* (Hawthorn). It is flailed annually. Woody species include abundant *Prunus spinosa* (Blackthorn) and *Rubus fruticosus* agg. (Bramble), with rarely-occurring *Malus sylvestris* (Crab Apple) and *Rosa canina* (Dog-rose). The understorey comprises a range of shade tolerant herbs and climbers including *Arum maculatum* (Lords-and-Ladies), *Anthriscus sylvestris* (Cow Parsley), *Hedera helix* (Ivy), *Heracleum sphondylium* (Hogweed), *Galium aparine* (Cleavers), *Myosotis sylvatica* (Wood Forget-me-not), *Rumex sanguineus* (Wood Dock), *Urtica dioica* (Common Nettle). The dominant grasses are *Arrhenatherum elatius* (False Oat-grass), and *Holcus lanatus* (Yorkshire-fog).

Target Note 2. Rough grassland on field margin. The grassland is heavily grazed by rabbits and features *Anthriscus sylvestris* (Cow Parsley), *Galium aparine* (Cleavers), *Geranium dissectum* (Cut-leaved Crane's-bill), *Geum urbanum* (Wood Avens), *Heracleum sphondylium* (Hogweed), *Myosotis arvensis* (Field Forget-me-not), *Lamium album* (White Dead-nettle), *Ranunculus repens* (Creeping Buttercup), *Rumex sanguineus* (Wood Dock), *Trifolium repens* (White Clover) and *Urtica dioica* (Common Nettle). Grasses present include *Agrostis capillaris* (Common Bent), *Agrostis stolonifera* (Creeping Bent), *Arrhenatherum elatius* (False Oat-grass), *Deschampsia cespitosa* (Tufted Hair-grass), *Schedonorus arundinaceus* (Tall Fescue), *Lolium perenne* (Perennial Rye-grass), and *Poa trivialis* (Rough Meadow-grass).

Target Note 3. An area of scrub growing over a nettlebed community. Scrub species include *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn), and *Rubus fruticosus* agg. (Bramble). The field layer is dominated by *Urtica dioica* (Common Nettle), with *Arum maculatum* (Lords-and-Ladies), *Filipendula ulmaria* (Meadowsweet), *Galium aparine* (Cleavers), *Glechoma hederacea* (Ground Ivy), *Heracleum sphondylium* (Hogweed), and *Myosotis arvensis* (Field Forget-me-not).

Target Note 3a. Wet woodland with a canopy to 16 m. Tree species include *Betula pendula* (Silver Birch), *Crataegus monogyna* (Hawthorn), *Fraxinus excelsior* (Ash), *Prunus spinosa* (Blackthorn), *Quercus robur* (Pedunculate Oak), *Rosa canina* (Dog-rose), *Rubus fruticosus* agg. (Bramble), *Salix alba* (White Willow), *Salix cinerea* (Grey Willow), *Sambucus nigra* (Elder), and *Ulmus procera* (English Elm). The field layer consists of *Anthriscus sylvestris* (Cow Parsley), *Chamerion angustifolium* (Rosebay Willowherb), *Galium aparine* (Cleavers), *Heracleum sphondylium* (Hogweed), and *Urtica dioica* (Common Nettle).

Target Note 4. Moderately-flowing stream over cobbles and silt, up to 2.5 m wide and 0.3 m deep. The earth banks are 2m deep. In places there are debris bars and silt accumulations with marginal vegetation on them, which include basal rosettes of *Epilobium hirsutum* (Great Willowherb), *Phalaris arundinacea* (Reed Canary-grass), and *Urtica dioica* (Common Nettle). One bank is shaded with an outgrown hedge; the other is grassy with a high proportion of tall herbs. Trees on the banks include; *Crataegus monogyna* (Hawthorn), *Fraxinus excelsior* (Ash), *Prunus spinosa* (Blackthorn), *Rubus fruticosus* agg. (Bramble), *Salix cinerea* (Grey Willow), *Salix viminalis* (Basket Willow), and *Sambucus nigra* (Elder). The field layer comprises *Glechoma hederacea* (Ground Ivy), and *Ribes nigrum* (Black Currant), and *Urtica dioica* (Common Nettle). Marginal species on the banks include *Angelica sylvestris* (Wild Angelica), *Apium nodiflorum* (Fool's Water-cress), *Carex otrubae* (False Fox-sedge), *Ficaria verna* (Lesser Celandine), *Filipendula ulmaria* (Meadowsweet), *Geum urbanum* (Wood Avens), *Juncus effusus* (Soft-rush), *Myosotis scorpioides* (Water Forget-me-not) and *Scrophularia nodosa* (Figwort). Grasses present include *Arrhenatherum elatius* (False Oat-grass), and *Dactylis glomerata* (Cock's-foot).

Target Note 5. Outgrown species-rich and 'important' hedge 7 m tall by 2 m wide, managed on one side. Woody species include *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn), *Quercus robur* (Pedunculate Oak), *Sambucus nigra* (Elder), *Salix fragilis* (Crack Willow), *Rosa canina* (Dog-rose) and *Ulmus procera* (English Elm). Herb and climber species in the field layer include *Anthriscus sylvestris* (Cow Parsley), *Galium aparine* (Cleavers), *Hedera helix* (Common Ivy), and *Urtica dioica* (Common Nettle).

Target Note 6. Areas of un-harvested, fertiliser-free conservation headland (Higher Level Stewardship agreement HF14) within an agricultural field. There is a mixture of grasses and weeds, including *Arrhenatherum elatius* (False Oat-grass), *Cirsium vulgare* (Spear Thistle), *Dactylis glomerata* (Cock's-foot), *Galium aparine* (Cleavers), *Holcus lanatus* (Yorkshire-fog), *Lolium perenne* (Perennial Rye-grass), *Ranunculus repens* (Creeping Buttercup), *Rumex obtusifolius* (Broad-leaved Dock), *Silene latifolia* (White Champion), *Taraxacum* species (Common Dandelion), *Trifolium pratense* (Red Clover), and *Vicia sativa* (Common Vetch).

Target Note 7. Well-maintained, species-rich hedge, 2 m tall by 2 m wide. Woody species include *Acer campestre* (Field Maple), *Crataegus monogyna* (Hawthorn), *Fraxinus excelsior* (Ash), *Prunus spinosa* (Blackthorn), *Sambucus nigra* (Elder), and *Ulmus procera* (English Elm). The field layer consists of shade-tolerant herb and climber species including *Anthriscus sylvestris* (Cow Parsley), *Ficaria verna* (Lesser Celandine), *Galium aparine* (Cleavers), *Hedera helix* (Ivy), *Rubus fruticosus* agg. (Bramble), and *Urtica dioica* (Common Nettle). Grasses present include *Arrhenatherum elatius* (False Oat-grass) and *Elytrigia repens* (Common Couch).

Target Note 8. Outgrown, species-rich hedge, 7 m tall by 2 m wide, on a bank next to the canal. Woody species include *Crataegus monogyna* (Hawthorn), *Fraxinus excelsior*

(Ash), *Malus sylvestris* (Crab Apple), *Prunus spinosa* (Blackthorn), *Rosa canina* (Dog-rose), and *Sambucus nigra* (Elder). The field layer contains *Arrhenatherum elatius* (False Oat-grass), *Geum urbanum* (Wood Avens), *Hedera helix* (Ivy), *Lamium album* (White Dead-nettle), *Rubus fruticosus* agg. (Bramble), *Rumex sanguineus* (Wood Dock), *Urtica dioica* (Common Nettle), and *Viola reichenbachiana* (Early Dog-violet).

Target Note 9. Wet ditch, 30 cm wide and 10 cm deep, with a moderate flow. The earth banks are steep and 1.5 m deep. Marginal and aquatic species include *Carex riparia* (Greater Pond-sedge), *Epilobium hirsutum* (Great Willowherb), *Glyceria fluitans* (Floating Sweet-grass), and *Juncus effusus* (Soft-rush). Other herb species include *Arum maculatum* (Lords-and-ladies), *Ranunculus repens* (Creeping Buttercup), *Rumex conglomeratus* (Clustered Dock), *Rumex sanguineus* (Wood Dock), and *Urtica dioica* (Common Nettle). Shrubs include *Crataegus monogyna* (Hawthorn), *Rosa canina* (Dog-rose), and *Rubus fruticosus* agg. (Bramble).

Target Note 10. A recently-laid hedge, 2 m high and 1.5 m wide. It is made of *Corylus avellana* (Common Hazel), *Crataegus monogyna* (Hawthorn), *Euonymus europaeus* (Spindle) and *Prunus spinosa* (Blackthorn). The hedge is growing over *Arrhenatherum elatius* (False Oat-grass), *Galium aparine* (Cleavers), and *Urtica dioica* (Common Nettle).

Target Note 11. A species-rich hedge, with a large number of *Fraxinus excelsior* (Ash) trees. The hedge is adjacent to the canal. It is partially unmanaged and outgrown to 8 m tall. Other woody species growing in the hedge are *Acer pseudoplatanus* (Sycamore), *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn), *Rosa canina* (Dog-rose), and *Rubus fruticosus* agg. (Bramble). The field layer contains a mixture of herbs and climbers including *Anthriscus sylvestris* (Cow Parsley), *Geum urbanum* (Wood Avens), *Hedera helix* (Ivy), *Heracleum sphondylium* (Hogweed), *Lamium album* (White Dead-nettle), *Lapsana communis* (Nipplewort), *Myosotis arvensis* (Field Forget-me-not), *Rumex sanguineus* (Wood Dock), *Stellaria holostea* (Greater Stitchwort), *Veronica chamaedrys* (Germander Speedwell), *Vicia sativa* (Common Vetch). There are a mixture of grasses in the field layer including *Arrhenatherum elatius* (False Oat-grass), *Dactylis glomerata* (Cock's-foot) and *Elytrigia repens* (Common Couch).

Animal Note 1. Nesting bird habitat can be found in hedges, woodland, in rough grassland and in arable fields, including areas of un-harvested, fertiliser-free conservation headland (Higher Level Stewardship agreement HF14). Yellowhammer (*Emberiza citrinella*) and other common garden bird species were seen on the site.

Animal Note 2. Field signs of Badger (*Meles meles*) were found within the woodland and along the edge of the field, including several latrines, well-worn pathways, and a ~20-hole sett, some of which showed signs of recent use.

Animal Note 3. Trees, including one *Salix fragilis* (Crack Willow) and one *Populus nigra* (Black Poplar), with features which provide opportunities for roosting bats. The site as a whole contains habitats which present 'medium' potential for foraging and commuting bats.

Animal Note 4. Footprints of an Otter (*Lutra lutra*) in mud on the bank of the unnamed stream, as described in *Target Note 4*. The habitat is suitable for this species as well as Water Vole (*Arvicola amphibius*)

Animal Note 5. A wet ditch, as described in *Target Note 9*, which provides suitable habitat for Water Voles (*Arvicola amphibius*).

Animal Note 6. Areas of un-harvested, fertiliser-free conservation headland (Higher Level Stewardship agreement HF14), marginal vegetation, and rough grassland, as described in *Target Notes 2, 6, 9 and 11*, which provide opportunities for all four common reptile species. Scrub and wooded areas may also offer hibernation potential.

Animal Note 7. Two ponds are situated in woodland adjacent to the site. These could not be accessed during the survey but could be viewed from a distance. Both the ponds and the terrestrial habitat surrounding them may provide opportunities for Great Crested Newts (*Triturus cristatus*).

APPENDIX B – NOTEWORTHY SPECIES RECORDS

Table 7 displays noteworthy species records that are located within 2 km of the site boundary. These species records were obtained from Northamptonshire Biodiversity Records Centre, Thames Valley Environmental Records Centre, and Warwickshire Biological Records Centre. The Latin and common names for species are given as well as their level of designation. A glossary defining abbreviations used in the table is given in *Table 7, Appendix B*. If a species is not included in the table below it does not necessarily mean the species is absent from the search area, but rather that data-holding organisations do not have records of it in these locations.

Table 7: Noteworthy Species Records within 2 km of the Site Boundary:

Latin Name	Common Name	Designation
Amphibians		
<i>Bufo bufo</i>	Common Toad	WCA5, S41
<i>Rana temporaria</i>	Common Frog	WCA5
<i>Triturus cristatus</i>	Great Crested Newt	EPS(Sch2), WCA5, S41
Birds		
<i>Anas platyrhynchos</i>	Mallard	Amber
<i>Apus apus</i>	Swift	Amber
<i>Emberiza citrinella</i>	Yellowhammer	S41, Red
<i>Milvus milvus</i>	Red Kite	WCA1.1, Amber
<i>Motacilla flava</i>	Yellow Wagtail	S41, Red
<i>Poecile montana</i>	Willow Tit	S41, Red
<i>Pyrrhula pyrrhula</i>	Bullfinch	S41, Amber
<i>Turdus philomelos</i>	Song Thrush	S41, Red
<i>Turdus pilaris</i>	Fieldfare	WCA1.1, Red
Invertebrates		
<i>Bombus (Thoracombus) ruderarius</i>	Red-shanked Carder-bee	S41
<i>Caradrina morpheus</i>	Mottled Rustic	S41
<i>Coenonympha pamphilus</i>	Small Heath	S41
<i>Ecliptopera silaceata</i>	Small Phoenix	S41
<i>Eulithis mellinata</i>	Spinach	S41
<i>Hepialus humuli</i>	Ghost Moth	S41
<i>Hypera (Eriinomorpha) arundinis</i>	A Beetle	Locally Rare
<i>Lasiommata megera</i>	Wall	S41
<i>Malacosoma neustria</i>	Lackey	S41
<i>Malthinus balteatus</i>	A Beetle	Notable: B

Latin Name	Common Name	Designation
<i>Melanchra pisi</i>	Broom Moth	S41
<i>Mythimna comma</i>	Shoulder-striped Wainscot	S41
<i>Pyrgus malvae</i>	Grizzled Skipper	S41, GB RDB(VU)
<i>Rhagonycha lutea</i>	A Beetle	NS
<i>Satyrrium w-album</i>	White-letter Hairstreak	WCA5, S41, GB RDB(EN)
<i>Timandra comae</i>	Blood-Vein	S41
<i>Tyria jacobaeae</i>	Cinnabar	S41
Mammals		
<i>Arvicola amphibius</i>	European Water Vole	WCA5, S41
<i>Lepus europaeus</i>	Brown Hare	S41
<i>Lutra lutra</i>	European Otter	EPS(Sch2), WCA5, S41
<i>Meles meles</i>	Eurasian Badger	BA
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	EPS(Sch2), WCA5
<i>Plecotus auritus</i>	Brown Long-eared Bat	EPS(Sch2), WCA5, S41
Plants and Lichen		
<i>Bromus secalinus</i>	Rye Brome	GB RDB(VU), NS
<i>Galium palustre subsp. elongatum</i>	Great Marsh-bedstraw	Locally rare
<i>Malva setigera</i>	Rough Marsh-mallow	WCA8
<i>Potamogeton berchtoldii</i>	Small Pondweed	Locally scarce
<i>Potamogeton friesii</i>	Flat-stalked Pondweed	ENG BSBI RDB(VU), NS
<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed	Locally rare
<i>Rosa sherardii</i>	Sherard's Downy-rose	Locally scarce
<i>Riccia cavernosa</i>	Cavernous Crystalwort	NS
Reptiles		
<i>Natrix natrix</i>	Grass Snake	WCA5, S41
<i>Vipera berus</i>	Adder	WCA5, S41

APPENDIX C – ABBREVIATIONS

Table 8 displays abbreviations of protected species legislation.

Table 8. Glossary of abbreviation used in this report

Code	Full Title	Explanation
Amber	Amber list	Amber listed species have a population status in the UK of medium conservation concern.
BA	The Protection of Badgers Act 1992	Legislation making it an offence to kill, injure or take a Badger, or to damage or interfere with a sett unless a licence is obtained from a statutory authority.
BAP	Biodiversity Action Plan	A plan that identifies threats to significantly important species and habitats, and sets out targets and actions to enhance or maintain biodiversity.
DA	The Deer Act 1991	All wild deer with the exception of Muntjac (<i>Muntiacus reevesi</i>) and Chinese Water deer (<i>Hydropotes inermis</i>) are protected by a closed season.
ENG BSBI RDB	A Vascular Plant Red List for England	A list published in 2014 by the Botanical Society of Britain and Ireland of the red list status of plants in England. Measured against standardised IUCN criteria.
ENG BSBI RDB(CR)	Critically Endangered	A BSBI Red List designation for species at an extremely high risk of extinction.
ENG BSBI RDB(EN)	Endangered	A BSBI Red List designation for species at a very high risk of extinction.
ENG BSBI RDB(VU)	Vulnerable	A BSBI Red List designation for species at high risk of extinction.
EPS (Sch 2)	European Protected Species (Schedule 2)	European protected animal species (listed on <i>Schedules 2 of The Conservation of Habitats and Species (Amendment) Regulations 2012</i>)
EPS (Sch 5)	European Protected Species (Schedule 5)	European protected plant species (listed on <i>Schedules 5 of The Conservation of Habitats and Species (Amendment) Regulations 2012</i>)
GB RDB	Red Data Book Species	Species identified in one of the UK Red Data 2001.
GB RDB(CR)	Critically Endangered	An IUCN Red List designation for species at an extremely high risk of extinction.
GB RDB(EN)	Endangered	An IUCN Red List designation for species at a very high risk of extinction.
GB RDB(VU)	Vulnerable	An IUCN Red List designation for species at high risk of extinction.

Code	Full Title	Explanation
HAP	Habitat Action Plan	A plan that identifies threats to a priority habitat and sets out targets and actions to enhance or maintain that habitat.
IUCN	International Union for Conservation of Nature and Natural Resources (also known as The World Conservation Union)	A worldwide partnership and conservation network to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.
LBAP	Local Biodiversity Action Plan	A plan that identifies threats to locally important species and habitats, and sets out targets and actions in Species Action Plans and Habitat Action Plans to enhance or maintain biodiversity at the county or regional level.
LHAP	Local Habitat Action Plan	A plan that identifies threats to a locally important priority habitat and sets out targets and actions to enhance or maintain that habitat.
LSAP	Local Species Action Plan	A plan that identifies threats to locally important species, and sets out targets and actions to prevent losing that species from the local area.
Notable	Scarce and threatened invertebrates	Invertebrate species which are estimated to occur within the range of 16 to 100 10km squares but subdivision into Notable A and Notable B categories is not possible as there is insufficient information available).
Notable:A	Scarce and threatened invertebrates	Taxa which do not fall within Red Data Book categories but which are none-the-less uncommon in Great Britain and thought to occur in 30 or fewer 10km squares of the National Grid or, for less well-recorded groups, within seven or fewer vice-counties.
Notable: B	Scarce and threatened invertebrates	Taxa which do not fall within Red Data Book categories but which are none-the-less uncommon in Great Britain and thought to occur in between 31 and 100 10km squares of the National Grid or, for less-well recorded groups between eight and twenty vice-counties.
NN	Nationally Notable	Designation for invertebrate taxa that are thought to be notably important in the UK.
NR	Nationally Rare	Species in 15 or fewer hectads in Great Britain.
NS	National Scarce	Species in 16-100 hectads in Great Britain.
Red	Red List	Red listed species have a population status in the UK with high conservation concern.
SAP	Species Action Plan	A plan that identifies threats to significantly important species, and sets out targets and actions to prevent losing that species to extinction.

Code	Full Title	Explanation
S41	Species of Principal Importance	Species of Principal Importance in England under <i>The Natural Environment and Rural Communities (NERC) Act (2006)</i>
UKBAP	UK Biodiversity Action Plan	A plan that identifies threats to locally important species and habitats, and sets out targets and actions in Species Action Plans and Habitat Action Plans to enhance or maintain biodiversity in the UK.
WCA	<i>The Wildlife and Countryside Act 1981</i> (as amended)	Containing 4 Parts and 17 Schedules, the Act covers protection of wildlife (birds, and some animals and plants), the countryside, National Parks, and the designation of protected areas, and public rights of way. All wild plants in Britain are protected from intentional uprooting by an unauthorized person, but land owners, land occupiers, persons authorized by either of these or persons authorized in writing by the Local Authority for the area are exempt. Protection for some species may be limited to certain Sections of the Act (e.g. S13(2)).
WCA1	Schedule 1 of <i>The Wildlife and Countryside Act 1981</i> (as amended)	<p>This Schedule lists birds protected by special penalties at all times, but virtually all wild birds have some protection in law.</p> <p>Acts which are prohibited for all wild birds (except derogated 'pest' species) include intentional killing, injuring or taking; taking, damaging or destroying nests in use or being built; taking or destroying eggs; possessing or having control of (with certain exceptions but including live for dead birds, parts or derivative); setting or permitting certain traps, weapons, decoys or poisons. Selling, offering or exposing for sale, possessing or transporting for sale any live wild bird, egg or part of an egg or advertising any of these for sale, or dead wild bird including parts or derivatives are also prohibited. Many birds must be formally registered and ringed if kept in captivity.</p> <p>Schedule 1 WCA birds are additionally protected from intentional or reckless disturbance while building a nest, or when such a bird is in, on or near a nest containing eggs or young, or intentional or reckless disturbance of dependent young.</p>
WCA5	Schedule 5 of <i>The Wildlife and Countryside Act 1981</i> (as amended)	Schedule 5 animals are protected from intentional killing, injuring or taking; possessing (including parts or derivatives); intentional or reckless damage, destruction or obstruction of any structure or place used for shelter or protection; selling, offering or exposing for sale,

Code	Full Title	Explanation
		possessing or transporting for the purpose of sale (alive or dead, including parts or derivatives). Protection of some species is limited to certain Sections of the Act (e.g. S9(1), S9(4a), S9(4b), S9(5)).
WCA8	Schedule 8 of <i>The Wildlife and Countryside Act 1981</i> (as amended)	Plants and fungi protected from intentional picking, uprooting, destroying, trading (including parts or derivatives), etc.