

Borough of Broxbourne

Wildlife Site Review and Habitat
Survey of Prospective Strategic
Development Areas

FINAL

Issuing office

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1 Summary

- 1.1 BSG Ecology was commissioned by Broxbourne Borough Council (BBC) to undertake an ecological study of specific areas within the borough as part of the Development Plan process. The Council's Submission Core Strategy identified four Areas of Search (AoS) for future development and one Strategic Site. Although the Council has decided not to adopt the Core Strategy, it will nevertheless be moving forward with a new-style local plan. The brief was therefore to carry out a habitat survey of the four AoS and undertake more detailed appraisals of the Local Wildlife Sites (LWS) that lie in and around the four AoS and Strategic Site to establish whether they meet the LWS selection criteria. This study will be used to inform BBC's preparatory work for analysing and allocating sites for future development and for shaping policies within the Broxbourne Local Plan.
- 1.2 Phase 1 Habitat surveys have been carried out on land within the four AoS. The survey data collected was used to inform an appraisal of the ecological value of the habitats within the AoS. For ease of reference a colour-coding approach (red-amber-green) has been taken to the evaluation.
- 1.3 More detailed surveys have been carried out on 35 Local Wildlife Sites in order to determine whether they should be retained as Local Wildlife Sites or considered for de-notification.
- 1.4 Three separate GIS layers have been produced to display the results of the habitat surveys of AoS and Local Wildlife Sites, and the subsequent appraisal of ecological value.
- 1.5 Using existing criteria for the identification of LWS, the following recommendations have been made. One LWS (Halstead Hill Pond (Site Code 80/001)) has been recommended for de-designation. Three LWS (Wormleybury Lake (Site Code 71/028/03), Cheshunt Park Golf Course Pond (Site Code 81/011) and Halfhide Allotments (Site Code 81/016)) have been provisionally recommended for retention; with further surveys recommended to confirm this (two of these have also had provisional boundary amendments recommended). One LWS (Lucas End Meadows, East (Site Code 80/002)) has been classed as 'borderline' and requires a further survey to confirm its status. One LWS (Burygreen Plantation (Site Code 80/073)) has lost land to a new roundabout, so amendment of its boundary has been recommended. The remaining 29 sites meet the LWS selection criteria without boundary change and their retention is recommended. Management recommendations have been made to enhance the LWS and generic indicative biodiversity management costs have been provided for the actions identified.
- 1.6 The data collected and the appraisal of ecological value of the AoS and associated LWS have been used to inform a preliminary assessment of the potential impacts on Priority habitats and species and other features of ecological value. This has been based on indicative development proposals provided by Broxbourne Borough Council. Preliminary recommendations for mitigation and opportunities for enhancement of potentially affected habitats and species have also been identified.

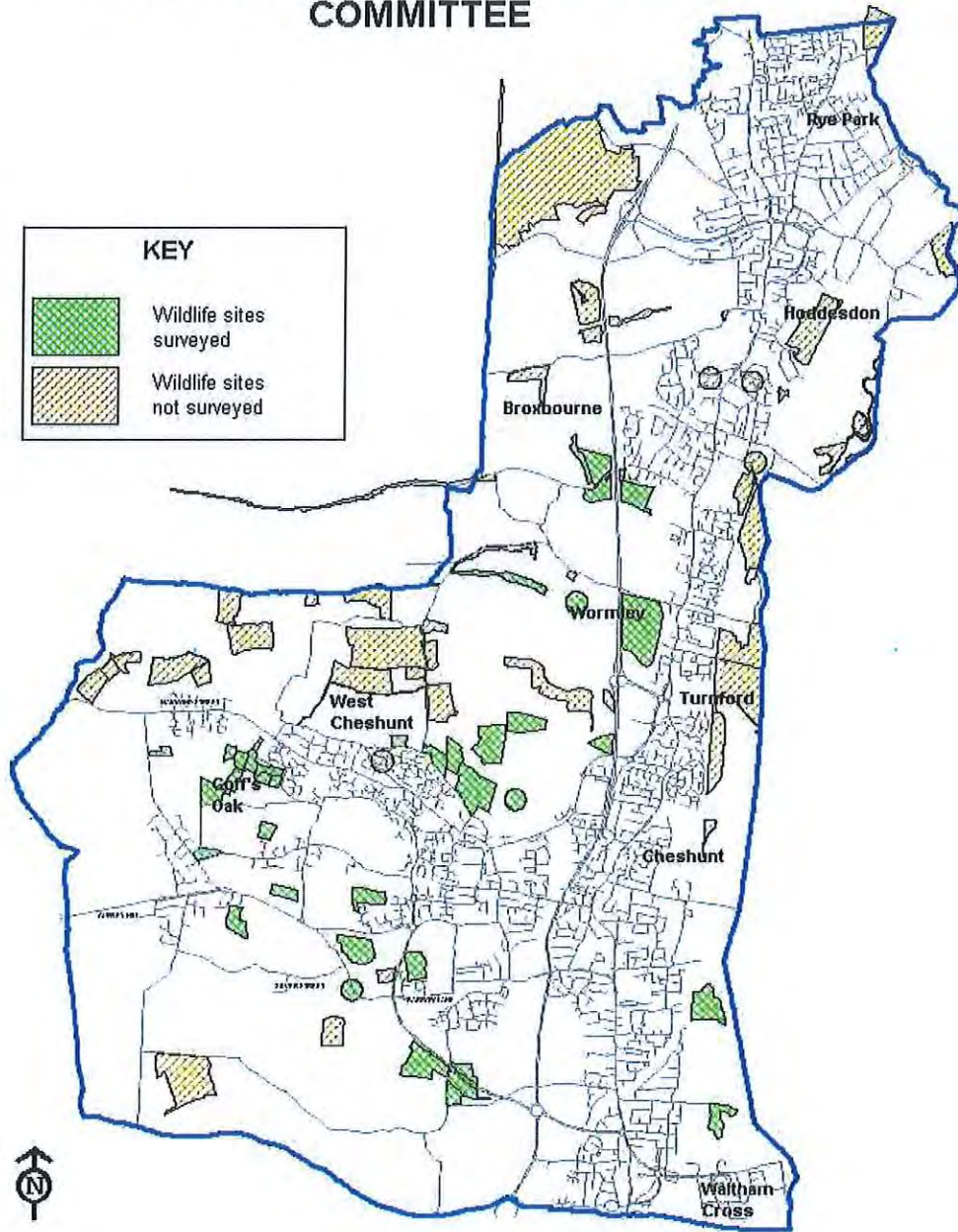
2 Introduction

Background to Commission

- 2.1 BSG Ecology was commissioned by Broxbourne Borough Council (BBC) to undertake an ecological study of certain areas within the Borough as part of the Development Plan process. The Council's Submission Core Strategy identified four Areas of Search (AoS) for future development and one Strategic Site. The brief was to carry out a habitat survey of the four AoS and undertake more detailed appraisals of the Local Wildlife Sites (LWS) that lie in and around them to establish whether they meet the LWS selection criteria¹. LWS in and around the Strategic Site ('Greater Brookfield') were also appraised as well as selected LWS further afield, as requested by BBC.
- 2.2 There are currently 82 wildlife sites in the Borough of Broxbourne as designated in the Local Plan 2005. They were identified by Hertfordshire Biological Records Centre and Herts and Middlesex Wildlife Trust, who also meet annually through a formal ratification committee to review them. The 2010 ratification report produced identifies 85 local wildlife sites in the borough, covering an area of just under 480 hectares. This study has surveyed 35 of those wildlife sites because they are either located within or close to the four Areas of Search and Strategic Site. The remaining wildlife sites were not surveyed either because:
1. There is no evidence to suggest that these wildlife sites should be altered or deleted; or
 2. they are not considered to be potentially threatened from future prospective strategic development areas; or
 3. access to the wildlife site was not viable.
- 2.3 A map of the borough's wildlife sites as designated in 2005 and as proposed by the ratification committee can be found below. Those which have been surveyed in this study are highlighted in green. Figures 1-7 in Appendix 1 provide further clarification of the wildlife sites surveyed and the Areas of Search.
- 2.4 This study will be used to inform BBC's preparatory work for analysing and allocating sites for future development and for shaping policies within the Local Plan. It will also be used as a material consideration in the determination of planning applications and it will help inform Section 106 (Town and Country Planning Act 1990) contributions and the forthcoming Community Infrastructure Levy charging scheduling. The study will also provide data to help BBC maintain and improve the natural landscape and ecological value of the borough.

¹ As defined in Hertfordshire Local Wildlife Site Partnership (2012) Selection Criteria for Local Wildlife Sites in Hertfordshire (6th Version).

BROXBOURNE WILDLIFE SITES AS PER 2005 LOCAL PLAN AND SUBSEQUENT SITES IDENTIFIED BY WILDLIFE RATIFICATION COMMITTEE



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Title

Location **Borough of Broxbourne**

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Objectives of the Study

- 2.5 The objectives of the study are as follows.
- Carry out a detailed habitat survey of each of the LWS identified by BBC.
 - Use the survey data to inform an assessment of whether each site still meets the criteria for selection as a LWS
 - Carry out a habitat survey of the four Areas of Search (AoS), in order to identify features of ecological value, protected species or Priority² habitats and species.
 - Examine the impact of potential development on LWS and habitats and species of ecological value identified during the habitat survey of the AoS.
 - Identify measures to protect, mitigate or strengthen the LWS and habitats and species of ecological value identified during the habitat survey of the AoS, and provide indicative costs for doing so.

Survey Areas

- 2.6 The AoS and LWS that were surveyed are illustrated in Figures 1 – 7 in Appendix 1. Appendix 3 lists the LWS that were surveyed.

² The NPPF (paragraph 117) indicates that local authorities should take measures to "promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species" linking to national and local targets through local planning policies. Priority habitats and species are shown on the UK Biodiversity List. The content of this list broadly accords with the content of the lists published in response to Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (species and habitats of principal importance for biodiversity). Planning authorities have a duty under Section 40 of the NERC Act to have regard to species and habitats of principal importance, in the exercise of their functions including development control and planning.

3 Methods

Review of Existing Data

- 3.1 The following information was provided by Hertfordshire Biological Records Centre (HBRC).
4. Records of all protected and Priority species information within the boundaries of the AoS.
 5. Previous survey data (where available) for the LWS.
 6. Protected species information for those LWS that are designated for their species interest.
 7. 'Wildlife Report 2012' and 'Spreadsheet of Broxbourne Wildlife Sites', which both provide information on the qualifying interest of each LWS.
- 3.2 This information was reviewed prior to carrying out the field surveys, and was used to inform subsequent assessments of the AoS and LWS.

Site Access

- 3.3 Before carrying out the surveys, permission to access the land had to be arranged. BBC drew up a spreadsheet of all known landowner details for the areas to be surveyed. This included details of the Council's known local contacts supplemented with Land Registry information. BBC then sent out a letter to all landowners on the spreadsheet informing them that the surveys were taking place. BSG Ecology followed this up with another letter providing more information on the survey and giving approximate survey dates and names and phone numbers to contact if further information was required. Follow-up phone calls were made to those landowners who requested more information or where special arrangements needed to be made to access a site.

Field Survey

Timing

- 3.4 The study was commissioned in March 2012, and BBC required that the report be delivered as soon as possible in order to inform the Local Plan process. In order to meet the requirements of the BBC and at the same time provide robust data, the field survey programme was planned as follows.
- 3.5 The Phase 1 habitat survey of the AoS was carried out in April, which for some habitats is an appropriate time of year, but for some habitats, in particular more species-rich grasslands, this may be too early if not all the botanical species present are in evidence. Where habitats were present that the surveyors considered could not be appropriately assessed, these were flagged up for a re-visit when the LWS were surveyed.
- 3.6 The LWS were surveyed during May and early June. The early May visits concentrated on those LWS for which the interest was protected fauna or woodland, for which spring is an appropriate time to survey. The acid grasslands were then surveyed to identify any early annual species that might be in evidence earlier in the season. The neutral grassland sites were surveyed in late May and early June, an appropriate time of year for this habitat. Any habitats that had been identified as needing a re-visit during the Phase 1 AoS survey were also re-surveyed at this time.

Areas of Search

- 3.7 A Phase 1 habitat survey was carried out according to standard methodology (JNCC, 2010). This involved walking over all semi-natural (undeveloped) parts of each AoS, where access was available, and assigning habitat types to a map based on the descriptions provided in JNCC 2010. (For example, habitat descriptions can include agriculturally improved, semi-improved or unimproved neutral, acidic or calcareous grassland; woodland is divided into broadleaved/broadleaved plantation/mixed plantation/conifer plantation and so on). More detailed information was recorded, where appropriate, and annotated on the map as 'target notes'. During the survey, note was also taken of any evidence of protected faunal species, or habitats that had the potential to support them. This information was mapped in the field using standard Phase 1 codes and then transferred to a GIS (see 'Mapping' section below).

3.8 Any land that was identified as having potential to qualify as a LWS was noted, and was re-visited and surveyed according to the LWS protocol detailed in the 'Local Wildlife Sites' Section below.

Local Wildlife Sites

3.9 Local Wildlife Sites were surveyed according to the protocol produced by the Hertfordshire Wildlife Sites Partnership for Local Wildlife Sites in Hertfordshire (HWSP, 2012). This involves the completion of a detailed proforma and an Excel spreadsheet 'tick list' of botanical species, both of which were completed following a visit to each site. As well as a site description, the HWSP (2012) protocol requires information to be collected on the condition and current management of each site, and prompts for recommendations for additional surveys and future management. Clarification of how these sections were dealt with is provided below.

3.10 Further surveys were only recommended where it was considered that additional information was necessary to complete the assessment of whether a site meets the relevant LWS selection criteria. For example a site designated for its great crested newt interest would generally require that a dedicated great crested newt survey be carried out; or a habitat that is so closely mown that a representative botanical survey could not be carried out might require a further survey after the sward has been left to grow longer.

3.11 The condition of each site was assessed with reference to the methods and terminology used by Natural England for assessing Sites of Special Scientific Interest (EN 2000) and summarised in Table 1 below. Sites that are termed 'favourable' are being managed in such a way that the qualifying interest of the site is being conserved. Those that are termed 'unfavourable' may still narrowly meet the selection criteria or they may have lost their qualifying interest. As well as considering whether the site still meets the selection criteria, a number of factors (described below) were taken into consideration depending on the habitat in question. If these factors were likely to continue or to worsen under present management then the site would be classed as 'declining'. Some examples are given below.

- a. For grasslands, factors that would contribute to the site being judged 'unfavourable' include >5% bare ground, a large proportion of agricultural weed species, a thick layer of thatch present indicating that the grassland has not been managed for a period of time or scrub encroachment.
- b. For woodland, factors that would contribute to the site to being judged unfavourable include a dense canopy shading out ground flora, the presence of a large proportion of invasive exotic species or extensive fly tipping.
- c. For a LWS selected for its great crested newt interest, a pond with poor water quality, heavily shaded by trees, or that had clearly been dry for some years, would be classed as 'unfavourable'.

3.12 Note was made of the current management of the site based on on-site observations, but no discussions with the owner/occupiers of the site were undertaken.

3.13 Brief recommendations were made for the future management of the site, for which generic costs are provided in Section 5.

Table 1: Condition Assessment

Condition	Explanation
Favourable - stable	Site meets the qualifying criteria and with current management is likely to remain unchanged.
Favourable declining	- Site meets its qualifying criteria but with current management there is a risk this may be lost.
Unfavourable stable	- Site still meets the criteria or has lost its qualifying interest but with current management it is likely to remain in this state.
Unfavourable declining	- Site meets the criteria or has lost its qualifying interest and is likely to decline further if management is not adjusted.

- 3.14 In addition to collecting the information necessary to complete the proforma and tick list for each LWS, a Phase 1 habitat map (see paragraph 3.7 above) was also completed for each LWS to illustrate the habitats present.
- 3.15 The information gathered during the surveys for each LWS was used to inform an appraisal of whether each site should retain its LWS designation or be de-notified. The appraisal was based on HLWSP (2012). The rationale for this is provided in the pro-forma for each LWS.
- 3.16 In addition to surveying the LWS, sites that had been identified during the AoS Phase 1 habitat survey as having potential to qualify as a LWS were re-visited, surveyed and appraised according to the methodology above. Those sites that meet the LWS criteria for selection are discussed in paragraphs 4.29 – 4.31 below.

Assessment of Ecological Value

- 3.17 Once the data from the field surveys were mapped, an assessment of the ecological value of the habitats present on site was made. Habitats or areas of land were graded according to a four-colour system as described below.
- 3.18 Sites or areas that are classed as red are considered to be of high ecological value at the time of survey and are likely to present a reasonable constraint to development or the design of development proposals. The degree of constraint will depend on the nature of the ecological interest.
- 3.19 Those classed as amber are of some ecological value based on the surveys undertaken in this study. They possess a degree of interest or potential interest, and are still likely to require careful design and mitigation measures to offset impacts on the particular ecological interest of that area, if development is to take place. Although their apparent ecological value might be lower, some areas have potential to support protected species, which will need investigation in due course. If further surveys reveal that an area supports protected species then the implications for development may become more onerous. Amber areas may present good opportunities for habitat and connectivity enhancement and many are amber by virtue of their connectivity.
- 3.20 Areas classed as green have generally low ecological value and should present accordingly fewer constraints to development based on the surveys undertaken in this study. Although no evidence of protected species has been located during the course of this study, further study may reveal their presence although the risk of this is currently considered to be relatively low. Green sites may also present opportunities for enhancement of local habitat networks.
- 3.21 The red-amber-green approach is intended as a guide only, to help those involved in the forward planning process. It does not provide a replacement for appropriately targeted and detailed ecological surveys that should inform the proper assessment of potential ecological constraints and opportunities, should proposals for development on a particular site be brought forward.
- 3.22 The fourth colour used is purple, to denote land that could not be accessed or surveyed properly.
- 3.23 The following sets out the considerations that were made in characterising land as red, amber or green for the purposes of this study.

Red

Intrinsic Value

- a. Site designated as a LWS and meets the selection criteria.
- b. Land not a LWS but it meets the selection criteria.

Protected Species

- d. Protected species evidence recorded on site.

Connectivity / Complementary Habitats

- a. Linear feature that links LWS via similar habitat. For example a hedgerow connecting two woodland LWS.
- b. Linear feature that links Priority habitats.

Amber**Intrinsic Value**

- a. Land just falls short of threshold for qualification as a LWS.
- b. Presence of a Priority habitat.
- c. Veteran trees.

Protected Species

- a. Land with potential to support protected species (apart from breeding birds).

Connectivity / Complementary Habitats

- a. Land adjacent to a LWS.
- b. Linear feature adjacent to a LWS, of similar habitat that provides a link to other land of similar habitat. For example a line of scrub and trees linking a woodland LWS to another block of undesignated woodland.
- c. A group of linear features that form a cohesive network linking to similar habitats. For example a network of hedgerows, scrub and tree-lines linking blocks of woodland in the wider area.
- d. An assemblage of diverse habitats that individually may have low ecological value but together form an ecologically diverse mosaic. For example, a group of semi-natural grasslands interconnected with patches of scrub, hedgerows and blocks of woodland.

Green**Intrinsic Value**

- a. Land does not meet LWS selection criteria.
- b. Land does not support a Priority habitat.

Protected Species

- a. No obvious evidence or obvious potential for protected species.

Connectivity / Complementary Habitats

- a. Land not adjacent to LWS.
- b. Land does not form part of a network of linear features or a mosaic of varied habitats.

Purple

- 3.24 Land not surveyed. This included built up areas, private gardens and areas that could not be accessed because ownership could not be established. See Constraints section (paragraph 4.50) for further detail.

Mapping

- 3.25 At the outset of the project, GIS shape files of the AoS and LWS and Ordnance Survey Landline basemaps were supplied by BBC.
- 3.26 The following GIS map layers were produced and have been provided to BBC in MapInfo format.
- a. Phase 1 habitat map of AoS including target notes.
 - b. Phase 1 habitat map of the LWS surveyed.
 - c. Ecological Value map of AoS and LWS showing habitats as purple, red, amber or green.

Consideration of Impacts of Potential Development

- 3.27 The study takes account of indicative development proposals for sites in three Areas of Search - West of Hoddesdon, Goffs Oak and Bury Green. The information gathered during the surveys was used to make a preliminary assessment of the potential impacts on ecological receptors in each

AoS, and to identify opportunities to mitigate for these impacts and to provide ecological enhancements.

4 Results and Evaluation

Phase 1 Habitat Survey of Areas of Search and Local Wildlife Sites

- 4.1 The Submission Core Strategy included four AoS and one Strategic Site. The AoS were surveyed for this study as listed below and illustrated in Figures 1-4 in Appendix 1.
- West of Hoddesdon
 - Goff's Oak
 - Bury Green
 - Southern A10 Corridor
- 4.2 The AoS survey was carried out during the week beginning 16th April 2012 by Stephanie Boocock MIEEM and Liz Rose-Jeffreys MIEEM. Any habitats that were identified as needing a re-visit during the Phase 1 AoS survey were re-surveyed by Mark Woods MIEEM during May and June.
- 4.3 The results of the survey have been provided in GIS MapInfo format and as Figures 11-21 in Appendix 1. Target Notes to accompany the Figures can be found in Appendix 2. The Priority habitats present are summarised below in Table 2. Table 3 lists protected and Priority species for which records have been provided by HBRC or BBC on the surveyed areas, or for which habitat was identified during the Phase 1 surveys.

Table 2: Priority Habitats Present in the AoS

Habitat	Location	Extent (Approx.)	Notes
Hedgerows	Within all 4 AoS	24.58m	Both species-rich and species poor present.
Lowland mixed deciduous woodland	Within all 4 AoS	84 ha	Small patches – more extensive areas are LWS.
Acid grassland	LWS 72/004, 72/012 (both north of Brookfield Strategic Site), 80/070 (Brookfield Strategic Site)	14ha	Within LWS only.
Unimproved neutral grassland	24 separate LWS (15 in Goff's Oak, 2 in or near Bury Green, 7 in or near Brookfield Strategic Site) 2 proposed LWS (West of Hoddesdon and Goff's Oak AoS)	116ha	Within LWS or proposed LWS only
Wood Pasture	LWS 72/041 (east of Brookfield Strategic Site)	80ha	Within LWS only.
Ponds of high conservation importance.	LWS 81/011 (Brookfield Strategic Site)	<1ha	Records of great crested newts in LWS. Other ponds present in AoS have potential to support great crested newts but presence of these and other protected/Priority species is unconfirmed.

Table 3: Protected, Priority and Rare Species Records in the AoS

Species	Scientific Name	Status Code (see key below)	Location and Latest Record
Great crested newt	<i>Triturus cristatus</i>	1	Bury Green AoS 1985 LWS 80/001 1988
Dormouse	<i>Muscardinus avellanaria</i>	1	Record for Goffs Oak AoS 1972
Pipistrelle bat	<i>Pipistrellus pipistrellus</i>	1	Record for Goffs Oak AoS 2003 Record for LWS 71/028/03 1978
Nathusius' bat	<i>Pipistrellus nathusii</i>	1	Record for LWS 71/028/03 1978
Serotine bat	<i>Eptesicus serotinus</i>	1	Record for LWS 71/028/03 1979
Daubenton's bat	<i>Myotis daubentonii</i>	1	Record for LWS 71/028/03 1978 Record for LWS 71/028/01
Whiskered bat	<i>Myotis mystacinus</i>	1	Record for LWS 71/028/03 1984
Natterer's bat	<i>Myotis natterii</i>	1	Record for LWS 71/028/01 1987 Record for LWS 71/028/03 1985
Noctule bat	<i>Nyctalus noctula</i>	1	Record for LWS 71/028/03 1978
Brown long-eared bat	<i>Plecotus auritus</i>	1	Record for LWS 71/028/01 1985
Bat species	Chiroptera	1	Records for Goffs Oak AoS 2003
Golden plover	<i>Pluvialis apricaria</i>	2	Records for Southern A10 Corridor AoS 2011 Records of this species from public have also been submitted to BBC.
Water vole	<i>Arvicola amphibius</i>	3	Records for LWS 71/028/03 1977
Grass snake	<i>Natrix natrix</i>	4	Records for Bury Green AoS 1991 LWS 71/028/03 1977
European Brown hare	<i>Lepus europaeus</i>	5	LWS 71/028/03 1977
Cinnabar moth	<i>Tyria jacobaeae</i>	5	LWS 80/046 2008
Song thrush	<i>Turdus philomelos</i>	5	LWS 80/046 2008 LWS80/011 2010
Harvest mouse	<i>Micromys minutus</i>	5	Records for Bury Green AoS 1985
Common toad	<i>Bufo bufo</i>	5	LWS 80/001 1988
Oak hook-tip moth	<i>Watsonalla binaria</i>	5	Record for Goffs Oak AoS 2000
Rustic moth	<i>Hoplodrina blanda</i>	5	Record for Goffs Oak AoS 2000
White-letter hairstreak butterfly	<i>Satyrrium w-album</i>	5	Records for Bury Green AoS 2010
Small heath butterfly	<i>Coenonympha pamphilus</i>	5	LWS 81/011 Cheshunt Park 1999
Stag beetle	<i>Lucanus cervus</i>	5,6	Record for Bury Green AoS 1997
River Water-dropwort	<i>Oenanthe fluviatilis</i>	6	Adjacent to Southern A10 Corridor AoS (New River) 2003
Corn spurrey	<i>Spergula arvensis</i>	7	Record for Bury Green AoS 1991

Key to Status Codes is shown overleaf.

Key to Status Codes

1. Schedule 2 of the Conservation of Habitats and Species Regulations 2010.
2. Annex 1 Birds Directive
3. Wildlife and Countryside Act 1981 (as amended)
4. Wildlife and Countryside Act 1981 (as amended) - intentional killing and injuring only.
5. Priority species
6. Local Biodiversity Action Plan species
7. Listed as 'Vulnerable' on GB Red Data List (Cheffings and Farrell 2005)

West of Hoddesdon

- 4.4 This AoS is approximately 50 ha in extent. It is composed of 3 blocks of land: an area to the north of the B1197 (Hertford Road), and areas to the north and south of the Dinant link road.
- 4.5 The northern block is composed primarily of broadleaved woodland and agriculturally semi-improved neutral grassland. There is also a small area of amenity grassland and there is scattered and dense scrub mostly around the westernmost field. The semi-improved grassland is made up four fields with swards of varying lengths (some tall, some closely mown) at the time of the survey. The field on the western side of the block is species-rich and meets the criteria for a LWS as discussed below. The woodland is mature and contains a number of large trees including oak *Quercus robur*, ash *Fraxinus excelsior* and horsechestnut *Aesculus hippocastanum*, some of which are near-veteran³. The large mature trees have plenty of features (rotholes, loose bark, split limbs) that could support roosting bats, nesting birds and dead wood invertebrates. The ground flora is patchy with much bare ground, but where present includes dog's mercury *Mercurialis perennis*, bluebell *Hyacinthoides non-scripta*, cow-parsley *Anthriscus sylvestris* and ground ivy *Glechoma hederacea*. The woodland, grassland and scrub form a patchwork of structurally varied habitats that have potential to support common reptile species, bat species, breeding birds and a range of invertebrates.
- 4.6 The block to the north of the Dinant link road is largely composed of agriculturally semi-improved neutral grassland, with small patches of plantation broadleaved woodland and dense scrub to the south, and the tree-lined Woollens Brook running along the eastern boundary and occasional mature trees. The fields are bounded by species-poor hedgerows, and there is a small pond in the extreme south-east corner of the block. The fields to the south of the block were unmanaged at the time of survey and were rank and tussocky. In this condition, taken together with the woodland and scrub, they have potential to support common reptile species, amphibians and breeding birds. Woollens Brook provides a green corridor in the wider landscape, although is severed by the Dinant Link road and B1197, which limits its potential as a wildlife commuting route. It has some potential to support water vole *Arvicola amphibius* where steep earth banks are present.
- 4.7 The block to the south of the Dinant link road is a mixture of agriculturally improved and semi-improved fields bounded by species-poor hedgerows. Ecological value is limited in this block, although a strip of plantation mixed woodland to the east may provide a link to the parkland habitat lying outside the AoS to the south.

Goff's Oak

- 4.8 Goff's Oak AoS covers approximately 500 hectares of land to the north-east of Goff's Oak centre. It includes large blocks of existing residential development as well as smaller plots of commercial and residential land; these areas were not surveyed. The intervening undeveloped land is largely composed of meadows and pastures bounded by thick hedgerows. The majority of the fields are agriculturally improved or species-poor semi-improved grassland, but there are a number of more species-rich semi-improved or unimproved fields that are either existing LWS or have been put forward for consideration as new LWS (see paragraphs 4.29 – 4.31 below). There are 17 LWS within the AoS, all of which are grassland except Hammond Street Scrub (Site Code 80/037), which is a mosaic of scrub, woodland and grassland.
- 4.9 The hedgerows are generally fairly species poor but many are thick, almost bands of woodland in places, and include mature trees, some near-veteran. These hedgerows form a continuous network

³ 'Veteran' or 'ancient' tree: A tree that looks older than others of its species and have a large girth for the species, a hollow or hollowing trunk and a large quantity of deadwood in the canopy. (RDS 2006)

in places, creating a potentially valuable wildlife corridor. This connectivity is enhanced by the presence of Rags Brook running north of, and parallel to, Andrew's Lane. The brook is lined with mature trees and scrub, mainly pedunculate oak and hawthorn *Crataegus monogyna* with occasional hornbeam *Carpinus betulus* trees also present.

- 4.10 Four ponds were noted within the AoS. One in a horse grazed paddock in the block of land between Crouch Lane and St James's Road, a large ornamental pond set within a large garden south of Crouch Lane, a large fishing pond to the south of Rosedale Sports Ground set within an area of amenity grassland and woodland, and a pond in an area of scrub adjacent to Halstead Hill road.
- 4.11 The habitats present in Goff's Oak AoS could potentially support a number of protected species including foraging, commuting and roosting bats, breeding birds, dormice, great crested newts and common reptile species.

Bury Green

- 4.12 Bury Green AoS is a block of approximately 75ha of land around Churchgate, bounded by the B198 Lieutenant Ellis Way to the south and west and the B156 Goff's Lane to the north. Much of the land within the AoS boundary is built-up (either residential, commercial or recreational) and was not surveyed, but there are areas of undeveloped land to the north, on either side of Dark Lane, and to the south where Bury Green Road meets the B198.
- 4.13 There are two LWS within the AoS. To the north is Bonney Grove Wood by B198 LWS (Site Code 80/058) and to the south is Broom Hills LWS (Site Code 80/072). Both of these are broadleaved woodland. The remainder of the AoS is mostly amenity grassland (playing fields) or arable farmland bounded by both fences and hedgerows. To the west of Dark Lane there is a plot of allotments and an unmanaged field adjacent to Bonney Grove Wood LWS. To the east of Dark Lane there is a pond with an island in the middle. The island and the land immediately surrounding the pond is broadleaved woodland. A second pond is present at the southern end of the AoS. It is located in a strip of grassland that runs alongside the B198 and is surrounded by blackthorn *Prunus spinosa* scrub.
- 4.14 The ponds could potentially support great crested newts, although their location is isolated from the surrounding countryside by the B198 to the west and Cheshunt to the east. Similarly isolated populations of reptiles could potentially occur around the ponds or in the areas of unmanaged grassland. The LWS have the potential to support protected species including a range of breeding birds, badger and roosting bats.

Southern A10 Corridor

- 4.15 This AoS covers approximately 90 ha of land positioned around the roundabout linking the A10 and the A121. To the north of the B198 and A121 the majority of the land is arable farmland bounded by fences. The block of land to the north of the AoS and east of the A10 includes areas of amenity grassland used for playing fields and a block of broadleaved woodland. To the south of the A121 and east of the A10 is a block of agriculturally semi-improved grassland covered with hawthorn and blackthorn scrub. In the north-east corner of this block is a large pond surrounded by trees and scrub. The pond and scrubby grassland has some potential to support great crested newts and common reptile species, although the potential is fairly limited given its isolated situation (surrounded by trunk roads and built up land). Some opportunities for protected species may also be present in the patch of woodland to the north, for example breeding bird habitat and roost habitat for bats, although again the isolated situation limits its potential. The large expanse of arable land could provide habitat for wintering birds (anecdotal records of golden plover in this area have been reported to BBC and a record has been provided by the HBRC – see Table 3).

Review of Local Wildlife Sites

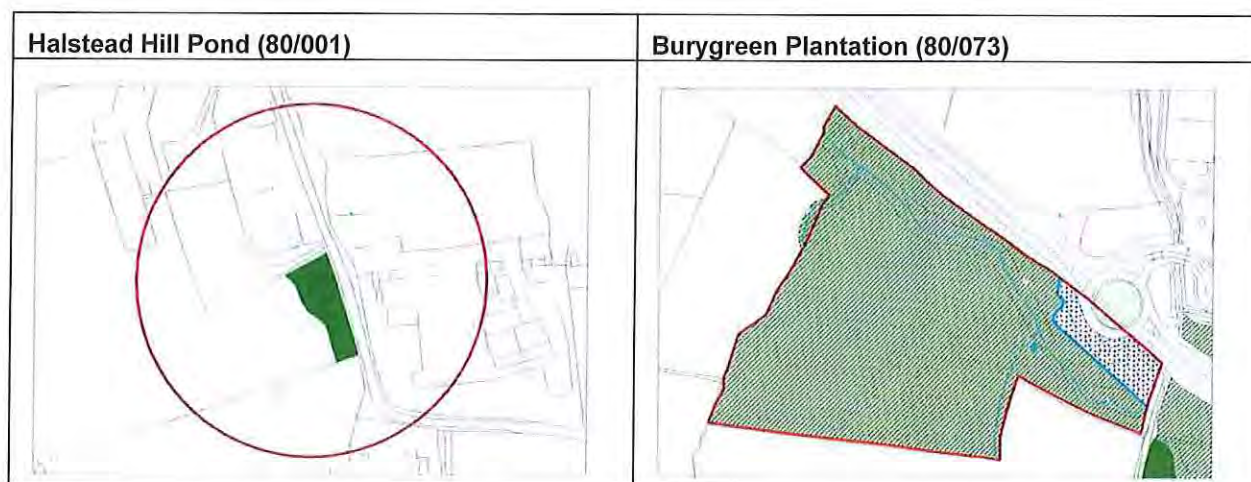
- 4.16 The survey of existing and proposed LWS was carried out by Mark Woods MIEEM throughout May and June 2012.

Existing Local Wildlife Sites

- 4.17 Thirty-five LWS were surveyed for this study. These are listed in Appendix 3. The survey pro-forma for each LWS is included in Appendix 4 along with a Phase 1 habitat map of the site. A GIS layer

showing the Phase 1 habitat survey, and an Excel database of the full botanical species lists for each LWS has been provided separately to BBC.

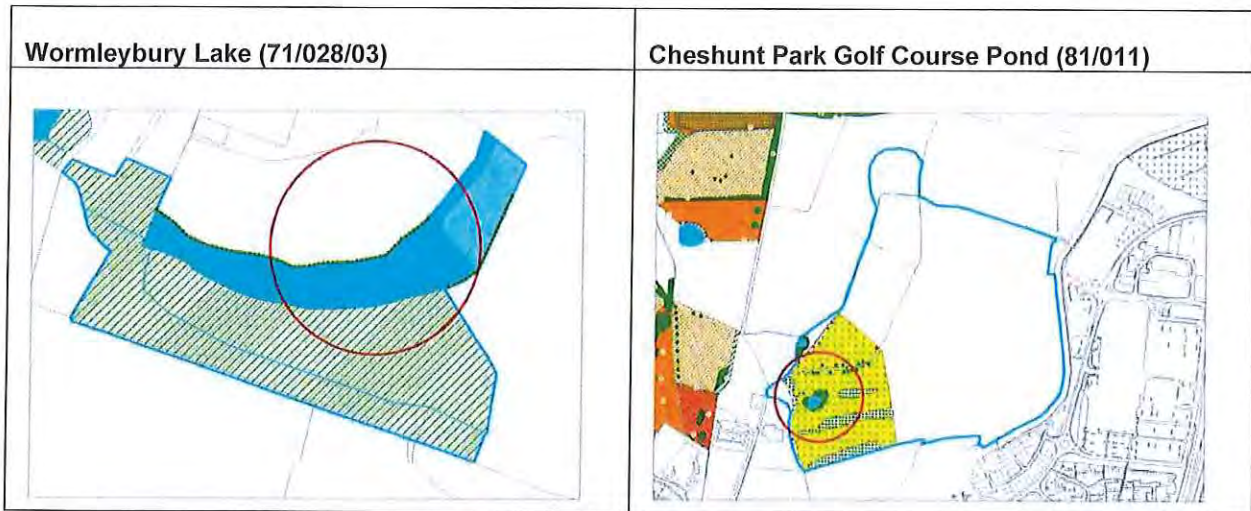
- 4.18 Twenty-nine of the 35 sites surveyed meet the selection criteria set out in HLWSP (2012) with no adjustment to their boundaries proposed, and no additional survey work required. These are all recommended for retention. The rationale for this is provided on the survey pro-forma for each site in Appendix 4. One LWS has been recommended for deletion. One LWS has been classed as 'borderline' and requires further survey. One LWS requires an amendment to its boundary. Three LWS are provisionally recommended for retention, but further surveys are recommended to confirm this. Further detail is provided below.
- 4.19 One site does not meet the selection criteria laid out in HLWSP (2012). This is Halstead Hill Pond (Site Code 80/001) (see map below and on survey sheet in Appendix 4), which is designated for its species interest. It is described as being 'important for a range of amphibians' (from Spreadsheet of Broxbourne Wildlife sites provided by HBRC). The selection criteria (HLWSP 2012) state that in order to qualify as an Amphibian LWS, the site should meet one of the following criteria:
- Support an exceptional breeding population of great crested newts.
 - Have records of palmate newt dating from within the last 5 years.
 - Have good populations of three or more native amphibian species.



- 4.20 The pond has clearly been dry for some time as it is colonised with terrestrial vegetation so is no suitable longer breeding habitat for amphibian species and there are no records of palmate newt connected with the pond (HBRC hold records of common frog, common toad, great crested newt and smooth newt dating from 1988). On the basis of the habitat survey and the records provided by HBRC, it is considered that this site no longer meets the amphibian selection criteria for a LWS and should be de-designated.
- 4.21 Lucas End Meadows, East (Site Code 80/002) requires a further survey to establish whether it meets the selection criteria. It is currently managed as amenity grassland and was mown so tightly that it was not possible to carry out a realistic assessment of its botanical composition. There was little evidence of herb species within the sward, and it is probable that the frequent mowing regime is reducing the botanical interest. For the purposes of re-survey, it is recommended that the owner is contacted and arrangements made to relax the mowing regime for 4 - 6 weeks prior to a follow up survey being carried out in May/June next year.
- 4.22 Burygreen Plantation (Site Code 80/073) meets the LWS selection criteria, but some of its woodland habitat (in the north-east corner) has been lost to make way for a new roundabout and road re-alignment. A proposed amended site boundary is shown in blue on the map above and on the survey proforma for the site in Appendix 4).
- 4.23 Further surveys have been recommended for Wormleybury Lake (Site Code 71/028/03), Cheshunt Park Golf Course Pond (Site Code 81/011) and Halfhide Allotments (Site Code 81/016). These sites are designated for their species interest and it was not possible to confirm on the basis of a habitat survey alone whether they meet the relevant selection criteria. However, on the basis of the habitat

present it is considered likely that they will meet the criteria and these sites have been provisionally recommended for retention as LWS.

- 4.24 Halstead Hill Pond (Site Code 80/001), Wormleybury Lake (Site Code 71/028/03) and Cheshunt Park Golf Course Pond (Site Code 81/011) do not have precise boundaries. On the GIS layer provided by HBRC and BBC a circle has been drawn around each site with no relation to site boundaries. The HBRC was consulted and they explained that in the past, the idea was for species LWS to have circular boundaries (indicating a general location) rather than specific polygons (highlighting an exact boundary). This was mainly to obscure the exact location of sensitive bat roosts or breeding newt ponds. However, a recent decision has been made to map species LWS as accurately as possible with a suitable boundary. HBRC are currently working through all the species LWS to revise the boundaries where habitat information is available. They have suggested that the revised boundary of Halstead Hill Pond (Site Code 80/001) (and presumably Cheshunt Park Golf Course Pond (Site Code 81/011) as it is also a single pond with records for great crested newts) will probably be the boundary of the pond itself. They have asked BSG Ecology to provide recommendations for a suitable revised boundary of Wormleybury Lake (Site Code 71/028/03).
- 4.25 Recommendations for boundary amendments for Cheshunt Park Golf Course Pond (Site Code 81/011) and Wormleybury Lake (Site Code 71/028/03) are discussed below. As Halstead Hill Pond is recommended for deletion its boundary is not considered further here.
- 4.26 Wormleybury Lake (Site Code 71/028/03). To the south of the lake is a block of plantation woodland, to the west is agriculturally improved grassland, and to the north is an expanse of amenity grassland. HBRC hold records dating from the 1970s and 1980s for grass snake and water vole and for seven species of bat. Water vole is only likely to be found in the pond and its margins; grass snake could be present in this location as well as in the surrounding habitat, particularly the margins of the woodland. Some of the bat species, being highly mobile, could be roosting in the woodland to the south or in nearby buildings, or they may be roosting much further afield and travelling to the lake and its surroundings to forage. As the existing records are around 30 or 40 years old, it is recommended that surveys of the lake and its surrounding habitats are carried out to establish their interest and a suitable boundary for the LWS. These surveys should include a water vole and reptile survey of the lake and its boundaries and bat activity surveys of the lake and surrounding habitats.
- 4.27 Cheshunt Park Golf Course includes a number of ponds that appear to provide suitable breeding habitat for great crested newts. It is therefore recommended that an amphibian survey of all ponds within the golf course is carried out, with a view to extending the boundary of Cheshunt Park Golf Course Pond LWS (Site Code 81/011) to include additional ponds and terrestrial habitat. During the survey, a grass snake was noted next to a pond 100m to the north of the current LWS pond. A reptile survey of the golf course should also be considered to further inform the assessment of the interest of the site and therefore establish an appropriate boundary for the LWS.



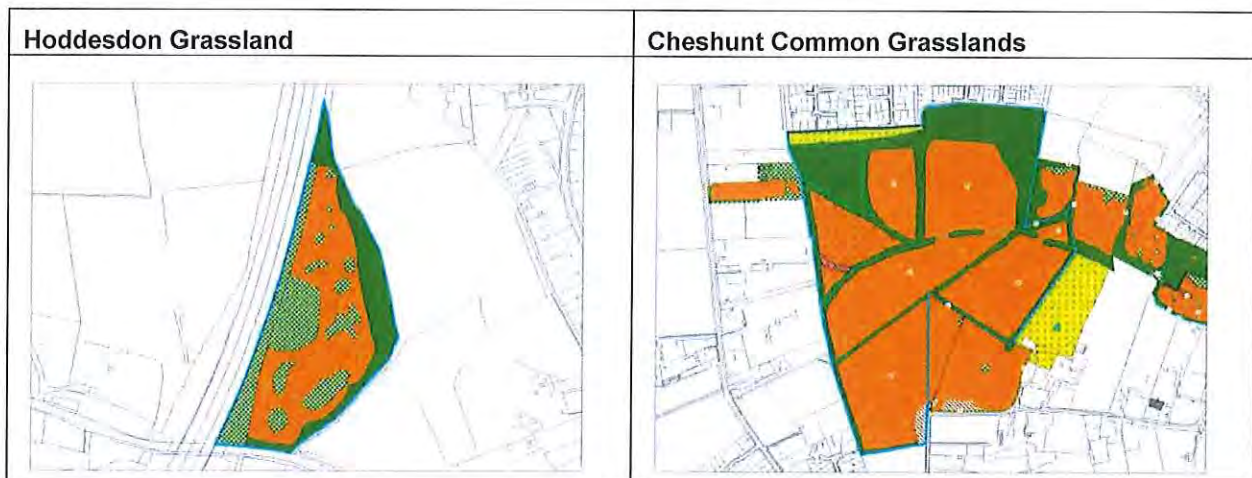
4.28 Indicative boundaries for the two sites are shown above in blue and on the survey sheets in Appendix 4, but these should be considered as preliminary boundaries only. The final boundaries should be confirmed once further surveys have been carried out as discussed above.

Proposed Local Wildlife Sites

4.29 Two sites were identified as having potential to qualify as LWS during the initial Phase 1 survey of the AoS (see maps below and on the survey forms in Appendix 5). These were re-visited by Mark Woods and surveyed according to the HWSP (2012) survey protocol. The sites have provisionally been named 'Hoddesdon Grassland' and 'Cheshunt Common Grasslands'.

4.30 Hoddesdon Grassland is located at grid reference TL362092 within the 'West of Hoddesdon' Area of Search. It is agriculturally unimproved neutral grassland with scattered and dense scrub. It meets the selection criteria for neutral grassland because 10 grassland indicator species are present (at least 8 are required to qualify).

4.31 Cheshunt Common Grasslands is a group of five unimproved/semi-improved neutral grasslands lying adjacent to Lucasend Farm Pasture West (Site Code 80/002). Each of these fields meets the selection criteria for neutral grassland LWS, all having over 8 grassland indicator species. As these fields form a continuous block, it is recommended that they are considered for designation as a single LWS.



Summary of Assessment of Ecological Value

4.32 The results of the assessment can be viewed on the GIS that accompanies this report. A general summary is provided here.

- 4.33 All of the LWS that were surveyed as part of this study have been classed as Red apart from Halstead Hill Pond (Site Code 80/001), which no longer meets the selection criteria. Those areas that have been put forward for consideration for new LWS have also been classed as Red.
- 4.34 The majority of hedgerows have been classed as Amber, based on the JNCC UK BAP Priority habitat (Maddock 2008) definition of hedgerows, being composed of at least 80% native woody species. Where a hedgerow is also species-rich, or has other value, for example as a connecting habitat, this is detailed in the GIS attribute table. Similarly the majority of the woodland that lies within the study area falls within the UKBAP Priority habitat 'Lowland mixed deciduous woodland' and has therefore been classed as Amber.
- 4.35 Ponds that have potential to support great crested newts have been classed as Amber based on their potential to support a protected species. In these cases the immediate surrounding terrestrial habitat is included within the classification, if considered likely to be suitable for the species.
- 4.36 Trees that have been noted as having high roosting potential for bats have been coloured amber.

Impact of Potential Development on Areas of Search

- 4.37 A preliminary assessment of the potential impacts of development on the ecology of each AoS using the habitat survey data alongside records received from HBRC, has been made below. To inform this assessment, indicative development proposals were provided by BBC for the Area West of Hoddesdon, Goff's Oak and Bury Green. For these three AoS, a more detailed assessment based on this additional information has been made.

Area West of Hoddesdon

- 4.38 The AoS is composed of three blocks of land: an area to the north of the B1197, and areas to the north and south of the Dinant link road, for which indicative development proposals were provided by BBC.

Land to the north of the B1197

- 4.39 This is composed of a patchwork of woodland, grassland and scrub that have potential to support common reptile species, bat species, breeding birds and a range of invertebrates. Development of this area could potentially impact on any of these species groups. The following list includes some of the negative impacts that could potentially occur, without mitigation and/or compensation, depending on the nature of any development on this area.
- Loss of bat roosts if trees supporting roosting bats are felled. Killing or injury of bats.
 - Loss or severance of links to bat foraging or commuting habitat.
 - Disturbance to bats, resulting from introduction of inappropriate lighting to areas used by these species.
 - Loss of bird nesting habitat or destruction of nests if scrub/tree clearance carried out at an inappropriate time of year
 - Killing or injury to reptiles during construction phase, and resulting loss of habitat.
 - Loss of a variety of invertebrate habitats, including deadwood and tussocky grassland.
 - Loss of grassland that meets LWS criteria (Hoddesdon Grassland - see paragraph 2.29 -2.31 above).

Land north and south of Dinant Link Road

4.40 Threats:

- Two agriculturally semi-improved fields to the north of Dinant link road may be lost. These currently form part of a mosaic of habitats suitable for reptiles.
- Corridor of woodland to the south of Dinant link road may be lost. This strip is a potential corridor of terrestrial habitat for great crested newts, linking to an extensive network of woodland and a pond to the south.
- Potential run-off issues impacting upon Woollens Brook.
- Loss of bird nesting habitat. Any tree and scrub clearance should be carried out outside the bird breeding season or nest searches carried out prior to clearance.
- Loss of potential bat roosting habitat where mature trees are removed.
- The potential impacts of increased lighting spilling onto Woollens Brook and other potential commuting corridors for bats should be considered.

4.41 Opportunities:

- Enhancement of Woollens Brook corridor by increasing width of flanking semi-natural vegetation by a combination of tree and shrub planting and a variable cutting regime.
- Enhancement of woodland to the north of Dinant link road by appropriate woodland management.
- Improve connectivity between wooded areas and Woollen Brook by creation of a network of hedgerows and wooded corridors throughout the developed area.

Goff's Oak

4.42 Indicative development proposals were provided for land in the north-east part of Goff's Oak AoS.

Land in the south and west of Goff's Oak AoS

Goff's Oak includes a number of LWS as well as a group of fields that meet the criteria for a LWS. Other habitats of note include the network of thick hedgerows, mature and near-veteran trees, Rags Brook and four ponds. The habitats present could potentially support bats, breeding birds, dormice, great crested newts and common reptile species. The following list includes some of the negative impacts that could potentially occur, without mitigation and/or compensation, depending on the nature of any development on this area.

- Loss of bat roosts if trees supporting roosting bats are felled. Killing or injury of bats.
- Loss or severance of links to bat foraging or commuting habitat.
- Disturbance to bats, resulting from introduction of inappropriate lighting to areas used by these species.
- Loss or severance of dormouse habitat, killing or injury during construction.
- Loss of aquatic or terrestrial great crested newt habitat, severance of commuting routes, killing or injury during construction.
- Loss of bird nesting habitat or destruction of nests if scrub/tree clearance carried out at an inappropriate time of year
- Killing or injury to reptiles during construction phase, and resulting loss of habitat.
- Loss of a variety of invertebrate habitats, including deadwood and tussocky grassland.
- Loss of, or other impacts (for example fly tipping, heavy recreational use and so on) on LWS.
- Loss of grassland that meets LWS criteria (see paragraphs 2.29-2.31 above).
- Loss of species-rich hedgerows.

Land in the north-east of Goff's Oak AoS

4.43 Threats:

- Meadow South of Rosedale Sports Ground LWS (Site Code 80/035) may be lost. This LWS still meets the criteria of a neutral grassland LWS.
- Loss of agriculturally semi-improved neutral grasslands south of Rags Brook. These fields are species-poor but may have some value as nectar source and habitat for invertebrates.
- Loss of bird nesting habitat. Any tree and scrub clearance should be carried out outside the bird breeding season or nest searches should be carried out prior to clearance.
- Loss of potential bat roosting habitat where mature trees are removed.
- The potential impacts of increased lighting spilling onto Rags Brook and other potential commuting corridors for bats should be considered.

4.44 Opportunities:

- A greatly enhanced river corridor along Rags Brook with areas of woodland planting and new water bodies.
- Potential for creation of great crested newt habitat if new water bodies along Rags Brook, south of Andrews Lane and east of Rosedale sports ground are created sympathetically. This would involve inclusion of semi-natural marginal habitat and the creation of linkages (for example hedgerows or tree and scrub lines) between ponds and to wider environment.
- Enhancement of woodland to the east of Rags Lane. Planting should consist of native, locally-appropriate species complemented by natural regeneration.
- Enhancement of retained areas of grassland along Rags Brook, east of Rags Lane and south of Peakes Way. These retained areas could be enhanced by a varied mowing regime and introduction of locally-appropriate native wildflower species.
- Retention and enhancement of existing network of hedgerows. The opportunity should be taken to increase their value as a habitat and network, by appropriate management and targeted planting.
- Opportunities to create new bird breeding habitat should be considered.

Bury Green

4.45 Bury Green includes two ponds and two woodland LWS and small areas of unmanaged grasslands. There is some potential for the AoS to support great crested newts and common reptile species although the habitats are cut off from the wider countryside by roads and development. The LWS have the potential to support protected species including a range of breeding birds, badger and roosting bats. The following list includes some of the negative impacts that could potentially occur, without mitigation and/or compensation, depending on the nature of any development on this area.

- Loss of, or other impacts (for example fly tipping, heavy recreational use and so on) on LWS habitat and species (for example loss of bat roosts and bird nesting habitat).
- Loss of aquatic or terrestrial great crested newt habitat, killing or injury during construction.
- Loss of bird nesting habitat or destruction of nests if scrub/tree clearance carried out at an inappropriate time of year.
- Killing or injury to reptiles during construction phase, and resulting loss of habitat.

4.46 Threats:

- Loss of habitat (pond and surrounding semi-natural grassland and scrub) with potential to support great crested newts and reptiles. This relates to the strip of land running along the B198.
- Potential to kill or injure any great crested newts or reptiles that might be present in the above areas.

- Loss of bird nesting habitat. Any tree and scrub clearance should be carried out outside the bird breeding season or nest searches should be carried out prior to clearance. Opportunities to create new bird breeding habitat should be considered.
- Loss of potential bat roosting habitat where mature trees are removed.

4.47 Opportunities:

- Indicative development plans show a 30m landscape buffer between the B198 and the proposed development. This has the potential to provide increased habitat for breeding birds and, potentially reptiles and great crested newts if present in the vicinity. Measures for enhancement could include pond creation, tree and scrub planting and a varied mowing schedule.

Southern A10 Corridor

4.48 No indicative development proposals were provided for this AoS, so comments are of a general nature only.

4.49 This AoS includes a pond with associated scrubby grassland that has some potential to support great crested newts and common reptile species, although the potential is fairly limited given its isolated situation. There is also a block of woodland which could support protected species such as breeding birds and bats. The large expanse of arable could provide habitat for wintering birds. The following list includes some of the negative impacts that could potentially occur, without mitigation and/or compensation, depending on the nature of any development on this area.

- Loss of aquatic or terrestrial great crested newt habitat, killing or injury of great crested newts during construction.
- Loss of bat roosts if trees supporting roosting bats are felled. Killing or injury of bats.
- Loss of bird nesting habitat or destruction of nests if scrub/tree clearance carried out at an inappropriate time of year.
- Killing or injury to reptiles during construction phase, and resulting loss of habitat.

Potential Constraints on the Study

4.50 Broxbourne Borough Council provided landowner contact details for the majority of the land within the AOS and the LWS. However for some parts of the AoS, particularly in the Goffs Oak AoS, no landowner information was available. These areas were not entered during the survey, but where it was possible to view the fields from the boundary, or where it was clear from viewing aerial photographs what the habitats present were they were included in the survey results. Where this information was not available, the land has been marked as 'unsurveyed' on the GIS layers. Built up areas and private gardens were not surveyed.

5 Habitat Management

- 5.1 Where appropriate, biodiversity management recommendations have been made in the LWS survey proforma (See Appendix 4) with the aim of restoring LWS to 'favourable' condition or otherwise enhancing the ecological value of the site. Table 4a below provides some generic prices to cover the management recommendations made, and Table 4b includes accompanying notes. These are adapted from the *Agricultural Budgeting & Costing Book (67th Edition) (Agro Business Consultants 2008)*. The prices have been adjusted by adding 5% to reflect inflationary increases to date and do not take account of future increases in inflation. These figures are approximate and are not site-specific; they should be used as a guide only.

Table 4a: Prices for Generic Management Actions

Management Action	Price	
Day rate for agricultural contractor		
Grade 2 Standard Worker	£51.27	£256.35
Grade 3 Lead Worker	£56.43	£282.15
Grade 4 Craft grade	£60.52	£302.63
Woodland / Trees		
Coppicing/pollarding ¹	See note below	
Tree thinning ²	£10.00 - £20.00/cubic m.	
Selective removal of exotic tree species.	£320.00/cubic m ⁴	
Hedge laying ⁶	£8.50 - £12.50/m ¹	
Grassland		
Strimming ³	£55.00/day	
Weed spraying (spot application using knapsack sprayer & inc of materials)	£80.00 - £130.00/ha	
Mowing ⁵	£5.50 - 8.50/ha	15ha per hr
Chain Harrowing	£10.00 - £16.00/ha	3.6ha per hr
Grazing Charges (per head)		
Sheep (per week)	£0.50 - £0.70	
Cattle (per week) 6-12months old	£2.25 - £3.00	
Cattle (per week) 12-21months old	£2.75 - £3.75	
Cattle (per week) >21months	£3.70 - £4.70	
Horses and ponies (per week)	£6.50 - £10.50	
Fencing (labour & materials per m)		
Post & rail (nailed)	£17.00 - £23.00	
Stock fence	£5.50 - £7.50	
Post & wire (4 strand)	£3.50 - £4.50	
Deer fence	£9.00 - £12.50	
Rabbit fence	£5.50 - £7.50	
Gates (materials inc fittings): 2.4m – 4.2m wide	£140.00 - £190.00	
Gates (labour) ⁷	£60.00 - £70.00	
Water trough ⁸ and water piping		

Table 4b: Notes to Accompany Table 4a

Number	Note
1	It is not possible to give a price for coppicing and pollarding because it depends on the state of the coppice (neglect, age, species), size of coupes and local markets. The best coppice coupes can be rented out and the workers sell their own products. The nearest costs for re-coppicing would be equivalent to implementing a second thinning in a woodland, which is valued by the cubic metre rather than area. For neglected coppice and re-instatement of rotations the nearest equivalent would be scrub clearance, which is costs £300-450 per hectare.
2	As a guide this is based on the average conifer tree, which when harvested is about 3 cubic metres.
3	There is no particular rate per unit area for strimming; most contractors will work on a day rate. The area that can be cut depends on the extent of growth, the terrain, access and type of area (verges or patches, continuous or discontinuous).
4	Allow the maximum rate for thinning because access to individual trees may be compromised by neighbouring trees and sectional felling may be required, which will further increase the overall costs.
5	Based on trailed mower of 8-10m width on a 180-230bhp tractor. There will be raking, tedding, turning, baling, loading and transport costs to add if hay making.
6	Prices vary depending on condition of hedge. The larger and more neglected the more expensive
7	Assumes 1 craft and 1 standard labourer will take half a day to complete installation.
8	Unable to provide a standard costs, depends on whereabouts of water source, gradient, distance and so on.

6 Recommendations for Further Work

- 6.1 The following recommendations for further work have been made based on the findings of the AoS habitat survey and LWS appraisal.

Areas of Search

- 6.2 The habitat survey of each AoS provides a preliminary assessment of potential ecological issues and opportunities relating to these broad areas. This is not a substitute for the detailed site-specific ecology surveys that are likely to be required for individual plans and projects that are brought forward within these areas. Such future studies should be carefully scoped depending on the extent and nature of the development proposed and taking into account the latest available data and information relating to a particular AoS.

Local Wildlife Sites

- Advice on appropriate biodiversity management prescriptions for each LWS and proposed LWS are provided in the survey proforma for each site in Appendices 4 and 5.
 - Lucas End Meadows East LWS requires a further habitat survey in May/June following a period where the mowing regime is relaxed for 4-6 weeks, to establish whether or not it meets the published criteria for a LWS.
 - Wormleybury Lake (Site Code 71/028/03) requires targeted protected species surveys to confirm that it meets LWS criteria and to provide information to draw up an appropriate new boundary. Bat activity and reptile surveys of the lake margins and surrounding habitats, and a water vole survey of the lake margins are recommended.
 - Cheshunt Park Golf Course Pond (81/011) requires great crested newt surveys to confirm that it meets the LWS criteria and to provide information to draw up an appropriate new boundary. It is recommended that the surveys are carried out on all ponds within the golf course to establish whether any of them would also qualify and therefore should be included in the revised LWS boundary. A reptile survey of the golf course is also recommended.
 - Halfhide Allotments (81/016) requires a reptile survey to confirm that it meets the LWS criteria.
- 6.3 The surveys recommended above should be carried out according to the relevant best practice guidelines and by an appropriately qualified ecologist. It is recommended that they are instigated by Broxbourne Borough Council in consultation with the HMWT and HBRC.

7 References

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Rural Development Service (2006) Environmental Stewardship. Farm Environment Plan Guidance 009. First Edition.

<http://jncc.defra.gov.uk/page-5155> (The UK Biodiversity Action Plan) – 14 June 2011

8 Files to Accompany this Study

- 8.1 Excel spreadsheet species lists for each LWS using format provided in HWSP 2012.
- 8.2 GIS layers in MapInfo format as follows.
 - AoS Phase 1 Maps.
 - LWS Phase 1 Maps.
 - Ecological Value maps

Appendix 1: Maps

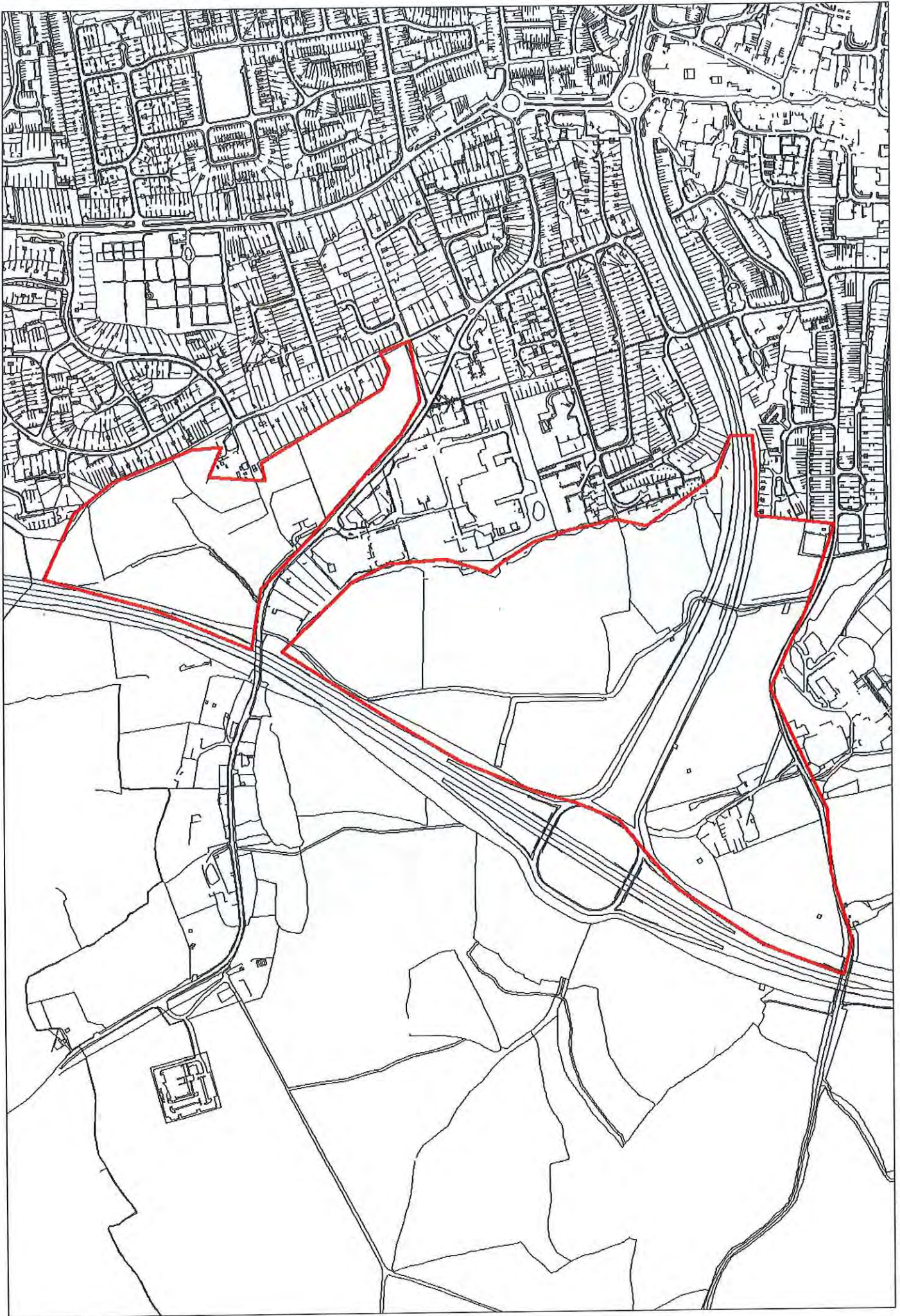


Figure 1: Area of Search- West of Hoddesdon

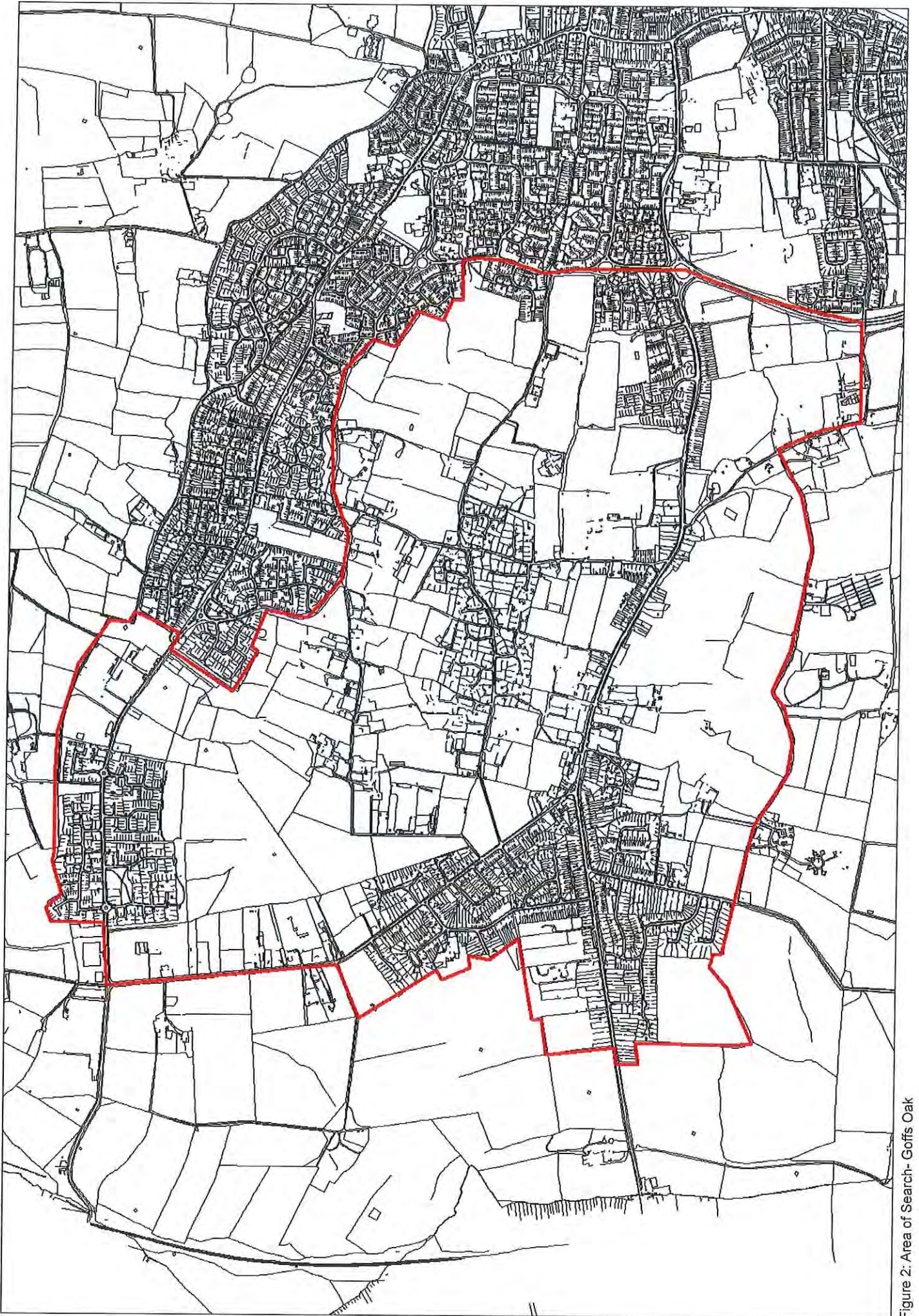


Figure 2: Area of Search- Goffs Oak

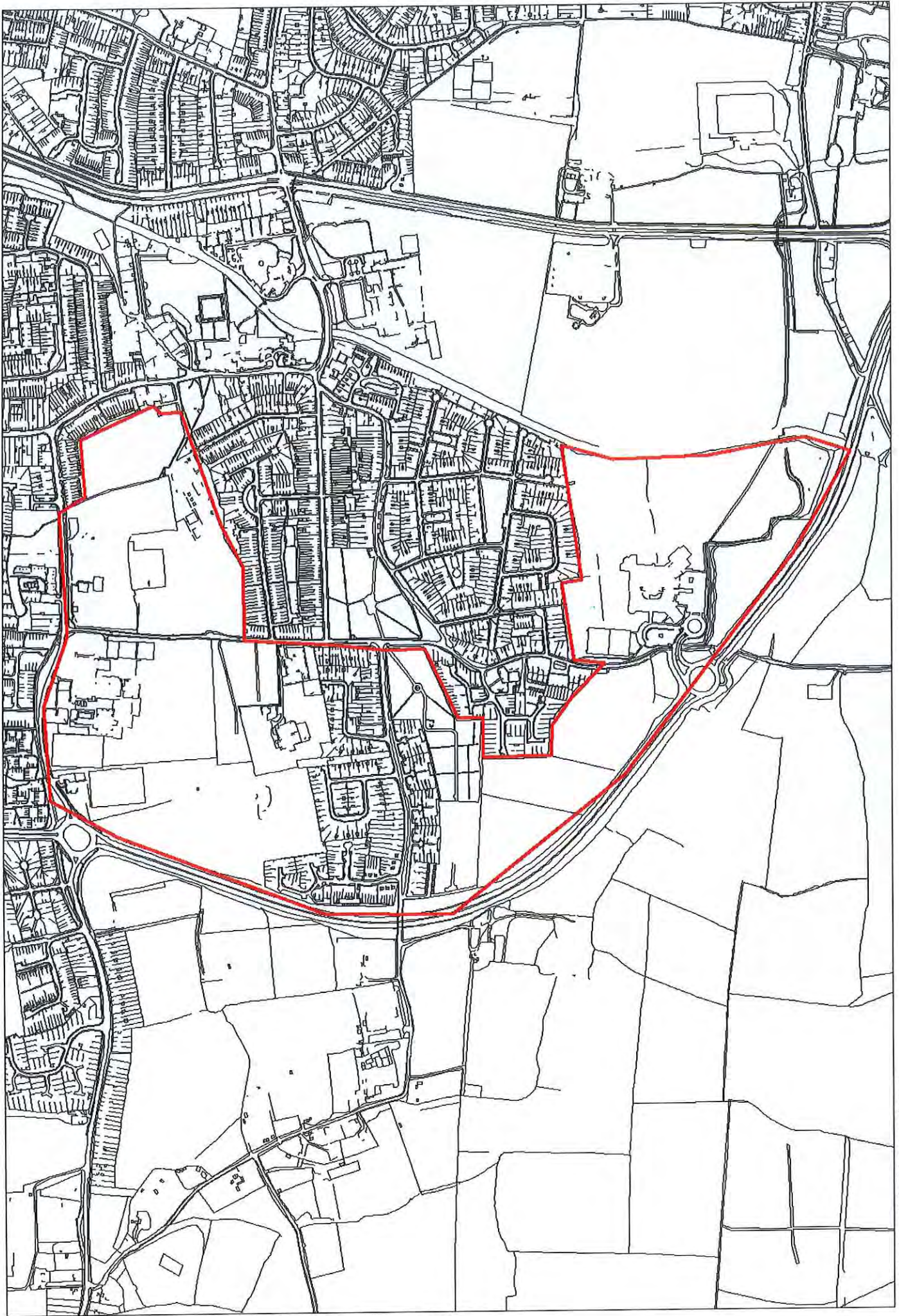


Figure 3: Area of Search- Bury Green

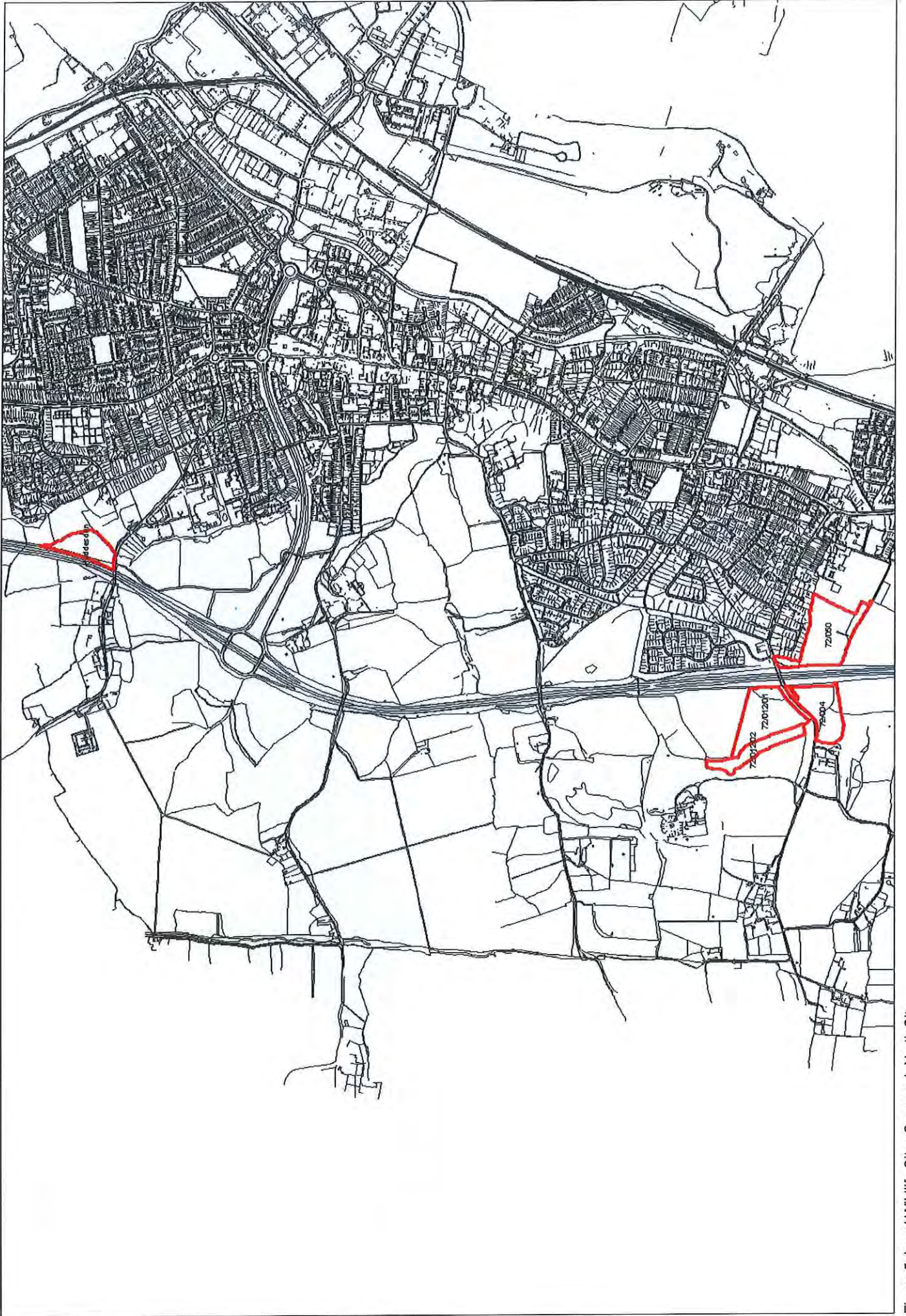


Figure 5: Local Wildlife Sites Surveyed- North Site

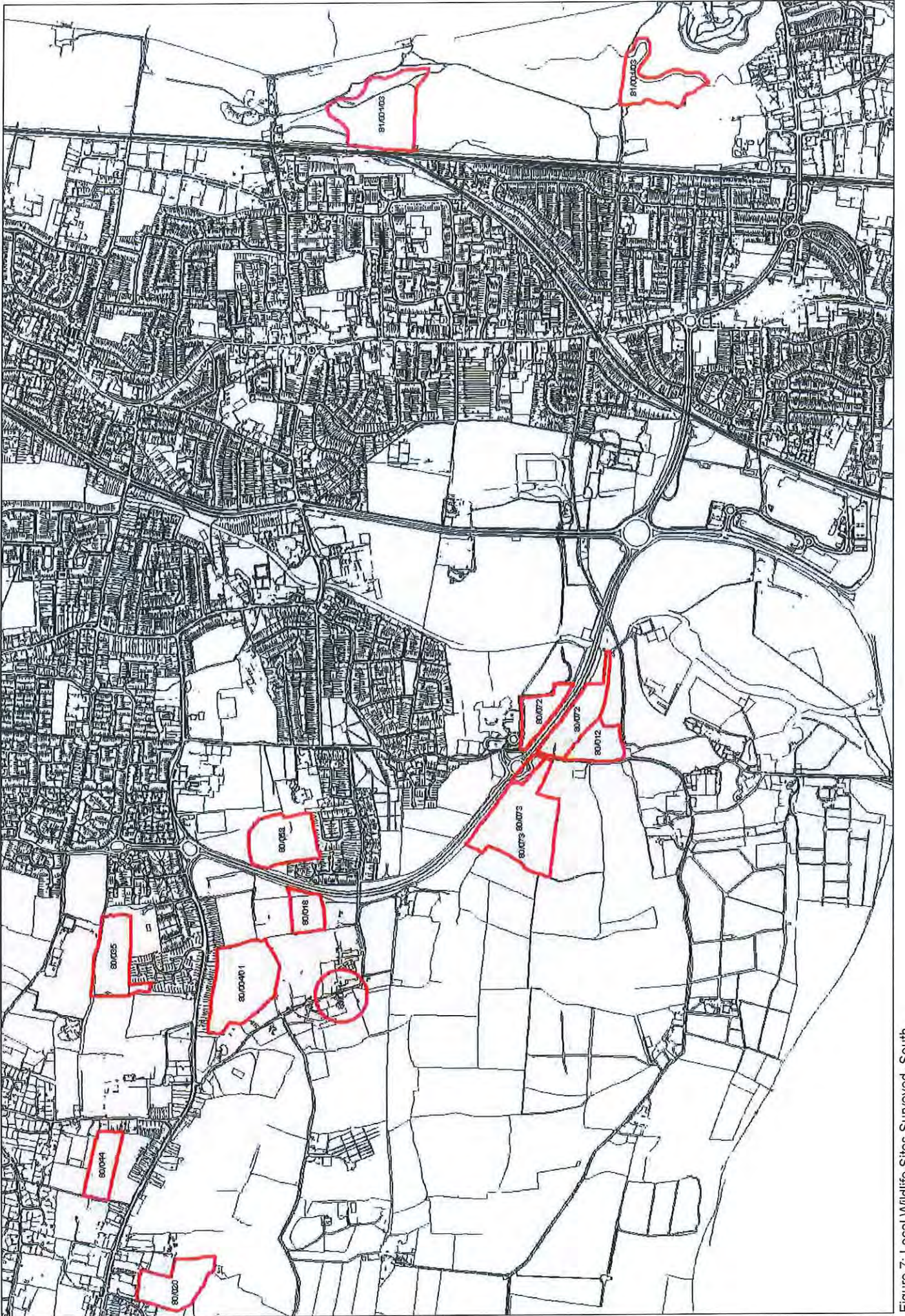
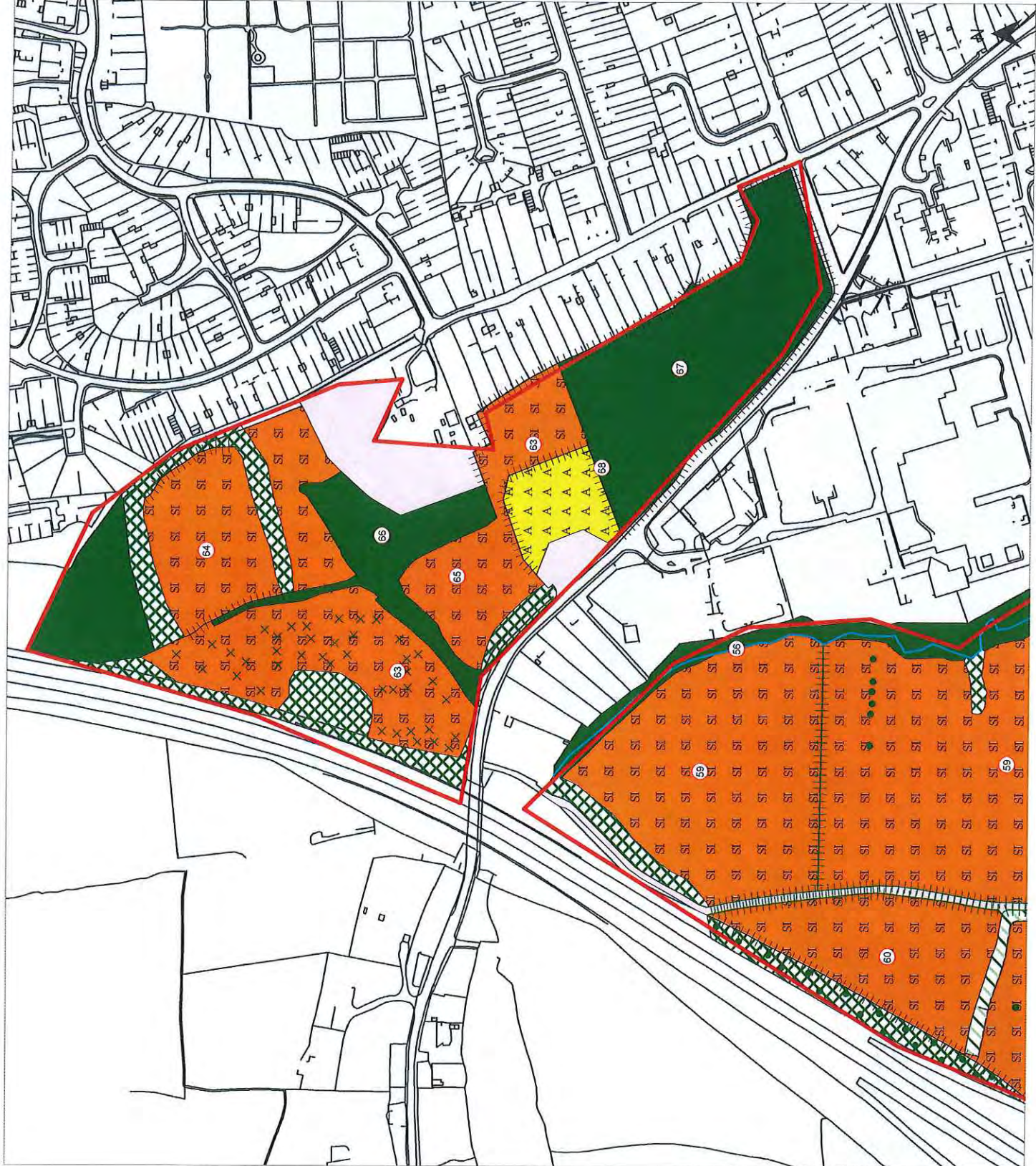


Figure 7: Local Wildlife Sites Surveyed- South



LEGEND

	Area of Search		Local Wildlife Site
	Target note		Running water
	Semi-natural broadleaved woodland		Inlaid species poor hedgerow
	Broadleaved plantation		Defunct species poor hedgerow
	Mixed plantation		Inlaid species rich hedgerow with trees
	Dense scrub		Inlaid species poor hedgerow with trees
	Neutral grassland		Fence
	Semi-improved neutral grassland		Dry ditch
	Improved grassland		Earth bank
	Marshy grassland		Scattered scrub
	Tall ruderals		Broadleaved tree
	Swamp		
	Standing water		
	Arable		
	Amenity grassland		
	Building		
	Bare ground		
	Not surveyed		

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PROJECT TITLE
BROXBORNE HABITAT SURVEY

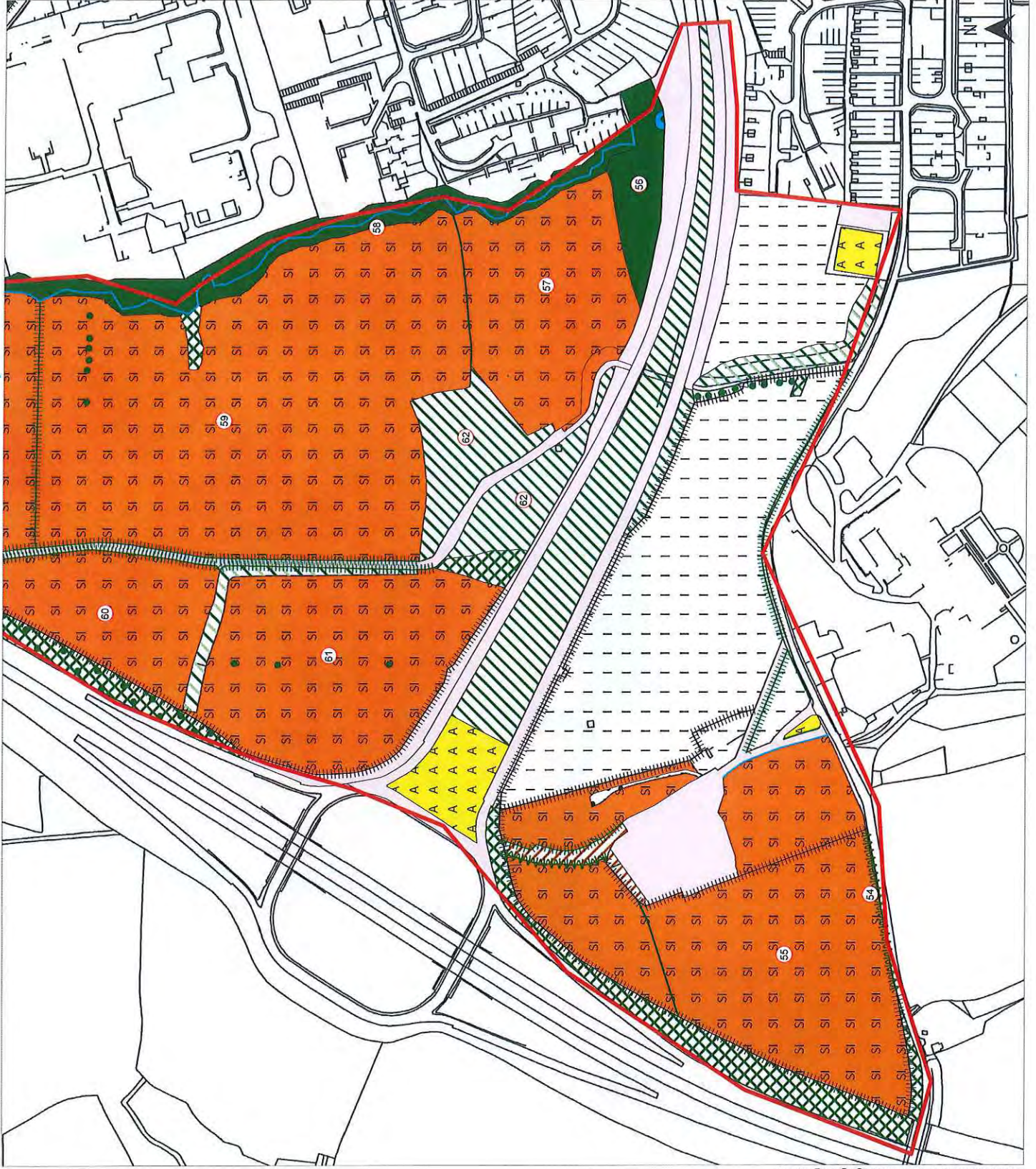
DRAWING TITLE
Figure 8. Phase 1 habitat map of Wot Hoddesdon Area of Search 1/2

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DRAWN: JW

CHECKED: AG
APPROVED: AG

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STATUS: FINAL

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- LEGEND**
- | | |
|-----------------------------------|---|
| Area of Search | Local Wildlife Site |
| Target note | Running water |
| Semi-natural broadleaved woodland | Intact species poor hedgerow |
| Broadleaved plantation | Defunct species poor hedgerow |
| Mixed plantation | Intact species rich hedgerow |
| Dense scrub | Intact species poor hedgerow with trees |
| Neutral grassland | Intact species poor hedgerow with trees |
| Semi-improved natural grassland | Fence |
| Improved grassland | Dry ditch |
| Marshy grassland | Earth bank |
| Tall ruderals | Scattered scrub |
| Swamp | Broadleaved tree |
| Standing water | |
| Arable | |
| Amenity grassland | |
| Building | |
| Bare ground | |
| Not surveyed | |

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PROJECT TITLE
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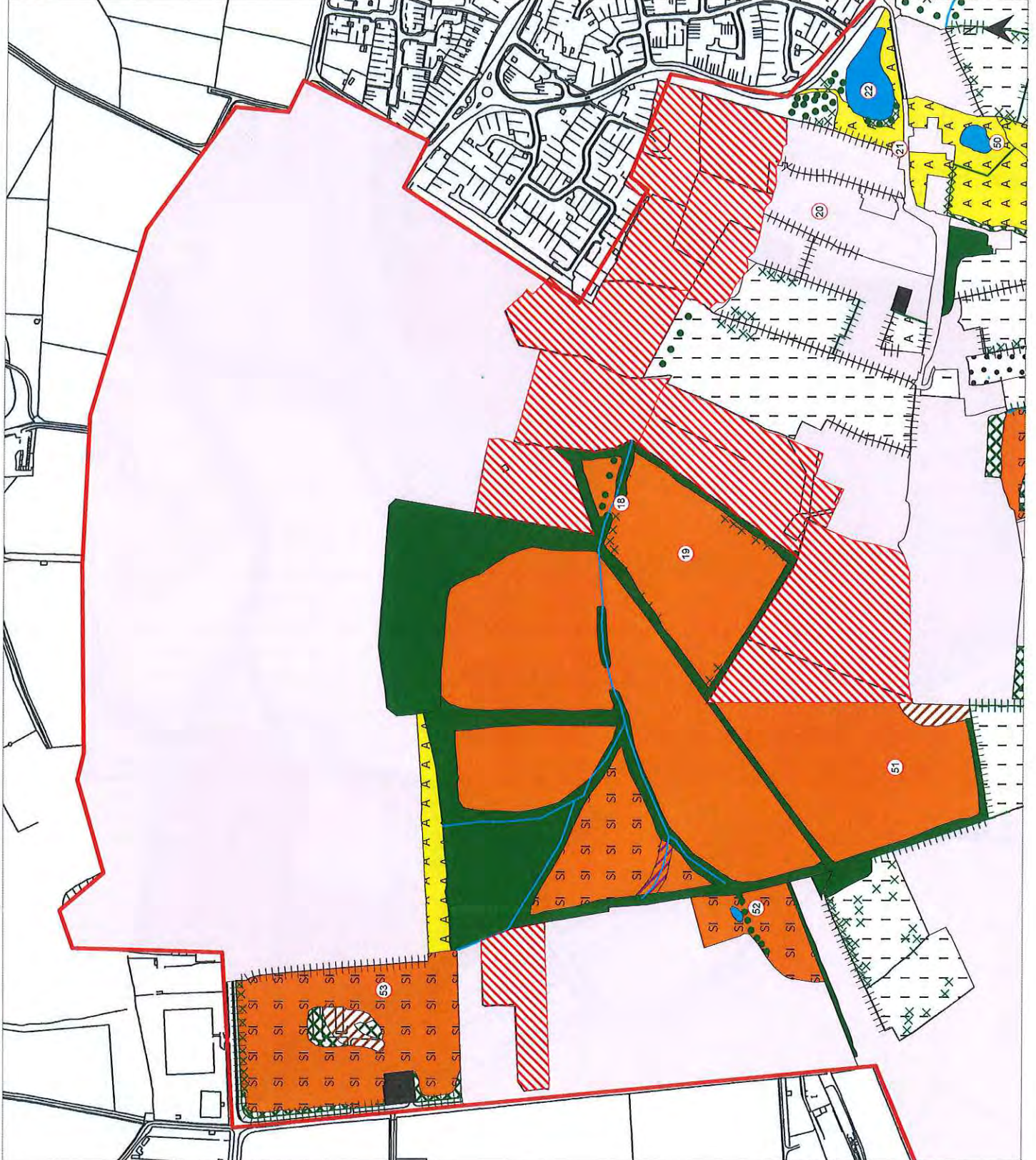
DRAWING TITLE
Figure 9: Phase 1 habitat map of Wolf Hoddesdon Area of Search 2/2

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DRAWN: JW
CHECKED: AG
APPROVED: AG
SCALE: 1:3,000
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LEGEND

- | | | | |
|--|-----------------------------------|--|---|
| | Area of Search | | Local Wildlife Site |
| | Target note | | Running water |
| | Semi-natural broadleaved woodland | | Intact species poor hedgerow |
| | Broadleaved plantation | | Defunct species poor hedgerow |
| | Mixed plantation | | Intact species rich hedgerow with trees |
| | Dense scrub | | Intact species poor hedgerow with trees |
| | Neutral grassland | | Fence |
| | Semi-improved neutral grassland | | Dry ditch |
| | Improved grassland | | Earth bank |
| | Marshy grassland | | Scattered scrub |
| | Tall ruderalis | | Broadleaved tree |
| | Swamp | | |
| | Standing water | | |
| | Arable | | |
| | Amenity grassland | | |
| | Building | | |
| | Bare ground | | |
| | Not surveyed | | |



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DRAWING TITLE

Figure 10: Phase 1 habitat map of Goffs Oak
Area of Search 1/5

DATE: 16.08.2012

CHECKED: AG

SCALE: 1:4,500

DRAWN: JW

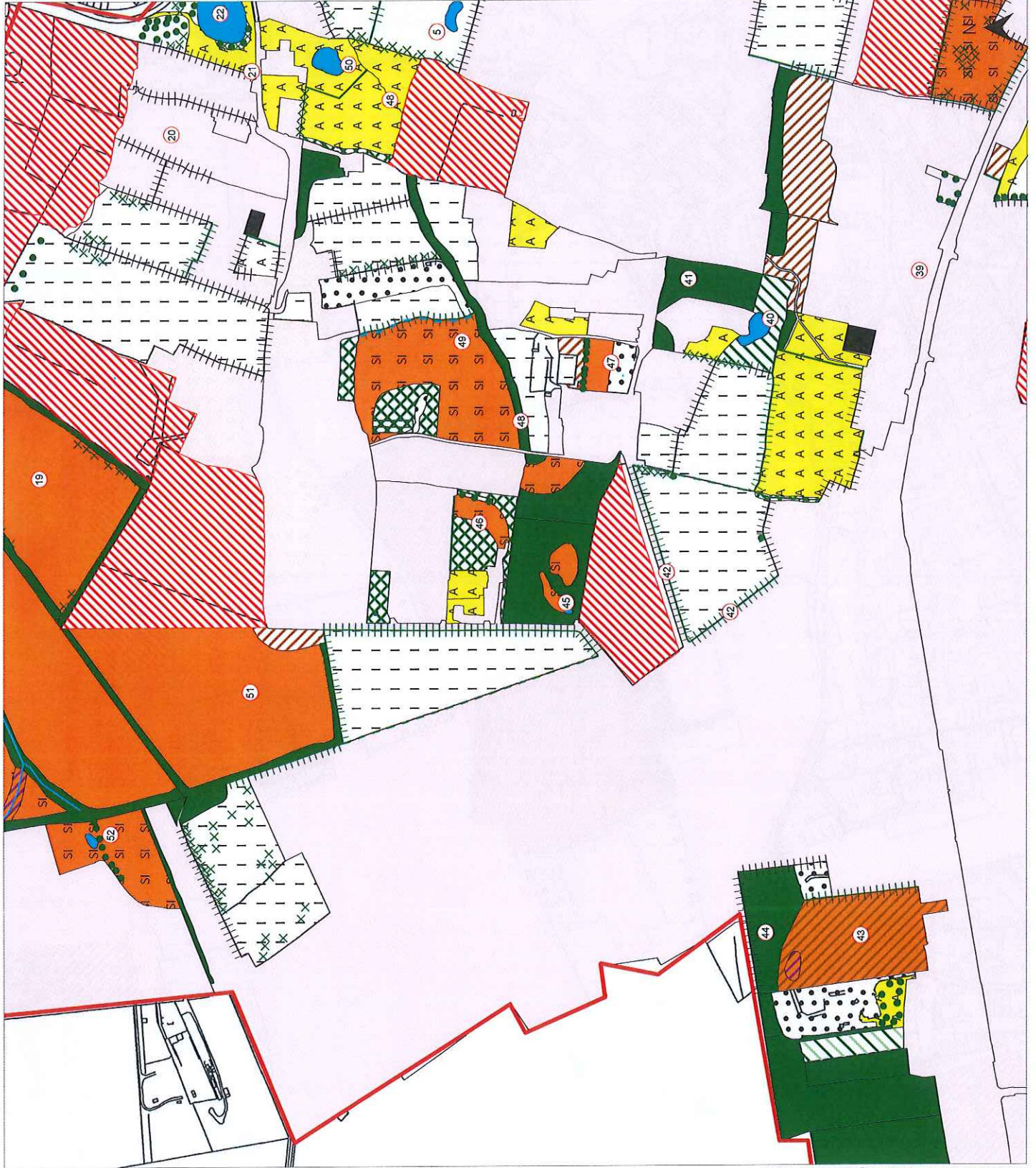
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LEGEND

	Area of Search		Local Wildlife Site
	Target note		Running water
	Semi-natural broadleaved woodland		Intact species poor hedgerow
	Broadleaved plantation		Defunct species poor hedgerow
	Mixed plantation		Intact species rich hedgerow with trees
	Dense scrub		Intact species poor hedgerow with trees
	Neutral grassland		Fence
	Semi-improved neutral grassland		Dry ditch
	Improved grassland		Earth bank
	Marshy grassland		Scattered scrub
	Tall ruderals		Broadleaved tree
	Swamp		
	Standing water		
	Arable		
	Amenity grassland		
	Building		
	Bare ground		
	Not surveyed		

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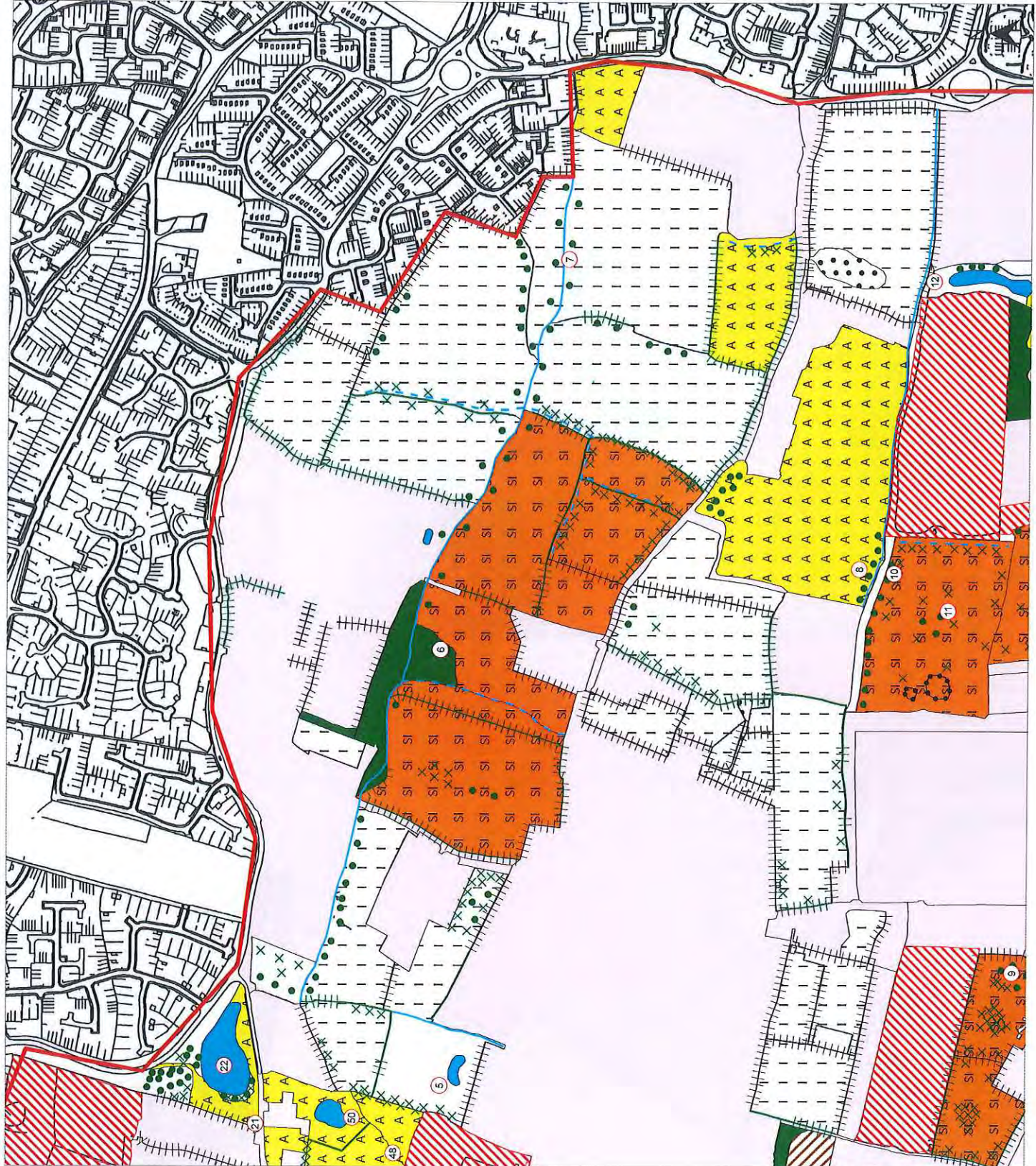
JOB REF: 6029

PROJECT TITLE
BROXBORNE HABITAT SURVEY

DRAWING TITLE
Figure 11: Phase 1 habitat map of Goff's Oak
Area of Search 2/5

DATE: 16.08.2012
DRAWN: JW
CHECKED: AG
APPROVED: AG
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LEGEND

	Local Wildlife Site
	Running water
	Intact species poor hedgerow
	Defunct species poor hedgerow
	Intact species rich hedgerow with trees
	Intact species poor hedgerow with trees
	Fence
	Dry ditch
	Earth bank
	Scattered scrub
	Broadleaved tree
	Swamp
	Standing water
	Arable
	Amenity grassland
	Building
	Bare ground
	Not surveyed
	Improved grassland
	Marshy grassland
	Tall ruderals
	Neutral grassland
	Semi-improved neutral grassland
	Target note
	Semi-natural broadleaved woodland
	Broadleaved plantation
	Mixed plantation
	Dense scrub
	Area of Search

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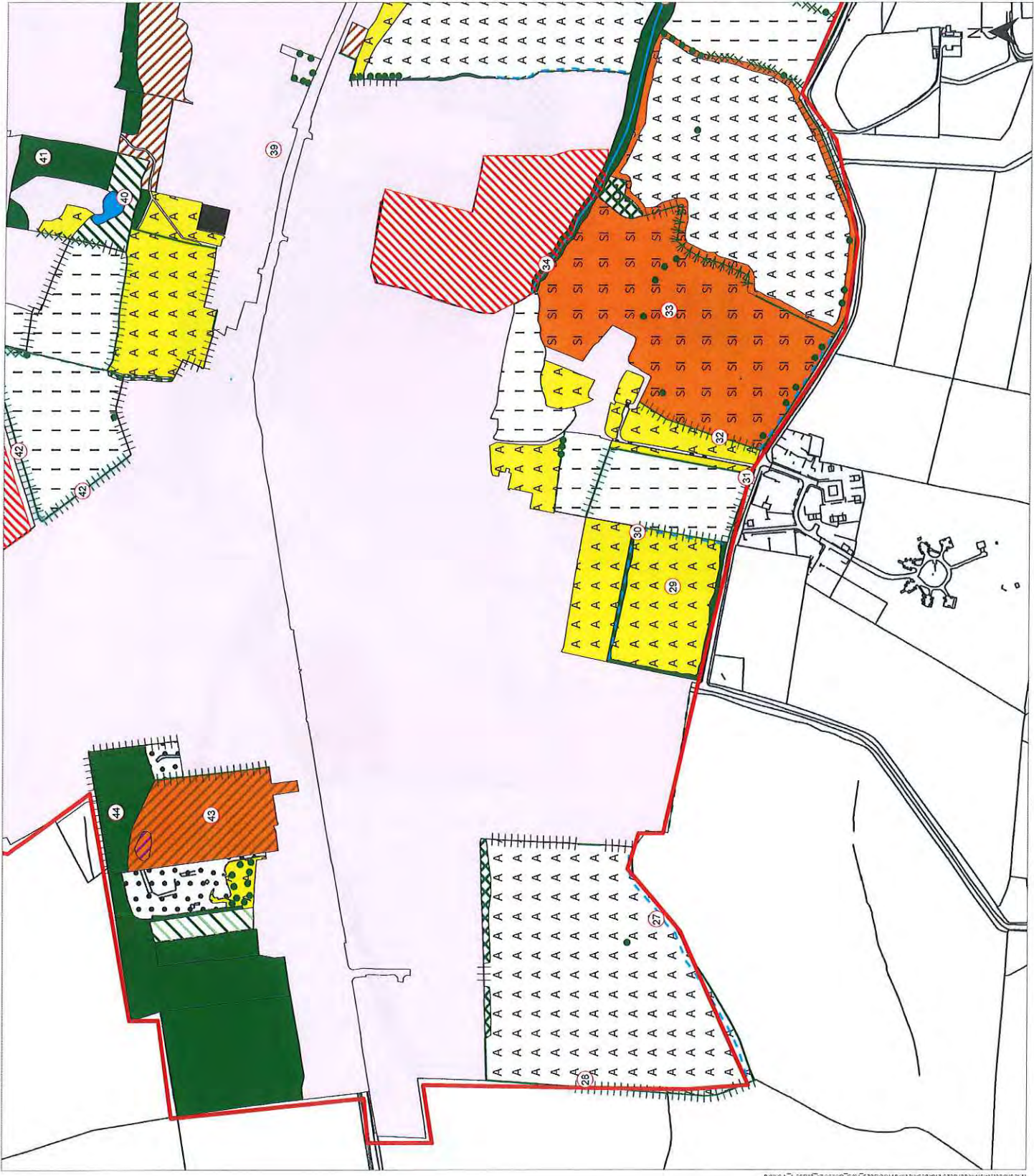
PROJECT TITLE
BROXBORNE HABITAT SURVEY

DRAWING TITLE
Figure 12: Phase 1 habitat map of Goffs Oak
Area of Search 3/5

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APPROVED: AG
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LEGEND

	Area of Search
	Target note
	Semi-cultural broadleaved woodland
	Broadleaved plantation
	Mixed plantation
	Dense scrub
	Neutral grassland
	Semi-improved neutral grassland
	Improved grassland
	Marshy grassland
	Tall ruderals
	Swamp
	Standing water
	Arable
	Amenity grassland
	Building
	Bare ground
	Not surveyed

Local Wildlife Site

Running water
Intact species poor hedgerow
Defunct species poor hedgerow
Intact species rich hedgerow with trees
Intact species poor hedgerow with trees
Fence
Dry ditch
Earth bank
Scattered scrub
Broadleaved tree

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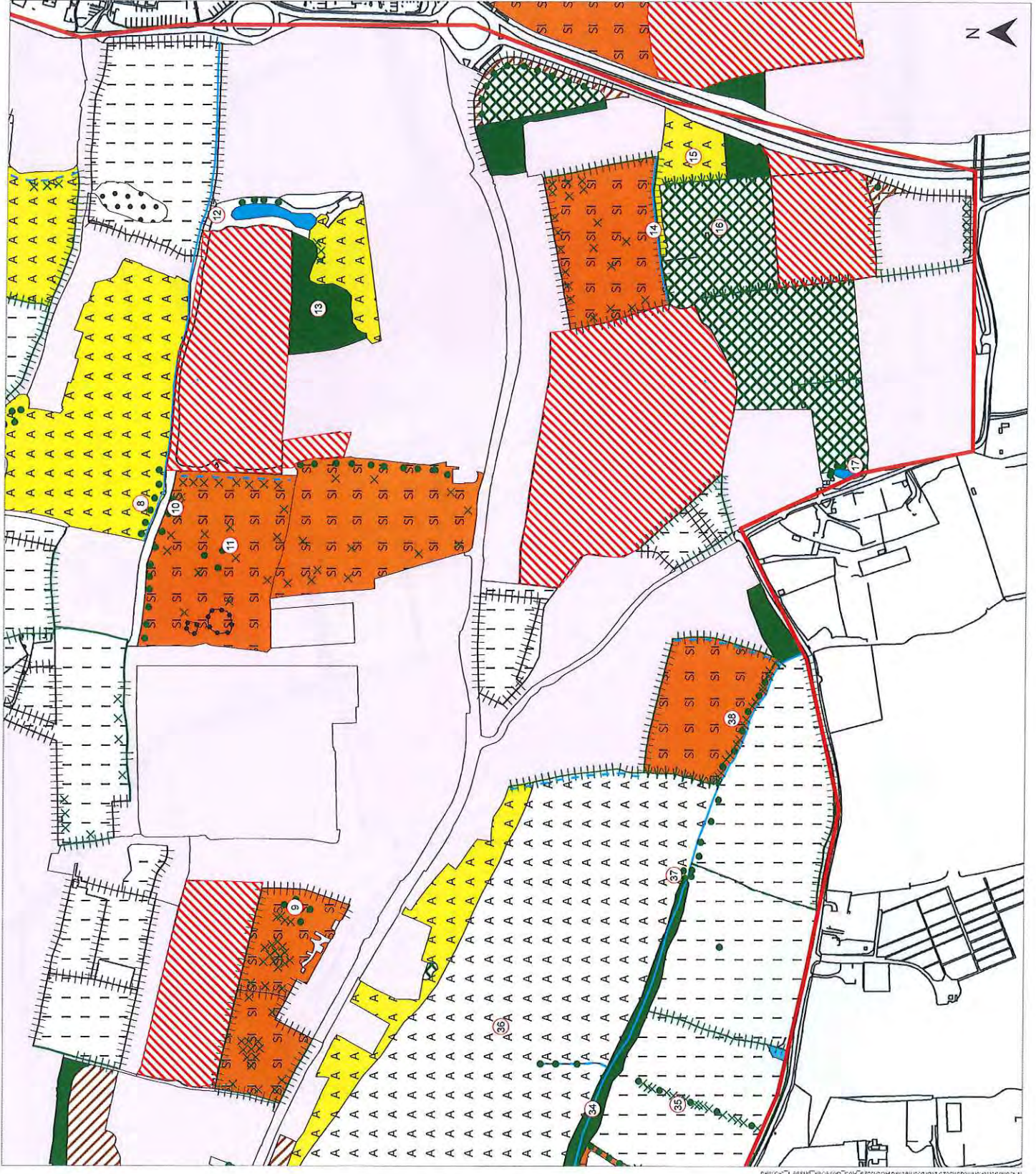
PROJECT TITLE
BROXBOURNE HABITAT SURVEY

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Figure 13: Phase 1 habitat map of Goff's Oak
Area of Search 4/5

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DRAWN: JW

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LEGEND

	Local Wildlife Site
	Running water
	Target note
	Semi-natural broadleaved woodland
	Broadleaved plantation
	Mixed plantation
	Dense scrub
	Neutral grassland
	Semi-improved neutral grassland
	Improved grassland
	Marshy grassland
	Tall ruderalis
	Swamp
	Standing water
	Arable
	Amenity grassland
	Building
	Bare ground
	Not surveyed

	Local Wildlife Site
	Running water
	Target note
	Semi-natural broadleaved woodland
	Broadleaved plantation
	Mixed plantation
	Dense scrub
	Neutral grassland
	Semi-improved neutral grassland
	Improved grassland
	Marshy grassland
	Tall ruderalis
	Swamp
	Standing water
	Arable
	Amenity grassland
	Building
	Bare ground
	Not surveyed

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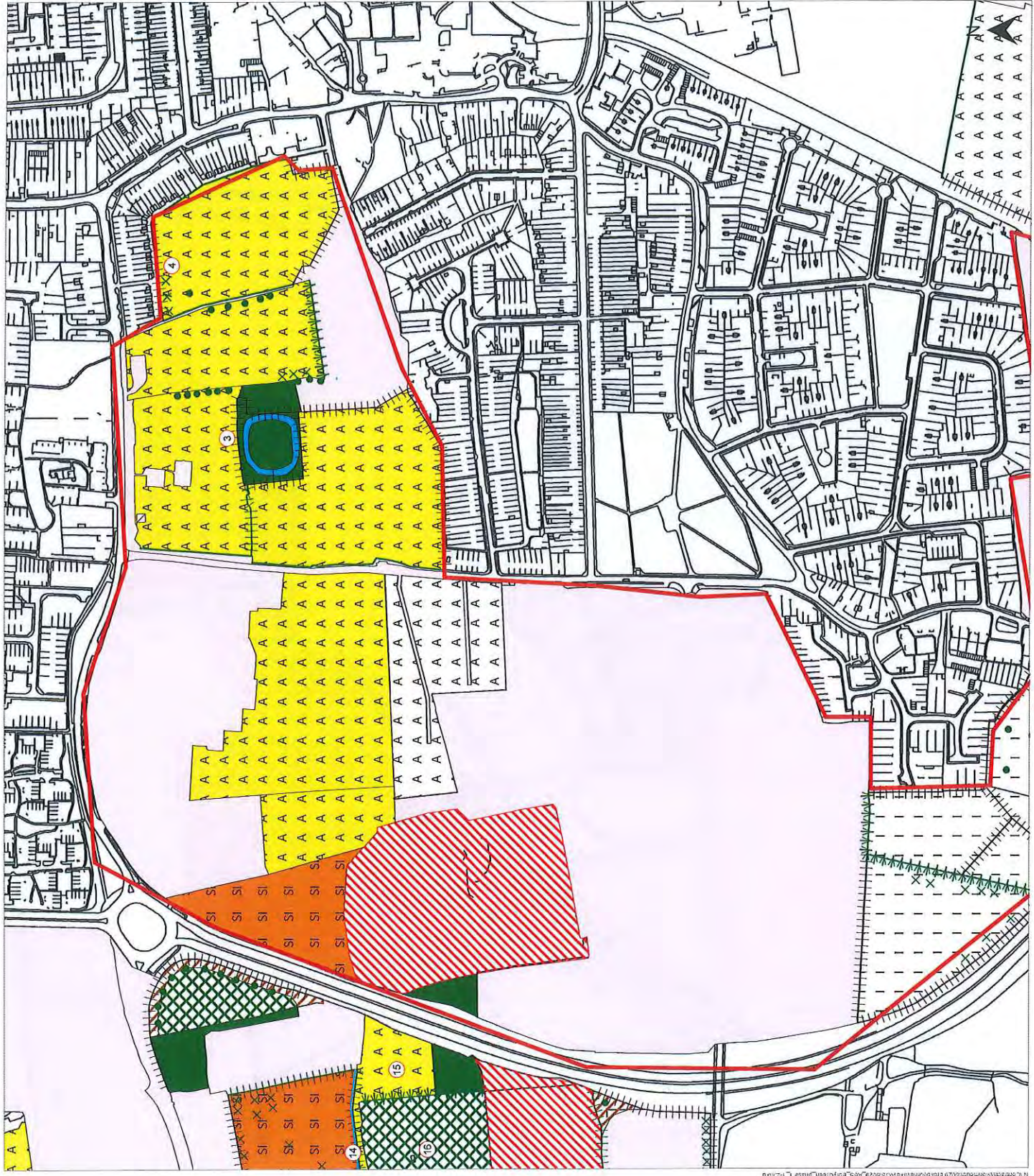
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BROXBORNE HABITAT SURVEY

DRAWING TITLE
Figure 14: Phase 1 habitat map of Goff's Oak
Area of Search 5/5

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LEGEND

	Area of Search
	Target note
	Semi-natural broadleaved woodland
	Broadleaved plantation
	Mixed plantation
	Dense scrub
	Neutral grassland
	Semi-improved neutral grassland
	Improved grassland
	Marshy grassland
	Tall ruderals
	Swamp
	Standing water
	Arable
	Amenity grassland
	Building
	Bare ground
	Not surveyed

	Local Wildlife Site
	Running water
	Intact species poor hedgerow
	Defunct species poor hedgerow
	Intact species rich hedgerow with trees
	Intact species poor hedgerow with trees
	Fence
	Dry ditch
	Earth bank
	Scattered scrub
	Broadleaved tree

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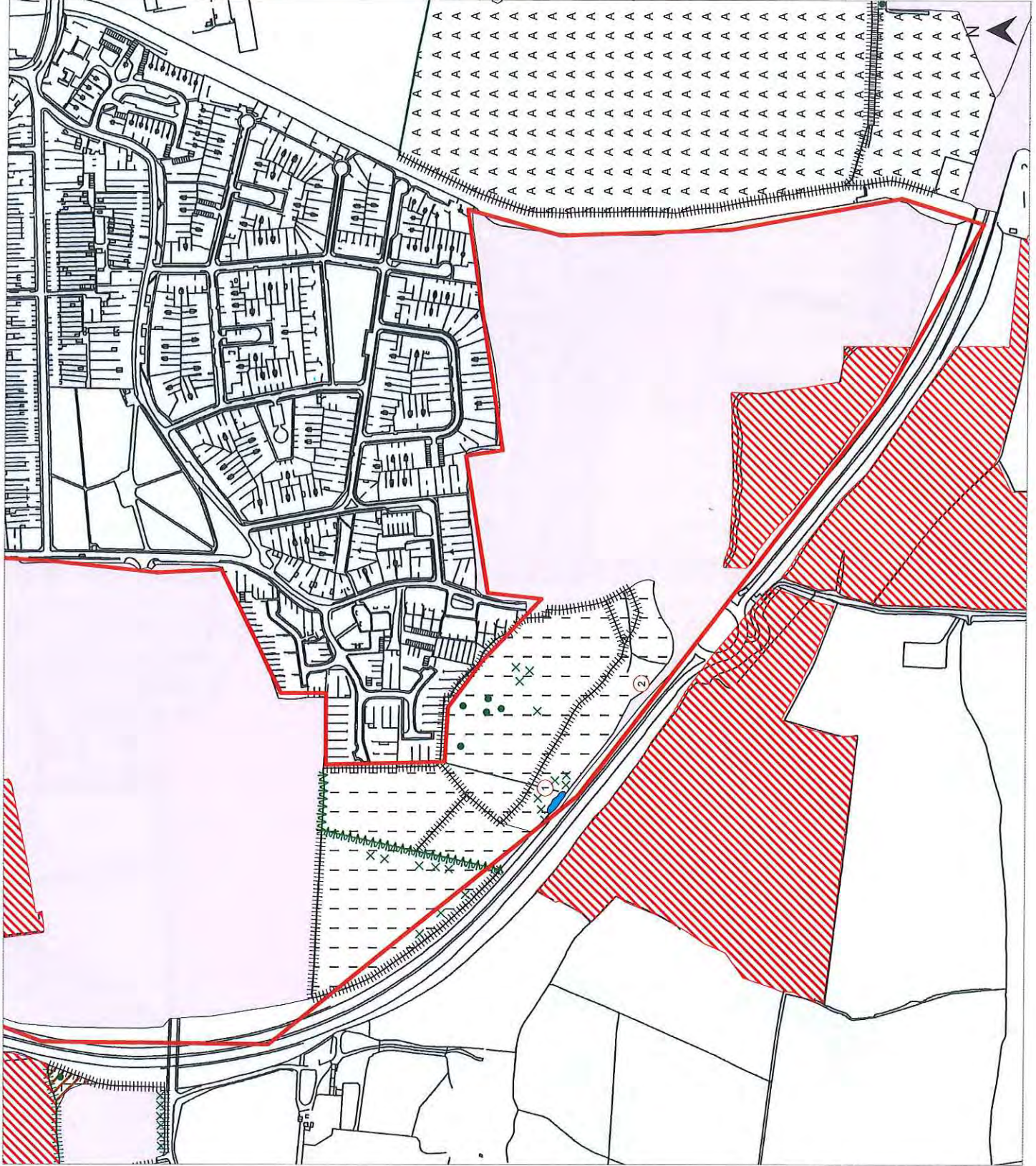
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BROXBORNE HABITAT SURVEY

DRAWING TITLE
**Figure 15: Phase 1 habitat map of Bury Green
Area of Search 1/2**

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APPROVED: JAG
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STATUS: FINAL

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LEGEND

	Area of Search		Running water
	Target note		Iniaet species poor hedgerow
	Semi-natural broadleaved woodland		Defunct species poor hedgerow
	Broadleaved plantation		Intact species rich hedgerow with trees
	Mixed plantation		Intact species poor hedgerow with trees
	Dense scrub		Fence
	Neutral grassland		Dry ditch
	Semi-improved neutral grassland		Earth bank
	Improved grassland		Scattered scrub
	Marshy grassland		Broadleaved tree
	Tall ruderals		
	Swamp		
	Standing water		
	Arable		
	Amenity grassland		
	Building		
	Bare ground		
	Not surveyed		

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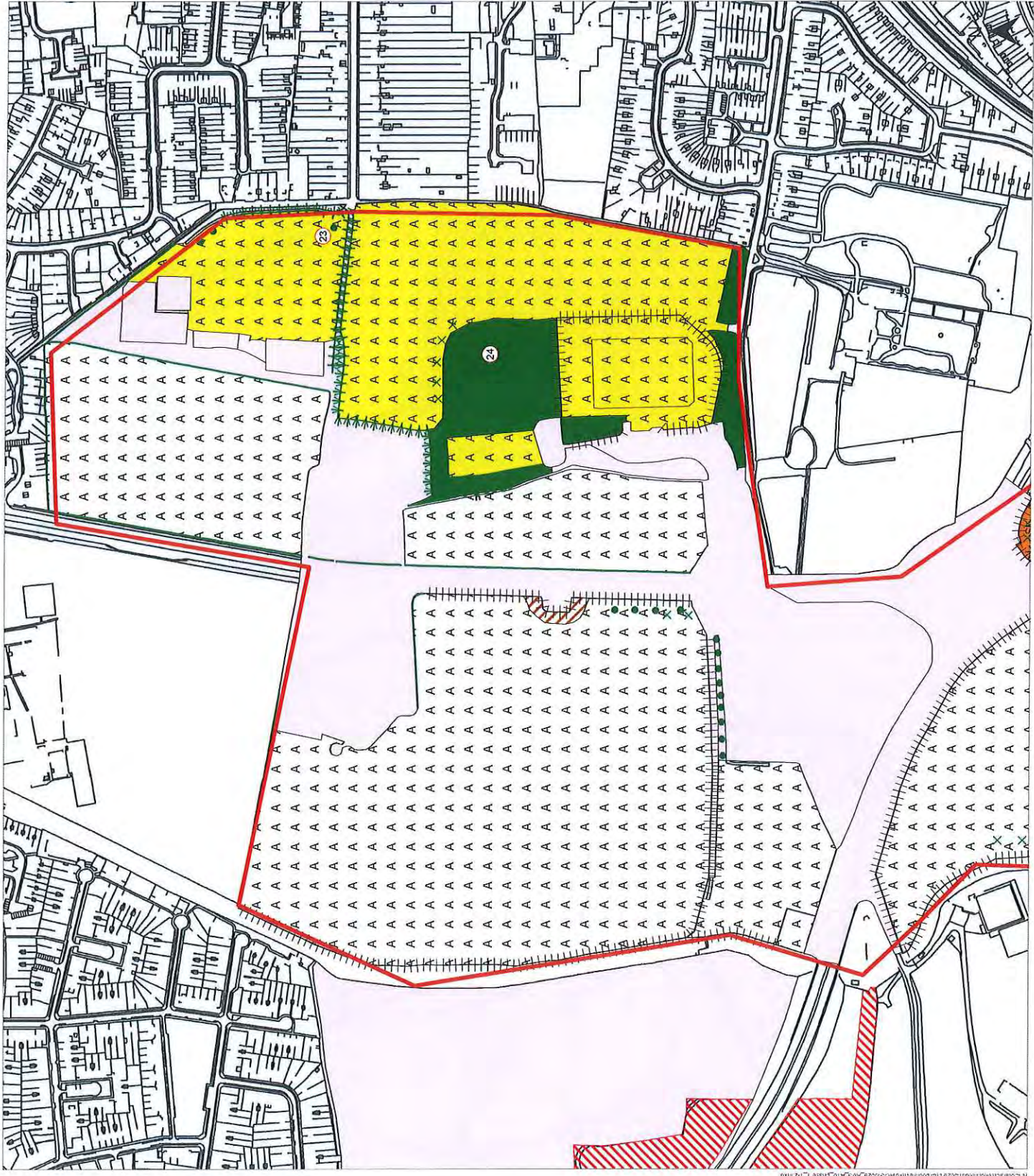
PROJECT TITLE
BROXBORNE HABITAT SURVEY

DRAWING TITLE
Figure 16: Phase 1 habitat map of Bury Green
Area of Search 2/2

DATE: 16.08.2012
DRAWN: JM

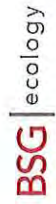
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LEGEND

- | | | | |
|--|-----------------------------------|--|---|
| | Area of Search | | Local Wildlife Site |
| | Target note | | Running water |
| | Semi-natural broadleaved woodland | | Intact species poor hedgerow |
| | Broadleaved plantation | | Defunct species poor hedgerow |
| | Mixed plantation | | Intact species rich hedgerow with trees |
| | Dense scrub | | Intact species poor hedgerow with trees |
| | Neutral grassland | | Fence |
| | Semi-improved neutral grassland | | Dry ditch |
| | Improved grassland | | Earth bank |
| | Marshy grassland | | Scattered scrub |
| | Tall ruderals | | Broadleaved tree |
| | Swamp | | |
| | Standing water | | |
| | Arable | | |
| | Amenity grassland | | |
| | Building | | |
| | Bare ground | | |
| | Not surveyed | | |



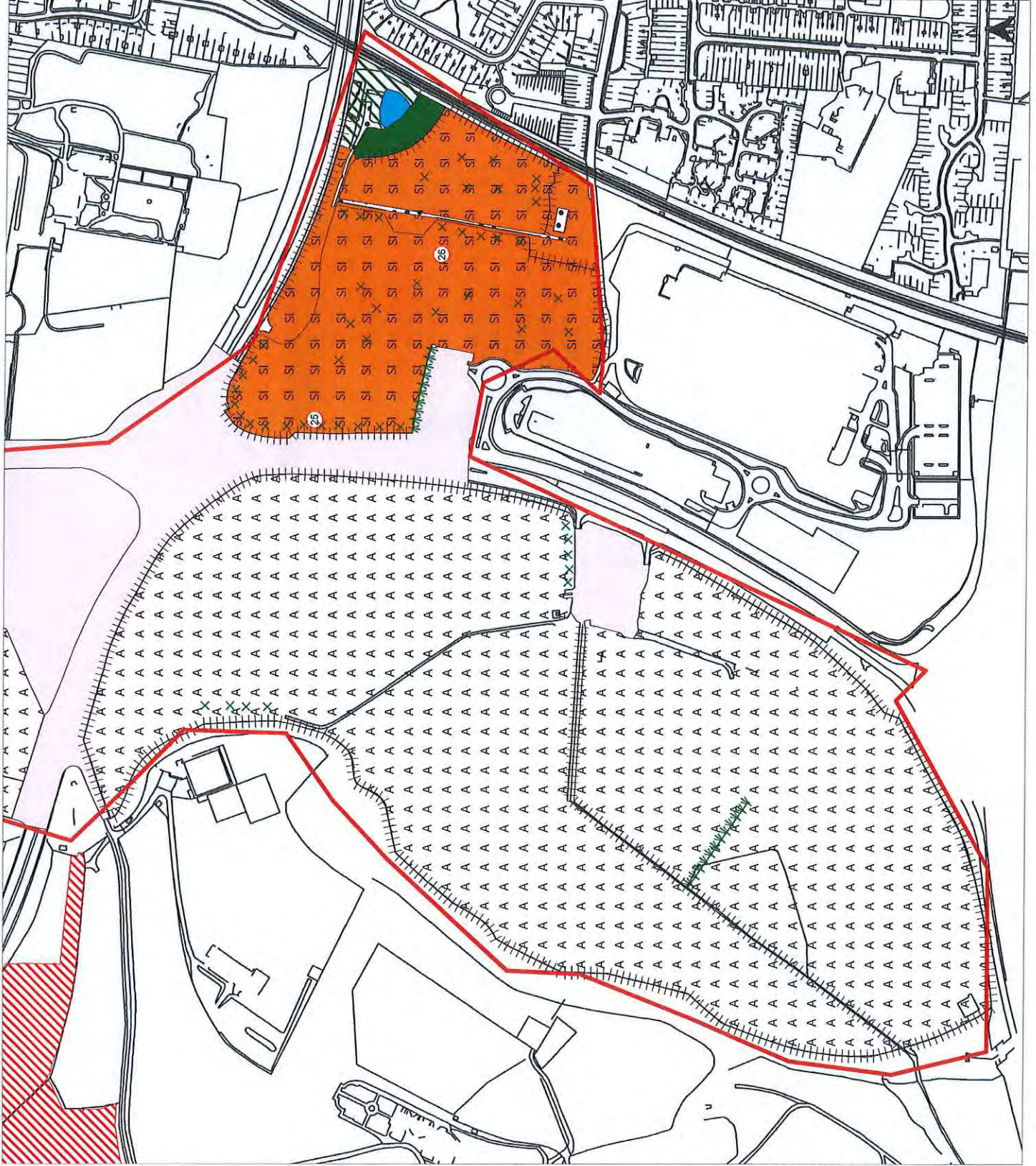
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Figure 17: Phase 1 habitat map of the A10 corridor
Area of Search 2/2

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LEGEND

	Area of Search		Local Wildlife Site
	Target note		Running water
	Semi-natural broadleaved woodland		Inland species poor hedgerow
	Broadleaved plantation		Distinct species poor hedgerow
	Mixed plantation		Inland species rich hedgerow with trees
	Dense scrub		Inland species poor hedgerow with trees
	Neutral grassland		Fence
	Semi-improved neutral grassland		Dry ditch
	Improved grassland		Earth bank
	Marshy grassland		Scattered scrub
	Tall ruderalis		Broadleaved tree
	Swamp		
	Standing water		
	Arable		
	Amenity grassland		
	Building		
	Bare ground		
	Not surveyed		

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PROJECT TITLE
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DRAWING TITLE
**Figure 18: Phase 1 habitat map of the A10 corridor
Area of Search 2/2**

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DRAWN: JW APPROVED: AG STATUS: FINAL

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