Chapter 14 Natural heritage

Introduction

14.1 The following chapter provides an ecological impact assessment of the proposed development on land south-west of Bicester. The legal and policy framework for the assessment is summarised. A baseline description of the ecological interest is provided from interpretation of collated data and new surveys undertaken in 2005 and 2006. An evaluation is made of the ecological interest of the habitats and species on the site. Significant impacts on these features are identified, mitigation and enhancement described and the residual impacts quantified. Assessment procedures broadly follow the Guidelines for Ecological Impact Assessment of the Institute of Ecology and Environmental Management (IEEM 2005).

14.2 Bioscan and Faber Maunsell carried out two ecological appraisals at the site in 2004. A review of this information during the scoping stage of the EIA identified natural heritage as a secondary issue for consideration in the ES. This existing information has been supplemented by further surveys undertaken in 2005 and 2006 coordinated by Terence O'Rourke.

Legislation and policy

International designations and policy

14.3 In 1992 the European Union adopted Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, known as the Habitats Directive. The UK Government approved statutory regulations to implement the requirements of the Directive in October 1994. These are the Conservation (Natural Habitats, &c.) Regulations 1994 (the 'Habitats Regulations').

14.4 One purpose of the Habitats Regulations is (Regulation 39) to give special protection to a number of species, listed in Schedule 2 of the regulations, for which it is an offence to '*disturb*' the animals or '*damage or destroy [*a*] breeding site or resting place*'. This exception is for the conservation of a Schedule 2 species, but only (Regulation 44) '*if there is no satisfactory alternative*' to the development proposal and the action '*will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range*'.

14.5 The Habitats Directive and the European Union's Birds Directive (79/409/EEC) require member states to create a network of key sites for the conservation of certain habitats, plant species, bird species and other fauna. These sites, jointly known as European sites, comprise Special Protection Areas (SPA) for birds and Special Areas of Conservation (SAC) for plants, vegetation types and fauna other than birds.

14.6 The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty that provides the framework for national action and

international cooperation for the conservation and wise use of wetlands and their resources. There is often some overlap between European sites and sites included in the Ramsar List of Wetlands of International Importance.

National legislation and policy

14.7 The Wildlife and Countryside Act 1981 (as amended), or WCA, sets out the legal protection afforded to wild animals and plants in Great Britain, and requires the government to select sites of special scientific interest (SSSI) and protect them against potentially damaging operations. Most bird species are protected at all times from intentional killing and against intentional damage or destruction to the nest or eggs. All native reptile species are protected against intentional killing. Selected rare, vulnerable or declining animals listed on schedule 1 (birds) and schedule 5 (other animals) are additionally protected against disturbance at the nest (birds) or places used for shelter and protection (other animals).

14.8 The Countryside and Rights of Way Act 2000, known as the CROW Act, deals with some weaknesses in the WCA. Powers are provided to enforce appropriate management on SSSIs and provisions on 'reckless' disturbance to schedule 1 and 5 species strengthens the law against disturbance. The UK's position as a signatory to the 1992 Convention on Biological Diversity is given its first legal support through the requirement to maintain lists of priority habitats and species for biodiversity action plans (BAP), to have regard to biodiversity and for the Secretary of State to take measures to further the conservation of listed habitats and species and promote this to other authorities.

14.9 The Protection of Badgers Act 1992 is primarily animal welfare rather than nature conservation legislation, but has implications for developers. Both badgers and their occupied setts are protected, though there is a licensing procedure than enables animals to be excluded from the sett and the empty sett destroyed at certain times of the year.

14.10 Planning Policy Statement (PPS) 9: Biodiversity and Geological Conservation sets out government policy. PPS 9 is accompanied by a circular: Biodiversity and geological conservation: statutory obligations and their impact within the planning system (ODPM Circular 06/2005; DEFRA Circular 01/2005). Key principles include statements that: '(ii)…planning decisions should aim to maintain and enhance, restore or add to biodiversity and geological conservation interests'*; and '*(vi) The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests'. *Section 14, Biodiversity within developments, notes that '*Development proposals provide many opportunities for building-in beneficial biodiversity or geological feature as part of good design. When considering proposals, local planning authorities should maximise such opportunities in and around developments, using planning obligations where appropriate'.

14.11 The circular notes that: '*The potential effects of a development on habitats or species listed as priorities in the UK BAP and by Local Biodiversity Partnerships…are capable of being a material consideration in…the making of planning decisions'*

14.12 The Cherwell Local Plan 2011 Revised Deposit Draft (July 2004) seeks to '*conserve and enhance the natural environment of the District including its ecological resource'*. In addition to policy commitments to protect designated wildlife sites and legally protected species, policies EN22 and EN27 are relevant to the present development.

14.13 Policy EN22 states that: '*Development proposals will be expected to incorporate features of nature conservation value within the site. Features of value should be retained and enhanced wherever possible. The use of planning conditions and planning obligations will be sought to secure their protection and management, or the provision of compensatory measures where appropriate.'*

14.14 Policy EN 27 states that: 'Development proposals should incorporate the creation of new habitats, particularly those concerning priority habitats or species, wherever possible. The Council will promote the interest of nature conservation within the context of new development and will establish or assist with the establishment of ecological and nature conservation areas, where such areas would further the opportunity for environmental education and passive recreation.'

14.15 The local plan considers hedgerows, woodlands and trees specifically in terms of their landscape character, but does *'welcome opportunities for countryside management projects where: (i) all important trees, woodland and hedgerows are retained; the ecological value of the site will be enhanced;… and (iii) new tree and hedgerow planting using species native to the area and of local provenance is encouraged and subsequently managed'* (Policy EN37).

Methodology

14.16 Baseline conditions were established through a desktop study and collation of existing data, followed by field surveys where existing data were considered out of date or inadequate for an accurate evaluation. IEEM guidance is used in the evaluation of features and assessment of the residual significance of impacts.

Desktop study

14.17 Countryside Properties provided existing information on the site, in the form of two ecological appraisals of parts of the site undertaken by Bioscan and Faber Maunsell. These were based on field surveys carried out in July and August 2004 respectively. The Thames Valley Environmental Records Centre (TVERC) provided information on statutory and non-statutory sites of nature conservation interest and protected and notable species within 1km of the site. Additional sources of data and references used to establish and evaluate baseline conditions are tabulated in figure 14.1.

Field surveys

14.18 Bioscan undertook an extended phase I and protected species survey in July 2004. All habitat parcels were mapped and classified according to the phase I habitat classification (JNCC 1990) and target notes taken of representative habitats. Hedgerows were classified by Bioscan as species-rich if they held five or more woody species along the total length. Hedgerow features were surveyed in sufficient detail for important hedges, as defined under the 1997 Hedgerow Regulations, to be identified. Uninhabited buildings were searched from the ground in daylight hours for evidence of bat roosts. Evidence of badger *Meles meles* was searched for throughout the site and of water vole *Arvicola terrestris* along all watercourses.

Biological records centres
Thames Valley Environmental Records Centre
Websites
Cherwell Biodiversity Action Plan – Species and Habitat Action Plans. www.cherwell-dc.gov.uk/leisure/biodiversity.cfm (Accessed 11/05)
English Nature – SSSI and European Site information. www.natureonthemap.org.uk (Accessed 2/8/05)
Oxfordshire Ornithological Society– Information on breeding birds. www.oos.org.uk/oxonlist.php (Accessed 29/7/05)
Oxfordshire Nature Conservation Forum – Information on Local Biodiversity Action Plan. www.oncf.org.uk (Accessed 2/8/05)
Oxfordshire amphibian and reptile group – Status of reptiles and amphibians in Oxfordshire. www.oxfordshire-arg.org.uk (Accessed 2/8/05)
Oxfordshire Wildlife and Landscape Study – Information on biodiversity and landscape types. www.owls.oxfordshire.gov.uk (Accessed 2/8/05)
Species of conservation concern- the national red, amber and green lists for birds. www.bto.org/birdtracks/bird-recording/red_list.htm (Accessed 11/05)
UK Biodiversity Action Plan – Species Action Plan information. www.ukbap.org.uk (Accessed 3/8/05)
Literature
BBOWT. 2000. *Strategic Action plan for bats in Berkshire, Buckinghamshire and Oxfordshire*. Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust.
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JNCC. 1989. *Guidelines for the selection of biological SSSIs*. Joint Nature Conservation Committee.
JNCC. 1990. *Handbook for Phase 1 habitat survey: a technique for environmental audit*. Joint Nature Conservation Committee.
Killick, J., Perry, R. & Woodell, S. 1998. *Flora of Oxfordshire*. Pisces Publications.
Mitchell-Jones A.J. 2004 *Bat mitigation guidelines*. Version: January 2004. English Nature
Rodwell J.S. 1991. British Plant Communities. Volume 1. Woodland and scrub. Cambridge University Press.
Rodwell J.S. 1992. *British Plant Communities. Volume 3. Grasslands and montane communities*. Cambridge University Press.
Rodwell, J.S. 1995. *British Plant Communities. Volume 4. Aquatic communities, swamps and tall-herb fen*. Cambridge University Press.
Rose F. 1999. Indicators of ancient woodland. The use of vascular plants in evaluating ancient woods for nature conservation. *British Wildlife*. Volume 10. No 4 pp241-251
Stace C. 1997. *New flora of the British Isles*. Second edition. Cambridge University Press
Wingfield Gibbons D, Reid J.B & Chapman R.A. 1993. *The New Atlas of Breeding Birds in Britain and Ireland 1988-1991*. 1993. T & A D Poyser

Figure 14.1 Data sources and references

14.19 Faber Maunsell undertook a walkover protected species survey over one day in August 2004. A daytime search was made for evidence of badger, water vole and otter *Lutra lutra,* and an evening transect survey was carried out for bat activity along the boundaries of one field in the west of the site. Neither the Bioscan nor the Faber Maunsell survey included the land east of the A41.

14.20 Terence O'Rourke up dated and supplemented the surveys over four days between April and July 2005. The phase I survey was repeated (figure 14.5) and habitats of interest were assigned to plant communities of the national vegetation classification (NVC; Rodwell 1991, 1992, 1995), which allows more precise evaluation of their nature conservation interest (JNCC 1989). The identity of NVC communities was made in the field and not confirmed by quadrat data. The wet fields in the north-eastern corner of the site were resurveyed by Terence O'Rourke at the request of the County Ecologist during August 2006.

14.21 Badger and water vole surveys were carried out, with a concurrent survey for evidence of otter during the latter. Transect surveys across the site were made to record bat activity in July 2005 and hedgerow trees assessed for their potential to hold bat roosts. Whiteland Cottages were surveyed for signs of bat activity by Simon Colenutt of ECOSA in November 2005. Following recommendations made after the first survey, emergence surveys were undertaken at the cottages in September 2006.

14.22 A survey for wall whorl snail *Vetigo pasilla* was carried out in August 2005. A crayfish survey was carried out along Pingle Brook at the request of the Environment Agency in October 2005. The Pingle Brook was resurveyed for signs of crayfish activity in September 2006. Birds were incidentally recorded during other surveys and assigned to categories of breeding evidence (Wingfield Gibbons *et al*. 1992). Butterflies, dragonflies and damselflies were also incidentally recorded.

14.23 Bicester has many great crested newt *Triturus cristatus* breeding ponds, but there are no ponds on the site. The provisions of the Habitats Directive have been interpreted as giving protection to habitats used in the terrestrial phase of great crested newts' life cycle, which can include land up to 500m from breeding ponds. There was therefore the potential for great crested newt to be present on the site.

14.24 In July 2005, Simon Colenutt of ECOSA undertook a survey to assess the potential of the site to support great crested newts during the terrestrial phase of their lifecycle and identify those habitats most suitable for the species (figure 14.6). This assessment is reported on in more detail in the Natural Heritage Technical Appendix. From July to early November a total of 645m of Animex great crested newt drift fencing with pit-fall traps was placed across suitable habitats and the traps checked. The results of this survey have been summarised in this chapter.

Assessment of significance

14.25 The draft IEEM guidance is followed in assigning value to a feature and in the assessment of the significance of effects. The value of a feature is assigned by IEEM

to seven levels, from international to '*within the immediate zone of the proposal only*'. For the purpose of this assessment, international, national, county, district and local levels are considered. The levels correspond to administrative units except for local level, which is applied more subjectively. In this assessment, local applies to an area mapped as a discrete block of a landscape character type in the Oxfordshire Wildlife and Landscape Strategy (OWLS). The blocks relevant to the proposal cover several parishes, though they do not follow parish boundaries. The justification for selecting the level of significance is given for each feature in the assessment, but some comments on what is a comparatively recent and unfamiliar method of assessment are given here.

14.26 A nature conservation designation does not necessarily imply a level of significance. For example, if a county wildlife site is cited for the population of a particular species of bird, that population is of county importance, but other features of the site may be less important. Similarly, legal protection at a national level, or the presence of a priority species or habitat in the UK Biodiversity Action Plan, does not imply national importance. The mitigation required to meet legal obligations is provided as separate advice for protected species.

14.27 For each feature of value, the effects of proposed activities during construction and after construction are assessed and the type of impact characterised according to its extent, magnitude, duration, reversibility, timing, frequency and cumulative effects. The effect of the impact on the function of the ecosystem ('integrity'), the quality and extent of the habitat or the population size of the species is predicted and an estimate made of the degree of uncertainty in the prediction. Mitigation and enhancement measures, if applicable, are described and the residual impact after these measures have been taken into account is quantified as accurately as possible.

14.28 Significance is defined as significant or not, at the level of value of the feature, then quantified, rather than given a value such as high or medium. For example, a proposal that would have affected a bird population for which a county wildlife site was cited, but which was fully mitigated, would be described as an impact on a feature of county value that was not significant.

14.29 In order to provide an assessment of impacts that is in harmony with the other chapters of this environmental statement, a level of significance is also given to each impact, following protocols developed by Terence O'Rourke. Where there is uncertainty over the level of significance, for example when there is considerable uncertainty about the full extent of the local resource (habitat area or population size), this is stated and as a precaution the higher level of significance of the impact is applied.

14.30 Significance has been derived from two measures, the sensitivity of receptors and the magnitude of change. In determining whether an effect on a receptor is significant, reference is made to a wide range of criteria relating to species and communities. The two sets of criteria (magnitude and sensitivity) fed into the significance matrix

generate the generic definitions of the significance of potential effects. This process is set out in figures 14.2-14.4.

Baseline

Context

14.31 The site lies within English Nature's Thames and Avon Valleys natural area. The dominant geology of this lowland natural area is Jurassic clays, with occasional Portland and Purbeck limestone outcrops. Woodland cover in most of the area is low, with hazel coppice with oak (NVC W10), now often abandoned to high forest, the main woodland structure. On more calcareous soils, ash woodland with abundant dog's mercury (NVC W8) occurs.

14.32 The main land uses of the natural area are beef and dairy pasture, arable and gravel extraction. The farmland is characterised by dense hedges and, where there is livestock grazing, a high density of ponds supporting good populations of great crested newt, which are notably common in the natural area. Much of the grassland is intensively managed and has lost its botanical interest, but in a national context the key feature of this Natural Area is the relatively large number of fields of unimproved neutral dry (NVC MG5) and seasonally wet (NVC MG4) pasture and hay meadows. Typical examples within 5km of the site are Wendlebury Meadows and Mansmoor Closes SSSI and Arncott Bridge Meadows SSSI.

14.33 River and ditch systems are an important resource in the Natural Area, which includes much of the Upper Thames catchment. There are diverse fish and freshwater invertebrate faunas in places and a small and declining population of the native Atlantic stream crayfish.

14.34 The OWLS divides the site and surrounding countryside into two broad landscape types, not readily separable on the site itself; Wooded Estatelands and Clay Vales. These landscape types are classified as very high and high respectively for biodiversity in a county context. The classification is based on the range of habitats within the whole landscape type. Of relevance to the site and its vicinity, the OWLS identifies species-rich hedgerows, ancient semi-natural woodland, watercourses, unimproved and neutral grassland as priority habitats in one or both landscape types.

Desktop survey

European and Ramsar sites

14.35 There is one European site within 10 km of the site. The Oxford Meadows SAC falls just within 10km. This is one of five SACs in the UK classified for the Annex I habitat of the Habitats Directive lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*). This equates to the NVC's MG4 grassland, a lowland grassland community characteristic of areas where traditional hay meadow treatment has been applied to seasonally flooded land with alluvial soils. The Oxford Meadows

is one of the largest examples in the best conservation condition in UK. The SAC is also the only one in the UK classified for the Annex II species creeping marshwort *Apium repens*. The SAC has the largest population in the UK of this species, a floodplain grassland species which is known from only two other UK locations.

Sites of special scientific interest

14.36 There are no SSSIs within 2km of the study area. The nearest SSSI, Ardley Cutting and Quarry, is to the north-east of Bicester. This is a limestone railway cutting and quarry, notified for its geological interest. The citation also notes the limestone flora, rare in Oxfordshire, associated invertebrate fauna and a large population of great crested newts.

14.37 Three SSSIs lie within 4km of the site; Wendlebury Meads and Mansmoor Closes, Arncott Bridge Meadows and Stratton Audley Quarries. Wendlebury Meads and Mansmoor Closes and Arncott Bridge Meadows are both unimproved neutral or calcareous grasslands with a diverse flora. The nationally rare narrow-leaved water-dropwort (*Oenanthe silaifolia*)

14.38 occurs at Arncott Bridges Meadows. Over 160 vascular plants have been recorded at Wendlebury Meads and Mansmoor Closes. Stratton Audley Quarries is a geological SSSI notified due to exposed formations of Jurassic white limestone, Forest Marble and Lower Cornbrash.

County wildlife sites

14.39 One county wildlife site (CWS) occurs within 1km of the site. Gravenhill Wood is ancient semi-natural woodland on a hill rising to 115m to the south-east of the site. The wood has 15 ancient woodland indicator species and both historic map and earthworks evidence support its ancient origin, that is prior to 1600, a modified relict of the UK's woodland cover after the last ice age. The species list and description in the citation suggest the wood is a mix of the NVC W8 and W10 plant communities, typical of lowland woodland on a mix of neutral and more calcareous clays.

Protected species

14.40 The TVERC held a record of grass snake *Natrix natrix* from the boundary of the site at Oxford Road (A41) and old records of common pipistrelle bats *Pipistrellus pipistrellus* (prior to this species' split into two species) from the 1km square that includes the north-east corner of the site. Badgers or evidence of the species' presence are recorded from the 1km square that includes the south-west of the site. Water vole was recorded in 2003 at Bucknell in Bicester, some 800-900m north of the site. There were no records of schedule I bird species.

14.41 The Environment Agency noted recent records of the alien signal crayfish *Pacifastacus leniusculus*, but none of the native Atlantic stream crayfish *Austropoamobius pallipes*.

Other notable species

14.42 There is a record from TVERC of the butterfly white letter hairstreak *Satyrium w-album* in the 1km square that includes Whitelands Farm in 1997, when one or two individuals were recorded. The location is noted to be Whitelands Farm, so assumed to be a hedgerow within the study area. Another butterfly, small blue *Cupido minimus*, was recorded several times in 1990, with numbers between 10 and 30, from the 1 km grid square that includes the north-west of the site. It is not known whether these records refer to the site.

14.43 The nationally notable whorl snail *Vetigo pusilla* has been recorded from the boundary wall of Bignell Park, which is immediately to the north-west of the site.

Field survey

14.44 The site description combines the surveys undertaken and reported separately by Bioscan and Faber Maunsell in 2004 and a number of specialist species surveys undertaken or contracted by Terence O'Rourke in 2005. The study area for ecological surveys (figure 14.5) is land bounded by the A41 to the east, the A4095 and the town of Bicester to the north, the A4095 to the west and Gagle Brook to the south, plus one field to the east of the A41. This is a larger area than the site, which is defined by the red line of the proposal. The study area was defined by the likely zone of influence of the development on features of ecological value.

Vegetation and habitats

14.45 The results of the 2005 phase I habitat survey are shown on figure 14.5. The site is largely arable land with improved pasture and rough grassland comprising most of the remaining area.

Arable and improved grassland

14.46 Whitelands Farm is largely arable, parts of which are under set-aside. Most fields had crops of barley *Hordeum disticon sens. Lat.* and wheat *Triticum aestivum*, with a smaller extent of rape *Brassica napus*. In the centre of the study area are four smaller fields used as sheep pasture, with improved grassland dominated by perennial rye-grass *Lolium perenne*, red fescue *Festuca rubra*, Yorkshire fog *Holcus lanatus* and rough meadow-grass *Poa trivialis*, with a very low diversity of associated herbs. This vegetation can be assigned to species-poor stands of the NVC's MG6, the dominant lowland pasture derived from agricultural improvement of more botanically rich grasslands or the maturation of sown rye grass leys.

Semi-improved grassland

14.47 The field to the east of the A41 is unmanaged grassland with considerable invasion of scrub. Coarse grasses, particularly false-oat grass *Arrhenatherum elatius,* cock's foot *Dactylis glomerata* and umbellifers including cow parsley *Anthriscus sylvestris*,

hogweed *Heracleum sphondylium* and wild parsnip *Pastanica sativa,* are prominent in tall vegetation with locally abundant wild angelica *Angelica sylvestris* and sneezewort *Achillea millefolium*. In places there is a diverse understory that includes lady's bedstraw *Galium verum*, agrimony *Agrimonia eupatoria*, cowslip *Primula veris* and pepper saxifrage *Silaum silaus*.

14.48 This is a more species-rich example of the NVC's MG1 grassland, probably a mix of MG1d and MG1e. This is the community of unmanaged grassland on more nutrient rich and, in the case of MG1d, more calcareous soils. Pepper saxifrage is more typical of the more species-rich MG5 grassland and it may be that this field has derived from that community through neglect.

14.49 The two north-eastern fields on the site, bounded by the A41 and A4095, have a mix of improved grassland, semi-improved calcareous grassland and rush pasture. Two to three hectares of rush pasture extend north on level ground from the northern bank of Pingle Brook. The NVC community is MG10b, where hard rush *Jucus inflexus* is dominant in tall tussocks. Associated species are typically few, with several dock species *Rumex* sp., silverweed *Potentilla anserina*, sorrel *Ruex acetosa*, creeping buttercup *Ranunculus repens* and figwort *Scrophularia nodosa* prominent. This is characteristic vegetation of permanently moist soils, the hard rush sub-community occurring on more calcareous soils. The tips of some of the hard rush have been grazed, but this vegetation is relatively unpalatable and is usually left by livestock.

14.50 The slopes above the rush pasture have species-poor MG6 grassland, similar in species composition to the fields at the centre of the Whitelands Farm, but with more coarse grasses such as Yorkshire fog *Holcus lanatus*, perhaps due to lower grazing pressure.

14.51 The western of the two fields, which is within the same grazing unit as the eastern field, has an approximate rectangle of low, fragmented, raised earth banks, enclosing between one and two hectares of the field, within which are frequent earth mounds. Much of the field has species-poor MG6 grassland, but the slopes of the banks and mounds have patchy calcareous grassland, on what is thought to be an old limestone quarry, possibly of Roman origin.

14.52 Sheep's fescue *Festuca ovina* is locally the dominant grass. Mouse-ear hawkweed *Pilosella officinarum* forms frequent large patches and other frequent species include salad burnet *Sanguisorba minor*, rough hawkbit *Leontodon hispidus*, hoary plantain *Plantago media* and burnet-saxifrage *Pimpinella saxifraga*. This calcareous grassland has few species and lacks the full set of constant species for any NVC community. It best fits CG7, a community characteristic of thin, stony, very free-draining, nutrient-poor, often disturbed calcareous soils.

14.53 These fields were resurveyed in August 2006 at the request of the County Ecologist. This work confirmed the findings of the initial survey and recorded no species of particular conservation significance. A full list of the NVC communities and plant species recorded during 2006 can be found in the technical appendix 6.

Woodland and scrub

14.54 There are three small, field corner copses within the study area. The largest of these, Foxey Leys Copse, has an area of approximately 1ha. Foxey Leys Copse has a canopy dominated by ash *Fraxinus excelsior* and is largely semi-natural woodland. The ground flora within the woodland is species-poor, dominated by species such as common nettle *Urtica dioica* and cleavers *Galium aparine* that thrive on disturbed soils in nutrient rich conditions. A small number of species that are poor colonists of new woodland, including wood sedge *Carex sylvatica* and field maple *Acer campestre* are recorded here, but not in the other two woods. These point to its greater age, but no features support this being ancient woodland.

14.55 The other two copses are planted on ridge and furrow and the mature trees are largely alien species, of which sycamore *Acer pseudoplatanus* and horse chestnut *Aesculus hippocastanum* are prominent. Both copses are shown on the 1885 Ordnance Survey map and are likely nineteenth century plantations.

14.56 Foxey Leys Copse is a species-poor example of the NVC's W8. The other two copses have an alien flora that does not fit the NVC.

Hedgerows and hedgerow trees

14.57 The hedgerows within the farm are dominated by hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa* and English elm *Ulmus glabra*. *A* number, with five or more woody species, are classified as species-rich. These are concentrated in the centre of the study area and along the northern, western and southern boundaries. Less frequent species in the hedges include buckthorn, *Rhamnus cathartica*, spindle *Euonymus europaeu*s, wayfaring tree *Viburnum lantana* and field maple. None of these hedges has associated banks that are species-rich in herbs. Most of the site boundary hedges, but none within the interior of the site, were classified as important, in the sense of the 1997 Hedgerow Regulations, by Bioscan in 2004. However, no justification or supporting data for the selection are provided, so the classification is considered provisional.

14.58 In the west and east of the study area, where there are larger arable fields, there is evidence of hedgerow removal and some of the remaining hedges have frequent gaps.

14.59 There are frequent mature hedgerow trees, of which pedunculate oak *Quercus robur* and ash are the most common species. These are most abundant along the boundary hedges and most often in species-rich hedges.

Watercourse and aquatic and swamp vegetation

14.60 The Pingle Brook flows through two fields of pasture in the north-east of the site. In this length it has an apparently natural, meandering course, with natural, shallow earth banks, though bounded by low earth embankments set back from the channel. The channel bottom has a substrate of fine mineral sediment with limestone cobbles and

pebbles and the water is very clear. The watercourse is then detoured and an artificial channel forms part of the eastern boundary of the site as it flows along the edge of the sewage works.

14.61 Where Pingle Brook flows through pasture, the banks are grazed and heavily trampled by cattle in many places. The bank-side vegetation is mainly a mix of hard rush *Juncus inflexus* and tufted hair-grass *Deschampsia caespitosa*. There is abundant emergent vegetation within the channel, predominantly lesser water-parsnip *Berula erecta*, fool's water-cress *Apium nodiflorum*, water forget-me-not *Myosotis scorpioides,* water-cress *Rorippa nasturtium-aquaticum* and brooklime *Veronica beccabunga*.

14.62 Where Pingle Brook flows along the eastern boundary of the site, much of its length is heavily shaded by young, pollarded crack willows *Salix fragilis*. The bank side vegetation is dominated by common nettle, cleavers, great willowherb *Epilobium hirsutum* and hogweed. There is some emergent vegetation within the channel, predominantly water mint *Mentha aquatica* and fool's water-cress. The banks along this stretch are much steeper than where it flows through Whitelands Farm.

14.63 The emergent vegetation in both lengths of the brook fall into the NVC's S23 *Other water-margin vegetation*. This is swamp vegetation of mesotrophic to eutrophic shallow waters that is tolerant of cutting, dredging, moderate trampling and periodic drying out of the watercourse.

Fauna

Bats

14.64 A survey of the unoccupied farm buildings at Whitelands Farm in July 2004 identified one building with low numbers of droppings and five barns with moth wings, indicating use as a night roost and feeding perches by brown long-eared bats *Plecotus auritus*. An external examination only of Whitelands Farm house showed features that might allow bats to enter the roof void, therefore the farm house could be the location of the brown long-eared bat day roost.

14.65 Whitelands Cottages had little potential for access by bats. Internal surveys of the roof spaces of the two cottages in November 2005 found no evidence of bat roosts. There are some cracks in the brickwork that could feasibly hold roosting pipistrelle species, although the absence of external droppings puts the balance of evidence against this. An emergence survey undertaken in September 2006 recorded no bats emerging from Whitelands Cottages and also recorded very few bats foraging in the vicinity of the cottages. Based on the findings of the field surveys it is considered that these buildings do not regularly support roosting bats.

14.66 Inspection of the hedgerow trees during habitat surveys in 2004 and 2005 identified that many of the mature trees had the potential to hold bat roosts. These trees are shown on figure 14.7. Of the 50 potentially suitable trees, the main clusters occur in

the boundary hedges in the north-east corner and to the south-east of Whitelands Farm. The three blocks of woodland were not assessed for their suitability for bats.

14.67 A single evening survey in August 2004 recorded foraging common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and a bat of the genus *Myotis*. A single noctule *Nyctalis noctua* commuted over the site. A transect survey of the study area in 2005 again recorded foraging common and soprano pipistrelle, a *Myotis* species considered to probably be Natterer's bat *Myotis nattereri* and brown long-eared bats. A single noctule was again recorded commuting over the site. The foraging bats were recorded around mature trees, along hedgerows or the edge of woods and over rough grassland.

14.68 In September 2006 the surveyors undertook a brief survey of the area around Whitelands Cottages and Whitelands Farm. Only common pipistrelle and a single noctule were recorded during this survey. All the field data collected would indicate that bat activity across the site is limited. Given the lack of known roosts within the site and the extent of arable land within the survey area it is not that surprising that only limited bat activity has been recorded.

Great crested newt

14.69 A total of 78 terrestrial trapping nights were completed at this site. Traps were open on suitable nights between 1 October and 9 November 2005 and 15 March and 29th May 2006. No great crested newts were recorded during this survey work. Other amphibians trapped or incidentally recorded during the survey were common frog *Rana temporia*, common toad *Bufo bufo* and smooth newt *Triturus vulgaris*. All details of the survey work undertaken can be found in the technical appendix 6.

Water vole

14.70 Two water vole burrows were found in the north-east of the site, on the bank of Pingle Brook, in 2004. It was noted by Bioscan in 2004 that the banks were heavily poached by cattle and that cattle activity could have obscured further evidence and caused the collapse of other burrows. The condition of the banks was similar in 2005 and no evidence of water vole was found.

Otter

14.71 No evidence of otter was found in the study area.

Atlantic stream crayfish

14.72 No evidence of this species was found in the study area. Current surveys showed no evidence of the alien signal crayfish in Pingle Brook, although it had been recorded previously by the Environment Agency.

Reptiles

14.73 No bespoke reptile surveys were carried out. There is suitable habitat for slow worm *Anguis fragilis*, common lizard *Lacerta vivipara* and grass snake to be resident on the site. Grass snake is likely to occur along Pingle Brook and the rush pasture in the north-east of the site, slow worm in the same north-east field and all three species could occur on the field east of the A41.

Badger

14.74 Badger activity was recorded across the site in 2004 by Bioscan. A badger survey was undertaken in 2005 and an outlying sett was located in a hedge in the study area, but outside the site, in both years. An active main sett with several fresh latrines nearby was located outside the study area to the south of Whitelands Farm in 2004 and 2005. Latrines are used for territory marking. Assuming that territories do not cross the main A roads and M40, it is possible, though not conclusive, that the territory of the social group that forages on the site is bounded by the A41, A4095 and Gagle Brook. A map showing the findings of the 2005 survey is included as a confidential appendix.

Birds

14.75 Forty eight species of bird were recorded from the study area during the spring and summer 2005 survey work, of which 38 were classified as breeding. Species are listed in the Natural Heritage Technical Appendix. The species recorded are typical of mixed farmland in lowland England and included skylark *Alauda arvensis*, yellowhammer *Emberiza citrinella*, reed bunting *Emberiza schoeniclus*, bullfinch *Pyrrhula pyrrhula*, song thrush *Turdus philomelos*, linnet *carduelis cannabina* and little owl *Athene noctua*. One schedule 1 (see section 14.7) species was recorded; a hobby *Falco subbuteo* flying over the site in 2005. A single sighting does not constitute evidence of breeding. However, this species is elusive when not displaying or feeding young, is widespread if uncommon in Oxfordshire and nests in undisturbed farmland woods and hedgerow trees. Breeding cannot therefore be ruled out, but is considered unlikely due to the level of human activity on the borders of the site and the size and condition of the woods.

14.76 Casual observations of migrant and wintering birds were made during the terrestrial great crested newt surveys between July and November 2005. Of note were flocks totalling approximately 60 yellowhammer and 30 linnet on the study area. In early autumn these species were widespread, feeding on stubble. Later, when the arable was ploughed and re-sown, both species were concentrated around Whitelands Farm. Reed bunting was resident around Pingle Brook, where this species bred. A single record of snipe *Gallinago gallinago* in November 2005 along Pingle Brook was the only record of a wader on the site.

Invertebrates

14.77 White-letter hairstreak and small blue butterflies were not incidentally recorded during the other surveys. White letter hairstreak's larval food plant is elm *Ulmus* sp. which is abundant in the study area's hedgerows. This species is increasingly establishing colonies on young suckering elms in the Thames region (Clarke and Bourn 2000), which are less prone to Dutch Elm Disease and it is considered likely that the species remains in the study area. The larval foodplant of small blue, kidney vetch *Anthyllis vulneraria*, was not recorded in the study area. The numbers recorded in 1990 are typical of a breeding colony (Bourne and Warren 2000). It is therefore considered that either the species breeds outside the study area, or that habitat change has removed the necessary areas of bare ground for abundant setting of kidney vetch seed and the species is locally extinct. Kidney vetch is mainly a species of calcareous grassland and was not present in the one area of this habitat on the site. Butterfly, dragonfly and damselfly species recorded on the site are listed in the Natural Heritage Technical Appendix.

14.78 The wall whorl snail *Vertico pusilla* was not recorded during the specialist survey in August 2005. It is considered that the north-facing side of the stone wall bounding the site to the north, adjacent to the A4095, has the most suitable habitat. The wall is shaded, has a good growth of ivy and the adjacent road ditch has much dumped stone, all features favouring the presence of this species. It is possible that despite the intensive search effort, this diminutive species, which often lives in small colonies, could have been overlooked.

14.79 The other walls on the site were more exposed, with less vegetation and were all fragments separated from other wall fragments by 60m or more, reducing the likelihood of colonisation by the snail. For these reasons, it is considered unlikely that the species was present and overlooked on these walls during the survey. The full methods and results of the wall whorl snail survey are provided in the Natural Heritage Technical Appendix and the location of the wall surveyed shown in figure 14.8.

Assessment of value

14.80 The assessment of ecological value is carried out for the study area and for statutory sites within a 1km buffer. A wider buffer would be justified if there were potential hydrological effects on off-site ecologically sensitive wetlands, or indirect effects through, for example, quarrying for building material at sensitive sites. No such impacts are predicted.

Features of international and national value

14.81 Within the study area and a 1km buffer there are no statutory sites of international or national importance and surveys found none meeting the criteria for designation of European sites or SSSIs. There are therefore no receptors of international or national importance.

Features of county value

Gravenhill Wood

14.82 The wood is approximately 1km to the east of the site. It has strong evidence of being ancient and is classified as such in the county ancient woodland inventory. Ancient woodland is a scarce resource in Oxfordshire, accounting for 4770 ha or 1.5% of the UK resource. The South East Plan identifies ancient woodland as irreplaceable and the woodland Habitat Action Plan for Berkshire, Buckinghamshire and Oxfordshire seeks to ensure local plan policy is adequate to safeguard all examples of the habitat. The plant communities are typical of the Thames and Avon Vales Natural Area. The county wildlife site citation notes only the botanical and plant community interest. In the absence of faunal data, these are the features of county value.

Features of local value

Semi-improved neutral grassland

14.83 MG1 grassland, often used interchangeably with rough grassland, is a nationally widespread community of neglected, or mown but not grazed land, found for example extensively along motorway verges. It is considered nationally to be a plant community of low conservation interest (JNCC 1989). However, the Cherwell BAP notes that, with so little semi- or unimproved grassland in the District, the better examples of rough grassland are of value and can have plant species that are more characteristic of semi-improved grassland. The Cherwell BAP lists the more extensive and interesting examples of rough grassland in the district. The field east of the A41 is not included in this list, but derives its local value from the presence of less widespread plant species, including pepper saxifrage, which is classified as a local character species of unimproved neutral grassland in the Oxfordshire BAP. The field also has the potential to hold populations of three common species of reptile.

Calcareous grassland

14.84 Calcareous grassland is a locally common habitat in Oxfordshire, with extensive examples of national importance designated as SSSIs. In Cherwell, the habitat is scarce and almost entirely restricted to quarries and rail cuttings; the field in the north-east of the site is therefore being a typical example. The Cherwell BAP notes only 14 locations, not including the field on the site. The better examples that are not within SSSIs are listed in the BAP. The district scarcity of the habitat justifies local value for this example.

Species-rich and important hedges

14.85 Species-rich hedges are estimated to account for 20% of the UK's hedgerows. The Oxfordshire hedgerow survey found only 11% of the county's hedgerows were important in the sense of the 1997 Hedgerow Regulations. There are no data to assess

the extent of the local resource of species-rich hedges. The OWLS notes that species-rich hedgerows occur throughout both of the landscape types that cross the study area, but definitions of what is species-rich are variable and the phase I habitat manual definition is ambiguous. The ecological as opposed to landscape value of these hedges is a combination of their age and connectivity. Older hedges acquire more plant species by chance colonisation over a longer period of time, because they are relicts of ancient woodland or because woodland plant and animal species can colonise along hedgerow networks, but not across open fields. Species-rich hedges will tend to have more associated invertebrate species and more fruiting shrubs and therefore provide better quality foraging habitat for bat species and both frugivorous and insectivorous bird species. However, hedge structure may be more important, with bulky uncut hedges with mature trees providing more invertebrate biomass.

14.86 The provisional classification by Bioscan of most the site boundary hedges as important gives the site a greater than average concentration of such hedges, in the context of Oxfordshire. Species-rich hedges internal to the site remain well connected in the centre of the site. The absence of herb-rich banks to the hedgerows, most of which have been ploughed to their margins, justifies no more than local value.

Pingle Brook and water vole

14.87 Pingle Brook has an unexceptional aquatic and swamp flora in the length that runs through the site, characterised by a low diversity of common and widespread plant communities. The community S23 is widespread and characteristic of disturbance to the channel and periodic drying out. The local interest is the presence of breeding water vole at least until 2004, the habitats on which water voles depend, and the potential for improvement of the habitat for water vole and its re-colonisation of this length of the brook. The valuable habitats are stable earth banks for burrows and vegetation on the bank and in the channel for shelter and food.

14.88 Water vole is not rare in Cherwell, but is very localised. The Oxford Canal and River Cherwell between Oxford and Kidlington have been a county stronghold for the species, though populations have declined in these locations with the spread of mink which predate water voles. Elsewhere in the district four isolated populations of water vole are known. These occupy one to two tetrads and include watercourses adjacent to Bicester, within the River Ray catchment. Although surveys of the district are incomplete, the evidence of a sample survey of all Oxfordshire's river catchments in 1998/99 as part of the county's Water Vole Recovery Project showed the River Ray catchment to be poor for water vole, with no evidence of the species from any of the sampled lengths of watercourse.

14.89 The implications for the development of the legal protection provided to water voles and their places of shelter, through inclusion on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), is discussed in the assessment of potential effects, below.

Reptiles

14.90 Grass snake, common lizard and slow worm potentially occur on the site. All three species are widespread in lowland England. Their status in Cherwell is not known. A provisional assessment is that suitable habitats are the fields in the north-east including the rush pasture and Pingle Brook and the field east of the A41. These fields justify local value as suitable rough grassland and unmanaged land in the proximity of wetlands is infrequent in this intensively farmed landscape.

14.91 The implications for the development of the legal protection provided to the three reptile species, through inclusion on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), is discussed in the assessment of potential effects, below.

White-letter hairstreak

14.92 This butterfly species is of medium conservation concern in Oxfordshire, where there are an estimated 10 to 20 main sites. The number of white-letter hairstreaks recorded in the study area suggests this is not a major colony. The number of minor colonies in Oxfordshire is not known, but the species is known to be increasing after the decline caused by Dutch Elm Disease (Clarke and Bourn 2000). The abundance of colonies in Cherwell is not known. Assuming an even distribution of main sites throughout Oxfordshire, the presence of one or two individuals is considered to be of local value.

Features of parish value

Bats

14.93 The bat species recorded are all widespread in Oxfordshire. The brown long-eared bat roost is not a major roost in the context of Oxfordshire (BBOWT 2000). There is inadequate comparative information to assess the importance of the site for bat foraging. There are a good number of hedgerow trees with potential as bat roosts and the value of intact hedges, Pingle Brook and the tall grassland and scrub of the field east of the A41 as foraging habitat give these features local value.

14.94 The implications for the development of the legal protection provided to all bat species and their places of shelter, through inclusion on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Habitats Regulations, is discussed in the assessment of potential effects, below.

Badger

14.95 Badger is widespread in Oxfordshire and Cherwell. The farmland in the study area may provide a large part of the foraging range of one social group. The farmland is similar in type to surrounding farmland in the parishes of Chesterton and Bicester, so is considered of no more than parish value.

Farmland birds

14.96 Farmland birds have in recent years been recognised as a group of birds of value, due to the similar factors, broadly classified as agricultural intensification, that have led to their decline and the consequent inclusion of a number of these species in the priority list for the UKBAP and the Red List of birds of conservation concern (BTO 2002).

14.97 The site has eight red list species breeding, five of which are UKBAP priority species. Two of these species, linnet and yellowhammer, winter on the site in reasonable numbers. The other red list species are skylark, starling, house sparrow, bullfinch and reed bunting. The habitats on the site are not favourable for farmland birds. Unfavourable features are autumn sowing of cereals and the lack of uncultivated field margins. Whilst no numerical comparison can be made with other farmland locally, these features are considered to give the site only parish value for farmland birds.

Future baseline

14.98 In the absence of development, it is anticipated that the study area would continue to be farmed. The type of farming will to some extent depend on available subsidies and the market value of produce. Farmland in the study area presently reflects trends in more intensively farmed land in Oxfordshire recorded between 1986 and 1996 (Killick *et al*. 1998). There is a preponderance of arable over grassland, autumn as opposed to spring sowing of crops, an increased area of rape and a lack of uncultivated field margins. Some hedges have deteriorated and have an increased number of gaps, where they no longer have a function as livestock barriers.

14.99 Under these conditions, the present ecological value would be retained and no new ecological interest is predicted to develop. Damage to the Pingle Brook banks and marginal vegetation by cattle may have contributed to the loss of water vole and would continue to contribute to the brook's unfavourable status for this species.

Potential effects

Introduction

Potential zones of influence of the development on ecological features of value

14.100 The zone of influence of the proposal on features of ecological interest is the red line boundary of the development for vegetation and beyond the red line where animal territories or ecological processes overlap and extend further. Impacts beyond the red line may occur for water vole, badger, reptile species and breeding farmland birds. The zone of influence for these species, other than water vole, is bounded by the A41, A4095 and Gagle Brook in the south. The site and adjacent farmland are surrounded on three sides by A roads which may act as barriers.

14.101 For land east of the A41, where there may be mobile reptile populations, the zone of influence is estimated to be 500m around the field, comprising the fields and watercourses enclosed by the A41, Oxford railway line and Bicester town.

14.102 For water vole, the potential zone of interest is Pingle Brook in and downstream of the site. Features of ecological value outside of these zones of influence are not considered further in this impact assessment.

14.103 For bat species, which may forage over larger areas, an area of 4km radius centred on the site is the estimated zone of influence.

14.104 No other development proposals that would affect the features of ecological value were identified, therefore a cumulative impact assessment has not been carried out.

14.105 No assessment of impacts on great crested newt is made, as this species has not been found on the site. Full details of the survey work undertaken can be found in the technical appendix 6.

Potentially significant activities

14.106 During construction, the key potentially significant activities are:

- vegetation clearance
- soil removal
- construction of building and hard surfaces
- temporary offices, building compounds and storage areas
- environmental accidents in the proximity of Pingle Brook

14.107 Post-construction, the key potentially significant activities are:

- increased public access
- increased traffic
- increase in numbers of cats and dogs
- drainage
- implementation of the landscape design and habitat management plan.

During construction

Semi-improved grassland: field east of the A41

14.108 Construction of a minor road though the field will result in the loss of a proportion of the species-rich MG1 grassland. The resulting loss will be limited to the extent of the road and surrounding verges. Without mitigation this impact is permanent and irreversible. This is a significant effect on a feature of local value. The loss is of medium magnitude (1-10% of the resource of rough grassland), so an adverse effect of slight significance.

Semi-improved grassland: field in the north-east of the site

14.109 Vegetation clearance and soil stripping will result in the loss of all of the CG7 grassland under the footprint of the residential housing. Without mitigation the impact is permanent and irreversible. This is a significant adverse effect on a feature of local value. The magnitude of loss is large (all of the resource), so of moderate significance.

Species-rich hedges

14.110 Vegetation clearance and soil stripping will result in the loss of approximately 2.5km of the study area's hedgerows, some of which are species-rich. Without mitigation the impact is permanent and irreversible. This is a significant adverse effect on a feature of local value. The magnitude of loss for species-rich hedgerows is medium in the context of the study area, so of moderate significance.

Water vole

14.111 Pingle Brook is retained within informal open space in the master plan. The short section that is to be realigned did not have water vole burrows in 2004 or 2005. The realignment may briefly increase sediment loads and affect water quality, which could damage burrows downstream, if these are present. This impact is reversible over a period of time. Construction near to the brook has the potential to increase sediment loads. Spillage of pollutants into the brook, directly or indirectly, could affect water voles directly, as a toxin, or indirectly, through damage to bank-side vegetation on which water voles feed.

14.112 The developer will stipulate an environmental management plan for contractors to control the risk of pollution and sediment load. The developer has accepted the Environment Agency's requirement that the realignment of the brook results in no change in the total length of the brook and that the development will not result in a change in the brook's water quality. The predicted impact on water vole is therefore not significant, but with some uncertainty due to the pollution risk.

Implications of the legislation

14.113 It is possible if cattle are removed from the field, for example in the period between planning permission being granted and building commencing, that the brook could return to more favourable status for water vole and the species could re-colonise.

14.114 Water vole is presently protected through inclusion in schedule 5 of the WCA 1981 (as amended) in respect of section 9(4). This makes it an offence to recklessly damage a water vole burrow or disturb the animal whilst it is in this place of shelter. Further protection of the animal itself against intentional killing is proposed in the 2005 quinquennial review of the WCA schedules, but Defra has no timetable for the implementation of this extension of protection.

14.115 A survey to check for water vole will be required within the working corridor of the length of the brook prior to any works. Under the present protection, mowing of bank-side vegetation and trapping of water voles can be used to remove animals from the working corridor. Should water voles be fully protected at the time of the works, a licence will be required for this work.

Reptiles (grass snake, slow worm, common lizard)

14.116 There is some loss of land that may be used by reptiles, in the fields in the north-east of the site and east of the A41. The size of the populations and the distribution of the three species is not known, therefore the magnitude of the effect on populations is uncertain, but covers only a small proportion, less than 10%, of the habitat of potential value in the study area. The road across the field east of the A41, which will become the main route into and out of Bicester onto the A41 dual carriageway, will further fragment the isolated field and is expected to result in reduced populations. The combined impacts are significant and on a feature potentially of local value. The adverse effect is at worst probably of small magnitude (less than 1% of each population), so of slight significance.

Implications of the legislation

14.117 Partial protection is given to these three species through inclusion on schedule 5 of the WCA 1981 (as amended) in respects of section 9(1), which prohibits intentional killing. A presence and absence survey of suitable areas will be undertaken prior to development. The implications of this for the development are that if reptiles are present, there is a requirement to attempt to remove all of the population without injury. The Abandonment of Animals Act 1960 requires that the removed reptiles be released in a location where they have a reasonable chance of survival. Depending on the size of the population, a minimum of 60 trapping days between March and September in the calendar year prior to any disturbance of the vegetation and soils will be required (HGBI 1998). If reptiles are found on the site in prior to construction, a translocation strategy will be produced. Sufficient open areas are retained within the red line to allow translocated reptiles to be accommodated.

White-letter hairstreak

14.118 The exact location of the recorded breeding colony within the 1km square is not known. Almost all of the hedgerows in this 1km square are retained, the exceptions being a length of defunct hedge north of Whitelands Farm and a short length where the new road into to the site feeds into the A4095. There is an extremely low probability that any colony will be affected and the likely impact is considered not significant.

Bats

14.119 No known roosts will be destroyed. Twelve trees with the potential to hold bat roosts may be felled or require surgery. These are in the hedge running west to east from

Foxey Leys Copse and in the north-west corner, where the new road breaks through the hedgerows. The necessity of felling these trees is subject to detailed design of the road and an arboricultural survey.

14.120 There will be a loss of approximately 3km of hedges that may be used for bat foraging. This is between 10% and 20% of the linear features (hedges, watercourses and woodland edge) in the study area that are likely bat foraging habitat. As the bat species recorded foraging over the site are likely to have foraging ranges several times larger than the site, the loss is likely to be less than 10% of foraging habitat in the range and, in the context of the study area, of lower quality habitat of defunct hedges and hedges without trees. This is a significant impact on a feature of parish interest. The magnitude of change is medium (probably 1-10% of foraging habitat and potential tree roosts within the foraging range), so the significance is slight.

Implications of the legislation

14.121 The inclusion of all bat species on schedule 2 of the Habitats Regulations and with full protection on schedule 5 of the WCA 1981 (as amended) makes it an offence to recklessly disturb bats at their roosts or destroy a roost, except under DEFRA licence. Trees with the potential to hold roosts and that require felling or tree surgery are generally not dealt with as if they were roosts, but require further checks prior to felling, to safeguard bats that may be using the cavities. Prior to treatment or felling, cavities need to be checked by ladder, cherry picker or climbing, by a licensed bat worker. If no bat use is proved, work can proceed. If bat occupation is proved, a DEFRA licence would be required before further work on the tree.

Badger

14.122 If the assumption of one clan with a territory confined to the study area is correct, approximately 20% of the foraging habitat will be lost under hardstanding. The impact may be food shortage for the clan and is a significant effect on a feature of parish value. The predicted magnitude of the effect is large (loss of more than 10% of apparently suitable badger foraging habitat in the study area), so of moderate significance.

Implications of the legislation

14.123 No badger setts will be disturbed and no work is proposed within 30m of any sett. Therefore no licence for disturbance is required under the provisions of the Protection of Badgers Act 1992 (English Nature 1995).

Farmland birds

14.124 Development will result in the loss of approximately 20% of the farmland in the study area, comprising arable fields, hedges of less value for birds, calcareous grassland, part of a field of improved grassland and approximately 20% of the rush pasture.

14.125 Of the red list species of conservation concern, in the absence of changing farming practices elsewhere, a small parish decline would be expected for skylark (breeding), yellowhammer (breeding), song thrush (breeding) and starling (breeding and wintering), due to loss of arable and hedges. Reed bunting is confined to wetland habitats in the north-east and south-east of the site, which are retained. Bullfinch is more dependent on woodland and bulky hedgerows, which are retained. Linnet is nationally increasing in the short term in response to an increase in sown rape varieties with fine seeds, therefore is probably not limited by nesting sites and local loss of hedgerows. House sparrow is associated with the farm buildings, which are retained. Wintering yellowhammers and linnets concentrate around Whitelands Farm, where they are probably dependent on grain spillage. This habitat is retained.

14.126 This is a significant impact on a feature of parish value. Parish and local breeding populations, overall for this group of birds, are predicted to have a loss of medium magnitude (1-10% of the population for the relevant species) and so the impact is of slight significance, with skylark, starling, song thrush and yellowhammer affected.

Post-construction

Water vole

14.127 Livestock will be excluded from the two fields along Pingle Brook, most of which are retained as informal open space. This will stop trampling of the banks and will encourage the growth of bank-side and emergent vegetation. Approximately 80% of the rush pasture is retained. Three balancing ponds with a total area of approximately 0.68ha will be created in the fields, within 20m of the brook, as part of the Sustainable Urban Drainage Scheme. The ponds will permanently hold water, so should develop emergent vegetation. These features provide a net improvement in the habitats for water vole and so could encourage their re-colonisation, if they are still present downstream of the site. The third balancing pond of approximately 1ha will also permanently hold water, but is isolated from the brook by more than 500m of the new housing development, so is unlikely be colonised by water vole.

14.128 Overall the landscape and drainage schemes provide a significant positive effect on the suitability of the Pingle Brook catchment for water vole. The magnitude of change is large in the context of the study area, so the potential significance is moderate.

Reptiles (grass snake, slow worm, common lizard)

14.129 The road that dissects the field east of the A41 will increase the probability of road casualties if reptiles are present in this land parcel. As populations are expected to be small in this isolated area of suitable habitat, the significance of effect is slight.

14.130 The removal of grazing and creation of permanently wet balancing ponds in the north-east fields will improve the habitat potential for slow worm and grass snake. The increased number of domestic cats associated with the new occupied dwellings may partly counteract that effect for slow worm, which are predated by cats. Overall, the

landscape and drainage strategies should have a significant positive effect on reptiles in the north-east fields and Pingle Brook. The increase is probably small in a local context, so of slight significance.

Bats

14.131 There should be at least an equivalent amount of foraging habitat for bats in the long term to that lost through hedge removal. This will develop as the landscape plantings and trees in gardens and along roads and rough grassland in the north-east and around the balancing ponds mature. This will be a significant positive effect of moderate magnitude in the context of the study area (1-10% increase in bat foraging and potential roosts) so of slight significance.

Badger

14.132 The perimeter road will dissect at least one badger social group's territory. The 50 mph speed limit will reduce the number of road kills of badgers, but it is likely that there will be some, as the road may be crossed daily. As road kills are a major cause of badger death, and social groups typically number fewer than 12 individuals, road deaths may have an effect of large magnitude (loss of more than 10% of the social group population) so be of moderate significance.

Farmland birds

Landscape and drainage strategies

14.133 Effects are considered for the red list species. More habitat for breeding reed bunting may develop around the three permanently wet balancing ponds. This species is generally associated with tall vegetation and scrub adjacent to open water. In the short term, the new woodland landscape plantings will provide good breeding and foraging habitat for linnet and yellowhammer, whilst the trees are at scrub height and have an under-story of tall herb vegetation. This interest will be lost as the woodland canopies close, but bullfinch and song thrush may then nest and forage in these habitats.

Residential development

14.134 Bullfinch, a species that does not feed far from hedgerows and woodland, can benefit from the seeds, buds and berries provided in suburban gardens. Breeding song thrush may benefit after several years from the development of lawns and playing fields, which will provide good foraging habitat. Suburban song thrush populations nationally have not declined to the extent of farmland populations for this reason. Whilst the new dwellings may provide breeding habitat for starling and house sparrow, the national decline of starling is mainly a consequence of changes in agricultural practices and the reasons for the decline of house sparrow are uncertain. The increased number of dwellings will not necessarily benefit these species. The other red list species are not regularly found in residential areas.

14.135 The increased number of cats associated with the new dwellings is likely to result in increased mortality to ground nesting birds near to the dwellings. This should not affect the red list species, which are either not ground nesting or, in the case of skylark, have most of their habitat separated from the residential land by the formal open space and playing fields.

14.136 Overall, the effects of the proposal, post-construction, on farmland birds are predicted to be positive. The magnitude of the effect will be large in the short term (more than 10% increase in the study area populations of reed bunting and yellowhammer), so of moderate significance. In the longer term the large change will be sustained for reed bunting and will also occur for song thrush and bullfinch, so be of moderate significance for these species.

Mitigation

Introduction

14.137 Mitigation meets the legal requirements for protected species and seeks to support the relevant policies of the Cherwell Local Plan and objectives of the Oxfordshire BAP and the Cherwell BAP.

14.138 The land available for mitigation is within the red line. The main areas with the option for mitigation or ecological enhancement are the proposed informal open space areas in the north-east along Pingle Brook, south-east of Whitelands Farm and on the eastern boundary around the larger balancing pond. These areas will be the subject of a land management plan to create suitable habitats and maintain them in favourable conservation status for the targeted habitats and species.

Semi-improved grassland: field east of the A41

14.139 The loss of rough grassland within the development footprint will be mitigated through the creation of an equivalent area through re-seeding some improved grassland in the informal open space south-east of Whitelands Farm or the north-east fields. This will ensure no net loss of rough grassland from the development. Mitigation will contribute to the Cherwell BAP for grassland, grazing marsh and heathland.

Semi-improved grassland: field in the north-east of the site

14.140 The soils supporting the fragments of dry calcareous grassland will be stripped and translocated. Suitable receptor sites are the north-east fields where there is improved grassland and the informal open space south-east of Whitelands Farm. Both are south-facing. The calcareous grassland community requires free draining soils, so will be placed on suitable sloping ground. A suitable maintenance regime will be stipulated in the management plan. Mitigation will contribute to the Cherwell BAP for grassland, grazing marsh and heathland.

Species-rich hedges

14.141 A total of approximately 5km of new hedgerow planting is proposed for this site. Native species will be used for this planting and once mature these hedgerows will provide a valuable additional habitat for wildlife within the application boundary. Although the proposals will result in a temporary loss in the extent of available hedgerow habitat, the proposals will result in an additional 2.5km of hedgerow being established within the application boundary. A suitable management regime for the hedgerows will be stipulated in the management plan. Mitigation will contribute to the Cherwell BAP for farmland. The development if a management plan will address some of the key concerns highlighted in the BAP relating to hedgerow neglect, loss of elm trees and subsequent loss of hedgerow structure.

Water vole

14.142 Measures will be put in place, to encourage the re-colonisation of water vole on Pingle Brook within the site and at the three adjacent balancing ponds. Measures will include (BBOWT un-dated):

- a rotational mowing regime to retain tall bank-side vegetation throughout the year along Pingle Brook
- maintenance of the rush pasture
- scrub control, including limited planting of willows for bank stability and winter water vole forage
- design of the balancing ponds with appropriate earth banks and maximised bank length
- appropriate planting of emergent vegetation on the balancing pond margins.

14.143 The mitigation will contribute to the Cherwell wetland BAP. The increase in the extent of suitable habitat is of large magnitude (more than 10% within the study area) so of moderate significance.

Reptiles (grass snake, slow worm, common lizard)

14.144 Subject to the findings of reptile surveys, a translocation strategy will be developed to meet the legal requirements to avoid intentional killing of reptiles and their translocation to suitable receptor sites in the informal open space within the development. The translocation will ensure no net loss of reptiles locally.

Small blue

14.145 This species occurs locally on semi-natural calcareous grassland and where this habitat is created at quarries and road cuttings that expose limestone. Small blue is of medium priority in the Butterfly Conservation Thames Region BAP. The BAP target is to maintain or increase the range and an objective to meet this target is to consider creation of suitable habitat along new roads or developments at suitable locations. The need to translocate the limestone grassland on the site presents the possibility of

creating suitable habitat on the south-facing slopes of either the north-east field or the informal open space south-east of Whitelands Farm. The reintroduction of kidney vetch will be incorporated in the management plan. Habitat creation will contribute to the Butterfly Conservation Thames Region BAP. This is an effect of positive value on a species of district value due to its scarcity. The magnitude of change is large (creation of new habitat where it formerly did not occur), so the potential significance is substantial, but with uncertainty over the species' ability to colonise the new site.

Bats

14.146 Bat boxes will be placed on retained trees within the development, to increase the number of potential bat roosts on the site. This will be a positive effect of large magnitude (increase of more than 10% in the resource) so of moderate significance.

Farmland birds

14.147 No mitigation is proposed.

Habitat improvements

14.148 Management of the small area of woodland to the north of the existing service area will be undertaken as part of the proposals. The woodland is currently in poor condition with much dead elm and alder resulting in the loss of a canopy layer and the development of scrub and dense ruderal vegetation. It is recommended that the area is replanted with native trees such as alder, downy birch, ash and willow species as well as some native shrubs. These will be managed to ensure they become fully established.

14.149 Once a canopy layer has developed the possibility of sowing a suitable woodland flora mix beneath the trees will be explored. Emorsgate seeds can supply suitable seed mixes for woodlands such as their EW1 woodland mix if sowing is required. It is considered that the proposals for habitat improvement will represent a medium magnitude of change resulting in a moderate magnitude of change.

Residual impacts

Species-rich hedges

14.150 There will be a negative effect of moderate significance through the loss of approximately 2.5km of hedgerows during the construction phase of the development. However the mitigation proposed will result in new hedgerow planting totalling 2.5km, as well as 2.5km of replacement planting for the loss of the existing hedgerows. The proposed management plan will ensure sympathetic management of the new hedgerows in the future to maintain their value as wildlife habitats. With the mitigation in place it is predicted that once established the hedgerows will provide valuable additional habitats for many species. This will be a positive effect of medium magnitude so of moderate significance.

Water vole

14.151 There is a positive effect of moderate significance through the improvement of Pingle Brook, the creation of additional suitable habitat for water vole in and around the balancing ponds and the securing of long-term suitable management to maintain the habitats in favourable status for water vole.

Reptiles (grass snake, slow worm, common lizard)

14.152 There is a positive residual effect of slight significance through the increase in suitable habitat for reptiles in the fields around Pingle Brook, the informal open space south-east of Whitelands Farm and the balancing ponds.

Small blue

14.153 There is a positive effect of potentially substantial significance through the creation of new habitat targeted for this species to colonise.

Bats

14.154 There is a positive effect of slight significance through no loss of roosts, no net long term loss of foraging habitat and a net increase in potential roosts through the provision of bat boxes.

Badger

14.155 There is a negative effect of moderate significance through the loss of foraging habitat (and therefore a potential reduction in the number of badgers that the land can sustain) and through a slightly increased risk of road casualties.

Farmland birds

14.156 There is a negative effect of slight significance due to the loss of farmland and therefore the reduction in the population sizes of some red list farmland birds that the study area can hold. Species negatively affected are anticipated to be breeding skylark and yellowhammer and wintering starling. There are positive effects of moderate significance on red list breeding bullfinch, song thrush and reed bunting.

14.157 The residual effects are summarised in figure 14.9.

Topic	Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Significance	Level of certainty
Natural heritage	Species-rich hedges – lost under footprint	Medium	Medium	Short term	Adverse	Moderate	Absolute
	Replacement hedgerow planting and planting of new hedgerows	Medium	Medium	Long-term	Beneficial	Moderate	Absolute
	Replanting and management of woodland north of service area	Low	Medium	Long-term	Beneficial	Moderate	Likely
	Water vole habitat – created along Pingle Brook and balancing ponds	Medium	Large	Long term	Beneficial	Moderate	Reasonable
	Reptiles (grass snake, slow worm, common lizard) – translocated if necessary and habitat improvement in informal open space	Medium	Small	Long term	Beneficial	Slight	Reasonable
	Small blue butterfly – habitat creation on translocated calcareous grassland	Medium	Large	Long term	Beneficial	Substantial	Uncertain
	Bats – net increase of foraging habitat and potential roosts	Medium	Small	Long term	Beneficial	Slight	Reasonable
	Badger –new road casualties and loss of foraging habitat under footprint	Medium	Medium	Long term	Adverse	Moderate	Reasonable
	Farmland birds (yellowhammer, skylark, starling) – loss of foraging and nesting habitat under footprint	Medium	Small	Long term	Adverse	Slight	Reasonable
	Farmland birds (song thrush, bullfinch, reed bunting) – increase in foraging and nesting habitat	Medium	Medium	Long term	Beneficial	Moderate	Reasonable

Figure 14.9 Natural heritage residual effects

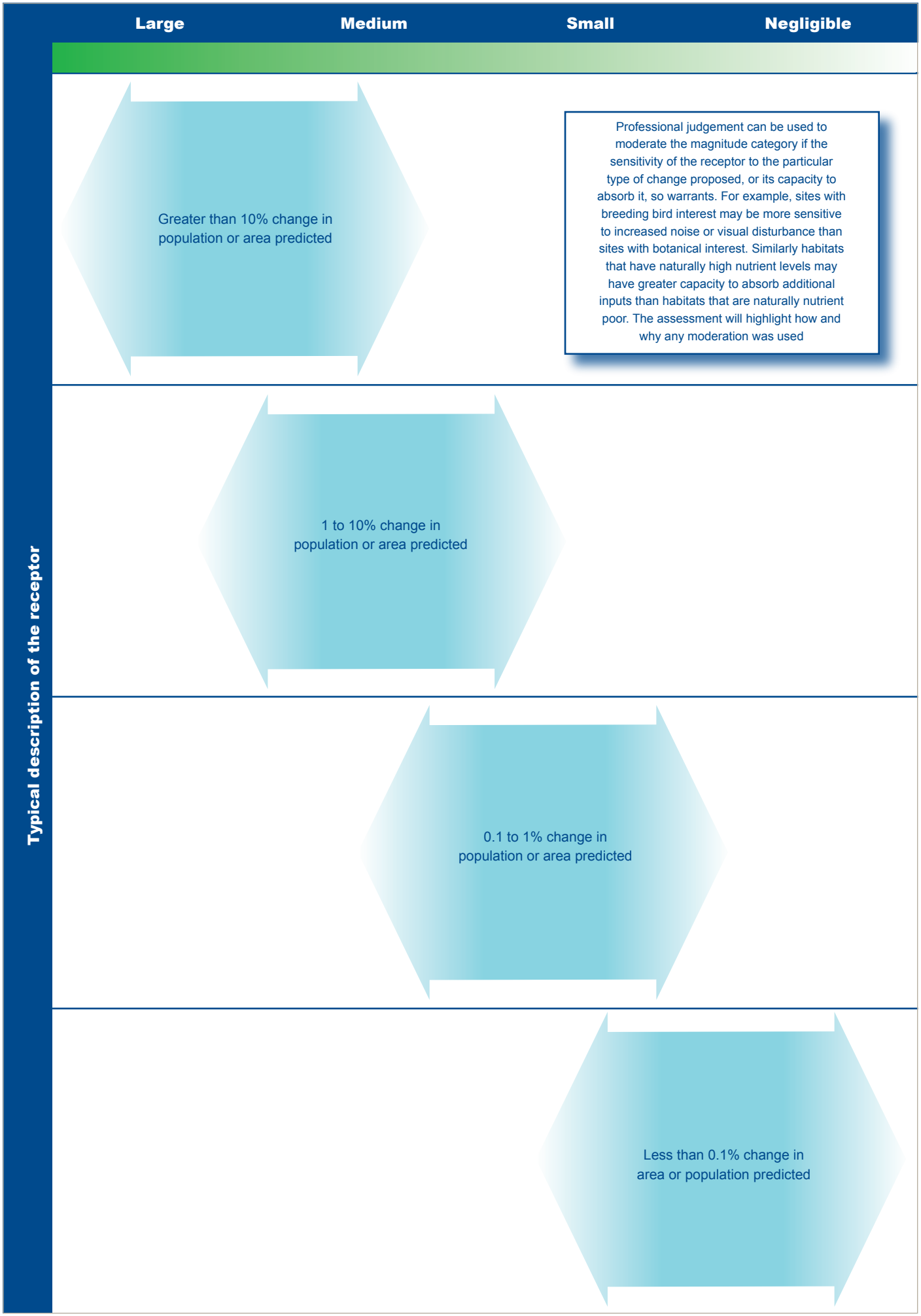


Figure 14.2 Natural heritage: magnitude of change

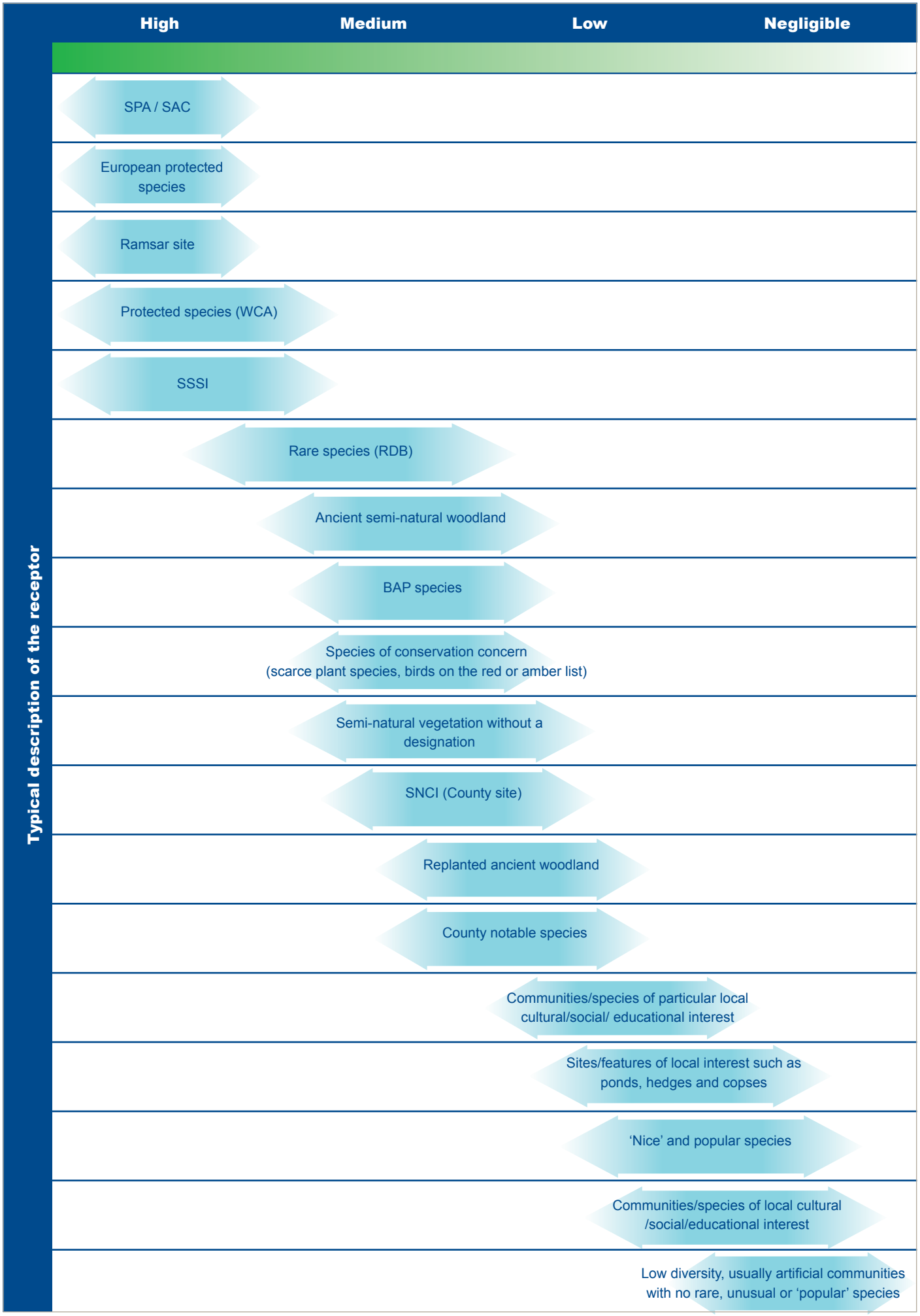
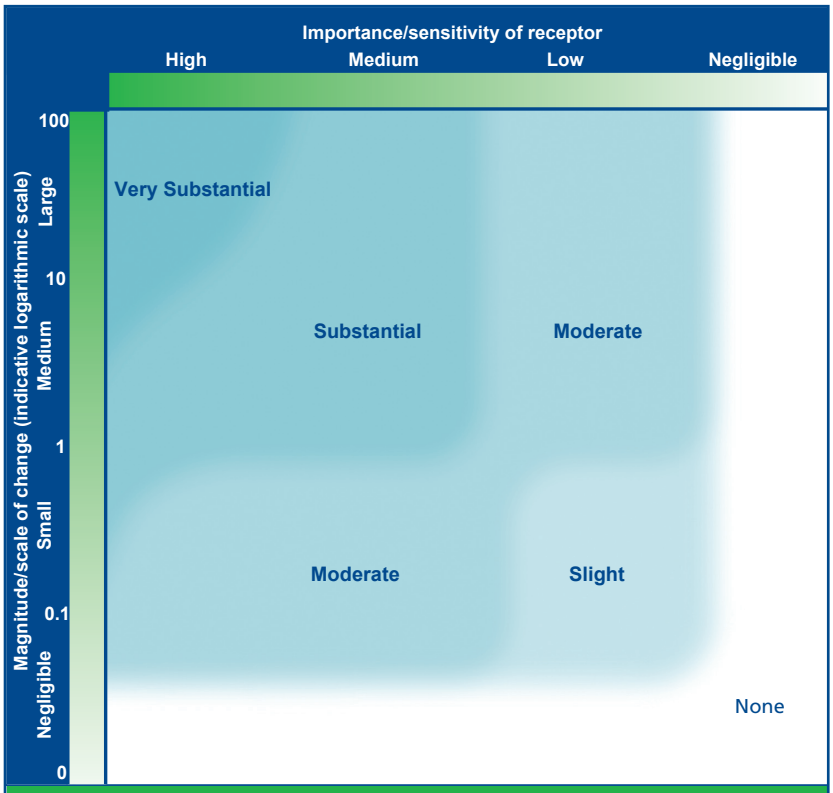


Figure 14.3 Natural heritage: sensitivity or importance of receptor



Very substantial:
A major change in the numbers of one or more very important species or the composition or extent of very important communities, or those which support beneficial or very important species. This might be a reduction or complete eradication of a species, which for some organisms could lead to a negative effect on the functioning of the particular ecosystem and/or other connected ecosystems.

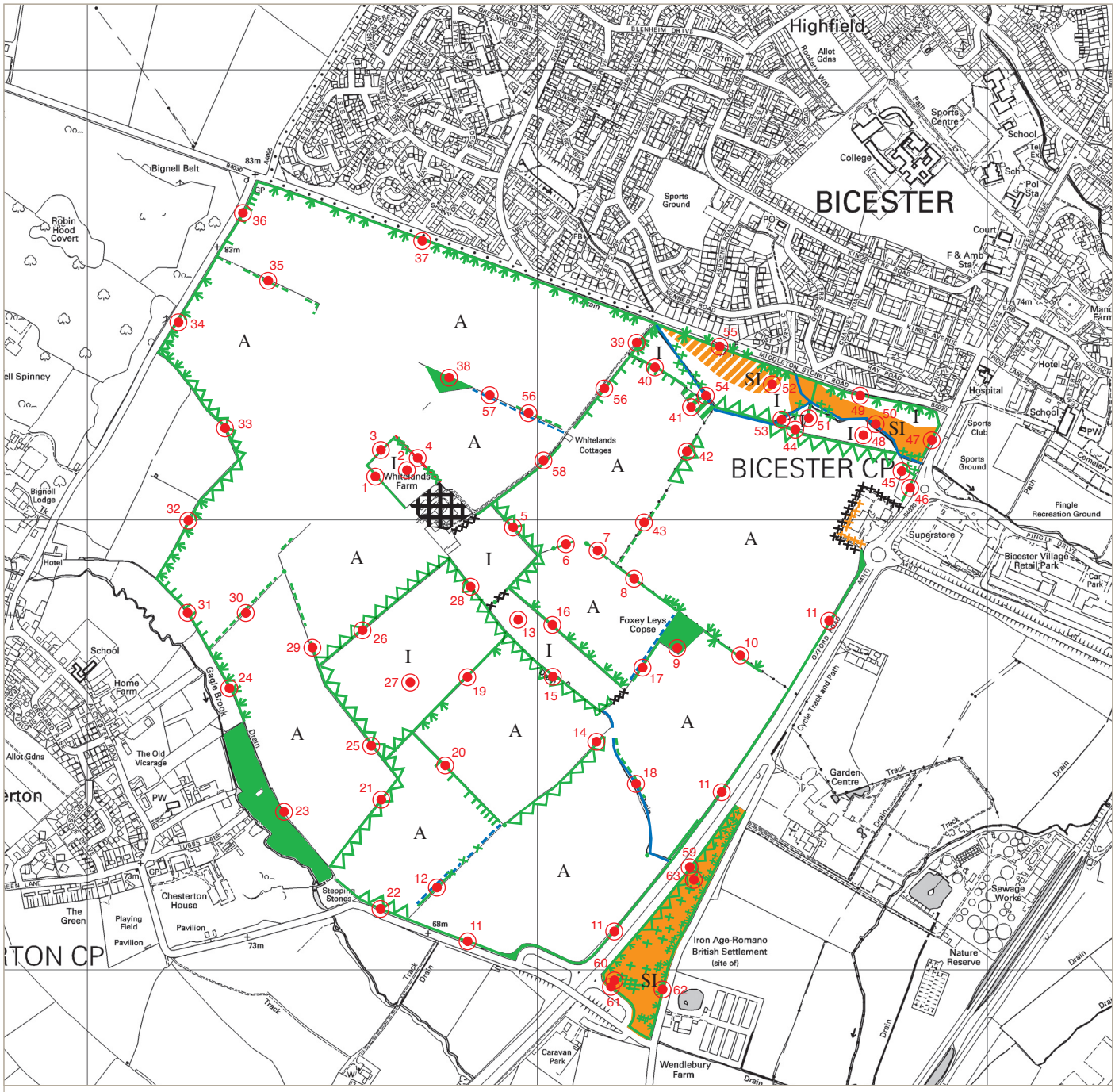
Substantial:
A marked change in the numbers of one or more important or very important species or the composition or extent of important or very important communities, or those which support beneficial or important species.

Moderate:
A marked change in population densities or community composition or extent, but not a change which results in total eradication of a species or community or which has any marked effect on important or beneficial species, or important communities.

Slight:
Some change in the population densities or community composition or extent, but without total eradication of any species or community, and with no effects on important species or communities, or ecosystem function.

None:
No marked changes in any of the populations in the environment or in any ecosystem functions.

Figure 14.4 Natural heritage significance matrix



Hedges

- Native species-rich hedge
- Native species-rich hedge with trees
- Species-poor hedge
- Species-poor hedge with trees
- Species-poor defunct hedge

Woodland and scrub

- Broad-leaved semi-natural woodland
- Broad-leaved plantation woodland
- Scattered scrub
- Dense scrub

Fields

- A Arable/set-aside
- I Improved grassland
- SI Poor semi-improved grassland
- SI Semi-improved neutral grassland
- SI Semi-improved calcareous grassland

Other habitats

- Fence
- Introduced shrub
- Running water
- Dry ditch
- Wall
- No. Target note
- Not surveyed

Figure 14.5 Phase 1 Habitat Survey

0 125m

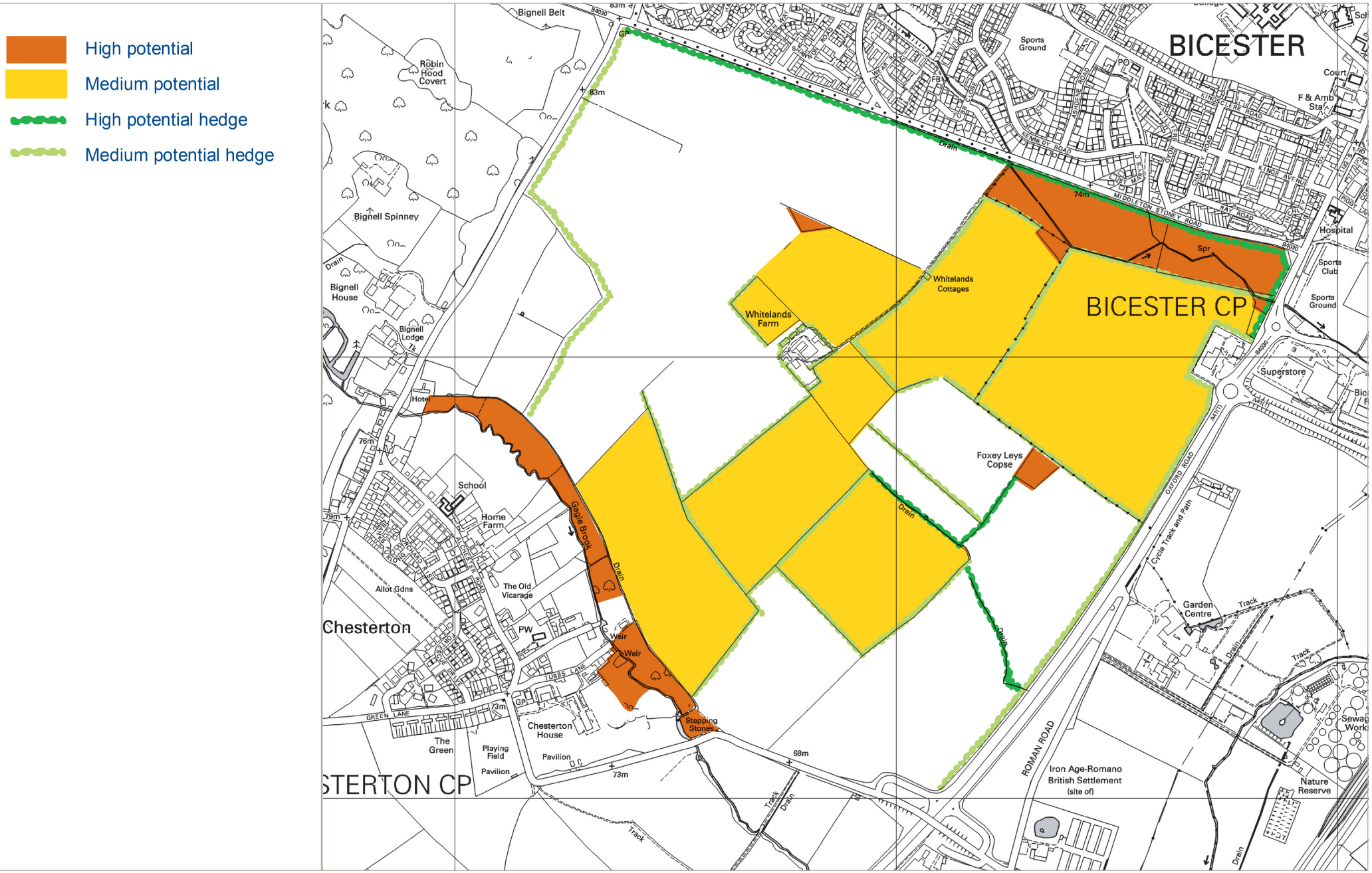


Figure 14.6 Great crested newt terrestrial habitat survey

- Trees which may be felled or require surgery and have potential for bat roosts
- Trees which will be retained and have potential for bat roosts

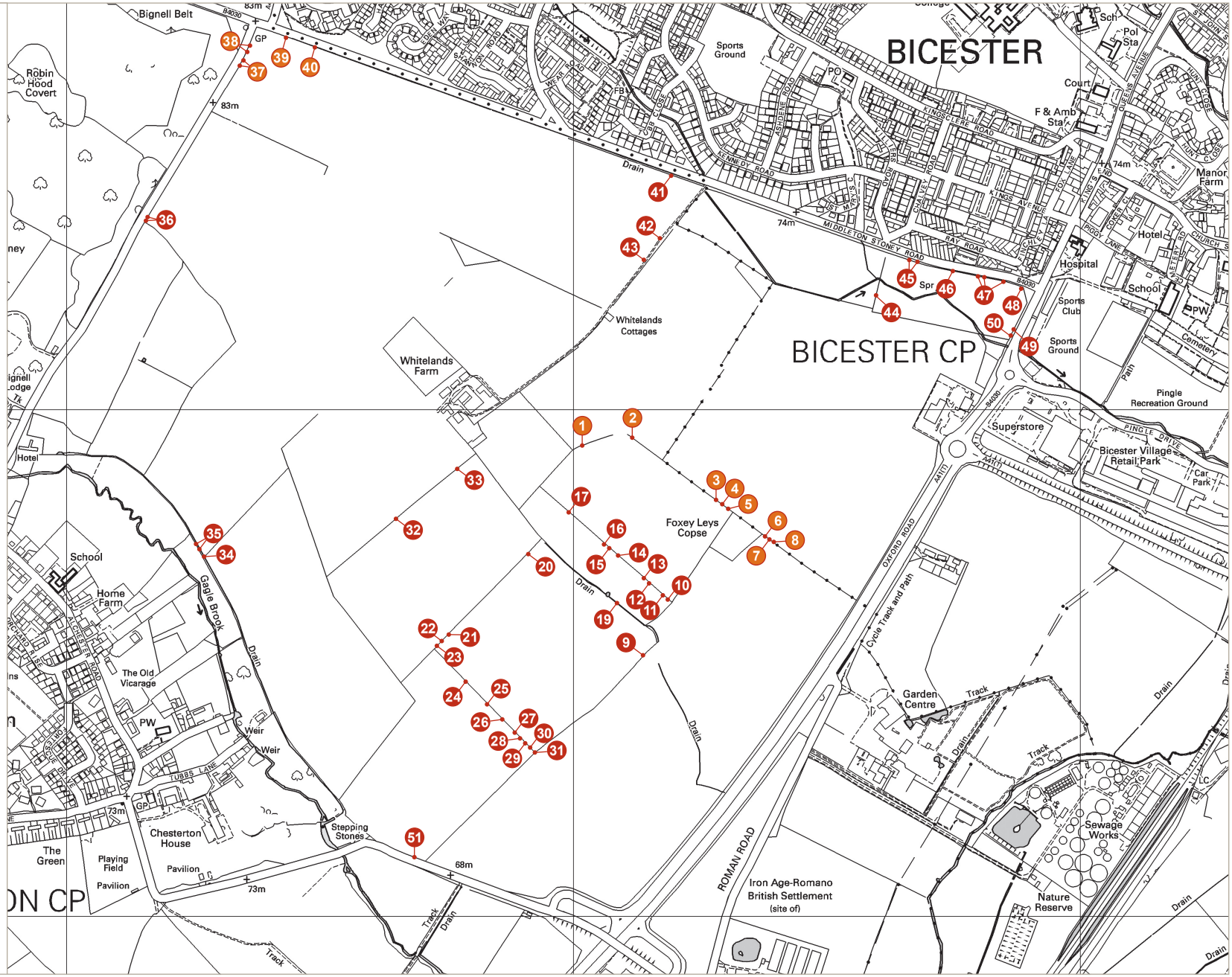


Figure 14.7 Trees with the potential for bat roosts

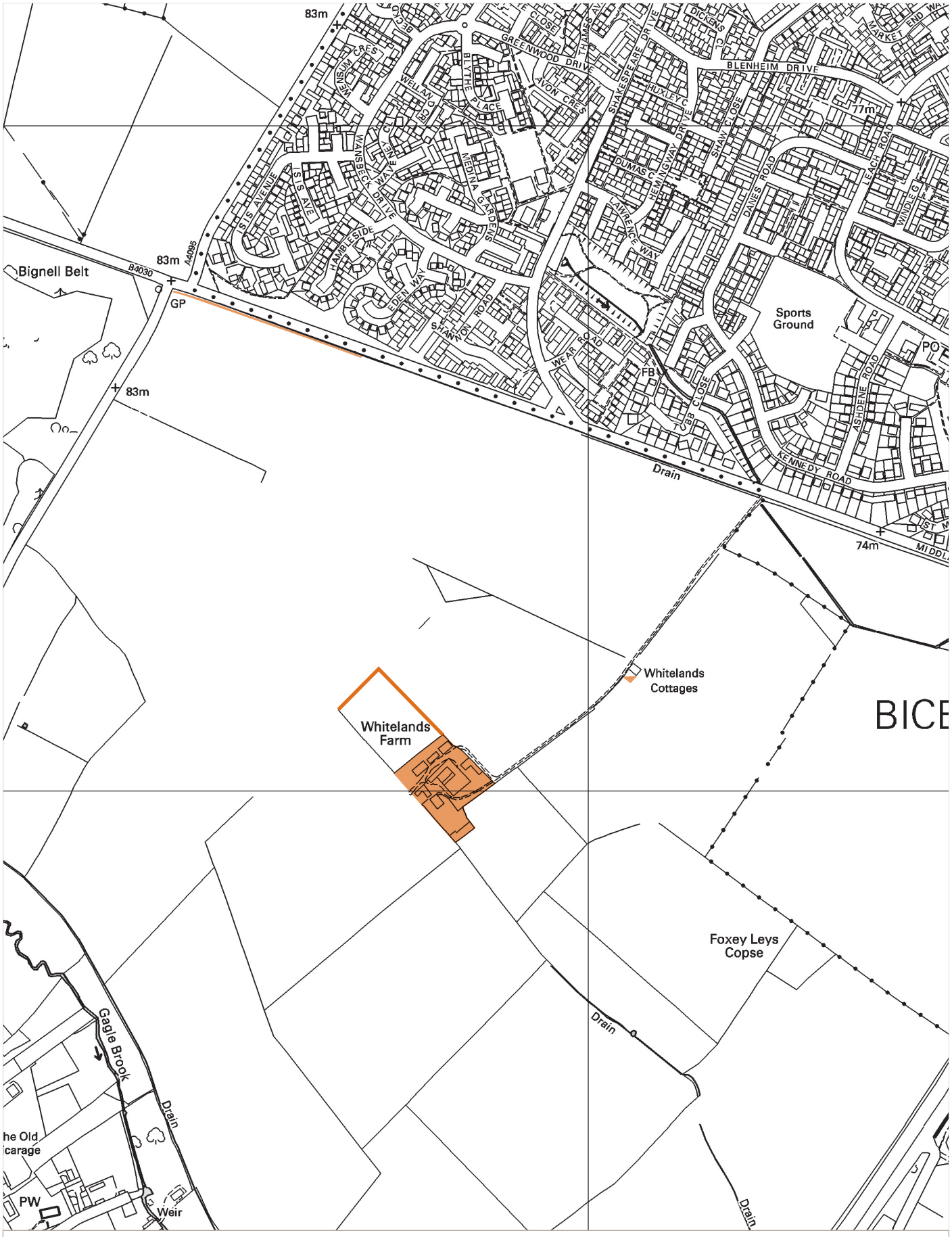


Figure 14.8 Snail survey areas