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**PHASE 1 AND PHASE 2 SURVEYS OF LAND TO THE NORTH OF
 TETBURY, GLOUCESTERSHIRE**

CLIENT: FAY AND SON LTD

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PHASE 1 AND PHASE 2 SURVEYS OF LAND TO THE NORTH OF TETBURY, GLOUCESTERSHIRE

NON-TECHNICAL SUMMARY

This report details the results of Phase 1 and further Phase 2 surveys undertaken at the site between October 2009 and January 2010.

The site (shown on Figure 1) is situated on the northern fringes of Tetbury (centred on OS grid reference ST 895 941), with residential areas to the south, arable and grazed farmland to the north, east and west and the A4135 (London Road), with industrial and commercial premises beyond, to the south east. The site comprises poor semi-improved grassland, ponds, hedgerows, trees and woodland copses. Stone walls are present throughout the site. In total the site covers approximately 10.25ha.

A full desktop study was undertaken, which included a web based search and an information request to the local records centre for protected/notable species records within 2km of the site (4km for bats).

An extended Phase 1 habitat survey of the site was conducted on 1 October 2009 using a standard Phase 1 habitat survey method, extended to record provisional signs of and potential for protected or notable species. Detailed notes of vegetation, habitats and signs of animal activity were recorded.

Based on the survey, the primary ecological interests of the site are related to:

- The presence of several species rich hedgerows on site and links to a wider hedgerow network
- The use of the site by badgers (evidenced by a latrine present on site)
- The presence of habitats suitable for amphibians (including great crested newt), bats, birds, reptiles and common invertebrates

Further Phase 2 surveys, including surveys for bats and amphibians (including great crested newt), were recommended. All Phase 2 surveys were undertaken by qualified and experienced staff of ecosulis ltd following standard, recommended survey guidelines.

A summary of the Phase 1 and Phase 2 results and assessment is included within table below. Further ecological enhancement opportunities have also been detailed within this report. Local Plan policies (*Policy 1, Policy 4 and Policy 10*) all apply to the site.

Summary of Phase 1 and Phase 2 Survey Results and Assessment

Habitat/species	Qualifying Criteria	Ecological Value
Poor semi-improved grassland	Provides suitable habitat for a range of local wildlife, including badgers, bats, birds, reptiles, amphibians and invertebrates	Local Value
Mixed plantation woodland	Provides limited habitat for range of local wildlife including birds, bats, badgers, invertebrates, reptiles, small mammals and amphibians	Local value
Hedgerows and trees	Provides habitat for a range of local wildlife including birds, bats, badgers, invertebrates, reptiles, small mammals and amphibians	Local Value
Ponds	Ponds 1-3 provide suitable habitat for amphibians such as the protected great crested newt as well as a foraging resource for common reptiles such as grass snake and habitat for common invertebrates	District Value
Adjacent habitats	Local farmland habitats with hedgerow networks and associated copses Local buildings and gardens, including Highfield Farm buildings	District Value Local Value
Badger	Site used for foraging in combination with a wider territory	Site Value (preliminary)
Bats	Site may be used for foraging and commuting common species of bat in combination with the wider area	Local Value
Other mammals e.g. hedgehog, brown hare	The site provides limited suitable habitat for hedgehog and brown hare in the form of semi-improved grassland, hedgerows and trees	Site Value

Habitat/species	Qualifying Criteria	Ecological Value
Birds	Bird nesting opportunities are present within the hedgerows, trees and grassland	Local Value
Great crested newt	A moderate population is possible within Ponds 1 and 3. These ponds could also support breeding great crested newt. Pond 2 is likely to be used for foraging, but unlikely to be used for breeding. Suitable terrestrial habitats exist on site in the form of long grassland and hedgerows	Local Value (preliminary)
Reptiles	Some areas of the site is likely to support a low population of common species of reptiles	Local Value (preliminary)
Invertebrates	The structural diversity on site is likely to support a good range of common invertebrate species (including freshwater species)	Site Value

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INTRODUCTION

1. In September 2009, ecosulis ltd was commissioned by Fay and Son Ltd to carry out an extended Phase 1 habitat survey and desk-based study of land north of Tetbury. The objective of this survey was to highlight potential constraints to the site proposals and to identify further surveys to ensure that ecology is fully considered within development plans. The Phase 1 survey identified the need for further Phase 2 surveys, including bat and amphibian surveys, in order to fully inform proposals. ecosulis ltd was subsequently commissioned to undertake the Phase 2 surveys. The methods and results of the Phase 1 and Phase 2 surveys are detailed in this report.

Objectives of Study

2. This study provides information on the existing ecological conditions at the site and details the methodologies and results of the Phase 1 and Phase 2 (habitats and protected species surveys) undertaken and subsequent assessment of the value of the site or component habitat/species. This information will form Technical Appendix 1. The site is subject to an outline planning application and landuse masterplan for a residential scheme. The intended land uses and layout are shown in the Land Use Masterplan (drawing reference: 969.03D). The purpose of the ecological surveys was to inform the final proposed layout and a subsequent Ecological Impact Assessment.

General Description of the Site

3. The site (shown on Figure 1) is situated on the northern fringes of Tetbury (centred on OS grid reference ST 895 941), with residential areas to the south, arable and grazed farmland to the north, east and west and the A4135 (London Road), with industrial and commercial premises beyond, to the south east. The site is currently managed as farmland and comprises poor semi-improved grassland, ponds, hedgerows, trees and woodland copses. Stone walls are present throughout the site. In total the site covers approximately 10.25ha.
4. The site is adjacent to Highfield Farm and Sir William Romney's School. Highfield Farm includes a farmhouse and outbuildings to the north of the site including a stable yard, gravel parking, several further cottages and the Cherish Salon. Sir William Romney's School includes hedgerows, amenity grassland and a gravel parking area, and is located west of the site.

Nomenclature

5. The common name only of flora and fauna species is given in the main text of this report; however, Latin names are used for species where no common name is

available. A full list of all species recorded on site during the surveys is given in Appendix I with their Latin names. All plant names follow the nomenclature of Stace (1997).

DESKTOP STUDY

Methods

6. The Gloucestershire Centre for Environmental Records (GCER) was asked to provide any information on non-statutory site designations within 2km of the site and records of protected and/or notable species within 2km of the site (4km for bats).
7. The 'Local Live' website was accessed for aerial views of the site and used as a visual aid to put the site into context with its surroundings and to identify any potential features of interest in the surrounding land.
8. The Multi-Agency Geographical Information for the Countryside (MAGIC) website was consulted for information on statutory site designations in the area.
9. The National Biodiversity Network (NBN) website was also consulted for information on records of protected and notable species in the area.

Local Planning Policies and Biodiversity Action Plans

10. A review of Local Plan policies and local Biodiversity Action Plans (LBAP) was undertaken to identify those potentially relevant to the site.

Results

Designated Sites

11. Details of statutory and non-statutory sites designated for conservation received from GCER and obtained from the MAGIC website, are given in Table I below. The site falls within the boundary of the Cotswolds Area of Outstanding Natural Beauty (AONB), however this is primarily a landscape designation and not for nature conservation. The site is also located within 2km of a Site of Special Scientific Interest (SSSI), Veizey's Quarry SSSI, however this is designated purely for geological reasons. The site also falls within 2km of a Key (County) Wildlife Site (KWS). Distances given below are approximated from the central grid reference for the site (ST 895941).

Table 1: Designated Sites of Nature Conservation Interest within 2km of the Site (GCER and MAGIC website, 2009)

Non-Statutory Site Name	Distance from Site	Description/Reasons for Designation
Cotswolds AONB	Site is located within AONB	Known for its rare limestone grassland habitat with rich flora and ancient beech woods
Newton Hill Banks KWS	1 km south east	This site was designated for semi-natural calcareous grassland and as a result is listed on the Grassland Inventory. Chalk-hill Blue and Brown Argus have been recorded at the site

Species

12. A full list of species records received from GCER and NBN is given in Appendix IV. Those records relevant to the site are given in Table 2 below. All distances are approximated from the central grid reference for the site (ST 895941).

Table 2. Summary of Relevant Species Records (GCER and NBN website)

Mammals	Bats – lesser horseshoe, greater horseshoe, noctule, long-eared and common and soprano pipistrelle bats	1 km to 4km from the site
	Badger	Within 2km of the site
Reptiles	Grass snake and common lizard	1.1 km and 2km from the site
Amphibians	Great crested newt	500m from the site
	Common frog, common toad and smooth newt	Between 0.35km and 1.8km from the site
Invertebrates	Several species of moths and butterflies which are included in the LBAP	Within 2km of the site
Birds	Grey wagtail and house sparrow	Within 2km of the site
Flora	Several species of plants including bluebell	Within 2km of the site

Habitats

13. The aerial photograph interpretation shows that the site is located on the edge of the town of Tetbury, within mixed use farmland with associated hedgerow networks and small copses to the north and west, residential areas to the south and industrial and commercial buildings to the east beyond the London Road. A number of ponds are present within the local area and surrounding farmland; the closest pond is located just off-site at the north-western corner of the site, and another located approximately 270m from the site, however more may be present within the numerous copses and underneath tree cover and therefore not visible from aerial photographs.
14. A further pond (shown on Figure 2 as Pond 3) is apparent from Ordnance Survey mapping, just outside the site boundary at the northern corner, within a small copse between the grounds of Highfield Farm and Sir William Romney's School.

Local Planning Policies and Biodiversity Action Plans

15. A summary of local natural environment policies from the Cotswold Local Plan (2001-2011) are given below. For a summary of national policies and legislation, refer to Appendix V (for full details reference must be made to the policies themselves).
16. *Policy 1 – Natural Resources.* Development will only be permitted where:
- Natural resources, such as biodiversity, will be managed efficiently and in the most sustainable manner.
17. *Policy 4 – Environmental Impact.* Development that is likely to significantly harm the natural or built environment, owing to its nature, size or location, will only be permitted if the benefits outweigh the environmental impact.
18. *Policy 10 - Trees, woodlands and hedgerows.* Permission will not be granted for development that would adversely affect ancient semi-natural or ancient replanted woodland or veteran trees. Hedgerows which are visually, ecologically or biologically important, or historically or culturally significant, shall be retained unless there are overriding reasons for their removal. Development that would destroy or adversely affect a tree or woodland protected by a Tree Preservation Order, or is within a conservation area, will not be permitted unless the removal of the tree(s):
- would be of benefit to the character or appearance of the area, or

- is in the interest of good forestry or arboricultural practice

The Biodiversity Action Plans for Gloucestershire

19. The Gloucestershire LBAP is currently being updated, and the full habitat and species action plans are not yet available. Reference has therefore been made to the previous LBAP (2000) plans' actions and objectives for those habitats and species identified as being retained within the updated plans. Within the Gloucestershire LBAP tassel stonewort, bullfinch, song thrush, hedgehog, slow worm, dormouse and glow worm have their own Species Action Plan (SAP). Standing open water and ancient and/or species rich hedgerows have their own Habitat Action Plans (HAPs).

EXTENDED PHASE I HABITAT SURVEY

Methods

20. Phase I habitat survey is a survey method and habitat classification system that was developed by the Nature Conservation Council, now Joint Nature Conservation Committee (JNCC 2007) to map habitats and land use categories to a 'consistent level and accuracy'. Vegetation and habitats are mapped using standard colour codes, allowing rapid visual assessment of the extent and distribution of different habitat types. Where appropriate, Target Notes highlight features of interest. An extended Phase I habitat survey also records provisional signs of protected or notable species and assesses the suitability of the habitats on site and within the accessible surroundings to support such species.
21. The survey was undertaken on 1 October 2009, by a qualified and experienced ecologist of ecosulis ltd, Jen Weaver.

Assessment

22. Habitats within the site are assigned ecological values on a scale between International Value and Negligible Value. The value assigned to habitats and species adopts the recommendations for evaluating habitats given in the Institute of Ecology and Environmental Management (IEEM) guidelines for Ecological Impact Assessment (2006). The geographical value categories used in this assessment are: *International* (i.e. Europe), *UK*, *National* (England), *Regional* (South-West England), *County* (Gloucestershire), *District* (Cotswold), *Local* (Tetbury), and *Site* (i.e. within immediate the zone of influence only). Examples of the factors that are considered in defining such ecological values are given in Appendix II. Natural processes and interactions between physical and biotic factors are all considered in the

assessment. Values are assigned to all habitats likely to be directly or indirectly affected by the proposed development.

23. The site as a whole has also been assessed using criteria set out by Ratcliffe (1977) as a guide (Appendix III).

RESULTS

24. The following habitat types were recorded on site (key habitats are shown on Figure 2). They are broadly described below. Adjacent habitats are also described. Target Notes highlight features of interest and are also shown on Figure 2.

- Poor semi-improved grassland
- Mixed plantation woodland
- Hedgerows and trees
- Ponds

Poor Semi-improved Grassland

25. Semi-improved grassland is present across the site, the majority in the form of horse and occasionally cattle-grazed pasture (evidenced by the presence of tracks and poaching near ponds). These pastures are species poor, comprising false oat-grass (this species usually being present in the absence of grazing, but here where evidence of grazing is present, indicates an infrequent or light grazing regime and nutrient enrichment), cock's-foot, red fescue and bent species. Common nettle, hedge bindweed and hogweed were also noted in the fields. Piles of stones and garden debris lie on the edge of these fields in places (Target Note 1, Figure 2).
26. Small patches of tall ruderals including common nettle and broadleaved dock indicating nutrient enrichments are scattered within this habitat.

Mixed Plantation Woodland

27. Two small areas of woodland occur on site comprising European larch, Scots pine and cypress species with scattered holly, cherry cultivars, hawthorn, beech and elder. A defunct hedgerow and dry-stone wall run through the more northerly woodland plantation area. Ground flora is limited with occasional ivy and common nettle along with some bramble scrub.

Hedgerows and Trees

28. There are five native hedgerows (both intact and defunct) on site as well as a non-native hedgerow in the south of the site, and one along part of the northern boundary. These hedgerows are generally single width hedgerows with standard mature trees and are often associated with a bank and wall. Two hedgerows along

the eastern and western site boundary appear species rich, containing hawthorn, blackthorn, field maple, oak, small-leaved lime, rose species and ash (Target Note 2, Figure 2), although the eastern boundary hedgerow is dominated by lime trees and has sparse ground cover.

29. Standard trees are present across the site within the hedgerows, along the boundaries and within the pastures. Species present include ash, pedunculate oak, and walnut. Ground flora within the hedgerows appears limited, being dominated by ivy and nettles, although the survey was not carried out at an optimal time of the year for detecting ground flora.
30. 11 standard trees on site are mature or over-mature with dense ivy cover, split or rotten branches and apparent hollows. They enhance the ecological value of the site.

Ponds

31. Two ponds are present on site (Figure 2). Pond 1 is located within grazed pasture and shows signs of recent cattle poaching. It is shaded by mature ash and oak trees and is nearly entirely covered with duckweed. This pond contained around 1m depth of water at the time of survey and lies within a depression approximately 3m deep. Marginal vegetation is limited. Pond 2 lies beyond a hedgerow to the south of Pond 1. This pond was dry at the time of survey with scattered brooklime present within the mud. The wet mud and duckweed present within the depression suggests this pond had dried recently. An area of inundation grassland with creeping bent lies to the east of Pond 2. Pond 2 is shaded by mature ash trees to the north with surrounding elder and hawthorn scrub.

Adjacent Habitats

32. The site is set on the edge of Tetbury within a rural farmland landscape. Farmland lies immediately north of the site, with London Road forming the eastern boundary and industrial and commercial land beyond. Sir William Romney's School forms the western boundary of the site. To the south lies a residential area with associated gardens and infrastructure. Highfield farm and arable and grazed pasture with associated hedgerows lie to the north.
33. Highfield Farm is located on the northern boundary of the site and comprises buildings, hard-standing and gravel, and amenity grassland. Five buildings are present on the farm; the farmhouse, stable yard, storage shed, terraced cottages, and the Cherish Salon and adjoining cottage. The majority of buildings appear to be barn conversions and are now in residential or commercial use. Gardens at the rear and

front of the main farmhouse and cottages comprise amenity grassland with ornamental planting.

Field Observations and Consideration to Protected/Notable Species

Flora

34. No species listed upon Schedule 8 of the Wildlife and Countryside Act 1981, were noted during the Phase I habitat survey. No other notable species of flora were observed, and habitats across the site are generally improved and highly managed and are considered unlikely to support notable or rare species. The habitats on site are not considered suitable to support the UKBAP species identified as present in the local area on NBN gateway (such as cornflower, shepherd's-needle and caraway) due to the level of recent improvement to which the habitats have been subjected. The site has the potential to support tassel stonewort, which is included within the Gloucestershire LBAP, and is associated with ponds especially those that are dry during the summer months and disturbed. As the survey was carried out during a sub-optimal time of year for the identification of flowering plants it is possible the less disturbed hedgerow habitats on site could support notable flora.
35. No invasive species listed on Schedule 9 of the amended Wildlife and Countryside Act 1981 was observed on site at the time of the survey.

Mammals

Badger

36. A single badger latrine was found on site (Target Note 2, Figure 2), providing evidence that the site is used by badgers and is likely to fall within the territory of a local badger population. The site provides suitable foraging for badger in the form of grassland and berry-bearing shrubs and trees; several mammal paths were noted within grassland and at scrub and woodland edges. Dense vegetation at the time of survey may have obscured further signs of badger activity.

Dormouse

37. The woodland and western boundary hedgerow provide small areas of suitable habitat for dormice, but the small size and young age of the woodland trees, as well as a lack of understory structure and beneficial species such as hazel and honeysuckle, limits their potential to support dormouse. The woodland is isolated within the site owing to the gappy nature of adjacent hedgerows, which limits their suitability to provide part of a wider foraging area. The western boundary hedgerow is poorly connected to the wider hedgerow network owing to the presence of a large gap at its northern end. Furthermore, there are no significant

areas of woodland present within the local area, and there are no known records of dormice in the area. Dormice are therefore for unlikely to be present on site.

Bats

38. The site provides suitable foraging opportunities for bats in the form of pasture, woodland and hedgerows. However, the built-up area comprising the town of Tetbury combined with well lit roads and industrial and commercial sites to the south and east are likely to restrict the use of the site by commuting and foraging bats, especially those species more sensitive to disturbance. Linear features are present in the surrounding countryside, which provide commuting and foraging corridors for bats.
39. There are a number of trees on site suitable for roosting bats including mature and over-mature pedunculate oaks adjacent to Pond 1 and a mature walnut within horse-grazed fields near the main farmhouse.
40. Records of the rare greater horseshoe bat exist 4km from the site, as well as more common bat species. GCER hold records of four species of bat within 4km of the site, including the rare lesser horseshoe bat. Horseshoe bats are considered unlikely to use the site due to the existing light levels and low quality foraging habitats immediately surrounding the site.

Other Mammals

41. The site provides habitat for hedgehog (a UKBAP and LBAP species) and a range of small mammals. The grassland provides some suitability for brown hare, which may use the site in combination with the wider farmland landscape. There are no suitable habitats on site for otter and water vole and there is an absence of flowing water and connectivity to suitable habitats in the wider area.

Birds

42. Bird nesting opportunities are present within the hedgerows, grassland and trees on site. Common species including carrion crow, wood pigeon, robin, blue tit and blackbird were noted on site. The site is likely to provide habitat for a range of common bird species and potentially some declining species associated with the farmland setting such as bullfinch, song thrush, skylark, starling, tree sparrow and turtle dove. The site has potential to support house sparrow, a declining species on the Red-list of Birds of Conservation Concern (BOCC), which has been recorded within the local area on NBN Gateway.
43. No buildings are present on site; however the buildings within Highfield Farm to the north of the site provide suitable opportunities for nesting birds. All are

considered unsuitable or sub-optimal for barn owl, being generally very open or in constant use and lacking in features such as ledges and enclosed areas, which may provide potential roost sites.

Reptiles

44. The site provides some suitable habitat for common reptile species, namely slow worm, common lizard and grass snake. Much of the grassland is long and tussocky, which increases its suitability for reptiles. The ponds provide suitable amphibian prey for grass snake and patches of tall ruderals, woodland, hedgerows, stone walls and rubble piles provide good refuge, foraging and hibernacula habitat. In addition, the hedgerows on site provide good connectivity to surrounding habitats. Adjacent gardens and compost heaps also provide good habitat for common reptiles including breeding opportunities for grass snake. GCER hold records of grass snake and common lizard 1.1km and 2km from the site.

Amphibians

45. GCER holds records of the protected great crested newt within 500m of the site, recorded within the adjacent Sir William Romney's School grounds, and suitable habitat exists to support the species on site in the form of a cluster of field ponds (two on site and one just off site) for breeding, and long grassland and hedgerows for foraging and hibernation. The site also provides suitable habitat for common amphibian species, namely common frog, common toad (UK BAP species), and smooth and palmate newts.

Invertebrates

46. The site is unsuitable for the dingy skipper, brown argus, chalk-hill blue and small blue identified in the area by NBN gateway, due to a lack of suitable foodplant species and habitats, although suitable habitat exists on site for the small heath butterfly in the form of the foodplants, bent and fescue grasses. The structural diversity on site is likely to support a good range of common invertebrate species.

ASSESSMENT

Component Habitats

47. Table 3 (below) provides an evaluation of habitats on site and adjacent habitats, based upon the results of the desk based study and Phase I survey.

Table 3 Evaluation of Component Habitats

Habitat	Qualifying Criteria	Ecological Value
Poor semi-improved grassland	Semi-improved cattle and horse-grazed grassland. Provides suitable habitat for a range of local wildlife, including badgers, bats, birds, reptiles, amphibians and invertebrates. Habitat is common and widespread in the local area	Local Value
Mixed plantation woodland	Provides limited habitat for range of local wildlife including birds, more common bat species, badgers, invertebrates, reptiles and small mammals, as well as potential foraging and refuge habitat for amphibians such as great crested newt. Enhances the wider hedgerow network to some degree	Local value
Hedgerows and trees	Provides habitat for a range of local wildlife including birds, more common bat species, badgers, invertebrates, reptiles and small mammals, as well as potential foraging and refuge habitat for amphibians such as great crested newt. Two hedgerows are species rich. Species rich hedgerows are a priority habitat	Local Value
Ponds	Ponds 1 and 2 on site provide suitable habitat for amphibians such as the great crested newt as well as a foraging resource for common reptiles such as grass snake and habitat for common invertebrates. Pond 3 just off site to the north adds to the aquatic habitat network. Standing open water is a priority habitat	District Value

Habitat	Qualifying Criteria	Ecological Value
Adjacent habitats	Local farmland habitats with hedgerow networks and associated copses provide foraging, commuting opportunities and refuge for species such as badgers, moer common bat species, birds, invertebrates, reptiles and amphibians.	District Value
	Local buildings and gardens also provide foraging and refuge for species such as hedgehog, common reptiles, invertebrates and birds. Highfield Farm buildings provide opportunities for roosting bats and nesting birds	Local Value

Overall Site Evaluation

48. The site is of moderate size in an ecological context, and comprises a range of habitats related to the farm environment, including grassland, hedgerows, trees and ponds. Habitat diversity is moderate, and species diversity is likely to be correspondingly moderate.
49. Naturalness, fragility and permanence are limited on site, with habitats present being generally man-made or heavily managed, common and widespread in the local area. However, the standard trees, hedgerows, ponds and grassland provide some elements of these characteristics. No rare habitats were noted on site, although ponds occurring within this context (farmland) are declining. If protected species, such as the great crested newt, were found to be present then this could provide the site with an element of rarity.
50. The ecological interest of the site is related to:
- The presence of two species rich hedgerows on site
 - The use of the site by badgers (evidenced by a latrine present on site)
 - The presence of habitats (ponds and surrounding terrestrial habitats, such as hedgerows and grassland) suitable for amphibians, including great crested newt
 - The suitability of mature trees as roosting habitat for bats, and the surrounding grassland, woodland and hedgerows as suitable foraging and commuting habitats for common bat species

- The suitability of the grassland, hedgerows and woodland as nesting and foraging habitats for birds
 - The suitability of the grassland, ponds, hedgerows and woodlands mosaic for common reptile species
 - The suitability of the grassland, ponds, hedgerows and woodlands mosaic in providing habitats for common invertebrates
51. Based on the survey results and following an assessment of the site, the habitats present are generally of ecological value from a Local to District level.

ECOLOGICAL CONSIDERATIONS AND RECOMMENDATIONS

52. This section considers the ecology of the site and adjacent habitats with respect to development proposals and local plan policies to ensure that impacts on ecology are avoided and / or mitigated within any development plans.

Phase 2 Surveys

53. Recommendations for Phase 2 surveys include:
- A full hedgerow survey to assess the importance of the hedgerows under the Hedgerow Regulations 1997
 - A full badger survey to determine whether any setts occur on site or within the immediate surroundings
 - Bat surveys to include: A daytime assessment and survey. Evening emergence/dawn swarming survey of trees may be required
 - Presence/likely absence survey for reptiles
 - Habitat Suitability Index (HSI) assessment of ponds on site and great crested newt presence/absence survey

Other Considerations

54. Species including nesting birds should be taken into consideration during any disturbing works on site, such as vegetation (scrub) clearance. Clearance should avoid the sensitive stages of these species life-cycles, namely the bird nesting season (generally occurring March to September). If unavoidable clearance is carried out during the nesting season, then a check for nesting birds should be undertaken.

CONSIDERATION IN RELATION TO THE RELEVANT LOCAL PLAN POLICIES

55. *Policy 1 – Natural Resources.* The site is of moderate size and comprises a range of habitats, and trees, hedgerows and ponds on site increase its naturalness and

fragility. The site is located within the Cotswolds AONB and any development will therefore need to manage biodiversity on site.

56. *Policy 4 – Environmental Impact.* The proposed development is likely to affect the habitats on site, and therefore consideration should be given to ways of minimizing impacts and mitigating those that remain to ensure that adverse environmental impacts are avoided wherever possible. The ecological enhancement opportunities include replacement pond creation, provision of bat and bird boxes and appropriate planting to reduce the environmental impact of the development.
57. *Policy 10 Trees, woodlands and hedgerows* applies to the site as the site features mature trees, mixed plantation woodland and hedgerows. Consideration should therefore be given to the retention of ecologically important hedgerows and trees. The recommendations include retaining all trees with potential to support roosting bats. A buffer should be provided around the retained trees to protect them during construction and operational stages of development.
58. The development is unlikely to impact Newton Hill Banks KWS, as the site does not provide suitable habitat to support invertebrates supported by the designated site, such as chalk-hill blue and brown argus.

PHASE 2 SURVEYS

59. This section of the report details the results of the Phase 2 surveys undertaken to date, including bat and great crested newt surveys. Methods and results are given followed by an assessment of the use of the site by any species found, and the contribution of the site to the maintenance of the species recorded. Recommendations are then provided based on the assessment. Due to requirements for project timings a number of the recommended surveys have not yet been carried out, and are proposed for spring and summer 2010. Where surveys have not been undertaken the proposed methodology and timings are outlined within the section below, along with a preliminary assessment based on results from the Phase I habitat survey and extensive knowledge of the ecology of the species.

METHODS

Hedgerow Survey

60. A full hedgerow survey of the site will be carried out between April and September 2010 in order to ensure notable and indicative species are identified (surveying between April and May is preferred, in order to pick up the majority of woodland flora).
61. All hedges on site will be mapped and surveyed by an experienced ecologist of *ecosulis* ltd. Hedges must have existed for 30 years or more and lie adjacent to either common land, protected land, agricultural land, forestry, land where horses, donkeys or ponies are kept or by a footpath or byway in order to qualify as hedgerows and be subject to the Hedgerow Regulations 1997. In addition, they must not lie on the boundary of a dwelling and must be over 20m in length or, if not, must meet another hedge at both ends.
62. Hedgerows will be surveyed for woody species, ground flora, isolated trees, length and connectivity with other hedgerows, woodlands and ponds according to the Hedgerow Survey Handbook (2007). Woody species will be surveyed within a central 30m section of each hedgerow. Where the hedgerow exceeds 100m in length, two 30m sections will be surveyed and the average number of woody species was calculated for the purposes of the assessment.

Badger Survey

63. A badger survey is proposed for the site and immediate adjacent habitat in spring/summer 2010. A systematic walk of the site will be undertaken to check for the presence of signs of badger, such as setts, latrines, signs of foraging, tracks and

prints. The survey will follow recommended guidelines in Harris *et al.* (1989). The survey will concentrate on areas that are likely to support badger or signs of badger such as hedgerows, woodland, dense scrub, raised banks and other boundary features. During the survey suitable habitat will be carefully examined for signs of use, including the presence of setts, tracks, prints, hair, latrines and foraging signs.

64. Any badger setts will be recorded for location, status, number of holes present and level of activity according to Harris *et al.* (1989) and Neal and Cheeseman (1996).

Bat Surveys

Daytime Bat Assessment of Trees

65. ecosulis ltd undertook a daytime bat assessment and survey of mature trees on site on 22 January 2010. The trees on site were assessed for their suitability to offer roost sites for bats. Consideration was given to the age and structure of the trees and the presence of features such as crevices, holes, fissures and arboreal ivy. The trees were then rated as having high, medium, low or negligible suitability for roosting bats, using the criteria detailed in Appendix VII as a guide. Following this assessment a ground-based search of the bases of the trees was undertaken for evidence of bat use such as droppings, urine and grease staining, foraging remains or bats themselves.
66. An assessment of the ecological context of the site was also undertaken with notes made with respect to the suitability of on site habitats and surrounding habitats to support foraging and commuting bats. The ecological context of a structure, such as a tree, can significantly influence the likelihood of it supporting roosting bats. For example, a structure of low suitability is more likely to be used if it is set within an area of high quality habitat with few alternative roosting opportunities. Likewise, a highly suitable structure is less likely to be used by roosting bats if it is isolated within an area providing no suitable foraging or commuting habitat.
67. All assessment and survey methods followed current best practice guidance including those outlined within the Bat Mitigation Guidelines (English Nature, 2004), the Bat Workers' Manual (JNCC, 2004) and the Bat Surveys Good Practice Guidelines (Bat Conservation Trust, 2007).
68. Methodologies will follow current best practice guidance including those outlined within the Bat Surveys – Good Practice Guidelines (Bat Conservation Trust, 2007) Bat Mitigation Guidelines (English Nature, 2004) and the Bat Workers' Manual (JNCC, 2004).

Reptiles

69. A survey for reptiles will be undertaken during the optimal survey months, which generally include April, May and September, subject to weather conditions. This will identify any species that may be using the site, the extent of use, and to give an estimate of population sizes in order to assess the impacts on these species and to inform mitigation proposals if necessary. For the purposes of this report, it has been assumed that reptiles are present on site
70. A presence/likely absence survey would utilise artificial refugia, which would be laid out across the site and checked during seven visits in suitable weather conditions. The survey would follow guidelines in Gent and Gibson (2003), and the artificial reptile refuges would be distributed around the site within areas of suitable habitat such as grassland, ruderal vegetation and scrub.
71. Within each area, refuges will be positioned to ensure that they received direct sunlight in the morning and/or evening. Following a period of approximately one week, seven site visits will be made in optimum conditions to check beneath the refuges for signs of reptile presence. During each visit, presence/absence together with the species and numbers seen (where applicable) will be recorded.
72. During the reptile checks any signs of reptile presence will be noted. Any sightings or evidence of reptile presence, such as sloughed skins will be recorded.

Great Crested Newt

Great Crested Newt Habitat Suitability Index (HSI) Survey and Assessment

73. Two ponds on site and a further pond just outside the site boundary at the northern corner were surveyed in January 2010. The HSI for the great crested newt was developed by Oldham et al. (2000). The HSI is a numerical index, for which scores between 0 and 1.0 indicate the suitability of the habitat. The scoring system is shown in Table 4 below.

Table 4: Great Crested Newt Habitat suitability Index (HSI) score summary (Oldham, 2000)

HSI score	Pond suitability
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

74. The final HSI score gained for each water body can be used to predict the suitability of the habitat to support great crested newt. The HSI for the great crested newt incorporates ten suitability indices, all of which are factors thought to affect great crested newts and these were recorded for each pond in site, including the location of the water body, water body area, water body drying, water quality, shade, presence of water fowl, presence of fish, presence of nearby water bodies, adjacent terrestrial habitat and the presence of macrophytes.
75. The HSI for great crested newts is not a substitute for newt surveys. In general, water bodies with high HSI scores are probably more likely to support great crested newts than those with low scores; however, the calculation is not precise enough to allow the conclusion that any water body with a high score will probably support newts, or that any pond with a low score probably will not.

Great Crested Newt Presence/Absence Survey

76. A great crested newt presence/absence survey comprising four evening and morning visits will be undertaken between mid-March and mid-June 2010, with at least half the visits undertaken in the optimum period between mid-April and mid-May. All visits will be undertaken by qualified experienced staff of ecosulis ltd, working under a Natural England Great Crested Newt survey licence. The survey methods will follow guidelines set out by English Nature (2001).

Bottle trapping

77. Bottle-traps constructed from 2 litre plastic bottles will be secured around the pond margins at intervals of approximately 2m where water levels allow. Bottles will be angled to allow for a bubble of air. The traps will be left overnight and checked the following morning. Any newts found will be identified to species and gender, counted and recorded before being released.

Torch Searches

78. Night time searches by torchlight using high power torches (minimum 500,000 candlepower) will be undertaken to search the ponds, including areas of open water and margins, for the presence of newts. The perimeter of each pond will be walked slowly (where access allowed) and all species seen, numbers and where possible gender and life-stage, will be recorded.

Egg Searches

79. Submerged vegetation suitable for egg-laying will be recorded within each water body. Once presence of great crested newt eggs is confirmed this method will cease in order to prevent excessive damage to eggs.

Population Size Class Assessment

80. If great crested newt presence is established, an additional two survey visits will be undertaken to establish the population class size present.

Phase 2 Survey Assessment Methodology

81. Habitats and species populations within the study area are assigned ecological values on a scale between International Value and Negligible Value. The values assigned to habitats and species adopts the recommendations for evaluating habitats given in the IEEM guidelines for Ecological Impact Assessment (2006). The geographical value categories used in this assessment are: International (i.e. Europe), UK, National (i.e. England), Regional (South West), County (Gloucestershire), District (Cotswolds), Local (Tetbury), and Site (i.e. within immediate the zone of influence only). Examples of the factors that are considered in defining such ecological values are given in Appendix IV. Natural processes and interactions between physical and biotic factors are all considered in the assessment. Values are assigned to all habitats likely to be directly or indirectly affected by the proposed development.
82. An assessment of the presence of animal activity is based on visual evidence at the time of the survey(s), and apparent suitability of habitats present within the survey area. The assessment also considers the surrounding land and level of connectivity.

RESULTS, ASSESSMENT AND RECOMMENDATIONS**Hedgerows**

83. The Phase 1 habitat survey recorded six hedgerows on site, and these are mapped on Figure 2. Two species rich native hedgerows were recorded, and these form the eastern and western boundaries of the site. Part of the northern boundary is

formed by a non-native leylandii hedge. Internal hedgerows within the site comprise three species poor native hedgerows, of which two are defunct, with large gaps. All hedgerows on site contain associated standard trees.

84. Hedgerows that comprise more than 80% native species are considered to be UK BAP priority habitat; as such, the five native hedgerows (hedgerows H1-H5) on site are considered to be UKBAP habitat, and are likely to be important under the hedgerow regulations. Ancient and/or species-rich hedgerows are an LBAP habitat and as such the two species rich boundary hedgerows are considered to be LBAP habitat; the remaining hedgerows are not considered LBAP habitat due to their lack of woody and herbaceous species diversity.
85. The network of hedgerows on site is considered to be of Local value due to the presence of UK BAP and LBAP qualifying hedgerows and the diversity of structure and species provided by the habitat on site, which contributes to the wider hedgerow network in the local area.

Recommendations

86. It is recommended that hedgerows are retained within the proposals wherever possible, and this should include in particular the two species rich hedgerows. Planting of trees and scrub could be considered along the northern and southern boundaries to provide additional corridors and provide compensation for the loss of internal hedgerows. Retained hedgerows should be protected with buffers where space allows. Additional planting to enhance defunct hedgerows should be considered.

Badgers

87. The Phase I habitat survey did not record the presence of any setts on site, but a latrine was recorded on the western boundary, indicating that the site is used by badgers. The grassland, copses and hedgerows all provide suitable foraging habitats for badgers, and are well connected to extensive suitable surrounding farmland habitat.
88. Badger group territory sizes vary widely, however a rough guide for the south-west is 50ha (based on a national average size), meaning that the site may provide up to 20% of a local badger group's territory. Whilst the site is suitable for badgers, the apparent low level of use, the lack of setts and the abundance of adjoining suitable habitats with no barriers to movement indicate that it is unlikely to form a significant part of any badger territory. The site is therefore considered to be of Site Value to badgers.

Recommendations

89. No setts have been recorded on site, but because of the use of the site by badgers, they will need to be considered during construction i.e. ensuring exposed trenches include a means of escape and ceasing works one hour before sunset so as not to disturb badger foraging activity. A Precautionary Method of Working (PMW) should be drawn up to ensure badgers are considered during daily construction operations.
90. Badgers should also be considered in the design plans of future development and planting schemes, for example using native fruit and nut-bearing species and ensuring a suitably-sized corridor is retained around the edges of the site. This also offers benefits to other species known to occur in the area, reptiles, invertebrates, bats and birds.

Bat Surveys

Daytime Bat Assessment of Trees

91. The site supports a number of trees of varying suitability for bats, from Low to Medium suitability. Suitable commuting and foraging habitats are also present in the form of trees, hedgerows and grassland. Table 5 below gives a summary of the assessment of mature trees on site, and considers their potential to support species of bat (Figure 3 provides tree locations). Where present on site tag numbers have been provided. Other trees on site were assessed as having negligible suitability.

Table 5. Assessment of Mature Trees on Site, 22 January 2010

Tree number	Field notes	Suitability to bats	Evidence of bats
T1	Ivy clad mature ash with split limbs and rot holes	Medium	None
T2 (tag 1786)	Mature oak with cracked bark and split limbs. No ivy present	Low	None
T3 (tag 1783)	Mature ash with moderate ivy cover and a large crack and split limbs potentially leading to a cavity	Medium	None
T4 (tag 1770)	Dead pedunculate oak tree with exposed bark and dead wood. Several rot holes and crevices recorded	Medium	None

Tree number	Field notes	Suitability to bats	Evidence of bats
T5 (tag 1769)	Mature pedunculate oak with a dead branch, exposed bark and some rot holes	Low	None
T6 (tag 1768)	Mature pedunculate oak with no ivy cover and few split limbs	Low	None
T7	Mature oak, ivy clad with exposed bark, cracks and a dead branch	Medium	None
T8	Mature oak, ivy clad with exposed bark and a dead branch	Low	None
T9	Mature walnut with a large rot hole located at the top of the trunk. Split limbs	Medium	None
T10	Two mature ivy clad oak trees with split limbs and rot holes	Medium	None

92. 11 mature trees on site were assessed as ranging from low to medium suitability for roosting bats; six trees have Medium suitability (Trees T1, T3, T4, T7, T9 and T10) and four have Low suitability (Trees T2, T5, T6 and T8). No evidence of bats was recorded.

Ecological Context of the Site

93. The site is located within a rural setting, with arable fields on and adjacent to the site. The grassland, hedgerows and trees on site provide suitable foraging for bats and commuting habitat. Similar habitats surround the site to the north, east and west. Residential properties and associated gardens lie to the south of the site. The mature trees on site are associated with the hedgerows on site, increasing their potential to support roosting bats.

94. Anecdotal evidence was provided by a local resident, who stated that the site is regularly used by foraging bats.

95. The site is considered likely to support low numbers of common bat species using the site for foraging in combination with the wider habitats, especially that to the north. The urban edge location of the site and presence of street lighting along the eastern site boundary is likely to deter its use by species less tolerant of disturbance such as the rarer horseshoe species. The hedgerows on site provide suitable commuting habitat for bats, however these hedgerows have limited

connectivity with wider habitats, reducing the sites potential to support commuting bats. No trees on site offer high suitability for roosting bats, and therefore the site is likely to be used only by transient individuals for roosting, if at all. Suitable roosting opportunities for bats are provided in adjoining habitats in the form of farm buildings and trees. The site is therefore considered to be of Local Value for common species of bats, providing suitable foraging and roosting habitat and limited commuting habitat in combination with the wider area. Given the limited habitat connectivity and light spill, the site is unlikely to be used by horseshoe bats.

Recommendations

96. It is recommended that the trees with Low to Medium suitability for roosting bats be retained and incorporated into the development plans. If this is not possible or if the trees are likely to be isolated by development, then it is recommended that a PMW be compiled for removal of these trees. This will include the appointment of bat and tree climbing specialists to carry out a climbing inspection or dawn swarming survey of the trees with Medium suitability to check for the presence of bats prior to works, and soft felling techniques for all trees with Low suitability.
97. Should evidence of bats be recorded in any of the trees being felled, works would need to halt and further advice provided by the appointed bat specialists. A Natural England licence may be required before works can commence, which would need further supporting survey data.
98. A buffer and fencing should be provided around the retained trees to protect them during construction and operational phases of development. Any lighting required within the scheme should be kept to a minimum and carefully consider bats (BCT, 2008).
99. The boundary hedgerows provide some limited commuting habitat for bats. If they are proposed for removal, severance or subject to increased lighting then consideration should be given to re-instating suitable flight lines within any future proposals for the site through replacement planting, particularly if flight lines lead directly to trees that offer suitable roosting opportunities. Provision for further roosting habitat could be provided within the development, primarily in the form of bat boxes on existing retained trees and bat features within new builds.

Reptiles

100. A reptile presence/absence survey has not yet been undertaken. Based on the Phase I survey results, the site provides suitable habitat for foraging reptiles in the form of grassland, trees stone walls, rubble piles, hedgerows and woodland.

101. The majority of the site is known to be grazed, and is therefore of limited value for reptiles, but the boundary features and associated tall grass, copses and ponds provide good habitat for slow worm, grass snake and common lizard. Given the managed nature of the site it is likely to be used by low populations of common species in association with habitats in the wider surroundings. It is therefore considered that the site is of Local Value (at most) with respect to reptiles.

Recommendations

102. Common species of reptile are protected partially under the Wildlife & Countryside Act 1981 (as amended), under which it is an offence to recklessly kill or injure a reptile. Slow worm is also a UKBAP priority species.
103. Due to the assumed presence of low numbers of reptiles on site, it is recommended that a relocation strategy be implemented prior to any works commencing. The details of any relocation strategy would be based on results of a reptile survey, and agreed with the Local Planning Authority prior to implementation, however it is likely to include a strategy of habitat manipulation. The exercise should be carried out between April and September subject to suitable weather.
104. Retention of hedgerows and associated buffers would be beneficial to reptiles to allow movement across and off-site, and provision of areas of less intensively managed grassland, scrub and trees would provide good quality habitat patches. These should be linked with off-site habitats.

Amphibians

Great Crested Newt Habitat Suitability Index (HSI) Survey and Assessment

105. Pond 1 is a dew pond located within grazed pasture and is shaded by mature ash and oak trees with little macrophyte vegetation consisting of duckweed. The pond is approximately 8m x 15m and contained around 3m depth of water at the time of survey. The pond was flooding into the field at the time of survey. Marginal vegetation is moderate. Waterfowl and fish appear to be absent and the pond appears to have good water quality.
106. Pond 2 is another dew pond, which lies beyond a hedgerow to the south of Pond 1. This pond is approximately 15m x 15m and was 2m deep and flooding into the surrounding field during the survey. Brooklime was present on the flooded margins of the pond. An area of inundation grassland with creeping bent lies to the east of Pond 2. Pond 2 is shaded by mature ash trees to the north with surrounding elder

and hawthorn scrub. Waterfowl and fish appear to be absent and the pond had good water quality.

107. A further pond (shown on Figure 1 as Pond 3) is located just outside the site boundary at the northern corner, within a small copse between the grounds of Highfield Farm and Sir William Romney's School. This pond is approximately 25m x 15m with moderate water quality and some macrophyte content. The pond was flooded at the time of the survey. Mature ash and scrub surround the pond. Waterfowl and fish were absent and moderate suitable newt habitat surrounds the pond.
108. The great crested newt HSI criteria for each pond is detailed within Table 6 below. Calculations can be found within Appendix VII.

Table 6: Great Crested Newt HSI index for each pond

Habitat suitability criteria	Pond 1	Pond 2	Pond 3
Location	Zone A	Zone A	Zone A
Pond area	120m ²	225m ²	375m ²
Drought	Sometimes dries	Annually dries	Sometimes dries
Water quality	Good	Good	Moderate
Shade	50%	65%	65%
Waterfowl	Absent	Absent	Absent
Fish	Absent	Absent	Absent
Pond Count	3	3	3
Terrestrial Map	Good	Poor	Good
Macrophyte Score	20%	10%	10%

Assessment

109. The HSI assessment indicates that Pond 1 has 'average' to 'good' suitability to support great crested newt, with a score of 0.68. The HSI score for Pond 2 indicates that it has 'below average' suitability to support great crested newt, with a score of 0.56. Pond 3 has 'good' suitability to support great crested newt with a score of 0.72. Details of the HSI calculations can be found in Appendix VII.

Recommendations

110. Great crested newts are protected under the Wildlife & Countryside Act ((1981) as amended) and the Conservation (Natural Habitats &c.) Regulations 1994 (as amended) from deliberate capture, injury and killing, intentional or reckless disturbance, intentional or reckless obstruction of access to any structure or place which any such animal uses for shelter or protection, and deliberate damage or destruction of a breeding site or resting place.
111. One pond on site has been assessed as having 'average' to 'good' suitability to support great crested newt and a further pond on site has 'below average' suitability to support great crested newt. One pond just off site has 'good' suitability to support great crested newt. The habitats surrounding the ponds include long grassland, dry stone walls and hedgerows, which are suitable for foraging, sheltering and hibernating great crested newt.
112. Suitable habitats to support the great crested newt have been identified on site and as such a presence/absence survey will be undertaken on site. Any proposals affecting aquatic and terrestrial habitats (taken to be up to 500m from ponds known to support great crested newts) may require a licence from Natural England. As for bats, applications for development licences can only be made once planning permission has been granted (with no outstanding conditions relating to nature conservation), and Natural England aim to process licence applications within 30 working days.
113. Ponds should be retained on site where possible, as the loss of a breeding pond is considered to be a high scale impact (English Nature, 2001), and should great crested newts be present a detailed mitigation strategy will need to be produced to accompany any licence application to ensure that the population on site is protected during works and will remain at favourable conservation status within any proposals. Given the presence of suitable habitat on site and records in the local area consideration should be given to the potential presence of this species within any masterplan design as the requirements are likely to have a significant impact on any proposals. Replacement ponds will need to be provided for any lost (preferably two replacement ponds for each one lost) and these will need to be created at least six months in advance of any loss. Suitable adjacent terrestrial habitat will need to be retained in the form of grassland, scrub and trees, and it is considered that a minimum of 0.5ha would need to be provided, with links to the wider area maintained and enhanced where possible. A detailed capture/exclusion methodology will need to be drawn up to ensure that no newts are harmed during

the construction phase, and a long-term habitat management and monitoring scheme will need to be implemented. Such works can have serious implications on development timescales.

114. Consideration should be given to integrating the drainage system on site. The ponds on site are dew ponds and therefore rely on surface run off to maintain them. A drainage system could therefore be incorporated to direct clean water towards any retained ponds as part of a Sustainable Urban Drainage Scheme (SUDS).

SUMMARY AND ASSESSMENT

PHASE 2 SURVEYS

Species/ habitat	Survey Results	Ecological Value
Hedgerows	Two hedgerows are species rich. These hedgerows are likely to be important under the Hedgerow Regulations.	Local Value (preliminary)
Badger	Site used for foraging in combination with a wider territory	Site Value (preliminary)
Bats	Site may be used for foraging and commuting common bat species in combination with the wider area, but the site is unlikely to form a significant route due to its proximity to the urban area of Tetbury. The site has potential for a tree roosts	Local Value
Other mammals e.g. hedgehog, brown hare, dormouse	The site provides limited suitable habitat for hedgehog and brown hare in the form of semi-improved grassland, hedgerows and trees. Dormouse are unlikely to be present due to the small, isolated areas of suitable habitat	Site Value
Birds	Bird nesting opportunities are present within the hedgerows and trees, and the site may support a number of declining farmland species	Local Value

Species/ habitat	Survey Results	Ecological Value
Great crested newt	A moderate population is possible within Ponds 1 and 3. These ponds are suitable to support breeding great crested newt. Pond 2 provides sub-optimal breeding habitat, but is likely to be used for foraging by any local population	Local Value (preliminary)
Reptiles	The site is likely to support a small to medium population of common species of reptiles. The site is likely to be used in combination with the wider area	Local Value (preliminary)
Invertebrates	The structural diversity on site is likely to support a good range of common invertebrate species	Site Value

RECOMMENDATIONS AND FURTHER ENHANCEMENT OPPORTUNITIES

Receptor (species and habitats likely to be affected by development)	Recommendations	Further enhancement Opportunities
Badger	PMW during construction Further monitoring of badger activity	Buffer adjacent to hedgerow boundaries Appropriate planting scheme (incorporating fruit bearing species) Long-term habitat management plan
Bats	Trees with low-medium suitability for roosting bats should be retained. If this is not possible, trees should be removed under a PMW. Wildlife corridors and a sensitive lighting scheme should be included in the proposals	Provision of roosting opportunities, such as bat boxes Long-term habitat management plan

Receptor (species and habitats likely to be affected by development)	Recommendations	Further enhancement Opportunities
Birds	Vegetation clearance is timed to avoid sensitive stages of life cycles	Provision of nesting opportunities, such as bird boxes. Appropriate planting scheme. Long-term habitat management plan
Reptiles	Reptile survey to inform any strategies, for example relocation, prior to works PMW during construction	Buffer adjacent to hedgerow boundaries Provision of log piles (refuges) within buffer Long-term habitat management plan
Amphibians (great crested newt)	A presence/likely absence survey for great crested newt will be undertaken between mid-March and mid-May	Replacement pond creation, mitigation area for great crested newt and integration into SUDS

LIMITATIONS OF SURVEYS

115. This method for assessing trees for their suitability to support bats aims to provide an indication of the potential value of a structure to bats; however, it cannot definitely state whether bats are using any trees as roost sites. Some features were impossible to reach from the ground; therefore a detailed inspection could not be undertaken.
116. The HSI assessment guidance recommends certain times of the year for several of the field scores, for example macrophyte cover should be assessed between March and May. The HSI survey was limited due to the ponds on site being flooded at the time of survey.
117. Some Phase 2 surveys are yet to be undertaken; therefore the assessment of these components is based on habitat conditions during the Phase 1 survey and knowledge of the ecology of the species.
118. This report records wildlife found during the survey and anecdotal evidence of sightings. It does not record any plants or animals that may appear at other times of the year and were therefore not evident at the time of visit. Some species that

might use the site or be apparent at other times of year, or only in certain years, would not have been detected.

119. The behaviour of animals can be unpredictable and may not conform to standard patterns recorded in current scientific literature. This report therefore cannot predict with absolute certainty that animal species will occur in apparently suitable locations or habitats or that they will not occur in locations or habitats that appear unsuitable.
120. The advice contained in this report relate primarily to factual survey results and general guidance only. On all legal matters you are advised to take legal advice.



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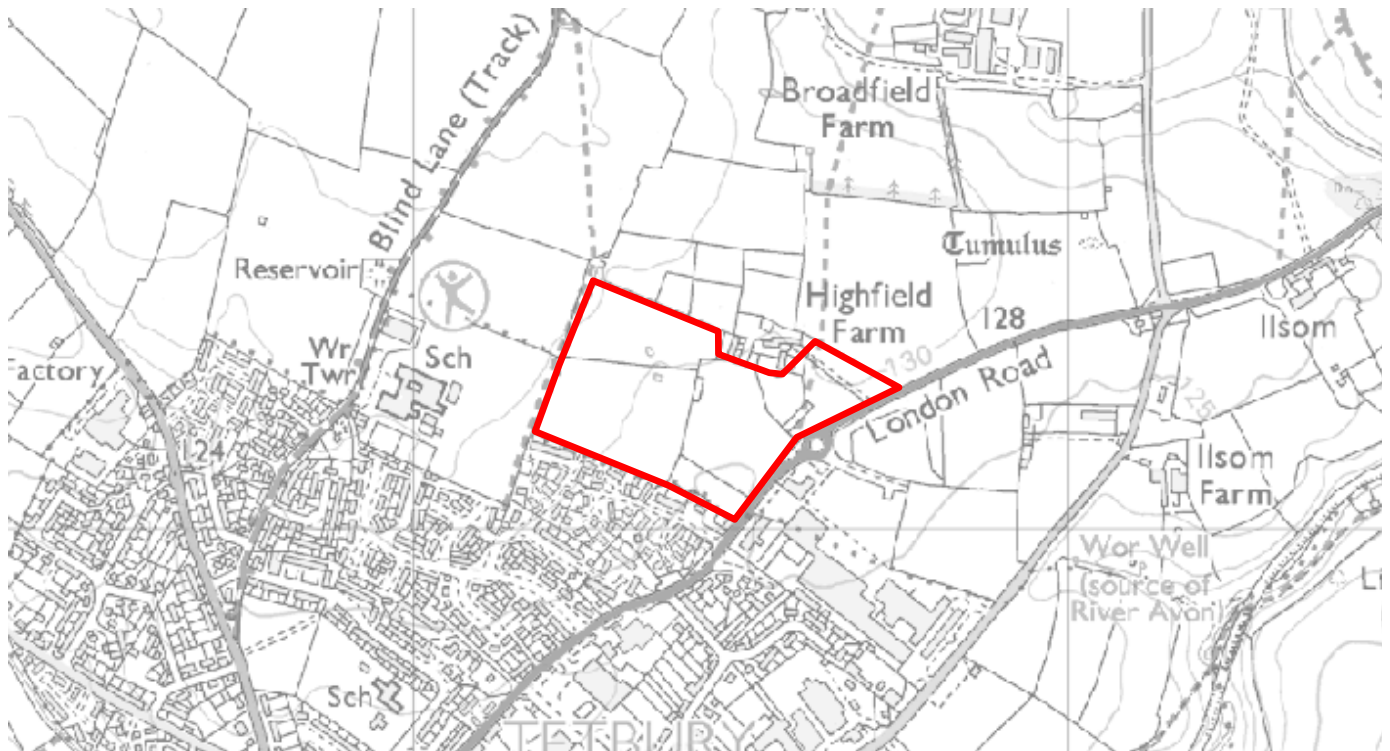
The Rickyard, Newton St Loe,
Bath, BA2 9BT
Tel: 01225 874040 Fax: 01225 874554

Key

 Site Boundary



Client	Fay and Son Ltd	
Project	Land North of Tetbury	
Title	Site Location	
Date	Scale	Figure
October 2009	SCHEMATIC ONLY	I



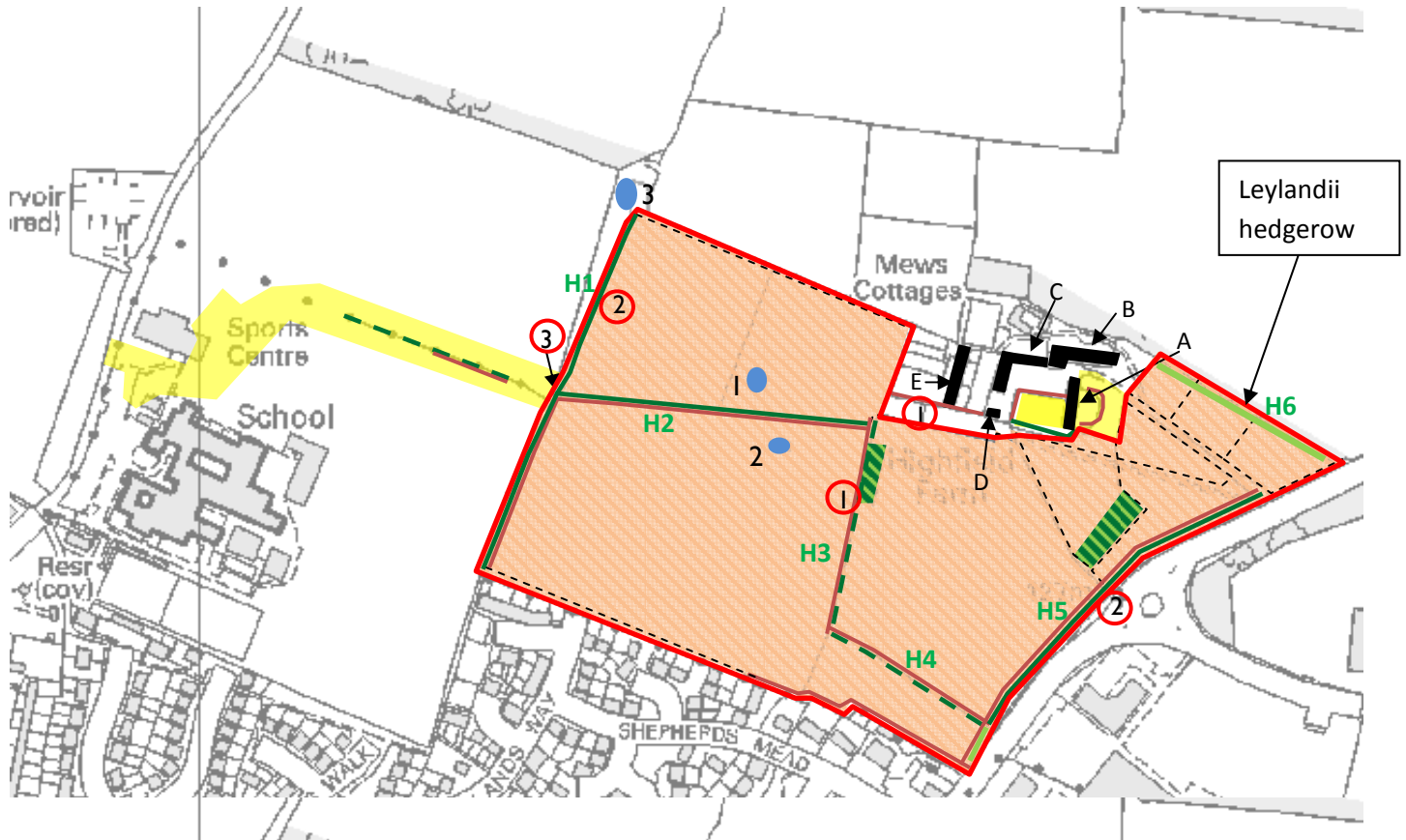


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Client	Fay and Son Ltd	
Project	Land North of Tetbury	
Title	Phase I habitat map	
Date	Scale	Figure
October 2009	SCHEMATIC ONLY	2

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Key	
	Buildings
	Gravel/Hard-standing
	Mixed plantation woodland
	Poor semi improved grassland
	Amenity grassland
	Intact, native hedgerow
	Defunct, native hedgerow
	Non-native hedgerow
	Dry-stone wall
	Pond
	Target note





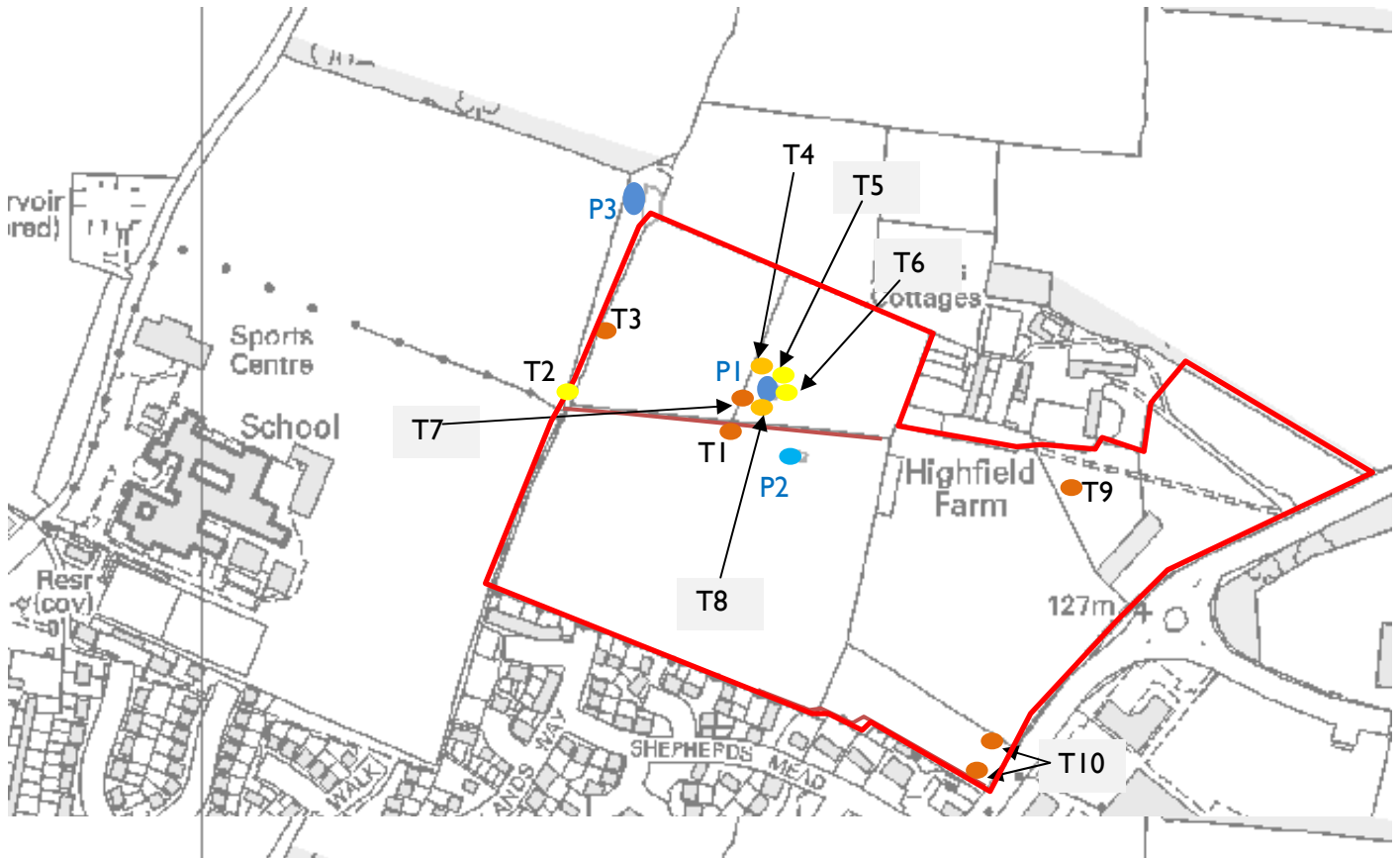
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Client	Fay and Son Ltd	
Project	Land North of Tetbury	
Title	Daytime Bat and HSI Plan	
Date	Scale	Figure
January 2010	SCHEMATIC ONLY	3

Key

- Mature Trees with Medium potential as bat roosts
- Mature Trees with Low-Medium potential as bat roosts
- Mature Trees with Low potential as bat roosts
- Pond with average suitability for great crested newt
- Ponds with 'below average' suitability for great crested newt
- Site boundary

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APPENDIX I: SPECIES LIST (SPECIES RECORDED ON SITE DURING PHASE 1 AND PHASE 2 SURVEYS)

Flora	
Common name	Scientific name
Ash	<i>Fraxinus excelsior</i>
Beech	<i>Fagus sylvatica</i>
Bent-grasses	<i>Agrostis species</i>
Blackthorn	<i>Prunus spinosa</i>
Brook lime	<i>Veronica beccabunga</i>
Cherry cultivars	<i>Prunus species</i>
Cock's-foot	<i>Dactylis glomerata</i>
Common nettle	<i>Urtica dioica</i>
Cypress	<i>Euphorbia cyparissias</i>
Duckweed	<i>Lemna minor</i>
Elder	<i>Sambucus nigra</i>
European larch	<i>Larix decidua</i>
False oat-grass	<i>Arrhenatherum elatius</i>
Field maple	<i>Acer campestre</i>
Hawthorn	<i>Crataegus monogyna</i>
Hedge bindweed	<i>Calystegia sepium</i>
Hogweed	<i>Heracleum sphondylium</i>
Holly	<i>Ilex aquifolium</i>
Ivy	<i>Hedera helix</i>
Penduculate oak	<i>Quercus robur</i>
Red fescue	<i>Festuca rubra</i>
Rose	<i>Rosa</i>
Scots pine	<i>Pinus sylvestris</i>
Small-leaved lime	<i>Tilia cordata</i>
Walnut	<i>Juglans regia</i>

Fauna	
Common name	Scientific name
Black bird	<i>Turdus merula</i>
Blue tit	<i>Parus caeruleus</i>
Carrion crow	<i>Corvus corone</i>
Robin	<i>Erithacus rubecula</i>
Wood pigeon	<i>Columba palumbus</i>

APPENDIX II: DEFINING ECOLOGICAL VALUES

Institute of Ecology and Environmental Management

- I. The examples contained in the table below are only for general guidance and other considerations may apply, e.g. features of low value in isolation but are subject to cumulative national decline may be afforded higher values in certain circumstances.

Level of Ecological Value	Examples of Criteria
International	<ul style="list-style-type: none"> • An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, Ramsar site, Biogenetic Reserve) • A sustainable area of a habitat listed in Annex I of the Habitats Directive, or smaller areas of such habitat that are essential to maintain the viability of a larger whole • A sustainable population of an internationally important species, e.g. a UK Red Data Book species, species listed under categories 1 or 2 of the UK BAP, or listed under Annex IV of the Habitats Directive • Sites supporting a breeding population of internationally important species or supplying a critical element of their habitat requirements
National	<ul style="list-style-type: none"> • A nationally designated site (SSSI, ASSI, NNR, MNR) or a discrete area that meets the selection criteria for national designation (e.g. SSSI selection guidelines) • A sustainable area of a priority habitat identified in the UK BAP, or smaller areas of such habitat that are essential to maintain the viability of a larger whole • A sustainable population of a nationally important species or a site supporting such a species, i.e. a species listed on Schedules 5 and 8 of the W&CA (as amended) which is a UK Red Data Book species that is not listed as being of unfavourable conservation status in Europe, of uncertain conservation status or of global concern in the UK BAP • A non-Red Data Book species that is listed as occurring in

Level of Ecological Value	Examples of Criteria
	15 or fewer 10km squares in the UK (categories 1 and 2 of the UK BAP). Also sites supporting a breeding population of such a species or supplying a critical element of their habitat requirements
Regional	<ul style="list-style-type: none"> • Sustainable areas of key habitat identified in the relevant Regional BAP or smaller areas of such habitat that are essential to maintain the viability of a larger whole • Sustainable areas of key habitat identified as being of Regional Value in the appropriate Natural Areas profile • A population of a species listed as being nationally scarce (i.e. occurring in 16 - 100 10km squares in the UK, or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation. Sites supporting a breeding population of such a species or supplying a critical element of their habitat requirements • Sites, which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur
County/ Metropolitan	<ul style="list-style-type: none"> • Semi-natural ancient woodland greater than 0.25 ha • County/Metropolitan sites and other sites which meet the ecological selection criteria for designation • A sustainable area of habitat identified in a county BAP • A population of a species that is listed in a county/metropolitan 'red data book' or BAP on account of its regional rarity or localisation. Also sites supporting a breeding population of such a species or supplying a critical element of their habitat requirements

Level of Ecological Value	Examples of Criteria
District	<ul style="list-style-type: none"> • Semi-natural ancient woodland smaller than 0.25 ha • Sustainable areas of habitat identified in a sub-county (district/borough) BAP or in the relevant Natural Area profile • Sites/features that are scarce within the district/borough or which appreciably enrich the district/borough habitat resource • A diverse and/or ecologically valuable hedgerow network • A population of a species that is listed in a district/borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation. Also sites supporting a breeding population of such a species or supplying a critical element of their requirements
Local	<ul style="list-style-type: none"> • Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or local neighbourhood, e.g. isolated species-rich hedgerows
Site	<ul style="list-style-type: none"> • Small patches of poor semi-improved grassland, amenity grassland not used by Badgers
Negligible	<ul style="list-style-type: none"> • Areas of little current or potential ecological value

APPENDIX III: AN ECOLOGICAL EVALUATION

The Criteria for Evaluation

1. The criteria for evaluation have been adopted from the widely used set developed by Ratcliffe (1977). These were originally conceived to provide a systematic framework for the selection of Sites of Special Scientific Interest (SSSI) by the Nature Conservancy Council (NCC), but have since been adopted and adapted widely by ecologists, for example in Local Authorities and Wildlife Trusts.

The criteria used in this report are drawn from these widely applied criteria. They are:

Size

2. In general, larger sites are more highly valued than smaller ones, all else being equal. However, relative size to similar sites and other local sites should be considered. The area of a site is also important in management terms, i.e. whether short-term neglect/disturbance or any small changes would lead to the loss of a site's interest.

Diversity

3. One of the most important site attributes is the variety of communities and species which is largely dependent on diversity of habitat. Large numbers of species, particularly when represented by large populations, are to be valued. Diversity can also be related to habitat instability that may affect management prescriptions.

Naturalness

4. Ecosystems least modified by man tend to be rated more highly. However, most sites are influenced by man, the degree and nature of which is important.

Fragility

5. This reflects the degree of sensitivity of habitats, communities and species to environmental change. Fragile sites often represent ecosystems that are highly fragmented, dwindling or difficult to re-create.

Typicalness

6. The typical and commonplace within a field of ecological variation are also of value.

Recorded History

7. The existence of a scientific record of long-standing adds considerably to the value of a site.

Permanence

8. A site that has been occupied by a semi-natural habitat for a long time is usually more valuable than one that has only recently arisen. This is because they have had time to acquire rich assemblages of plants and animals.

Lack of Modification

9. Adverse influences from humans, such as inappropriate management regimes and pollution, will reduce the quality of an area.

Rarity

10. Rarity is concerned with communities and habitats as well as species. The presence of rare species adds to overall ecological value especially when a habitat also ranks highly on other criteria. The habitat type too may also be nationally or regionally rare.

Position in an Ecological Unit

11. In the event of two sites being of equivalent intrinsic value, the close proximity of one site to a highly rated example of another type increases the value of the site. The presence of other areas of semi-natural habitat adjacent or close to a site enhances the value of both habitats.

Potential Value

12. Certain sites could, through appropriate management or even natural change, eventually develop a nature conservation interest substantially greater than that existing at present.

Intrinsic Appeal

13. While science may view all creatures as equal, pragmatism dictates that in nature conservation it is realistic to give more weight to the more popular appeal of some species, groups or habitats than others.

These criteria provide a useful basis against which to evaluate the intrinsic ecological quality of a site, but in an urban area it is also important to consider the value of an area to the local people (GLC 1985). Thus the appeal of a site, its educational and amenity value, as well as its accessibility as a wildlife area, need to be included in the evaluation.

14. The survey results were assessed and evaluated using these criteria as a guide.

APPENDIX IV: SPECIES RECORDS

All distances are approximated from the central grid reference for the site (ST 895 941).

Table 1: Protected and/or Notable Species Records (GCER, January 2010)

Species	Number of records	Closest record (distance from site)
Plants		
Bluebell	1	Within 2km of the site
Birds		
Grey wagtail	1	Within 2km of the site
Mammals		
Badger	1	Within 2km of the site
Bats		
A bat species	3	1km south-west of the site
Lesser horseshoe bat	3	1.8km north-west of the site
Long-eared	3	1.2km south-west of the site
Pipistrelle	1	4km north-west of the site
Amphibians		
Common frog	1	1.6km south-west of the site
Common toad	3	1.8km south-west of the site
Great crested newt	3	500m south-west of the site
Smooth newt	1	1.35km south-west of the site
Reptiles		
Grass snake	1	1.1km north-west of the site
Common lizard	3	2km west of the site
Invertebrates		
Brindled beauty	1	Within 2km of the site
Brown argus	6	Within 2km of the site
Chalk-hill blue	3	Within 2km of the site
Dark-barred twin-carpenter	1	Within 2km of the site
Deep brown dart	1	Within 2km of the site
Dingy skipper	1	Within 2km of the site
Duke of Burgundy fritillary	1	Within 2km of the site
Galium carpet	1	Within 2km of the site
Rosy minor	1	Within 2km of the site

Small emerald	1	Within 2km of the site
Small heath	2	Within 2km of the site
Small phoenix	1	Within 2km of the site
Sprawler	1	Within 2km of the site

Table 2: Protected and/or Notable Species Records (NBN website, September 2009)

Species	Distance from Site
Plants	
Basil thyme	Within 10km of the site
Caraway	Within 10km of the site
Corn buttercup	Within 10km of the site
Corn cleavers	Within 10km of the site
Cornflower	Within 10km of the site
Fly orchid	Within 10km of the site
Frog orchid	Within 10km of the site
Red hemp-nettle	Within 10km of the site
Shepherd's needle	Within 10km of the site
White helleborine	Within 10km of the site
Yellow bird's-nest	Within 10km of the site
Fungus	
<i>Phylloporus pelletieri</i>	Within 10km of the site
Mammals	
Greater horseshoe bat	4km north west of the site
Noctule bat	2km north west of the site
Soprano pipistrelle	2km north west of the site
Birds	
House sparrow	1km south west
Amphibians	

Species	Distance from Site
Great crested newt	Within 1km of the site
Invertebrates	
Dingy skipper	Within 10km of the site
Small blue	Within 10km of the site
Small heath	Within 10km of the site

APPENDIX VI: BAT ASSESSMENT CRITERIA

The following table was used to guide the assessment of features (trees) for their suitability to support roosting bats.

Roost Suitability Category	Criteria
Negligible	No features or locations presenting roosting opportunities apparent. Building, structure or tree considered unlikely to be used by roosting bats, although occasional or transient use can rarely be entirely ruled out
Low	Few features or locations within building, structure or tree with the potential to support roosting bats, although quality of these features limited by size, aspect or internal micro-climate. Although not directly assessed by these criteria, the chances of significant roost types (maternity or hibernation) is not considered likely
Medium	Some features/locations within building, structure or tree with the potential to be used by roosting bats. Although not directly assessed by these criteria, the chances of significant roost types (maternity or hibernation) is considered possible
High	Several features/locations within building, structure or tree with the potential to support roosting bats. Combination of size, aspect and internal micro-climate within these locations make them very suitable for roosting bats. Although not directly assessed by these criteria, the chance of significant roost types (maternity or hibernation) is considered possible

APPENDIX VII: HABITAT SUITABILITY INDEX (HSI) ASSESSMENT CALCULATIONS

Table 1: Summary of HSI calculations

HSI criteria	Pond 1	Pond 2	Pond 3
Location	1.00	1.00	1.00
Pond area	0.24	0.45	0.75
Drought	0.50	0.10	0.50
Water quality	1.00	1.00	0.67
Shade	1.00	0.90	0.90
Waterfowl	1.00	1.00	1.00
Fish	1.00	1.00	1.00
Pond Count	0.55	0.55	0.64
Terrestrial Map	0.67	0.33	0.67
Macrophyte Score	0.50	0.40	0.40
HSI Scores	0.68	0.56	0.72
Pond suitability	Average to Good	Below Average	Good