ecology solutions ltd

REDROW HOMES LTD

Land at St Nicholas, Vale of Glamorgan

Ecological Assessment

e c o l o g y s o l u t i o n s f o r p l a n n e r s a n d d e v e l o p e r s

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PROTECTED SPECIES

This report contains sensitive
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contained herein should not be
disseminated without the prior consent
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1. INTRODUCTION

1.1. Background & Proposals

1.1.1. Ecology Solutions was commissioned by Redrow Homes Ltd in April 2014 to undertake an Ecological Assessment of Land at St Nicholas, Vale of Glamorgan (see Plan ECO1).

1.1.2. An Ecological Assessment was previously carried out by David Clements Ecology Ltd in March 2012, which included the southern section of the Application Site and an adjacent field to the east.

1.1.3. The proposals for the Application Site are for residential development together with associated areas of hardstanding, landscape planting and open space (see Appendix 1).

1.1.4. The Application Site currently comprises part of a candidate site that is allocated for residential development under policy MG 2 – Housing Allocations within the new Vale of Glamorgan Local Development Plan (LDP), which is yet to be fully adopted. The candidate site is Site 43 – Land to the East of St Nicholas.

1.2. Application Site and Wider Study Area Characteristics

1.2.1. The Application Site is situated to the northeast of St Nicholas and mainly comprises managed improved grassland, together with a series of hedgerows and occasional areas of ruderal vegetation, scrub, trees, amenity grassland, amenity planting, buildings and hardstanding (see Plan ECO2).

1.2.2. An area of land to the north of the Application Site was also surveyed as part of this assessment and is known as the wider study area (see Plans ECO1 and ECO2). No development is to take place within the wider study area and the habitats mainly comprise managed improved grassland and hedgerows.

1.2.3. Existing residential development is located to the west of the Application Site, intensively managed agricultural land is located to the north and east, and existing residential development and the A48 main road is located to the south.

1.3. Ecological Assessment

1.3.1. This document assesses the ecological interest of the Application Site and wider study area as a whole. The importance of the habitats present is evaluated with regard to current guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM).

1.3.2. Where necessary, mitigation measures are recommended so as to safeguard any significant existing ecological interest within the Application Site and wider study area and, where appropriate, potential enhancement measures are put forward and reference made to both habitats and species of principal importance.

2. SURVEY METHODOLOGY

2.1. The methodology utilised for the survey work can be split into three areas, namely desk study, habitat survey and faunal survey. These are discussed in more detail below.

2.2. Desk Study

2.2.1. In order to compile up to date background information on the Application Site, wider study area and its immediate surroundings Ecology Solutions contacted the South East Wales Biodiversity Records Centre (SEWBReC) in June 2014 and the Glamorgan Badger Group in September 2014. Where appropriate this information is included within this report, although much of it is confidential and can only be made available upon request.

2.2.2. Further information on ecological designations from a wider search area have been obtained from National Resources Wales (NRW) and the online Multi-Agency Geographic Information for the Countryside (MAGIC). This information is reproduced at Appendix 2 and, where appropriate on Plan ECO1.

2.3. Habitat Survey Methodology

2.3.1. A number of surveys were carried out between April and October 2014 in order to ascertain the general ecological value of the land contained within the boundaries of the Application Site and wider study area and to identify the main habitats and associated plant species present, with notes made on fauna utilising these areas.

2.3.2. In April 2014 the Application Site and wider study area were subject to detailed surveys based around an extended Phase 1 survey methodology, whereby the habitat types present are identified and mapped, together with an assessment of the species composition of each habitat. This technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential which require further survey. Any such areas identified can then be examined in more detail.

2.3.3. Using the above method, the Application Site and wider study area were classified into areas of similar botanical community types, with a representative species list compiled for each habitat identified.

2.3.4. In addition, in July and October 2014, walk-over surveys of the Application Site and wider study area were undertaken in order to update the previous work completed.

2.3.5. All the species that occur in each habitat would not necessarily be detectable during survey work carried out at any given time of the year, since different species are apparent at different seasons. The survey work was undertaken within the optimal period for Phase 1 surveys and given the number of surveys undertaken, the habitats present and the regular management they are subjected to, it is considered that an accurate and robust assessment has been made.

2.3.6. In addition, a Phase 1 survey was also carried out on the southern section of the Application Site and an adjacent field to the east by David Clements Ecology Ltd in March 2012, following the same methodology as detailed above.

2.4. Faunal Survey

2.4.1. General faunal activity observed during the course of the surveys was recorded, whether visually or by call. Specific attention was paid to the potential presence of any protected, rare, notable or priority species. In addition, specific surveys were undertaken for bats, Badgers *Meles meles*, Dormice *Muscardinus Avellanarius* and Great Crested Newts *Triturus cristatus*.

2.4.2. **Bats**. Field surveys were undertaken following best practice guidelines issued by the Bat Conservation Trust (2012), Natural England (Mitchell-Jones, 2004) and the Joint Nature Conservation Committee (Mitchell-Jones & McLeish, 2004).

Internal / external building inspections

2.4.3. In October 2014 the two buildings within the Application Site were subject to detailed external and internal surveys. No buildings are located in the wider study area.

2.4.4. These surveys utilised ladders, mirrors, endoscope, torches and binoculars, where necessary. Particular attention was paid to the roof structures with evidence searched for past or present activity within any voids and around joists.

2.4.5. Evidence of the presence of bats was searched for with particular attention paid to any loft voids and gaps between rafters and beams. Specific searches were made for bat droppings that can indicate present or past use and extent of use, as well as other signs to indicate the possible presence of bats e.g. feeding remains, presence of stained areas, or areas that are cobweb-free.

2.4.6. The probability of a building being used by bats as a summer roost site increases if it:

- Is largely undisturbed;
- Dates from pre 20th Century;
- Has a large roof void with unobstructed flying spaces;
- Has access points for bats (though not too draughty);
- Has wooden cladding or hanging tiles; and/or
- Is in a rural setting and close to woodland or water.

2.4.7. Conversely, the probability decreases if a building is of a modern or pre-fabricated design / construction, is in an urban setting, has small or cluttered roof voids, has few gaps at the eaves or is a heavily disturbed premises.

2.4.8. The main requirements for a winter / hibernation roost site is that it maintains a stable (cool) temperature and humidity. Sites commonly utilised by bats as winter roosts include cavities / holes in trees, underground sites and parts of buildings. Whilst different species may show a preference for one of these types of roost site, none are solely dependent on a single type.

Tree Assessment

2.4.9. In April and July 2014 all trees within the Application Site and wider study area were assessed for their potential use by bats. Ladders, binoculars and an endoscope were used where necessary.

2.4.10. For a tree to be classified as having some potential for roosting bats it must usually have one or more of the following characteristics:

- Obvious holes, e.g. rot holes and old woodpecker holes;
- Dark staining on the tree below a hole;
- Tiny scratch marks around a hole from bats' claws;
- Cavities, splits and / or loose bark from broken or fallen branches, lightning strikes etc; and / or
- Very dense covering of mature Ivy *Hedera helix* over trunk.

2.4.11. In addition, in March 2012 David Clements Ecology Ltd surveyed all trees within their survey area for the potential of the trees to support roosting bats, which included trees within hedgerows H6, H7, H8, H9, H10 and H11.

Emergence Survey

2.4.12. The tree assessment highlighted one tree within the Application Site as having limited potential to support roosting bats (see Plan ECO2). As such, this tree was subject to evening emergence surveys on the 30th June 2014 and 13th August 2014.

2.4.13. The emergence surveys commenced approximately half an hour before sunset and extended until over two hours after sunset. These surveys utilised EM3 bat detectors and involved surveyors watching potential entrance/exit points for bats.

2.4.14. The weather conditions for the emergence surveys are detailed in the table below:

Table 1. Bat emergence survey weather conditions

Date	Temperature °C	Weather Conditions
30.6.14	17	Dry, Partly Cloudy
13.8.14	16	Dry, Partly Cloudy

2.4.15. One tree along the northern boundary of the wider study area was also identified as having low potential to support roosting bats. However, this tree is to remain unaffected by the proposed development and is located away from the Application Site, therefore no emergence surveys were considered necessary.

Activity Survey

2.4.16. Bat activity surveys were undertaken throughout the Application Site and wider study area on the 15th May 2014, 30th June 2014, 13th August 2014 and 8th October 2014. These surveys incorporated the different habitat types present and the survey transects varied in their direction, as advocated in the Bat Workers' Manual[1].

2.4.17. The activity surveys utilised EM3 bat detectors to record the bat activity and aimed to identify the level of bat activity and the species present within the Application Site and wider study area. The surveys started at sunset and lasted for approximately two to three hours. Following completion of the activity surveys the bat detectors were strategically positioned within the Application Site and wider study area in order to record any further activity throughout the night (see Plan ECO2).

2.4.18. Automated bat detectors were also positioned within the Application Site and wider study area before the bat activity surveys were undertaken, in order to record any bat species utilising the habitats present and the levels of any bat activity within the Application Site and wider study area. These detectors were then collected the next morning.

Table 2. Bat activity survey weather conditions

Date	Temperature °C	Weather Conditions
15.5.14	12	Dry, Scattered Clouds
30.6.14	17	Dry, Partly Cloudy
13.8.14	16	Dry, Partly Cloudy
8.10.14	14	Dry, Partly Cloudy

Static Automated Activity Survey

2.4.19. In addition to the above surveys, static automated activity surveys were undertaken across the Application Site and wider study area on the 10th June 2014 and 23rd June 2014. SM2 automated detectors were placed within the hedgerows and were set to record from half an hour before sunset until half an hour after sunrise the following day (see Plan ECO2).

2.4.20. The SM2s were placed within the centre of the hedgerows and extendable microphones were used, so that the microphones could be positioned at the top of the hedgerows. By positioning the microphones in these locations all bat activity could be recorded on either side of the hedgerows and at any height, maximising the amount of data that can be recorded.

2.4.21. These surveys aimed to record any bat species utilising the habitats present and the levels of any bat activity within the Application Site and wider study area.

2.4.22. The surveys detailed above were undertaken during suitable weather conditions with further detail shown on the table below:

[1] JNCC. 2004. Bat Workers Manual. 3rd Edition. Peterborough.

Table 3. Automated bat survey weather conditions

Date	Temperature °C	Weather Conditions
10.06.14	14	Dry, Scattered Clouds
23.06.14	19	Dry, Partly Cloudy

2.4.23. All bat survey data was analysed using Analook software.

2.4.24. Given the number of surveys that have been completed at the Application Site and wider study area, it is considered that an accurate and robust assessment has been made.

2.4.25. **Badgers**. Specific surveys were undertaken to search for evidence of Badgers in April and July 2014. Such surveys comprise two main elements. The first of these is a thorough search for evidence of Badger setts. If any setts are encountered each sett entrance is noted and plotted even if the entrance appeared disused. The following information is recorded:

i) The number and location of any well used or very active entrances; these are clear from any debris or vegetation and are obviously in regular use and may, or may not, have been excavated recently.

ii) The number and location of any inactive entrances; these are not in regular use and have debris such as leaves and twigs in the entrance or have plants growing in or around the edge of the entrance.

iii) The number of any disused entrances; these have not been in use for some time, are partly or completely blocked and cannot be used without considerable clearance. If the entrance has been disused for some time all that may be visible is a depression in the ground where the hole used to be and the remains of the spoil heap.

2.4.26. Secondly, Badger activity such as well-worn paths and run-throughs, snagged hair, footprints, latrines and foraging signs is recorded so as to build up a picture of the use of the Application Site and wider study area, if any, by Badgers.

2.4.27. In addition, David Clements Ecology Ltd undertook specific surveys to search for evidence of Badgers within field F3 and the adjacent field to the east in March 2012.

2.4.28. **Dormice.** A Dormouse nest tube survey was carried out at within the Application Site and wider study area between May and September 2014. This survey involves the placement of nest tubes within all hedgerows in the Application Site and wider study area as detailed within the Dormouse Conservation Handbook[2].

[2] Bright,P, Morris, P & Mitchell-Jones, T (2006). The Dormouse Conservation Handbook. Second Edition. English Nature. Peterborough.

2.4.29. The Dormouse nest tubes utilised were those provided as standard by the Mammal Society and were placed in accordance with the guidance provided by the Mammal Society and within the Dormouse Conservation Handbook. Typically tubes are placed within suitable habitat approximately every 20 metres where suitable locations can be identified. The nest tubes were attached with wire ties underneath suitably sturdy horizontal branches and positioned on average at approximately 1.5 metres above ground level.

2.4.30. Once the nest tubes are fixed in place, monitoring surveys were undertaken between May and September 2014.

2.4.31. The surveys have been scored for effort according to the method developed from the South West Dormouse Project[3]. The system used provides an overall score that reflects the chances of Dormice being discovered if present, and thus provides an indicator of 'thoroughness' of a survey. This score is calculated based on the number of tubes used and the number of months the tubes were in place.

2.4.32. The months of the year are weighted according to the likelihood of recording Dormice as set out on the table below

Table 4: Monthly Score Weighting (Chanin & Woods 2003)

Month	Weighting
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

2.4.33. The index of effort is calculated based on the use of 50 nest tubes as a standard minimum, with less tubes used proportionately reducing the overall score and more tubes proportionately increasing the score (i.e. 25 tubes halve the score and 100 tubes double the score).

2.4.34. A score of 20 (or above,) is deemed a thorough survey, and a score of 15 to 19 may be regarded as adequate where circumstances do not permit more time or more tubes (particularly if other survey methods have also proved negative).

2.4.35. For the Application Site and wider study area the number of nest tubes that were used during the surveys was 100 and under current guidance, the surveys have exceeded the required minimum survey effort. In line with good practice, these tubes were checked between May 2014 and September 2014 for signs of Dormice, which results in a total score of 40 [(4+2+2+5+7) x 2 = 40].

[3] Chanin, P. & Woods, M. (2004) 'English Nature Research Report 524; Results and Experiences From the South West Dormouse Project.' English Nature, Peterborough.

2.4.36. In addition, in October 2014 a systematic search was undertaken for gnawed Hazelnuts, whereby an area of Hazel *Corylus avellana* was selected and a 10m x 10m area on the ground was searched for 20 minutes. There is an 80% probability that, if Dormice are present the characteristically gnawed nuts will be discovered once three such squares have been searched, and if five squares have been searched and no characteristic gnawed Hazelnuts have been recorded, then it is 90% certain that Dormice are not present[4]. During the surveys completed in 2014, five squares were searched for the presence of gnawed Hazel nuts.

2.4.37. In addition, a collection of Hazelnuts that had been opened by small rodents were selected from the Application Site and wider study area and were assessed for evidence of use by Dormice. Research has indicated that if 100 gnawed Hazelnuts are assessed and there are no nuts present that have been opened by Dormice within the collected sample of nuts there is a high probability that Dormice are not present[4].

2.4.38. **Great Crested Newts.** There are no ponds or water bodies within or adjacent to the Application Site, although one pond is located adjacent to the northern boundary of the wider study area (see Plan ECO1 and ECO2).

2.4.39. Analysis of local OS maps indicate a total of seven ponds, are located within the potential dispersal distance of Great Crested Newts to the Application Site and wider study area and that are not separated by significant dispersal barriers (see Plan ECO1). Therefore, these ponds were subject to specific Great Crested Newt surveys during the optimum survey period in 2014.

2.4.40. These surveys followed the guidance detailed within the Great Crested Newt Mitigation Guidelines[5]. This states that for presence/absence surveys at least three survey methodologies should be undertaken at a pond. As such, the survey methodology undertaken principally comprised three methods, torch survey, bottle-trapping and netting, although terrestrial and egg searches were also conducted in order to create a thorough and robust survey.

2.4.41. Surveys were carried out between early May and June 2014 (see table below) during suitable survey weather conditions, which are deemed to be those nights when the night-time air temperature is more than 5°C, with little or no wind and no rain. The surveys were conducted during such conditions (see Appendix 3).

[4] Natural England. 2006. The Dormouse Conservation Handbook. Second Edition. Peterborough.
[5] English Nature. 2001. Great Crested Newt Mitigation Guidelines. Peterborough.

Table 5: Great Crested Newt survey dates.

Survey Number	Date
1	04.05.14
2	06.05.14
3	13.05.14
4	10.06.14
5	13.06.14
6	16.06.14

2.4.42. Torch counting involved the use of high-powered torches to find and, if possible, count the number of adults of each amphibian species. As recommended in the guidelines the entire margin of the ponds were continually walked, slowly checking for Great Crested Newts.

2.4.43. Bottle trapping involves setting traps made from two-litre plastic bottles around the pond margins. The traps were left overnight and checked the following morning. A density of one trap per two metres of shoreline was utilised where possible.

2.4.44. In theory, netting involves sampling for a period dictated by the size of the waterbody, and the guidelines recommend 15 minutes of search time for every 50 metres of shoreline. In practice, the search time significantly exceeded this recommendation.

2.4.45. Egg searches are detailed within the mitigation guidelines, as being an effective method for detecting Great Crested Newts. It involves the systematic searching of both live and dead submerged vegetation around ponds for the eggs of Great Crested Newts.

2.4.46. Terrestrial habitats were also searched for the presence of Great Crested Newts. This involved searching under logs and rocks, which are favoured hiding places.

Habitat Suitability Index Survey

2.4.47. In addition to the surveys detailed above, a Habitat Suitability Index (HSI) survey of all the ponds within the dispersal distance of newts to the Application Site and wider study area, and which are not separated by significant dispersal barriers, was undertaken between April and June 2014 (Ponds P1-P7).

2.4.48. An HSI survey is a quantitative measure of habitat quality for Great Crested Newts and is utilised as part of the assessment for a European Protected Species licence application.

2.4.49. An HSI survey is based on ten suitability indices that include:

- Location;
- Pond area;
- Pond drying;
- Water quality;
- Shade;

- Fowl;
- Fish;
- Ponds;
- Terrestrial habitat; and
- Macrophytes cover.

2.4.50. Scores are attributed to each index and are then converted to Suitability Indices (SI) scores, on a scale from 0.01 to 1 (1 represents optimal habitat). The ten scores are multiplied together and the tenth root of this number is then calculated to give the overall HSI score.

3. ECOLOGICAL FEATURES

3.1. The Application Site and wider study area were subject to a number of ecological surveys in April 2014, July 2014 and October 2014. The vegetation present enabled the habitat types to be satisfactorily identified and an accurate assessment of their ecological interest to be undertaken.

3.2. The following main habitat / vegetation types were identified:

- Improved Grassland;
- Hedgerows;
- Ruderal Vegetation;
- Scrub;
- Trees;
- Amenity Grassland;
- Amenity Planting;
- Buildings; and
- Hardstanding.

3.3. The location of these habitats is shown on Plan ECO2.

3.4. Each habitat present is described below with an account of the representative plant species present.

3.5. **Improved Grassland**

3.5.1. The Application Site comprises four improved grassland fields, which are subject to regular management throughout the year, resulting in a short sward height being present (see Plan ECO2).

3.5.2. Field F1 is located in the west of the Application Site and comprises Yorkshire Fog *Holcus lanatus*, Crested Dog's-tail *Cynosurus cristatus*, Common Bent *Agrostis capillaris*, Perennial Rye Grass *Lolium perenne*, Cock's-foot *Dactylis glomerata,* Red Fescue *Festuca rubra,* Creeping Buttercup *Ranunculus repens*, Dandelion *Taraxacum officinal*, Common Nettle *Urtica dioica,* Hogweed *Heracleum sphondylium*, Common Mouse-ear *Cerastium fontanum,* Creeping Thistle *Cirsium arvense*, Common Sorrel *Rumex acetosa,* Red Clover *Trifolium pratense*, Broad-leaved Dock *Rumex obtusifolius* and Yarrow *Achillea millefolium* (see Photograph 1).

3.5.3. Field F2 is located to the east of field F1 and comprises the same species as field F1 with additional species including Smooth Sow-thistle *Sonchus oleraceus*, Cleavers *Galium aparine*, Common Vetch *Vicia sativa* and Broad-leaved Willowherb *Epilobium montanum* (see Photograph 2).

3.5.4. Field F3 is located in the south of the Application Site and comprises the same species previously detailed in F1 and F2, although there is a higher number of the ruderal species previously detailed present (see Photograph 3). Additional species include Smooth Meadow Grass *Poa pratensis*, False Oat Grass *Arrhenatherum elatius*, Greater Plantain *Plantago major*, Ribwort Plantain *Plantago lanceolata* and Greater Stitchwort *Stellaria holostea*.

3.5.5. Field F4 is located to the east of F2 and is essentially a continuation of field F2, being only separated by a post and wire fence (see Photograph 2). The southern section of this field is located within the Application Site, but the majority extends into the wider study area (see Plan ECO2). Field F4 comprises the same species as field F2.

3.6. **Hedgerows**

3.6.1. There are a number of hedgerows within the Application Site and wider study area, each of which is described individually below (see Plan ECO2).

3.6.2. H1 is a regularly managed amenity hedgerow, which had been recently cut to approximately 1m in height and is dominated by Beech *Fagus sylvatica* together with Bramble *Rubus fruticosus*, Common Nettle and Cleavers.

3.6.3. H2 is regularly managed to approximately 2.5m in height and located along a post and wire fence. Species present comprise Hazel, Hawthorn *Crataegus monogyna*, Elder *Sambucus nigra*, Elm *Ulmus* sp., Blackthorn *Prunus spinosa*, Sycamore *Acer pseudoplatanus*, Rose *Rosa* sp., Holly *Ilex aquifolium*, Bramble, Honeysuckle *Lonicera periclymenum*, Ground Ivy *Glechoma hederacea*, Cleavers, Common Nettle and Ivy.

3.6.4. H3 is located in the Application Site and extends into the wider study area. The hedgerow is regularly managed to 2m in height, located along a post and wire fence and is gappy in places. Species present comprise Hazel, Hawthorn, Elder, Bramble, Holly, Rose, Honeysuckle, Common Nettle, Cleavers, Bracken *Pteridium aquilinum*, Ivy, Red Campion *Silene dioica* and Ground-ivy.

3.6.5. H4 is regularly managed to approximately 2.5m in height, located along a wooden fence and is gappy in places. This hedgerow is dominated by Hawthorn, together with Elder, Holly, Bramble, Foxglove *Digitalis purpurea* and Common Nettle.

3.6.6. H5 is a short amenity hedgerow, which is heavily managed to approximately 1m in height and is located on the boundary of the Application Site along a wooden fence. This hedgerow is dominated by Cherry Laurel *Prunus laurocerasus*.

3.6.7. H6 is regularly managed to approximately 2m in height and is dominated by Hawthorn, together with Hazel, Holly, Ash *Fraxinus excelsior*, Sycamore, Bramble, Common Nettle, Red Campion, Ivy, Common Nettle, Cleavers, Hedge Woundwort *Stachys sylvatica*, Broad-leaved Dock, Cow Parsley *Anthriscus sylvestris*, Hogweed and Herb Robert *Geranium robertianum*.

3.6.8. H7 comprises amenity planting associated with the adjacent residential properties and is more a line of scrub in places than a real hedgerow. The hedgerow is located along a wire fence, is gappy in nature and is well managed in places. Species present comprise Hawthorn, Ash, Sycamore, Hazel, Elder, Bramble, Honeysuckle, Bamboo *Fargesia* sp., Hedge

Woundwort, Bracken, Cleavers, Creeping Thistle, Hedge Bindweed *Calystegia sepium* and Common Nettle.

3.6.9. H8 is regularly managed to approximately 1.5m in height and is associated with adjacent residential properties. This hedgerow is dominated by Hawthorn, together with Holly, Elder, Rose, Hazel, Bramble, Bamboo, Garden Privet *Ligustrum ovalifolium*, Hogweed, Cleavers, Creeping Thistle and Common Nettle.

3.6.10. H9 is a regularly managed to approximately 1.5m in height and species present comprise Hawthorn, Elder, Garden Privet, Hazel, Bramble, Hogweed, Black Bryony *Tamus communis* and Cleavers.

3.6.11. H10 is regularly managed to approximately 2m in height and is a residential boundary hedgerow. This hedgerow is dominated by *Leylandii* sp., together with Garden Privet, Apple *Malus* sp., Ash, Hawthorn, Bramble, Hogweed, Common Nettle, Silverweed *Potentilla anserine* and Cleavers.

3.6.12. H11 is more a line of trees than a hedgerow, is gappy in places and is located along a post and wire fence. Species present include Ash, Hawthorn, Elder, a standard Ash, Holly, Sycamore, Hazel, Bramble, Cleavers, Common Nettle, Ivy, Bracken, Cocks-foot, Yorkshire Fog, Common Thistle and Red Campion.

3.6.13. H12 is a managed hedgerow located along a post and wire fence, is gappy in nature and dominated by Blackthorn, together with Hawthorn, Ash, Elder, Hazel, Rose, Holly, Bramble, Ivy, Red Campion, Bracken, Hogweed, Black Bryony, Cleavers and Common Nettle.

3.6.14. H13 is a managed hedgerow that is gappy in nature and is located along a post and wire fence in the wider study area. This hedgerow is dominated by Blackthorn, together with Hawthorn, Ash, Elder, Hazel, Rose, Holly, Bramble, Ivy, Red Campion, Bracken, Hogweed, Cleavers and Common Nettle.

3.6.15. H14 is a regularly managed hedgerow, that is gappy in nature and located along a post and wire fence in the wider study area. Species present comprise two standard Oak, Willow *Salix* sp., Ash, Blackthorn, Hawthorn, Hazel, Elder, Holly, Bramble, Honeysuckle, Foxglove and Common Nettle.

3.7. Ruderal Vegetation

3.7.1. Occasional areas of ruderal vegetation that are subject to regular management are located on the margins of the Application Site. Species present include Bramble, Hedge Woundwort, Bracken, Broadleaved Willowherb, Creeping Buttercup and Common Nettle (see Plan ECO2).

3.8. Scrub

3.8.1. Occasional areas of scrub that are subject to regular management are located within the Application Site. Bramble dominates, together with Common Nettle and Creeping Thistle (see Plan ECO2).

3.9. Trees

3.9.1. In addition to the trees located within the hedgerows, a mature Sycamore is located on the western boundary of the Application Site and two amenity planted Sycamores and a Pine *Pinus* sp. are located within in the south of the Application Site, associated with the residential property.

3.10. Amenity Grassland

3.10.1. Managed amenity grassland is located around the buildings within the south of the Application Site (see Plan ECO2). Species present include Perennial Rye Grass, Creeping Bent *Agrostis stolonifera*, *Festuca* sp., Dandelion, White Clover *Trifolium repens*, Daisy *Bellis perennis*, Creeping Buttercup, Yarrow, Ribwort Plantain and Common Mouse-ear.

3.11. Amenity Planting

3.11.1. Amenity planting is located along the margins of the amenity grassland in the south of the Application Site and species present include *Pyracantha* sp., Rose, Cherry Laurel, Oregon Grape *Mahonia aquifolium*, *Leylandii* sp., Butterfly-bush *Buddleja davidii*, *Geranium* sp., Hydrangea *Hydrangea macrophylla*, Apple, *Fuchsia* sp., Rowan *Sorbus aucuparia*, *Cyclamen* sp. and *Wisteria* sp. (see Plan ECO2).

3.12. Building

3.12.1. Building B1 is a relatively modern brick built bungalow that has only recently become unoccupied (see Photograph 4). The roof is multi-pitched with clay tiles that are well sealed. One chimney is located on the roof, with lead flashing at the base that is also well sealed. Plastic soffit and barge boards are present, which are in a good state of repair, and the gable ends of this building are filled with concrete. Internally, a loft void is present, in which part has been converted into a living space with skylights present. The remaining loft void is well sealed, with no gaps at the eaves and has wooden beams, internal felt lining and insulation on the floor. This void has lights present and was previously in regular use for storage.

3.12.2. Building B2 is a relatively modern, single storey brick building that was in use as a garage and has two small rooms adjoining the northern section (see Photograph 5). The building has only recently become disused and the roof is single pitched with clay tiles that are well sealed. Plastic soffit and barge boards are located on the exterior, which are in a good state of repair and the gable ends of this building are filled with concrete. External windows are present creating a light interior. The main garage is open to the apex of the roof with wooden beams and internal felt lining. An open shelving area is also present that was previously used for storage.

3.12.3. A small loft void is present above the adjoining rooms to the garage. The void has wooden beams, with internal felt lining and no insulation is present. This void was full of cobwebs and is well sealed, with no gaps at the eaves.

3.13. **Hardstanding**

3.13.1. Areas of hardstanding are located around the buildings within the Application Site and were in regular use by vehicles.

4. WILDLIFE USE OF THE APPLICATION SITE AND WIDER STUDY AREA

4.1. During the surveys undertaken in 2014, general observations were made of any faunal use of the Application Site and wider study area, with specific attention paid to the potential presence of protected or notable species. Specific surveys were also undertaken for bats, Badgers, Dormice and Great Crested Newts.

4.2. Bats

4.2.1. The buildings within the Application Site are not considered to be suitable to support roosting bats on account of their fabric, well sealed roofs, lack of suitable features and the fact that they were recently subject to regular use and disturbance. Furthermore, no evidence of bats was recorded within these buildings during the specific internal and external survey work undertaken.

4.2.2. One tree on the western boundary of the Application Site was identified as having some potential to support roosting bats, due to rot holes and cracked limbs present. As such, two emergence surveys were carried out on this tree on the 30th June and 13th August 2014, during which no bats were recorded emerging from the tree.

4.2.3. Previous surveys carried out by David Clements Ecology Ltd identified trees within hedgerow H11 as having moderate to low potential for use by bats. Further surveys carried out in July 2014 found that these trees did not have any potential to support roosting bats, as they lacked any suitable features.

4.2.4. During the activity surveys undertaken within the Application Site and wider study area, low numbers of Common Pipistrelle *Pipistrellus pipistrellus* and Soprano Pipistrelle *Pipistrellus pygmaeus* were recorded foraging / commuting along the hedgerows during every survey completed.

4.2.5. Common Pipistrelle were the most common species recorded within the Application Site and wider study area, albeit in low numbers, with registrations recorded along the majority of the hedgerows. Soprano Pipistrelle were the next most common species recorded, although still in low numbers, with registrations recorded along the majority of the hedgerows within the Application Site and wider study area (see Plan ECO2).

4.2.6. Very occasional *Myotis* sp. were recorded within the Application Site and wider study area, with this species recorded on 5 out of the 6 surveys completed, although only very occasional recordings on each survey. The only locations *Myotis* sp. were recorded was along hedgerows H6 and H14.

4.2.7. Very occasional Serotine *Eptesicus serotinus* were also recorded within the Application Site. This species was recorded on 3 out of the 6 surveys completed, and was only very infrequently recorded foraging and commuting along hedgerows H2 and H6

4.2.8. The automated activity surveys recorded similar results to the activity surveys, with only low numbers of Common Pipistrelle and Soprano Pipistrelle and a very occasional number of Serotine and *Myotis* sp. calls recorded (see Plan ECO2).

4.2.9. The highest level of bat activity recorded throughout the Application Site and wider study area was along hedgerow H6, with mainly Common Pipistrelle, Soprano Pipistrelle and very occasional numbers of Serotine and *Myotis* sp. recorded.

4.2.10. No Greater Horseshoe *Rhinolophus ferrumequinum* or Lesser Horseshoe Bats *Rhinolophus hipposideros* were recorded during the activity and automated activity surveys.

4.2.11. Information received from SEWBReC returned no records of any bats from within the Application Site and wider study area. The closest record returned was a four figure grid square reference for 1 adult Whiskered Bat *Myotis mystacinus*, located within the same 1km grid square as the Application Site. The closest roost record returned was for a Serotine from 2012, located approximately 0.12km west of the Application Site.

4.2.12. The closest record returned for a Lesser Horseshoe bat roost, was located approximately 3.4km northeast of the Application Site in 2009. No Greater Horseshoe bat roosts were return within the 4km search area for bats.

4.3. Badgers

4.3.1. Surveys carried out in July 2014 by Ecology Solutions, recorded no specific evidence of Badger in the form of any setts, latrines, snagged hairs, snuffle holes, mammal push-through or footprints within or adjacent to the Application Site or wider study area.

4.3.2. In March 2012, David Clements Ecology Ltd identified Badger activity along hedgerow H6 (see Plan ECO2), this included a mammal path, latrine, signs of foraging and several Badger hairs. However, this evidence was not recorded during the 2014 surveys.

4.3.3. Information received from SEWBReC returned no Badger records from within the Application Site or wider study area. The closest record of Badger activity returned was for a Badger latrine and Badger run that crossed a lane, located approximately 1.3km northeast of the Application Site. In addition, the closest actual recorded Badger was for a road casualty in 2013, located approximately 1.2km southwest of the Application Site.

4.3.4. Information received from the Glamorgan Badger Group, returned no sett records from within the search area. The closest record returned was for a road traffic accident along the A48, located approximately 1.2km southwest of the Application Site from August 2014.

4.4. Dormouse

4.4.1. The hedgerows are considered to offer some opportunities for Dormice, due to the presence of vegetation favoured by this species, notably Hazel and Honeysuckle.

4.4.2. However, no Dormice or evidence of Dormice was recorded during the Dormouse nest tube surveys carried out between May and September 2014 (see Appendix 3 for full details).

4.4.3. In addition, no evidence of Dormice was recorded during the nut search that was undertaken across the Application Site and wider study area.

4.4.4. Information received from SEWBReC returned no Dormouse records from within the search area.

4.5. Great Crested Newts

4.5.1. No ponds are located within the Application Site. The majority of habitats within the Application Site are not suitable terrestrial habitat for Great Crested Newts or other amphibians, due to being regularly managed, although the hedgerows do offer some terrestrial habitat for Great Crested Newts and other amphibians.

4.5.2. One pond is located adjacent to the northern boundary of the wider study area and is labelled P1 (see Plan ECO1 and ECO2). The majority of habitats within the wider study area are not suitable terrestrial habitat for Great Crested Newts or other amphibians due to being regularly managed, although the hedgerows do offer some terrestrial habitat for Great Crested Newts and other amphibians.

4.5.3. Analysis of local OS maps indicate a total of seven ponds, which are located within the potential dispersal distance of Great Crested Newts to the Application Site and which are not separated by significant dispersal barriers (see Plan ECO1). The distance of all the ponds are detailed below:

- P1 is located approximately 80m to the north.
- P2 is located approximately 175m to the east.
- P3 is located approximately 85m to the west.
- P4 is located approximately 200m to the northwest.
- P5 is located approximately 340m to the northwest.
- P6 is located approximately 350m to the northwest.
- P7 is located approximately 490m to the northeast.

Survey Results

4.5.4. Detailed aquatic surveys were undertaken at all ponds detailed above (P1-P7), during the optimum survey periods. A summary of the results is detailed below and shown on Table 6, with a full set of results provided in Appendix 4.

4.5.5. No Great Crested Newts or any other amphibian species were recorded within ponds P1, P3, P4 and P7 during surveys carried out between May and June 2014.

4.5.6. Surveys undertaken at pond P2 recorded a single Great Crested Newt on one occasion and a single Smooth Newt *Lissotriton vulgaris* on one occasion.

4.5.7. Surveys undertaken at pond P5 recorded a single Great Crested Newt on one occasion, with no other newt species recorded.

4.5.8. Surveys undertaken at pond P6 recorded four Smooth Newts on two occasions. No Great Crested Newts or any other newt species were recorded.

Table 6. Total Peak Number of Amphibians Recorded During 2014 Surveys.

Pond ref	Total Peak Number of Great Crested Newts Recorded	Total Peak Number of Smooth Newts Recorded	Total Peak Number of Other Amphibians Recorded
P1	0	0	0
P2	1	1	0
P3	0	0	0
P4	0	0	0
P5	1	0	0
P6	0	4	0
P7	0	0	0

4.5.9. From looking at the results shown on Table 6, it can be seen that there is a small population of Smooth Newts and Great Crested Newts in pond P2, a small population of Great Crested Newts in pond P5 and a small population of Smooth Newts in pond P6. These population estimates are based on the Great Crested Newt Mitigation Guidelines[6]. No Great Crested Newts or other amphibians were recorded within ponds P1, P3, P4 and P7 (see Appendix 3 for further detail).

[6] Natural England. 2001. Great Crested Newt Mitigation Guidelines. Version August 2001. Peterborough

HSI Survey

4.5.10. The results of the HSI surveys undertaken on ponds P1-P7 are summarised below and on Table 7.

Table 7. Habitat Suitability Index [7]

Pond ref	P1	P2	P3	P4	P5	P6	P7
SI1 - Location	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SI2 - Pond area	0.3	0.8	0.05	0.05	0.2	0.5	0.3
SI3 - Pond drying	0.9	0.9	0.1	0.1	1	0.9	0.5
SI4 - Water quality	0.1	0.67	0.01	0.33	0.67	0.67	0.67
SI4 - Shade	0.6	1	1	0.6	1	0.6	1
SI6 - Fowl	1	1	1	1	1	1	1
SI7 - Fish	1	1	1	1	1	1	1
SI8 - Ponds	0.9	0.9	0.98	0.9	0.98	0.98	0.98
SI9 - Terr'l habitat	0.67	0.67	0.33	0.67	1	1	0.67
SI10 - Macrophytes	0.4	0.9	0.5	1	0.6	1	0.8
HSI	0.54	0.82	0.29	0.44	0.72	0.78	0.70

Table 8. Categorisation of HSI scores

HS1	Pond Suitability
<0.5	Poor
0.5 - 0.59	Below Average
0.6 - 0.69	Average
0.7 - 0.79	Good
>0.8	Excellent

4.5.11. P1 is located adjacent to the northern boundary of the wider study area (see Photograph 6). This pond has limited aquatic and marginal vegetation present and is heavily shaded by surrounding trees and vegetation. The HSI score for P1 is 0.54, which indicates that this pond has below average suitability to support Great Crested Newts, mainly due to the lack of aquatic and marginal vegetation and the poor water quality, which is indicated by the lack of invertebrate species present. The value of this pond is also impacted upon through regular use by cattle that are causing poaching and also likely increasing nitrate levels.

4.5.12. P2 is located to the northeast of the Application Site and has large areas of aquatic vegetation present, good immediate terrestrial habitat and is not heavily shaded. The HSI score for P2 is 0.82, indicating that this pond has excellent suitability to support Great Crested Newts and this is supported by the fact a single Great Crested Newts was recorded in this pond during the surveys.

4.5.13. P3 is a very small garden pond located adjacent to residential properties and had limited amounts of water and aquatic vegetation present. The HSI score for P3 is 0.29, indicating that this pond has poor suitability to support

[7] Habitat Suitability Index Table based from Natural England's Great Crested Newt Licence Application Method Statement.

Great Crested Newts, which is mainly due to its small size and limited amount of vegetation and water.

4.5.14. P4 is a small shallow pond located in an agricultural field and is covered by overgrowing scrub and trees. The HSI score for P4 is 0.44, indicating that this pond has poor suitability to support Great Crested Newts, which is mainly due to its small size and the limited amount of water it supports.

4.5.15. P5 is a small shallow pond located adjacent to a country lane. The HSI score for P5 is 0.72, indicating that this pond has a good suitability to support Great Crested Newts, which is due to the amount of immediate terrestrial vegetation present and the number of nearby ponds within the wider area.

4.5.16. P6 is a medium sized pond with large amounts of aquatic and immediate terrestrial vegetation. The HSI score for P6 is 0.78, indicating that this pond has good suitability to support Great Crested Newts, which is due to the size of the pond and the amount of terrestrial and aquatic vegetation that is present.

4.5.17. P7 is a shallow pond located within an agricultural field. The HSI score for P7 is 0.70, indicating that this pond has good suitability to support Great Crested Newts, which is due to the size of the pond and the amount of aquatic vegetation present.

4.5.18. Information received from SEWBReC returned no records of amphibians including Great Crested Newts from within the Application Site or wider study area. The closest Great Crested Newt record returned was located approximately 1.5km northwest of the Application Site from 2006. The closest other amphibian record returned was for a Common Frog *Rana temporaria* located approximately 0.1km east of the Application Site from 2011.

4.6. **Birds**

4.6.1. The Application Site and wider study area offer some opportunities for nesting birds in terms of the trees and hedgerows that are present, but it is not considered to be of any particular ornithological interest.

4.6.2. Ecology Solutions recorded a number of bird species either by sight or call within the Application Site and wider study area during the surveys undertaken in 2014. These included Wood Pigeon *Columba palumbus*, Swallow *Hirundo rustica*, Goldfinch *Carduelis carduelis*, Wren *Troglodytes troglodytes*, Great Tit *Parus major*, Chaffinch *Fringilla coelebs* and Magpie *Pica pica*.

4.6.3. In March 2012, David Clements Ecology Ltd identified a number of bird species within the Application Site, although their survey effort only included the southern section of the Application Site and an adjacent field to the east, which is not part of the Application Site. Species recorded included Chaffinch, Greenfinch *Carduelis chloris*, Goldfinch, Great Tit, Wood Pigeon, Wren, Robin *Erithacus rubecula*, Dunnock *Prunella modularis* and Blackbird *Turdus merula*.

4.6.4. No specific records of any Schedule 1 or Red List[8] species were returned by SEWBReC from within the Application Site or wider study area. The closest record returned was a four figure grid square reference for a Yellow Hammer *Emberiza citrinella* and Grey Partridge *Perdix perdix*, which are both Red List and priority species and are located within the same 1km grid square as the Application Site.

4.7. Reptiles

4.7.1. The majority of habitats within the Application Site and wider study area are subject to regular management that creates a short sward height, even along the field margins, and as such does not provide suitable habitat for reptiles. The hedgerows within the Application Site and wider study area do offer some limited foraging and commuting habitat for reptiles, although the surrounding habitats comprise largely residential and intensively managed agricultural land, which are not suitable for reptiles, reducing the likelihood of this faunal group being present.

4.7.2. Information received from SEWBReC returned no reptile records from within the Application Site. The closest record returned was for a Grass Snake *Natrix natrix* located approximately 1.5km northwest of the Application Site.

4.8. Invertebrates

4.8.1. The Application Site and wider study area are expected to support a range of common invertebrate species, but there is no evidence to suggest that any protected or notable species are likely to be present. The habitats and the management regime of the Application Site and wider study area reduce their suitability for this group.

4.8.2. Information received from SEWBReC returned no notable or rare invertebrate species records from within the Application Site and wider study area. The closest record returned was a four figure grid square reference for a Golden-ringed Dragonfly *Cordulegaster boltonii* located approximately 0.85km northeast of the Application Site.

[8] Red list species are those that are globally threatened, whose population or range has declined rapidly in recent years (ie by more than 50% in 25 years), or which have declined historically and not recovered. Amber list species are those whose population or range has declined moderately in recent years (by more than 25% but less than 50% in 25 years), those whose population has declined historically but recovered recently, rare breeders (fewer than 300 pairs), those with internationally important populations in the UK, those with localised populations, and those with an unfavourable conservation status in Europe.

5. ECOLOGICAL EVALUATION

5.1. The Principles of Site Evaluation

5.1.1. The latest guidelines for ecological evaluation produced by CIEEM proposes an approach that involves professional judgement, but makes use of available guidance and information, such as the distribution and status of the species or features within the locality of the project.

5.1.2. The methods and standards for Site evaluation within the British Isles have remained those defined by Ratcliffe[9]. These are broadly used across the United Kingdom to rank Sites, so priorities for nature conservation can be attained. For example, current Site of Special Scientific Interest (SSSI) designation maintains a system of data analysis that is roughly tested against Ratcliffe's criteria.

5.1.3. In general terms, these criteria are size, diversity, naturalness, rarity and fragility, while additional secondary criteria of typicalness, potential value, intrinsic appeal, recorded history and the position within the ecological / geographical units are also incorporated into the ranking procedure.

5.1.4. Any assessment should not judge Sites in isolation from others, since several habitats may combine to make it worthy of importance to nature conservation.

5.1.5. Further, relying on the national criteria would undoubtedly distort the local variation in assessment and therefore additional factors need to be taken into account, e.g. a habitat type with a comparatively poor species diversity common in the south of Wales may be of importance in the north.

5.1.6. Levels of importance can be determined within a defined geographical context from the immediate Site or locality through to the International level.

5.1.7. The legislative and planning policy context are also important considerations and have been given due regard throughout this assessment.

[9] Ratcliffe, D A (1977). *A Nature Conservation Review: the Selection of Sites of Biological National Importance to Nature Conservation in Britain*. Two Volumes. Cambridge University Press, Cambridge.

Habitat Evaluation

5.2. Designated Sites

5.2.1. **Statutory Sites.** There are no statutory designated sites of nature conservation interest within the Application Site or wider study area. The nearest statutory designated site is Ely Valley SSSI, which is situated approximately 2km to the north of the Application Site (see Plan ECO1). This SSSI is separated from the Application Site by intensively managed agricultural land and given its distance from the Application Site it is not considered that there will be any impacts to this SSSI as a consequence of the proposed development.

5.2.2. The nearest European designated site is Cardiff Beech Woods Special Area of Conservation (SAC) located approximately 7.5km to the northeast of the Application Site. The next nearest European designated site is the Severn Estuary SAC located approximately 10km to the southeast of the Application Site (see Plan ECO1). These SACs are separated from the Application Site by existing residential development, intensively managed agricultural land and roads, and given their distance from the Application Site it is not considered that there will be any impacts to these SACs as a consequence of the proposed development, either alone or in combination with any other plans or projects.

5.2.3. In addition, the Habitats Regulation Assessment (HRA) that was completed as part of the LDP process concluded that the development of Site 43, which includes the Application Site, will not have any residual effects on any European Designated Sites either alone or in combination with any other plans or projects.

5.2.4. **Non-Statutory Sites.** There are no non-statutory designated sites of nature conservation interest within the Application Site or wider study area. The nearest non-statutory designated site is the East of Glyncory Water Works Site of Importance for Nature Conservation (SINC), which is also designated an Ancient Semi Natural Woodland, and is situated approximately 0.4km to the north of the Application Site. The next nearest non-statutory designated site is Land at Winchpit SINC located approximately 0.5km southeast of the Application Site (see Plan ECO1). These non-statutory designated sites are separated from the Application Site by intensively managed agricultural land and given their distance from the Application Site it is not considered that there will be any impacts to these non-statutory designated sites as a consequence of the proposed development.

Mitigation/Enhancement

5.2.5. Although it is not considered that any statutory or non-statutory sites will be impacted upon by the proposed development, consideration has been given to potential impacts that could arise from dust, noise and run-off.

5.2.6. Dust arising during construction work only has a significant impact within 20 metres where heavy soiling of vegetation can occur, so no impacts are likely to occur. Nonetheless potential adverse impacts through dust will be mitigated by best engineering practice adhering to current guidance and legislation, i.e. store aggregate on far side of construction site away from the designated site and spray dry materials to limit airborne movement.

5.2.7. Noise emanating during construction may impact upon nesting birds, although given the distances this impact is not likely to be significant. Nonetheless potential adverse impacts through noise pollution at the local level will be mitigated through standard industry practice, adhering to current guidance and legislation.

5.2.8. Potential of laden silts and surface runoff from the construction site entering the designated sites is considered low given the distances involved and the habitats that separate them. Nonetheless, it is recommended that standard engineering safeguards, such as interceptor fencing is installed to negate this low risk, where necessary.

5.3. Habitats within the Application Site

5.3.1. The habitats within the Application Site are generally not considered to be of particular ecological importance, although the hedgerows have some limited value within the context of the Application Site.

5.3.2. **Improved Grassland**. The improved grassland within the Application Site is considered to be of negligible ecological value, being subject to regular management and not supporting a diverse species complement.

Mitigation/Enhancement

5.3.3. Areas of public open space are to be provided as part of the proposals and it is recommended that these be oversown with a native wildflower seed mix and subject to appropriate management, creating a habitat that is of greater biodiversity interest than that which is currently present and helping to achieve an ecological enhancement post-development.

5.3.4. **Hedgerow**. The hedgerows are of some value within the context of the Application Site, due to the number of native species they support and the opportunities they offer faunal groups, such as birds and bats.

Mitigation/Enhancement

5.3.5. The proposals retain all the hedgerows within the Application Site. There will be some small losses to hedgerows H4 and H6 to facilitate access as development proceeds, although existing gaps will be used where possible.

5.3.6. In order to compensate for these small losses, two new hedgerows will be planted in the east of the Application Site (see Appendix 1). These hedgerows will be located where no hedgerows are currently present and will increase the amount of hedgerow habitat present post-development. The provision of these new hedgerows will also increase connectivity for wildlife throughout the Application Site and to the wider area.

5.3.7. It is recommended that the two new hedgerows, and any other new hedgerows to be created within the Application Site, are planted with native species of local provenance, in order to increase biodiversity post-development.

5.3.8. In addition, it is also recommended that all existing hedgerows are bolster planted with a diverse native species mix in order to improve their structure, diversity and connectivity for wildlife post-development.

5.3.9. The layout for the Application Site has been designed to reduce impacts to hedgerows, with the new and existing hedgerows buffered, where possible, from the proposed development by areas of open space.

5.3.10. In order to further compensate the small losses that are to take place, areas of new tree planting are proposed throughout the Application Site and it is recommended that this new planting utilises native species of local provenance to increase biodiversity post-development.

5.3.11. All retained hedgerows should be fenced according to the current British Standards before construction work commences, where necessary, in order to protect roots from compaction. Fences should remain in place until construction work is complete within the vicinity of the hedgerows.

5.3.12. **Ruderal Vegetation.** The areas that have been colonised by ruderal vegetation are small in size, subject to regular management and comprise species that are common and widespread within the local area. Therefore any losses to the development would be of negligible significance and proposed new hedgerows and tree planting that are to take place throughout the Application Site, will more than compensate for their loss.

5.3.13. **Scrub.** The areas of scrub comprise only common and widespread species and are subject to regular management and comprise species that are common and widespread within the local area. Therefore any losses to the development would be of negligible significance and proposed new hedgerows and tree planting that are to take place throughout the Application Site, will more than compensate for their loss.

5.3.14. **Trees.** The trees within and adjacent to the Application Site offer some limited opportunities to birds and bats, but they are not considered to be of much ecological significance in their own right.

Mitigation/Enhancement

5.3.15. The tree with bat potential, located on the western boundary of the Application Site, is to be retained, although the three amenity planted trees associated with the residential buildings in the south of the Application Site are to be lost.

5.3.16. In order to compensate for these losses, extensive areas of new tree planting are proposed, which will result in a net gain in tree numbers post-development and together with new hedgerow planting, will help to increase biodiversity. It is recommended that new tree planting utilise native species of local provenance, in order to increase biodiversity post-development.

5.3.17. All retained trees should be fenced at canopy width according to the current British Standards before construction work commences, where necessary, in order to protect roots from compaction. Fences should remain in place until construction work is complete within the vicinity of the trees. No development should occur underneath the canopy of any trees, or within the immediate area around the trees, unless agreed with the local planning authority.

5.3.18. **Amenity Grassland.** The amenity grassland within the Application Site is considered to be of limited ecological significance, comprising only common and widespread species and being subject to regular management.

Mitigation/Enhancement

5.3.19. Areas of amenity grassland are to be provided as part of the proposals and it is recommended that where possible this grassland be oversown with a native wildflower seed mix and subject to appropriate management, creating a habitat that is of greater biodiversity interest than that which is currently present and helping to achieve an ecological enhancement post-development.

5.3.20. **Amenity Planting.** The small areas of amenity planting comprising non-native species, are not considered to be of any ecological value and their loss to the proposed development would be of no significance.

Mitigation/Enhancement

5.3.21. It is recommended that any areas of new amenity planting within the Application Site comprise a mix of native species and those species of known value to wildlife, in order to increase biodiversity and create an ecological enhancement post-development.

5.3.22. **Buildings.** The buildings do not have any ecological value and no mitigation or enhancements measures are necessary.

5.3.23. **Hardstanding.** The hardstanding does not have any ecological value and no mitigation or enhancements measures are necessary.

5.3.24. Overall the Application Site is not considered to support any habitats of high ecological importance. The proposals retain the areas of higher value (hedgerows) and include areas of open space and new habitat planting, which will help to increase biodiversity post-development and achieve an overall ecological enhancement.

5.4. Habitats within the wider study area

5.4.1. The habitats within the wider study area are to be retained as part of the proposals and will remain unaffected as part of the proposed development. These habitats are generally not considered to be of particular ecological importance, although the hedgerows have some value within the context of the area.

Faunal Evaluation

5.5. **Bats**

5.5.1. **Legislation.** All bats are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and included on Schedule 2 of the Conservation of Habitats and Species Regulations 2010 ("the Habitats Regulations"). These include provisions making it an offence:

- Deliberately to kill, injure or take (capture) bats;
- Deliberately to disturb bats in such a way as to:-
  (i) be likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or to hibernate or migrate; or
  (ii) affect significantly the local distribution or abundance of the species to which they belong;
- To damage or destroy any breeding or resting place used by bats;
- Intentionally or recklessly to obstruct access to any place used by bats for shelter or protection.

5.5.2. While the legislation is deemed to apply even when bats are not in residence, guidance suggests that certain activities such as re-roofing can be completed outside sensitive periods when bats are not in residence provided these do not damage or destroy the roost.

5.5.3. European Protected Species licences are available from Natural Resources Wales in certain circumstances, and permit activities that would otherwise be considered an offence.

5.5.4. **Application Site Usage.** No buildings within the Application Site are considered to be suitable to support roosting bats on account of their fabric, well sealed roofs, lack of suitable features and the fact that they were recently subject to regular use and disturbance. Furthermore, no evidence of bats was recorded within these buildings during the specific internal and external survey work.

5.5.5. One tree on the western boundary of the Application Site was identified as having some potential to support roosting bats, due to rot holes and cracked limbs present. As such, two emergence surveys were carried out on this tree on the 30th June and 13th August 2014, during which no bats were recorded emerging from the tree.

5.5.6. During the activity surveys undertaken within the Application Site and wider study area, low numbers of Common Pipistrelle and Soprano Pipistrelle were recorded foraging / commuting along the hedgerows, together with very occasional *Myotis* sp. and Serotine.

Mitigation & Enhancement

5.5.7. The tree with bat potential is to be retained as part of the proposals, as are the hedgerows, although there will be some small losses to facilitate access.

5.5.8. In addition, two new hedgerows will be planted in the east of the Application Site (see Appendix 1). The provision of these new hedgerows will increase foraging and commuting opportunities for bats and enhance connectivity throughout the Application Site and to the wider area post-development.

5.5.9. In order to enhance and maintain opportunities for bats, new and existing hedgerows will be buffered from the development by areas of open space, where possible.

5.5.10. Furthermore, extensive tree planting across the Application Site will also increase foraging and commuting opportunities for bats post-development (see Appendix 1). It is recommended that these new areas of planting incorporate native species, which will further enhance foraging opportunities for bats post-development.

5.5.11. The proposals include the creation of open space and it is recommended that where possible these be sown with wildflower grassland, which will further enhance foraging opportunities for bats post-development.

5.5.12. In order to ensure impacts to bats are kept to a minimum, care should be taken in the placement of any external lighting to ensure the hedgerows are not lit. Furthermore, low pressure sodium lights (if acceptable) with hoods to direct light downwards, should be employed wherever possible to reduce light spillage.

5.5.13. Although no bat roosts are currently present within the Application Site and none will be affected by the proposals, in order to enhance roosting opportunities post-development, it is recommended that 25% of all new buildings have built in bat tiles or bricks incorporated into their design. In addition a number of bat boxes could be provided on trees within the Application Site to provide additional roosting opportunities post-development.

5.5.14. All hedgerows within the wider study area are to remain unaffected by the proposed development, retaining existing foraging and commuting opportunities for these species.

5.6. Badgers

5.6.1. **Legislation**. The Protection of Badgers Act 1992 consolidates the previous Badgers Acts of 1973 and 1991. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain, with particularly high populations in the southwest.

5.6.2. As well as protecting the animal itself, the 1992 Act also makes the intentional or reckless destruction, damage or obstruction of a Badger sett an offence. A sett is defined as “any structure or place which displays signs indicating current use by a Badger”. ‘Current use’ of a Badger sett is defined as “how long it takes the signs to disappear, or more precisely, to appear so old as to not indicate “current use”.[10]

[10] http://www.naturalengland.org.uk/Images/WMLG17_tcm6-11815.pd

5.6.3. In addition, the intentional elimination of sufficient foraging area to support a known social group of Badgers may, in certain circumstances, be construed as an offence by constituting 'cruel ill treatment' of a Badger.

5.6.4. Work that disturbs Badgers is illegal without a licence. Recent guidelines have been developed on the types of the activity considered should be licensed within certain distances of sett entrances. For example, using heavy machinery within 30m of any entrance to an active sett, and lighter machinery within 20m, or light work such as hand digging within 10m, all may require a licence.

5.6.5. 'Interim guidance' issued in September 2007 specifically states *"it is not illegal, and therefore a licence is not required, to carry out* disturbing *activities in the vicinity of a sett if no badger is disturbed and the sett is not damaged or obstructed."*

5.6.6. More recent guidance produced in 2009 states that Badgers are relatively tolerant of moderate levels of disturbance and that low levels of disturbance at or near to Badger setts do not necessarily disturb the Badgers occupying those setts. However, guidance continues by stating that any activity that will, or is likely to cause one of the interferences defined in Section 3 (such as damaging a sett tunnel or chamber or obstructing access to a sett entrance) will continue to be licensed.

5.6.7. In addition, this latest guidance no longer makes reference to any 30m/20m/10m radius as a threshold for whether a licence would be required. Nonetheless, it is stated that tunnels may extend for 20m so care needs to be taken when implementing excavating operations within the vicinity of a sett and to take appropriate precautions with vibrations and noise, etc. Fires / chemicals within 20m of a sett should specifically be avoided.

5.6.8. This guidance allows greater professional judgement as to whether an offence is likely to be committed by a particular development activity and therefore whether a licence is required or not. For example, if a sett clearly orientates southwards into an embankment it may be somewhat redundant to have a 30m-exclusion zone to the north.

5.6.9. It should be noted that a licence cannot be issued until a site is in receipt of a full and valid planning permission and that generally licences are not granted between December and June inclusive to avoid disruption to the Badger breeding cycle.

5.6.10. Local authorities are therefore obliged to consult NRW over any work which is considered likely to adversely affect Badgers.

5.6.11. **Application Site Usage.** Surveys carried out in July 2014 by Ecology Solutions, recorded no specific evidence of Badger in the form of any setts, latrines, snagged hairs, snuffle holes, mammal push-through or footprints within or adjacent to the Application Site or wider study area.

5.6.12. In March 2012, David Clements Ecology Ltd identified Badger activity along hedgerow H6 (see Plan ECO2), this included a mammal path, latrine, signs of foraging and several Badger hairs. However, this evidence was not recorded during the 2014 surveys.

5.6.13. The change in Badger evidence recorded within the Application Site is attributed to the dynamic nature of this species, which can result in activity levels regularly changing within an area over short periods of time.

Mitigation/Enhancement

5.6.14. Although no specific evidence of Badger has been recorded 2014, evidence of Badger activity was recorded in 2012, so it is possible that they could utilise the Application Site and wider study area to commute or forage on occasion. As such, in order to ensure that no impacts occur to Badgers during any construction activities, all contractors working on the Application Site will be briefed regarding the potential presence of Badgers. Any trenches or deep pits within the Application Site that are to be left open overnight should be covered or provided with a means of escape should a Badger enter. This could simply be in the form of a roughened plank of wood placed in the trench as a ramp to the surface.

5.6.15. Any trenches or pits should be inspected each morning to ensure no Badgers have become trapped overnight. Should a Badger become trapped in a trench it will likely attempt to dig itself into the side of the trench, forming a temporary sett. Should a trapped Badger be encountered Ecology Solutions should be contacted immediately for further advice.

5.6.16. The storage of topsoil or other ‘soft’ building materials on site will be given careful consideration. Badgers will readily adopt such mounds as setts, which would then be afforded the same protection as established setts. Such mounds should be regularly inspected to check for use by Badgers.

5.6.17. Foraging opportunities will still be available for Badgers post-development, within the areas of open space and as a consequence of the new hedgerows and trees that are to be created. In addition, more extensive and optimum foraging opportunities for Badgers are available within the wider area and will remain unaffected by the proposals.

5.7. Great Crested Newts

5.7.1. **Legislation. Legislation.** Great Crested Newts are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and included on Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (“the Habitats Regulations”). These include provisions making it an offence:

- Deliberately to kill, injure or take (capture) Great Crested Newts;
- Deliberately to disturb bats in such a way as to:-
  (i) be likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or to hibernate or migrate; or
  (ii) affect significantly the local distribution or abundance of the species to which they belong;

- To damage or destroy any breeding or resting place used by Great Crested Newts;
- Intentionally or recklessly to obstruct access to any place used by Great Crested Newts for shelter or protection.

5.7.2. European Protected Species licences are available from Natural Resources Wales in certain circumstances, and permit activities that would otherwise be considered an offence.

5.7.3. **Application Site Usage.** No ponds are located within the Application Site. The majority of habitats within the Application Site are not suitable terrestrial habitat for Great Crested Newts or other amphibians, due to being regularly managed, although the hedgerows do offer some terrestrial habitat for Great Crested Newts.

5.7.4. The results of the survey work indicate that there is a small population of Great Crested Newts in ponds P2 and P5. Although Great Crested Newts were only recorded in ponds P2 and P5, they could utilise other ponds within the local area on occasion due to their transient nature.

5.7.5. It is known that newts can disperse up to 500 metres through suitable terrestrial habitat from their breeding pond, but it is widely accepted that they utilise suitable terrestrial habitat within a much closer distance, activity is usually concentrated within 100m of breeding ponds and key habitat is located within 50 metres[11].

5.7.6. Pond P2 is located approximately 175m west of the Application Site and therefore Great Crested Newts could utilise the hedgerows in the east of the Application Site to forage and commute on occasion, although more optimum habitat is located immediately adjacent to pond P2, which is located within the key habitat distance for Great Crested Newts.

5.7.7. Pond P5 is located approximately 340m northwest from the Application Site, is separated by areas of unsuitable habitat, such as a country lane and intensively managed agricultural land. Given the distance that this pond is from the Application Site and the habitats that separate them, no Great Crested from P5 are likely to utilise the habitats within the Application Site.

Mitigation/Enhancement

5.7.8. All ponds and areas of potential terrestrial newt habitat in the wider area are to be retained and will remain unaffected by the proposed development. In addition, all hedgerows within the Application Site are to be retained, with only minor losses occurring to facilitate access. This will maintain suitable terrestrial habitat for Great Crested Newts post-development.

5.7.9. On the basis of the results, Great Crested Newts are present within the local area and could utilise the potential terrestrial habitat within the Application Site (hedgerows). As a consequence, proposed removal of

[11] Natural England's Research Report 576 (An assessment of the Efficiency of Capture Techniques and the Value of Different Habitats for the Great Crested Newt *Triturus cristatus)*

suitable Great Crested Newt habitat within the Application Site that is within the dispersal distance of Great Crested Newts from pond P2, will be undertaken under an NRW European Protected Species Licence. As part of the licence application, a mitigation strategy will be agreed with NRW and will ensure maintenance of the local Great Crested Newt population at a favourable conservation status.

5.7.10. The mitigation strategy that will be agreed with NRW will include the provision of temporary exclusion fencing along hedgerows H6, H11 and H12 on the Application Site side of the hedgerows. These hedgerows are within the dispersal distance for Great Crested Newts located in pond P2 and the exclusion fencing will prevent Great Crested Newts from entering the Application Site during the construction phase.

5.7.11. The proposals for the Application Site will remove small sections of hedgerow H4 and H6 to facilitate access. The section of hedgerow H4 to be removed is approximately located 320m from pond P2. The section of hedgerow H6 to be removed is approximately located 290m away from the pond P2. Therefore, given the distances that these habitats are from pond P2, and the small areas of habitat to be removed, this will results in a low scale of impact to Great Crested Newts in line with the mitigation guidelines[12].

5.7.12. Any removal of suitable terrestrial habitat will be undertaken by hand tools, following a suitable capture period that will be agreed with NRW as part of the licence application. The habitat to be removed will be hand searched by a qualified ecologist for the presence of Great Crested Newts before any suitable terrestrial habitat is removed. The habitat will then be maintained in a cleared state to ensure that no Great Crested Newts re-colonise.

5.7.13. If a Great Crested Newt is found during the hand search, it will be placed in suitable terrestrial habitat sounding pond P2, which as indicated by the survey results, is where the Great Crested Newts will have originated from.

5.7.14. All removal of suitable habitat will be carried out during the Great Crested Newt active season (February-October), to avoid any risk to hibernating Great Crested Newts.

5.7.15. As part of the proposals, all hedgerows within the Application Site are to be retained and two new hedgerows are to be created, which will increase the amount of suitable terrestrial habitat for Great Crested Newts post-development and increase connectivity for this species across the Application Site.

5.7.16. New and existing hedgerows will also be buffered, where possible, with areas of open space, which will provide further terrestrial habitat for this species post-development. It is recommended that these areas of open space are seeded with wildflower grassland and appropriately managed to enhance the habitat present for Great Crested Newts.

[12] English Nature. 2001. Great Crested Newt Mitigation Guidelines. Peterborough.

5.7.17. It is recommended that a series of log piles and hibernacula are included within the Application Site, adjacent to the eastern boundary hedgerows, in order to provide suitable resting and hibernation opportunities for Great Crested Newts and other amphibians post-development.

5.7.18. In order to ensure no impacts occur post-development to Great Crested Newts, it is recommended that the proposed development be specifically designed to avoid the use of upright kerbs and gully pots, which can result in high mortality rates for Great Crested Newts. It is recommended to avoid this potential impact that the drainage scheme omits sumps and incorporates Sustainable Urban Drainage Schemes (SUDS). Where kerbs and gully pots are required, it is recommended that slopping kerbs are provided either side or adjacent to the gully pots to avoid associated impacts.

5.8. Birds

5.8.1. **Legislation.** Section 1 of the Wildlife and Countryside Act 1981 (as amended) is concerned with the protection of wild birds, whilst Schedule 1 lists species that are protected by special penalties. All species of birds receive general protection whilst nesting.

5.8.2. **Application Site Usage.** The Application Site supports a number of locally common breeding birds, although it is not considered to be of any special ornithological interest.

Mitigation/Enhancement

5.8.3. The hedgerows and trees are, in the main, being retained as part of the proposals, which will maintain the existing foraging and commuting habitat for birds post-development.

5.8.4. New areas of hedgerow and extensive tree planting are proposed, which will increase the amount of bird nesting and foraging opportunities post-development (see Appendix 1). It is recommended that these new areas of planting comprise native berry producing species to enhance opportunities for birds post-development.

5.8.5. As a precaution to avoid a possible offence, it is recommended that any tree felling or removal of suitable nesting habitat, be undertaken outside of the breeding season (March – July inclusive) or checked for nesting birds by a trained ecologist immediately prior to removal. Where any nesting birds are recorded within the Application Site, no work should take place in that location until the young have left the nest.

5.8.6. Although the majority of bird nesting habitat is to remain unaffected by the proposals, in order to enhance nesting opportunities post-development it is recommended that, where appropriate, a range of bird boxes are placed on suitable trees and/or buildings.

5.9. Reptile

5.9.1. **Legislation**. All six British reptile species receive a degree of legislative protection that varies depending on their conservation importance.

5.9.2. Rare, endangered or declining species receive 'full protection' under the Wildlife and Countryside Act 1981 as well as protection under the Conservation (Natural Habitats &c.) Regulations 2010, which transposed into UK law the European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, more commonly known as the Habitats Directive. Species that are fully protected include Smooth Snake *Coronella austriaca* and Sand Lizard *Lacerta agilis*. These receive the following protection from:

- Killing, injuring, taking;
- Possession or control (of live or dead animals, their parts or derivatives);
- Damage to, destruction of, obstruction of access to any structure or place used for shelter or protection;
- Disturbance of any animal occupying such a structure or place; and
- Selling, offering for sale, possession or transport for purposes of sale (live or dead animal, part or derivative).

5.9.3. Due to their abundance in Britain, Common Lizard *Zootoca vivipara*, Slow Worm *Anguis fragilis*, Grass Snake and Adder *Vipera berus* are only 'partially protected' under the Wildlife and Countryside Act 1981 (as amended) and as such only receive protection from:

- Deliberate killing and injuring;
- Being sold or other forms of trading.

5.9.4. The habitat of common reptiles is therefore not directly protected. However, because of their partial protection, disturbing or destroying their habitat while they are present may lead to an offence. Therefore, mitigation measures undertaken prior to development that avoids killing or injuring common reptiles will ensure that an offence is avoided.

5.9.5. **Application Site Usage.** The majority of habitats within the Application Site and wider study area are subject to regular management that creates a short sward height, even along the field margins, and as such does not provide suitable habitat for reptiles. The hedgerows within the Application Site and wider study area do offer some limited foraging and commuting habitat for reptiles, although the surrounding habitats comprise largely residential and intensively managed agricultural land, which are not suitable for reptiles, reducing the likelihood of this faunal group being present.

Mitigation/Enhancement

5.9.6. The hedgerows are, in the main, being retained as part of the proposals, which will maintain the existing terrestrial habitat for reptiles post-development.

5.9.7. Due to the hedgerows limited suitability to support reptile species, a precautionary approach will be undertaken during any hedgerow removal. This will involve a hand search carried out by a qualified ecologist before the habitat is removed and once removed, the habitat will then be maintained in a cleared state to ensure that no reptiles re-colonise. Furthermore, the mitigation outlined for Great Crested Newts will further reduce any possible impacts and ensure no reptiles or Great Crested Newts are impacted during habitat removal.

5.9.8. The two new hedgerows to be created as part of the proposed development will increase the amount of suitable terrestrial habitat present for reptiles post-development. These new hedgerows will also improve connectivity throughout the Application Site and to the wider area for reptiles.

5.9.9. It is recommended that the areas of open space to be provided as part of the proposed development are subject to appropriate management in order to increase the available habitat for reptile species. In addition, the recommendations regarding the provision of log piles and hibernacula for Great Crested Newts will also provide further opportunities for reptiles post-development.

6. PLANNING POLICY CONTEXT

6.1. The planning policy framework that relates to nature conservation issues at the Application Site is issued at two main administrative levels – Nationally through Planning Policy Wales (2012), which includes Technical Advice Note 5 on Nature Conservation and Planning, at the County level through the Vale of Glamorgan Adopted Unitary Development Plan and the new Local Development Plan, which is still in preparation.

6.2. National Policy

Planning Policy Wales (PPW) (Edition 5 November 2012)

6.2.1. PPW sets out guidance with regard to nature conservation under Chapter 5 'Conserving and Improving Natural Heritage and the Coast'. It provides guidance to local planning authorities relating to caring for biodiversity and safeguarding statutorily designated sites, non-statutorily designated sites and protected species and their habitats. It also recognises the importance of trees, woodlands and hedgerows.

6.2.2. PPW requires local authorities to fully consider the effect of planning decisions on natural heritage, inclusive of biodiversity and geological conservation in Wales, ensuring that development 'contributes to meeting international responsibilities and obligations for the natural environment' and ensure that appropriate weight is attached to statutory nature conservation designations, protected species and biodiversity within the wider environment.

6.2.3. It also considers the potential biodiversity and geological conservation gains which can be secured within developments, including the use of planning obligations.

6.2.4. National policy therefore implicitly recognises the importance of biodiversity and that with sensitive planning and design, development and conservation of the natural heritage can co-exist and benefits can, in certain circumstances, be obtained.

Technical Advice Note (Wales) 5: Nature Conservation and Planning

6.2.5. The purpose of Technical Advice Note (Wales) 5 (TAN5) is to supplement the information provided in PPW.

6.2.6. TAN5 requires local planning authorities to fully consider the effect of planning decisions on biodiversity, and ensure that appropriate weight is attached to statutory nature conservation designations, protected species and biodiversity and geological interests within the wider environment. It also considers the potential biodiversity and geological conservation gains which can be secured within developments, including the use of planning obligations.

6.2.7. National policy therefore implicitly recognises the importance of biodiversity and that with sensitive planning and design, development and conservation of the natural heritage can co-exist and benefits can, in certain circumstances, be obtained.

6.3. County Policy

Vale of Glamorgan Unitary Development Plan (UDP)

6.3.1. The Vale of Glamorgan Adopted Unitary Development Plan 1996 - 2011 constitutes the development plan for the authority. There are a number of policies within the UDP which relate in whole or in part to nature conservation, including: Strategic Policies 1 and 2 – The Environment, and Policies ENV12: Woodland Management; ENV13 – International Areas of Nature Conservation Importance, ENV14 – National Sites of Nature Conservation Importance, ENV15 – Local Sites of Nature Conservation Significance, and ENV16 – Protected Species.

Local Development Plan (LDP)

6.3.2. The Vale of Glamorgan Council is in the process of preparing a new LDP, which will set out how land within the Vale of Glamorgan is used between 2011 and 2026.

6.3.3. Policies currently detailed within the LDP that relate in whole or in part to nature conservation include: SP10 – Built and Natural Environment, MG 18 – Green Wedges, MG 19 – Sites of Importance for Nature Conservation, MD 8 – Environmental Protection and MD 10 – Promoting Biodiversity.

6.3.4. The Application Site is partly located within Site 43 – Land to the East of St Nicholas, which also extends to the east the Application Site boundary. This Site is allocated under of Policy MG2 – Housing Allocation, which is in accordance with the LDP strategy and Policy SP 3 – Residential Requirement.

6.3.5. Policy MG2 identifies allocated sites within the area for residential development, in order to meet the housing requirement identified within Policy SP 3. These sites have been allocated in settlements which the Council consider are the most appropriate to assimilate new development.

6.3.6. As part of the HRA that was conducted on the LDP, it concluded that any development at Site 43 will not have any residual effects to any European Designated Site either alone or in combination with any other plans or projects.

6.4. Discussion

6.4.1. It is considered that any development following the recommendations in this report, would fully accord with national and county policy and will avoid any significant impacts on any designated sites for nature conservation. The potential presence of protected species is acknowledged and measures to safeguard these put forward, where necessary, whilst those habitats of ecological importance have been identified and measures recommended to ensure their protection.

7. SUMMARY AND CONCLUSIONS

7.1. Ecology Solutions was commissioned by Redrow Homes Ltd in April 2014 to undertake an Ecological Assessment of Land at St Nicholas, Vale of Glamorgan.

7.2. An Ecological Assessment was previously carried out by David Clements Ecology Ltd in March 2012, which included the southern section of the Application Site and an adjacent field to the east.

7.3. The proposals for the Application Site are for residential development together with associated areas of hardstanding, landscape planting and open space.

7.4. The Application Site currently comprises part of a candidate site that is allocated for residential development under policy MG 2 – Housing Allocations within the new Vale of Glamorgan LDP, which is yet to be fully adopted. The candidate site is Site 43 – Land to the East of St Nicholas.

Designated Sites

7.5. There are no statutory designated sites of nature conservation interest within the Application Site or wider study area. The nearest statutory designated site is Ely Valley SSSI, which is situated approximately 2km to the north of the Application Site, is separated from the Application Site by intensively managed agricultural land. Given its distance from the Application Site it is not considered that there will be any impacts to this SSSI as a consequence of the proposed development.

7.6. The nearest European designated site is Cardiff Beech Woods SAC located approximately 7.5km to the northeast of the Application Site. The next nearest European designated site is the Severn Estuary SAC located approximately 10km to the southeast of the Application Site. These SACs are separated from the Application Site by existing residential development, intensively managed agricultural land and roads, and given their distance from the Application Site it is not considered that there will be any impacts to these SACs as a consequence of the proposed development, either alone or in combination with any other plans or projects.

7.7. An HRA was completed as part of the LDP process and concluded that the development of Site 43, which includes the Application Site, will not have any residual effects on any European Designated Sites either alone or in combination with any other plans or projects.

7.8. There are no non-statutory designated sites of nature conservation interest within the Application Site or wider study area. The nearest non-statutory designated site is the East of Glyncory Water Works SINC, which is also designated an Ancient Semi Natural Woodland, and is situated approximately 0.4km to the north of the Application Site. The next nearest non-statutory designated site is Land at Winchpit SINC located approximately 0.5km southeast of the Application Site. These non-statutory designated sites are separated from the Application Site by intensively managed agricultural land and given their distance from the Application Site it is not considered that there will be any impacts to these non-statutory designated sites as a consequence of the proposed development.

7.9. Although it is not considered that any statutory or non-statutory sites will be impacted upon by the proposed development, consideration has been given to potential impacts that could arise from dust, noise and run-off.

Habitats

7.10. The habitats within the Application Site are generally not considered to be of particular ecological importance, although the hedgerows have some limited value within the context of the Application Site.

7.11. Areas of public open space and grassland are to be provided as part of the proposals and it is recommended that these be oversown with a native wildflower seed mix and subject to appropriate management, creating a habitat that is of greater biodiversity interest than that which is currently present and helping to achieve an ecological enhancement post-development.

7.12. The proposals retain all the hedgerows within the Application Site. There will be some small losses to hedgerows H4 and H6 to facilitate access as development proceeds, although existing gaps will be used where possible.

7.13. To compensate for these small losses, two new hedgerows will be planted in the east of the Application Site. These will be located where no hedgerows are currently present and will increase the amount of hedgerow habitat present post-development. The provision of these new hedgerows will increase connectivity for wildlife throughout the Application Site and to the wider area. In addition, tree planting is proposed throughout the Application Site to further compensate for this small loss. It is recommended that all new planting utilises native species of local provenance to increase biodiversity post-development.

7.14. It is also recommended that all existing hedgerows are bolster planted with a diverse native species mix in order to improve their structure, diversity and connectivity for wildlife post-development.

7.15. The layout for the Application Site has been designed to reduce impacts to hedgerows, with the new and existing hedgerows buffered, where possible, from the proposed development by areas of open space.

7.16. All retained hedgerows and trees should be fenced according to the current British Standards before construction work commences, where necessary, in order to protect roots from compaction. Fences should remain in place until construction work is complete within the vicinity of the hedgerows.

7.17. The tree with bat potential, located on the western boundary of the Application Site, is to be retained, although the three amenity planted trees associated with the residential buildings in the south of the Application Site are to be lost.

7.18. It is recommended that any areas of new amenity planting within the Application Site comprise a mix of native species and those species of known value to wildlife, in order to increase biodiversity and create an ecological enhancement post-development.

Protected Species

7.19. No buildings within the Application Site are considered to be suitable to support roosting bats and no evidence of bats was recorded within these buildings during the specific internal and external survey work.

7.20. One tree on the western boundary of the Application Site was identified as having some potential to support roosting bats, however emergence surveys were carried out, during which no bats were recorded emerging from the tree. This tree is to eb retained as part of the proposals.

7.21. During the activity surveys undertaken within the Application Site and wider study area, low numbers of Common Pipistrelle and Soprano Pipistrelle were recorded foraging / commuting along the hedgerows, together with very occasional Myotis sp. and Serotine.

7.22. The hedgerows are, in the main, being retained as part of the proposals, which will maintain the existing foraging and commuting habitat for bats and birds post-development.

7.23. Two new hedgerows will be planted in the east of the Application Site, which will increase foraging and commuting opportunities for bats, birds, Great Crested Newts and reptiles, as well as a range of other species and will enhance connectivity throughout the Application Site and to the wider area post-development.

7.24. In order to enhance and maintain opportunities for wildlife, new and existing hedgerows will be buffered from the development by areas of open space, where possible. It is recommended that these open spaces be sown with wildflower grassland and are subject to appropriate management, in order to increase the available habitat for Great Crested Newts and reptile and increasing biodiversity post-development.

7.25. New areas tree planting is also proposed, which will increase the amount of commuting and foraging opportunities for bats and birds post-development. It is recommended that these new areas of planting incorporate native species to further enhance foraging opportunities for wildlife post-development.

7.26. In order to ensure impacts to bats are kept to a minimum, care should be taken in the placement of any external lighting to ensure the hedgerows are not lit. Furthermore, low pressure sodium lights (if acceptable) with hoods to direct light downwards, should be employed wherever possible to reduce light spillage.

7.27. Although no bat roosts are currently present within the Application Site and none will be affected by the proposals, in order to enhance roosting opportunities post-development, it is recommended that bat bricks and/or boxes are provided within the Application Site to provide additional roosting opportunities post-development.

7.28. The survey results indicate that Badgers could utilise the Application Site and wider study area to commute or forage on occasion. As such, in order to ensure that no impacts occur to Badgers during any construction activities, all contractors working on the Application Site should be briefed regarding the potential presence of Badgers.

7.29. As a precaution to avoid a possible offence, it is recommended that any tree felling or removal of suitable nesting habitat, be undertaken outside of the breeding season (March – July inclusive) or checked for nesting birds by a trained ecologist immediately prior to removal. Where any nesting birds are recorded within the Application Site, no work should take place in that location until the young have left the nest.

7.30. Although the majority of bird nesting habitat is to remain unaffected by the proposals and new habitat is to be created, in order to enhance nesting opportunities post-development further, it is recommended that, where appropriate, a range of bird boxes are placed on suitable trees and/or buildings.

7.31. No ponds are located within the Application Site. The majority of habitats within the Application Site are not suitable terrestrial habitat for Great Crested Newts or other amphibians, due to being regularly managed, although the hedgerows do offer some terrestrial habitat for Great Crested Newts.

7.32. The results of the survey work indicate that there is a small population of Great Crested Newts in pond P2 and P5 and small population of Smooth Newts in pond P2 and P6. No Great Crested Newts or other amphibians were recorded within ponds P1, P3, P4 and P7.

7.33. All ponds and areas of potential terrestrial newt habitat in the wider area are to be retained and will remain unaffected by the proposed development. In addition, all hedgerows within the Application Site are to be retained, with only minor losses occurring to facilitate access. This will maintain suitable terrestrial habitat for Great Crested Newts post-development.

7.34. On the basis of the results, Great Crested Newts are present within the local area and could utilise the areas of potential terrestrial habitat within the Application Site (hedgerows). As a consequence, proposed removal of suitable Great Crested Newt habitat that is within the dispersal distance of Great Crested Newts from pond P2, will be undertaken under an NRW European Protected Species Licence. As part of the licence application, a mitigation strategy will be agreed with NRW and will ensure maintenance of the local Great Crested Newt population at a favourable conservation status.

7.35. The mitigation will involve the use of temporary exclusion fencing and hand searches over an agreed period of time and during the active newt season.

7.36. It is recommended that a series of log piles and hibernacula are included within the Application Site, adjacent to the eastern boundary hedgerows, in order to provide suitable resting and hibernation opportunities for Great Crested Newts and other amphibians post-development. This will also increase opportunities for reptiles post-development.

7.37. In order to ensure no impacts occur post-development to Great Crested Newts, it is recommended that the proposed development be specifically designed to avoid the use of upright kerbs and gully pots, which can result in high mortality rates for Great Crested Newts. It is recommended to avoid this potential impact that the drainage scheme omits sumps and incorporates SUDS. Where kerbs and gully pots are required, it is recommended that slopping kerbs are provided either side or adjacent to the gully pots to avoid associated impacts.

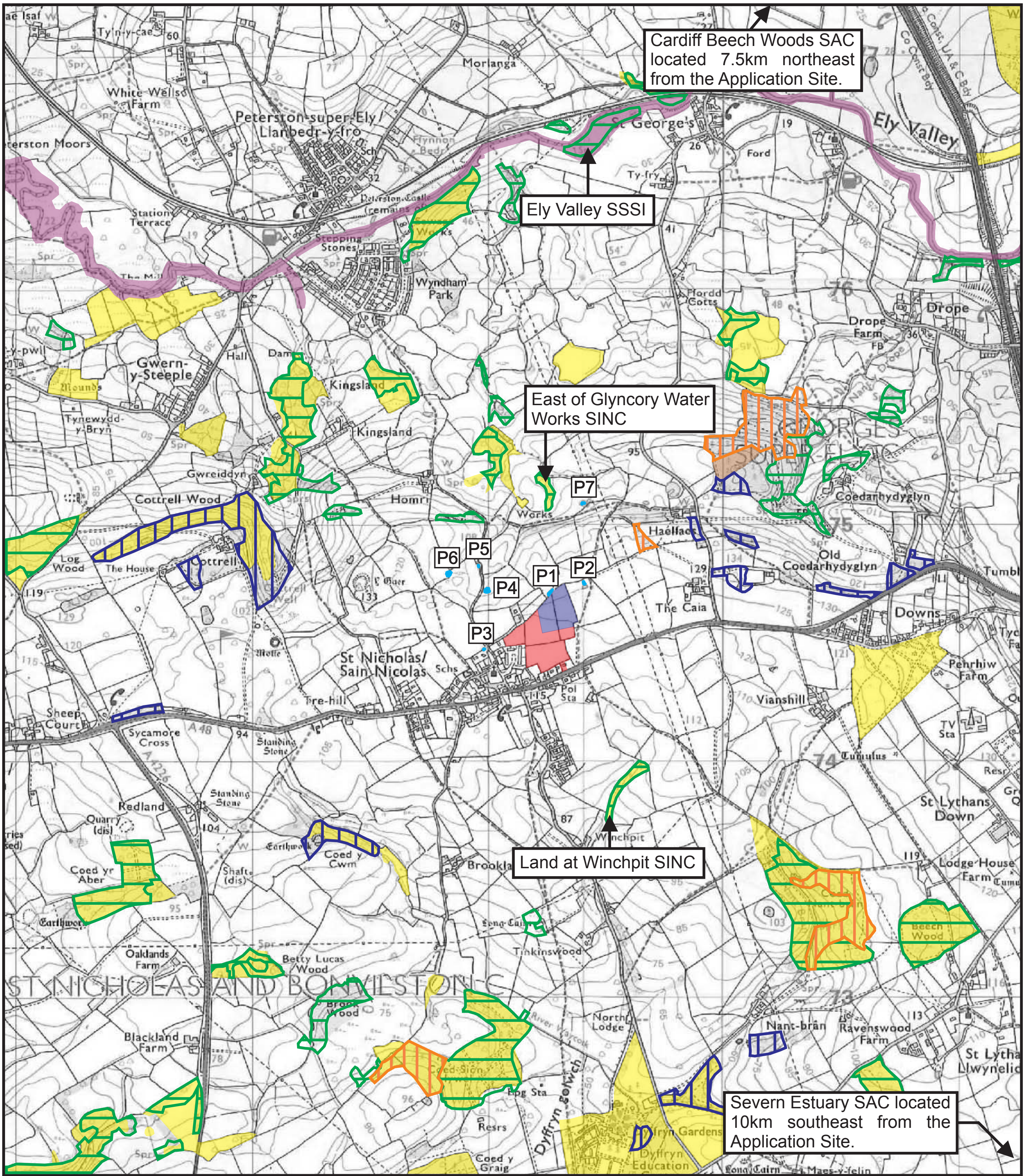
7.38. Although the majority of habitats are not suitable for reptile, a precautionary approach will be undertaken during any hedgerow removal. This will involve a hand search carried out by a qualified ecologist before the habitat is removed and once removed, the habitat will then be maintained in a cleared state to ensure that no reptiles re-colonise. Furthermore, the mitigation outlined for Great Crested Newts will further reduce any possible impacts and ensure no reptiles or Great Crested Newts are impacted during habitat removal.

7.39. In conclusion, all relevant ecological issues have been addressed and on the evidence of the specific ecological surveys undertaken and with the implementation of the mitigation and recommendations set out in this report, there is no current evidence to suggest that there are any overriding ecological constraints in relation to the land within the Application Site.

PLANS

PLAN ECO1

Application Site, Wider Study Area & Pond Locations & Ecological Designations



KEY:

- APPLICATION SITE
- WIDER STUDY AREA
- SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)
- SITE OF IMPORTANCE FOR NATURE CONSERVATION (SINC)
- ANCIENT SEMI NATURAL WOODLAND
- RESTORED ANCIENT WOODLAND SITE
- PLANTATION ON ANCIENT WOODLAND SITE
- ANCIENT WOODLAND SITE OF UNKNOWN CATEGORY
- PONDS

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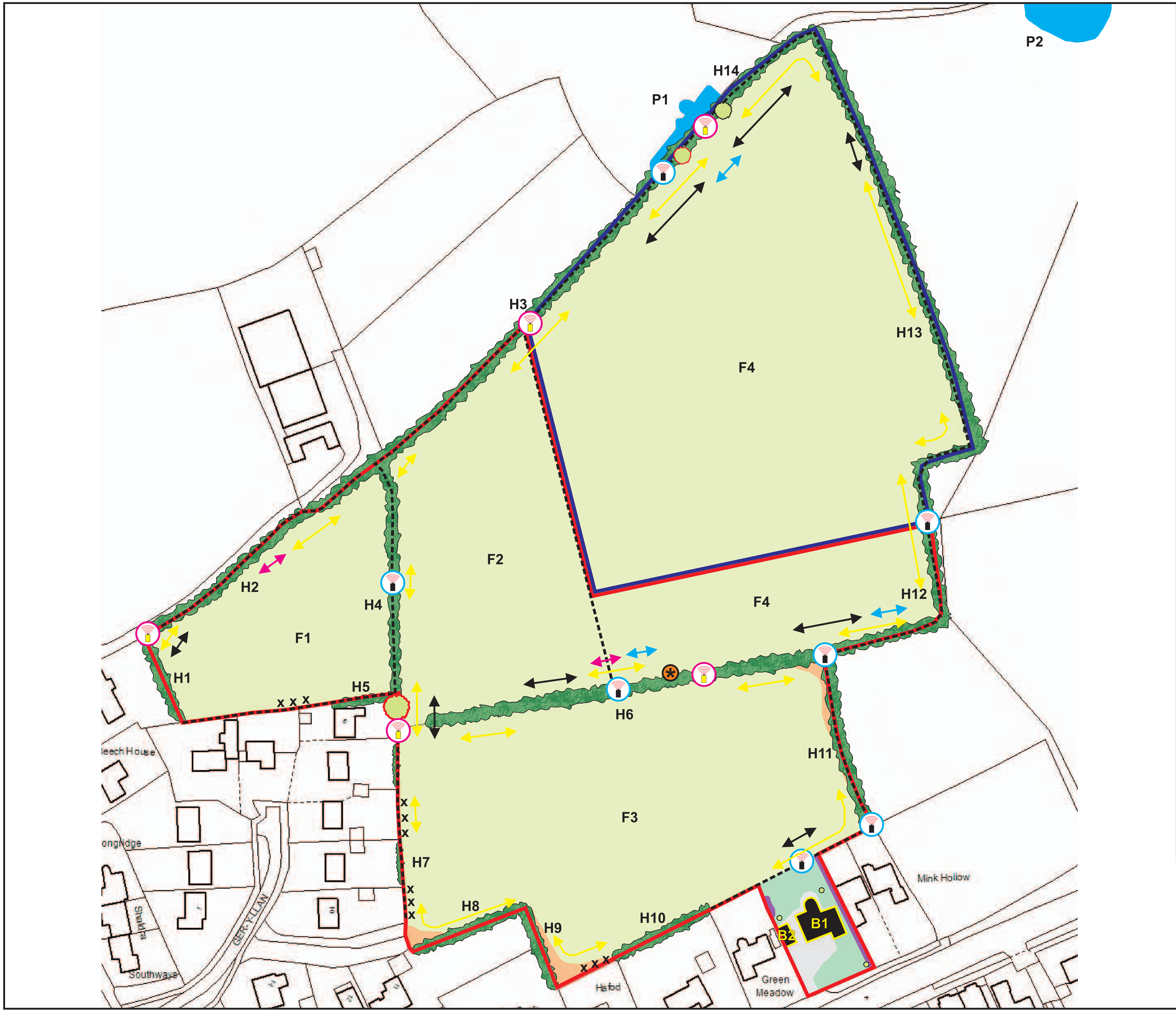
6283: LAND AT ST NICHOLAS, VALE OF GLAMORGAN

PLAN ECO1: APPLICATION SITE, WIDER STUDY AREA & POND LOCATIONS & ECOLOGICAL DESIGNATIONS

PLAN ECO2

Ecological Features & Survey Results



KEY:

- APPLICATION SITE
- WIDER STUDY AREA
- IMPROVED GRASSLAND
- AMENITY GRASSLAND
- AMENITY PLANTING
- RUDERAL VEGETATION
- x SCRUB
- HEDGEROW
- POND
- TREE
- BAT POTENTIAL TREE
- BUILDING
- HARDSTANDING
- FENCE
- STATIC AUTOMATED BAT SURVEY DETECTOR LOCATIONS
- BAT ACTIVITY SURVEY AUTOMATED DETECTOR LOCATIONS
- COMMON PIPISTRELLE
- SOPRANO PIPISTRELLE
- MYOTIS SP.
- SEROTINE
- APPROXIMATE LOCATION OF BADGER ACTIVITY RECORDED BY DAVID CLEMENTS ECOLOGY LTD IN MARCH 2012

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6283: LAND AT ST NICHOLAS, VALE OF GLAMORGAN

PLAN ECO2: ECOLOGICAL FEATURES & SURVEY RESULTS

PHOTOGRAPHS

PHOTOGRAPH 1: View of Field F1.

PHOTOGRAPH 2: View of Field F2 and the section of Field F4 that is located in the wider study area

PHOTOGRAPH 3: View of Field F3.

PHOTOGRAPH 4: View of Building B1

PHOTOGRAPH 5: View of Building B2

PHOTOGRAPH 6: View of Pond P1 in the wider study area, showing some impacts from cattle

APPENDICES

APPENDIX 1

May 2014. St Nicholas. Appraisal Layout.

site	St Nicholas		E RANGE			
	Housetypes		No Storeys	No.	Sq ft	Total sq ft
	New Heritage Collection					
Open	Evesham		2		699	0
Market	Ledbury		2		762	0
	Ledbury 3		2		866	0
	Evesham 3		2		805	0
	Broadway		2		839	0
	Malvern		2		908	0
	Letchworth		2		963	0
Open	Stroud		2		1018	0
Market	Warwick		2		1059	0
	Kenilworth		2.5		1114	0
	Kenilworth M		2.5		1292	0
	Kenilworth S		2.5		1292	
	Worcester		2	9	1252	11268
	Shrewsbury		2		1134	0
	Stratford		2		1173	0
	Windsor		2		1189	0
	Marlow		2		1259	0
	Oxford		2	10	1300	13000
	Leamington		2		1361	0
	York		2.5		1356	0
	Cavendish		2.5		1315	0
	Cambridge		2	3	1382	4146
	Shaftsbury		2	2	1402	2804
	Canterbury		2		1408	0
	Harrogate		2	6	1511	9066
	Welwyn		2		1533	0
	Henley		2	5	1769	8845
	Sunningdale		2	4	1621	6484
	Balmoral		2		1807	0
	Marlborough		2	5	1901	9505
	Richmond		2	2	2030	4060
	Sandringham		2	2	2483	4966
	Highgrove		2	4	2764	11056
	Total No. of Houses			52		85200
Low	E		2	5	699	3495
Cost	E 3		2		805	0
	B		2		839	0
	1 bed flat		2		550	0
	Total No. of Low Cost Houses			5		3495
	4.2.1		2	6	833	4998
Social	4.2.2		2	6	833	4998
Housing	5.3.1		2	2	952	1904
	6.4.1		2		1107	0
	Tavy		2		818	0
	Dart		2		840	0
	1 bed flat (Common Access)		2	8	550	4400
	2 bed flat (Common Access)		2		635	0
	Total No. of Social Rented			22		16300
	Total No. of Social Houses			27		
	Total No. of Plots			79		104995
		AREA OF ROAD / ACRE		-314 m2 / Acre		
	FILTRATION POND			0.0ac		
	POS Area			1.67ac		
	Net Site Area - Open Market			6.28ac		
	Net Site Area - Social			1.04ac		
	Gross Site Area			9.03ac		

St Nicolas

Appraisal Layout

May 2014 1:500 @AO

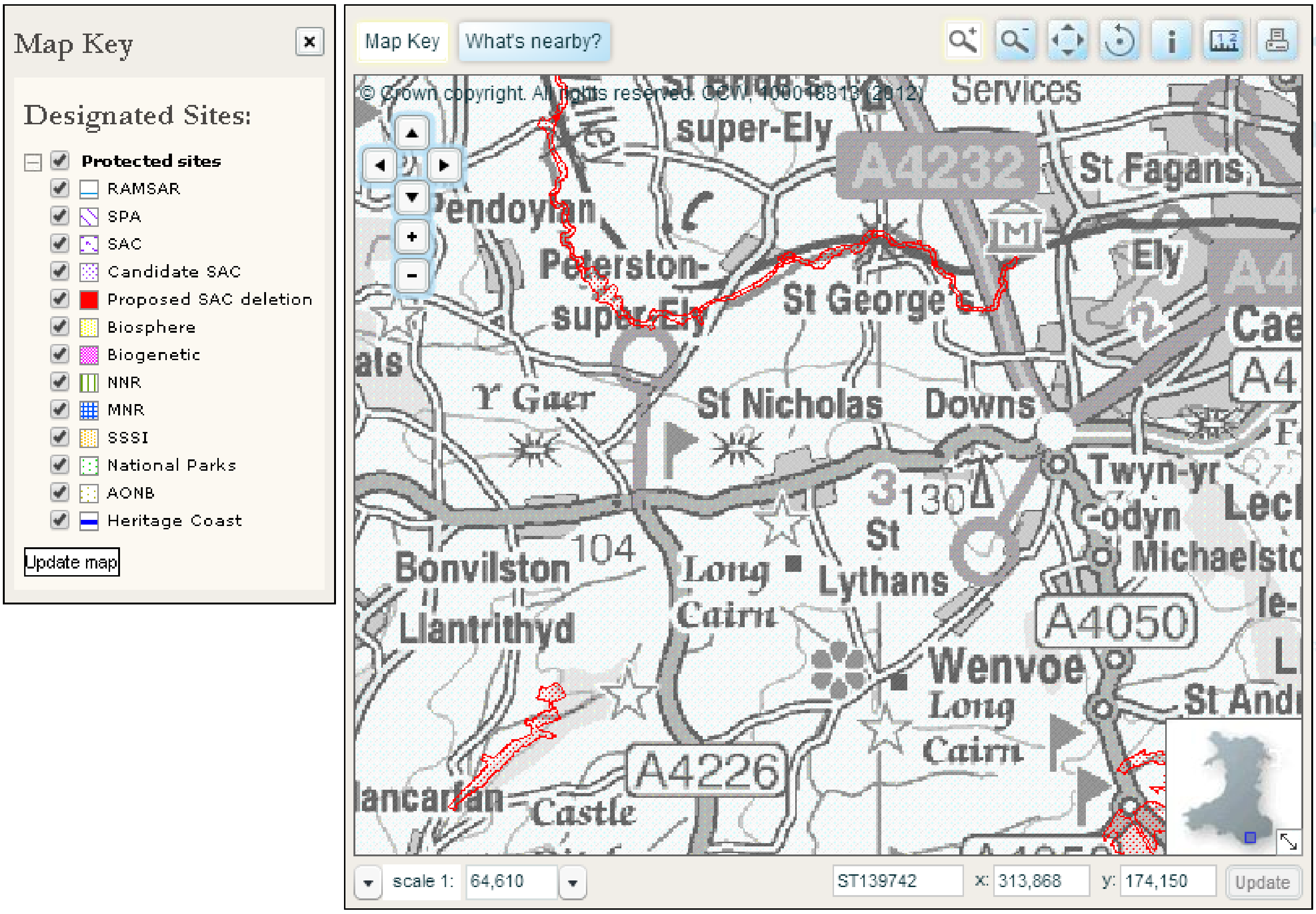
Revised

19/06/2014 08:55:08

Mods post Models

APPENDIX 2

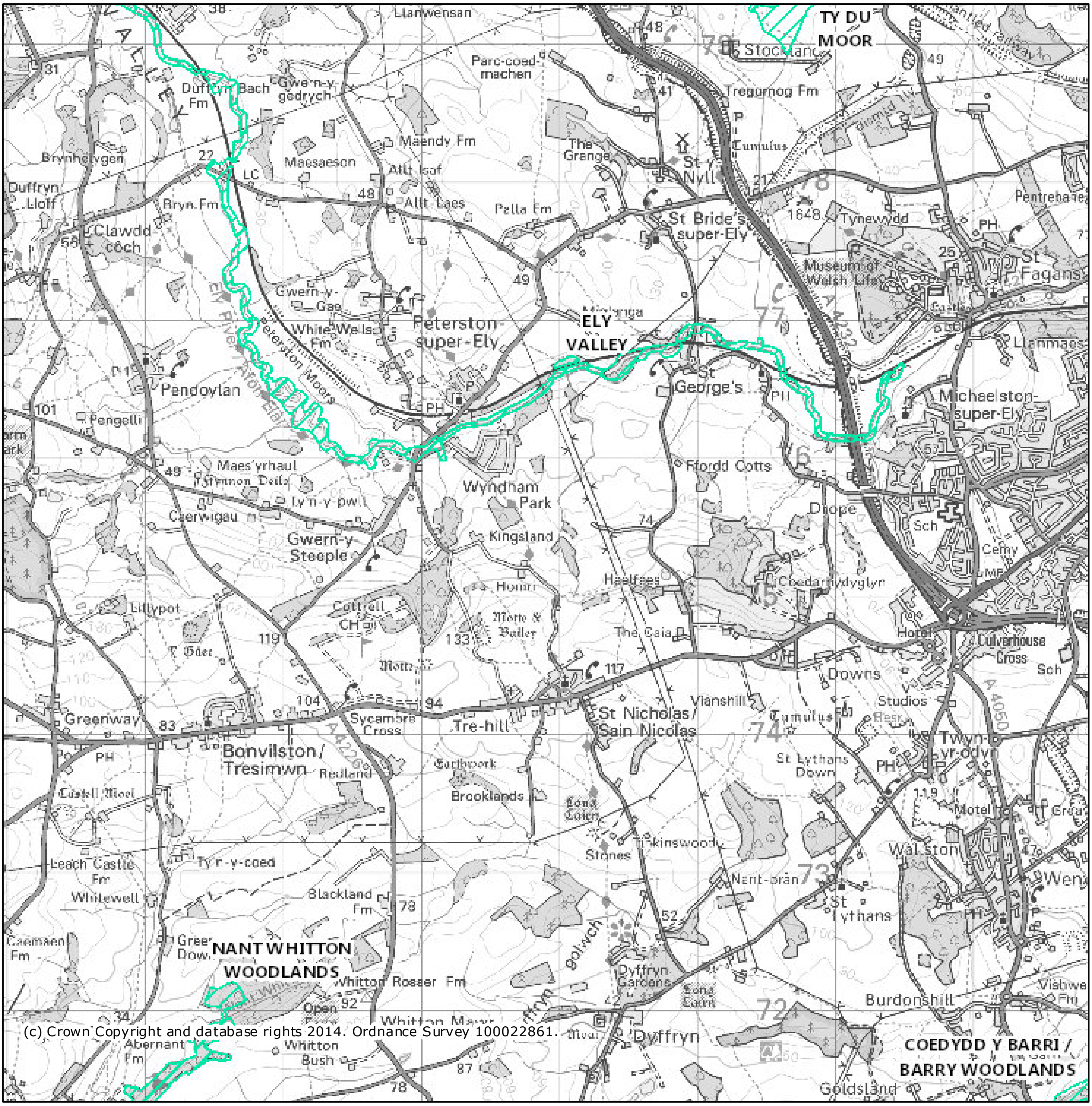
Information obtained from Natural Resources Wales website and MAGIC



To use our interactive maps you will need Adobe Flash Player. You can download the Flash Player, free of charge, from the Adobe website.

For full terms & Conditions click here.

Magic Map



Legend

- National Nature Reserves (Wales)
- Ramsar Sites (Wales)
- Sites of Special Scientific Interest (Wales)
- Special Areas of Conservation (Wales)
- Special Protection Areas (Wales)

Projection = OSGB36

xmin = 302100

ymin = 171500

xmax = 315800

ymax = 179100

Map produced by MAGIC on 11 November, 2014.

APPENDIX 3

Dormouse Nest Tuber Survey Results

DORMOUSE NEST TUBE SURVEY RESULTS

Project	Survey date	Number of nesting tubes	Number of potential Dormice nests located	Number of Dormice located
Land at St Nicholas, Vale of Glamorgan	29.5.2014	100	0	0
Land at St Nicholas, Vale of Glamorgan	23.6.2014	100	0	0
Land at St Nicholas, Vale of Glamorgan	24.7.2014	100	0	0
Land at St Nicholas, Vale of Glamorgan	29.8.2014	100	0	0
Land at St Nicholas, Vale of Glamorgan	16.9.2014	100	0	0

APPENDIX 4

Great Crested Newt Survey Results

GREAT CRESTED NEWT SURVEY RESULTS

Site	Survey	Cloud Cover / Conditions	Temp.	Date	Pond	No. Traps	Great Crested Newt								Smooth Newt								Palmate Newt							
							Male				Female				Male				Female				Male				Female			
							NT	TO	BT	ES	NT	TO	BT	ES	NT	TO	BT	ES	NT	TO	BT	ES	NT	TO	BT	ES	NT	TO	BT	ES
Land at St Nicholas, Vale of Glamorgan	1	Dry/ 60% Cloud	10	4.5.14	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	1	Dry/ 60% Cloud	10	4.5.14	2	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	1	Dry/ 60% Cloud	10	4.5.14	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	1	Dry/ 60% Cloud	11	4.5.14	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	1	Dry/ 60% Cloud	10	4.5.14	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	2	Overcast & Windy	11	6.5.14	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	2	Overcast & Windy	11	6.5.14	2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	2	Overcast & Windy	11	6.5.14	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	2	Overcast & Windy	11	6.5.14	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	2	Overcast & Windy	11	6.5.14	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	2	Overcast & Windy	11	6.5.14	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	3	Drizzly	10	13.5.14	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	3	Drizzly	10	13.5.14	2	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	3	Drizzly	10	13.5.14	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	3	Drizzly	10	13.5.14	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	3	Drizzly	10	13.5.14	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	3	Drizzly	10	13.5.14	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	3	Drizzly	10	13.5.14	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	4	Rain, 100% Cloud	12	10.6.14	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	4	Rain, 100% Cloud	12	10.6.14	2	12	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	4	Rain, 100% Cloud	12	10.6.14	5	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	4	Rain, 100% Cloud	12	10.6.14	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	4	Rain, 100% Cloud	12	10.6.14	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	5	Clear/slight breeze/ 30% cloud	18	13.6.14	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	5	Clear/slight breeze/ 30% cloud	18	13.6.14	2	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	5	Clear/slight breeze/ 30% cloud	18	13.6.14	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	5	Clear/slight breeze/ 30% cloud	18	13.6.14	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	5	Clear/slight breeze/ 30% cloud	18	13.6.14	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	5	Clear/slight breeze/ 30% cloud	18	13.6.14	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	6	Clear/dry/30% cloud	16	16.6.14	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	6	Clear/dry/30% cloud	16	16.6.14	2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	6	Clear/dry/30% cloud	16	16.6.14	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	6	Clear/dry/30% cloud	16	16.6.14	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land at St Nicholas, Vale of Glamorgan	6	Clear/dry/30% cloud	16	16.6.14	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

KEY
NT = Netting
TO = Torching
BT = Bottle Trapping
ES = Egg Search