



Gravity

Smart Campus

Gravity EIA Scoping Report

Chapter 12

Appendix L – Ecology Baseline Report

COPYRIGHT

The copyright of this document
remains with Ecology Solutions
The contents of this document
therefore must not be copied or
reproduced in whole or in part
for any purpose without the
written consent of Ecology Solutions.

CONTENTS

1	INTRODUCTION	1
2	SURVEY METHODOLOGY	3
3	ECOLOGICAL FEATURES	10
4	WILDLIFE USE OF THE SITE	25
5	LOCAL WILDLIFE SITES WITHIN THE SITE BOUNDARY	42
6	SUMMARY AND CONCLUSIONS	45

PLANS

PLAN ECO1	Local Wildlife Sites Within the Site Boundary
PLAN ECO2	Ecological Features
PLAN ECO3	Bat Survey Plan
PLAN ECO4	Badger Survey Results
PLAN ECO5	Breeding Bird Survey Results
PLAN ECO6	Reptile Survey Plan
PLAN ECO7	Water Voles Survey Results
PLAN ECO8	GCN Survey Results
PLAN ECO9	GCN Survey Results (2018)

APPENDICES

APPENDIX 1	MAGIC Map
APPENDIX 2	Interim Invertebrate Report
APPENDIX 3	Hedgerow Descriptions
APPENDIX 4	Bat DNA sample results
APPENDIX 5	Bat Survey Results Tables
APPENDIX 6	Historic Badger Sett Locations
APPENDIX 7	Great Crested Newt Survey Results Tables
APPENDIX 8	Local Wildlife Site Citation and SERC Survey Sheets

1. INTRODUCTION

1.1. Background

- 1.1.1. Ecology Solutions Ltd was commissioned on behalf of This Is Gravity in March 2020 to undertake a comprehensive programme of ecology survey work for This is Gravity Ltd (TIGL), at the site known as Gravity, at Puriton, near Bridgwater, Somerset; hereafter referred to as the 'Site'.
- 1.1.2. The full site is an Enterprise Zone (EZ) and TIGL are working collaboratively with the EZ partners including Sedgemoor District Council (SDC), Somerset County Council, the Heart of the South West Local Enterprise Partnership (HotSW LEP) and the Ministry of Housing, Communities and Local Government (MHCLG) to implement a comprehensive commercial led scheme between 1.4.2017 and 31.3.2042. The EZ was formerly a Royal Ordnance manufacturing facility.
- 1.1.3. SDC as the local planning authority have agreed to pursue a developer led Local Development Order (LDO) process, driven by a Clean and Inclusive Growth agenda, to create a smart campus and community. A LDO proposal was submitted to and considered by SDC and now forms the basis of a full programme of work during 2020- 2021 to enable SDC to adopt a LDO by November 2021.
- 1.1.4. To inform the LDO programme and any other planning processes on site, a full update of ecological surveys was triggered at the earliest opportunity and to avoid further delays in EZ implementation. The surveys have been conducted in close consultation and engagement with the on-site team ensuring health and safety compliance.
- 1.1.5. Survey work undertaken at the Site includes a range of habitat and species-specific surveys covering the 2020 survey period. This report has been produced in order to detail the methodologies and findings of the work undertaken.
- 1.1.6. It should also be recognised that the Site has already been subject to previous extensive ecological survey and assessment work as part of the decommissioning and remediation works which have planning consent, as well as to inform the extant hybrid planning permission for the Site redevelopment and Natural England licence applications.
- 1.1.7. The majority of the Site has been the subject of numerous ecological surveys since 2008. EnvironPlus International Limited (EPI) undertook an initial suite of surveys in 2008, with Ecology Solutions having undertaken regular update work since 2011. The results of the survey works are detailed in the Environmental Statement (2013) and ES Addendum (2017) produced by Ecology Solutions in support of the extant planning permission.
- 1.1.8. The majority of the site and the previous surveys on it, did not include the 'full' EZ site, therefore as well as updating previous surveys, surveys of the additional EZ land to be contained in the LDO were included.

- 1.1.9. The extensive historic survey information available has been used to inform the update survey work and is referenced, where necessary, within this report.

1.2. Site Characteristics

- 1.2.1. The main component of the Site is located to the north east of Puriton. In addition, the Site includes a railway spur to the north west, a road connection from Junction 23 of the M5 motorway to the south west of the Site and a reedbed system that connects the Site to the River Huntspill to the north. The Site is within an agricultural setting, and is located between the villages of Puriton (to the west) and Woolavington (to the east).
- 1.2.2. Broadly, the Site comprises grasslands, woodland, scrub, hedgerows, tall ruderal and ephemeral vegetation along with standing water, reed bed, wet and dry ditches as well as buildings and hardstanding. There are also areas of disturbed / bare ground.

1.3. Consideration of the Site Boundary

- 1.3.1. It should be noted that whilst the Site boundary (as shown on Plan ECO1) represents the full extent of the area of study considered within this report, historic survey and assessments may have covered a reduced scope within the Site. For example, the planning application boundary described within the Environmental Statement and ES Addendum is similar to the Site boundary, but focusses mainly on the former Royal Ordnance Factory (ROF), with some peripheral areas in the north west, south, south east are not included.
- 1.3.2. In light of the above, 'the Site' is defined as the full extent of the land ownership boundary. The 'ROF site' refers to lands contained within the secure perimeter fence.
- 1.3.3. Furthermore, work to inform specific operations onsite may also have limited scope of works within smaller parts of the Site, based on the potential impact identified (e.g. habitat clearance). Where necessary, descriptions of the scope of such survey elements is provided.

1.4. Ecology Baseline Survey Report

- 1.4.1. This document describes the results of ecological baseline survey work undertaken and provides a broad assessment of the current ecological interest of the Site as a whole, based upon field and desk-based studies. The importance of the habitats within the site is evaluated with due consideration given to the guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM)¹.

¹CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester

2. SURVEY METHODOLOGY

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

2.2. Desk Study

- 2.2.1. In order to compile background information on the sites and their immediate surroundings including species and habitat records, Ecology Solutions contacted Somerset Ecological Records Centre (SERC).
- 2.2.2. Further information on designated sites from a wider search area was obtained from the online Multi-Agency Geographic Information for the Countryside (MAGIC)² database. This information is reproduced where appropriate on Plan ECO1 and at Appendix 1.
- 2.2.3. As part of the preliminary appraisal of the Site and to determine the scope and methodologies of further survey effort, the historic survey information available from ES Chapter and other intervening *Ad hoc* survey work has been reviewed.

2.3. Habitat Survey Methodology

- 2.3.1. Habitat surveys have been undertaken throughout 2020 to ascertain the general ecological value of the Site and to identify the main habitats and associated plant species.
- 2.3.2. The site was surveyed based around extended Phase 1 survey methodology³, as recommended by Natural England, 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 site was classified into areas of similar botanical community types, with a representative species list compiled for each habitat identified.
- 2.3.4. 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. Nonetheless, the timing of the surveys undertaken allows for habitats present to be identified and as such it is considered that a robust appraisal has been made of the habitat interest.

² <http://magic.defra.gov.uk>

³ Joint Nature Conservation Committee (2010). *Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit*. England Field Unit, Nature Conservancy Council, reprinted JNCC, Peterborough.

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*, breeding birds, reptiles, Water Vole *Arvicola amphibius*, Great Crested Newt *Triturus cristatus* and invertebrates.
- 2.4.2. **Bats.** Trees and buildings present within the Site, were assessed for their potential to support roosting bats in April 2018. The work was led by an experienced bat worker and aimed to establish the likelihood of presence / absence of bats. Update surveys / appraisals were undertaken in 2020.
- 2.4.3. Field surveys were undertaken with regard to best practice guidelines issued by Natural England (2004⁴), the Joint Nature Conservation Committee (2004⁵) and the Bat Conservation Trust (2016⁶).
- 2.4.4. Trees at the Site were assessed for their potential to support roosting bats. For a tree to be classed 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.;
 - very dense covering of mature Ivy *Hedera helix* over trunk.
- 2.4.5. All buildings/structures present within the Site were assessed for potential to support bat roosts. 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
 - is in a rural setting and close to woodland or water.
- 2.4.6. 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.
- 2.4.7. All accessible internal spaces and external features of the buildings/structures assessed to have bat roost potential were thoroughly searched for any signs of use by bats.

⁴ Mitchell-Jones, A. J. (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

⁵ Mitchell-Jones, A.J. & McLeish, A.P. (Eds.) (2004). *Bat Workers' Manual*. 3rd edition. Joint Nature Conservation Committee, Peterborough.

⁶ Collins, J. (Eds.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)*. Bat Conservation Trust, London.

- 2.4.8. Historically the Site contained a large number of buildings and previous surveys had recorded evidence of bats roosting within 18 of them. As part of the remediation of the ROF site, the majority of the buildings were demolished. All buildings containing bat roosts, except one in the ROF site, were demolished under Natural England licence in 2011. The remaining building is shown as **B4** on Plan ECO2. The building was previously recorded as a bat roost for Brown Long-eared Bat *Plecotus auritus*. In order to ascertain whether the building continued to support roosting bats, inspection and emergence surveys were undertaken in May 2017. No roosting bat activity was identified in relation to the building and it was concluded that the building no longer supported a bat roost. Outside of the ROF site, additional buildings were noted to have previously contained bat roosts and were due to be retained.
- 2.4.9. Buildings have been reappraised for their potential to support roosting bats during detailed inspection surveys undertaken 2018 and 2020. Where present, evidence of bats being present was recorded as well as samples taken of any DNA evidence (i.e. droppings) for laboratory analysis to determine the related species.
- 2.4.10. In addition, evening activity surveys were undertaken to ascertain whether the Site and surrounding area supports any features of potential importance for foraging and commuting bats. A total of seven surveys were undertaken monthly between April 2020 and October 2020.
- 2.4.11. The evening activity surveys were conducted from sunset to approximately 2 hours after sunset. Surveyors utilised EchoMeter Touch 2 Pro (EMT) bat detectors to aid identification of bats and record data. Surveyors walked transects in order to encompass relevant features of potential value to foraging and commuting bats.
- 2.4.12. In addition to the activity transects, automated detectors (Wildlife Acoustic Song Meter 4) were also deployed for several consecutive nights following the activity surveys at a strategic location to collect longer term data regarding the use of the Site by foraging and commuting bats. All bat data recorded was subsequently analysed using Kaleidoscope bat sound analysis software.
- 2.4.13. It should be noted that detectors may experience errors when deployed. Such an occurrence can be caused by a multitude of technical factors including issues with batteries, the internal clock, or the corruption of data. As such, on occasions, it is possible that deployed detectors either fail to record (or only partially record) data, or the data is corrupted and cannot be processed. In order to ensure that such incidents do not significantly impact the robustness of the survey, care has been taken to ensure that should any one detector fail, the survey area will remain adequately covered. In this instance, where detectors have failed for any given survey period, it is considered that the robustness of the wider survey has not been effected.
- 2.4.14. **Badgers.** The Site has been subject to regular survey and surveillance for Badger throughout 2020 with specific search of the Site undertaken in June 2020 and October 2020. Surveys comprised two main elements. The first of these was a thorough search for evidence of Badger setts. For any setts

encountered each sett entrance would be recorded and plotted, even if the entrance appeared disused. The following information was recorded if appropriate:

- i) The number and location of well used or very active entrances; these are clear of 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 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 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.

2.4.15. Secondly, evidence of Badger activity, such as well-worn paths and run-throughs, snagged hair, footprints, latrines and foraging signs, was also searched for in order to build up a picture of the use of the Site and surrounding area by Badgers.

2.4.16. **Breeding Birds.** The survey methodology utilised across the Site comprises of walked transects. Transect surveys are focussed on general breeding bird interest associated within the Site. The transects were planned to incorporate all habitat types (e.g. woodland, wetland and farmland) present within or adjacent to the Site.

2.4.17. Survey visits were carried out at suitable times (i.e. early mornings) in April 2020 and early June 2020. In general surveys were undertaken over a three to four hour period, with continual observations being taken for the duration of the survey.

2.4.18. Transects were walked by experienced ornithologists covering the Site. The activity of all bird species present within Site during the survey period were recorded.

2.4.19. To ascertain the breeding status of birds using the Site, the following criteria were applied following the methodology used in the 'Atlas' surveys of 1988-1991 (Gibbons et al, 1993)⁷. This accepts the following activities as denoting breeding (including those probably breeding although definite proof was lacking):

- Bird apparently holding territory;
- Courtship and display;
- Nest-building (including excavating nest-hole);
- Distraction display or feigning injury;
- Adult carrying faecal sac or food;

⁷ Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993) *The New Atlas of Breeding Birds in Britain and Ireland: 1988–1991*. T. & A.D. Poyser, London.

- Adult entering or leaving apparently occupied nest site;
 - Nest with eggs or eggshells found, or bird sitting but not disturbed;
 - Nest with young; or downy young of ducks, game-birds, waders and other nidifugous species; and
 - Recently fledged young.
- 2.4.20. Observations were recorded within Site itself as well as adjacent suitable habitats, where present.
- 2.4.21. **Reptiles.** Specific surveys to identify the presence or absence of reptiles within the Site, were undertaken in September 2020 and October 2020. The survey was timed to cover the later part of the active season, when refugia surveys are known to be most effective.
- 2.4.22. Following an initial assessment to identify areas of suitable reptile habitat within the Site, refugia surveys were undertaken. Surveys were focussed on areas considered to be of value within the Site as informed by habitat suitability assessments and historic survey results. Locations include the ditch network and fishing lake to the north-east, meadow grassland in the north-west and marshy grassland to the south of the Site as well as the reedbed to the north.
- 2.4.23. A total of 197 'tins' (0.5 x 0.5 metre squares of heavy roofing felt which are often used as refuges by reptiles) were distributed in areas comprising suitable habitat at the Site. Tins were placed within the Site at a density of to allow for a population size assessment to be undertaken, as set out within relevant guidance produced by Froglife⁸. The tins provide shelter and heat up quicker than the surroundings in the morning and can remain warmer than the surroundings in the late afternoon. Being ectothermic (cold blooded), reptiles use them to bask and raise their body temperature which allows them to forage earlier and later in the day.
- 2.4.24. The tins were left in place for several days to 'bed in' prior to surveys commencing. They were subsequently surveyed for reptiles beneath or upon them during suitable weather conditions.
- 2.4.25. Suitable weather conditions to carry out surveys are when the air temperature is between 9 and 18°C. Heavy rain and windy conditions should be avoided.
- 2.4.26. **Water Vole.** Surveys involved careful searching along the banks of suitable aquatic habitat within the Site, using the standard methodology as advocated within The Water Vole Conservation Handbook⁹ and The Water Vole Mitigation Handbook¹⁰. Wherever possible, access was obtained to both banksides and a thorough search was possible to complete.
- 2.4.27. The basis of the surveys undertaken was to determine the presence / absence, and where necessary distribution and abundance of Water Voles

⁸ Froglife (1999). Froglife Advice Sheet 10: reptile survey. Froglife, London.

⁹ Strachan, R., Moorhouse, T. and Gelling, M. (2011) Water Vole Conservation Handbook. Third Edition. Wildlife Conservation Research Unit, Oxford.

¹⁰ Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. Mammal Society, London.

within suitable habitat within the Site through the detection of signs such as burrows, feeding stations, latrines, faeces, lawns, footprints, and potentially from sightings of the animals themselves.

- 2.4.28. All survey visits were undertaken to coincide with stable weather conditions and timed to ensure coverage of the habitats across the optimum periods for Water Vole surveys. Multiple visits were undertaken throughout the survey period to ensure coverage of any seasonal / management related changes to habitats on site.
- 2.4.29. **Amphibians / Great Crested Newts.** The Site contains a number of ponds and a network of ditches as well as another aquatic habitat such as reedbed and fishing lakes. Furthermore, additional ponds have been identified within 500m of the Site, these were subject to further assessment for their suitability to support GCN.
- 2.4.30. The Site was subject to two licenced trapping and translocation exercises (completed in 2014 and 2017).
- 2.4.31. A trapping and translocation exercise (completed in 2014) was undertaken in the east of the Site as part of the installation of a pipeline. No specific receptor site was created as part of this process.
- 2.4.32. However, GCN were trapped within central areas of the Site (in 2017) and translocated to a purpose-built mitigation areas located in the north west and south east of the Site (see Plan ECO8).
- 2.4.33. The waterbodies present within these mitigation areas have been subject to regular presence / absence monitoring, utilising eDNA sampling in the main.
- 2.4.34. eDNA testing was carried out according to the methodology outlined in the analytical and methodological development for the improved surveillance of Great Crested Newt¹¹, published by Defra. This involves taking several water samples from various points around the waterbody. These are then combined and mixed with eight small samples of the mixture taken and added to a preservative liquid. Testing is then performed under laboratory conditions by SureScreen Scientifics in order to determine if Great Crested Newt DNA is present.
- 2.4.35. **Invertebrates.** A detailed invertebrate survey of the Site commenced in May 2020. Habitat assessments were completed in early 2020 and subsequent sampling was undertaken up to September 2020.
- 2.4.36. Habitats of interest to invertebrates were identified and targeted for further detailed sampling. Habitats within the Site that were subject to further sampling include; meadow grasslands, woodland, ditches (notably those to the north east of the site, within the Puriton Rhynes and Ponds Local Wildlife Site (LWS), the northern reedbed as well as the short perennial habitat associated with the Puriton Ash Ground LWS. These areas are generally associated with the Sites boundaries. The central part of the site is

¹¹ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

considered to be of low significance to invertebrates overall, given the lack of optimal habitats and their poor connectivity.

- 2.4.37. Sampling methodologies utilised within the survey include; malaise trapping, pitfall trapping, aerial interception traps, sweep netting and vacuum sampling.
- 2.4.38. The full methodologies are detailed within the interim invertebrate survey report (see Appendix 2) that is to be provided as a separate annex to this report.

3. ECOLOGICAL FEATURES

- 3.1. The Site was subject to numerous ecological surveys since 2008, with initial work undertaken by EPI and subsequent update work carried out by Ecology Solutions in 2011 and 2017 to document any material changes have occurred within the Site. Over this period the Site has experienced a change in land use, with the decommissioning of the original BAE facility and the remediation of contaminated land within the ROF site. In the wider Site boundary, construction of the new road connection in the southwest and clearance related to the Hinckley 'C' grid connection has commenced. As such, the extent and condition of some habitats previously recorded have changed recently.
- 3.2. The vegetation present enabled the habitat types to be satisfactorily identified and an accurate assessment of the ecological interest of the habitats to be undertaken.
- 3.3. The following main habitat / vegetation types were identified:
- Improved Grassland;
 - Semi-Improved Grassland;
 - Amenity / Rough Grassland;
 - Marshy Grassland;
 - Plantation Woodland / Orchard;
 - Trees;
 - Scrub;
 - Hedgerows;
 - Tall Ruderal Vegetation;
 - Ephemeral / Short Perennial Vegetation;
 - Standing Water;
 - Reed Bed;
 - Bare Ground;
 - Seasonal Wet Ditches / Dry Ditches; and
 - Buildings and Hardstanding.
- 3.4. Each habitat present is described below with an account of their representative plant species. The location of these habitats is shown on Plan ECO2.
- 3.5. Consideration of the habitats present within areas of the Site that are also designated for their nature conservation interest are discussed further within section 5 of this report.

Improved Grassland

- 3.6. The majority of the fields within the Site including the fields in the south east, north east and north west of the Site are cattle, sheep or horse grazed pastures. This reflects the main land use of the wider landscape within which the Site is located. This habitat is typically intensively managed, either as grazing or as a combination of grazing and forage harvesting.
- 3.7. The grassland sward is typically species-poor as a result of the management / grazing regime in place. Perennial Rye *Lolium perenne* is typically dominant throughout, however localised patches of relatively higher herb content occur

within certain fields particularly where management is not as intensive. Equally, localised patches of pernicious weed species are also present.

Semi-Improved Grassland

- 3.8. There are areas of this habitat throughout the Site. These grassland areas are typically grazed (less intensively as improved grasslands) or cut for hay / silage.
- 3.9. These grasslands display a relatively greater floral diversity than the improved grasslands onsite, although the quality is variable across the Site. Areas of greater overall quality are limited to the north west of the Site in fields adjacent to the GCN pond mitigation area and the small field in the south of the Site known as the 'Puriton Cowslip Field'. Other areas of semi-improved grassland are of lower relative quality and are considered to be species-poor semi-improved grassland.
- 3.10. As noted above, the species composition of the semi-improved grassland varies somewhat across the Site. The species present are typical of the National Vegetation Classification habitats MG5 and contain species such as Species recorded include; Perennial Rye, False-oat Grass *Arrhenatherum elatius*, Meadow Foxtail *Alopecurus pratensis*, Meadow Barley *Hordeum brachyantherum*, Yellow Oat *Trisetum flavescens*, Common Mouseear *Cerastium fontanum*, Field Bindweed *Convolvulus arvensis*, Hogweed *Heracleum sphondylium*, Cock's-foot *Dactylis glomerata*, Creeping Thistle *Cirsium arvense*, Meadow Vetchling *Lathyrus pratensis*, Red Fescue *Festuca rubra*, Tall Fescue *Festuca arundinacea*, Common Ragwort *Jacobaea vulgaris*, Hoary Ragwort *Jacobaea erucifolia*, Pyramidal Orchid *Anacamptis pyramidalis*, Oxeye Daisy *Leucanthemum vulgare* and False Fox Sedge *Carex obtusae*.

Amenity / Rough Grassland

- 3.11. A large component of the grassland within the Site is associated with now mostly demolished buildings and internal road network related to the Site's former use. These amenity grasslands were formerly intensively managed, with a short, even and low diversity sward maintained. However, since the cessation of regular mowing, rough grassland has developed in many of these areas.
- 3.12. The botanical composition has been affected by both the regular mowing regime in the past and intensive grazing by rabbits. The mounds surrounding a number of existing buildings within the Site were originally constructed from both on-site and imported material, resulting in a variety of plant communities, from species-poor swards to relatively herb-rich communities. However, the majority of this grassland consists of Perennial Rye, Red Fescue, Yorkshire Fog, Daisy and Creeping Buttercup *Ranunculus repens* with rough grassland elements containing Cock's Foot and False Oat Grass. In some areas the rough grassland has developed into tall ruderal communities.

Marshy Grassland

- 3.13. The most extensive area of this habitat is present to the north and west of the 37 Club (west of the existing Site entrance). An area of marshy grassland was also created as part of the GCN mitigation area in the north west of the Site.

- 3.14. The land to the north and west of the 37 Club contains habitats indicative of wetter ground. These areas contain a mix of communities that have developed, likely to a lack of regular management and/or the variations in hydrology. Vegetative communities range from scrub, ruderal species, rush pasture and wet grassland.
- 3.15. The wettest areas contain areas of tall herb and sedges, often forming dense stands of vegetation dominated by a limited number of species. Notably, dense areas of Greater Pond Sedge *Carex riparia* and Soft Rush *Juncus effusus* were recorded. Other species recorded in these areas include; Hemlock Water-dropwort *Oenanthe crocata*, Bittersweet *Solanum dulcamara*, Ragged Robin *Silene flos-cuculi*, Great Willowherb *Epilobium hirsutum*, Teasel *Dipsacus fullonum*, Common Nettle *Urtica dioica*, Water Figwort *Scrophularia umbrosa*, Field Horsetail *Equisetum arvensis* and Reedmace *Typha latifolia*.
- 3.16. Other areas support species or communities associated with drier conditions or are tolerant of occasional, or seasonal inundation / waterlogging. Species recorded include; Common Ragwort, Chickweed *Stellaria media*, Creeping Buttercup, Creeping Cinquefoil *Potentilla reptans*, Selfheal *Prunella vulgaris*, Common Spikerush *Eleocharis palustris*, Square-stalked Willowherb *Epilobium tetragonum*, Yorkshire Fog, Great Willowherb, Common Mouseear, Hard Rush *Juncus inflexus*, Short-fruited Willowherb *Epilobium obscurum*, White Clover, Spear Thistle *Cirsium vulgare*, Prickly Sedge *Carex muricata* agg., Hairy Sedge *Carex hirta*, Ground Ivy *Glechoma hederata*, Cut-leaved Cranesbill *Geranium dissectum*, False Fox Sedge, Soft Rush, Broad-leaved Dock *Rumex obtusifolius*, Curled Dock *Rumex crispus*, Red Fescue, False Oat Grass, Creeping Thistle, Meadow Barley and Common Fleabane *Pulicaria dysenterica*,
- 3.17. The marshy grassland associated with the GCN mitigation area in the north west of the Site consisted of a similar compliment of species as described above. Although additional species present include; Quaking Grass *Briza media*, Sweet Vernal Grass *Anthoxanthum odoratum*, Tufted Hair-grass *Deschampsia cespitosa*, Meadowsweet *Filipendula ulmaria*, Oxeye Daisy, Greater Bird's-foot Trefoil *Lotus pedunculatus*, Cowslip *Primula veris* and Common Sorrel *Rumex acetosa*.

Plantation Woodland / Orchard

- 3.18. There are discrete blocks of plantation woodland present throughout the Site, with larger areas present in the north west and south east and smaller isolated blocks scattered elsewhere within the Site. Given the nature of the plantation, the woodlands lack structural, age and species diversity.
- 3.19. In the north western part of the ROF site this habitat is more mature and is dominated by Poplar species *Populus nigra* and *Populus alba*. Throughout the rest of the ROF site, the plantation contains a mixture of native and non-native species, including Ash *Fraxinus excelsior*, Field Maple *Acer campestre*, Small-leaved Lime *Tilia cordata*, Silver Birch *Betula pendula*, Rowan *Sorbus aucuparia*, Black-poplar *Populus nigra*, Alder *Alnus glutinosa*, Pedunculate Oak *Quercus robur* and Sycamore *Acer pseudoplatanus*.
- 3.20. Due to low ambient light levels there are few understorey species, although tall herbs and Bramble *Rubus fruticosus* agg. scrub is present in many areas along the edge of plantation.

- 3.21. A remnant orchard is located to the south east of the Site. This area contains relatively few orchard trees (*Malus* sp.) while the remaining area consists of a mix of scrub, tall ruderal and semi-improved grassland.

Trees

- 3.22. Outside of the woodland, orchard and hedgerow treelines, there are relatively few mature trees within the Site.
- 3.23. Within the ROF site and along the approach roads, there are tree lined avenues consisting primarily of Horse Chestnut *Aesculus hippocastanum*. The majority of the trees present have been subject to pollarding, that had ceased in recent years resulting in an increased risk of structural failure as the pollards over mature. As such, an arboricultural management regime has initiated as of 2020. This has involved selective thinning of tree crowns and reinstating pollard management where possible.
- 3.24. In general, above the bole, the main branches lack any loose bark, cracked limbs or obvious holes. However, in some instances where specimens contained dead wood, conspicuous cracks and holes have been identified. As part of the ongoing management, this dead wood is to be removed or the tree removed entirely, where necessary. The removal of these features was facilitated by detailed internal inspections in search of evidence for potential roosting bats. Further details on the survey is provided below.
- 3.25. Other standard trees present along the roads within the ROF site include; Tulip Tree *Liriodendron tulipifera*, Gum Tree *Liquidambar* sp., Cherry *Prunus avium* and Leyland Cypress *Cupressus* × *leylandii*. None of these trees are considered to offer any suitable roost features for bats.

Scrub

- 3.26. Large areas of dense scrub are present across the Site. Furthermore, given the recent change in use of the Site and current construction activities underway, the extent of this habitat has varied over time. Scrub is also found in smaller patches throughout the Site, often alongside buildings which have been decommissioned and ditches.
- 3.27. The scrub is typically dominated by Bramble, most notably in areas that have been subject to recent clearance or in areas where no recent management has taken place. Other areas of more mature scrub present within the site consist of Goat Willow *Salix caprea*, Grey Willow *Salix cinerea*, Hawthorn *Crataegus monogyna*, and Blackthorn *Prunus spinosa*.
- 3.28. The railway corridor to the north-west of the Site has also been subject to extensive encroachment by scrub. The footprint of the (now removed) railway track is formed of railway ballast that remains free of scrub in areas, although Bramble has spread over significant portions of it. Areas adjacent have developed into dense scrub and is formed of Goat Willow, Hawthorn, Blackthorn and Field Maple.

Hedgerows

- 3.29. In line with the broad definition of hedgerows utilised by EPI, hedgerows identified within the Site include traditional hedgerows, tree belts and belts of woody scrub that form boundary features.
- 3.30. Hedgerows are largely isolated from one another across the Site, with low levels of connectivity. However, the complex of fields to the south east of the Site and along the route of the new access road are typically bound by hedges. However, it should be noted that these areas are currently subject to construction activities requiring the removal of hedgerow sections.
- 3.31. Construction activity related to the Hinkley Point C Connection Project, is currently underway in the south east of the Site. This project has required the removal of several hedgerows along the corridor of the connection route. The hedgerows in this area vary in species composition and structure, with a mix of treelines and hedges with trees also present. Species present include; Blackthorn, Hawthorn, Wild Privet *Ligustrum vulgare*, Elder *Sambucus nigra*, Field Maple; Elm *Ulmus procera*, Hazel *Corylus avellana*, Wayfaring Tree *Viburnum lantana*, Ash, Bramble, Sycamore *Acer pseudoplatanus*, Horse Chestnut and Dogwood *Cornus sanguinea*.
- 3.32. To the south west of the Site, the road connection from the Site to Junction 23 of the M5 motorway is under construction. This development also required the removal of section of hedgerow along the road corridor. The hedgerows within this part of the Site are generally in poor condition, with poor structure and low species diversity, consisting mainly of Hawthorn.
- 3.33. It is evident that hedgerows within the main part of Site have been subject to variable management over recent years; the majority are either open based and forming a canopy, or have broadened into more substantial corridors as a result of encroachment into areas of former grassland. Most hedgerows within the Site have limited botanical diversity consisting mainly of Hawthorn, Blackthorn and Bramble.
- 3.34. Hedgerow features are described further within Appendix 3.

Tall Ruderal

- 3.35. Patches of tall ruderal vegetation are present across the Site in locations where disturbance has occurred, notably in the northern, central and western parts of the Site. In addition, ruderal vegetation has become established in areas where mowing and cattle grazing has been reduced or excluded. Tall ruderal communities have also developed on areas of cleared ground and stockpiled material.
- 3.36. Species present include Common Nettle *Urtica dioica*, Hogweed, Great Willowherb, Creeping Thistle *Cirsium arvense*, Prickly Sow-thistle *Sonchus asper* and Broad-leaved Dock, Hemlock *Conium maculatum*, Vervain *Verbena officinalis*, Teasel, Oxeye Daisy, Common Forget-me-not *Myosotis arvensis*, Common Vetch *Vicia sativa*, Field Bindweed, Cleavers *Galium aparine*, Bristly Oxtongue *Helminthotheca echioides* and Spotted Medick *Medicago arabica*.

Ephemeral / Short Perennial Vegetation

- 3.37. This habitat is present across the Site although often to a limited extent and persists in areas that are subject to regular disturbance. However, in the south west of the Site, in an area where boiler ash was historically disposed of, a larger area of ephemeral / short perennial vegetation has established. The deep bed of hardcore in this part of the site has slowed scrub encroachment (in the absence of active management) and has promoted the development of ephemeral vegetation.
- 3.38. The ephemeral vegetation supports a relatively wide diversity of herbs and grasses in localised patches, with many species demonstrating stunted growth due to nutrient deficiency as well as rabbit grazing. Vervain, Bugle *Ajuga reptans*, Common Stork's-bill *Erodium cicutarium*, Butterfly Bush *Buddleja davidii*, Prickly Sow-thistle, Creeping Cinquefoil *Potentilla reptans* and Ground Ivy *Glechoma hederacea* are present. Most notably the area contains a distinct cover of lichen *Cladonia portentosa* and mosses.
- 3.39. Although the process of scrub encroachment into this area is slowed due to the ground conditions, a notable amount of scrub have developed, reducing the extent of the open ground vegetation. Furthermore, a landscape bund has been created adjacent to and within the area thereby reducing its overall extent.

Standing Water

- 3.40. The most prominent water feature is the Borrow Pit located in the east of the Site, which is currently utilised for angling. The pit forms a relatively substantial aquatic habitat supporting a range of plant communities, including open water communities, reedbed and scrub. The open water habitat was recorded to consist of Canadian Pond Weed *Elodea canadensis*, Rigid Hornwort *Ceratophyllum demersum*, Frogbit *Hydrocharis morsus-ranae*, Water Lillie *Nymphaea alba*, Ivy-leaved Duckweed *Lemna trisulca* and Common Duckweed *Lemna minor*. Marginal species include Corky-fruited Water-dropwort *Oenanthe pimpinelloides*, Fool's Watercress *Apium nodiflorum*, Lesser Water-parsnip *Berula erecta*, Watermint *Mentha aquatica*, False Fox Sedge *Carex otrubae* and Gypsywort *Lycopus europaeus*.
- 3.41. A number of small seasonal ponds are located to the south east of the Site associated with grasslands, hedgerows and orchard. The ponds are generally small and noted to regularly dry out. The ponds commonly support dense vegetation growth, including aquatic, emergent and marginal vegetation, but are generally isolated from other aquatic features within the Site.
- 3.42. Four ponds have been created in the north west of the Site as part of the GCN mitigation area. These ponds have become well established and are considered to be in good condition. Aquatic and marginal species recorded include; Reedmace, Frogbit, Water Plantain *Alisma plantago-aquatica*, Celery-leaved Buttercup *Ranunculus sceleratus*, Gypsywort and Water-crowfoot *Ranunculus* subgenus *Batrachium*.
- 3.43. A number of built aquatic features are also present which supported operation of the factory, including save-alls, drainage bunds and emergency fire water tanks. Whilst the save-alls were subject to regular management, some of the other artificial features have not been in operation for an extended period of time.

Reed Bed

- 3.44. A substantial corridor of reed bed is present to the north of the Site which connects to the River Huntspill to the north. This series of connected reed beds was developed specifically to filter runoff from the site. The reed beds almost exclusively comprise Common Reed *Phragmites australis* although there is some scrub encroachment. As a result of decommissioning operations there has been a significant reduction in through flow.
- 3.45. There is also an area of extensive reed bed habitat adjacent to the Borrow Pit, as described previously. An invasive species, Himalayan Balsam *Impatiens glandulifera* is present within the reed bed located in this area.

Bare Ground

- 3.46. As part of the ongoing operation of the Site as well as historic and current remediation and construction works taking place, areas of bare ground have been created. These areas include footprints of demolished buildings, cleared ground, crushed hardcore, stockpiled materials or areas subject to regular disturbance by vehicle movements. These areas are, in the main, devoid of vegetation, although some ephemeral / ruderal species (as described above) occur sparingly across this habitat.

Seasonal Wet Ditches / Dry Ditches

- 3.47. Across the Site are a number of drainage ditches, forming a network of wetland habitats. Many of these features appear to pre-date the explosives factory, and would have formed part of the 'natural' drainage system of the former agricultural landscape. However, more recent drainage features, associated with the operations of the factory, are also present.
- 3.48. The more recently engineered drainage features include principal drainage ditches, flowing south to north through the centre of the Site and along the western boundary of the site, and an effluent ditch, which is connected to the reed bed to the north of the Site. A number of older ditches are connected to the effluent ditch.
- 3.49. In general, the main drainage ditches across the Site are deep, steep sided channels that are permanently wet. They are subject to regular maintenance, including dredging and scrub removal. As such, the vegetation associated with many of these ditches is limited.
- 3.50. The characteristics of the original 'natural' drainage ditches vary considerably across the Site. A number of ditches have become redundant, and now represent dry ditches. In many cases these are subject to extensive scrub growth, although this is limited where livestock have access.
- 3.51. Other ditches present within the Site are either seasonally inundated, support flows or permanently support water. Few features support standing water all year round and it is considered that the majority of watercourses only support water for part of the year, typically winter.

- 3.52. Consequently, the vegetation supported by ditches varies considerably across the Site. Many periodically dry ditches contain communities dominated by Sedges *Carex* sps., Common Reed or Willowherbs *Epilobium* sps., or have been subject to scrub encroachment.
- 3.53. Ditches supporting water all year round are typically more diverse; these features are most prevalent in the north eastern part of the Site (such as those associated with the Puriton Ponds and Rhynes LWS). Ditches in this area are typically unshaded, with wide channels and shallow banksides. Species associated with the ditches include; Greater Pond Sedge, Lesser Pond Sedge *Carex acutiformis*, Common Reed, Duckweed *Lemna* sp., Reedmace, Frogbit, Water Crowfoot and Water Plantain.

Buildings and Hardstanding

- 3.54. There are a number of buildings / buildings complexes remaining within the Site, although the majority of the previously existing buildings have been demolished. Those remaining are described below and shown graphically on Plan ECO2.
- 3.55. Building **B1** is known as the 37 Club and is a social and function venue. The building is a single storey structure with a complex shape that is of varied construction. The building is primarily of rendered brick construction with a mix of flat and pitched roof structures. The majority of the roof is felt covered, with smaller areas that are tiled.
- 3.56. Previous evidence (from 2008) of bat droppings was recorded on part of the roof edge, although subsequent emergence survey work did not record any roosting activity. Internal inspections of the building undertaken in 2020 observed a dead juvenile Pipistrelle below a void near the roof edge previously identified as a roosting location.
- 3.57. Building complex **B2** is formed of a gate house and reception with other smaller storage buildings. The buildings are all single storey with flat roofs.
- 3.58. Building **B3** is a disused fire depot. The structure is brick built with steel frames and large garage doors to the southern aspect. The building is currently used for storage.
- 3.59. Building **B4** is a disused office building with several flat concrete roof sections. No significant enclosed roof voids exist. The structure is understood to be in poor condition with sections of roof susceptible to leaking.
- 3.60. This building has previously been identified as a bat Brown Long-eared bat roost (in 2008), although further update work (2017) recorded no evidence of use by bats.
- 3.61. Building **B5** is a large shed comprised of a metal pitched roof structure used for storage as part of construction works.
- 3.62. Building **B6** is a currently in use as an office building with flat concrete roof sections. No significant enclosed roof voids exist. The building is considered to be in relatively good condition.

- 3.63. Building **B7** is a disused brick-built structure with concrete roofs without enclosed voids.
- 3.64. Building **B8** is a disused warhead lining facility that is a double storey brick-built / steel framed structure with a flat roof. The northern aspect consists of a single storey elevation.
- 3.65. Building **B9** is a disused double storey brick-built structure with a flat roof. The southern elevation is single storey.
- 3.66. Building **B10** is a residential dwelling location to the south of the Site, along Woolavington Road. The structure is a brick-built, two-storey dwelling with a pitched and tiled roof. A loft void is present. A small single storey, flat roof extension is present on the western aspect. The structure is in a state of disrepair with a number of large holes in the eaves of the roof, creating large access points to the loft void.
- 3.67. In 2008, abundant Brown Long-eared droppings were recorded within the loft, although subsequent emergence surveys recorded no roosting activity. In 2020 Brown Long-eared bat droppings were again recorded within the loft void.
- 3.68. A series of other smaller structures including small stores and utilities housings are present around the ROF site. They are predominantly constructed of brick or concrete blocks, with concrete or corrugated composite/iron roofs without enclosed voids.
- 3.69. In addition, a number of pillboxes are present at the Site boundary. Again, these are typically formed of brick walls with concrete slab roofs. No voids are present, although loopholes and open doorways are usually present. Those that remain are considered to be of no value to roosting bats, due structures providing no perching sites or crevices to shelter within as well as their exposure to climatic changes (e.g. temperature and humidity). However, during inspections undertaken in 2020, two pill boxes (shown as buildings **B11** and **B12**) were noted to have developed suitable perching sites, where part of the concrete ceilings had eroded and exposed the reinforcing metal bar.
- 3.70. None of the buildings are considered to offer suitable roosting features, except for those with a history of roosting bat evidence being present (**B1**, **B4** and **B10**) and **B11** and **B12** all of which are considered to offer low suitability for roosting bats, except for B10 with is considered to offer moderate roost potential.
- 3.71. Where these buildings have been removed there are areas of bare ground, cleared land and crushed hardcore.
- 3.72. Areas of hardstanding in the form of roads, tracks and rail head are distributed throughout the Site.
- 3.73. **Background Information**
- 3.73.1. The desk study undertaken by SERC returned several records of protected or notable plant species from within the Site.

- 3.73.2. These included Rootless Duckweed *Wolffia arrhizal*, Greater Water-parsnip *Sium latifolium*, Frogbit, all these records pre-date 2000 with the most recent from 1997.
- 3.73.3. Other records of plant species from within the local area that were returned post-2000 include Greater Butterfly-orchid *Platanthera chlorantha*, Sea barley *Hordeum marinum* and Yellow vetchling *Lathyrus aphaca*.

4. WILDLIFE USE OF THE SITE

- 4.1. General observations were made during the survey of any faunal use of the Site with specific attention paid to the potential of any protected or notable species. Habitats present were assessed for their potential to support such species.

Bats

- 4.2. The Site is noted to contain habitats suitable for bats foraging and commuting and is considered to be of moderate suitability for this species group. Potential roosting habitat is also present in the form of Trees and Buildings.
- 4.3. **Previous surveys.** A suite of surveys was undertaken by EPI in 2009, including roost surveys and activity surveys. Furthermore, Ecology Solutions undertook additional update survey work in 2011 and 2017. The findings are summarised below.
- 4.4. In 2009 a total of 19 individual trees were assessed to have medium to high potential for roosting bats, with an additional 29 trees and an orchard within the wider Site assessed as having value for roosting bats. Of the 19 trees within the Site with medium to high potential for roosting bats, further survey work was carried out and none were found to support bat roosts.
- 4.5. A licence was granted by Natural England in relation to the loss of all roost sites within the ROF site and the mitigation strategy was agreed and implemented (construction and monitoring of three purpose built bat barns (see Plan ECO3) and the erection of bat boxes). However, remnant buildings still remain within the ROF site and wider Site.
- 4.6. Three buildings remain which were previously been identified as roost sites for Brown Long-eared or Common Pipistrelle bats (buildings **B1**, **B4** and **B10** on Plan ECO2). Other remaining buildings are considered suboptimal for roosting bats given their design and condition.
- 4.7. During an update emergence survey of the remaining building (undertaken in May 2017 by Ecology Solutions) previously shown to be a roost site (building **B4**), no bats were observed to emerge from this building. This building is not currently considered to be a roost site.
- 4.8. Prior to undertaking works to effect any roost features, should further investigation identify a roost present, a licence will be required. However, given that licenced roost destruction has taken place already within the ROF site and the low conservation value of the remaining roosts historically recorded the principle that it is not unlikely that such a licence can be granted has been demonstrated.
- 4.9. Activity surveys undertaken in 2009 and 2011 recorded 5 species of bat including; Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Brown Long-eared, Noctule *Nyctalus noctula* and a *Myotis* species. The majority of this activity was associated with Pipistrelle species.
- 4.10. Bat activity surveys undertaken in 2017 recorded a broadly comparable number of species. The majority of registrations are again attributed to Soprano

Pipistrelle and Common Pipistrelle with Brown Long-eared Bat, Noctule and Serotine *Eptesicus serotinus* also recorded in lesser numbers. In addition, several registrations for rarer species including; Greater Horseshoe Bat *Rhinolophus ferrumequinum*, Lesser Horseshoe *Rhinolophus hipposideros* and Barbastelle *Barbastella barbastellus* were recorded. Registrations for these species were levels indicative use of the Site by single / small numbers bats on an occasional basis.

- 4.11. The majority of the bat activity was associated with the eastern boundary, with higher levels of activity in the south east close to woodland and also with woodland edge / scrub habitat in the west and north west. In addition, localised activity was recorded along the southern boundary and in the centre of the Site.
- 4.12. Barbastelle and Lesser Horseshoe registrations (both in low numbers) were recorded in the south east and along the southern boundary. Greater Horseshoe registrations were recorded in the west and north west.
- 4.13. **Update surveys.** Buildings identified to have suitability as potential bat roost features were subject to update inspections in November 2020. During the course of the inspections evidence of bats was recorded in buildings **B1**, **B10**, **B11** and **B12**. The evidence is described further below for each of these buildings.
- 4.14. Building **B1** (the 37 Club) has historically been recorded as a roost site for Pipistrelle bats. During update inspections undertaken in 2020 evidence of bat presence within the buildings was confirmed with the observation of a dead juvenile Pipistrelle, located below a dislodged tile within a suspended ceiling above the main function room. Given the construction of the ceiling it is not possible to access the void extensively, although the entry point is considered to be on the eastern elevation of the structure. Given the presence of juveniles within the roost it is considered that building **B1** is used as a maternity roost for Pipistrelle species.
- 4.15. Building **B10** has historically been recorded as a Brown Long-eared bat roost. The update inspection recorded a small scattering of bat droppings within the loft void of the house. These were located below the ridge beam of the roof structure. Samples were collected for DNA analysis, which confirmed the droppings were from Brown Long-eared bats (see Appendix 4 for results). Access points are present in the form of large holes in the eaves present in the west and east of the roof. Given the small scattering of droppings and lack of any other evidence of bat presence, it is considered that the buildings **B10** is currently used as a summer roost for Brown Long-eared bats.
- 4.16. Buildings **B11** and **B12** have not historically been recorded as having any evidence of bats roosts being present. However, during update inspections in November 2020, a small collection of droppings were observed below a potential perching location in building **B11**. Subsequent DNA analysis confirmed that the droppings were from Lesser Horseshoe bat (see Appendix 4). Furthermore, a single Lesser Horseshoe bat was observed within building **B12**, perching from the ceiling. No other potential perching locations were identified within either structure. It is considered that these buildings not used as maternity or hibernations roost, but are used as alternative day/night roosting sites by small numbers or individual of bats.

- 4.17. Bat surveys (both activity and automated surveys) have been conducted across the active season in 2020. The results of the surveys are presented below in chronological order.
- 4.18. Five bat activity transect surveys were undertaken at the Site during 2020, in line with methodology outlined in section 2 above. Table 1 below outlines the weather conditions during each survey visit.

Date	Weather Conditions
28.05.2020	20°C, 10% Cloud Cover, Dry, Moderate Winds
25.06.2020	22°C, 10% Cloud Cover, Dry, Light Breeze
27.07.2020	17°C, 80% Cloud Cover, Dry, Light Breeze
03.09.2020	16°C, 10% Cloud Cover, Dry, Moderate Breeze
30.09.2020	14°C, 70% Cloud Cover, Dry, Light Breeze

Table 1: Weather conditions during each bat activity survey.

Automated Detector Survey 27th April - 12th May

- 4.19. Automated detectors were deployed throughout the Site at locations **D1**, **D2**, **D3** and **D4** (see Plan ECO3) and set to record for 16 consecutive nights from April 27th to May 12th. The results from each night are detailed below in Tables 1 to 3 (Appendix 5) for each of the detector locations. The detector placed at location **D4** experienced technical difficulties resulting in no recordings being made for this survey period. However, given the coverage provided by the other detectors deployed, this is not considered have significantly impacted the robustness of the survey (see paragraph 2.13 for further details).
- 4.20. The automated detector survey undertaken between 27th April and 12th May showed mostly consistent bat activity within the Site, although some nights recorded relatively higher registrations than others. Bat activity was noted to be reduced towards the end of the survey period in all three locations.
- 4.21. The detector placed at **D3** recorded the highest amount of bat registrations during this survey period with relatively high numbers of *Nyctalus* and Common Pipistrelle registrations.
- 4.22. The detector placed at **D1** recorded the lowest amount of bat registrations during the survey period with the highest proportion of registrations associated with *Nyctalus* species although the majority of these registrations were recorded on just two nights (27th April and 3rd May)
- 4.23. The detector placed at **D3** also recorded the highest total registrations of notable species, namely Barbastelle, Greater Horseshoe and Lesser Horseshoe (54 total registrations) as well as the highest total counts of Barbastelle (2 registrations), Greater Horseshoe (45 registrations) and Lesser Horseshoe (7 registrations).

28th May Activity Survey

- 4.24. The activity survey undertaken on May 28th recorded a total of 557 registrations, most of which were related to Common Pipistrelle (231 registrations). Other species recorded during this survey were, unidentified *Nyctalus* species (120 registrations), Soprano Pipistrelle (117 registrations), Nathusius' Pipistrelle *Pipistrellus nathusii*, (37 registrations), Serotine (35 registrations), Brown Long-eared Bat (7 registrations), Barbastelle (6 registrations), unidentified *Myotis* species (3 registrations) and Lesser Horseshoe Bat (1 registration).
- 4.25. The majority of the activity of common and widespread species was associated with southern and south-eastern areas of the Site.
- 4.26. Nathusius' Pipistrelle is a species not previously recorded during 2017 surveys. The majority of Nathusius' Pipistrelle activity during this survey was associated with the north-eastern and south-eastern areas of the Site.
- 4.27. The Lesser Horseshoe and Barbastelle registrations were recorded in south and south-eastern areas of the Site.

Automated Detector Survey 28th May - 8th June

- 4.28. Following the activity survey, automated detectors were deployed throughout the site at locations **D1, D2, D3, D4, D5, D6, D7, D8, D9 and D10** (see Plan ECO3) and set to record for 12 consecutive nights from 28th May to 8th June. The results from each night are detailed below in Tables 4 to 12 (Appendix 2) for each of the detector locations. The detector located at **D8** experienced technical difficulties, resulting in no recordings being made during this survey period. Again, given the coverage provided by the other detectors deployed, this is not considered to have significantly impacted the robustness of the survey (see paragraph 2.13 for further details).
- 4.29. The automated detector survey undertaken between 28th May and 8th June showed mostly consistent and frequent bat activity within the Site, although some nights recorded relatively higher registrations than others.
- 4.30. The detectors placed at **D1** and **D4** recorded the highest amount of bat registrations during this survey period with relatively high numbers of Common Pipistrelle registrations at **D1** and relatively high numbers of Common Pipistrelle, Soprano Pipistrelle and Nathusius' Pipistrelle at **D4**.
- 4.31. The detectors placed at **D6, D8** and **D10** recorded the lowest amount of bat registrations during the survey period with the highest proportion of registrations associated with Common Pipistrelle in all three locations.
- 4.32. The detector placed at **D5** recorded the highest total registrations of notable species, namely Barbastelle, Greater Horseshoe and Lesser Horseshoe (41 registrations) as well as the highest counts of Lesser Horseshoe (14 registrations). **D8** returned the highest amount of Greater Horseshoe registrations despite recording a relatively low number of registrations (12 registrations), as noted above. The detector placed at **D6** recorded a high number of registrations associated with notable species (40 registrations) and the highest total registrations of Barbastelle (28 registrations). As with **D8**, the detector placed at **D6** recorded a relatively low number of registrations.

25th June Activity Survey

- 4.33. The activity survey undertaken on June 25th recorded a total of 378 registrations, most of which were attributed to Common Pipistrelle (172 registrations). Other species recorded during this survey were, Soprano Pipistrelle (113 registrations), unidentified *Nyctalus* species (52 registrations), Serotine (17 registrations), Brown Long-eared Bat (10 registrations), unidentified *Myotis* species (9 registrations), Nathusius' Pipistrelle (5 registrations) and Greater Horseshoe (1 registration).
- 4.34. The majority of the activity of common and widespread species during this survey was more widespread than in the survey undertaken on the 28th May, although still concentrated along the southern and south-eastern boundaries.
- 4.35. Nathusius' Pipistrelle was recorded three times throughout the Site in north-western, central and south-eastern areas.
- 4.36. A single Greater Horseshoe Bat registration was recorded along the south-eastern boundary of the Site.

Automated Detector Survey 25th June - 5th July

- 4.37. Following the activity survey, automated detectors were deployed throughout the Site at locations **D1, D2, D3, D4, D5, D6, D7, D8, D9 and D10** (see Plan ECO3) and set to record for 11 consecutive nights from June 25th to July 5th. The results from each night are detailed below in Tables 13 to 21 (Appendix 5) for each of the detector locations. The detector located at **D8** experienced technical difficulties, resulting in no recordings being made during this survey period. Again, given the coverage provided by the other detectors deployed, this is not considered have significantly impacted the robustness of the survey (see paragraph 2.13 for further details).
- 4.38. The automated detector survey undertaken between 25th June and 5th July showed mostly consistent and frequent bat activity within the Site, although some nights recorded relatively higher registrations than others.
- 4.39. The detectors placed at **D2** and **D9** recorded the highest amount of bat registrations during this survey period with relatively high numbers of Common Pipistrelle and Soprano Pipistrelle registrations at both locations.
- 4.40. The detectors placed at **D1, D4** and **D6** recorded the lowest amount of bat registrations during the survey period, with the highest proportion of registrations associated with Common Pipistrelle and Soprano Pipistrelle at location **D4** and **D6** and *Nyctalus* species at **D1**.
- 4.41. The detector placed at **D3** recorded the highest total registrations of notable species, namely Barbastelle, Greater Horseshoe and Lesser Horseshoe (55 registrations) as well as the highest counts of Lesser Horseshoe (9 registrations) and Barbastelle (32 registrations). **D9** returned the highest amount of Greater Horseshoe registrations (18 registrations).

- 4.42. When comparing this survey to previous surveys in April and May, it can be seen that there is an obvious decline in notable species registrations at a number of the detector locations.

27th July Activity Survey

- 4.43. The activity survey undertaken on July 27th recorded a total of 485 registrations, most of which are once again related to Common Pipistrelle (260 registrations). Other species recorded during this survey were Soprano Pipistrelle (108 registrations), unidentified *Nyctalus* species (51 registrations), Serotine (22 registrations), unidentified *Myotis* species (22 registrations), Brown Long-eared Bat (10 registrations), Barbastelle (4 registrations), Nathusius' Pipistrelle (4 registrations) and Greater Horseshoe (4 registrations).
- 4.44. The majority of the activity of common and widespread species during this survey was concentrated along the southern and eastern boundaries of the site.
- 4.45. A small number of registrations of the previously unrecorded Nathusius' Pipistrelle were recorded in the south of the Site.
- 4.46. The small numbers of Greater Horseshoe Bat were recorded along the southern and northern boundaries of the Site and the Barbastelle registrations were recorded throughout the Site.

Automated Detector Survey 27th July - 9th August

- 4.47. Following the activity survey, automated detectors were deployed throughout the Site at locations **D1, D2, D3, D4, D5, D6, D7, D8, D9 and D10** (see Plan ECO3) and set to record for 14 consecutive nights from July 27th to August 9th. The results from each night are detailed below in Tables 22 to 30 (Appendix 5) for each of the detector locations. The detector located at **D6** experienced technical difficulties, resulting in no recordings being made during this survey period. Again, given the coverage provided by the other detectors deployed, this is not considered have significantly impacted the robustness of the survey (see paragraph 2.13 for further details).
- 4.48. The automated detector survey undertaken between 27th July and 9th August returned a mixed set of results with some detector locations recording consistent and frequent bat activity within the Site, although some nights recorded relatively higher registrations than others. And other detector locations only recording bat registrations during a small number of nights within the survey period.
- 4.49. The detector placed at **D2** recorded the highest amount of bat registrations during this survey period with the vast majority of registrations associated with Common Pipistrelle and Soprano Pipistrelle.
- 4.50. The detectors placed at **D1** and **D5** recorded the lowest amount of bat registrations during the survey period with the highest proportion of registrations associated with Common Pipistrelle, Soprano Pipistrelle and *Nyctalus* species at both locations. It should be noted that the detector placed at **D5** recorded registrations on only two of the fourteen nights of the survey period.

- 4.51. The detector placed at **D9** recorded the highest total registrations of notable species, namely Barbastelle, Greater Horseshoe and Lesser Horseshoe (90 registrations) as well as the highest counts of Lesser Horseshoe (44 registrations) and Barbastelle (38 registrations) registrations. **D4** returned the highest amount of Greater Horseshoe (28 registrations) registrations.
- 4.52. This survey period continued the trend of low amounts of activity recorded by the detector placed at **D1** seen in the 25th June to 5th July survey period. The detector placed at this location recorded just 583 registrations across the 14 night survey period.

3rd September Activity Survey

- 4.53. The activity survey undertaken on September 3rd recorded a total of 377 registrations, Common Pipistrelle was recorded the most (168 registrations). Other species recorded during this survey were Soprano Pipistrelle (108 registrations) unidentified *Nyctalus* species (65 registrations), unidentified *Myotis* species (17 registrations), Brown Long-eared Bat (8 registrations), Serotine (6 registrations), Barbastelle (3 registrations), Nathusius' Pipistrelle (1 registration) and Greater Horseshoe (1 registration).
- 4.54. The majority of activity of common and widespread species during this survey was concentrated along the southern and south-eastern areas with northern and central areas of the site seeing minimal activity.
- 4.55. The low number of registrations of Barbastelle were recorded in the south-east of the Site. The registration of Greater Horseshoe was recorded in the south of the Site.

Automated Detector Survey 3rd September - 7th September

- 4.56. Following the activity survey, automated detectors were deployed throughout the Site at locations **D1, D2, D3, D4, D5, D6, D7, D8, D9 and D10** (see Plan ECO3) and set to record for 5 consecutive nights from September 3rd to September 7th. The results from each night are detailed below in Tables 31 to 39 (Appendix 5) for each of the detector locations. The detector located at **D4** experienced technical difficulties, resulting in no recordings being made during this survey period. Again, given the coverage provided by the other detectors deployed, this is not considered have significantly impacted the robustness of the survey (see paragraph 2.13 for further details).
- 4.57. The automated detector survey undertaken between 3rd September and 7th September again returned a mixed set of results with some detector locations recording consistent and frequent bat activity within the Site, although some nights recorded relatively higher registrations than others. And other detector locations only recording bat registrations during a small number of the nights within the survey period.
- 4.58. The detector placed at **D7** recorded the highest amount of bat registrations during this survey period with the vast majority of registrations associated with Common Pipistrelle and Soprano Pipistrelle. However, there was also a relatively high number of *Plecotus* species registrations recorded at **D7** compared to in other locations.

- 4.59. The detectors placed at **D1**, **D2**, **D6** and **D10** recorded the lowest amount of bat registrations during the survey period with the highest proportion of registrations associated with Common Pipistrelle and *Nyctalus* species at **D1**, Common Pipistrelle at **D2** and Common Pipistrelle and Soprano Pipistrelle at both **D6** and **D10**.
- 4.60. The detectors placed at **D2**, **D6** and **D10** all recorded bat registrations on only some of the five nights of the survey period. With **D6** and **D10** recording registrations on only two nights and **D2** recording registrations on just three nights.
- 4.61. The detector placed at **D8** recorded the highest total registrations of notable species, namely Barbastelle, Greater Horseshoe and Lesser Horseshoe (27 registrations) as well as the highest counts of Greater Horseshoe registrations (15 registrations). **D1** returned the highest amount of Lesser Horseshoe registrations although it should be noted that this was a relatively low total of 4 registrations. **D3** and **D9** recorded the highest amount of Barbastelle registrations (14 registrations) during this survey period.
- 4.62. The detector placed at **D1** recorded just 214 registrations during this survey period, continuing the trend of low amounts of activity recorded by the detector placed at **D1** seen in both the 25th June to 5th July and 27th July to 9th August survey periods.

30th September Activity Survey

- 4.63. The activity survey undertaken on September 30th recorded a total of 212 registrations, most of which were related to Soprano and Common Pipistrelle (73 and 61 registrations respectively). Other species recorded were unidentified *Nyctalus* species (43 registrations), Brown Long-eared Bat (12 registrations), Serotine (11 registrations), unidentified *Myotis* species (11 registrations) and Greater Horseshoe (1 registration).
- 4.64. The majority of the activity of common and widespread species was once again concentrated in the south and south-eastern areas of the Site. With central and northern areas of the Site seeing little activity.
- 4.65. The Greater Horseshoe registration was recorded in the south of the Site.

Automated Detector Survey 30th September - 12th October

- 4.66. Following the activity survey, automated detectors were deployed throughout the Site at locations **D1**, **D2**, **D3**, **D4**, **D5**, **D6**, **D7**, **D8**, **D9** and **D10** (see Plan ECO3) and set to record for 13 consecutive nights from September 30th to October 12th. The results from each night are detailed below in Tables 40 to 49 (Appendix 5) for each of the detector locations.
- 4.67. The automated detector survey undertaken between 30th September and 12th October again returned a mixed set of results with some detector locations recording consistent and frequent bat activity within the Site, although some nights recorded relatively higher registrations than others. Whilst other detector

locations only recording limited bat registrations during a small number of the nights within the survey period.

- 4.68. The detector placed at **D8** recorded the highest amount of bat registrations during this survey period with the vast majority of registrations associated with Common Pipistrelle and Soprano Pipistrelle.
- 4.69. The detectors placed at **D1**, **D2** and **D5** recorded the lowest amount of bat registrations during the survey period with the highest proportion of registrations associated with *Nyctalus* species at **D1**, *Myotis* species at **D2**, and Common Pipistrelle at **D5**.
- 4.70. The detectors placed at **D1**, **D2** and **D5** all recorded bat registrations on only a small number of the thirteen nights of the survey period, with **D1** and **D2** recording registrations on only four and three nights respectively and **D5** recording registrations on six nights.
- 4.71. The detector placed at **D6** recorded the highest total registrations of notable species, namely Barbastelle, Greater Horseshoe and Lesser Horseshoe (142 registrations) as well as the highest count of Greater Horseshoe registrations (54 registrations). **D9** returned the highest amount of Lesser Horseshoe registrations (19 registrations) and **D10** recorded the highest amounts of Barbastelle (118 registrations) during this survey period, despite recording just 849 and 638 total bat registrations respectively.
- 4.72. The 142 registrations of notable species recorded at **D6** during this survey period is the highest total number of registrations recorded at any one location during surveys undertaken in 2020.
- 4.73. This survey period once again continued the trend of low amounts of activity recorded by the detector placed at **D1** seen in the three previous survey periods.

21st October Activity Survey

- 4.74. The activity survey undertaken on October 21st recorded a total of 461 registrations, most of which were related to Common Pipistrelle (262 registrations). Other species recorded were Soprano Pipistrelle (82 registrations), unidentified *Nyctalus* species (56 registrations), Serotine (46 registrations), unidentified *Myotis* species (7 registrations), Barbastelle (4 registrations), Nathusius' Pipistrelle (2 registrations) and Greater Horseshoe (2 registration).
- 4.75. The majority of the activity of common and widespread species was once again concentrated in the south and south-eastern areas of the Site. With central and northern areas of the Site seeing little activity.
- 4.76. The Greater Horseshoe and Barbastelle registrations were all recorded in the south and south-east of the Site.

Automated Detector Survey 21st October - 4th November

- 4.77. Following the activity survey, automated detectors were deployed throughout the Site at locations **D1, D2, D3, D4, D5, D6, D7, D8, D9** and **D10** (see Plan ECO3) and set to record for 15 consecutive nights from October 21st to November 4th. The results from each night are detailed below in Tables 50 to 59 (Appendix 5) for each of the detector locations.
- 4.78. The automated detector survey undertaken between 21st October and 4th November once again returned a mixed set of results with some detector locations recording consistent and frequent bat activity within the Site, although some nights recorded relatively higher registrations than others. Whilst other detector locations only recorded limited numbers of bat registrations.
- 4.79. The detector placed at **D5** and **D10** recorded the highest amount of bat registrations during this survey period with the vast majority of registrations associated with Common Pipistrelle and Soprano Pipistrelle at both locations.
- 4.80. The detectors placed at **D1, D2, D6 and D7** recorded the lowest amount of bat registrations during the survey period with the highest proportion of registrations associated with *Myotis* species at **D1**, Soprano Pipistrelle at **D2**, Common Pipistrelle and *Nyctalus* species at **D6** and Brown Long-eared Bat at **D7**.
- 4.81. The detectors placed at **D2** and **D9** both recorded bat registrations on only a fraction of the fifteen nights of the survey period, with **D2** recording registrations on only seven nights and **D9** recording registrations on eleven nights.
- 4.82. The detector placed at **D5** recorded the highest total registrations of notable species, namely Barbastelle, Greater Horseshoe and Lesser Horseshoe (121 registrations) as well as the highest count of Barbastelle registrations (118 registrations). **D8** returned the highest amount of Greater Horseshoe registrations (45 registrations) and **D9** recorded the highest amounts of Lesser Horseshoe (46 registrations) during this survey period.

Summary of Activity Surveys

- 4.83. Bat activity surveys undertaken throughout the active period of 2020 show that the vast majority of bat activity within the Site can be attributed to either Common Pipistrelle, Soprano Pipistrelle or *Nyctalus* species. Other species recorded were Serotine, *Myotis* species, Brown Long-eared Bat, Nathusius' Pipistrelle, Barbastelle, Greater Horseshoe Bat and Lesser Horseshoe Bat.
- 4.84. The activity of both common and widespread species and rarer species such as Barbastelle, Lesser Horseshoe and Greater Horseshoe is seen to be focused in the southern and south-eastern areas of the Site.
- 4.85. Given the small numbers of Barbastelle, Greater Horseshoe Bat and Lesser Horseshoe Bat registrations it is deemed that the Site is of use by single / small numbers of individual bats on an occasional basis.

Summary of Automated Surveys

- 4.86. Automated surveys undertaken throughout the active period of 2020 show similar patterns to the activity surveys. The vast majority of registrations recorded can be attributed to either Common Pipistrelle, Soprano Pipistrelle or *Nyctalus* species. No additional bat species were recording during automated surveys that were not recorded during the activity surveys.
- 4.87. The activity of common and widespread species is well distributed across the Site with no one location showing significantly higher registrations than the others. However, it should be noted that location **D6** consistently recorded lower amounts of registrations compared to other detector locations throughout the survey period and as mentioned above location **D1** also recorded low numbers of registrations in the majority of the survey periods.
- 4.88. When analysing the activity of notable species during the active period of 2020, it can be seen that on average locations **D1**, **D2** and **D4** returned the fewest numbers of notable bat registrations, whilst locations **D3**, **D6**, **D9** and **D10** returned the highest numbers.
- 4.89. Given location **D6's** high number of notable species registrations and low number of total bat registrations across the survey period. It is no surprise that **D6** recorded the highest proportion of notable bat species registrations with nearly 6.5% of the bat registrations recorded at this location associated with a notable species.
- 4.90. **Background records.** The desk study undertaken with SERC returned several records of bat species from within or immediately adjacent to the Site.
- 4.91. The records returned include Brown Long-eared Bat (2017) Lesser Horseshoe Bat (2017), Common Pipistrelle (2016), Greater Horseshoe Bat (2017), Barbastelle (2017), Noctule bat (2016) and Soprano Pipistrelle (2016). The nearest recorded roost site is located approximately 0.7km south east of the Site at its closest point recorded in 2018. This record does not identify the species of bat.

Badgers

- 4.92. The Site has been subject to regular monitoring for the presence of Badgers. Indeed, Badger field signs have been recorded and historically, several Badger setts have been recorded within the Site.
- 4.93. **Previous surveys.** A number of Badger setts had been identified within the Site during surveys undertaken by EPI in 2008 and 2009. Ecology Solutions carried out further surveys of the Site in 2011 and 2012 to establish the use of the Site by Badgers.
- 4.94. Additional update survey work was undertaken by Ecology Solutions to inform two Badger sett closure licence applications that were granted in 2012 and 2013. Temporary sett closure works were completed in 2012 in the north of the Site in order to support remediation work.

- 4.95. A main sett located in the west of the Site, under the footprint of the proposed landscape mound was the subject of an aborted sett exclusion undertaken in 2013. The works in relation to the latter licence were undertaken in 2018 to complete the aborted works to exclude Badgers and this process was accompanied by update survey work.
- 4.96. This update survey work recorded that of the 21 setts previously reported within the Site, 19 no longer display signs of current use and accordingly they are no longer considered to be setts. The details of each sett (including former setts) as recorded during the survey in June 2018 are given below and shown graphically at Appendix 6.
- 4.97. S1 was formerly recorded as a two entrance outlier sett located in dense scrub to the west of the Site. The sett was last recorded as being active in 2008, but has consistently been recorded as inactive since that time, including in June 2018. The two entrances have now collapsed.
- 4.98. S2, located to the west of S1, was previously recorded throughout the surveys in 2008, 2009, 2011 and 2012 as a disused three entrance sett occupied by rabbits. Evidence in July 2013 indicated Badgers had recolonised this sett. Evidence of use was also recorded in June 2018. It was considered to be an annex sett. A single active entrance was present and a large spoil pile was recorded at its front. Two disused entrances are also present, while a further two entrances recorded in previous surveys were noted to have collapsed.
- 4.99. S3 was recorded in 2008 and 2009 as being a main sett with four entrances. However, evidence recorded during the 2011 and 2012 surveys indicated that activity levels had reduced here, while nearby sett S4 (described below) showed higher levels of use, more indicative of use as the main sett for this social group. S3 was subsequently recorded as disused in 2013 with all four entrances being overgrown and subject to collapse. No signs of current use were recorded in June 2018 and it therefore considered that S3 is no longer a sett.
- 4.100. S4 was a large sett which lies adjacent to S3. The sett was recorded as active in 2008, 2009, 2011 and 2012 with higher levels of use in the 2011 and 2012 surveys. Following the survey in 2013 it was considered that S4 constituted a main sett. The survey in June 2018 recorded 11 active entrances, 12 inactive entrances and 2 possibly active entrances. A number of other blocked, collapsed or disused entrances were also present in the vicinity. Evidence of rabbit activity was also recorded across the area.
- 4.101. S5 was formerly recorded as an annex sett to the north of S4 with at least five entrances. The sett was recorded as active in 2008, with all five entrances in use. No evidence of Badger activity was recorded in the 2011, 2012 or 2013 surveys. Accordingly, S5 was no longer considered to be a sett at that time. Only a single inactive entrance was recorded in June 2018.
- 4.102. S6 was formerly a four entrance sett located north of S5. No evidence of regular activity was recorded through any of the surveys leading up to 2013. S6 was recorded as inactive June 2018 and has since been closed under licence.

- 4.103. S7 was previously recorded as a five entrance subsidiary sett to the north of S6. The sett was active in 2008. However, the surveys undertaken in 2009, 2011 and 2012 recorded a decline in activity. The entrances had collapsed by the 2013 survey and no recent evidence of Badger activity was recorded in the immediate vicinity. No evidence of Badger activity was recorded in June 2018. As such S7 is no longer considered present.
- 4.104. S8 was initially recorded as an active single entrance sett located to the north of S7 in an old boiler ash mound. Surveys undertaken in 2009, 2011 and 2012 reported that the sett was occupied by Rabbits and no evidence of Badger use was recorded. Furthermore, no evidence of Badger use was recorded in 2013 or June 2018, and so S8 is no longer deemed to be a sett.
- 4.105. S9 is a former five entrance sett located in the northern part of the Site. It was partially active in 2008, but disused and occupied by rabbits in 2009, 2011, 2012. The entrances were recorded to have collapsed in 2013 and no evidence of Badger activity was recorded in June 2018. Accordingly, S9 no longer represents a sett.
- 4.106. S10 was previously a two entrance sett located within dense scrub. The sett was recorded as active in 2008, 2009 and 2011, but not in 2012 or 2013 when the entrances had collapsed and were blocked by debris. No evidence of Badger activity was recorded in June 2018 and S10 is no longer considered to be a sett.
- 4.107. S11 was previously recorded in surveys undertaken in 2008, 2009 and 2011 as a single disused entrance occupied by Rabbits. In 2012 the sett appeared to be in use by Badgers again and new spoil was present. It was at that time considered to be an outlier sett associated with main sett S20 (described below). Activity levels had increased at the time of the 2013 survey. No Badger activity was recorded in June 2018 and the sett was instead occupied by Rabbits. Consequently, S11 is no longer considered to be a sett.
- 4.108. S12 was previously considered to be a main sett for the social group in this area of the Site in 2008, 2009 and 2011. However, surveys undertaken in 2012 recorded a new sett in the vicinity of S12 (sett S20) which exhibited far greater levels of use and it was considered that the new sett (S20) had become the new main sett. It was identified at the time that S12 then constituted an active annex or subsidiary sett to the new main sett. It was subject to a temporary exclusion exercise under licence (Licence ref: WLM/2012/2179) which allowed for demolition works to be undertaken in respect of a building on top of the concrete slab above the sett. Following this exercise the Badger gate was removed from the sett entrance. It was considered Badger had recolonised the sett in July 2013, but no evidence of use was recorded in June 2018. The area had scrubbed over and no evidence of Badger activity was recorded in the vicinity. Consequently S12 is no longer considered to be an active sett.
- 4.109. S13 was a single entrance sett. The sett was recorded as partially active in 2008 but was occupied by Rabbits in 2009. Following subsidence in 2009, the S13 is disused / collapsed and no longer considered a sett.
- 4.110. S14 was previously recorded as a single entrance sett below a steel tank, situated to the south of S13. The sett was recorded as possibly active in 2008;

however since this date no evidence of use by Badgers has been recorded and it no longer constitutes a sett.

- 4.111. S15 was formerly a single entrance sett located in the south-eastern part of the ROF site. The sett was recorded as partially active in 2008 but was occupied by Rabbits in 2009, 2011 and 2012. In 2013 and June 2018 it exhibited no signs of use by Badger and is therefore no longer considered to be a sett.
- 4.112. S16 was recorded in 2008 as an active two entrance sett located to the east of S15 in the south-eastern part of the ROF site. It was occupied by Rabbits only in 2009, 2011 and 2012, while in 2013 the entrances had collapsed and were blocked by debris. No evidence of Badger activity was recorded in the vicinity in June 2018 and S16 is no longer considered to be a sett.
- 4.113. S17 is a former sett located to the east of S11 and S12. It was not in use by Badger from 2008 to 2012, although one entrance appeared to be used by a Fox *Vulpes vulpes* as an earth in 2012. Fresh digging and a guard hair indicated the sett was in use by Badger in 2013, but there was no evidence the sett was in use by Badger in the most recent survey in June 2018 with rabbits noted to have colonised the area. Accordingly, it is no longer considered to be a sett.
- 4.114. S18 was recorded in 2008 as a single entrance sett located in the south-eastern part of the ROF site adjacent to the security fence. Despite being situated within an area of high Badger activity, with latrines and foraging signs close by, S18 has not been recorded as active in any of the subsequent surveys. As of 2013 the entrances had collapsed. S18 is considered to be disused and no longer represents a sett.
- 4.115. S19 was a single entrance sett located adjacent to the southern boundary of the ROF site. The sett was recorded as partially active in 2008; however, it was recorded as being used by Rabbits only in 2009. Subsidence / collapse was recorded in June 2009 and as of 2013 the former entrance had completely collapsed and was overgrown. No evidence of Badger activity was recorded in June 2018. Accordingly S19 is no longer a sett.
- 4.116. S20 was a four entrance sett located at the top of the blast bund close to S12. It was discovered in 2012 and a significant level of activity was recorded at that time, indicating it had become the main sett for the Badger social group in the area. Results from the July 2013 surveys found that the activity level of S20 had reduced. No evidence of use by Badger was recorded in June 2018, with the sett instead occupied by Rabbit. S20 is no longer considered to be a sett.
- 4.117. S21 was first recorded in 2013. It was considered to be a three entrance subsidiary sett, but no evidence of use was recorded in June 2018. Like S11, S12 and S20, it is currently occupied by Rabbits. Accordingly, it is no longer considered to be a sett.
- 4.118. Following the closure of the active setts as part of the licenced procedure, no active setts were considered to be present within the central part of the Site, except for the artificial badger sett.
- 4.119. **Update surveys.** The Site has been subject to regular surveillance for Badger since 2018 with update surveys undertaken in June 2020 and October 2020. As

has been described above, there has been a notable decline in activity over recent years. Of the setts historically recorded across the ROF site, currently none are considered to be active, with several having collapsed and no longer present.

- 4.120. Notwithstanding this, recent evidence of badgers, including latrines and foraging signs and visual sightings, have been recorded in areas near the ROF site boundaries (in the north west, south west and south east), confirming that this species continues to utilise the Site.
- 4.121. Badger activity has been recorded in close proximity to the sett and it is considered that the artificial sett remains in active use.
- 4.122. Evidence of two setts have been recorded along the railway spur to the north west of the Site.
- 4.123. This includes a partially active sett (sett BS1 on plan ECO4) that consists of 11 entrances, 4 of which are considered to be active, with the remainder showing signs of no recent use. This sett is located within the north embankment behind the eastern abutment of the railway bridge crossing the M5 motorway.
- 4.124. Another sett (sett BS2 on plan ECO4) is located further west of BS1, to the west of the M5 motorway. The sett is located on the southern embankment to the railway line and consists of 8 entrances, of which 6 are considered active, with the remainder showing no signs of recent use.
- 4.125. **Background records.** The data search undertaken with SERC returned one record of Badger recorded within the Site from 1998. The next closest record was from 0.2km north of the Site in 2018 where a dead badger was recorded.
- 4.126. As part of the work undertaken as part of the Hinckley C Power Connection, a number of Badger setts were identified in the wider areas to the south and east of the Site. Those setts in proximity to the Site were closed under licence in 2019. The locations are shown on Plan ECO4.

Birds

- 4.127. Given the habitats present it is considered that the Site has potential to support a range of bird species.
- 4.128. **Previous surveys.** Breeding bird surveys were undertaken by EPI in April and May 2009. Dawn surveys were conducted to record general breeding behaviours as well as evening visits to look for evidence of Barn Owls *Tyto alba*.
- 4.129. The areas with most breeding activity within the Site were recorded to be the trees and scrub towards the periphery. In addition, high levels of breeding activity were recorded in the reed bed to the north, the disused railway to the north-west, the Borrow Pit to the east and the orchard to the south-east of the Site. Low levels of breeding activity were recorded throughout much of the central part of the Site.
- 4.130. In total of 67 species were recorded during the breeding bird survey. The survey identified a number of species listed on Schedule 1 of the Wildlife and

Countryside Act, the UK and Somerset Biodiversity Action Plans (BAPs) and/or on the Red and Amber Lists of Species of High Conservation Concern. These species are listed in Table 2 below.

Species	Schedule 1	BAP Status	BoCC Status
Barn Owl	Yes	Somerset	Amber
Bullfinch		UK and Somerset	Amber
Cetti's Warbler	Yes		
Cuckoo		Somerset	Red
Dunnock			Amber
Herring Gull		Somerset	Red
Hobby	Yes	Somerset	
House Sparrow		Somerset	Red
Kingfisher	Yes	Somerset	Amber
Linnet		UK and Somerset	Red
Little Owl		Somerset	
Merlin	Yes	Somerset	Amber
Mistle Thrush		Somerset	Red
Reed Bunting		UK	Amber
Skylark		UK and Somerset	Red
Song Thrush		UK and Somerset	Red
Snipe		Somerset	Amber
Starling		Somerset	Red
Wood Warbler			Red

Table 2: Protected and notable bird species recorded in breeding bird survey 2009 by EPI

- 4.131. All of the buildings with opportunities for breeding Barn Owls on the Site have since been removed as part of the remediation process. Barn owl nesting opportunities have been provided at the Site in the form of an enclosed box within one of the Bat roost buildings and in two nesting boxes located close to suitable retained foraging habitat within the Site.
- 4.132. Sixteen Cetti's Warbler territories were recorded within the Site, associated with the scrub and reeds along ditches, particularly in the western and north-eastern parts of the site including the Fishing Lake.
- 4.133. **Update surveys.** Breeding bird surveys were undertaken by Ecology Solutions in April 2020 and May 2020.
- 4.134. Much like the previous surveys undertaken for breeding birds, the areas with most breeding activity within the Site related to trees, ditches and scrub towards the periphery and high levels of breeding activity were recorded in the reed bed to the north. Low levels of activity were recorded throughout much of the central part of the Site.
- 4.135. In total 47 species were recorded during these surveys with 28 of these species showing signs of breeding including singing, nest construction and territory displays. A further three species were recorded that were likely to be breeding however no signs of this were recorded during the surveys. The results of the survey work undertaken are shown graphically on Plan ECO5.

- 4.136. The survey identified a number of species listed on Schedule 1 of the Wildlife and Countryside Act, the UK and Somerset BAPs and/or on the Red and Amber Lists of Species of High Conservation Concern. These species are listed in Table 3 below.

Species	Schedule 1	BAP Status	BoCC Status
Bullfinch		UK and Somerset	Amber
Cetti's Warbler	Yes		
Cuckoo		Somerset	Red
Dunnock			Amber
Herring Gull		Somerset	Red
House Sparrow		Somerset	Red
Linnet		UK and Somerset	Red
Little Owl		Somerset	
Mistle Thrush		Somerset	Red
Reed Bunting		UK	Amber
Song Thrush		UK and Somerset	Red
Starling		Somerset	Red

Table 3: Protected and notable bird species recorded in breeding bird survey 2020 by Ecology Solutions

- 4.137. Cetti's Warbler territories were recorded within the Site, again associated with the scrub and reeds along ditches, particularly in the northern reed bed and north-eastern parts of the site including the Fishing Lake.
- 4.138. **Background records.** The desk study undertaken with SERC returned several records of protected or notable bird species from within the Site. These included Grey heron *Ardea cinerea*, Chiffchaff *Phylloscopus collybita*, Pintail *Anas acuta*, Cetti's Warbler *Cettia cetti*, Shoveler *Anas clypeata*, Goldeneye *Bucephala clangula*, Red-breasted Merganser *Mergus serrator*, Red-necked Grebe *Podiceps grisegena*, Pochard *Aythya farina*, Gadwall *Anas strepera*, Bittern *Botaurus stellaris*, Teal *Anas crecca*, Great Crested Grebe *Podiceps cristatus*, Gadwall *Anas strepera*.

Reptiles

- 4.139. The Site consists of grasslands, scrub, hedgerows and woodland edge habitat that are of value to common reptile species. Furthermore, the Site has areas of standing water, ditches and wetland habitats that are of particular value to Grass Snake. As such, the Site has been subject to detailed survey for this species group both historically and in 2020.
- 4.140. **Previous surveys.** Refugia surveys were undertaken at the Site by EPI between March and June 2009. In total, 1137 tins were distributed within the Site.
- 4.141. The surveys recorded that there is a small population of Grass Snakes within the Site. Adults were recorded primarily in the northern and south-eastern parts of the Site, with sub-adults and juveniles also recorded in areas of suitable habitat in the southern, north-western and eastern parts of the Site.
- 4.142. **Update surveys.** Further update refugia surveys have been undertaken focussed on habitat of known value to reptiles across the Site. The survey was timed to cover the later part of the active season, when refugia surveys are known to be most effective. Tins were placed within the site at a density to allow

for a population size assessment to be undertaken, as set out within relevant Froglife guidance¹². Areas subject to tinning include the grasslands / wetland adjacent to the ditch network and Fishing Lake to the north-east, meadow grassland in the north-west and marshy grassland to the south of the Site as well as the reedbed to the north. These areas are shown graphically on Plan ECO6.

- 4.143. The results of the updated survey work undertaken in 2020 are presented within Table 4 below.

Date	Cloud Cover %	Temperature (°C)	Grass Snake				
			M	F	J	U	Total
23/09/20	100	15	0	0	0	0	0
25/09/20	20	12	0	0	0	0	0
29/09/20	90	15	0	0	2	0	2
01/10/20	70	12	0	0	0	0	0
06/10/20	100	13	0	0	1	0	1
08/10/20	40	15	0	0	2	0	2
09/10/20	100	11	0	0	2	0	2

Table 4: 2020 reptile survey results

- 4.144. On the basis of the results of the 2020 survey work, it is considered that a small population of Grass Snake remains present within suitable habitat at the margins of the Site. It is considered that no other reptile species are present at the Site.
- 4.145. **Background records.** The desk study undertaken with SERC did not return any records of reptiles from within or immediately adjacent to the Site. The nearest records returned are of Grass Snake from a location approximately 0.06km to the north-west in 2008. Slow worm *Anguis fragilis* were also recorded in the local area.

Water Vole

- 4.146. Evidence of Water Vole activity, in the form of physical sightings, burrows, feeding remains, prints and latrines, was recorded along a number of water bodies within the Site.
- 4.147. **Previous surveys.** Specific surveys were undertaken for Water Voles in 2008/09 by EPI with further surveys undertaken in 2011, 2013, 2015 and 2016 by Ecology Solutions. The species has been recorded in association with the northern and north-eastern part of the Site, including rhynes associated with cattle grazed pastures. More isolated drainage ditches in the central part of the Site were noted to support Water Voles. There were also a number of ditches to the west and south-west of the Site which supported Water Voles.
- 4.148. Over the course of the surveys undertaken the population levels and extent have been known to vary. This is possibly a result of the widespread variations in water levels within the ditches at the Site. Following a long dry spell in 2011 the water levels within many of the ditches within the Site (including ditches supporting Water Voles) were very low. This situation was followed by very wet weather in

¹² Froglife (1999). Froglife Advice Sheet 10: reptile survey. Froglife, London.

early 2012 which resulted in extensive flooding. These effects continue to effect the Site. As such the Water Voles may have been forced to vacate ditches within the Site. In addition, predation by Mink *Neovison vison* is also a likely key factor.

- 4.149. **Update surveys.** A full suite of update surveys were undertaken in 2020. The distribution of Water Vole is considered to remain broadly similar to recent years, with the rhynes in the west and north east providing the greatest extent of suitable habitat, with other isolated populations elsewhere. The distribution of Water Vole evidence across the Site is shown graphically on plan ECO7.
- 4.150. Mink continue to be observed onsite. Their continued presence is considered to be a cause of the dispersion of small populations of Water Vole across the Site.
- 4.151. **Background records.** The desk study undertaken with SERC returned five records of Water Vole from within the Site the most recent from 2015 as well as records six records of Otter *Lutra lutra* from within the Site most recently 2000.
- 4.152. The nearest records of Water Vole are from a location approximately 0.16km east of the Site, recorded in 1994.

Amphibians / Great Crested Newts

- 4.153. A number of waterbodies are located within the Site and wider area in the form of ponds, reed beds, rhynes and fishing lakes. Some of which are considered to offer potential value to breeding amphibians.
- 4.154. **Previous surveys.** Ecology Solutions carried out specific surveys for Great Crested Newts (GCN) during May and June 2011. A total of 49 waterbodies were surveyed. During these surveys all other amphibian species present were recorded including Smooth Newt *Lissotriton vulgaris* and Palmate Newt *Lissotriton helveticus*.
- 4.155. The above survey work was used to inform the licenced translocation of GCN from within the Site to two receptor areas (see Plan ECO8). A receptor area is located in the north west of the Site, where four new ponds were created as well as hibernacula and suitable habitats. An additional receptor area was located in the east of the Site, where a pond, hibernacula and suitable habitat was created. The translocation took place over the active period in 2017. In total 100 GCN were moved and Smooth Newt, Common Toad *Bufo bufo* and Common Frog *Rana temporaria* were also recorded.
- 4.156. In addition to the above translocation, a second translocation was also undertaken in the east of the Site, in relation to the installation of a pipeline. The licence was granted and trapping took place in 2014. 24 GCN were moved to the receptor area created in the east of the Site.
- 4.157. Rhynes and field ponds located to the south of the Site and wider areas were subject to surveys in 2018 to inform the development of the new access road. A single pond was recorded to hold GCN, although given its distance from the Site, it was considered that no impacts would arise. The location of these ponds is shown at Plan ECO9.

- 4.158. **Update surveys.** Monitoring surveys have been completed annually at both receptor sites, as per the conditions of the extant licences, and presence has been recorded each year utilising eDNA sampling techniques.
- 4.159. In addition, these ponds (13 ponds in total) were subject to a full suite of detailed surveys, including bottle-trapping, netting and torching techniques in 2020. The results of the survey are tabulated at Appendix 7. Of the 13 ponds subject to survey, 6 ponds (ponds P1 and P2 in the north west of the Site and ponds P36, P35 and P32 in the south east of the Site) were recorded as supporting GCN.
- 4.160. The reed bed and adjacent rhynes to the north of the Site were also sampled for eDNA in 2020 and returned negative results for the presence of GCN.
- 4.161. The results of recent GCN survey work is shown graphically at Plan ECO8.
- 4.162. **Background records.** The desk study undertaken with SERC returned two records of amphibian species within or immediately adjacent to the Site. The records of amphibians nearest to the Site are of Common Toad and GCN recorded in 1988. The desk study also returned records of Smooth newt and Palmate newt.
- 4.163. A number of the ponds surveyed by Ecology Solutions in 2018 and 2020 were subject to detailed surveys in respect to the Hinkley Point C connection project in 2013 and 2014. As part of the project a large study area, which includes eastern and south parts of the Site was subject to suitability assessments and detailed surveys. The results of these surveys on relevant ponds are detailed below.
- 4.164. During 2013 and 2014, detailed surveys were undertaken on ponds P10, P11, P12, P23, P31, P32, P35, P36, P37 and P38 (see Plan ECO8 and Plan ECO9), to inform the Hinkley Point C connection project. Of these ponds the presence of GCN was found in ponds P31, P35, P36 and P37.
- 4.165. During the surveys of P31 undertaken across 2013 and 2014 no adult GCN were recorded, however an unspecified number of GCN eggs were present. During the surveys undertaken at P35 across 2013 and 2014 a peak count of four individuals were recorded. During the surveys undertaken at both P36 and P37 across 2013 and 2014 a peak count of a single individual was recorded in each pond.
- 4.166. Additional ponds to the east and south of ponds P10 and P11 were found to support GCN in 2013 and 2013. However, both ponds are over 500 metres from the site and as such were not subject to detailed survey by Ecology Solutions.

Invertebrates

- 4.167. Given the habitats present, notably those associated within the Puriton Ash Ground LWS and Puriton Rhynes and Ponds LWS, it is likely an assemblage of common invertebrate species would be present within the Site as well as the potential for more notable species to also be present.
- 4.168. **Previous surveys.** Terrestrial invertebrate surveys (for butterfly and dragonfly species) were undertaken by EPI between March and August 2009. The diversity

of butterflies recorded during the survey was reasonably notable, with 22 of the 46 species known to occur in Somerset recorded either within or adjacent to the Site. Dragonfly diversity was similarly notable, with 13 of the 28 species known to occur in Somerset recorded during the surveys. Most species recorded are relatively common. Variable Damselfly, a notable species, was recorded predominantly from the Borrow Pit to the east of the Site.

- 4.169. Aquatic invertebrate surveys were also undertaken by EPI in May 2009 within the Site and in the local area. In total 573 records were gathered, pertaining to 160 invertebrate taxa. The majority of recorded species are relatively common and are considered to be typical of the waterbodies represented at the Site and local area. The survey provides evidence that more open water (such as clear drainage ditches and the Borrow Pit located to the east) supports greater assemblages of species.
- 4.170. **Update surveys.** Detailed update invertebrate surveys have recently been completed within the Site. Habitat assessments were completed in early 2020, with sample collection undertaken thereafter. Sample identification and results analysis is still currently in progress.
- 4.171. To date, survey work has identified 255 species of terrestrial invertebrate in and around the Site. The data is only partial and consists of those taxa reliably identified in the field such as butterflies, dragonflies, dayflying moths, readily identified beetles and flies as well as some initial results from early trapping efforts. The bulk of the solitary bees, wasps, beetles and spiders are in the process of being identified.
- 4.172. A nationally scarce Horsefly *Atylotus rusticus* has been confirmed as present within the Site and is associated with wet plant debris within the Somerset levels.
- 4.173. Other notable species that are considered to be potentially present include the Noble Chafer *Gnorimus nobilis* which is associated with orchard habitat. However, further detailed survey for these species is considered unnecessary due to the lack of effects any future development is anticipated to have on their supporting habitats within the Site.
- 4.174. Further detail of the work undertaken is provided within the Interim Report that is included at Appendix 2.
- 4.175. The final invertebrate survey report will be provided as a separate annex to this report.
- 4.176. **Background records.** A number of invertebrate records were returned from the Site including Wall *Lasiommata megera* (2014), Grizzled Skipper *Pyrgus malvae* (1992) Common Darter *Sympetrum striolatum* (1981).
- 4.177. Other invertebrate species recorded in the wider area include; White-letter Hairstreak *Satyrrium w-album*, Great Silver Water Beetle *Hydrophilus piceus*.
- 4.178. The Lesser Silver Diving Beetle *Hydrochara caraboides* is also known to be present within the rhyme system beyond the Site boundary to the east.

5. LOCAL WILDLIFE SITES WITHIN THE SITE BOUNDARY

- 5.1. There are eight non-statutory designated sites of nature conservation interest within the Site (as illustrated on Plan ECO1). These are described below individually, with further details provided on the type and condition of habitats present as well as protected / notable species present where relevant. Relevant citation and SERC survey sheets for these sites are included at Appendix 8.
- 5.2. In the northeast corner of the Site lies **Puriton Rhyne and Ponds LWS**, which includes an area of reed bed that runs north of the Site to the Huntspill River. It is designated for its notable plant species within the rhynes, and as it has been noted to support Otter and the nationally scarce Hairy Dragonfly *Brachytron pratense*. The shape of the LWS has been subject to a minor alteration following a resurvey in 2015 that noted historic features as no longer being present.
- 5.3. The reed bed to the north is notable for its extent, rather than its inherent ecological diversity. Floristically the area is dominated by Common Reed. This area is known to support Water Vole, breeding birds and provides wetland habitat connectivity between the River Huntspill and the rest of the Site.
- 5.4. The LWS is designated for its aquatic drainage ditches and the species that they support. During update habitat surveys undertaken in 2020, the main ditches within the LWS were noted to contain a diverse flora compared to the rest of the rhyme / ditch system in the Site. Evidence of Water Vole have also been recorded within the ditches, although no evidence of Otter presence has been recorded. Detail on the invertebrate assemblage within the ditch system required further analysis.
- 5.5. Dry and seasonally wet areas of ditch that are heavily overshadowed by encroaching scrub. None of these ditches have been recorded as supporting any notable or protected species. Furthermore, the grasslands within the LWS consist of improved grasslands that are of little ecological significance. Areas of hardstanding and cleared ground resultant from the demolition of buildings are equally insignificant in ecological terms.
- 5.6. **Borrow Pit, Puriton LWS** is situated in the east of the Site. It is designated for its breeding population of Cetti's Warbler.
- 5.7. The Borrow Pit is currently used as a fishing lake. The area has been subject to works to improve drainage across the Site, with a new ditch created in the north west of the Borrow Pit and the shape of the lake has been formalised. This has modified the drainage across the LWS and reduced the areas of inundated reed bed. The smaller areas of reed bed within the Borrow Pit are developing among existing scrub consisting of Goat Willow and Blackthorn. The wetland habitat is considered to continue to offer breeding habitat for Cetti's Warbler.
- 5.8. Small instances of Himalayan Balsam were recorded within the LWS.
- 5.9. **Stoning Pound Field and Rhyne LWS** is situated in the east of the Site and to the south of the Borrow Pit LWS. It is designated for its notable aquatic plant species present within boundary rhynes and on account of it previously supporting Otter.

- 5.10. The field itself consists of improved grassland which does not form part of the designating features for this LWS and it not considered to be of any significant ecological value.
- 5.11. The rhyme system varies in quality and in 2020 extensive build up of duckweed was noted across much of the Stoning Pound rhyme to the north, whilst the rhyme to the east was devoid of duckweed and contained greater species diversity. The western rhyme was heavily overshadowed by scrub.
- 5.12. **Woolavington Road and Fields North LWS** is situated immediately south of the Site. It is designated for the mire habitats that it supports. The LWS also contains areas of semi-improved grassland, rushes and scrub.
- 5.13. The majority of the LWS consists of semi-improved grassland that is generally species poor with False Oat grass and Yorkshire Fog forming much of the sward present. Other areas are heavily rabbit grazed and show signs of disturbance with nettle bed having formed. These areas are not considered to be of any great ecological significance.
- 5.14. Further north the ground level drops and conditions become wetter. In the wetter zones, extensive areas of Soft Rush and Greater Pond Sedge are present among dense areas of scrub formed primarily of Blackthorn. The species diversity within this area was noted to be limited.
- 5.15. **Puriton Cowslip Field LWS** is situated within the Site to the north of the Woolavington Road and Fields North LWS. It is designated for its calcareous to neutral grassland habitat and the plant species it supports.
- 5.16. Recent inspections of the LWS notes that the eastern field was is relatively good condition, with a sward that contain a mix of wildflowers and grasses. A notable population of Pyramidal Orchids was noted amongst the sward. This area represents one of the more ecologically valuable areas of grassland within the context of the Site. However, the field edges become more species poor, with a greater assemblage of robust grasses and scrub present. The western field shares a similar species composition as the eastern field although is generally less diverse. As such, the areas of greatest value are located centrally within the eastern field of the LWS.
- 5.17. **Puriton Ash Ground LWS** is situated within the western part of the Site and is designated for notable plant species that it supports. It is a species rich re-colonising waste ground with areas of scrub. The area was used as tip for rubble and ash associated with the factory. This has provided a basic nutrient poor substrate allowing the associated plant community to establish and also slows the establishment of perennial vegetative communities (such as permanent grasslands).
- 5.18. As part of the remediation of this part of the Site the LWS has been partially capped under a recently constructed landscape feature that is to be seeded native wildflower seed mixes. Areas within the LWS that have not been subject to treatment remain and comprise open ephemeral vegetation with scattered scrub, although in some areas the scrub is becoming more dense and reducing the open nature of the LWS.

- 5.19. This LWS is of potential value to the invertebrate assemblage at the Site due to vegetation that has developed on the nutrient poor substrate.
- 5.20. **Northmead Drove Fields LWS** is situated immediately to the northwest of the Site. It is designated for its mosaic habitats of grassland and rhynes. However, the grasslands themselves are species poor, consisting of improved grasslands that are of little ecological value. The rhynes are comparatively more species rich and therefore, more ecologically significant.
- 5.21. **Puriton Meadows and Rail Spur LWS** is situated in the northwest of the Site and then continues along the railway spur to the northwest where it bisects the Northmead Drove Fields LWS. It is designated for its notable species that it supports and an area of semi-natural grassland.
- 5.22. The vegetation along the railway spur is dominated by dense scrub consisting of Bramble, Blackthorn, Hawthorn and Willow species. Open areas are generally limited to railway ballast where vegetation has been unable to establish.
- 5.23. The grassland fields to the south east of the LWS consist of improved grassland, with a relatively diverse sward compared to other areas of more species-poor grassland within the Site.

6. SUMMARY AND CONCLUSIONS

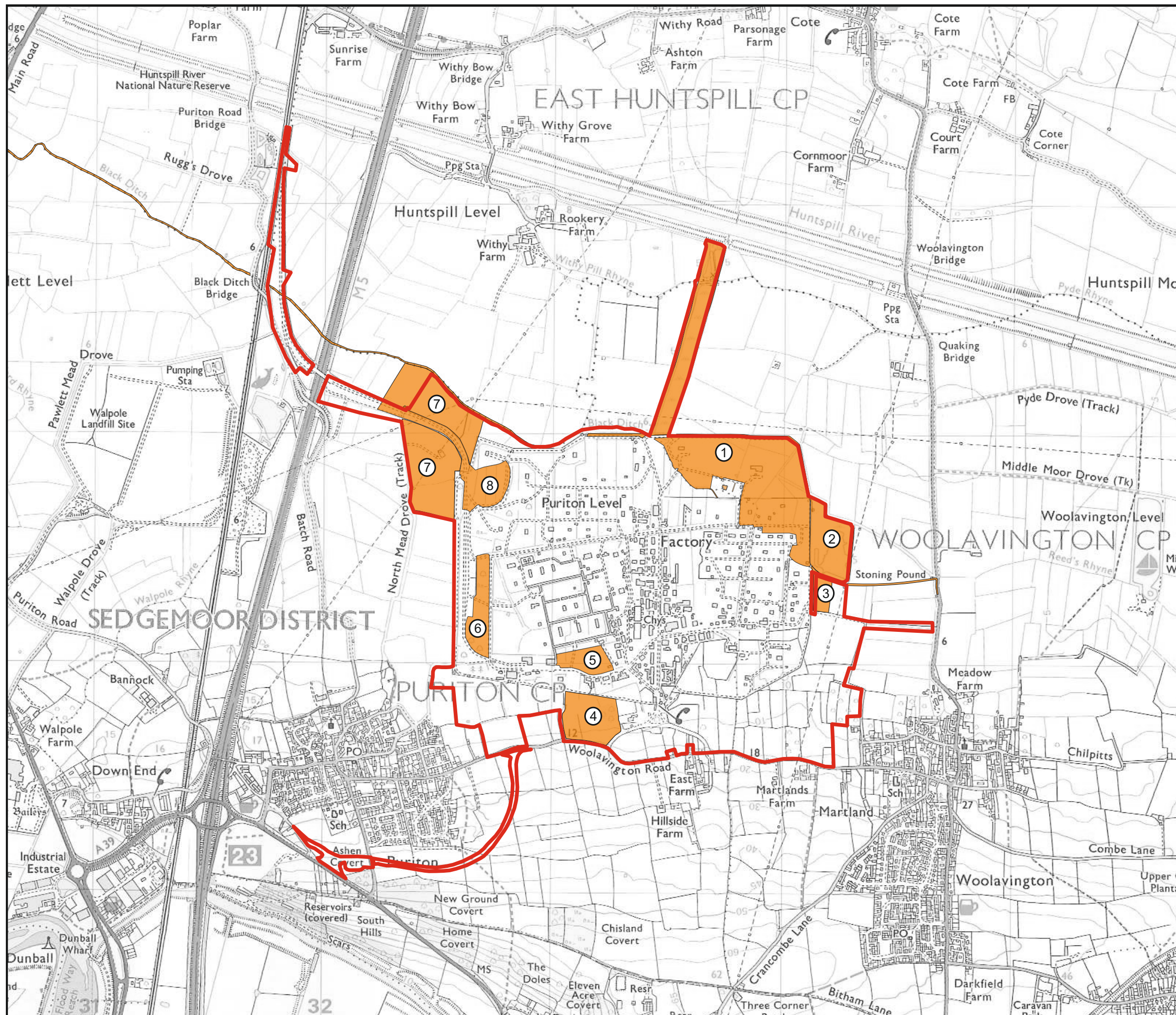
- 6.1. Ecology Solutions Ltd was commissioned on behalf of This Is Gravity in April 2020 to undertake a suite of ecology survey work at the site known as the Gravity Smart Campus, Puriton, Somerset.
- 6.2. The Site was surveyed based around extended Phase 1 survey methodology, as recommended by Natural England. In addition, specific surveys were undertaken within the Site in respect of bats, Badgers, reptiles, Water Vole, Great Crested Newts and Invertebrates.
- 6.3. The results of the survey work undertaken are present within this report and it is considered that an extensive ecological baseline has been established that can fully inform any future assessment / evaluation of the Site in ecological terms.
- 6.4. The survey work will inform the LDO process and the related Environmental assessment process.
- 6.5. The information will also support and inform collaborative work with Natural England and the Environment Agency on their ambitions to create natural capital and respond to climate change by pursuing the creation of a super national nature reserve.
- 6.6. Information from this study will inform the community newsletter and other partners such as Bridgwater and Taunton College, to add value to education and curricula development.
- 6.7. The report will be immediately shared with SDC as the funding agent for this work, with the requirement to conclude by 31.12.2020 and it will be shared with the wider LDO delivery Group in January 2021.



PLANS AND APPENDICES

PLANS

PLAN ECO1

Local Wildlife Sites Within the Site Boundary



-  SITE LOCATION
-  LOCAL WILDLIFE SITE (LWS)
- ① PURITON RHYNES & PONDS
- ② BORROW PIT, PURITON
- ③ STONING POUND FIELD SOUTH & STONING POUND RHYNE
- ④ WOOLAVINGTON ROAD & FIELDS NORTH
- ⑤ PURITON COWSLIP FIELD
- ⑥ PURITON ASH GROUND
- ⑦ NORTH MEAD DROVE FIELDS
- ⑧ PURITON MEADOWS & RAIL SPUR



Farncombe House
Farncombe Estate | Broadway
Worcestershire | WR12 7LJ

+44(0)1451 870767
info@ecology-solutions.co.uk
ecology-solutions.co.uk

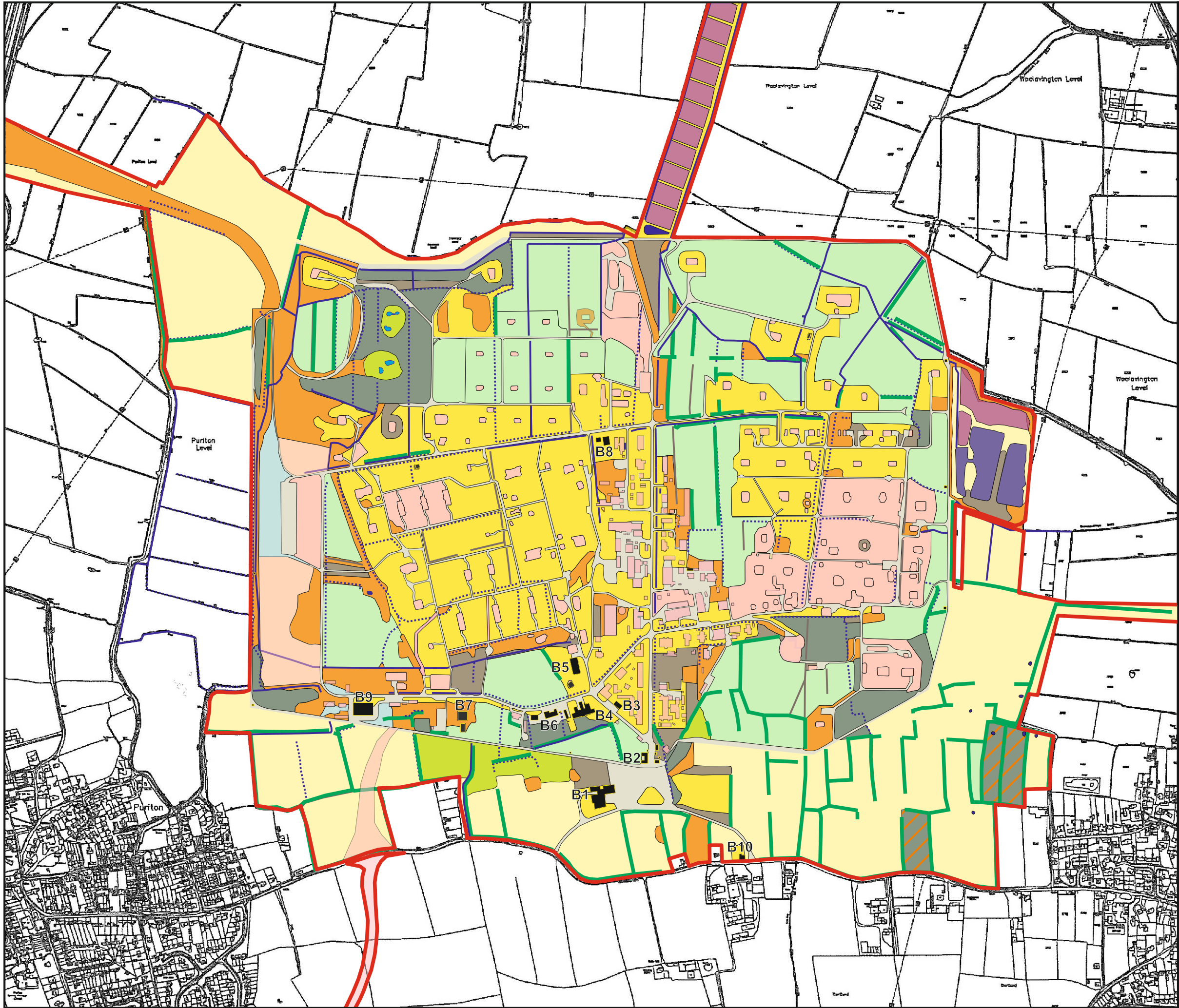
7761: GRAVITY

PLAN ECO1: LOCAL WILDLIFE
SITES WITHIN THE
SITE BOUNDARY

Rev: C
Feb 2021

PLAN ECO2

Ecological Features



KEY:

- BOUNDARY OF SITE
- IMPROVED GRASSLAND
- SEMI-IMPROVED GRASSLAND
- AMENITY / ROUGH GRASSLAND
- MARSHY GRASSLAND
- PLANTATION / WOODLAND
- ORCHARD
- SCRUB
- HEDGEROW
- TALL RUDERAL VEGETATION
- EPHEMERAL / SHORT PERENNIAL VEGETATION
- STANDING WATER
- REED BED
- DRAINAGE DITCH
- SEASONAL DRAINAGE DITCH
- DRY DITCH
- BUILDING
- HARDSTANDING
- BARE GROUND



ECOLOGYSOLUTIONS
Part of the ES Group

Farncombe House
Farncombe Estate | Broadway
Worcestershire | WR12 7LJ

+44(0)1451 870767
info@ecologysolutions.co.uk
ecologysolutions.co.uk

7761: GRAVITY

PLAN ECO2: ECOLOGICAL
FEATURES

Rev: B
Dec 2020