APPENDIX 5

Ecological Baseline

(Wider Site)

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Bicester Heritage: Site-Wide Ecological Baseline and Survey Methodologies

1. INTRODUCTION

1.1. Ecology Solutions was commissioned by Bicester Heritage in 2018 to undertake Ecological Assessment work of lands at Bicester Heritage (Bicester Airfield) and Stratton Audley Quarry, Bicester, Oxfordshire (see Plan ECO1). Together these sites are hereafter referred to as the wider site.

1.2. A suite of ecological survey work has been completed (and is ongoing) across the wider site between 2018 and 2019. The purpose of this survey work is both to inform the emerging, aspirational masterplan for the wider site and moreover to inform an appropriate, biodiversity led restoration scheme for the Stratton Audley Quarry site.

1.3. This report serves to summarise the baseline survey findings from the survey work completed in 2018 and 2019 across the wider site.

2. SURVEY METHODOLOGY

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

2.2. Desk Study

2.2.1. In order to compile background information on the Site and its immediate surroundings, Ecology Solutions contacted the Thames Valley Environmental Records Centre (TVERC).

2.2.2. Information has been provided by TVERC and is referenced within this report, where appropriate. Information regarding designated sites is also shown where appropriate on Plan ECO1.

2.2.3. Further information on designated sites from a wider search area was also obtained from the online Multi-Agency Geographic Information for the Countryside (MAGIC)[1] database. This information is reproduced where appropriate on Plan ECO1.

[1] http://magic.defra.gov.uk

2.3. **Habitat Survey Methodology**

2.3.1. Habitat surveys were carried out in May, June and August 2018 to ascertain the general ecological value of the land contained within the boundaries of the wider site and to identify the main habitats and associated plant species, with notes on fauna utilising the site.

2.3.2. The site was surveyed based around extended Phase 1 survey methodology[2], 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 of the species that occur in each habitat would not necessarily be detected during survey work carried out at any given time of the year, since different species are apparent at different seasons. However, given the habitats present, it is considered that an accurate and robust assessment of the ecological value of the habitats present within the Site has been made.

2.4. **Faunal Survey**

2.4.1. General faunal activity observed during the course of the survey 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*), amphibians and reptiles.

2.4.2. **Bats**. Bat surveys were undertaken in May, June and August 2018 to assess the potential for roosting bats within trees on and adjacent to the Site. The work was undertaken by an experienced bat worker and aimed to establish the likelihood of presence / absence of bats.

2.4.3. Field surveys were undertaken with regard to best practice guidelines issued by Natural England (2004[3]), the Joint Nature Conservation Committee (2004[4]) and the Bat Conservation Trust (2016[5]).

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

- is largely undisturbed;

[2] 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.
[3] Mitchell-Jones, A. J. (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.
[4] Mitchell-Jones, A.J. & McLeish, A.P. (Eds.) (2004). *Bat Workers' Manual*. 3rd edition. Joint Nature Conservation Committee, Peterborough.
[5] Collins, J. (Eds.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)*. Bat Conservation Trust, London.

- 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.

2.4.5. Conversely, the probability decreases if a building / structure 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.

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

2.4.7. All trees at the wider 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.

2.4.8. In addition, bat activity surveys and accompanying static monitoring surveys were undertaken throughout the wider site in order to establish whether there are any features of potential importance for foraging and commuting bats. Activity surveys were undertaken on a monthly basis between May and October 2018.

2.4.9. The evening activity bat surveys were conducted from sunset to approximately 2 hours after sunset. Surveyors utilised EchoMeter Touch 2 Pro (EMT 2 pro) bat detectors to aid identification of bats and record data. Surveyors walked transects in order to encompass all features of potential value to foraging and commuting bats, including hedgerows, treelines and scrub. All bat data recorded was subsequently analysed using Kaleidoscope bat sound analysis software.

2.4.10. Activity surveys undertaken between May and October 2018 were accompanied by static monitoring surveys. SongMeter SM4 bat detectors were deployed at strategic locations, as shown on Plan ECO3, for at least five consecutive nights. These surveys allowed for a longer term assessment of the use of the site by foraging and commuting bats.

2.4.11. **Badgers.** Surveys were undertaken to search for evidence of Badgers in June and August 2018 and 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:

- 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.

- 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.

- 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.

2.4.12. 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 by Badgers.

2.4.13. **Amphibians.** The wider site supports a number of waterbodies, including ponds and wet ditches, which were considered to offer potential opportunities for breeding amphibian species (including Great Crested Newts *Triturus cristatus*).

2.4.14. As such, detailed aquatic surveys were undertaken by Ecology Solutions between May and June 2018 to ascertain the presence or absence of this species from the wider site. A summary of the dates of surveys and the weather conditions during these surveys is included at Table 1, below.

Date	Survey Number	Weather Conditions
10.05.18	1	11C, 30% cloud cover, dry
14.05.18	2	7C, 5% cloud cover, dry
16.05.18	3	5C, 25% cloud cover, dry
07.06.18	4	16C, 100% cloud cover, dry
19.06.18	5	19C, 95% cloud cover, dry
21.06.18	6	17C, 5% cloud cover, dry

Table 1: 2018 Great Crested Newt Survey Dates and Weather Conditions

2.4.15. All of the surveys were undertaken in suitable weather conditions in accordance with the Natural England guidelines[6] to determine the presence or absence of Great Crested Newts. Surveys undertaken by Ecology Solutions utilised three methods per visit (torch survey, bottle-trapping and egg searches), where possible.

[6] English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.

2.4.16. Suitable survey weather conditions are deemed to be those nights when the night-time air temperature is more than 5°C, with little or no wind, and no rain, and surveys were conducted during such conditions.

2.4.17. Torch counting involved the use of high-powered torches to find and, if possible, count the number of adults of each amphibian species. As recommended by Natural England the entire margin of each waterbody was walked once, slowly checking for Great Crested Newts.

2.4.18. Bottle-trapping involved setting traps made from two litre plastic bottles around the margin of each waterbody, and leaving the traps set overnight before checking them the following morning. A density of at least one trap per two metres of shoreline was utilised, where possible, as recommended by Natural England.

2.4.19. In addition an egg search was undertaken of any aquatic vegetation to search for any evidence of breeding Great Crested Newts.

2.4.20. It should also be noted that a significant density of reptile tins were deployed in suitable terrestrial habitat within the wider site, which represents an additional form of survey work for amphibian species.

2.4.21. **Reptiles.** Specific surveys to identify the presence or absence of reptiles within the site were undertaken between August and October 2018.

2.4.22. Following an initial assessment to identify areas of suitable reptile habitat within the wider site, refugia surveys were undertaken. It was considered, given the size of the site, that a complete tinning exercise would be impractical, on this basis a sampling survey was utilised. A total of 700 'tins' (0.5 x 0.5 metre squares of heavy roofing felt which are often used as refuges by reptiles) were distributed in groups of between 20 and 60 within specific areas of suitable reptile habitat within the site, in order to provide a representative sample of the use of these habitats by reptiles.

2.4.23. These tins were left in place for two weeks to 'bed in' and subsequently surveyed for reptiles beneath or upon the tins during suitable weather conditions.

2.4.24. 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.

2.4.25. 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.

2.4.26. **Breeding Birds.** The site supports a variety of habitats offering potential opportunities for breeding birds, including scattered scrub, dense scrub, woodland, grassland, recolonising bare ground and waterbodies.

2.4.27. As such, and in order to assess the importance of the wider site to breeding birds, three early morning surveys were conducted between May and July 2018 in order to assess breeding bird activity within the site. The weather conditions during the surveys are given in Table 2.

Date	Start Time	Weather Conditions
15th May 2018	04:45	7C, 70% cloud cover, dry
13th June 2018	04:30	7C, 30% cloud cover, dry
21st June 2018	04:30	10C, 0% cloud cover, dry

Table 2. Dates of breeding bird surveys and weather conditions.

2.4.28. On each survey, an experienced ornithologist walked a circuitous route around the site, covering all field margins, recording the locations, numbers and activity of all bird species present within the area during this time. Over the three visits this methodology should ensure that the vast majority of species present at the site are recorded, although some species that may use the site as part of a larger territory (especially nocturnal species such as owls) may be missed.

2.4.29. 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). 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.
- 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.
- Recently fledged young.

2.4.30. **Wintering Birds.** The wider site was subject to wintering in January, February and March 2019. The adopted survey methodology includes for a walked transect of the wider site with stops at numerous vantage points. The dates and weather conditions for the surveys are detailed in Table 3 below.

Date	Weather Conditions
11th January 2019	50-90% high cloud cover, light air, 6C.
15th February 2019	Cloudless, light air, 14C
4th March 2019	60% Cloud, gentle breeze, 6C

Table 3. Dates of breeding bird surveys and weather conditions.

2.4.31. **Invertebrates.** Specific invertebrate surveys were undertaken at the Site by Colin Plant Associates to assess the importance of the site for a range of invertebrates. A total of 4 surveys were undertaken in 2018, with this allowing for full seasonal coverage of the Site. The dates of these surveys are as follows:

- 8th May 2018
- 9th July 2018
- 14th August 2018
- 11th September 2018

2.4.32. The sampling methodology for these surveys is detailed at Appendix 1 and is summarised below:

***Sweep-netting**. A stout hand-held net is moved vigorously through vegetation to dislodge resting insects. The technique may be used semi-quantitatively by timing the number of sweeps through vegetation of a similar type and counting selected groups of species.*

***Beating trees and bushes**. A cloth tray, held on a folding frame, is positioned below branches of trees or bushes and these are sharply tapped with a stick to dislodge insects. Black or white trays are used depending upon which group of invertebrates has been targeted for search. Insects are collected from the tray using a pooter – a mouth-operated suction device.*

***Grubbing/hand searching**. Important host plants may be searched by hand. This is particularly useful for species which live on or even below the ground surface and can be found by grubbing around and underneath basal leaf rosettes. Other invertebrate microhabitats such as loose bark, litter, fungi and various decay features associated with dead wood can also be productive when searched by hand. Turning large stones, pieces of wood and other refuse often reveal species which are nocturnally active, in particular ground beetles and rove beetles.*

***Suction Sampling** consists of using a converted leaf blower to collect samples from grass and other longer ground vegetation. The sample is then everted into a net bag and the invertebrates removed with a pooter. The advantage of suction sampling is that it catches species, which do not fly readily, or which live in deep vegetation. It is particularly productive for Coleoptera, some Diptera and Arachnida.*

***Pitfall trapping**. Vending-machine cups or similar are placed in the ground with the rim flush with, or slightly below, the surface. A fluid is added, containing ethylene glycol, sodium chloride and formalin with a little detergent to reduce surface tension. Traps may be covered or uncovered and are typically left in position for a month at a time. Holes made in the sides of the cups a couple of centimetres below the rim permit flood or rain water to drain without the traps over-flowing and the catch becoming lost. Invertebrates simply fall into the traps. This is the single most effective means of recording ground beetles (Carabidae) but is also effective for rove beetles (Staphylinidae), some other beetle groups, spiders and most non-insect soil-dwelling arthropods.*

***Pond netting**. Pond nets on wooden poles with a mesh diameter of one millimetre are used to capture invertebrates from all available aquatic habitats, including open water and amongst emergent, floating and submerged vegetation. Net samples are sorted in white trays on the bankside and stored in 50% isopropyl alcohol for subsequent identification. All three water bodies inside the Stratton Audley Quarry survey boundary were sampled in June and September, with the exception of P1, which was dry following the first visit.*

3. HABITATS

3.1. The wider site was subject to an ecological habitat survey by Ecology Solutions in May, June and August 2018. 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.

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

- Species-poor Semi-Improved Neutral and Calcareous grassland;
- Semi-Improved Neutral and Calcareous Grassland Mosaic;
- Semi-Improved Calcareous Grassland;
- Broadleaved Semi-natural Woodland;
- Dense Scrub;
- Dense Scrub / Marshy Grassland Mosaic;
- Scattered Scrub;
- Reedbed;
- Marginal Vegetation / Marshy Grassland;
- Hedgerows/treelines;
- Recolonising Bare Ground;
- Hardstanding / Bare Ground;
- Recolonising Hardstanding;
- Waterbodies;
- Wet Ditches; and
- Buildings

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

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

3.5. Where grasslands are described below, species abundance has been considered using the DAFOR scale whereby a species is assigned a category for its abundance within the sward (D = dominant, A = abundant, F = frequent, O = occasional, R = rare).

3.6. **Species-poor Semi-Improved Calcareous Grassland**

3.6.1. The wider site primarily comprises short grassland, located within the airfield itself, which due to the ongoing management regime, which involves regular mowing with the arisings left in-situ, supports a species poor sward of variable composition including species indicative of neutral and calcareous soils.

3.6.2. Species recorded within this habitat include Perennial Rye-grass *Lolium perenne* (F), Smooth meadow-grass *Poa pratensis* (A), Yorkshire Fog *Holcus lanatus* (F), Red Fescue *Festuca rubra* (A), Cock's-foot *Dactylus glomerata* (O), Upright Brome *Bromopsis erecta* (O), Meadow Fescue *Schedonorous pratensis* (O), False Oat-grass *Arrhenatherum elatius* (O), Creeping Bent *Agrostis stolonifera* (O), Common Bent *Agrostis capillaris* (O), Lady's Bedstraw *Gallium verum* (R), Yarrow *Achillea millefolium* (O), White Clover *Trifolium repens* (O), Red Clover *Trifolium pratense* (O), Dandelion *Taraxacum officinale agg.* (O), Common Knapweed *Centaurea*

nigra (R), Ribwort Plantain *Plantago lanceolata* (O), Field Bindweed *Convolvulus arvensis* (O), Creeping Thistle *Cirsium arvense* (O), Broad-leaved Dock *Rumex obustifolius* (R), Creeping Cinquefoil *Potentilla reptans* (O), Hogweed *Heracleum sphondylium* (R), Mugwort *Artemisia vularis* (R), Dove's-foot Cranesbill *Geranium molle* (O), Daisy *Bellis perennis* (O) and Bird's-foot Trefoil *Lotus corniculatus* (R).

3.7. **Semi-Improved Neutral and Calcareous Grassland Mosaic**

3.7.1. Areas of grassland within the wider site which have been largely unmanaged for a substantial period support a more rank grassland structure with a variable composition including areas which are calcareous in nature and areas which display a more neutral character. Species composition within this habitat varies somewhat across the site.

3.7.2. Areas of this habitat supported within the Stratton Audley Quarry area, in the north of the wider site, comprise largely rank grassland dominated by stands of False Oat-grass, which blends into more nutrient poor herb-rich communities where it interfaces with areas of recolonising bare ground and spoil. In addition, presumably due to historical dumping of waste material a number of ornamental species are supported. Wetter areas are also supported and comprise a number of water tolerant species.

3.7.3. Species recorded within these areas include Crested Dog's-tail *Cynosurus cristatus* (A), Yorkshire Fog (D), False Oat-grass (D), Yellow Oat-grass *Trisetium flavescens* (F), Tufted Hair-grass *Deschampsia cespitosa* (O), Red Fescue (A), Meadow Fescue (O), Tall Fescue *Schedonorous arundinaceus* (O), False Brome *Brachypodium sylvaticum* (R), Upright Brome (F), Soft Brome *Bromus hordaceus* (R), Barren Brome *Anisantha sterilis* (R), Perennial Rye-grass (O), Rough Meadow-grass *Poa trivialis* (A), Annual Meadow-grass *Poa annua* (R), Cock's-foot (O), Fern Grass *Catapodium rigidum* (R), Sweet Vernal-grass *Anthoxanthum odoratum* (O), Glaucous Sedge *Carex flacca* (O), Pendulous Sedge *Carex pendula* (O), Hairy Sedge *Carex hirta* (O), False Fox Sedge *Carex otrubae* (O), Spiked Sedge *Carex spicata* (O), Field Wood-Rush *Luzula campestris* (O), Grey Club-rush *Schoenoplectus tabernaemontani* (R), Grass Vetchling *Lathyrus nissolia* (O), Meadow Vetchling *Lathyrus pratensis* (O), Goat's Rue *Galega officinalis* (R), Broad-leaved Everlasting Pea *Lathyrus latifolius* (R), Common Vetch *Vicia sativa* (O), Tufted Vetch *Vicia cracca* (R), Bush Vetch *Vicia sepium* (R), Black Meddick *Medicago lupulina* (O), Spotted Meddick *Medicago Arabica* (R), White Clover (F), Zig-zag Clover *Trifolium medium* (R), Lesser Trefoil *Trifolium dubium* (R), Hop Trefoil *Trifolium campestre* (R), Bird's-foot Trefoil (F), Smooth Tare *Vicia tetrasperma* (O), Hairy Tare *Vicia hirsuta* (R), Ribbed Melilot *Melilotus officinalis* (O), Yellow Rattle *Rhinanthus minor* (O), Common Fleabane *Pulicaria dysenterica* (O), Blue Fleabane *Erigeron acer* (R), Eyebright *Euphrasia sp.* (O), Goats-beard *Trapopogon pratensis* (R), Germander Speedwell *Veronica chamaedrys* (R), Grey Field Speedwell *Veronica polita* (R), Common Knapweed (R), Greater Knapweed *Centaurea scabiosa* (R), Selfheal *Prunella vulgaris* (R), Bugle *Ajuga reptans* (R), Water Mint *Mentha aquatica* (R), White Dead-nettle *Lamium album* (R), Hedge Woundwort *Stachys sylvatica* (R), Hoary Willowherb *Epilobium parviflorum* (O), Short-fruited Willowherb *Epiliobium obscurum* (O), Yarrow (O), Wild Carrot *Daucus carotta* (O), Wild Parsnip *Pastinaca sativa* (R), Oxeye Daisy *Leucanthemum vulgare* (F), Daisy (O), Field Forget-me-not *Myosotis arvensis* (F), Meadow Buttercup *Ranunculus*

acris (O), Creeping Buttercup *Ranunculus repens* (O), Bulbous Buttercup *Ranunculus bulbosa* (R), Ribwort Plantain (F), Creeping Cinquefoil (F), Silverweed *Argentina anserina* (R), Creeping Thistle (R), Spear Thistle *Cirsium vulgare* (O), Prickly Sow-thistle *Sonchus asper,* Bristly Ox-tongue *Helminthothequa echoides* (R), Rough Hawksbeard *Crepis biennis* (R), Hawkweed Sp. *Hieracium sp.* (R), Mouse-ear Hawkweed *Hieracium pilosella* (O), Dandelion (R), Ploughman's Spikenard *inula conzae* (R), Field Horsetail *Equisetum arvense* (O), Cut-leaved Cranesbill *Geranium dissectum* (R), Hedgerow Cranesbill *Geranium pyrenaicum* (R), Dove's-foot Cranesbill (R), Herb Robert *Geranium robertianum* (R), French Cranesbill *Geranium endressii* (R), Common Storksbill *Erodium cicutarium* (R), Agrimony *Agrimonia eupatoria* (O), Bee Orchid *Ophrys apifera* (F), Southern Marsh Orchid *Dactylorhiza praetermissa* (O), Pyramidal Orchid *Anacamptis pyramidalis* (R), Teasel *Dipsacus fullonum* (O), Red Hot Poker *Kniphofia uvaria 'nobilis'* (R), Red Bartsia *Odontites vernus* (R), Lady's Smock *Cardamine pratensis* (R), Common Mouse-ear *Cerastium fontanum* (F), Hairy Rock-cress *Arabis hirsuta* (R), Cleavers *Galium aparine* (O), Lady's Bedstraw (R), Field Madder *Sherardia arvensis* (R), Ragwort *Senecio jacobaea* (R), Common Nettle *Urtica dioica* (O), Bramble *Rubus fruticosus* (O), Water Figwort *Scrophularia auriculata* (R), Common Figwort *Scrophularia nodosa* (R), Hairy St.Johns Wort *Hypericum hirsutum* (O), Square-stalked St. John's Wort *Hypericum tetrapterum* (R), Perforate St. John's Wort *Hypericum perforatum* (R), Lady's Mantle *Achemilla vulgaris* (R), Hoary Cress *Lepidium draba* (R), Ground Elder *Aegopodium podagraria* (O), Curled Dock *Rumex crispus* (R), Wood Dock *Rumex sanguineus* (R), Red Campion *Silene dioica* (R), Russian Comfrey *Symphytum uplandica x* (R), Hemlock *Conium maculatum* (O), Hogweed (R), Upright Hedge Parsley *Torilis japonica* (R), Cow Parsley *Anthriscus sylvestris* (O), Rough Chervil *Chaerophyllum temulum* (R), Greater Burdock *Arctium lappa* (R), Mugwort (R), Reedmace *Typha latifolia* (R), Ground Ivy *Glechoma hederacea* (R), Coltsfoot *Tussilago farfara* (R), Thyme *Thymus vulgaris* (R), Wild Marjoram *Origanum vulgare* (R), Field Bindweed (R), Lungwort *Pulmonaria officinalis* (R), Cowslip *Primula veris* (O), Sun Spurge *Euphorbia helioscopia* (R), Common Mallow *Malva sylvestris* (R), Musk Mallow *Malva moschata* (R), White Iris *Iris hollandica* (R), Purple Toadflax *Linaria purpurea* (R), Snowberry *Symphoricarpos albus* (R), Green Alkanet *Pentaglottis sempervirens* (R), Wild Strawberry *Fragaria vesca* (R), Red Valerian *Centranthus ruber* (R), Great Mullein *Verbascum thapsus* (R), Columbine *Aquilegia vulgaris* (R), Elecampane *Inula helenium* (R), Wood Small-reed *Calamagrostis epigejos* (R), Canary Reed-grass *Phalaris arundinacea* (R), Solomon's Seal *Polygonatum x hybridum* (R), Wood Avens *Geum urbanum* (R), Hybrid Bluebell *Hyacinthoides massartiana* (R), Daffodil *Narcissus pseudonarciussus* (R), Lords and Ladies *Arum maculatum* (R), Biting Stonecrop *Sedum acre* (O), White Stonecrop *Sedum album* (O), Springy Turf-moss *Rhytididelphus squarrosus* (R).

3.7.4. Wetter areas support more water tolerant species including higher densities of Reedmace, Common Fleabane, Grey Club-Rush, Water Figwort, Short-fruited Willowherb, Hard Rush *Juncus inflexus,* Soft Rush *Juncus effusus,* Common Reed *Phragmites australis,* Great Willowherb *Epilobium hirsutum,* Water Mint *Mentha aquatica* and False Fox Sedge.

3.7.5. Areas of this habitat in the southern and south-eastern parts of the wider site (north of Skimmingdish Lane) are notably less species rich than those in the north and are of a more uniform rank structure. These areas are also

subject to significant levels of scrub encroachment and additionally grade into areas of recolonising hardstanding.

3.7.6. Species recorded in these areas include False Oat-grass (D), Red Fescue (D), Meadow Fescue (A), Upright Brome (F), Tor Grass *Brachypodium pinnatum* (O), Creeping Bent (O), Common Bent (O), Soft Brome (O), Smooth Meadow-grass (O), Smaller Cat's-tail *Phleum bertolonii* (O), Yellow Oat-grass (O), Cock's-foot (F), False Brome (R), Glaucous Sedge (O), Spear Thistle (O), Wooly Thistle *Cirsium eriophorum* (R), Creeping Thistle (O), Weld *Reseda luteola* (O), Ragwort (O), Hoary Ragwort *Senecio erucifolia* (O), Hedge Mustard *Sisymbrium officinale* (O), Wintercress *Barbarea vulgaris* (R), Prickly Sow-thistle (O), Bristly Ox-tongue (O), Smooth Hawk's-beard *Crepis capillaris* (R), Blue Fleabane (R), Ploughman's Spikenard (O), Nipplewort *Lapsana communis* (O), Dandelion (O), Common Nettle (O), Common Toadflax *Linaria vulgaris* (O), Mouse-ear Hawkweed (R), Autumn Hawkbit *Scorzoneroides autumnalis* (R), Field Bindweed (F), Field Scabious *Knautia arvensis* (O), Teasel (O), Red Campion (O), White Campion *Silene latifolia* (R), Germander Speedwell (O), Broad-leaved Dock (O), Burnet Saxifrage *Pimpinella saxifraga* (R), Hogweed (O), Wild Angelica *Angelica sylvestris* (R), Hemlock (O), Upright Hedge-parsley (O), Wild Parsnip (O), Lady's Bedstraw (O), Cleavers (O), Field Madder (R), Greater Knapweed (O), Common Knapweed (O), Wild Basil *Clinopodium vulgare* (R), Apple Mint *Mentha suaveolens* (R), Black Horehound *Ballota nigra* (R), Imperforate St. John's Wort *Hypericum maculatum* (R), Perforate St. John's Wort (O), Ribwort Plantain (F), Greater Plantain *Plantago major* (R), Scarlet Pimpernel *Anagallis arvensis* (R), White Clover (O), Lesser Trefoil (R), Hop Trefoil (R), Black Meddick (R), Common Restharrow *Ononis repens* (O), Salad Burnet *Sanguisorba minor* (O), Agrimony (O), Hedgerow Cranesbill (R), Oxeye Daisy (O), Yarrow (F), Woody Nightshade *Solanum dulcamara* (O), Field Forget-me-not (R), Great Mullein (R), Common Mouse-ear (O), Common Chickweed *Stellaria media* (O), Thyme-leaved Sandwort *Arenaria serpyllifolia* (R), Fairy Flax *Linum catharticum* (O), Horse-radish *Amoracia rusticana* (O), Creeping Cinquefoil (O), Creeping Buttercup (R), Common Mallow (R), Rosebay Willowherb *Chamerion angustifolium* (O), Cowslip (O), Red Bartsia (R), Lesser Burdock *Arctium minus* (R), Mugwort (O), Russian Comfrey (R), Lesser Periwinkle *Vinca minor* (R), Parsley Piert *Aphanes arvensis* (R), Common Spotted Orchid *Dactylorhiza fushii* (R), Biting Stonecrop (O) and White Stonecrop (O).

3.8. **Semi-Improved Calcareous Grassland**

3.8.1. Areas of grassland which lie outside of the central airfield but within the wider airfield site are understood to be subject to an annual hay cut, following which the arisings are removed from the site. It is considered likely that this management has been ongoing for a significant period and this has led to the establishment of a calcareous grassland sward indicative of more nutrient poor and calcareous soils. While areas of this grassland are relatively herb-rich the majority of this grassland is dominated by grasses with a relatively low number of forb species supported, in addition a number of species indicative of improved and neutral conditions are present.

3.8.2. While the species composition of this grassland is variable across the mapped areas, several portions, including along the boundary with Stratton Audley Quarry in the north, support a relatively herb-rich structure.

3.8.3. Species recorded within this habitat include Upright Brome (D), Red Fescue (D), Meadow Fescue (F), Tall Fescue (R), Smaller Cat's-tail (O), Timothy *Phleum pratense* (R), Creeping Bent (R), Common Bent (O), Tor Grass (O), Tufted Hair-grass (O), Meadow Oat-grass *Avenula pratensis* (O), Downy Oat-grass *Avenula pubescens* (O), False Oat-grass (O), Crested Dog's-tail (R), Smooth Meadow-grass (O), Rough Meadow-grass (R), Perennial Rye-grass (O), Cock's-foot (O), Yorkshire Fog (R), Fern Grass (R), Yarrow (A), Wild Carrot (O), Oxeye Daisy (F), Daisy (O), Common Knapweed (O), Greater Knapweed (O), Field Scabious (O), Burnet Saxifrage (O), Salad Burnet (O), Bird's-foot Trefoil (O), Lesser Trefoil (R), Hop Trefoil (R), Meadow Vetchling (R), Black Meddick (R), Red Clover (R), White Clover (R), Common Vetch (O), Common Restharrow (R), Wild Mignonette *Reseda lutea* (O), Weld (R), Mouse-ear Hawkweed (O), Smooth Hawk's-beard (R), Common Sorrel *Rumex acetosa* (O), Curled Dock (R), Broad-leaved Dock (R), Field Bindweed (O), Ribwort Plantain (O), Greater Plantain (R), Hoary Plantain *Plantago media,* Selfheal (R), Wild Onion *Allium vineale* (R), White Campion (O), Cow Parsley (O), Wild Parsnip (O), Dandelion (R), Cleavers (R), Mugwort (R), Creeping Thistle (R), Spear Thistle (R), Nodding Thistle *Carduus nutans* (R), Perforate St. John's Wort (O), Wild Marjoram (R), Basil Thyme *Clinopodium acinos* (R), Ploughman's Spikenard (O), Blue Fleabane (O), Agrimony (R), Hogweed (O), Creeping Cinquefoil (O), Common Toadflax (R), Small Toadflax *Chaenorhinum minus* (R), Thyme-leaved Sandwort (O), Fairy Flax (R), Common Nettle (R), Lady's Bedstraw (F), Hoary Ragwort (R), Ragwort (O), Hedgerow Cranesbill (R), Germander Speedwell (R), Meadow Buttercup (R), Moss *Rhytidiadelphus squarrosus,* Field Forget-me-not (R), Cowslip (F), Common Centaury *Centaurium erythraea* (O), Eyebright (R), Common Mouse-ear (R), Sticky Mouse-ear *Cerastium glomeratum* (R) and Field Mouse-ear *Cerastium arvense* (O).

3.9. **Broadleaved Semi-Natural Woodland**

3.9.1. A number of areas of broad-leaved semi-natural woodland are present around the boundaries of the airfield and Stratton Audley Quarry. These habitats are typically comprised of a limited range of woody species and are considered to be relatively young and arising from the development of long established scrub in addition to areas of historical planting.

3.9.2. Areas of woodland are variable in composition however the canopy layer is typically comprised of Hawthorn *Crategus monogyna,* Field Maple *Acer campestre,* Crab Apple *Malus sylvestris,* Apple *Malus domestica,* Sycamore *Acer pseudoplatanus,* Silver Birch *Betula pendula,* Cherry *Prunus avium,* Alder *Alnus glutinosa,* Oak *Quercus robur,* Ash *Fraxinus excelsior* and Crack Willow *Salix fragilis.*

3.9.3. Understorey and shrub layers within these woodlands are of variable structure and composition but are broadly comprised of Blackthorn *Prunus spinosa,* Damson *Prunus domestica sbsp. insititia,* Dog Rose *Rosa canina,* Spindle *Euonymus europaea,* Alder Buckthorn *Rhamnus frangula,* Elder *Sambucus nigra,* Dogwood *Cornus sanguinea,* English Elm *Ulmus minor var. vulgaris,* Gorse *Ulex europaeus,* Broom *Cytisus scoparius,* Redcurrant *Ribes rubrum,* Buddleia *Budleja davidii,* Bramble and Goat Willow *Salix caprea.*

3.9.4. Ground flora is variable given the changes in light levels between more open areas and those with a more closed canopy and include dense carpets of Common Striated Feather-Moss *Eurynchium striatum,* Bramble, Ground Ivy, Lords and Ladies and Bracken *Pteridium aquilinum.* Wood Avens, Ivy *Hedera helix,* Lesser Burdock, Hogweed, False Brome, Teasel, Common Nettle and Ploughman's Spikenard.

3.9.5. The area of woodland which is present to the south of pond P12 is of differing composition from other woodlands within the site and is comprised of a canopy dominated by Aspen *Populus tremula,* Grey Poplar *Populus x canescens,* Ash and Oak. This canopy is fairly open and a sparse understorey is supported.

3.9.6. The understorey is comprised of Hawthorn, Apple, Blackthorn, Elder, English Elm, Dog Rose, Spindle, Oak, Turkey Oak *Quercus cerris* and Buckthorn *Rhamnus cathartica.* Ground flora supported includes Bramble, Lesser Burdock, Hogweed, False Brome, Teasel, Ground Ivy, Common Nettle, Butterbur *Petasites hybridus* and Twayblade *Neottia ovata.*

3.10. **Dense Scrub**

3.10.1. Areas of dense scrub are present throughout the majority of the areas of the site not subject to regular management. These areas have clearly established over pre-existing habitats including grasslands and bare ground and are frequently dominated by just one or two species.

3.10.2. Species comprising this dense scrub include Dog Rose, Hawthorn, Blackthorn, Dogwood, Goat Willow, Crack Willow, Spindle, Buddleia, Gorse, Broom, Field Maple, Damson and Elder.

3.11. **Dense Scrub / Grassland Mosaic**

3.11.1. A single area of established scrub and grassland mosaic lies in the north-west of the Stratton Audley Quarry site. This area has presumably been recolonised following its previous use as a landfill. It largely supports established scrub with pockets of grassland.

3.11.2. Scrub species are largely comprised of Alder, Hawthorn, Blackthorn, Dog Rose, Bramble, Goat Willow, Grey Willow *Salix cinerea,* Apple, Ash and Oak.

3.11.3. Grassland species largely comprise a range of species which are also present in the adjacent areas of neutral and calcareous grassland mosaic. In addition, some marshy areas are supported which are dominated by Soft and Hard Rush. These grassland areas appear to be subject to continuing succession, resulting in a gradual decline in area.

3.12. **Scattered Scrub**

3.12.1. Scattered scrub is present throughout areas of unmanaged grassland and recolonising bare ground and is supported at varying density.

3.12.2. Species comprising this scattered scrub include Hawthorn, Blackthorn, Gorse, Broom, Buddleia, Daisy Bush *Olearia macrodonta,* Field Maple, Dogwood, Dog Rose, Laburnum *Laburnum anagyroides,* Hazel *Corylus*

avellana, Whitebeam *Sorbus aria,* Cotoneaster *Cotoneaster franchetii,* Cotoneaster *Cotoneaster horizontalis,* Goat Willow, Grey Willow, Crack Willow, Flowering Currant *Ribes sanguineum,* Sycamore, Cherry, Elder and Damson.

3.13. **Reedbed**

3.13.1. Several small patches of reedbed are present within the Stratton Audley Quarry area of the wider site. These are comprised of dense stands of Common Reed and Reedmace, and grade into areas of adjacent grassland, scrub and recolonising bare ground.

3.14. **Marginal Vegetation / Marshy Grassland**

3.14.1. Small areas of marginal vegetation and marshy grassland are present within the Stratton Audley Quarry area of the site in association with a number of supported waterbodies. These areas support a range of aquatic and water tolerant species including Reedmace, Floating Sweet-grass *Gyceria fluitans,* Soft Rush, Hard Rush, Common Spike Rush *Eleocharis palustris,* Grey Club-rush, Common Club-rush *Schoenoplectus lacustris,* Great Willowherb, Jointed Rush *Juncus articulatus,* Brooklime *Veronica beccabunga,* Pink Water-speedwell *Veronica catenata,* Gypsywort *Lycopus europaeus* and Common Fleabane.

3.15. **Hedgerows/Treelines**

3.15.1. The Site supports a number of hedgerows and treelines which constitute boundaries to the airfield and also to the Stratton Audley Quarry. These are labelled on Plan ECO2 and described below. None would qualify as species rich under the Hedgerow Regulations 1997.

3.15.2. H1 is located along the western boundary of the airfield, along the A4421, and comprises a gappy unmanaged narrow treeline, up to 13m tall, and comprising English Elm, Ash, Hazel, Hawthorn, Blackthorn, Sycamore, Ivy and Field maple. Gappy areas are dominated by dense stands of Bramble.

3.15.3. H2 is located along the north-western boundary of the airfield, along Bicester Road, and is of similar composition to H1 with a number of more mature Ash and Sycamore present.

3.15.4. H3 is located along the northern boundary of the Stratton Audley Quarry area, along Bicester Road, and is comprised of a band of scrub, including Hawthorn, Blackthorn, Sycamore, Dog Rose and Bramble. It is unmanaged up to 5m in height and grades into continuous dense scrub to the south.

3.15.5. H4 is located along the northern boundary of the Stratton Audley Quarry area and is effectively a continuation of H3, separated by a gateway, however it supports a number of mature Ash.

3.15.6. H5 is located along the north-eastern boundary of the Stratton Audley Quarry area and comprises a wide (approximately 2-4m) short treeline up to 4m in height. Species present include English Elm (dominant), Elder, Hawthorn and Dog Rose.

3.15.7. H6 is located along the north-eastern boundary of the Stratton Audley Quarry area and is largely a continuation of the unmanaged treeline and associated scrub recorded as comprising H5.However a number of middle age Ash and Sycamore are supported.

3.15.8. H7 is located in the north-east of the airfield area and represents the boundary between the airfield and the eastern area of Stratton Audley Quarry. It is an unmanaged gappy line of scrub and immature trees including Hawthorn, Bramble and Blackthorn.

3.15.9. H8 is effectively a continuation of H7 comprising an unmanaged band of bramble scrub with occasional Hawthorn, up to 3m in height.

3.15.10. H9 is an unmanaged hedgerow, and associated bands of scrub, and varies in height between 2 and 4m. It comprises Blackthorn, Hawthorn, Hornbeam *Carpinus betulus,* Bramble, Dog Rose, Field Maple, Ash and Elder.

3.15.11. H10 comprises the northern boundary of the airfield and separates it from the adjacent Stratton Audley Quarry area. It is an unmanaged hedgerow up to 4m in height and is comprised of Blackthorn, Hawthorn, Hornbeam, Bramble, Dog Rose, Field Maple, Ash, Elder and Sweet Chestnut *Castanea sativa.* In its south-western extent it becomes wider and scrubbier, encroaching upon areas of adjacent grassland.

3.15.12. H11 is an unmanaged young treeline, up to 8m in height, with associated scrub below. It is comprised of Ash, Sycamore, Hornbeam, Blackthorn, Hawthorn, Dog Rose and Goat Willow.

3.15.13. H12 is located along the eastern boundary of the Site and comprises a band of unmanaged scrub up to 8m in height. It is comprised of Hawthorn, Blackthorn, Sycamore, Hazel, Elder, Ash and Dog Rose, with significant areas of Bramble also supported.

3.15.14. H13 is located along the eastern boundary of the site and comprises a narrow band of unmanaged scrub including Hawthorn, Blackthorn, Bramble and Dog Rose.

3.15.15. H14 and H15 are located along the southern boundary of the site, along Skimmingdish Lane, and are comprised of a continuous gappy treeline with a gappy line of scrub below. Species supported include Cherry, Dogwood, Silver Birch, Alder, Sycamore, Dog Rose, Blackthorn, Elder, Bramble, Apple, Goat Willow and Ivy.

3.16. **Recolonising Bare Ground**

3.16.1. Areas of bare ground including a number of spoil mounds, associated with the partially restored quarry workings in the north of the wider site have been subject to varying levels of colonisation and succession by a range of plant species. These areas are in the majority comprised of bare ground, with colonising species largely including those recorded within adjacent grasslands and scrub.

3.16.2. Species recorded within these areas include Meadow Fescue, Red Fescue, Tufted Hair-grass, False Oat-grass, Yellow Oat-grass, Rough Meadow-grass, Smooth Meadow-grass, Creeping Bent, Fern-grass, Cock's-foot,

Crested Dog's-tail, Yorkshire Fog, Soft Brome, Barren Brome, Canary Reed-grass, Common Quaking-grass *Briza media,* False Fox Sedge, Glaucous Sedge, Spiked Sedge, Hard Rush, Compact Rush *Juncus comglomeratus,* Soft Rush, Ribbed Melilot, Bird's-foot Trefoil, Narrow-leaved Bird's-foot Trefoil *Lotus tenuis,* Hop Trefoil, Lesser Trefoil, White Clover, Black Meddick, Smooth Tare, Hairy Tare, Common Vetch, Tufted Vetch, Grass Vetchling, Oxeye Daisy, Daisy, Wild Carrot, Yarrow, Ragwort, Hoary Ragwort, Groundsel *Senecio vulgaris,* Bristly Ox-tongue, Selfheal, Fairy Flax, Ribwort Plantain, Greater Plantain, Hoary Plantain, Common Knapweed, Smooth Hawk's-beard, Mouse-ear Hawkweed, Teasel, Wild Parsnip, Cowslip, Creeping Cinquefoil, Spear Thistle, Common Sorrel, Curled Dock, Perforate St. John's Wort, Bee Orchid (a large population was supported in the western areas of the Stratton Audley Quarry), Pyramidal Orchid, Southern Marsh Orchid, Lady's Bedstraw, Blue Fleabane, Common Fleabane, Common Centaury, Common Mouse-ear, Lesser Stitchwort *Stellaria graminea,* Scarlet Pimpernel, Salad Burnet, Agrimony, Wild Strawberry, Yellow Flag Iris *Iris pseudacorus,* Common Storksbill, Dove's-foot Cranesbill, Musk Mallow, Wood Avens, Meadow Buttercup, Dandelion, Goat's-beard, Biting Stonecrop and White Stonecrop.

3.17. **Hardstanding / Bare Ground**

3.17.1. Areas of hardstanding are present in various locations within the wider site including the track which encompasses the airfield and associated hardstanding tracks which provide access to other parts of the Site, which are of varying composition with some areas formed of tarmac, concrete and gravel. A car park is also present in the southern area of the Site and is constructed from gravel.

3.17.2. These areas are largely bare and subject to minimal colonisation by a limited number of species including Basil Thyme, White Stonecrop, Field Bindweed, Weld and Knotgrass *Polygonum aviculare.*

3.18. **Recolonising Hardstanding**

3.18.1. Several areas previously occupied by buildings and bare hardstanding have been subject to significant levels of colonisation by a range of plant species, these areas include the bomb stores in the east of the wider site, an area in the south of the wider site and several areas previously occupied by airfield track which have since fallen into disuse.

3.18.2. Species recorded within these areas include Basil Thyme, White Stonecrop, Field Bindweed, Prickly Sow-thistle, Perennial Rye-grass, Weld, Wintercress, Creeping Thistle, Lady's Bedstraw, Fat Hen *Chenopodium album,* Oxeye Daisy, Dove's-foot Cranesbill, Knotgrass, Blue Fleabane, Parsley Piert, Teasel, Thyme-leaved Sandwort and Bird's-foot Trefoil.

3.19. **Waterbodies**

3.19.1. The Site supports a number of waterbodies of varying sizes primarily associated with historical quarry workings at the wider site. These features are described individually below.

3.19.2. P1 is a large (around 14,000m²) and deep waterbody which was created through historical mineral extraction at the wider site. It supports little aquatic vegetation and is currently utilised as a stocked fishing lake.

3.19.3. P2 is a small (approximately 15m²) shallow waterbody supporting limited aquatic vegetation including Common Water Crowfoot *Rancunculus aquatilis.* It is considered likely that this pond dries on a regular, perhaps annual, basis.

3.19.4. P3 is a small (approximately 23m²) shallow waterbody supporting limited aquatic vegetation including Common Water Crowfoot. This pond was recorded as dry in the early summer 2018, as such it is considered likely that this feature dries on an annual basis.

3.19.5. P4 is a small (approximately 67m²) shallow waterbody supporting limited aquatic vegetation including Common Water Crowfoot and Common Spike-rush.

3.19.6. P5 is a small (approximately 12m²), but relatively deep waterbody which is the tank for a disused wheel wash associated with the quarry workings at the site. This feature supports Common Reedmace but little additional aquatic vegetation.

3.19.7. P6 is a medium sized waterbody (approximately 1,500m²), created as a result of historical quarrying works, supporting a range of aquatic and marginal vegetation including Reedmace, Curled Pondweed *Potamogeton crispus* and Opposite-leaved Pondweed *Groenlandia densa.*

3.19.8. P7 is a small (approximately 148m²) ephemeral waterbody which was recorded to dry by mid-May 2018 and supported no aquatic vegetation. It is considered that this feature is likely to dry on a yearly basis.

3.19.9. P8 is a medium sized waterbody (approximately 2000m²) which was recorded to dry up over the summer of 2018. Bicester Heritage staff report that this feature dries on a yearly basis. A limited range of aquatic species including Nuttall's Waterweed *Elodea canadensis* and Opposite-leaved Pondweed were recorded.

3.19.10. P9 is a small ephemeral waterbody (approximately 300m²) which supports no aquatic vegetation and is heavy shaded by adjacent scrub and young woodland. It is considered likely that this feature dries out on a regular if not annual basis.

3.19.11. P10 is a large (approximately 10,200m²) waterbody, created as a result of historical quarrying works, and is utilised as a stocked fishing lake. It supports a range of marginal aquatic vegetation including Opposite-leaved Pondweed, Curled Pondweed, Reedmace, Common Spike Rush, Grey Club-rush and Common Club-rush.

3.19.12. P11 is a small ephemeral waterbody (approximately 110m²) which is heavily shaded by adjacent scrub and supports no aquatic vegetation, beyond the already present grassland species. It is considered that this feature dries on a regular and perhaps annual basis.

3.19.13. P12 is a large waterbody (approximately 12,700m²) which was created as a result of historical quarrying at the site. It is utilised as a stocked fishing lake and supports a limited range of aquatic vegetation including Reedmace, Curled Pondweed and White Water-lily *Nymphaea alba.*

3.20. **Wet Ditches**

3.20.1. The wider site supports a number of wet ditches, which are of varying depth and ecological interest.

3.20.2. D1 is a narrow ditch which runs along hedgerow H9, in the north of the site and was recorded to support standing water across the summer of 2018. The ditch supports a limited range of aquatic vegetation including Reedmace.

3.20.3. D2 is a heavily shaded and narrow ditch which was not continuous along its length with numerous dry sections. It was not recorded to support any aquatic vegetation and was subject to heavy leaf litter.

3.20.4. D3 is a wet ditch of variable depth and is associated with a historical access track for the adjacent bomb stores in the south-east of the Site. It supports a limited range of aquatic vegetation including Watercress *Rorippa nasturtium-aquaticum,* Marsh Speedwell *Veronica scutelata,* Celery-leaved Buttercup *Ranunculus sceleratus,* False Fox Sedge, Reedmace and Water Figwort.

3.21. **Buildings**

3.21.1. The Site supports a number of buildings of varying structure. These are labelled on Plan ECO2 and described individually below.

3.21.2. B1 is a single storey airfield defence structure heavily constructed from red brick, with a flat concrete roof and associated surrounding earth bunds. No loft void is supported. Internal conditions are light and airy.

3.21.3. B2 is an air-raid shelter style structure constructed from curved steel beams with sheet metal walls and roof, on top of which approximately 30cm of soil has been placed. Internal conditions are light and airy.

3.21.4. B3 is a single storey airfield defence structure heavily constructed from red brick, with a flat concrete roof and associated surrounding earth bunds. No loft void is supported. Internal conditions are light and airy.

3.21.5. B4-B9 are single storey bomb stores heavily constructed from blockwork with flat concrete roofs and associated surrounding earth bunds. No loft voids are supported and each building has a single open aspect. Internal conditions are light and airy.

3.21.6. B10 is a single storey airfield defence structure heavily constructed from red brick, with a flat concrete roof and associated surrounding earth bunds. No loft void is supported. Internal conditions are light and airy.

3.21.7. B11 is an air-raid shelter style structure constructed from curved steel beams with sheet metal walls and roof, on top of which approximately 30cm of soil has been placed. Internal conditions are light and airy.

3.21.8. B12-B17 are single storey bomb stores heavily constructed from blockwork with flat concrete roofs and associated surrounding earth bunds. No loft voids are supported and each building has a single open aspect. Internal conditions are light and airy.

3.21.9. B18 is a single storey airfield defence structure constructed from blockwork, with a single open aspect and associated surrounding earth bunds. Internal conditions are light and airy.

3.21.10. B19 is an air-raid shelter style structure constructed from curved steel beams with sheet metal walls and roof, on top of which approximately 30cm of soil has been placed. Internal conditions are light and airy.

3.21.11. B20, 21 and 22 are circular and depressed airfield defence structures, with internal ceilings at ground level and flat concrete and earth roofs. Internal conditions are generally light, damp and airy.

3.21.12. B23 and B24 are disused buildings which have subsequently collapsed. They currently support no roofs, and no cracks or fissures in the brickwork were noted.

3.21.13. B25 and B26 are single storey structures constructed from red brick, with flat concrete roofs.

3.22. **Open Habitat Mosaic**

3.22.1. As is frequently the case for areas of brownfield land, the wider site supports a range of early successional habitats, many of which, in the absence of management (targeted or not) are succeeding into more mature or established vegetation.

3.22.2. This ecological succession, whilst likely to be harmful to the sites nature conservation in the longer-term, has allowed a gradation of habitats to establish, in particularly within the Stratton Audley Quarry site. Given the gradation in habitats across present, it is considered that significant areas would qualify as *Open Mosaic Habitat on Previously Developed Land*.

3.22.3. Whilst many of the early successional habitats which form a component of this mosaic are of reduced ecological interest in isolation, combined together, these habitats support a wide and varied floral community, alongside a diverse habitat structure.

3.23. **Background Information**

3.23.1. The desk study undertaken with TVERC returned a large number of local plant records, including a relatively high number from within the Site itself. Records of notable or protected plant species from within the Site include that of Basil Thyme, Hoary Plantain, Quaking Grass, Corn Mint *Mentha arvensis* and Field Scabious, all returned from 2014. Additionally Jacob's Ladder *Polemonium caeruleum,* Hairy Rock-cress *Arabis hirsuta* and Bluebell *Hyacinthoides non-scripta* were returned from within the Stratton Audley Quarry from 2009.

3.23.2. With the exception of Corn Mint, Jacob's Ladder and Bluebell, all of these species were recorded during the habitat surveys undertaken in 2018.

3.23.3. A small number of notable plants were also recorded by TVERC during updated habitat survey work undertaken within the Stratton Audley Quarry site in 2018. Additional species recorded in this survey included for Galingale and Lesser Spearwort.

4. WILDLIFE USE OF THE SITE

4.1. During the surveys that have been undertaken within the wider site, general observations have been made of any faunal use, with specific attention paid to the potential presence of protected or notable species.

4.2. Bats

4.2.1. Given the general lack of mature trees within the wider site, and the predominance of middle-aged trees with relatively immature structures, no trees were recorded with potential to offer opportunities for roosting bats, as they do not support features of potential value such as cracks or splits, dense coverings of Ivy or cavities associated with old age.

4.2.2. While a number of buildings are present within the wider site, these features were not considered to offer potential opportunities for roosting bats, given the lack of gaps, cracks or loft voids supported. Internal inspections of these buildings, where possible, did not result in the recording of any evidence of the use of these features by roosting bats.

Bat Activity Surveys

4.2.3. A bat activity surveys were undertaken at the wider site between June and October 2018 in line with the methodology outlined in Section 2 above. Table 4 below outlines the weather conditions during this survey visit.

Date	Weather Conditions
26.06.2018	23C, 0% cloud cover, dry, light breeze
19.07.2018	22C, 40% cloud cover, dry, light breeze
29.08.2018	14C, 5% cloud cover, dry, light breeze
25.09.2018	15C, 0% cloud cover,dry, light breeze
15.10.2018	11C, 100% cloud cover, occasional drizzle, light to moderate breeze

Table 4: Weather conditions during bat activity surveys

4.2.4. The activity survey undertaken in June 2018, primarily recorded Common Pipistrelle *Pipistrellus pipistrellus* (56 registrations) and Nathusius' Pipistrelle *Pipistrellus nathusii* (26 registrations) and Soprano Pipistrelle *Pipistrellus pygmaeus* (13 registrations), in addition to lower numbers of registrations of Noctule *Nyctalus noctula* (10 registrations), Brown Long-eared *Plecotus auritus* (4 registrations) and a *Myotis* species (4 registrations). This bat activity was recorded primarily in association with the hedgerows, bands of scrub and woodland, and waterbodies within the site.

4.2.5. The activity survey undertaken in July 2018 primarily recorded Common Pipistrelle (32 registrations) in addition to Soprano Pipistrelle (14 registrations) and a *Myotis* species (12 registrations) in addition to low numbers of registrations of Noctule (5 registrations) and Brown Long-eared (a single registration). This activity was largely recorded in association with linear features and waterbodies.

4.2.6. The activity survey undertaken in August 2018 primarily recorded Common Pipistrelle (36 registrations) and Soprano Pipistrelle (18 registrations) in

addition to a *Myotis* species (6 registrations). This activity was concentrated on hedgerows, scrub bands and waterbodies.

4.2.7. The activity survey undertaken in September 2018 primarily recorded Common Pipistrelle (58 registrations) in addition to Soprano Pipistrelle (9 registrations), Noctule (13 registrations), a *Myotis sp.* (3 registrations) and Brown Long-eared (2 registrations). The location and nature of this activity was consistent with previous activity surveys.

4.2.8. The activity survey undertaken in October 2018 primarily recorded Soprano Pipistrelle (38 registrations) in addition to Common Pipistrelle (19 registrations), *Myotis sp.* (6 registrations) and Noctule (9 registrations). The majority of activity was associated with the linear features and waterbodies found within the north of the site. A single Barbastelle *Barbastella barbastellus* was recorded along a hedgerow within the west of the Site (northern end of **H1**).

Automated Detector Surveys

4.2.9. Following the 26th June activity survey four static bat detectors were deployed for a period of six nights, in locations marked as D1, D2, D3 and D4 on plans ECO3A and ECO3B.

4.2.10. The detector deployed at location D1 recorded a total of 35 registrations of Common Pipistrelle and 47 registrations of Soprano Pipistrelle in addition to 7 registrations of Noctule, 5 registrations of a *Myotis* sp., 2 registrations of Serotine *Eptesicus serotinus* and single registrations of both Brown Long-eared and Nathusius' Pipistrelle across the six night period.

4.2.11. The detector deployed at location D2 recorded a total of 319 registrations of Common Pipistrelle, 84 registrations of Soprano Pipistrelle, 285 registrations of a *Myotis* species, 71 registrations of Noctule, 8 registrations of Brown Long-eared, 6 registrations of Serotine and single registrations of Nathusius' Pipistrelle and Barbastelle *Barbastellus barbastella* over the 6 night period.

4.2.12. The detector deployed at location D3 recorded a total of 353 registrations of Common Pipistrelle, 82 registrations of Soprano Pipistrelle, 27 registrations of Noctule, 17 registrations of Nathusius' Pipistrelle, 7 registrations of a *Myotis* species and 3 registrations of Brown Long-eared over the six night period.

4.2.13. The detector deployed at location D4 recorded a total of 70 registrations of Common Pipistrelle, 11 registrations of Soprano Pipistrelle, 6 registrations of Noctule and a single registration of Serotine over the six night period.

4.2.14. Following the 19th July activity survey a four static detectors were deployed for a period of six nights in locations marked as D5-D8 on Plan ECO3A and ECO3B.

4.2.15. The detector deployed at location D5 recorded a total of 248 registrations of Common Pipistrelle, 133 registrations of Soprano Pipistrelle, 53 registrations of a *Myotis* sp., 25 registrations of Noctule, 19 registrations of Brown Long-eared and a single registration of Nathusius' Pipistrelle over the six night period.

4.2.16. The detector deployed at location D6 recorded a total of 203 registrations of Common Pipistrelle, 36 registrations of Soprano Pipistrelle, 22 registrations of Noctule, 29 registrations of *Myotis* sp., 5 registrations of Brown Long-eared and a single registration of Serotine over the six night period.

4.2.17. The detector deployed at location D7 recorded a total of 681 registrations of Common Pipistrelle, 60 registrations of Soprano Pipistrelle, 149 registrations of Noctule, 42 registrations of a *Myotis* sp., 19 registrations of Brown Long-eared, 5 registrations of Nathusius' Pipistrelle, 4 registrations of Serotine and 4 registrations of Barbastelle over the six night period.

4.2.18. The detector deployed at location D8 recorded a total of 90 registrations of Common Pipistrelle, 5 registrations of Soprano Pipistrelle, 8 registrations of Noctule and 6 registrations of a *Myotis* species over the six night period.

4.2.19. Following the 29th August activity survey three static bat detectors were deployed for a period of five nights in locations marked as D9-D11 on plans ECO3A and ECO3B.

4.2.20. The detector deployed at location D9 recorded a total of 28 registrations of Common Pipistrelle, 19 registrations of Soprano Pipistrelle, 36 registrations of Noctule, 22 registrations of a *Myotis* sp., 2 registrations of Brown Long-eared and a single registration of Serotine over the five night period.

4.2.21. The detector deployed at location D10 recorded a total of 481 registrations of Common Pipistrelle, 269 registrations of Soprano Pipistrelle, 421 registrations of a *Myotis* sp., 83 registrations of Noctule, 3 registrations of Serotine and a 10 registration of Barbastelle over the five night period.

4.2.22. The detector deployed at location D11 recorded a total of 120 registrations of Common Pipistrelle, 16 registrations of Soprano Pipistrelle, 67 registrations of Noctule, 7 registrations of a *Myotis* sp., 3 registrations of Brown long-eared, 2 registrations of each Serotine and Barbastelle.

4.2.23. Following the 25th September activity survey three static bat detectors were deployed for a six night period in locations marked as D12-D14 on Plan ECO3A and ECO3B. Due to a technical malfunction the detector deployed at location D13 failed to record.

4.2.24. The detector deployed at location D12 recorded a total of 75 registrations of Common Pipistrelle, 34 registrations of Soprano Pipistrelle, 67 registrations of a *Myotis* sp., 59 registrations of Noctule, 21 registrations of Brown Long-eared, 3 registrations of Barbastelle and a single registration of Nathusius' Pipistrelle over the six night period.

4.2.25. The detector deployed at location D14 recorded a total of 140 registrations of Common Pipistrelle, 55 registrations of Noctule, 11 registrations of Soprano Pipistrelle, 12 registrations of a *Myotis* sp., 17 registrations of Brown Long-eared, 2 registrations of Nathusius' Pipistrelle and a single registration of Barbastelle over the six night period.

4.2.26. Following the 15th October activity survey four static bat detectors were deployed for a seven night period in locations marked as D15-D18 on Plan ECO3A and ECO3B.

4.2.27. The detector deployed at location D15 recorded a total of 270 registrations of Common Pipistrelle, 62 registrations of Soprano Pipistrelle, 19 registrations of *Myotis sp.*, 19 registrations of Noctule*,* 5 registrations of Brown Long-eared bat and a single registration of Nathusius' Pipistrelle over a seven night period.

4.2.28. The detector deployed at location D16 recorded a total of 470 registrations of Common Pipistrelle, 65 registrations of Soprano Pipistrelle, 9 registrations of *Myotis sp.*, 13 registrations of Brown Long-eared bat, 21 registrations of Noctule and 24 registrations of Barbastelle.

4.2.29. The detector deployed at location D17 recorded a total of 118 registrations of Common Pipistrelle, 18 registrations of Soprano Pipistrelle, 2 registrations of Nathusius' Pipistrelle, 3 registrations of Brown Long-eared bat, 26 registrations of *Myotis sp*., 56 registrations of Noctule and 3 registrations of Barbastelle.

4.2.30. The detector deployed at location D18 recorded a relatively high amount of Common Pipistrelle activity, totalling 1616 registrations over the 7 night period (1075 of which were recorded on the night of the 17th October). Other activity recorded includes; 35 registrations of Soprano Pipistrelle, 3 registrations of *Myotis sp*., 49 registrations of Noctule and a single registration of Brown Long-eared bat.

4.2.31. **Background information.** The desk study undertaken with TVERC returned a number of bat records from the local area. The closest roost records were of unidentified bat species from within the Bicester Heritage landholding in its western extent (outside of the boundary of the wider site boundary that is the subject of this masterplan). These records consisted of the presence of droppings only and were both returned from 2017. Other records from the locality include activity records of Common Pipistrelle returned from a location approximately 100m to the south-west of the Site, from 2017.

4.3. Badgers

4.3.1. Evidence of the presence of Badger *Meles meles* was recorded in various parts of the wider site during surveys undertaken by Ecology Solutions in 2018. Additionally, a single Badger was seen within the Airfield during bat surveys undertaken in May 2018.

4.3.2. Evidence indicating the presence of Badger included a number of push-throughs and well-worn paths in addition to a number of potential setts. These sett locations are illustrated on Plan ECO5 (Confidential) and described below.

4.3.3. S1 is a large sett, comprising approximately 16 entrance holes of which only 3 were considered likely to be potentially used by Badger, with several collapsed entrances also present. This sett did not appear to be actively used.

4.3.4. S2 is a single entrance outlier sett, which may be used by foxes. 5 additional collapsed entrances are also present. This sett was clearly actively used.

4.3.5. S3 is a single entrance outlier sett, which is active and well used.

4.3.6. S4 is a large outlier or small subsidiary sett comprised of 6 entrance holes, two of which are clearly active and well used.

4.3.7. S5 is an old and disused sett previously comprising 6 entrances all of which have now collapsed.

4.3.8. S6 is an active outlier sett comprised of three entrance holes one of which is active, with the others either collapsed or filled with leaf litter.

4.3.9. S7 is an active outlier sett comprised of three entrance holes one of which is active, with the others either collapsed or filled with leaf litter.

4.3.10. **Background information.** The desk study undertaken with TVERC returned a number of Badger records from the local area. The closest record was returned from within the Site itself, in its southern extent, and comprises an individual record returned from 2005. An additional record of Badger sign was returned from within the Stratton Audley Quarry area, in the north of the Site, from 2008. Additional records, including sett records were returned from several locations to the east of the Site.

4.4. Amphibians

4.4.1. The wider site supports a number of permanent and ephemeral waterbodies which were considered to have potential to provide breeding opportunities for Great Crested Newts.

4.4.2. As such detailed aquatic surveys were undertaken to ascertain the presence or absence of amphibian species. All surveys were undertaken in line with the methodology outlined in the methodology section above, with surveys undertaken during suitable weather conditions and during the optimal period.

4.4.3. It is noted that while the majority of waterbodies within the wider site were subject to detailed aquatic surveys a number of large waterbodies, including P1 and P12 were not subject to survey given their size and their current use as stocked fisheries. These waterbodies, in addition to P10 (which was nonetheless subject to survey), are considered to support populations of fish which would prohibit their function as Great Crested Newt breeding ponds.

4.4.4. A number of ephemeral waterbodies which were recorded within the site are also considered likely to dry on an annual basis and as such present limited opportunities for breeding Great Crested Newt in the long term (i.e. functionally unsuitable to support breeding GCN).

4.4.5. The results of the survey are summarised in Table 5 below.

Waterbody	Maximum count of Great Crested Newts	Date of Maximum Count
P1	N/A	N/A

P2	3	10/05/18
P3	0	N/A
P4	1	10/05/18
P5	14	14.05.18
P6	68	14.05.18
P7	0	N/A
P8	0	N/A
P9	3	14.05.18
P10	0	N/A
P11	2	16.05.18
P12	N/A	N/A
D1	2	14.05.18
D2	0	N/A
D3	3	07.06.18

Table 5: Maximum count for ponds surveyed for Great Crested Newts.

4.4.6. A peak count of 89 Great Crested Newts was recorded during the suite of aquatic surveys undertaken at the wider site.

4.4.7. It is noted that the single large waterbody subject to survey (P10) was not recorded to support Great Crested Newts. Additionally, many of the smaller ephemeral ponds, including P2, P3, P4, P7 and P11 were recorded to dry completely over the survey period.

4.4.8. It is also noted that D3 which was recorded to support a peak count of 3 Great Crested Newts, is isolated from other waterbodies within the Site and no further waterbodies which could potentially function as stepping stones to this waterbody are present outside of the Site boundary. As such it is considered likely that this population is likely to comprise an isolated metapopulation within the Site, with occasional input through migration of individual newts from the wider site.

4.4.9. Given the above survey results it is apparent that a number of the waterbodies present within the wider site support breeding opportunities for a “medium” class population of Great Crested Newt in line with Natural England guidelines.

4.4.10. Checks of suitable terrestrial habitats present within the site (including a significant number of artificial tins utilised as part of the reptile survey, in addition to natural refugia such as logs and brash piles) did not record the presence of any amphibian species, including Great Crested Newts, within these terrestrial habitats.

4.4.11. Aquatic surveys also recorded the presence of populations of Smooth Newt *Lissotriton vulgaris* in P3, P5, P6, P8, P9, D1 and D3.

4.4.12. **Background Information.** The desk study undertaken with TVERC returned a small number of amphibian records from the local area. The closest records of Great Crested Newt were returned from within the site boundary, within the Stratton Audley Quarry site, from 2009. Additional records from this area include: Smooth Newt *Lissotriton vulgaris* and Common Frog *Rana temporaria* also returned from within the Stratton Audley Quarry site.

4.5. **Reptiles**

4.5.1. The majority of the wider site comprises regularly mown grassland which does not provide potential opportunities for common reptile species. However, areas of annually mown semi-improved grassland around the Airfield, in addition to unmanaged rough grasslands within the Stratton Audley Quarry and in the south and south-east of the airfield within the wider site provide potential opportunities for reptile species.

4.5.2. In order to ascertain whether the site supports this group, refugia surveys were undertaken from August-October 2018, in line with the methodology section above.

4.5.3. The results of the survey are summarised in Table 6 below.

Date	Survey Number	Weather Conditions	Reptiles Recorded
24/08/18	1	90% cloud cover, 16C	70 Common Lizard
29/08/18	2	10% cloud cover, 17C	7 Common Lizard, 2 Grass Snake
06/09/18	3	60% cloud cover, 19C	11 Common Lizard, 2 Grass Snake
11/09/18	4	100% cloud cover, 18C	24 Common Lizard
17/09/18	5	1% cloud cover, 19C	5 Common Lizard
25/09/18	6	80% cloud cover, 17C	6 Common Lizard
02/10/18	7	100% cloud cover, 17C	10 Common Lizard

Table 6: 2018 Reptile Survey Results (Summary)

4.5.4. Two Grass Snake were also recorded within P6, during Great Crested Newt surveys in May 2018.

4.5.5. It is noted, given the survey methodology utilised, that these findings are reflective of a sample of the supported reptile populations associated with the habitats in question. The vast majority of reptiles recorded were returned from rough grassland habitats within the Stratton Audley Quarry site, in the vicinity of the bomb stores and in the southern areas of the Site.

4.5.6. In order to ascertain the relative importance of common reptile populations recorded within the Site, the tinning density, which varies from between 54 tins/ha and 300 tins/ha, has been taken into account in line with guidance and population size estimates set out by the Herpetofauna Groups of Britain and Ireland (HGBI). On this basis it is considered that rough and unmanaged grassland habitats within the Site support a low to medium population of Common Lizard (around 36/ha) and a low population of Grass Snake (<2/ha).

4.5.7. It is noted that areas of grassland which are subject to annual cutting, namely areas of semi-improved calcareous grassland around the airfield, do not support a rough and tussocky sward and are likely therefore to provide relatively reduced opportunities for reptiles. This was substantiated

by the results of the tinning surveys which recorded few reptiles in these areas, limited to a single Common Lizard in the southern area of the site, where this grassland closely backs onto an adjacent band of scrub.

4.5.8. **Background Information.** The desk study undertaken with TVERC returned a number of reptile records from the local area. These records include several of Grass Snake, returned from within the Site itself, from within the Stratton Audley Quarry site, from 1991. A further record of Grass Snake was returned from just outside the eastern boundary of the Site, from 2016. Several records of Common Lizard were also returned from a location approximately 100m to the south-west of the Site, from 2017.

4.6. **Birds**

Breeding Birds

4.6.1. The site offers opportunities for nesting birds in terms of the hedgerows, treelines, scrub, woodland and grassland areas in addition to waterbodies and areas of recolonising vegetation and reedbed.

4.6.2. The site was subject to three breeding bird survey visits in May and June 2018.

4.6.3. A total of 41 species of birds were recorded within the survey area during the three surveys, of which 32 species were breeding or probably breeding, and seven species possibly breeding (i.e. habitat suitable to support the species is present). The remaining two species were recorded as migrants or flying over the site or represented only by non-breeding individuals.

4.6.4. The results of the breeding bird surveys are detailed in Table 7 below, and illustrated at Plans ECO4A and ECO4B, and include: species, whether they are listed on the Birds of Conservation Concern, and the estimated number of breeding pairs present per species. Additional field notes for each species are also provided.

Bird Species and BTO Code	**RSPB listed**	**Estimated Number of Pairs**
Robin (R.) *Erithacus rubecula*	Green	9
Blue Tit (BT) *Cyanistes caeruleus*	Green	13
Great Tit (GT) *Parus major*	Green	8
Dunnock (D.) *Prunella modularis*	Amber	7
Wren (WR) *Troglodytes troglodytes*	Green	22
Goldfinch (GO) *Carduelis carduelis*	Green	11
Chaffinch (CH) *Fringilla coelebs*	Green	6
Greenfinch (GR) *Carduelis chloris*	Green	2

Bullfinch (BF) *Pyrrhula pyrrhula*	Amber	4
Song Thrush (ST) *Turdus philomelos*	Red	3
Blackbird (B.) *Turdus merula*	Green	12
Chiffchaff (CC) *Phylloscopus collybita*	Green	7
Willow Warbler (WW) *Phylloscopus trochilus*	Amber	4
Blackcap (BC) *Sylvia atricapila*	Green	5
Whitethroat (WH) *Sylvia communis*	Green	5
Lesser Whitethroat (LW) *Sylvia curruca*	Green	1
Sedge Warbler (SW) *Acrocephalus schoenobaenus*	Green	1-2
Cetti's Warbler (CW) *Cettia cetti*	Green	0-2
Reed Bunting (RB) *Emberiza schoeniclus*	Green	7
Linnet (LI) *Linaria cannabina*	Red	1
House Sparrow (HS) *Passer domesticus*	Red	1
Meadow Pipit (MP) *Anthus pratensis*	Amber	14
Skylark (S.) *Alauda arvensis*	Red	10
Wood Pigeon (WP) *Columba palumbus*	Green	10
Magpie (MG) *Pica pica*	Green	3
Carrion Crow (C.) *Corvus corone*	Green	0-4
Tawny Owl (TO) *Strix aluco*	Amber	0-1
Buzzard (BZ) *Buteo buteo*	Green	0-2
Kestrel (K.) *Falco Tinunculus*	Amber	0-2
Red Kite (KT) *Milvus milvus*	Green	0-1
Cuckoo (CK) *Cuculus canorus*	Red	1
Moorhen (MH) *Galinula chloropus*	Green	3
Coot (CO) *Fulica atra*	Green	1
Mallard (MA) *Anas platyrhynchos*	Amber	0-2

Tufted Duck (TU) *Aythya fuligula*	Green	2
Lesser Black-backed Gull (LB) *Larus fuscus*	Amber	0
Black-headed Gull (BH) *Chroicocephalus ridibundus*	Amber	0
Swift (SI) *Apus apus*	Amber	0-1
Great Spotted Woodpecker (GS) *Dendrocopos major*	Green	0-1
Lapwing (L.) *Vanellus vanellus*	Red	1

Table 7. Breeding bird survey results summary

Wintering Birds

4.6.5. The habitats present on site are generally considered to be sub-optimal to support over-wintering birds, with the waterbodies relatively small (in the context of their suitability for wintering birds) and the larger open habitats utilised as an air strip (and therefore subject to disturbance).

4.6.6. Notwithstanding this position, and on a precautionary basis, a suite of three wintering bird surveys are being undertaken at the site, with one survey being undertaken in each of January, February and March respectively.

4.6.7. A total of 47 species of birds was recorded during the surveys. For each species, the numbers recorded on each visit and a summary of observations are given in Table 8, with the northern 'Quarry area' and the main 'Airfield area' shown separately. The locations of findings are detailed on Plan ECO6.

Species (and BTO species code)	**RSPB listed**	**Quarry area**			**Airfield area**			**Notes**
		Jan	**Feb**	**Mar**	**Jan**	**Feb**	**Mar**	
Canada goose (CG) *Branta canadensis*	Feral		7					On P12
Mallard (MA) *Anas platyrhynchos*	Amber	10	6	6				Ponds 1, 6, 10 and 12.
Tufted duck (TU) *Aythya fuligula*		2	8	13				Mostly on P12 (3 on P10 in March)
Pheasant (PH) *Phasianus colchicus*	Feral		3		1		1	

Red-legged partridge (RL) *Alectoris rufa*	Feral		5			1	2	
Grey partridge (P.) *Perdix perdix*	Red				2		2	On the south-east boundary
Cormorant (CA) *Phalacrocorax carbo*			1					On P12
Grey heron (H.) *Ardea cinerea*				3		1 (over)		Three on P10 in March
Little grebe (LG) *Tachybaptus ruficollis*		2	2	1				Mostly on P10 (also P6 in March)
Buzzard (BZ) *Buteo buteo*		2			2	1	3	Widely scattered
Red kite (KT) *Milvus milvus*					1	1	2	Ranging widley
Coot (CO) *Fulica atra*		6	7	9				Ponds 1, 6, 10 and 12
Moorhen (MH) *Gallinula chloropus*		1	2	1				On P12
Lapwing (L.) *Vanellus vanellus*	Red	(150)						In adjacent farmland
Woodcock (WK) *Scolopax rusticola*	Red		1					Flushed from bush near P8
Snipe (SN) *Gallinago gallinago*	Amber		12	13				Wet areas by P3 and P12
Woodpigeon (WP) *C. palumbus*		31	50	50	15	20	38	
Green woodpecker (G.) *Picus viridis*		2	1	1	1			
Great spotted woodpecker (GS) *Dendrocopos major*		2						
Kestrel (K.) *Falco tinnunculus*	Amber					1		On the south-east boundary
Jay (J.) *Garrulus glandarius*		3	1		2			In scrub
Magpie (MG) *Pica pica*		7	2	1	2	5	4	
Jackdaw (JD) *Corvus monedula*				2	1	2	1	

Rook (RO) *Corvus frugilegus*					150	100	20	Feeding in grassland
Carrion crow (C.) *Corvus corone*		4	1		9	13	11	
Raven (RN) *Corvus corax*				1				Flying over
Blue tit (BT) *Cyanistes caeruleus*		2	6	3	5	4	6	
Great tit (GT) *Parus major*		4	3	1	4		3	
Long-tailed tit (LT) *Aegithalos caudatus*		3	1	2	2		1	
Skylark (S.) *Alauda arvensis*	Red				1	2	3	In grassland SE of airfield
Wren (WR) *T. troglodytes*		1		1	1		1	
Starling (SG) *Sturnus vulgaris*	Red				25		10	Feeding in grassland
Blackbird (B.) *Turdus merula*		11	6	2	6	2	3	
Redwing (RE) *Turdus iliacus*	Red				4			In scrub
Song thrush (ST) *Turdus philomelos*	Red	3	1	1				
Fieldfare (FF) *Turdus pilaris*	Red	3	11		2	4		
Mistle thrush (M.) *Turdus viscivorus*	Red		2			1	1	
Robin (R.) *Erithacus rubecula*		5	1	1		1	1	
Dunnock (D.) *Prunella modularis*	Amber	1		2		2	2	
Pied wagtail (PW) *Motacilla alba*					1			
Meadow pipit (MP) *Anthus pratensis*	Amber				1	1		In grassland SE of airfield
Chaffinch (CH) *Fringilla coelebs*		3						
Bullfinch (BF) *Pyrrhula pyrrhula*	Amber	9	3	4	1	1		In scrub
Linnet (LI) *Linaria cannabina*	Red				1			Flying over

Goldfinch (GO) *Carduelis carduelis*		5		3		1	1	
Greenfinch (GR) *Chloris chloris*				3				
Reed bunting (RB) *Emberiza schoeniclus*					2			In peripheral vegetation
Total no. species				**35**			**32**	

Table 8. Wintering bird survey results summary

4.6.8. The wider site supports a relatively modest wintering bird assemblage, the variety of species reflecting the variation in habitats present across the site.

4.6.9. The most significant species recorded at the site were Grey Partridge and Skylark, both of which are declining farmland species included on the RSPB Red List (along with Lapwing, which was recorded in adjacent farmland). Both were recorded in tiny numbers in peripheral grassland southeast of the main airfield, along with Kestrel, Meadow Pipit and Reed Bunting, all Amber Listed. In contrast, the grassland of the open airfield supports unremarkable numbers of foraging Rooks, Carrion Crows, Starlings and Woodpigeons, all of which are widespread and abundant species in the winter.

4.6.10. Buzzards and Red Kites were recorded ranging widely across the airfield and adjacent areas, whilst most of the other species recorded in the 'Airfield area' are associated with peripheral scrub to the south and east, with none recorded in significant numbers.

4.6.11. In the 'Quarry area', the waterbodies support a number of species typical of such habitat, including Mallard, Tufted Duck, Little Grebe, Coot and Moorhen, with occasional visits from Canada Goose, Cormorant and Grey Heron. None of these species occurred in significant numbers. Up to 13 Snipe were present in adjacent marshy areas, with a single Woodcock also adding to the overall interest. Most of the remaining species recorded in the 'Quarry area' are associated with the scattered scrub, the only one occurring in significant numbers being Bullfinch, another declining species which is included on the RSPB Amber List having undergone a moderate decline in its UK population over 25 years. It nevertheless remains very common and widespread during the winter, both locally and nationally, as are all the other species recorded during the survey.

4.6.12. The total number of species recorded in both areas of the site were similar. Whilst the most notable species were recorded in the south-eastern grassland (Grey Partridge, and Skylark), they occurred in such tiny numbers that it is the assemblage associated with the mosaic of habitats (especially wetland habitats) in the 'Quarry area' that is considered to be the more ornithologically significant..

4.6.13. **Background Information.** The desk study undertaken with TVERC returned a number of records of notable bird species from the locality. A large proportion of these records were returned from within the site, including records of Grey Partridge *Perdix perdix*, Little Ringed Plover *Charadrius dubius,* Lapwing, Common Tern *Sterna hirundo,* Black-headed

Gull, Stock Dove, Reed Bunting, Bullfinch, Starling, Skylark, House Sparrow, Yellowhammer and Linnet returned from 2009; and Common Sandpiper *Actitis hypoleucos,* Green Sandpiper *Tringa ochropus,* Redshank *Tringa totanus,* Snipe *Gallinago gallinago,* Turtle Dove *Streptopelia turtur* and Kingfisher *Alcedo atthis,* returned from 2008, all from within the Stratton Audley Quarry site. In addition a number of records were returned from within Bicester airfield including Song Thrush, Red Kite, Kestrel, Lesser Black-backed Gull, Herring Gull, Skylark and Meadow Pipit returned from between 2003 and 2016. Records which have been withheld in detail, due to their sensitive nature, returned for the locality of the Site, include Hobby *Falco subbuteo* and Peregrine *Falco peregrinus,* from 2006.

4.7. **Invertebrates**

4.7.1. The wider site has been subject to a suite of four specific invertebrate surveys by Colin Plant Associates, invertebrate survey specialists. Survey visits were undertaken on the 13th June, 9th July, 14th August and 11th September 2018.

4.7.2. These surveys encompassed habitats of potentially greater invertebrate interest across the Site, including areas of recolonising bare ground, spoil mounds, scrub, waterbodies and rough and calcareous grassland.

4.7.3. The 2018 surveys recorded a total of 556 terrestrial species, confirming that a good range of invertebrate species utilise the site, including a number of notable species (i.e. species of conservation significance). A full list of the species recorded is detailed at Appendix 1. The key findings of the surveys are detailed below.

4.7.4. No invertebrate species which are afforded direct legal protection under any UK or European legislation were recorded during the surveys.

4.7.5. Four S41 invertebrate species were recorded during the surveys. Of these four S41 species, two, the Latticed Heath *Chiasma clathrate* and the Cinnabar *Tyria jacobaeae*, are highlighted for 'Research Only'. The remaining two S41 species include:

- Grizzled Skipper *Pyrgus malvae* which is associated with unimproved calcareous grassland and open woodland rides was recorded on both the airfield and wider quarry site.

- Small Heath *Coenonympha pamphilus* which is associated with open habitats was recorded on both the airfield, and wider quarry site.

4.7.6. A total of three *Nationally Rare* or *Red Data Book* (RDB) species were recorded. These species are detailed below, within which habitat requirements and current population trends are summarised, where known.

- *Lygus pratensis* RDB3. A true bug once extremely local and confined to lowland heathland in southern England, has recently experienced a significant range and population expansion. Given its now widespread status, it no longer warrants any

conservation status. This species is often found in dry open habitats, on a range of Asteraceae.

- *Placochilus seladonicus* RDBK. A true bug thought to be introduced to Britain before 1977, however this cannot be confirmed. This species favours open habitats on calcareous soils, in particular chalk downland.

- *Cistogaster globose* RDB2. A parasitic fly of the Bishop's Mitre *Aelia acuminate* shieldbug. Much more widespread than its RDB2 designation would suggest, this species is often associated with dry grassland, upon which its host feeds.

4.7.7. In addition, a total of 34 Nationally Scare (NS) species were recorded during the surveys. These Nationally Scare species are listed below, with more details on their status, population trends and habitat requirements detailed at Appendix 1.

- The ground beetle *Acupalpus exiguous* **NS**;
- The ground beetle *Bembidion octomaculatum* **NS**;
- The ground beetle Ophonus azureus **NS**;
- The ground beetle *Pterostichus gracillis* **NS**;
- The ground beetle *Syntomus truncatellus* **NS**;
- The water beetle *Peltodytes caesus* **NS**;
- The diving beetle *Hydaticus seminiger* **NS**;
- The rove beetle *Aleochara brevipennis* **NS(Nb)**;
- The rove beetle *Dacrila fallax* **NS(Nb)**;
- The small beetle *Olibrus pygmaeus* **NS(Nb)**;
- The flea beetle *Chaetocnema confusa* **NS;**
- The weevil *Oxystoma cerdo* **NS(Nb)**;
- The weevil *Squamapion cineraceum* **NS(Na)**;
- The weevil *Catapion pubescens* **NS(Nb)**;
- The weevil *Tychius squamulatus* **NS(Nb)**;
- The weevil *Zacladus exiguous* **NS(Nb)**;
- The weevil *Notaris scirpi* **NS(Nb)**;
- The weevil *Larinus planus* **NS(Nb)**;

- The true bug *Ceraleptus lividus* **NS**;
- The true bug *Megalonotus antennatus* **NS(Nb)**;
- The water boatman *Glaenocorisa propinqua propinqua* **NS**;
- The bug *Saldula pallipes* **NS**;
- The planthopper *Scottlianella dalei* **NS(Nb)**;
- The leafhopper *Lassus scutellaris* **NS(Na)**;
- The stiletto fly *Thereva plebeja* **NSb**;
- The picture-winged fly *Orellia falcata* **NS(Nb)**;
- The solitary wasp *Tiphia minuta* **NS(Nb)**;
- The Red-backed Mining Bee *Andrena similis* **NS(Nb)**;
- The Large Yellow-face Bee *Hylaeus signatus* **NS(Nb)**;
- The Sharp-collared Flower Bee *Lasioglossum malachurum* **NS(Nb)**;
- The Lobe-spurred Furrow Bee *Lasioglossum pauxillum* **NS(Na)**;
- The Swollen-thighed Blood Bee *Sphecodes crassus* **NS(Nb)**;
- The Variable Damselfly **NT NS**.

4.7.8. The total invertebrate assemblage recorded at the wider site is notable, with just over 7% of the total species inventory being of formal conservational concern.

4.7.9. The full assemblage of invertebrates recorded on site was further assessed using Pantheon, a software tool which allowed for the relative conservation value of assemblages to be assessed and subsequently to identify those habitats of relatively greater importance to them. Through this methodology, broad habitats are then afforded a Species Quality Index (SQI).

4.7.10. As set out at Appendix 1, Pantheon analysis calculated the following SQI scores for habitats within the site (a minimum sample size of 15 species is required to calculate an SQI score for a habitat type).

- Open habitats – Tall sward & scrub (SQI score of 116);
- Wetland - Marshland (SQI score of 121);
- Open habitats – Short sward & bare ground (SQI score of 126);
- Wetland – Peatland (SQI score of 138);
- Tree associated – Arboreal (SQI score of 109);

4.7.11. The SQI scores fall below the threshold score of 150 at which point Natural England would consider a site to represent a 'good' site supporting a regionally important invertebrate assemblage.

4.7.12. Notwithstanding this output, it believed that the Pantheon analysis may have underestimated the assemblage for two reasons, these being;

1. The unusually warm, and prolonged, weather experienced over the survey period may have resulted in an absence of the usual early spring species. Some of which would have been of significant conservational importance. Secondly;

2. Some of the species recorded are extremely rare in a regional context, in particular the beetles *Hydaticus seminiger*, and *Bembidion octomaculatum*, and the water bug *Glaenocorisa propinqua*. It is unknown to what extent these species exist within other sites within the county.

4.7.13. In light of the above, further updated invertebrate survey work is proposed to be undertaken in the Spring of 2019.

4.7.14. **Background Information.** The desk study undertaken with TVERC returned a large number of invertebrate records from the local area, including from within the site. These records include the following species returned from within the Stratton Audley Quarry site: Blackthorn Mining Bee *Andrena varians,* Southern Bronze Furrow Bee *Halictus confusus,* Orange-footed Furrow Bee *Lasioglossum xanthopus,* Sharp-collared Furrow Bee *Lasioglossum malachurum,* White-footed Furrow Bee *Lasioglossum leucopus,* Swollen-thighed Blood Bee *Sphecodes crassus,* Red-tailed Mason Bee *Osmia bicolor,* Small Tiphia *Tiphia minuta,* the beetles *Microplontis campestris, Haploglossa picipennis, Brachinus crepitans*, *Bembidon clarkii, Pterostichus anthracinus, Ophonos azureus, Lebia chlorocephala, Cryptocephalus aureolus,* the butterflies Grizzled Skipper *Pyrgus malvae,* Wall *Lasiommata megera,* Small Heath *Coenonympha pamphilus,* Small Blue *Cupido minimus,* the moths Latticed Heath *Chiasmia clathrata* and Cinnabar *Tyria jacobaeae* and the true bug *Macropsis glandacea.*

4.8. Otter and Water Vole

4.8.1. The habitats present within the wider site are considered to be sub-optimal to support Otter and Water Vole, not least given the limited presence of suitable bankside habitat which would provide opportunities for burrow or holt creation.

4.8.2. Moreover, it is noted that the habitats are largely isolated from any suitable watercourses in the wider area from which these species may have colonised in the intervening period since quarrying works ceased.

4.8.3. Due regard was nonetheless had to the potential presence of Otter or Water Vole as part of the habitat survey work undertaken, as well as during the course of faunal survey work (including bat and GCN surveys) which included inspection of the waterbodies over the course of 2018.

4.8.4. No evidence of either Water Vole or Otter were recorded within the Site and it is not considered that either species would be present within the site.

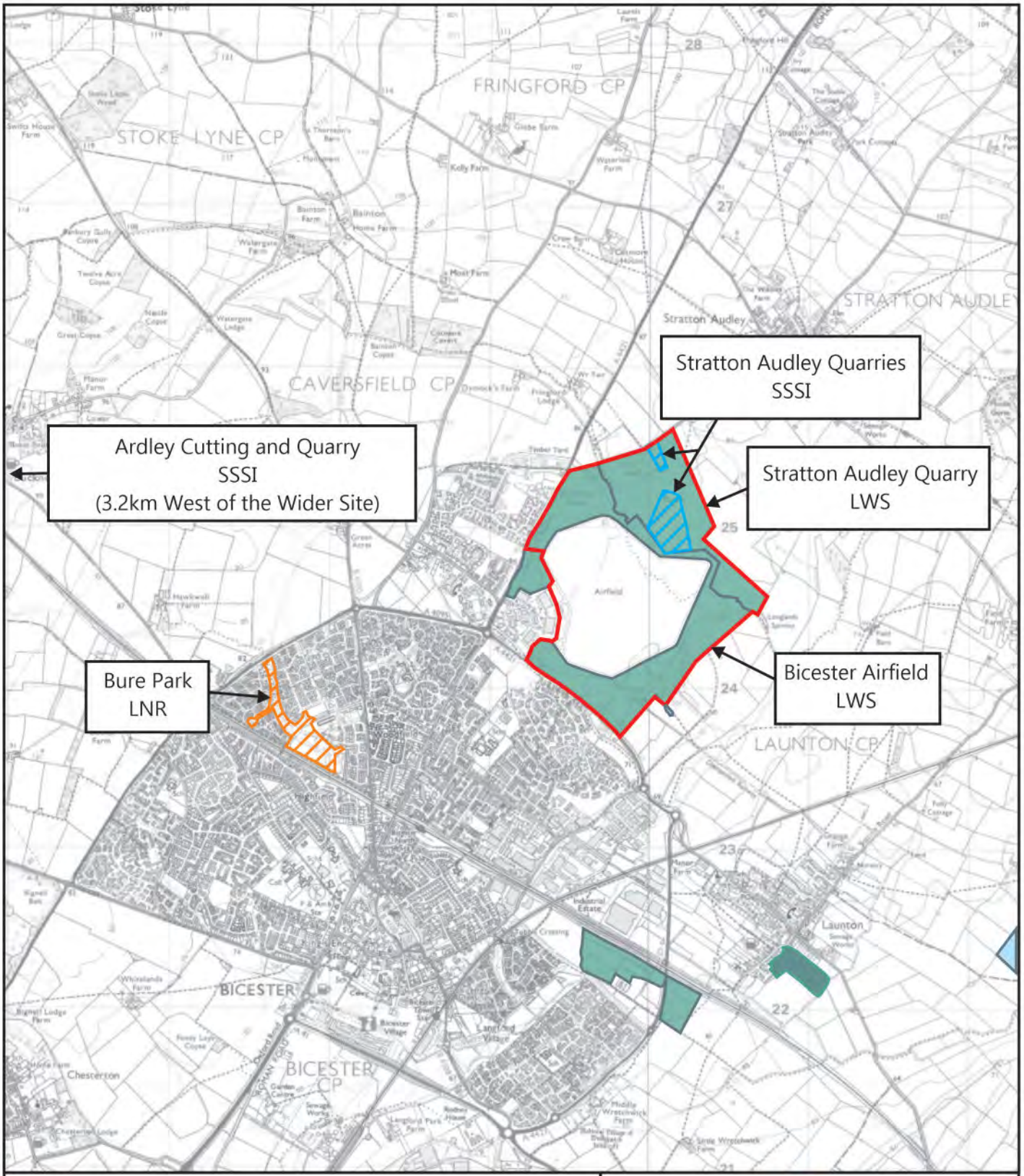
4.8.5. **Data Search**. The desk study undertaken with TVERC did not return any records of Otter in the local area. Two records of Water Vole were recorded, the closest being a record from 1.6km to the south-west of the Site and dating to 2003.

PLANS

PLAN ECO1

SITE LOCATION &

ECOLOGICAL DESIGNATIONS



KEY:

- SITE BOUNDARY
- SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)
- LOCAL NATURE RESERVE (LNR)
- LOCAL WILDLIFE SITE (LWS)
- PROPOSED LOCAL WILDLIFE SITE (pLWS)
- WOODLAND TRUST RESERVE

N

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PLAN ECO1: SITE LOCATION & ECOLOGICAL DESIGNATIONS

PLANS ECO2A & ECO2B

ECOLOGICAL FEATURES

H1
H2
H3
H4
H5
H6
H7
H8
H9
H10
H11
H12
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12
D1
D2
B25
B26
Timber Yard
Brashfield House
Cherwood House
Airfield
Elm Farm Quarry
Bicester Gliding Centre
BICESTER ROAD
A421
A4421
87m
86m
83m
82m
79m
78m
76m

KEY:

- SITE BOUNDARY
- SEMI-IMPROVED CALCAREOUS GRASSLAND
- SPECIES POOR SEMI-IMPROVED CALCAREOUS GRASSLAND
- SEMI-IMPROVED NEUTRAL AND CALCAREOUS GRASSLAND MOSAIC
- BROAD-LEAVED SEMI-NATURAL WOODLAND
- DENSE SCRUB
- DENSE SCRUB / GRASSLAND MOSAIC
- SCATTERED SCRUB
- REEDBED
- MARGINAL VEGETATION / MARSHY GRASSLAND
- HEDGEROW / TREELINE
- RECOLONISING BARE GROUND
- HARDSTANDING / BARE GROUND
- RECOLONISING HARDSTANDING
- WATERBODIES
- WET DITCH
- BUILDINGS

N

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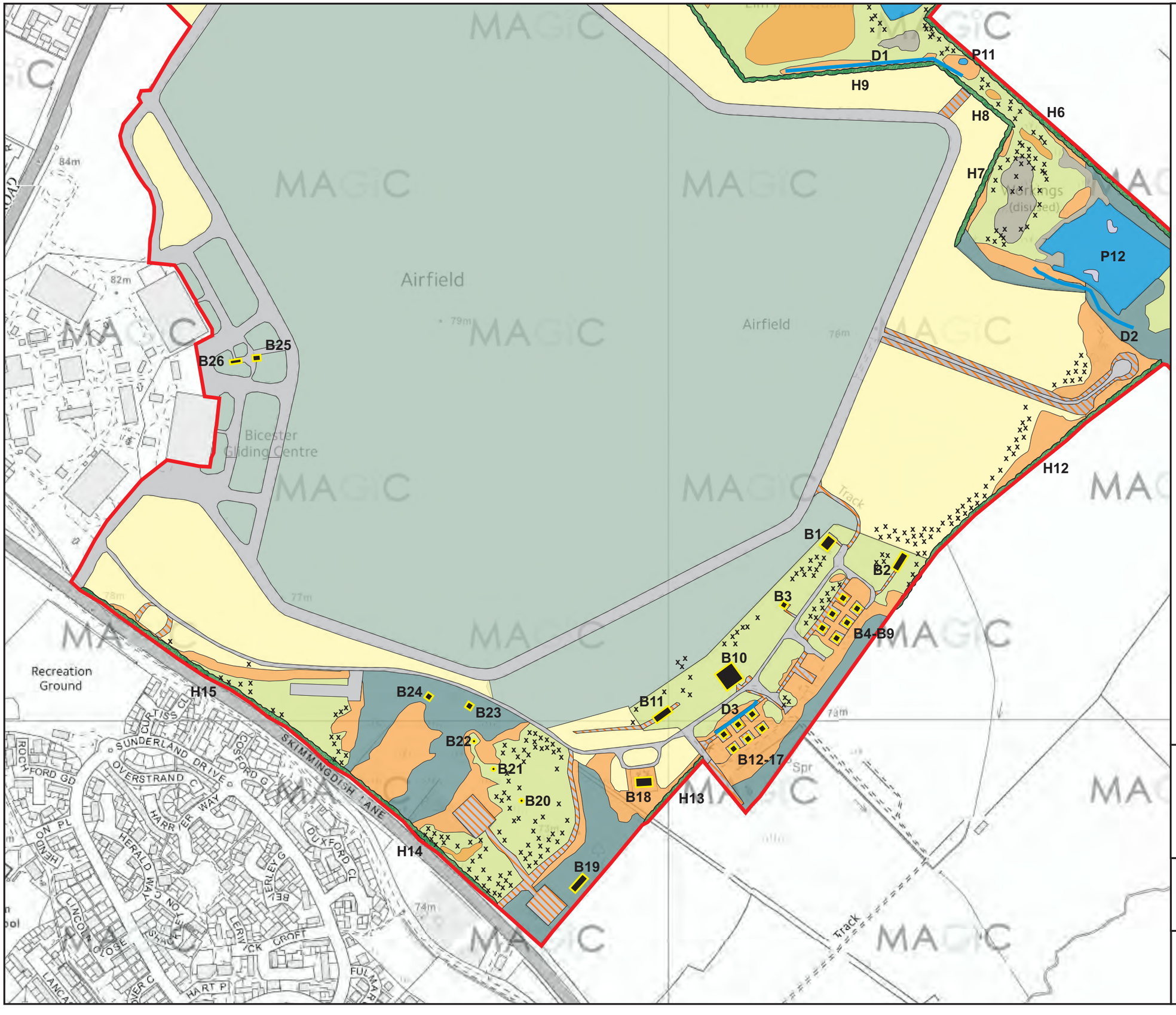
7884: BICESTER HERITAGE, BICESTER

PLAN ECO2A: ECOLOGICAL FEATURES (NORTH)



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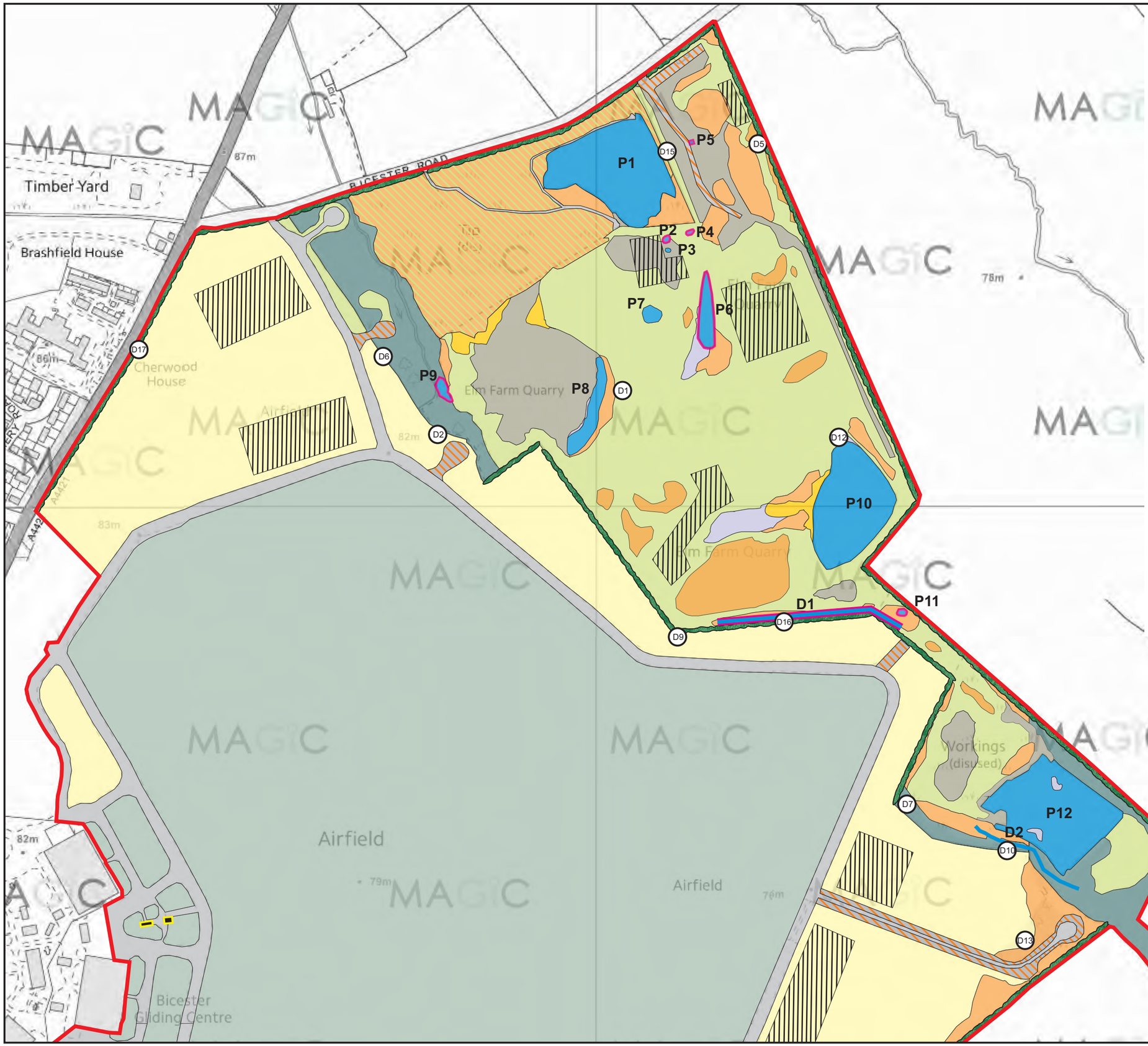
PLAN ECO2B: ECOLOGICAL FEATURES (SOUTH)

PLANS ECO3A & ECO3B

PROTECTED SPECIES



KEY:

- SITE BOUNDARY
- WATERBODY SUPPORTING GREAT CRESTED NEWTS
- AREAS TINNED FOR REPTILES
- STATIC BAT DETECTOR LOCATION (D1)

N

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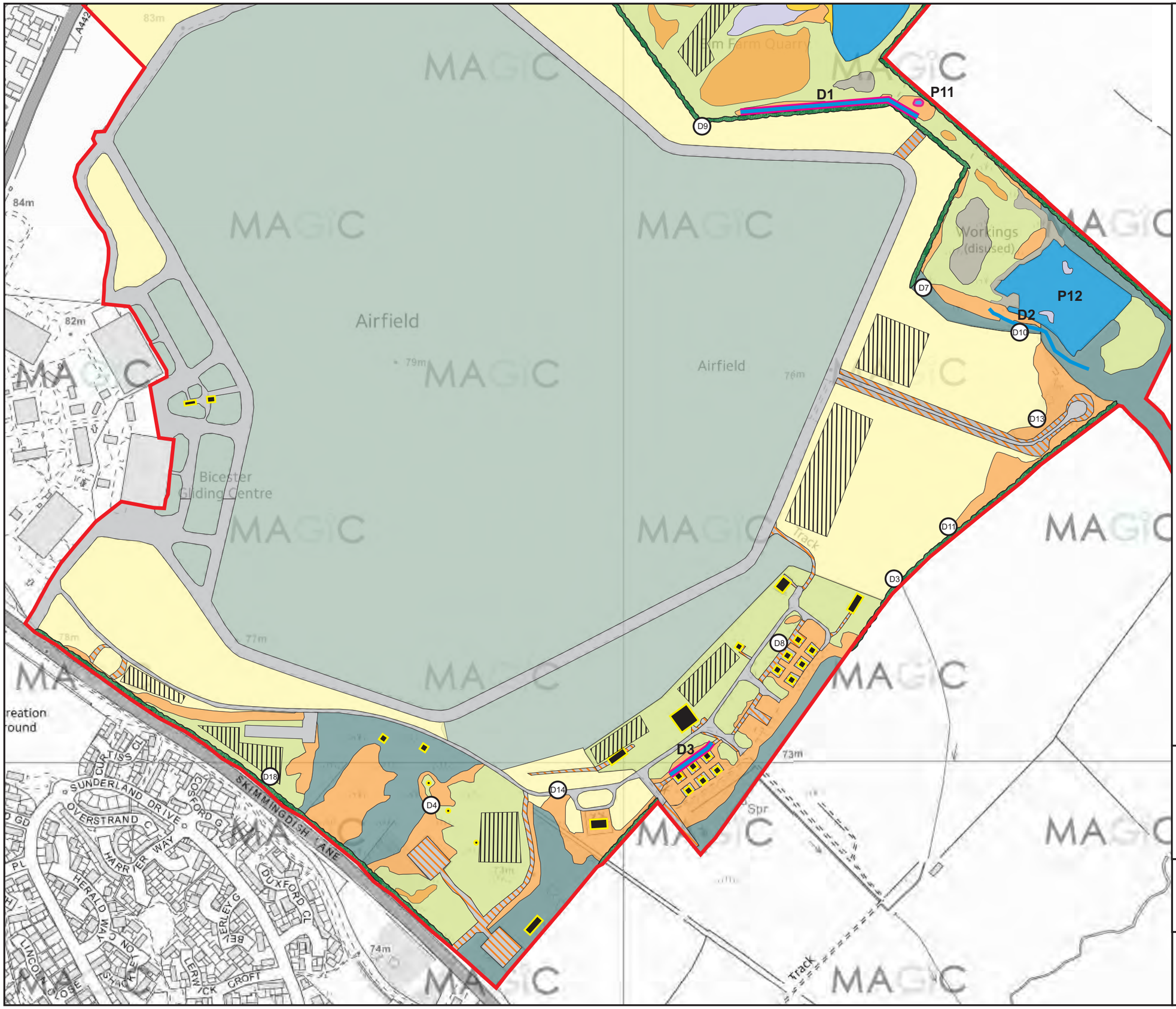
7884: BICESTER HERITAGE, BICESTER

PLAN ECO3A: PROTECTED SPECIES (NORTH)



KEY:

- SITE BOUNDARY
- WATERBODY SUPPORTING GREAT CRESTED NEWTS
- AREAS TINNED FOR REPTILES
- STATIC BAT DETECTOR LOCATION (D1)

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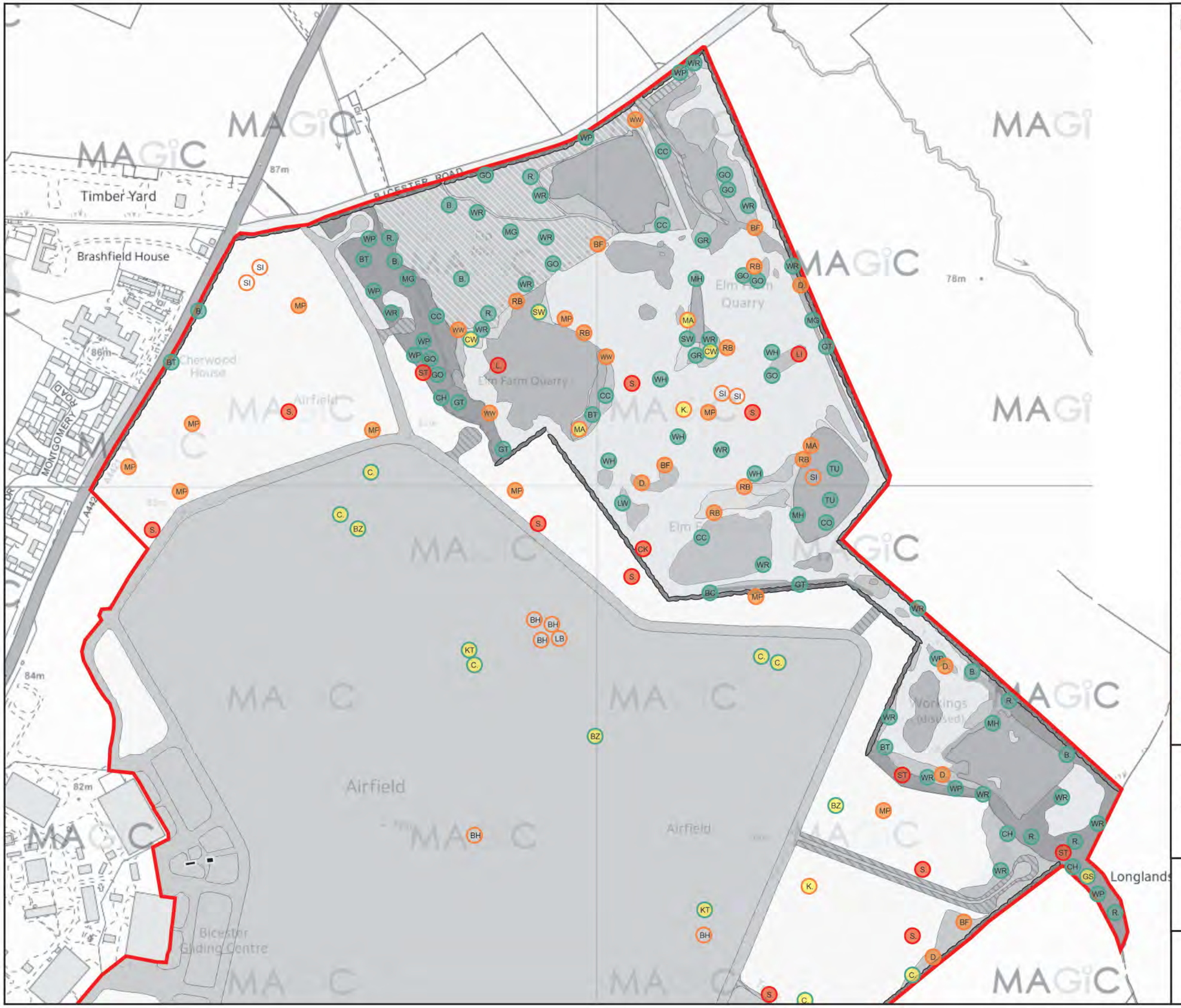
PLAN ECO3B: PROTECTED SPECIES (SOUTH)

PLANS ECO4A & ECO4B

BREEDING BIRD SURVEYS



KEY:

- SITE BOUNDARY
- ROBIN (R)
- BLUE TIT (BT)
- GREAT TIT (GT)
- DUNNOCK (D)
- WREN (WR)
- GOLDFINCH (GO)
- CHAFFINCH (CH)
- GREENFINCH (GR)
- BULLFINCH (BF)
- SONG THRUSH (ST)
- BLACKBIRD (B)
- CHIFFCHAFF (CC)
- WILLOW WARBLER (WW)
- BLACKCAP (BC)
- WHITETHROAT (WH)
- LESSER WHITETHROAT (LW)
- SEDGE WARBLER (SW)
- CETTI'S WARBLER (CW)
- REED BUNTING (RB)
- LINNET (LI)
- HOUSE SPARROW (HS)
- MEADOW PIPIT (MP)
- SKYLARK (S)
- WOOD PIGEON (WP)
- MAGPIE (MG)
- CARRION CROW (C)
- TAWNY OWL (TO)
- BUZZARD (BZ)
- KESTREL (K)
- RED KITE (KT)
- CUCKOO (CK)
- MOORHEN (MH)
- COOT (CO)
- MALLARD (MA)
- TUFTED DUCK (TU)
- BLACK-HEADED GULL (BH)
- LESSER BLACK-BACKED GULL (LB)
- SWIFT (SI)
- GREAT SPOTTED WOODPECKER (GS)
- LAPWING (L)

RED / AMBER / GREEN LISTED SPECIES BREEDING OR PROBABLY BREEDING

RED / AMBER / GREEN LISTED SPECIES POSSIBLY BREEDING

RED/ AMBER / GREEN LISTED SPECIES UNLIKELY TO BE BREEDING

N

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PLAN ECO4A:
BREEDING BIRD
SURVEY PLAN (NORTH)

KEY:

- SITE BOUNDARY
- (R) ROBIN
- (BT) BLUE TIT
- (GT) GREAT TIT
- (D) DUNNOCK
- (WR) WREN
- (GO) GOLDFINCH
- (CH) CHAFFINCH
- (GR) GREENFINCH
- (BF) BULLFINCH
- (ST) SONG THRUSH
- (B) BLACKBIRD
- (CC) CHIFFCHAFF
- (WW) WILLOW WARBLER
- (BC) BLACKCAP
- (WH) WHITETHROAT
- (LW) LESSER WHITETHROAT
- (SW) SEDGE WARBLER
- (CW) CETTI'S WARBLER
- (RB) REED BUNTING
- (LI) LINNET
- (HS) HOUSE SPARROW
- (MP) MEADOW PIPIT
- (S) SKYLARK
- (WP) WOOD PIGEON
- (MG) MAGPIE
- (C) CARRION CROW
- (TO) TAWNY OWL
- (BZ) BUZZARD
- (K) KESTREL
- (KT) RED KITE
- (CK) CUCKOO
- (MH) MOORHEN
- (CO) COOT
- (MA) MALLARD
- (TU) TUFTED DUCK
- (BH) BLACK-HEADED GULL
- (LB) LESSER BLACK-BACKED GULL
- (SI) SWIFT
- (GS) GREAT SPOTTED WOODPECKER
- (L) LAPWING

RED / AMBER / GREEN LISTED SPECIES BREEDING OR PROBABLY BREEDING

RED / AMBER / GREEN LISTED SPECIES POSSIBLY BREEDING

RED/ AMBER / GREEN LISTED SPECIES UNLIKELY TO BE BREEDING

N

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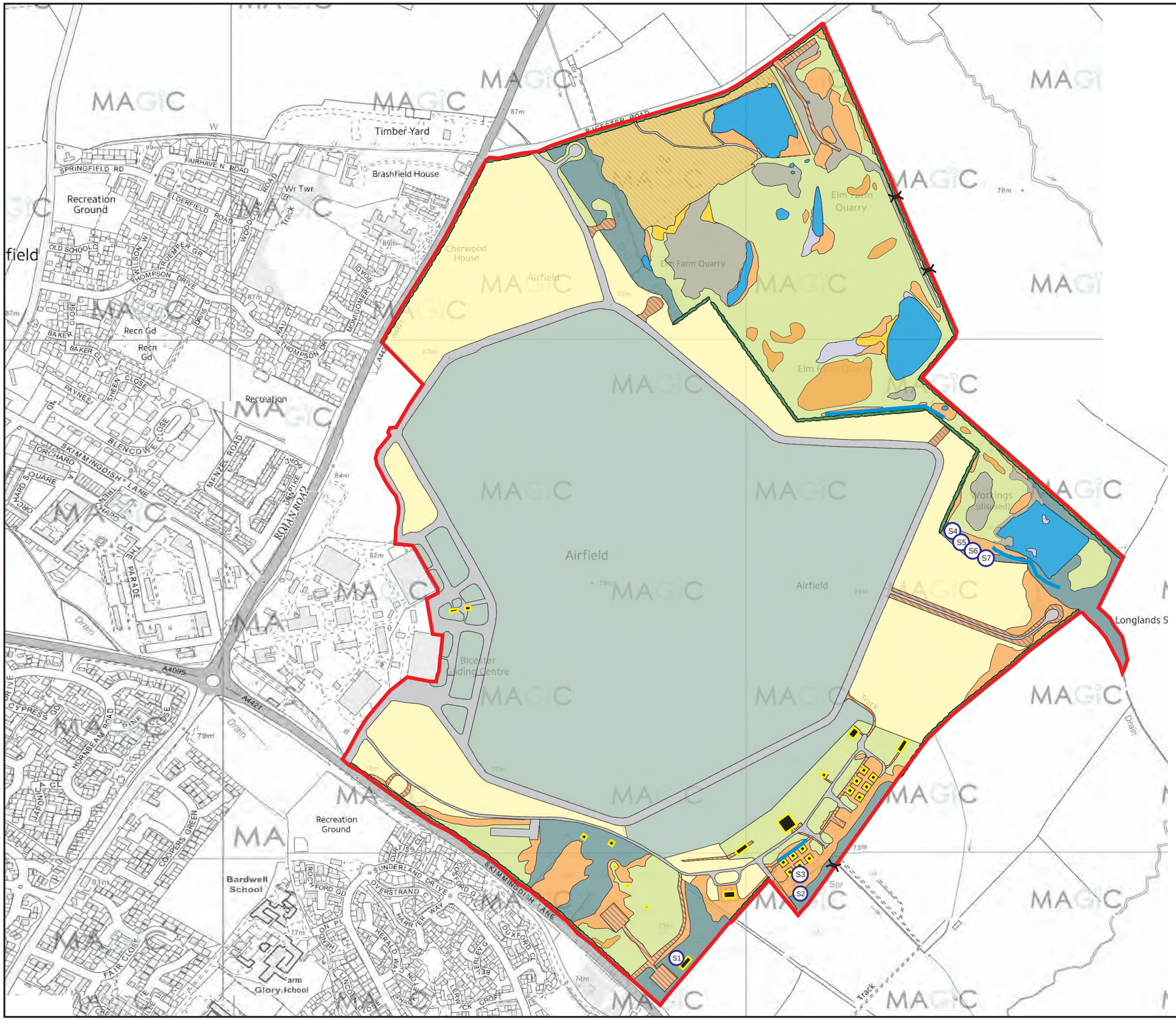
PLAN ECO4B: BREEDING BIRD SURVEY PLAN (SOUTH)

PLANS ECO5

PROTECTED SPECIES

(CONFIDENTIAL)



KEY:

- SITE BOUNDARY
- S1 BADGER SETT LOCATION
- PUSH-THROUGH

N

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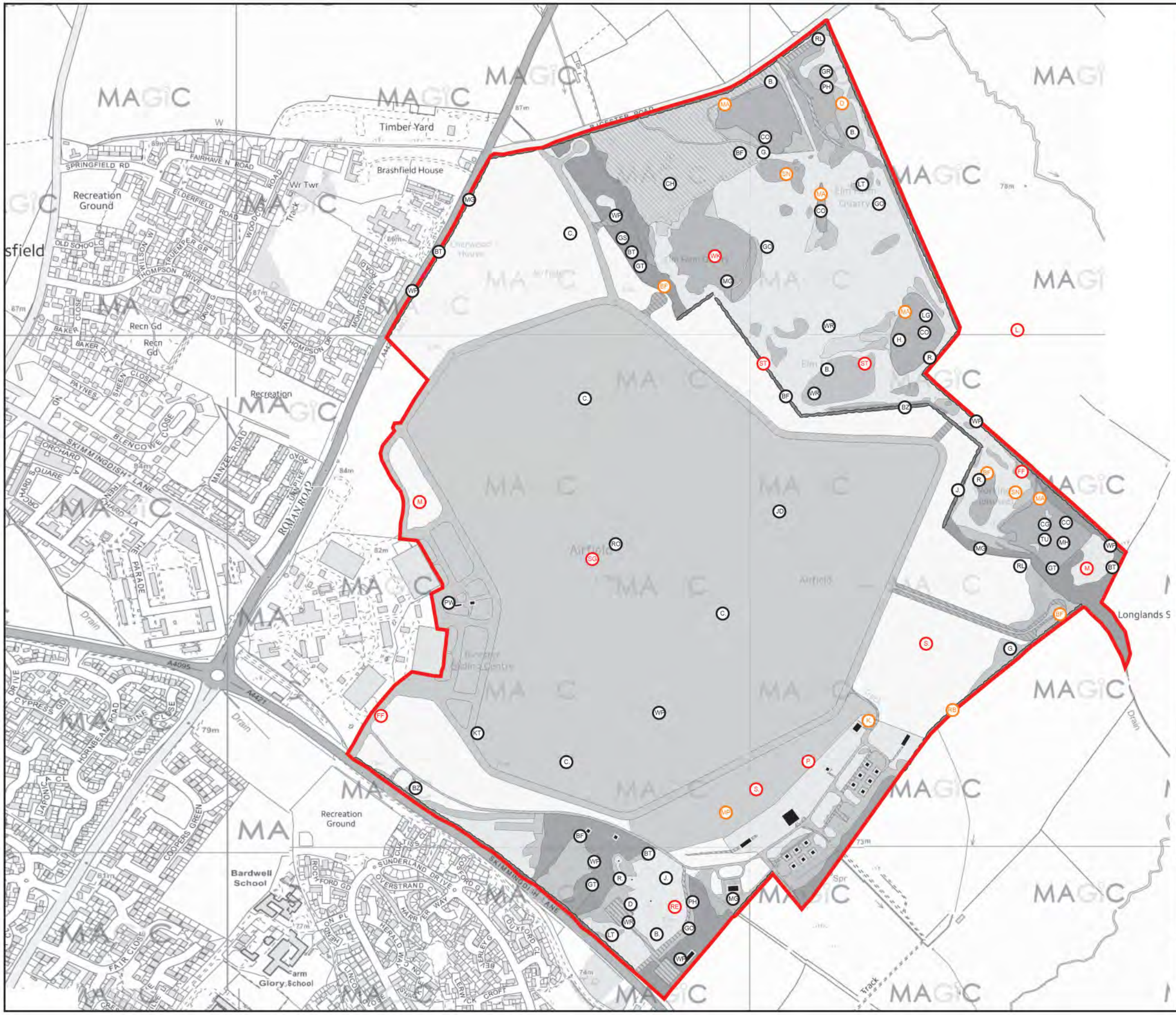
7884: BICESTER HERITAGE, BICESTER

PLAN ECO5: PROTECTED SPECIES (CONFIDENTIAL)

PLANS ECO6

WINTER BIRD SURVEY



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KEY:

- SITE BOUNDARY
- (R) ROBIN
- (BT) BLUE TIT
- (GT) GREAT TIT
- (D) DUNNOCK
- (WR) WREN
- (GO) GOLDFINCH
- (CH) CHAFFINCH
- (GR) GREENFINCH
- (BF) BULLFINCH
- (ST) SONG THRUSH
- (B) BLACKBIRD
- (WK) WOODCOCK
- (SG) STARLING
- (RE) REDWING
- (FF) FIELDFARE
- (M) MISTLE THRUSH
- (CG) CANADA GOOSE
- (PH) PHEASANT
- (RB) REED BUNTING
- (LI) LINNET
- (RL) RED LEGGED PARTRIDGE
- (MP) MEADOW PIPIT
- (S) SKYLARK
- (WP) WOOD PIGEON
- (MG) MAGPIE
- (C) CARRION CROW
- (P) GREY PARTRIDGE
- (BZ) BUZZARD
- (K) KESTREL
- (KT) RED KITE
- (SN) SNIPE
- (MH) MOORHEN
- (CO) COOT
- (MP) MEADOW PIPIT
- (PW) PIED WAGTAIL
- (MA) MALLARD
- (TU) TUFTED DUCK
- (G) GREEN WOODPECKER
- (JD) JACKDAW
- (J) JAY
- (GS) GREAT SPOTTED WOODPECKER
- (L) LAPWING
- (RO) ROOK
- (PW) PIED WAGTAIL
- (LT) LONG-TAILED TIT

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PLAN ECO6: WINTERING BIRD SURVEY PLAN

APPENDIX 6

Assessment, Evaluation and Mitigation Principles for Wider Site

Appendix 6: Site-wide Mitigation Principles in respect of Designated Site, Habitats and Fauna

Designated sites

1. **Non-statutory Sites**. The wider site boundary incorporates the entirety of Stratton Audley Quarry Local Wildlife Site (LWS), as well as the vast majority of Bicester Airfield LWS. The presence of these sites has been given due regard as part of the emerging development proposals and a suite of avoidance, mitigation and enhancement measures will form an intrinsic element of the emerging scheme.

Stratton Audley Quarry LWS

2. In regards Stratton Audley Quarry LWS, the site is designated on account of its diverse habitat mosaic which supports a wide range of notable plant and faunal species, not least GCN and notable invertebrate communities. The presence of the habitats and species for which the site is designated has been reaffirmed through the completion of ecological survey work by Ecology Solutions. It is further relevant to note that updated survey work was also undertaken in 2018 by the Thames Valley Ecological Records Centre (TVERC) and due regard has also been given to their findings.

3. The survey work undertaken in 2018 (as well as updated walkovers in 2019 & 2020) confirms that Stratton Audley Quarry LWS remains of value at the Local level. Notwithstanding this assessment, significant areas of the LWS were noted to support dense stands of scrub, with scrub encroachment (predominantly Bramble) noted to be continually reducing the extent of the significantly more valuable grassland mosaic within the site. In the absence of an appropriate management regime it is considered that scrub succession will result in a continued decline in the ecological value of this LWS.

4. It noted that there is a commitment for Stratton Audley Quarry to be subject to restoration works following the cessation of previous quarrying operations. Following extensive liaison between Bicester Motion, their advisors (including Ecology Solutions) and Oxfordshire County Council, it was agreed that a historically approved restoration plan for the quarry was inappropriate (ecologically harmful) and that it would be appropriate for a revised restoration strategy to be prepared which considers the current ecological baseline.

5. Ecology Solutions are currently advising on the delivery of an alternative, biodiversity led restoration scheme in this regard. It is considered that the implementation of appropriate, sensitive development, such as the emerging masterplan proposals could come forward in compliance with the ethos of such a scheme. Indeed, such proposals would offer an opportunity for enhancement in the longer term through facilitating long-term biodiversity management of the site (something which would not be secured under the previously approved scheme).

6. The emerging proposals within Stratton Audley Quarry LWS continue to be guided by the existing ecological interest of the site and the clear need to implement appropriate restoration alongside favourable, long-term habitat management at the site. The proposals in this regard, will facilitate delivery of a Nature Park as part of the scheme and will be led by the following principles:

- Any facilitating development to be low-key and to be targeted at the peripheries of the site, or otherwise in areas of reduced ecological interest. This to retain the vast majority of the site as a high-quality and naturalistic habitat mosaic;

- The design of new structures to be ecologically sensitive, including for structures on stilts (retaining vegetation underneath) as well as integrated invertebrate nesting walls, bat and bird boxes and areas of living roofs;
- Naturalistic recreational trails to guide users around the site and ensure passive avoidance of key / sensitive areas within the site;
- Targeted, ecology led restoration scheme to include for an appropriate scrub clearance regime and the subsequent implementation of a suitable habitat management regime for the site in the long-term. This regime to target the retention of the diverse habitat mosaic within the site, thus retaining a high quality yet ephemeral resource which would be lost in the absence of management;
- All works to be undertaken with due regard to the presence or potential presence of protected and notable species, with appropriate methodologies agreed and licensed obtained (where relevant). In particular the proposals will avoid a net loss of waterbodies and wetland (identified as some of the most valuable habitats for both GCN and invertebrate assemblages);
- Adoption of an appropriate lighting strategy which will retain the vast majority of the site as a dark habitat and minimise light spill; and
- Opportunities for educational facilities which will provide a resource by which users can learn about and engage with ecology, further ensuring that recreational use of the site is appropriate.

7. It is considered that, through adoption of the above mitigation and enhancement measures, the emerging proposals would ensure the retention and enhancement of the existing biodiversity value within the quarry and may fully comply with an alternative, ecology led restoration scheme for the LWS. It is anticipated that a revised restoration strategy will be prepared and approved for Stratton Audley Quarry by 2022.

8. Adoption of the above measures could further provide opportunities for the emerging masterplan to complement and contribute to local Habitat Action Plans (not least for 'Ponds' and 'Chalk and Limestone Grassland').

Bicester Airfield LWS

9. Bicester Airfield LWS is designated primarily on account of its 'lowland calcareous grassland', with reference also made to the presence of open habitat mosaic on hardstanding, alongside areas of scrub. Updated survey work undertaken at the site by Ecology Solutions between 2018 and 2020 has reaffirmed the presence of these habitats, albeit with areas of dense scrub again considered to be detracting from the sites value in some areas. Indeed, comparison studies or aerial photography between 2004 and 2018 identify significant scrub encroachment in the south of the site.

10. In this regard, the site is considered to warrant its LWS status, albeit the site is considered to be of relatively reduced intrinsic value relative to the adjoining Stratton Audley Quarry LWS.

11. In this regard, it is important to note that true ecological value of a site, not simply its designation, should be afforded weight in the planning process. This mater has been made clear by the Planning Inspectorate (and subsequently confirmed by the Secretary of State) when considering a scheme at Hermitage Quarry (ref: APP/W2275/V/11/2158341). In this case it is stated by the Inspector that:

"7.39 It would be equally inappropriate if, in the face of evidence to the contrary, the quality of all Local Wildlife Sites (LWS) were treated as identical, notwithstanding the absence of any explicit policy distinction between one LWS and another"

12. The above has been given due regard as part of the emerging masterplan proposals for the site, ensuring that the quantum of facilitating development may be minimised within the Stratton Audley Quarry area.

13. Notwithstanding the above, the emerging proposals within Bicester Airfield LWS have again been guided by the existing ecological interest of the LWS. Whilst development in some areas will necessitate some losses to areas of the grassland mosaic (i.e. the habitat of greater value within the LWS), much of the emerging development is proposed within habitats of reduced interest (such as areas of dense scrub and young woodland in the south of the site), within the central airfield area or otherwise upon areas of existing hardstanding (development in this regard contributing to the restoration or reinstatement of high value heritage assets).

14. The avoidance of development upon habitats of comparatively greater value, where possible, is a key design principle for the emerging proposals and will ensure that the potential for adverse impacts to arise are minimised.

15. Additional design principles which further guide the emerging proposals within the airfield area include:

- Adoption of a sensitive habitat management plan for the site, to include measures in relation to scrub management.
- New structures to include for a range of designs which will incorporate biodiversity features including integrated features for bats, birds and invertebrates. This to include living roofs and bee banks incorporated into the design of partially sunken or 'camouflaged' structures such as bomb stores and motor vaults;
- The majority of semi-natural habitats to be retained and subject to an appropriate, ecology led management regime in the long-term.
- Acoustic earth banks to be designed in a manner that will ensure they provide optimal nest banks for solitary insects;
- All works to be undertaken with due regards to the presence or potential presence of protected and notable species, with appropriate methodologies agreed and licensed obtained (where relevant); and
- Adoption of an appropriate lighting strategy which will retain the vast majority of the site as a dark habitat and minimise light spill.

16. It is considered that adoption of the mitigation and enhancement principles set out above, not least management to facilitate qualitative enhancements to existing habitats, would be sufficient to ensure that the biodiversity interest of both Stratton Audley Quarry and Bicester Airfield LWS to be retained in the long-term.

17. Given the nature of the scheme and the separation of the wider site from any other non-statutory designated sites, it is not considered that any adverse impacts would arise on any other designated sites as a result of the emerging proposals.

Habitats within the Site

18. As identified in the baseline section above, the wider site supports a wide range of semi-natural habitats, including extensive areas of grassland, scrub, woodland, wetland and re-colonising ground.

19. In assessing and evaluating the biodiversity value of these habitats, consideration has been given to the intrinsic value of the habitats in isolation, as well as their value as a

component of a wider habitat mosaic. In regards the latter, it is noted that many of the habitats on site would together be considered to comprise Open Mosaic Habitat on Previously Developed Land (OMH). With this in mind, it is important to also consider the holistic impacts of the development proposals on this OMH. Such an assessment has been undertaken below.

20. As well as being of intrinsic value, OMH is of particular importance to many of the faunal species / assemblages within the site, as is discussed further in the faunal section below.

Species-poor Semi-improved Calcareous Grassland

21. Areas of species-poor semi-improved calcareous grassland are to be largely retained as part of the development proposals, with only minor losses to facilitate built form (vehicle tracks).

22. Given the minor losses and the low intrinsic value of this habitat, it is not considered that any specific mitigation would be required. The establishment of an appropriate management regime for retained grassland within the wider site will more than account for any minor losses in this regard.

23. Moreover, and as an enhancement, significant areas of the grassland are to be retained within the central airfield area and will be bought under a sensitive management regime allowing new areas of grassland to become botanically enhanced post development.

24. As detailed above, and noted within the Bicester Airfield LWS citation, the existing value of this grassland is greatly tempered by an intensive cut and leave management regime. Through implementing a reduced cutting regime, which allows for a proportion of wildflowers to flower and set seed each year and moreover removes the arisings to prevent nutrient build-up, it is considered that the value of this habitat may be significantly enhanced in the short to medium term.

25. Further enhancements, such as completion of a green hay translocation from adjacent (species-rich) grassland areas would further expediate the establishment of a botanically diverse sward in this area.

26. The implementation of an appropriate regime, as set out above, offers opportunities for the value of the grassland to be enhanced such that it may reach LWS condition in the short to medium term, ensuring new areas of species-rich grassland within the site. Such management would complement targets set within the Oxfordshire Local Biodiversity Action Plan (LBAP) for Calcareous Grassland as well as for the nearby Ray CTA, which include for the management, restoration and creation of lowland meadows.

27. Elsewhere, areas of the existing, species-poor grassland are proposed to be managed to deliver areas of irregularly disturbed ground, ephemeral vegetation and potentially mixed, unmetalled surfacing. This will serve to deliver extensive areas of high quality Open Mosaic Habitat which will be both heightened intrinsic value and moreover offer optimal opportunities for faunal species.

Semi-improved Neutral and Calcareous Grassland Mosaic

28. Areas of semi-improved neutral and calcareous grassland mosaic are again to be largely retained as part of the development proposals, particularly within Stratton Quarry LWS, where losses are largely confined to the east of this LWS (i.e. where the habitats are recorded to be of reduced botanical interest).

29. The vast majority of grassland/ephemeral mosaic within the central area of the quarry, which represents the most biodiverse example of this habitat within the site and is considered to be of value at the local level, is to be retained.

30. Losses to this habitat type elsewhere within the wider site are largely limited to the southern boundary where the grassland is notably less species-rich, significant scrub encroachment is apparent and where grassland grades into areas of recolonising hardstanding.

31. Where losses are envisaged, it is considered that these impacts may be appropriately mitigated through the adoption of an appropriate management regime across the wider site. In particular, areas of the neutral and calcareous mosaic would benefit from the commencement of a scrub management regime, to include the grubbing out of dense scrub stands (retaining scattered scrub pockets) and ensuring an appropriate meadow cutting regime. These measures would reverse a longer-term trend of adverse scrub succession, as well as the gradual succession of calcareous grassland to coarser, neutral grassland habitats of reduced botanical interest.

32. Again, the instigation of appropriate grassland and scrub management would complement the ambitions of the nearby Ray CTA, as well as the Oxfordshire LBAPs for *Calcareous Grassland* and for *Neutral Grassland and Grazing Marsh*.

Semi-improved Calcareous Grassland

33. Notwithstanding the variation in quality within this habitat type on Site, areas of semi-improved calcareous grassland remain of greater value within the context of the wider site and are considered to be of value at the local level.

34. Whilst much of the calcareous grassland will be retained as part of the scheme, approximately a third of the grassland is envisaged to be lost to the emerging proposals.

35. As above, the implementation of an appropriate management regime for grassland habitats across the wider site would offer opportunities to mitigate for losses in this regard.

36. Indeed, it is pertinent to note that management of the grassland on site would ensure qualitative enhancements to retained habitats in the short to medium-term, with this including the restoration of some areas of currently close mown and species-poor grassland within the central airfield area.

37. Securing appropriate management for retained grassland habitats will in turn allow for long-term qualitative enhancements to be delivered in line with local CTA and LBAP targets, the emerging proposals (in line with the measures set out above) may ensure qualitative gains to further mitigate any losses to existing grassland habitats.

Broad-leaved Semi-natural Woodland

38. The majority of the woodland lacks significant maturity, supporting an unremarkable range and composition of semi-mature trees and shrubs and a ground flora of a largely ruderal nature. On this basis, the woodland habitats are considered to be of comparatively reduced value relative to other habitats on site (such as much of the grassland mosaic).

39. Nonetheless, woodland is considered to be of some value at the site level. As such, emerging proposals seek to retain an area of woodland surrounding P12, as well as to

retain much of the woodland located at the boundaries of the wider site. However, there will be losses to areas of scrubby woodland in the south-west of the Site (in proximity to B22 – B24), as well as minor losses in the north of the wider site at the interface between Bicester Airfield LWS and Stratton Audley Quarry LWS.

40. Where losses are proposed, these will be mitigated for through new woodland planting elsewhere within the wider site. New woodland planting will comprise a wide range of native, wildlife beneficial species appropriate for the local area, ensuring qualitative and quantitative enhancements in this habitat type relative to the existing situation.

41. Further enhancements to areas of woodland will be secured in the long-term through the implementation of a sensitive management regime for the wider site. At this stage, it is considered that woodland management will be governed by the following principles:

- Control / removal of non-native, undesirable and overly dominant species;
- Rotational management to seek a diverse woodland structure with a gradation of habitats from mature woodland/trees to shrub and open areas with an established, shade tolerant ground flora, maximising the value of edge habitats; and
- Retention of standing and fallen dead-wood.

Dense and Scattered Scrub, Dense Scrub / Grassland Mosaic, Scattered Scrub

42. Areas of dense scrub are present within the quarry, with scrub pockets of varying density also present within the south of the wider site. Whilst some areas of scrub support a moderate range of woody species, extensive areas are dominated by just one or two species, frequently Bramble.

43. Scrub of varying density is also noted elsewhere across the wider site, frequently being a dominant component in a grassland / scrub mosaic.

44. Areas of scrub are of low intrinsic ecological value in the context of the wider site, typically being species poor and often including for non-native species. Moreover, existing areas of scrub within the site are outcompeting relatively richer ecological habitats such as areas of neutral and calcareous grassland. As such, in the absence of appropriate management, scrub encroachment will continue to result in a decline in the ecological value of the wider site overall.

45. The emerging development proposals will result in the loss of significant areas of scrub within the Site, both to facilitate areas of built form, as well as to facilitate sensitive habitat management in the long-term (i.e. to reverse the trend of ecological succession within grassland / OMH areas).

46. Notwithstanding the above, the retention of pockets of scrub will be an important principle governing long-term management, ensuring the structural and botanical diversity of retained habitats (particularly within the quarry) are maximised.

Reedbed

47. As is typical for this habitat type, the reedbed habitat within the wider site is of limited botanical diversity. The functional value of this habitat (i.e. as refuge for faunal species) is moreover tempered by its relatively small extent, with much of the habitat located away from areas of open water.

48. Whilst minor losses to reedbed habitat will be necessitated by the proposals, these are considered to be of negligible ecological significance. In any event, it is noted that emerging proposals seek to retain a diverse habitat mosaic within the quarry, of which reed-bed habitat will form an important component.

Marginal Vegetation / Marshy Grassland

49. Areas of marginal vegetation and marshy grassland are present within the quarry area of the wider site. These areas support a moderate range of wetland flora and are relatively small in their extent. Whilst this habitat is a valuable component of the OMH within the site (not least on account of its value to faunal species), the habitat is of reduced intrinsic value when considered in isolation.

50. Areas of marginal vegetation / marshy grassland are envisaged to be retained as part of the emerging proposals. Indeed, emerging restoration proposals, alongside long-term management which would be facilitated as part of the emerging masterplan, will give specific regards to retaining and enhancing this habitat as part of the emerging scheme.

51. Where SuDS are required to facilitate drainage proposals, these features will be designed to deliver additional ecological enhancements within the Site, seeking to replicate the wetland habitats of ecological value (either intrinsically or functionally) within the quarry area.

Water-bodies and Wet Ditches

52. The wetland habitats within the site vary considerably in their size, composition and value, ranging from larger lakes (such as P1, P10 and P12) to small flooded areas of hardstanding (such as D3).

53. Where larger lakes are present, these generally supported steeper banks, with a much reduced marginal vegetation and were moreover of reduced interest to invertebrates (see faunal section below).

54. Despite considerable variability between individual features, and the comparatively lower botanical interest of the larger waterbodies (P1, P10, P12) the wetland network overall is considered to be of higher ecological value in the context of the wider site (not least given its value to faunal species).

55. A key principle of the emerging development proposals is to avoid a net loss of waterbodies within the wider site. Indeed, emerging proposals for the quarry area (where all but one of the waterbodies – D3 – are located) will target a net gain of wetland habitats, with future management to maximise the diversity of these features, from large open and permanent pools to smaller, ephemeral features.

56. Where a degree of development is proposed adjacent to ponds, this is limited to within a proximity of P10 and P12, waterbodies supporting a reduced botanical assemblage at the margins and moreover of limited interest for protected and notable faunal groups (see faunal section below).

57. In light of the above, it is considered that the retention, creation and management of wetland habitats within the quarry area will ensure that the wetland interest of the wider site is fully retained and indeed enhanced as part of the emerging masterplan.

Hedgerows / Treelines

58. Hedgerows and/or treelines are present along much of the wider site perimeter, as well as at the boundary between the quarry and the airfield. These habitats support a typical range of woody species and frequently lack a true hedge structure, with an absence of management meaning that they have invariably developed into tree lines, scrub belts or have a gappy structure. The hedgerows / treelines are considered to be of ecological value in the context of the site only.

59. The emerging proposals seek to retain these habitats as part of the proposals and bring them under appropriate management in the long-term. The bolster planting or infilling of gappy areas of hedge will moreover serve to enhance the structural and botanical value of the hedgerows within the site, providing betterment relative to the existing situation.

Re-colonising Bare Ground

60. Areas of re-colonising bare ground are present within the quarry area of the site support a good range of plant species, albeit with the habitat overall being sparsely vegetated with large areas comprising bare ground. This habitat is therefore considered to be of intrinsic value in the context of the Site only. Its value to protected and notable species as part of a wider open habitat mosaic is further considered in the OMH and faunal sections below.

61. It is envisaged that any minor losses to bare ground areas will be more than mitigated through the implementation of an appropriate restoration scheme for the quarry (delivering a Nature Park) and, importantly, the implementation of an appropriate management regime for the quarry site in the long-term.

62. The adoption of such management is essential to the retention of a diverse OMH in the short-medium term, noting that many of the component habitats (including re-colonising bare ground) are ephemeral in nature and would be lost to ecological succession in the absence of any intervention.

Hardstanding / Bare Ground

63. Areas of hardstanding and bare ground which lack any significant colonisation by floral species are considered to be extremely limited ecological value (notwithstanding the rare presence of Basil Thyme).

64. Whilst no specific mitigation would be required for losses to these habitats, it is noted that emerging proposals will include for the provision of 'ecology car park' areas. These areas will seek to deliver semi-natural surfacing which may comprise unsealed hardstanding (such as gravels), re-enforced grass or bare ground areas within which a range of early ephemeral floral species can colonise. Further opportunities for the establishment of early successional habitats will be delivered through incorporating living roofs on the bomb stores, motor vaults and cabins as part of the emerging scheme.

Re-colonising Hardstanding

65. In some areas, hardstanding has become colonised by a modest range of early successional species. Given the greater degree of re-colonisation (and noting that the habitat type is noted in the Bicester Airfield LWS citation), these areas are considered to be of improved ecological interest in the context of the wider site.

66. Areas of re-colonising hardstanding are to be lost to the emerging proposals (not least to facilitate the preservation / restoration of heritage assets). Where losses are required, it is considered that these may be more than mitigated for through the delivery of new ecology car park habitats and living roofs as part of the emerging proposals (see above).

Buildings

67. The buildings within the site are of negligible intrinsic ecological value and no mitigation would be required for any losses / impacts.

Open Habitat Mosaic

68. As identified above, many of the individual habitats present within the wider site form integral components of a wider open mosaic of habitats (OMH). Combined together, these habitats support a wide and varied floral community, alongside a diverse habitat structure and are resultantly of enhanced (local) value.

69. The emerging proposals for the wider site have been specifically informed by the OMH present and indeed the retention of a diverse habitat mosaic form a key element of the scheme. As set out above, Ecology Solutions are currently advising on the preparation of an alternative restoration scheme for the quarry which recognises this valuable mosaic and ensures its retention as part of a biodiversity led approach to restoration. The emerging masterplan proposals seek to build upon the emerging restoration proposals and would facilitate the implementation of a dedicated biodiversity management regime for the quarry site in the long-term. This management would, amongst other matters, seek to control ecological succession within the site.

70. The emerging proposals would also secure appropriate management for habitats in the wider site, including the grassland and scrub mosaic present towards the periphery of the airfield.

71. In the absence of appropriate management (i.e. retention of the status quo), ecological succession will continue within areas of the wider site, resulting in on-going declines in the ecological value of habitats and, ultimately, the loss of many open habitats and a reduction in the overall habitat mosaic. Appropriate management interventions are therefore essential to ensure that the structural and botanical diversity of habitats are retained and enhanced in the long-term.

Summary

72. In summary, the wider site supports a varied mosaic of habitats ranging from bare and recolonising ground to semi-mature woodland and lakes.

73. Of greatest ecological interest within the site are the wetland and open habitats, particularly within the quarry where diverse OMH is present. The emerging masterplan proposals for the wider site give due regard to the presence of these habitats and indeed the retention of the mosiac is an essential design element guiding the overall proposals. To this end, a suite of avoidance, mitigation and enhancement principles are set out above. It is considered that the adoption of these measures, which would include for the implementation of appropriate habitat management in the long-term (to be secured by way of a suitably worded condition) would ensure that the emerging masterplan proposals will retain the ecological interest of the wider site and ensure that the scheme may fully accord with legislation and planning policy of relevance to nature conservation.

Faunal Evaluation

Bats

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

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

- damage or destroy any breeding or resting place used by bats;
- Intentionally or recklessly to obstruct access to any place used by bats for shelter or protection (even if bats are not in residence).

75. The words deliberately and intentionally include actions where a court can infer that the defendant knew that the action taken would almost inevitably result in an offence, even if that were not the primary purpose of activity. The offence of damaging or destroying a breeding site or resting place (which can be interpreted as making it worse for the bat) is an absolute offence. Such actions do not have to be deliberate for an offence to be committed.

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

77. **Site Usage.** None of the buildings within the site offer potential opportunities for roosting bats and moreover no evidence of roosting was recorded during the completion of internal and external survey work. Moreover, the trees within the wider site do not offer potential roosting opportunities bats due to them being generally semi-mature in nature, with an absence of any potential roost features.

78. Bat activity surveys in the form of static and transect surveys confirmed the Site to be subject to generally low levels of bat activity, with activity unsurprisingly higher in close proximity to linear vegetation, waterbodies and wooded belts (particularly near P12). Whilst a good range of bat species were recorded during the course of surveys, activity was found to be dominated by *Pipistrelle* bat species, with only a low level of registrations pertaining to other species.

79. **Avoidance, Mitigation and Enhancement Opportunities.** The vast majority of features identified to be utilised by foraging and commuting bats are envisaged to be retained as part of the proposals, with the quarry in particular to be retained as a Nature Park. Retained habitats will include existing waterbodies (notably the larger lakes), much of the woodland within the proximity of P12 and linear shrub and hedge planting towards the peripheries of the site. Moreover, extensive areas of grassland will be retained as part of the emerging scheme. The retention of these habitats will allow for continued commuting opportunities for bats both within the wider site and the local area, avoiding any potential habitat fragmentation.

80. Management of new and retained habitats will give due regard to bats. In the proposed Nature Park for example, a diverse habitat mosaic will be retained, including for areas of woodland and mature scrub, species-rich grassland, herb-rich short perennial and ephemeral habitat and a mosaic of waterbodies, with this providing optimal bat foraging habitat. Elsewhere, such as at the site boundaries, management will seek to optimise the structure of linear features, maximising their value as commuting corridors.

81. The adoption of a sensitive lighting scheme during the construction phase, to include the avoidance of after dark lighting wherever possible, would be sufficient to ensure that adverse impacts on foraging and commuting bats may be avoided.

82. Where lighting is proposed during the operational phase, the emerging proposals seek a design approach which minimises adverse impacts on light sensitive species. The siting of individual lighting columns (to comprise LED lighting with no UV content) will be considered such that the lighting requirements for areas of built form can be met with minimal spill onto semi-natural habitats. Where necessary, screening vegetation will be provided to minimise light spill into wider semi-natural areas. Additionally, accessories (such as baffles, hoods or louvres) will be utilised to further minimise light spillage and direct light below the horizontal plane to where it is required (limiting light to an angle of 70 degrees or below wherever possible). It is proposed for new lighting to comprise warm white LED with a colour temperature of 3000K or below.

83. It is moreover considered that the emerging masterplan proposals offer significant opportunities to realise enhancements for roosting bats. Such enhancements will include for the provision of integrated roosting features within new and/or retained buildings, in addition to the provision of roosting boxes on suitable retained trees within the site. These measures will ensure a range of new roosting opportunities within the Site, benefiting many species noted on the national BAPs including Soprano Pipistrelle, Brown Long-eared Bats, Barbastelle and Noctule.

84. In summary, the retention and enhancement of extensive areas of semi-natural habitat and the strengthening of boundary vegetation would ensure continued and indeed enhanced foraging and commuting opportunities for bats within the local area. The adoption of a sensitive lighting strategy would further ensure that light spill is avoided onto new and retained habitats. The provision of extensive new roosting opportunities, integrated roosting features and the provision of bat boxes upon retained trees would ensure a significant increase in roosting opportunities for bats.

Badgers

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

86. As well as protecting the animal itself, the 1992 Act also makes the intentional or reckless destruction, damage or obstruction of a Badger sett an offence. A sett is defined as “any structure or place which displays signs indicating current use by a Badger”.

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

88. Previous guidelines were issued by Natural England on the types of activity that it considers should be licensed within certain distances of sett entrances. They stated that

works that may require a licence include using heavy machinery within 30m of any entrance to an active sett, using lighter machinery within 20m, and light work such as hand digging within 10m. However, guidance issued by Natural England in September 2007 specifically stated that:

"It is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if no Badger is disturbed and the sett is not damaged or obstructed."

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

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

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

92. **Site Usage**. Several Badger setts were recorded within the east of the site (see confidential Plan ECO5), although none of these were considered to comprise a main sett.

93. The habitats within the Site provide a range of foraging opportunities for Badger, however only relatively low levels of foraging were recorded.

94. **Avoidance, Mitigation and Enhancement Opportunities**. At this stage it is considered likely that one inactive sett (S1) would be lost to the emerging masterplan proposals given its proximity to existing built form (to be subject to restoration or demolition). The remaining 5 setts are envisaged to be retained and safeguarded as part of the proposals and as such it is not considered that a Natural England Badger licence would be required.

95. In regards foraging opportunities, it is noted that extensive areas of optimal foraging habitat are to be retained as part of the emerging proposals, with new landscaping (to include the provision of native fruiting species) to provide continued opportunities for this faunal group within the Site.

96. In light of the above, it is considered that the emerging masterplan proposals will ensure foraging and sett building opportunities for Badgers will be retained as part of the proposals.

97. Notwithstanding the above and given the mobile nature of Badgers, further update survey work would be undertaken at a detailed stage of planning to further inform the proposals, as well as prior to any construction works on site.

98. Subject to the findings of updated surveys in due course, forthcoming works may require a Natural England licence will be required to facilitate elements of the emerging masterplan. The emerging development proposals would easily be able to accommodate any mitigation measures which may be required as part of this licence process (including an artificial sett in the unlikely scenario that this is required).

Amphibians

99. **Legislation**: All British amphibian species receive a degree of protection under the 1981 Wildlife and Countryside Act (as amended). The level of protection varies from protection from sale or trade only, as is the case with species such as Smooth Newt and Common Toad, to the more rigorous protection afforded to Great Crested Newts, which is protected at the European level.

100. Although Great Crested Newts are regularly encountered locally and throughout much of England, the UK holds a large percentage of the world population of the species. As such the UK has an international obligation to conserve the species and they receive full protection under domestic and European legislation and are a material consideration under NPPF.

101. Great Crested Newts are also listed in Annex IV(a) of the European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, more commonly known as the Habitats Directive. The Habitats Directive was transposed into UK law by the Conservation of Habitats and Species Regulations 2017 (as amended), which lists Great Crested Newts under Schedule 2.

102. The legislation includes provisions making it an offence to:

- Deliberately to kill, injure or take (capture) Great Crested Newts;
- Deliberately to disturb Great Crested Newts in such a way as to:-
    1. Be likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or to hibernate or migrate; or
    2. Affect significantly the local distribution or abundance of the species to which they belong;
- Deliberately takes or destroys the Great Crested Newts eggs;
- To damage or destroy any breeding or resting place used by Great Crested Newts;
- Intentionally or recklessly to obstruct access to any place used by Great Crested Newts for shelter or protection (even if individuals are not in residence).

103. Licences can be granted that would permit otherwise unlawful activities. In every case, a licence cannot be granted unless:

i. There is no satisfactory alternative; and
ii. The action authorised would not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

104. It should be noted that a licence could only be granted following the receipt of a full valid planning permission.

105. **Site Use**: Specific surveys have confirmed the site to support a medium population size class of GCN (peak count of 89), with this population largely limited to six of the ponds within the quarry part of the wider site.

106. A small subset of the Site's GCN population was recorded in waterbody D3 (peak count of 3), located in the south of the Site. Given the separation of this waterbody from any other breeding ponds (and indeed non-breeding ponds), this population is likely to comprise a remnant, isolated population, which potentially benefits from infrequent migration from the GCN meta-population within the quarry area of the site.

107. Avoidance, Mitigation and Enhancement Opportunities. The presence of GCN within the wider site is a material consideration in the planning process and a mitigation and enhancement strategy for this faunal group will underpin the emerging masterplan proposals for the wider site.

108. The following principles will be integral to the emerging masterplan proposals for the wider site:

- To manage the quarry area as a Nature Park and ensure appropriate habitat creation and management which will retain and enhance the value of the site to GCN in the long-term;
- To deliver a net gain of ponds suitable for breeding GCN within the site (this to be focused within the quarry area).
- Habitat creation and management across the wider site (as detailed in habitats section above) to be sensitive to the presence of GCN and to seek enhancements for this faunal group;
- To minimise built form within core GCN habitat zones, seeking only small-scale and/or raised infrastructure in these areas;
- Any proposed infrastructure to be designed with due regard to minimising impacts on GCN with measures such as permanent exclusion features, dropped kerbs and amphibian friendly drainage feature to be utilised as required to ensure adverse impacts are avoided; and
- Provision of educational facilities and signage for future users which provide information on GCN ecology.

109. Whilst a detailed mitigation strategy would need to be agreed with Natural England as part of a European Protected Species Licence, careful consideration has been given to an appropriate strategy at this stage which would allow the existing population to be safeguarded at a Favourable Conservation Status (FCS) within the site post-development.

110. At this stage it is considered that a GCN translocation exercise will be required within the wider site, with this facilitating capture of GCN within the known breeding ponds, as well as surrounding terrestrial habitats.

111. Prior to any translocation commencing, it is anticipated that an appropriate area (or areas) within the quarry would be identified as temporary 'holding area(s)' for GCN. The holding area(s), which would include for breeding ponds as well as high quality terrestrial habitats, would be subject to sensitive enhancements as required to maximise their holding capacity prior to any translocation commencing. Following these enhancements, the holding area(s) would be enclosed by perimeter herpetofauna fencing and GCN would be translocated to them from the wider site (where necessary). Only following the completion of a sufficient trapping exercise (at this stage anticipated to be a minimum 60 days based on the population size class) would habitats in the wider site be declared 'trapped out' and construction works allowed to commence.

112. GCN would be retained within the holding area until the completion of habitat creation and enhancement across the wider quarry (this envisaged to be undertaken as the first stage of works), at which time fencing would be removed and GCN allowed to re-populate the wider quarry site. GCN exclusion fencing would remain, as required, around the wider site to prevent GCN from accessing active construction areas, until the completion of relevant works.

113. In complying with the above principles, it is considered that the emerging masterplan proposals, in accordance with any forthcoming restoration of the quarry, would allow GCN to be retained within the site at a FCS in the long-term.

Reptiles

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

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

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

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

- deliberate killing and injuring;
- being sold or other forms of trading.

117. **Site Use**: Two species of common reptile were recorded during the course of the surveys undertaken, Common Lizard and Grass Snake. In line with guidance on population size set by HGBI, it is considered that the site supports a low to medium population of Common Lizard (around 36/ha) and a low population of Grass Snake (<2/ha).

118. Higher populations of were recorded within the quarry area of the site, whilst the large central area of close mown grassland is considered to be unsuitable to support reptiles.

119. **Avoidance, Mitigation and Enhancement Opportunities**: The majority of suitable grassland habitats within the wider site, including those habitats identified to be of relatively higher value to reptiles (such as within the quarry) are envisaged to be retained as part of the emerging masterplan and will ensure continued foraging, breeding and resting opportunities for common reptiles.

120. Moreover, the removal of significant areas of dense scrub and young woodland in favour of meadow grassland creation / restoration, as well as the implementation of a scrub management regime in the long-term will mitigate for losses of suitable habitat to built form and ensure that suitable reptile habitat is retained within the site in the long-term. This contrasts with a no development situation within which unchecked scrub succession would continue to reduce the extent of reptile habitat within the wider site, not least within the quarry area and along the southern edge of the airfield.

121. As for GCN above, construction works in some areas may necessitate the completion of a translocation exercise, with reptiles relocated to temporary holding area(s) for the duration of the construction phase. It is noted that in many instances it is likely to be more appropriate for reptiles to be displaced by way of a sensitive habitat manipulation exercise rather than a translocation exercise, given that proposed built form will be located adjacent to extensive areas of retained grassland areas.

122. In summary, it is considered that the implementation of a suitable reptile avoidance strategy during the construction phase, alongside the retention and enhancement of vast areas of grassland within the site (not least within the quarry area) will ensure that reptiles are not only safeguarded within the site during construction, but that opportunities for this faunal group may be significantly enhanced in the long-term as part of the emerging masterplan.

Breeding Birds

123. **Legislation**. Section 1 of the Wildlife & Countryside Act is concerned with the protection of wild birds. With certain exceptions all wild birds and their eggs are protected from intentional killing, injuring and taking; and their nests, whilst being built or in use, cannot be taken, damaged or destroyed.

124. Schedule 1 of the Wildlife & Countryside Act 1981 is a list of the nationally rarer and uncommon breeding birds for which all offences carry special (i.e. greater) penalties. These species also enjoy additional protection whilst breeding, as it is also an offence to disturb adults or their dependant young when at the nest.

125. **Site Usage.** Breeding bird surveys of the wider site have confirmed the site to be of moderate interest to breeding birds, with this interest largely associated with the scrub habitats within the wider site, as well as open habitats which support a good number of territories for ground nesting species such as Skylark and Meadow Pipit. Of additional note was the presence of a breeding Lapwing pair within the quarry.

126. The majority of interest was found to be associated with the quarry area of the site, with slightly reduced breeding interest associated with the scrub and grassland areas which form part of Bicester Airfield LWS. The large central area of grassland was found to be of very limited interest to breeding birds.

127. Given the sensitivity of Lapwing to even low levels of anthropogenic disturbance, and notwithstanding the retention of suitable habitat within the proposed Nature Park, it is considered likely that this species would be lost as a breeding species within the site. It is important to note that this same outcome would be likely whatever the nature of the restoration works within the quarry (the scheme previously being enforced by the County Council sought delivery of a country park designed to support intensive recreation) and the impact, whilst unfortunate, should be viewed in this context.

128. Notwithstanding some losses to grassland and scrub within the wider site, extensive suitable habitat will be retained for scrub and ground nesting birds and impacts on the breeding assemblage overall are not considered to be significant.

129. **Avoidance, Mitigation and Enhancement Opportunities**. Any vegetation removal (including grassland) required by the emerging masterplan would be undertaken outside of the main nesting season (March to August inclusive) unless prior checks of potential nesting areas are undertaken by an ecologist to ensure no nesting birds are present. Should nests be present, they will be protected until it can be confirmed that fledglings have left the nest.

130. Where losses to existing nesting habitats are envisaged, these will be appropriately mitigated for through the provision of new shrub, scrub and tree planting at the boundaries of the site, with this to comprise native thicket and berry bearing species which provide foraging habitat, as well as high quality nesting opportunities for scrub nesting species such as Whitethroat, Linnet and Dunnock. It should be noted that extensive areas of scrub and grassland mosaic will also be retained within the proposed Nature Park on Site, albeit with the extent of scrub to be reduced and kept in check through appropriate long-term management. The retention of scattered scrub within the wider site, will further ensure continued opportunities for scrub nesting species. Moreover, the adoption of a sensitive management regime for grassland within the Site will ensure a net gain in suitable habitat for ground nesting birds.

131. To realise an enhancement for a range of species, the emerging proposals will include for the provision of a range of nesting features within the site, with this to include integrated features within buildings, as well as the provision of boxes upon retained trees. The design of bird boxes will be tailored to those species recorded within the site (targeting species such as Tawny Owl, House Sparrow and Swift), as well as species likely to be present in the local area.

132. In summary, the establishment of an extensive mosaic of habitats, all of which will be subject to ecologically sensitive management in the long-term, as well as the provision of new nesting features, will realise significant enhancements for nesting birds over the existing situation, ensuring that the qualitative value of foraging and nesting habitat is retained and enhanced going forward.

Wintering Birds

133. **Site usage.** The wintering bird surveys undertaken in 2019 found the site to support a modest assemblage of wintering birds, reaffirming the limited opportunities the site provides for this faunal group. Whilst notable farmland bird species (Skylark and Grey Partridge), were recorded in grassland areas of the airfield, these were only in tiny numbers, with the quarry area being of relatively greater interest.

134. **Avoidance, Mitigation and Enhancement Opportunities**. Given the limited interest of the site, it is not considered that any specific mitigation would be required as part of the emerging proposals.

135. Notwithstanding this position, it is noted that the emerging proposals will retain extensive areas of green space within the scheme, including the varied habitat mosaic within the quarry site and extensive areas of grassland and scrub within the wider airfield.

136. Through retaining these habitats, it is considered that existing opportunities for wintering birds can be maintained as part of the emerging proposals. In particular, it is noted that the three large waterbodies are to be retained as part of the proposals, with the northern

feature to be managed specifically for the benefit of waterfowl (with no built form proposed within a close proximity).

Invertebrates

137. Site Usage: The wider site supports a notable population of invertebrates, with a total of 717 species recorded. No species afforded direct legal protection under any UK or European legislation were recorded during the surveys.

138. Analysis using Pantheon has shown that a range of broad habitat types across the wider site are of heightened value to invertebrates, with wetland habitats and open habitats (short sward and bare ground) of particular importance.

139. The SQI scores for these comparatively more valuable habitats fall below the approximate threshold of a 'good' site supporting a regionally important invertebrate fauna. Nonetheless, noting the location of the site and the presence of regionally rare species, the assemblage supported in these areas are considered to be of regional significance.

140. Whilst emerging masterplan proposals would result in the loss of some areas of OMH, extensive areas of OMH would be retained and enhanced as part of the emerging proposals.

141. Avoidance, Mitigation and Enhancement Opportunities. The retention of a diverse area of OMH within a Nature Park setting (quarry), alongside the retention of extensive areas of OMH and grassland within the airfield area, and the potential to for development to facilitate a sensitive management regime for these habitats in the long-term, offers significant opportunities for the invertebrate interest of the site to be retained and enhanced post-development. Further opportunities will be realised through the creation/enhancement of extensive areas of specie-rich calcareous grassland, as well as structurally diverse ephemeral vegetation and unmetalled surfacing within the airfield area (habitats which currently comprise species-poor grassland).

142. Indeed, the presence of a notable invertebrate assemblage is one of the key considerations guiding both the emerging masterplan proposals and indeed a revised restoration scheme for the quarry area.

143. The emerging masterplan has adopted the following core principles and measures which seek to safeguard the sites invertebrate interest:

- To retain extensive areas of OMH, in particular within the quarry area but also within the airfield area of the wider site.
- To ensure that emerging proposals are complementary to restoration of the quarry and facilitate an appropriate long-term management regime (for both the quarry and the wider site) which may retain and enhance the OMH in the long-term;
- Retention of a diverse topography, particularly within the quarry where spoil mounds and wet depressions offer a range of micro-habitats for invertebrate assemblages;
- Retained areas of scrub to include a high proportion of early flowering species such as Blackthorn and Goat Willow which provide a valuable early foraging resource for nectar feeding insects;
- Areas of built form to be sensitive to invertebrates, minimise ground impacts and to incorporate features of value to invertebrates including:

- Development in the quarry to be largely restricted to low impact buildings and structures with small development footprints, integrated nesting walls and living roofs. Raised (stilted development) will further minimise losses to OMH.
- Areas to be utilised for car-parking and/or vehicle movement to be constructed from appropriate materials upon which early successional habitat and ephemeral vegetation can establish. Surfaces in this regard to be unmetalled, with materials such as compacted soils, gravels and reinforced grass (comprising bespoke seed mixes) to be considered as appropriate.
- Extensive new OMH and meadow habitat to be created within central airfield.
- Bomb stores and Motor Vaults to be encapsulated by earth banks. These banks to be designed as 'bee banks' with species rich grassland and OMH.
    - Bunding and banks elsewhere within the wider site, such as acoustic bunding (if required) around the track to further be designed so as to provide optimal nesting opportunities.
    - Bomb stores and Motor Vaults to further seek opportunities for living roof provision.
- Educational facility to inform potential users of the value of the site to invertebrates, identifying the importance of these often cryptic or hidden assemblages.

144. It is considered that the adoption of the above measures, to be fine-tuned as necessary following completion of further invertebrate survey work, would allow for the invertebrate interest of the Site to be safeguarded and indeed enhanced post-development.

APPENDIX 7

Aerial Photographs Showing

Scrub Enhancement


Bicester Airfield
2004 Aerial
A4421
Beverley Gardens
Sunderland Dr
Fulmar Cl
Google Earth
© 2019 Infoterra Ltd & Bluesky
N
300 m


Bicester Airfield
2018 Aerial
Beverley Gardens
Sunderland Dr
A4421
Fulmar Cl
Boston Rd
Google Earth
N
300 m

APPENDIX 8

Examples of Suitable Bat and Bird Features

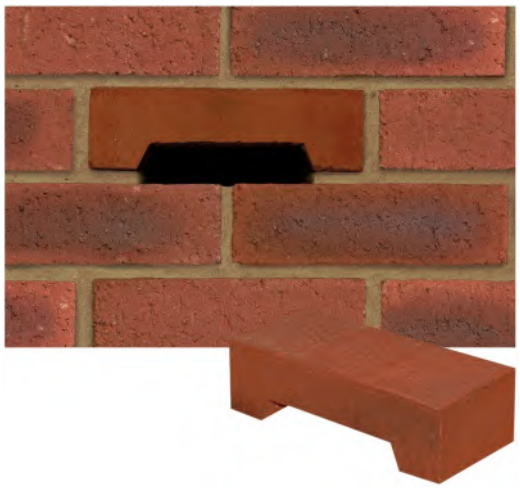
Bat Boxes

Ibstock Bat Box A

A discrete, easy to install single bat brick that allows bats to create a natural home habitat within the cavity of the building

Height: 215mm
Width: 65mm

Please note that this box is designed to be installed flush with a wall.



Enclosed Bat Box B

This bat box is designed specifically for the pipistrelle bats, providing a discrete roosting feature which is available in all brick types.

Bats are contained within the bat box itself, within which several roosting zones are provided.

This feature is maintenance free and ideal for new build & conservation work

Height: 290mm
Width: 215mm

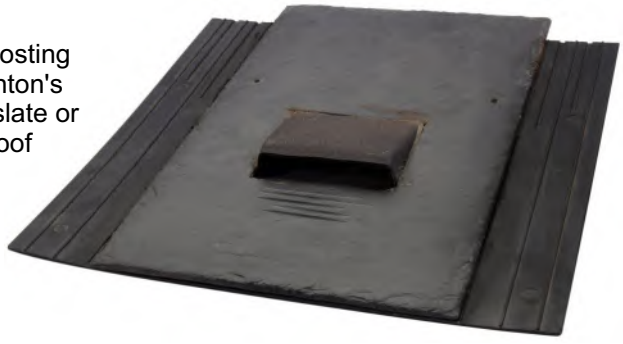
Please note that this box is designed to be installed flush with a wall.

Habibat Bat Access Slate

The Bat Access Slate consists of a standard sized slate, with a capped vent which allows access to roof felt (for roosting Pipistrelles) or roof space (for Serotine, Leisler's, Daubenton's and Barbastelle Bats). We can supply either a standard slate or custom slate that is coloured and sanded to match your roof exactly.

Height: 215mm
Width: 65mm
Depth: 80mm

Habibat Bat Access Slates are made to order and you may need to provide a slate to the manufacturer for customisation. Slates are shipped direct from the manufacturer and will incur a shipping cost of £30-40 (ex VAT) for between one and ten slates. Delivery time is expected to be 2 - 3 weeks.



Images and text adapted from manufacturer's websites:

www.ibstock.com/eco-products
www.habibat.co.uk

ECOLOGYSOLUTIONS

Bat Boxes

Schwegler bat boxes are made from ‘woodcrete’ and have the highest rates of occupation of all types of box.
The 75% wood sawdust, clay and concrete mixture is ideal, being durable whilst allowing natural respiration and temperature stability. These boxes are rot and predator proof and extremely long lasting.
Boxes can be hung from a branch near the tree trunk or fixed using ‘tree-friendly’ aluminum nails.

1FF Bat Box

The rectangular shape makes the 1FF suitable for attaching to the sides of buildings or in sites such as bridges, though it may also be used on trees. It has a narrow crevice-like internal space to attract Pipistrelle and Noctule bats.

Woodcrete (75% wood sawdust, concrete and clay mixture)
Width: 27cm
Height: 43cm
Weight: 8.3kg

2FN Bat Box

A large bat box featuring a wide access slit at the base as well as an access hole on the underside. Particularly successful in attracting Noctule and Bechstein’s bats.

Woodcrete construction, 16cm diameter, height 36cm.

2F Bat Box

A standard bat box, attractive to the smaller British bat species. Simple design with a narrow entrance slit on the front.

Woodcrete construction, 16cm diameter, height 33cm.

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Images and text adapted from manufacturer’s website: *https://www.schwegler-natur.de/fledermaus/?lang=en*

1FW Bat Hibernation Box

This huge box is designed to provide a protected environment which is particularly important through the cold winter months when bats are hibernating. Three wooden panels within the box imitate crevices for roosting.

Woodcrete construction, 38cm diameter, height 50cm, weight 28kg.

This heavy box requires secure mounting if placed above the ground and should be sited away from public areas.

1FD Bat Box

A larger than standard bat box, with two additional roughened l wooden panels inside to be used by the bats as perches.

Woodcrete construction, 16cm diameter, height 36cm.

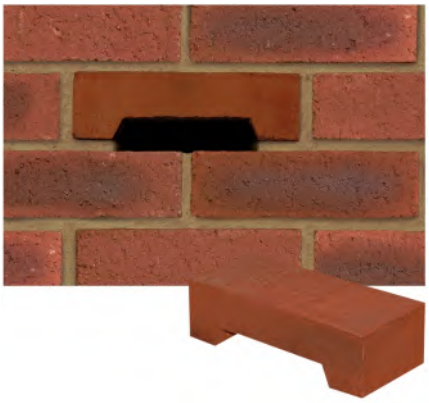
Habibat Bat Box (Rendering)

The Habibat Bat Box is a large, solid box made of insulating concrete with an internal roost space, which can be incorporated into the fabric of a building as it is built or renovated. A variety of facings can be fitted to suit any existing brick, wood, stonework or rendered finish, rendering the box unobtrusive and aesthetically pleasing.

The Habibat box is suitable for species which are commonly found roosting in buildings in the UK.

Height: 440mm, Width: 215mm, Depth: 102mm, Weight: 8kg

Please note that the Habibat box should be located on southerly aspects and positioned ideally near the eaves or gable apex of the property with a minimum of 2m but preferably 5-7m above the ground. Placement above windows, doors and wall climbing plants should be avoided.



Ibstock Bat Box A

A discrete, easy to install single bat brick that allows bats to create a natural home habitat within the cavity of the building

Height: 215mm Width: 65mm

Please note that this box is designed to be installed flush witha wall.

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Bird Boxes

Schwegler bird boxes have the highest rates of occupation of all types of box.

They are designed to mimic natural nest sites and provide a stable environment with the right thermal properties for chick rearing and winter roosting.

Boxes are made from ‘Woodcrete’. This 75% wood sawdust, clay and concrete mixture is breathable and very durable making these bird boxes extremely long lasting.

1B Schwegler Bird Box

This is the most popular box for garden birds and appeals to a wide range of species. The box can be hung from a branch or nailed to the trunk of a tree with a ‘tree-friendly’ aluminium nail.

Available in four colours and three entrance hole sizes. 26mm for small tits, 32mm standard size and oval, for redstarts.

1SP Schwegler Sparrow Terrace

A Woodcrete bird box which allows for several Sparrow pairs to nest in a single location. The box can either be integrated within the fabric of a building or otherwise fitted to the exterior of the building walls.

Brood chamber dimensions: Height: 16cm, Width: 10.5cm, Depth: 15cm

External dimensions: Height: 24.5cm, Width: 43cm, Depth: 20cm

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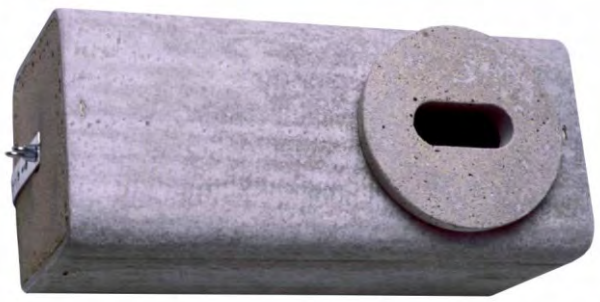
Images and text adapted from manufacteres websites.

Bird Boxes

2HW Schwegler Bird Box

This is designed for species that nest in cavities or recesses, such as Redstart, Wagtail and Flycatchers, in addition to Robin and Wren.
The box can be hung from walls using hanger and aluminium nail supplied.



No. 17 Schwegler Swift Nest Box

A Woodcrete bird box designed to appeal to Swifts. Due to its light weight these boxes can be easily mounted on existing external walls.
Should be installed at least 6-7m above ground preferably under the shelter of eaves or overhanging roofs.

2M Bird Box

A free-hanging box offering greater protection from predators.
Supplied complete with hanger which loops and fastens around a branch.

With standard general-purpose 32mm diameter entrance hole.
Schwegler boxes have the highest occupation rates of all box types. They are carefully designed to mimic natural nest sites and provide a stable environment for chick rearing and winter roosting. They can be expected to last 25 years or more without maintenance.

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Bird Boxes

Schwegler bird boxes have the highest rates of occupation of all types of box.
They are designed to mimic natural nest sites and provide a stable environment with the right thermal properties for chick rearing and winter roosting.
Boxes are made from 'Woodcrete'. This 75% wood sawdust, clay and concrete mixture is breathable and very durable making these bird boxes extremely long lasting.

5 Owl Box

This bird box is most suitable for tawny owl, stock dove, jackdaw, and in suitable areas goldeneye and goosander. The box can be hung from a branch or nailed to the trunk of a tree with a 'tree-friendly' aluminium nail.

Hanging height 4m.

Entrance hole 110 x 120mm.

28 Kestrel Box

Best sited in single trees, at the edge of quiet woods, or in barns, at least 6m high. If used in towns place on larger buildings, chimneys or church towers. In treeless areas the box can be put up on a pole at least 3m high.

Internal dimensions 30 x 30cm
Height 34cm
Entrance hole 17 x 24 cm

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