

Heyford Park

Designated Sites, Habitats and Plants
Baseline Report

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1 Introduction

Background to Commission

- 1.1 Dorchester Living Limited is bringing forward a proposal for the redevelopment of part of the former RAF Upper Heyford airfield and buildings. The boundary of this site (hereafter referred to as 'the Application Site') is shown in Figure 1.
- 1.2 In order to develop a baseline to inform the Environmental Impact Assessment which is to be carried out for this proposed development, BSG Ecology was commissioned in February 2017 to carry out a number of ecology surveys. These included an Extended Phase 1 Habitat Survey of the Application Site.

Site description

- 1.3 The Application Site measures 455.5 ha and is located largely to the north of the town of Upper Heyford, Oxfordshire (Central grid reference SP514267). It comprises large areas of grassland habitats around an airfield with numerous hangars and other large buildings. Small woodland plots are present in isolation around the Application Site. The southern part of the Application Site largely consists of more densely packed buildings with small amenity grassland areas and scattered trees. Photographs of the Application Site are given in Appendix 1.
- 1.4 The Application Site is largely surrounded by agricultural land in the wider landscape, though residential development borders much of the southern part of the Application Site.

Aims of study

- 1.5 This study aims to:
- Identify and present information pertaining to internationally important statutory sites of nature conservation interest within 5 km and nationally important statutory and all non-statutory sites within 2 km of the Application Site;
 - Characterise the habitats present within the Application Site;
 - Identify any habitats within the Application Site which are of particular conservation interest;
 - Identify hedgerows that meet the criteria for determining 'Important' hedgerows under *Wildlife and Landscape* in Schedule 1 of the Hedgerow Regulations 1997.

2 Methods

Designated sites

- 2.1 A search for internationally important statutory designated wildlife sites within 5 km of the Application Site was carried out using the Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk), which was accessed on 4 September 2017.
- 2.2 MAGIC was also accessed (on 4 September 2017), for information on Impact Risk Zones (IRZs). *'Natural England has produced guidance on the potential impacts of development on Sites of Special Scientific Interest to ensure their protection and enhancement in line with the policies in the NPPF and development plans. IRZs are a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts'* (Natural England, 2016).
- 2.3 A search for nationally important statutory and all non-statutory designated wildlife sites within the Application Site and in areas within 2 km of the Application Site was undertaken by Thames Valley Environmental Records Centre (TVERC) on 3 September 2017. TVERC also supplied records of legally protected and notable species held from within a 2 km radius of the Application Site.
- 2.4 Information on soils present at the Application Site was obtained from Cranfield University's Soilscales website (<http://www.landis.org.uk/soilscales/>) on 10 April 2017.

Phase 1 habitat survey

- 2.5 A extended Phase 1 habitat survey of the Application Site was carried out on 05 April, 06 April, 18 April, 22 May and 10 August 2017 by Stephen Beal ACIEEM. Stephen is a Senior Ecologist at BSG Ecology, with over seven years' experience conducting habitat and botanical surveys.
- 2.6 National Vegetation Classification (NVC) surveys were conducted within the site in 2014, 2015 and 2016 (VSA, 2014; VSA, 2015; 4Acre Ecology, 2016). These reports were reviewed and interpreted to support the Phase 1 habitat survey.
- 2.7 The survey methodology was based on that described in the Handbook for Phase 1 Habitat Survey (JNCC, 2010). Habitats present at the Application Site were identified and mapped, and target notes were made for features of potential ecological interest. Plant species present in each of the major habitat types were recorded. Scientific names of plants follow Stace (2010).
- 2.8 Freely available aerial imagery from Bing Maps (www.bing.com/maps) was used to aid in the mapping of habitats.

Hedgerow survey

- 2.9 Hedgerow surveys were carried out at the Application Site in addition to the extended Phase 1 habitat survey. Hedgerow surveys were carried out by John Baker MCIEEM on 8 and 13 September 2017.
- 2.10 During hedgerow surveys, further information was collected, including the presence of:
- a bank or wall
 - fewer than 10% gaps
 - standard trees

- woodland species¹
- an adjacent ditch
- a score of four or more points in connection with sub-paragraph 5 of paragraph 7 of the *Wildlife and Landscape* criteria in the list of *Additional Criteria for Determining "Important" Hedgerows* included in Schedule 1 of the Hedgerow Regulations 1997
- a parallel hedgerow within 15 m.

2.11 Freely available aerial imagery from Bing Maps (www.bing.com/maps) was used to aid in the mapping of hedgerows.

Assessment of habitats present

2.12 The habitats present were assessed to determine their likely conservation value. This included reviewing criteria for Habitats of Principal Importance (HPI) in England (under Section 41 of the NERC Act 2006) and determining whether they qualify for habitats listed elsewhere such as in Annex I of the EU Habitats Directive. The presence of a HPI would be a planning consideration in accordance with the NERC Act 2006.

Limitations to methods

2.13 The surveys were carried out during suitable times of the year. Time of year, weather conditions and site accessibility did not impose any significant constraints on the survey.

2.14 All parts of the Application Site were accessible, apart from the interior of areas of dense scrub.

¹ As per the list of Woodland Species included in Schedule 2 of the Hedgerow Regulations 1997.

3 Results and Interpretation

Designated wildlife sites

Statutory designated sites

- 3.1 There are no internationally designated statutory sites (such as Ramsar sites or Special Protection areas) within 5km of the Application Site.
- 3.2 There is one statutory designated site within 2 km of the Application Site boundary cited for its biological value: Ardley Cutting and Quarry Site of Special Scientific Interest (SSSI) (shown in Figure 1). This near-linear 40 ha site is located 130 m from the Application Site boundary to the north-east at the closest point and runs north-west to south-east. Therefore the Application Site falls partly within the IRZ for this designated site. It is cited for its biological interest (as well as geological) which includes:
- Limestone grassland on the steep banks of the railway cutting and the adjacent quarry which forms the main biological interest. It is one of the largest limestone grassland sites in the Oxfordshire Cotswolds where unimproved grassland is now very rare. The tall sward is either dominated by upright brome *Bromopsis erectus* or a mixture of brome and tor-grass *Brachypodium pinnatum*. The grassland contains a variety of species associated with limestone grassland including quaking grass *Briza media*, basil thyme *Acinos arvensis*, clustered bellflower *Campanula glomerata*, dropwort *Filipendula vulgaris* and sainfoin *Onobrychis viciifolia*. Other species which are locally common in the sward include horseshoe vetch *Hippocrepis comosa*, kidney vetch *Anthyllis vulneraria*, glaucous sedge *Carex flacca*, blue fleabane *Erigeron acer*, bee orchid *Ophrys apifera*, green-winged orchid *Orchis morio* and cowslip *Primula veris*.
 - Woodland which includes species such as lords and ladies *Arum maculatum*, wood anemone *Anemone nemorosa* and the uncommon green hellebore *Helleborus viridis*.
 - A seasonally dry pool at its base which is contiguous with a low lying, marshy section containing willow carr and a flora dominated by soft rush *Juncus effusus*, reedmace *Typha latifolia*, reed canary grass *Phalaris arundinacea*, and water mint *Mentha aquatica*.
 - The invertebrate fauna is particularly rich along the railway cutting, with large populations of calcareous grassland butterflies like small blue *Cupido minimus*, brown argus *Aricia agestis*, dark green fritillary *Argynnis aglaja*, green hairstreak *Callophrys rubi* and Duke of Burgundy *Hamearis lucina*, all of which are uncommon in Oxfordshire. There is also a colony of the nationally rare four-spotted moth *Tyta luctuosa* whose larvae feed on field bindweed *Convolvulus arvensis*, as well as the nationally uncommon leaf beetles *Cryptocephalus hypochaeridis* and *C. moraei*.
 - The Cutting and adjacent quarry also support a large population of great crested newt *Triturus cristatus* which spreads into several adjacent quarries.
- 3.3 Although the Application Site lies more than 2km from the Bestmoor SSSI, it falls within the IRZ from this designated site. This 12.4 ha site consists of a semi-improved floodplain meadow adjacent to the middle reaches of the River Cherwell and has a long history of traditional grassland management, although the sward has been affected to some extent by fertilisation and drainage improvement.

Non-statutory Designated Sites

- 3.4 There are five non-statutory designated sites and areas identified for future biodiversity enhancement within 2km of the Application Site (shown in Figure 1). These are:
- Upper Cherwell Valley Conservation Target Area (CTA) - This is a designation which aims to target conservation projects to maximise their value for other valuable receptors or designated sites. This

site is located 890 m to the west of the Application Site at its closest point and covers a range of habitats throughout its extent (though not necessarily within the vicinity of the Application Site) including: floodplain grazing marsh, lowland meadows and river. This site as a whole also supports a range of protected and notable species including otter *Lutra lutra*, water vole *Arvicola amphibius*, curlew *Numenius arquata* and lapwing *Vanellus vanellus* on the grazing marsh, tree sparrow *Passer montanus*, reed bunting *Emberiza schoeniclus*, skylark *Alauda arvensis*, grey partridge *Perdix perdix*, yellow wagtail *Motacilla flava*, yellowhammer *Emberiza citronella* and bullfinch *Pyrrhula pyrrhula*.

- Tusmore and Shelswell Parks CTA - This site is located approximately 1.8km to the east and encompasses the parks and woodland at Tusmore and Shelwell Parks and a number of ancient woodlands near Stoke Lyne. This ecological feature as a whole is likely to be of County or Regional value.
 - Upper Heyford Airfield Local Wildlife Site (LWS) - This site measures 74.41 ha and is enclosed in the Application Site boundary. It covers much of the eastern part of the Application Site and includes an area of grassland which ranges in diversity and includes some species-rich areas which are strongly calcareous in character, areas on thicker soils which are more neutral in character. These are contiguous to areas of grassland within the Application Site of similar character which are not within the designated site. The southern part of this LWS includes a series of water tanks known to support a large population of great-crested newts. A range of other protected and notable species are associated with LWS, including 14 species of butterfly, skylark, linnet *Linaria cannabina*, corn bunting *Emberiza calandra*, tree sparrow and grey partridge.
 - Rush spinney LWS - This 24.1 ha site is located approximately 1,150 m from the southwest corner of the Application Site and consists of a small area of marsh within an improved permanent pasture. Part of the site is dominated by tall tussocks of greater tussock sedge *Carex paniculata*.
- 3.5 There is a further non-statutory designated site within 2km of the Application Site but this is a proposed LWS: Ardley Field Quarry. This site supports an area of restored quarry that includes improved grassland, rough grassland with young planted trees, herb-rich grassland, ponds and wet ditches. The plant communities are still establishing.

Overview of habitats

- 3.6 The Application Site is dominated by poor semi-improved grassland. This is interspersed with hard standing and buildings, plantation woodland and individual trees, calcareous and neutral grassland and ephemeral vegetation. Arable fields which hedgrows are also included in the Application Site, mainly in separate plots in the southern part. The eastern part of the Application Site also supports semi-improved neutral, unimproved neutral and semi-improved and unimproved calcareous grasslands. Standing water is present within concrete water tanks. These are predominately located in the extreme north, south and east of the Application Site.
- 3.7 The Application Site boundary includes three parcels of land to the south of Camp Road. These support arable and amenity grassland.
- 3.8 The Application Site is on freely draining lime-rich loamy soils (Cranfield University, 2017).
- 3.9 The following paragraphs list and describe all of the habitats and categorise these into the Phase 1 habitat types. These are mapped in Figure 2. Accompanying target notes are included in Appendix 2.

Habitat Descriptions

Poor semi-improved grassland

- 3.10 Poor semi-improved grassland is the dominant habitat type within the Application Site. It is present in the north, west and south the Application Site. Dominant grass species include cocksfoot *Dactylis glomerata*, false-oat grass *Arrhenatherum elatius*, soft brome *Bromus hordeaceus*, tall

fescue *Festuca arundinacea*, red fescue *Festuca rubra*, Yorkshire-fog *Holcus lanatus* and ryegrass *Lolium perenne*. Grasses dominate the sward in these areas with a range of herbs present at low frequencies and abundance. These include: common mouse-ear *Cerastium fontanum*, cow parsley *Anthriscus sylvestris*, hogweed *Heracleum sphondylium*, dandelion *Taraxacum* agg., and beaked hawk's-beard *Crepis vesicaria*. The sward condition varies across the Application Site and includes both areas of well-developed tussocks and areas which are more frequently mown/grazed, resulting in a lower sward with less structure. Localised patches with species indicative of less improved grasslands are occasionally present. These areas include species such as: bird's-foot trefoil *Lotus corniculatus*, common knapweed *Centaurea nigra*, oxeye daisy *Leucanthemum vulgare* and bulbous buttercup *Ranunculus bulbosus*.

Unimproved neutral grassland

- 3.11 Areas of unimproved neutral grassland are present in the south and east of the Application Site. This habitat transitions to, and forms mosaics with, the unimproved calcareous grassland. As a result, species more typical of calcareous conditions are present in the areas mapped as unimproved neutral grassland. The sward is species-rich and contains species typical of low nutrient conditions. The dominant grasses are: red fescue, common bent *Agrostis capillaris*, Yorkshire-fog, cocksfoot and creeping bent *Agrostis stolonifera* and downy-oat grass *Helictotrichon pubescens*. Herbs present include: yellow-rattle *Rhinanthus minor*, cowslip *Primula veris*, red clover *Trifolium pratense*, common sorrel *Rumex acetosa* and ladies-bedstraw *Galium verum*.

Semi-improved neutral grassland

- 3.12 Small areas of semi-improved neutral grassland are present within the Northern Bomb Store (NBS) and south of the main runway. The former area is a mosaic of species-rich grassland and rank grassland dominated by cocksfoot and false-oat grass. The area is highly variable with patches of species-rich grassland occurring in rabbit grazed areas, where the growth of vigorous grasses has been suppressed. Small, discrete patches of semi-improved neutral grassland are also present in the south of the Application Site. These areas are dominated by red fescue and cocksfoot with a high proportion of herbs. Herbs present include: bird's-foot trefoil, germander speedwell *Veronica chamaedrys*, wild carrot *Daucus carota*, dandelion, creeping buttercup *Ranunculus repens* and meadow buttercup *Ranunculus acris*.

Unimproved calcareous grassland

- 3.13 Areas of unimproved calcareous grassland fall into two categories. The first type occurs as a mosaic with the unimproved neutral grassland and is present in the central and eastern parts of the Application Site, forming the dominant habitat within the Upper Heyford Airfield LWS. It consists of a similar suite of species except with a greater abundance of calcicolous species. These include: wild carrot *Daucus carota*, dwarf thistle *Cirsium acaule*, salad burnet *Sanguisorba minor*, mouse-ear hawkweed *Hieracium pilosella*, upright brome *Bromopsis erecta* and Tor-grass *Brachypodium pinnatum*.
- 3.14 The second type is less species-rich and is dominated by upright brome. This is present predominately in the southeast of the Application Site, within the Southern Bomb Store (SBS). Less extensive patches are present within the eastern and central sections of the Application Site.

Semi-improved calcareous grassland

- 3.15 A small patch of semi-improved calcareous grassland is present within the SBS, in the south-east of the Application Site. This area is a transition between upright brome dominated calcareous grassland and rank neutral grassland, dominated by false-oat grass and cock's foot. This increased abundance of rank neutral grassland species indicates higher nutrient levels are present compared to the unimproved calcareous grassland areas.

Amenity grassland

- 3.16 The most extensive areas of amenity grassland are present in the south-west corner of the Application Site. Small patches are also present surrounding buildings within the south of the

Application Site. In all cases the sward is low (as a result of mowing or grazing) and is dominated by perennial rye-grass and annual meadow-grass *Poa annua*. There is a low proportion of herbs with common daisy *Bellis perennis* and white clover *Trifolium repens* being the most frequent species.

Ephemeral/short perennial vegetation

- 3.17 Ephemeral/short perennial vegetation is present in areas which have experienced recent disturbance, most likely as a result of areas of concrete being removed. These are present in the western, central and the south-eastern sections respectively. These areas are relatively species-rich but consist of fast-colonising and drought-tolerant plant species and bryophytes. Species present include: perforate St John's-wort *Hypericum perforatum*, creeping cinquefoil *Potentilla reptans*, thyme-leaved sandwort *Arenaria serpyllifolia*, common mouse-ear, creeping thistle *Cirsium arvense*, procumbent pearlwort *Sagina procumbens*, thyme-leaved speedwell *Veronica serpyllifolia* and self-heal *Prunella vulgaris*.

Plantation woodland

- 3.18 Both coniferous and broad-leaved plantation woodland are present within the Application Site. The largest areas are in the north of the Application Site (mosaic of coniferous and broad-leaved woodland); the south-west of the Application Site (coniferous woodland) and within the SBS. The coniferous areas are predominantly Scots pine *Pinus sylvestris*. Broad-leaved areas contain a mixture of planted and self-sown trees including ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus*, pendunculate oak *Quercus robur* and cherry *Prunus* sp. The ground flora is typically species-poor and either dominated by rank grasses, such as false-oat grass and cocksfoot or nutrient demanding herbs such as cow parsley and ground-ivy *Glechoma hederacea*.

Hedgerows

- 3.19 Hedgerows are present within the Heyford Grange area and parcels of arable land which form the southern part of the Application Site. The majority of these are species-poor native hedges under relatively intensive management. Two hedgerows run along the eastern and western side of Chilgrove Drive, with the eastern hedgerow supporting several trees (sycamore, ash and pedunculated oak). These have been categorised as species rich hedgerow (western hedgerow) and species-rich hedgerow with trees (eastern hedgerow).
- 3.20 The species recorded in the hedgerows include hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, elder *Sambuca nigra*, wych elm *Ulmus glabra*, hazel *Corylus avellana*, spindle, *Euonymus europaeus*, ash, wayfaring-tree *Viburnum lantana*, buckthorn *Rhamnus cathartica*, bramble *Rubus fruticosus* agg. and dog rose *Rosa canina*.

Scrub (dense and scattered)

- 3.21 Patches of dense and scattered scrub are present surrounding disused buildings and neglected parts of the Site. The most extensive patches are on the southern boundary of the Application Site, adjacent to Letchmere Farm. The scrub consists mostly of bramble, and blackthorn. Self-sown butterfly-bush *Buddleja davidii* shrubs and sycamore trees are also present.

Arable

- 3.22 Arable land is present in the southern part of the Application Site. At the time of the survey barley *Hordeum vulgare* and oil-seed rape *Brassica napus* subsp. *oleifera* were being grown.

Arable margins

- 3.23 Conservation margins are present around field edges within the fields which support arable land. These have been sown with a species-rich grassland mix and contain species such as common knapweed and bird's-foot trefoil. These are up to 4 m wide in places, but are not present along all margins.

Ditches (dry and seasonally wet)

- 3.24 A ditch is present within the hedgerow in the south-west parcel of land. It is enclosed by the adjacent hedgerow but the presence of great willowherb *Epilobium hirsutum* indicates seasonally wet conditions. A network of dry ditches is present within the southern section of the Application Site. These have recently been excavated to act as a security barrier. They are mostly dry and contain rough grassland and scrub. Seasonally wet areas are indicated by the presence of great willowherb.

Standing water

- 3.25 A total of 25 water bodies are present within the Application Site. These are concrete-lined tanks historically used to store water and fuel when the Application Site was an active RAF base. Vegetation within the water-bodies is variable. Where an organic substrate is present aquatic plants and emergent vegetation can be abundant. Where no substrate has formed, and the tank sides are vertical, no vegetation is present.

Buildings

- 3.26 Buildings are a prominent feature of the northern and southern sections of the Application Site. These include concrete aircraft hangers, large steel and brick ware houses and former office block and sleeping quarters. The majority of these are flat roofed structures. The condition of the buildings is variable. Those in current use are well maintained, including some which have been redeveloped and modernised. Other buildings are derelict and have not been used since the airbase closed in 1997.

Plants of Conservation Interest

- 3.27 The desk study provided records of two notable plant species from within the Application Site: basil thyme *Acinos avensis* and dwarf spurge *Euphorbia exigua*.
- 3.28 Basil thyme is listed as Vulnerable in the *Vascular Plant Red List for England* (Stroh *et al.*, 2014) and is included in the *Oxfordshire Rare Plant Register*. It was recorded (in 2000) from LWS in the east of the Application Site. This species was not recorded during the Phase 1 habitat or NVC surveys.
- 3.29 Dwarf spurge is listed as Vulnerable in the *Vascular Plant Red List for England* (Stroh *et al.*, 2014) and is included in the *Oxfordshire Rare Plant Register*. It was recorded (in 2000) from LWS in the east of the Application Site. This species was recorded during the NVC survey in 2015.

Non-native invasive species

- 3.30 A stand of the non-native invasive Japanese knotweed *Fallopia japonica* is present in the southern section of the Application Site (see Target Note 1). The non-native invasive plant species butterfly-bush is a common feature of scrub habitat within the Application Site.
- 3.31 Of these species, Japanese knotweed is listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) making it an offence to plant or otherwise cause them to grow in the wild.

4 Habitats of Conservation Value

Annex I habitats

4.1 No EU Annex I habitats are present at the Application Site.

Habitats of Principal Importance

4.2 Five HPis are present at the Application Site:

Lowland meadow

4.3 Areas mapped as unimproved neutral grassland are classified as lowland meadow Habitat of Principal Importance (HPI), as described in Maddock (2011). The Maddock (2011) description states that “*In terms of National Vegetation Classification (NVC) plant communities, they [unimproved neutral grasslands] primarily embrace each type of Cynosurus cristatus - Centaurea nigra grassland, Alopecurus pratensis -Sanguisorba officinalis floodplain meadow and Cynosurus cristatus - Caltha palustris flood-pasture*”. The unimproved neutral grasslands within the Application Site were assessed as the MG5 *Cynosurus cristatus - Centaurea nigra* NVC community (4 Acre Ecology, 2014; 4 Acre Ecology, 2015), and are therefore are lowland meadow HPI.

Lowland calcareous grassland

4.4 Areas mapped as unimproved calcareous grassland are classified as lowland calcareous grassland HPI. Lowland calcareous grasslands are defined, in the context of HPI, as the first nine calcareous grasslands within the NVC (CG1 - CG9). All calcareous grasslands within the Application Site are assessed as CG3 *Bromopsis erectus* grassland (4 Acre Ecology, 2014; 4 Acre Ecology, 2015) and therefore all these habitats qualify as HPis..

Hedgerows

4.5 Of the hedgerows on the Application Site, two have been assessed as being important under the Hedgerows Regulations 1997. These are the two hedgerows either side of Chilgrove Drive. This is due to the presence of eight woody species per 30 m length (eastern hedgerow) and due to the presence of six woody species per 30 m section and three qualifying features (the presence of a path or bridleway, a parallel hedgerow and the hedgerow being intact).

4.6 All hedgerows on the Application Site also qualify as HPis.

Open mosaic habitats on previously developed land

4.7 Three discrete areas of the Application Site have experienced disturbance where concrete and/or buildings have been removed. Therefore consideration was given to the potential for the Priority Habitat *Open Mosaic Habitat on Previously Developed Land* (Maddock, 2011) to be present.

4.8 The areas identified as potentially being Open Mosaic Habitats (OMH) were assessed for their potential to meet the HPI habitat ‘Open Mosaic Habitat on Previously Developed Land’. Three areas in total (OMHA, OMHB, OMHC; shown on Figure 2) were assessed in this way. It is necessary to test against a number of criteria to determine if this HPI is represented, as outlined in Table 1 below. Each of these criteria must be met for an area of habitat to be defined as the HPI.

Table 1: Comparison of the Application Site against Open Mosaic Habitat criteria

Criterion	Site assessment	Meets criterion?
The area of open mosaic habitat is at least 0.25 ha in size.	OMHA, OMHB and OMHC: All three areas of habitat mosaic individually exceed 0.25 ha.	Yes (all three areas)

Criterion	Site assessment	Meets criterion?
Known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site. Extraneous materials/substrates such as industrial spoil may have been added.	OMHA, OMHB and OMHC: All three areas have experienced historical disturbance due to the removal of concrete ground and/or buildings.	Yes (all three areas)
The site contains some vegetation. This will comprise early successional communities consisting mainly of stress-tolerant species (e.g. indicative of low nutrient status or drought). Early successional communities are composed of (a) annuals, or (b) mosses/liverworts, or (c) lichens, or (d) ruderals, or (e) inundation species, or (f) open grassland, or (g) flower-rich grassland, or (h) heathland.	OMH-A: The area is characterised by the presence of fast-clonising and drought-tolerant species, predominately belonging to the annual, mosses/liverworts and ruderal groupings. These include perforate St-John's wort <i>Hypericum perforatum</i> , common centaury <i>Centaureum erythrae</i> , thyme-leaved sandwort, procumbent pearlwort and common ragwort <i>Senecio jacobaea</i> . OMH-B: The vegetation here consists of abundant bird's-foot trefoil, with frequent sheep's-fescue <i>Festuca ovina</i> , perforate St-John's wort and common ragwort. Bare ground is also a frequent feature. This community is a transition between the ruderal and flower-rich grasslands groupings. OMH-C: The vegetation here consists of sparse herb rich grassland. Several annuals were noted, including common centaury <i>Centaureum erythraea</i> . Other species included yarrow, red clover and common bird's-foot-trefoil <i>Lotus corniculatus</i> .	Yes (all three areas)
The site contains un-vegetated, loose bare substrate and pools may be present.	OMH-A: Large piles of bare rubble are present in the west of the area. OMH-B: Patches of open ground/bare substrate are present in the north of the area. OMH-C: Small patches of bare ground are present throughout and several larger patches (5 x5 m) are also present/	Yes (all three areas)
The site shows spatial variation, forming a mosaic of one or more of the early successional communities (a)–(h) above (criterion 3) plus bare substrate, within 0.25 ha.	OMH-A: A mosaic of annual, ruderal, bryophyte and bare ground dominated communities is present within the area. OMH-B: A mosaic of both ruderal and flower-rich communities is present within the area. OMH-C: A mosaic of bare ground and sparse grassland and flower-rich areas is present	Yes (all three areas)

4.9 Table 1 confirms that the assessed areas qualify as the HPI "Open Mosaic Habitat on Previously Developed Land".

Ponds

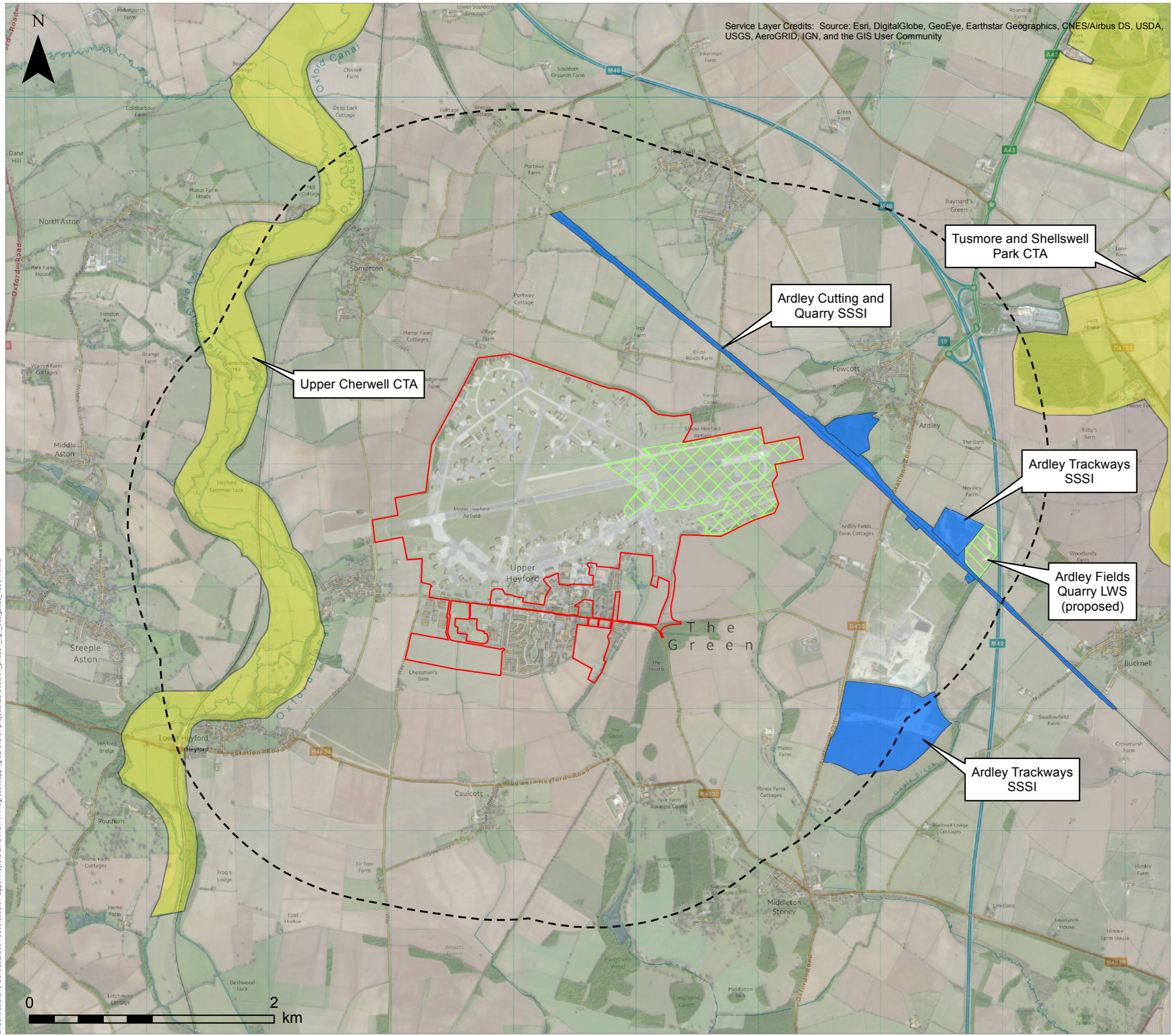
- 4.10 Of the 25 waterbodies present within the Application Site, the following qualify as HPis as they support a protected species (great crested newt *Triturus cristatus*): Ponds 1, 25, H, 10, 11, 12, 13, 14, 15, 16, 9, F, G, 9, 7 and E (further details are provided in the 4Acre Ecology, 2017 which covers the 2016 and illustrates the location of these ponds). The remaining ponds are unlikely to qualify as HPis as they are highly artificial in nature and support a poor botanical community.

5 References

- 4Acre Ecology (2017). *Heyford Park, Oxfordshire - Great Crested Newt Survey – 2016*.
- 4 Acre Ecology (2014) Heyford Park – *Flying Fields National Vegetation Classification Survey of the Grassland 2014*.
- 4 Acre Ecology (2015) Heyford Park – *Flying Fields National Vegetation Classification Survey of the Grassland 2015*.
- JNCC (2010) *Handbook for Phase 1 Habitat Survey: A technique for environmental audit*. JNCC. http://jncc.defra.gov.uk/PDF/pub10_handbookforphase1habitatsurvey.pdf [accessed 15/11/2016].
- Maddock, A. (2011) *UK Biodiversity Action Plan Priority Habitat Descriptions*. JNCC. http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc-Rev2011.pdf [accessed 25/11/2016].
- Stace, C. (2010) *New Flora of the British Isles*. Third Edition. Cambridge University Press.
- Stroh P. A., S.J. Leach, T.A. August, K.J. Walker, D.A. Pearman, F.J. Rumsey, C.A. Harrower, M.F. Fay, J.P. Martin, T. Pankhurst, C.D. Preston, I. Taylor (2014) *A Vascular Plant Red List for England*. BSBI. http://bsbi.org/England_Red_List_1.pdf [accessed 25/11/2016].

6 Figures

(overleaf)



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- LEGEND**
- Study area (whole site)
 - 2 km radius from site
 - Statutory designated sites**
 - Site of Special Scientific Interest (SSSI)
 - Non-statutory designated sites**
 - Local Wildlife Site (LWS)
 - Proposed Local Wildlife Site
 - Conservation Target Areas (CTA)

Upper Cherwell CTA

Ardley Cutting and Quarry SSSI

Tusmore and Shellswell Park CTA

Ardley Trackways SSSI

Ardley Fields Quarry LWS (proposed)

Ardley Trackways SSSI

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JOB REF: 8506.01

PROJECT TITLE
HEYFORD PARK

DRAWING TITLE
Figure 1: Application Site location and designated sites within 2 km

DATE: 15.09.2017 CHECKED: JB SCALE: 1:30,000
DRAWN: COH APPROVED: PS STATUS: FINAL

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- LEGEND**
- Study area (whole site)
 - Upper Heyford Airfield LWS
 - OMH-A
 - Amenity
 - Tall ruderal
 - Arable
 - Arable field margins
 - Broadleaved plantation
 - Coniferous plantation
 - Mixed plantation
 - Dense scrub
 - Ephemeral / short perennial
 - Species-poor semi-improved grassland
 - Unimproved neutral grassland
 - Semi-improved neutral grassland
 - Unimproved calcareous grassland
 - Semi-improved calcareous grassland
 - Pond
 - Species-rich intact hedge
 - Species-poor intact hedge
 - BL tree
 - Target note

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PROJECT TITLE
HEYFORD PARK

DRAWING TITLE
Figure 2: Phase 1 habitat map

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DRAWN: COH APPROVED: PS STATUS: FINAL

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Appendix 1: Photographs



Photograph 1: Poor semi-improved grassland.



Photograph 2: Unimproved neutral grassland.



Photograph 3: Unimproved and semi-improved calcaerous grassland in the Southern Bomb Store. Light brown areas are unimproved calcaerous.



Photograph 4: Amenity grassland with conifer plantation in the south-west of the Application Site.



Photograph 5: Short ephemeral/ruderal vegetation in the east of the Application Site.



Photograph 6: Arable land in the south of the Application Site.



Photograph 7: Seeded arable margin in the west of the Application Site



Photograph 8: Dry ditch in the east of the Application Site.



Photograph 9: Typical on site waterbody

Appendix 2: Target Notes

1	Stand of Japanese knotweed.
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