

Issue Date: June 2010	UNCLASSIFIED DIRECTORATE MAJOR PROJECT	Issue No: FINAL 2
15. Ecology	Hydrus Defence Exempt Environmental Appraisal Volume I	Reference: MER-110-009289

15. ECOLOGY

15.1 Introduction

This chapter assesses the potential for ecology and nature conservation effects as a consequence of the Proposed Development. It describes the habitat types at the Hydrus Development Site and identifies the potential for protected and notable species or areas of particular nature conservation interest to be affected by the construction and/or operation of the Proposed Development. This information has been used to identify potential ecological constraints and to identify measures to address such constraints. The assessment also identifies proposals to enhance existing habitats or create new habitats as part of the Proposed Development.

The chapter has been prepared by RPS Group and is based on a desk study and ecological surveys of the Hydrus Development Site undertaken in 2009 that are presented in Appendix G of this DEEA.

15.1.1 The Proposed Development

The Application Site comprises two parcels of land that are located within the AWE Aldermaston Site (See *Figure 1-1: Application Site Red Line Boundary*, in *Chapter 1: Introduction* of this DEEA). The Application Site and Proposed Development have been described in detail in *Chapter 1: Introduction* and *Chapter 5: The Proposed Development* of this DEEA.

The Proposed Development comprises the following components that fall within the Application Site:

- Hydrus Development Site – The operational Hydrus Facility;
- The temporary use of two existing construction enclaves; the CACE and WECE, and construction site access using existing AWE Aldermaston Site roads from, and including A340 Gate. Further details of the construction enclaves, can be found in *Chapter 6: Construction Phase* of this DEEA; and
- The permanent external works which include landscaping and a Sustainable Drainage System (SuDS).

CACE and WECE have already been granted temporary planning consent, and have been subject to environmental assessment as part of other AWE planning applications; these include WECE (part of New Office Accommodation) and CACE (part of HEFF). Construction of the Proposed Development will not change existing uses within these areas, and there will be no change in environmental impacts already assessed, therefore these areas are not considered further in this chapter.

15.2 Legislation and Planning Policy Context

A planning policy review is provided in *Chapter 3: Planning Policy Context* of this DEEA. The following plans and policies are specifically relevant to the ecological assessment and are set out in more detail at Appendix G.1 of this DEEA.

Relevant planning policy documents include:

- Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation (Ref. 15-1): The Government's national planning guidance on nature conservation;
- The South East Plan is the Regional Spatial Strategy for the South East of England (Ref. 15-2): This sets out the long term spatial planning framework for the region over the years 2006 – 2026. The South East Plan has five core policies (NRM5, NRM6, NRM7, CC2 and CC8) which are related to biodiversity, aimed at protecting and improving the diversity of habitats and species across the South East, particularly sites and species of national and international importance.
- West Berkshire Local Plan (Ref. 15-3): The local plan identifies the nature conservation features of the District and includes policies for their protection; and
- The UK Biodiversity Action Plan (Ref. 15-4) and Berkshire and Hampshire Biodiversity Action Plans (Ref. 15-5 & 15-6), which identify habitats and species for which targets and objectives, have been set for their protection and enhancement.

Key legislation relevant to the Proposed Development includes:

- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (Ref. 15-7);
- Wildlife and Countryside Act 1981 (as amended) (WCA) (Ref. 15-8);
- Countryside and Rights of Way Act 2000 (as amended) (Ref. 15-9); and
- Natural Environment and Rural Communities Act 2006 (Ref. 15-10).

15.3 Assessment Methodology

This assessment takes account of the following relevant guidance:

- Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment (Ref. 15-11); and
- Institute of Ecology and Environmental Management (2006) Guidelines for Ecological Impact Assessment in the United Kingdom (Ref. 15-12).

In accordance with this guidance, the assessment has been undertaken in four main stages:

- Baseline studies (existing conditions);
- Identification of Valued Ecological Receptors;
- Identification and characterisation of potential effects; and
- Assessment of significance of effects.

15.3.1 Baseline Studies

Baseline information about ecological features including sites of importance for nature conservation, species populations, species assemblages and habitats has been obtained from:

- Existing data and information relevant to the Hydrus Development Site from published sources, databases and local recorders;
- Consultation; and
- Ecological surveys.

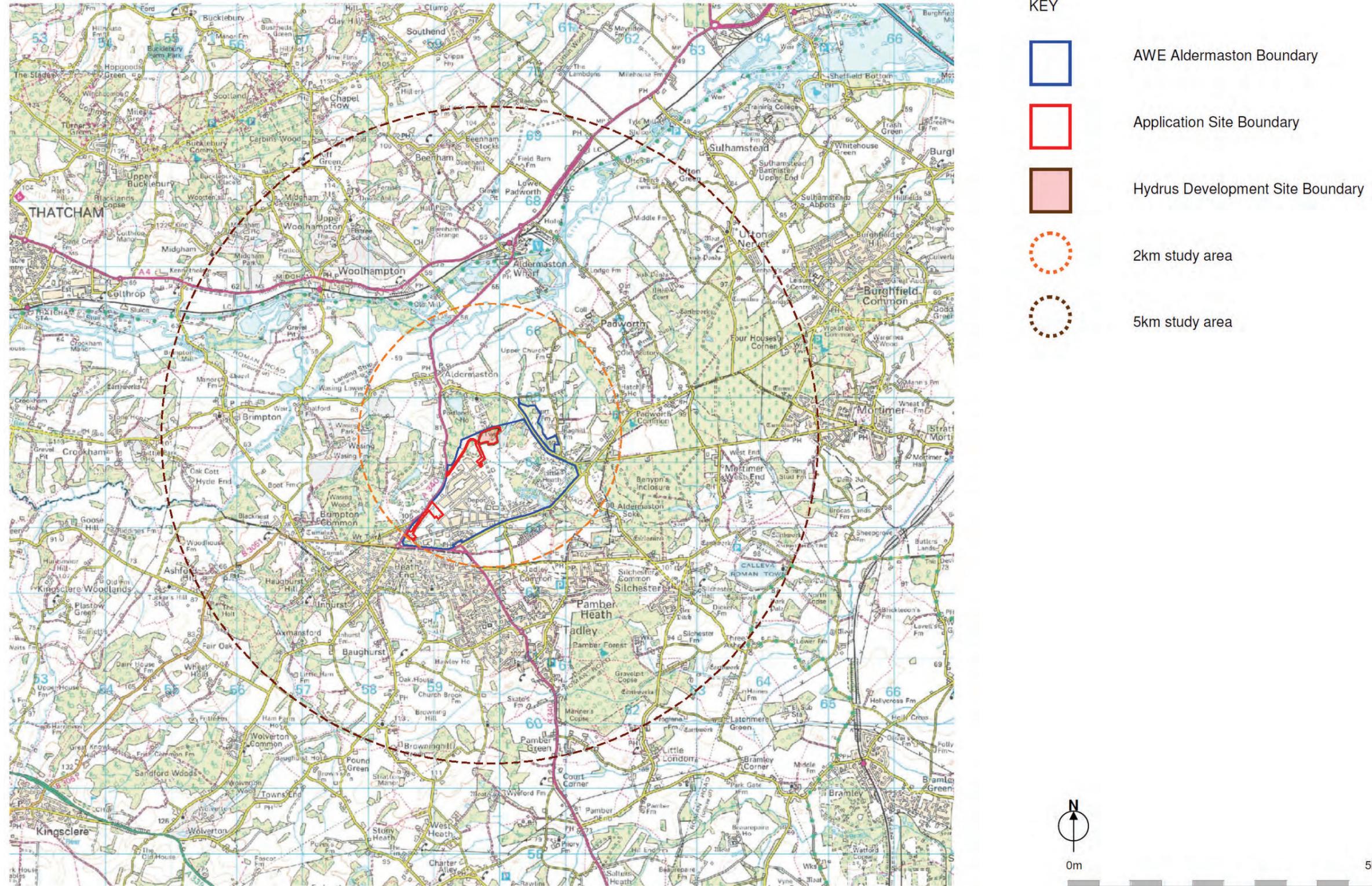
15.3.1.1 Desk Study

Information relating to sites designated for their nature conservation importance and records of protected (or otherwise 'notable') species were requested for a 2km to 5km study area around the Hydrus Development Site (see *Figure 15-1: Application Site Location and Desk Study Area*) from the following statutory and non-statutory consultees:

- Natural England (Berkshire and Buckinghamshire);
- Environment Agency (Thames Regional Office);
- West Berkshire Council (WBC);
- Thames Valley Environmental Record Centre (TVERC);
- Hampshire Biodiversity Information Centre (HBIC);
- Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT);
- Berkshire and South Buckinghamshire Bat Group;
- Berkshire Bird Recorder;
- Reading RSPB Group;
- Berkshire Ornithological Club;
- Berkshire Amphibian and Reptile Group;
- Binfield Badger Group;
- Berkshire County Butterfly Recorder; and
- Berkshire County Moth Recorder.

The aim of the desk study was to collate existing records for the Hydrus Development Site and surrounding area. In addition, reference was made to both the Hampshire and Berkshire Biodiversity Action Plans (BAP), the websites for Natural England and MAGIC (Multi-Agency Geographical Information for the Countryside) (Ref. 15-13).

Figure 15-1: Application Site Location and Desk Study Search Area (2km and 5km)



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Field Surveys

A Phase 1 habitat survey was carried out to JNCC guidelines (Ref. 15-14) to identify the habitats present within the Hydrus Development Site boundary, and to identify the potential for the Hydrus Development Site to support protected species.

The following additional surveys were subsequently carried out:

- Bat Activity, Emergence and Dawn Swarm Survey, plus Daytime Tree Checks in June and July 2009, undertaken in accordance with the Bat Surveys: Good Practice Guidelines (Ref. 15-15);
- Reptile Survey in May, June and July 2009, which followed the recommended methodology outlined in the Herpetofauna Workers' Manual and Froglife's Advice Sheet 10 (Ref. 15-16 and Ref. 15-17);
- Breeding Bird Survey in April, May and June 2009, (Ref. 15-18);
- Badger Scoping Survey in June 2009, following Cresswell et al. methodology (Ref. 15-19); and
- Invertebrate Habitat Assessment walkover survey in July 2009, which involved looking for features known to enhance invertebrate density (see *Technical Appendix G*).

The findings of the desk study and the site surveys have been used to assess the existing ecology and nature conservation interest of the Hydrus Development Site.

15.3.2 Identification of Valued Ecological Receptors

The desk studies and field studies allowed a number of sites, habitats, species assemblages and species populations to be identified. These features are known as receptors. Those receptors that are present within the zone of influence of the Proposed Development are evaluated with reference to their importance in terms of 'biodiversity conservation' (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations). Those receptors that are valued and could be affected by the Proposed Development in some way are considered Valued Ecological Receptors (VERs).

Where appropriate, reference is made to social benefits that species and habitats deliver (e.g. relating to enjoyment of flora and fauna by the public) and economic benefits that they provide, but only where these are significant considerations.

For the purposes of this assessment, sites, habitats, species assemblages and species populations have been valued using the following scale:

- International;
- National;
- Regional;
- County;
- District/Borough;

- Parish; and
- Neighbourhood.

The valuation of sites makes use of established value systems (e.g. Sites of Special Scientific Interest are of national importance, County Wildlife Sites are of county importance). Judgement is required for the valuation of sites of less than county value.

The valuation of habitats, species assemblages and species populations uses accepted criteria, examples include:

- Species populations. The importance of populations is evaluated on the basis of their size, recognised status (e.g. published lists of species of conservation concern, BAP status) and legal protection status. For example, bird populations exceeding 1% of published biogeographic populations are considered to be of international importance, those exceeding 1% of published national populations are considered to be of national importance, etc.
- Species assemblages. In some instances it is the species assemblage that is of importance. Criteria used to evaluate the importance of assemblages include Sites of Special Scientific Interest (SSSI) selection criteria. Fuller (Ref. 15-20), also provides a dated but useful framework for evaluating the relative importance of bird assemblages.
- Habitats. Criteria for the evaluation of habitats and plant communities include Annex III of the EC Habitats Directive, guidelines for the selection of biological SSSIs (Ref. 15-21) and, where available, Local Authority and Wildlife Trust criteria for the selection of Local Sites (e.g. County Wildlife Sites).

In this assessment, sites, habitats, species assemblages and species populations which could be affected by the proposals are considered to be VERs if they meet the district level of importance.

15.3.3 Identification and Characterisation of Potential Impacts

The likely impacts of the Proposed Development during its construction and operation are identified and characterised taking into consideration of the following parameters:

- Positive or negative – whether the impact will result in net loss or degradation of a VER or whether it will enhance or improve it;
- Magnitude – the size or intensity of the impact measured in relevant terms, e.g. number of individuals lost or gained, area of habitat lost or created, or the degree of change to existing conditions (e.g. noise or lighting levels);
- Extent – the spatial scope of the impact, for example the physical area affected or the geographical pattern of the impact;
- Duration – the length of time over which the impact occurs;
- Reversibility – the extent to which impacts are reversible either spontaneously or through active mitigation; and

- Timing and frequency – consideration of the timing of events in relation to ecological change, some impacts may be of greater significance if they take place at certain times of year (e.g. breeding season). The extent to which an impact is repeated may also be of importance.

The assessment takes into account any measures to avoid or reduce the impact, which are integral to the design of the development and to which there is commitment.

An indication of the confidence with which predictions of potential impacts are made has been given.

The magnitude of the predicted impact on VERs is assessed as indicated in Table 15-1 below.

Table 15-1: Criteria for Determining the Magnitude of Impacts

Magnitude of Impact	Criteria
Major negative	The proposal may adversely affect the conservation status of the site or feature.
Intermediate negative	The site or feature's conservation status will not be adversely affected, but the effect is likely to be significant in terms of ecological objectives or populations. If, in the light of full information, it cannot be clearly demonstrated that the proposal will not have an adverse effect on conservation objectives, then the impact should be assessed as major negative.
Minor negative	Neither of the above applies, but some minor negative impact is likely.
Negligible	No observable impact.
Positive	Impacts which provide a gain for biodiversity.

Conservation status as defined by the Institute of Ecology and Environmental Management (IEEM) guidelines is as follows:

- **Habitats** – 'conservation status is determined by the sum of the influences acting on the habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area'.
- **Species** – 'conservation status is determined by the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area'.

The assessment as to whether the favourable conservation status of a VER is likely to be compromised has been made using professional judgement based on an analysis of the predicted impact of the Proposed Development.

For designated sites that are affected by the project, the focus is on impacts on the integrity of each site, defined as 'the coherence of ecological structure and function, across a site's whole area, that enable it to sustain the habitat, complex of habitats and/or levels of populations of species for which it was classified.'

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This assessment has been made with reference to the features for which a site has been classified / notified and involves combining assessments of the impacts on the conservation status of each of these features.

For non-statutory sites, such features may not have been formally defined but the main interest features have been identified from the site description.

A positive impact is considered to be significant if it would result in:

- A non-valued ecological receptor becoming valued;
- Restoration of favourable conservation status for a habitat/species population; and/or
- Restoration of a site's integrity (where this has been undermined).

15.3.4 Assessment of Significance

The significance of adverse or beneficial effects has been assessed on the basis of the value of the features and the magnitude of impacts as set out in Table 15-2 below.

Table 15-2: Estimating the Significance of Impacts

Magnitude of impact	Nature conservation value of features affected				
	International	National	Regional	County	District/Borough
Major	Substantial	Substantial	Major	Moderate	Slight
Intermediate	Major	Major	Moderate	Moderate	Slight
Minor	Slight	Slight	Slight	Slight	Slight
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

The significance of the impacts is thus determined in terms of the importance/value and sensitivity of the sites, habitats and species that would be affected and the magnitude. The impacts listed in Table 15-2 can be both negative and positive.

An assessment has been made of the likely nature conservation impacts which would arise as a consequence of implementing the proposals both during construction and operation. The potential for positive and negative impacts has been considered. The significance of any impact has been determined in terms of the importance/value and sensitivity of the habitats and species that would be affected. It should be noted that whilst some residual impacts may be positive, to adhere to Institute of Ecology and Environmental Management (IEEM) guidelines the assessment always concludes with the highest level of impact.

It is generally the case that no significant impact can occur to features of less than district importance, other than in exceptional circumstances such as where a feature has high social or economic value, or the impact magnitude is particularly high.

The assessment also takes account of any likely changes including, for example, trends in the population size or distribution of species, likely changes to the

extent of habitats and the impact of other proposed developments or land-use changes.

15.4 Baseline Conditions

The AWE Aldermaston Site as a whole supports a diversity of flora and fauna, including legally protected species and those identified as priorities for conservation within national and local Biodiversity Action Plans (BAP).

The baseline is described in this section and comprises information provided by a desk study and a Phase 1 habitat survey undertaken in March and July 2009 and protected species surveys through 2006 to 2009 (Appendix G.4). The findings of these surveys have been used to describe the existing ecological and nature conservation interest of the Hydrus Development Site. The methodologies and results of the surveys are described below.

15.4.1 Desk Study

Organisations and individuals, both statutory and non-statutory, were asked to provide records of designated sites and protected or otherwise notable species within the study area. Copies of the replies received are attached at Appendix G.2 and these are summarised in Table 15-3 below.

Table 15-3: Summary of Consultee Responses

Consultee	Response
Environment Agency	Informed that otters are consolidating their presence in the Kennet Catchment
Natural England	Referred to TVERC
Thames Valley Environmental Record Centre (TVERC)	Records of protected species and designated sites within search area
Hampshire Biodiversity Information Centre (HBIC)	Records of protected species and designated sites within search area
West Berkshire Council	No response received
Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT)	No response received
Binfield Badger Group	Provided records of badgers within search area
Berkshire and South Buckinghamshire Bat Group	No response received
Reading Royal Society for the Protection of Birds (RSPB) Group	No response received
Berkshire Ornithological Club (BOC)	Provided records of birds within search area
Berkshire Bird Recorder	No response received
Berkshire Amphibian and Reptile Group	No response received
Berkshire County Butterfly Recorder	No response received
Berkshire County Moth Recorder	Referred to TVERC

15.4.2 Designated Sites

15.4.2.1 Statutory Designated Sites

The descriptions of these sites are summarised in Appendix G.3 and site locations are shown on Figure 15-2. There are 6 statutory sites within 2km of the Hydrus Development Site boundary, five of which are designated as Sites of Special Scientific Interest (SSSI):

- Decoy Pit, Pools & Wood SSSI;
- West's Meadow SSSI;
- Wasing Wood Ponds SSSI;
- Pamber Forest & Silchester Common SSSI;
- Aldermaston Gravel Pits SSSI; and
- Padworth Common LNR.

Part of the Pamber Forest and Silchester Common SSSI is managed as a Local Nature Reserve (LNR). Part of Decoy Pit, Pools and Wood SSSI is managed as a Wildlife Trust Reserve and also contains an area of Ancient Woodland. Aldermaston Gravel Pits SSSI is also designated as a Wildlife Trust Reserve. Padworth Common is designated as a Local Nature Reserve and also as a Local Wildlife Site (LWS).

15.4.2.2 Non-statutory Designated Sites

The descriptions of these sites (where available) are summarised in Appendix G.3 and site locations are shown on Figure 15-2. There are a total of 16 non-statutory designated sites within the 2km search area, including 2 Sites of Importance for Nature Conservation (SINC), 2 Wildlife Trust Reserves and 12 Local Wildlife Sites (LWS), 4 of which are within 1km of the Hydrus Development Site boundary.

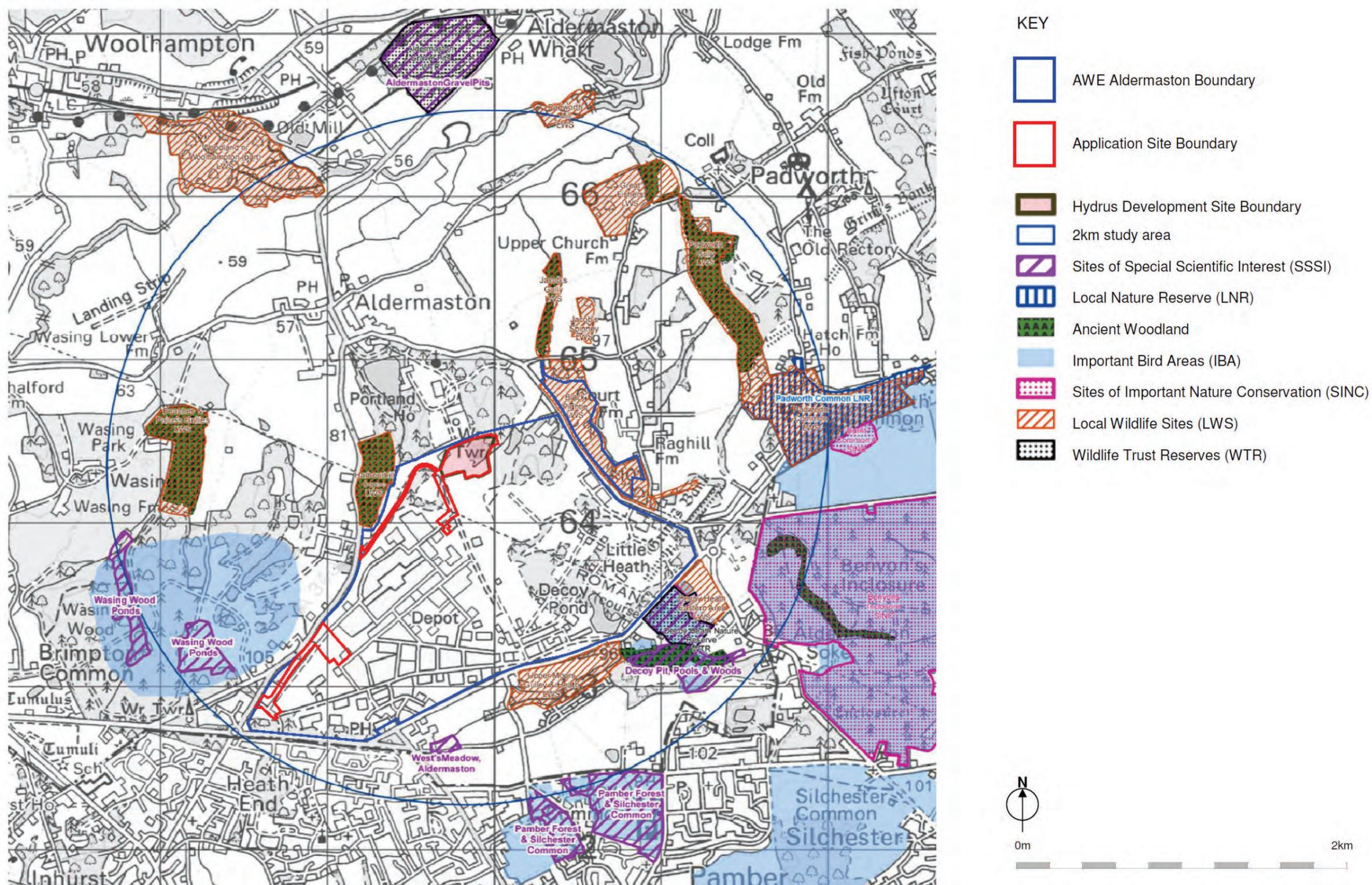
15.4.3 Ancient Woodlands

There are 6 sites of Ancient Woodland within 2km of the Hydrus Development Site boundary. These are within other statutory and non-statutory designated sites and described in Appendix G.3 and shown on Figure 15-2.

15.4.4 Flora

Three protected or other notable plant species have been recorded in the search area (dodder, *Cuscuta epithymum*, wild pansy, *Viola tricolour*, and sharp rush, *Juncus acutus*). These include 2 species listed on the International Union for Conservation of Nature (IUCN) Red List (Vulnerable and Near Threatened) and 1 species listed as Nationally Scarce (Ref. 15-22). The full details of these plant records are provided in full at Appendices G.3 and G.5.

Figure 15-2: Statutory and Non-Statutory Designated Sites within 2km



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15.4.5 Protected Species

Records of all protected species recorded within 2km of the Hydrus Development Site, post 1999 provided by consultees are summarised in tables at Appendix G.3 and shown on Figures 15-3 to 15-6.

'Protected Species' refers to any species specially protected under the following legislation:

- The Conservation (Natural Habitats &c.) Regulations 1994;
- European Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 92/43/EEC (the Habitats Directive) Annex IV (Ref. 15-23);
- Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) Annex I (Ref.15-24);
- Wildlife and Countryside Act 1981 (as amended) (WCA); and
- Protection of Badgers Act 1992 (Ref.15-25).

Full details of protected species records are given in Appendix G.5 and further information on the conservation status as listed below is provided in Appendix G.4.

Records of 'notable' species such as brown hare, hedgehog and varieties of bird that may not have full UK protection under certain Acts but require consideration due to their declining numbers or habitats i.e. UK and local Biodiversity Action Plans (BAP), Priority Species, Amber and Red List Birds of Conservation Concern etc. are also provided.

15.4.5.1 Birds

Sixty-six protected or notable bird species have been recorded in the search area. These include 12 species (fieldfare, *Turdus pilaris*, redwing, *Turdus iliacus*, goshawk, *Accipiter gentilis*, little ringed plover, *Charadrius dubius*, brambling, *Fringilla montifringilla*, black redstart, *Phoenicurus ochruros*, green sandpiper, *Tringa ochropus*, woodlark, *Lullula arborea*, hobby, *Falco subbuteo*, barn owl, *Tyto alba*, red kite, *Milvus milvus* and kingfisher, *Alcedo atthis*) listed on Schedule 1 of the WCA of which 3 (woodlark, kingfisher and golden plover, *Pluvialis apricaria*) are also listed on Annex 1 of the EC Birds Directive, 2 additional species (nightjar, *Caprimulgus europaeus* and shelduck, *Tadorna tadorna*) which are also listed on Annex 1 of the EC the Birds Directive, 22 UKBAP Priority species, 6 Local (Hampshire) BAP Priority species, 1 Local (Berkshire) BAP Priority species and 22 Amber-listed species.

The locations of the bird records are shown on Figure 15-3 with a full list provided at Appendix G.3. Bird records with grid references accurate to only 4 figures (i.e. records are located within a 1km grid square) are plotted at the centre point of the grid square.

The majority of bird records are located within Decoy Pit, Pools and Woods SSSI. Large numbers of bird records were also provided for the AWE Aldermaston Site mainly located to the south-east of the Hydrus Development Site and to the north of the Hydrus Development Site.

15.4.5.2 Herpetofauna

Records of 8 protected species of herpetofauna have been provided for the search area and are listed in Table 15-5. These include great crested newt (*Triturus cristatus*) (European Protected Species) and 7 species listed under Schedule 5 of the WCA (section 9 (5) only). The locations of the herpetofauna records are shown on Figure 15-4 and full details provided at Appendix G.3.

Two records of great crested newts were provided for the search area and are located within Decoy Pit, Pools and Wood SSSI.

Twenty-two records of common frogs (*Rana temporaria*) were provided for the search area and the closest location is west of the A340 approximately 1.16km from the Hydrus Development Site.

Two records of common toads (*Bufo bufo*) were provided for the search area and the closest location is west of the A340 approximately 1.12km from the Hydrus Development Site.

Fifty-seven records of slow worms (*Anguis fragilis*) were provided for the search area and are located within Decoy Pit, Pools and Wood SSSI and within Padworth Common Local Nature Reserve.

Thirteen records of grass snakes (*Natrix natrix*) were provided for the search area and are located within Decoy Pit, Pools and Wood SSSI.

Eighty-five records of adders were provided for the search area and the closest location is near Raghill Farm to the east of the Hydrus Development Site. Other records are located within Decoy Pit, Pools and Wood SSSI and Padworth Common Local Nature Reserve.

Twenty records of common lizard (*Lacerta vivipara*) were provided for the search area and the closest location is within Decoy Pit, Pools and Wood SSSI.

Eighteen records of smooth newts (*Triturus vulgaris*) were provided for the search area and are located within Decoy Pit, Pools and Wood SSSI.

15.4.5.3 Invertebrates

Records of 48 protected species of invertebrates have been provided for the search area and are listed at Appendix G.2. These include 2 species listed under Schedule 5 of the WCA (section 9 (5) only) (silver studded blue, *Plebejus argus*, and black hairstreak, *Strymonidia pruni*, butterflies), 24 UK BAP priority species, 3 Berkshire BAP priority species, 5 Hampshire BAP priority species, 6 Notable species and 8 Nationally Scarce species. The locations of the invertebrate records are shown on Figure 15-5 and more detail is provided at Appendix G.3.

There are records of silver studded blue and black hairstreak butterflies within Decoy Pit, Pools and Wood SSSI with additional records for Silver-studded blue located north of Pamber Forest.

Other invertebrate records are concentrated in and around the Decoy Pit, Pools and Wood SSSI, Pamber Forest and in or around Padworth Common Local Nature Reserve.

15.4.5.4 Mammals

Records of 9 protected or other notable species of mammal have been provided for the search area. These are 6 bat species which are European Protected Species and listed on Schedule 5 of the WCA, otter (*Lutra lutra*) which are European Protected Species and also listed on Schedule 5 of the WCA, badger (*Meles meles*) which is protected under the Protection of Badgers Act 1992 and harvest mouse (*Micromys minutus*) which is a UK and local BAP Priority species. The locations of the mammal records are shown on Figure 15-6 and full details at Appendix G.3.

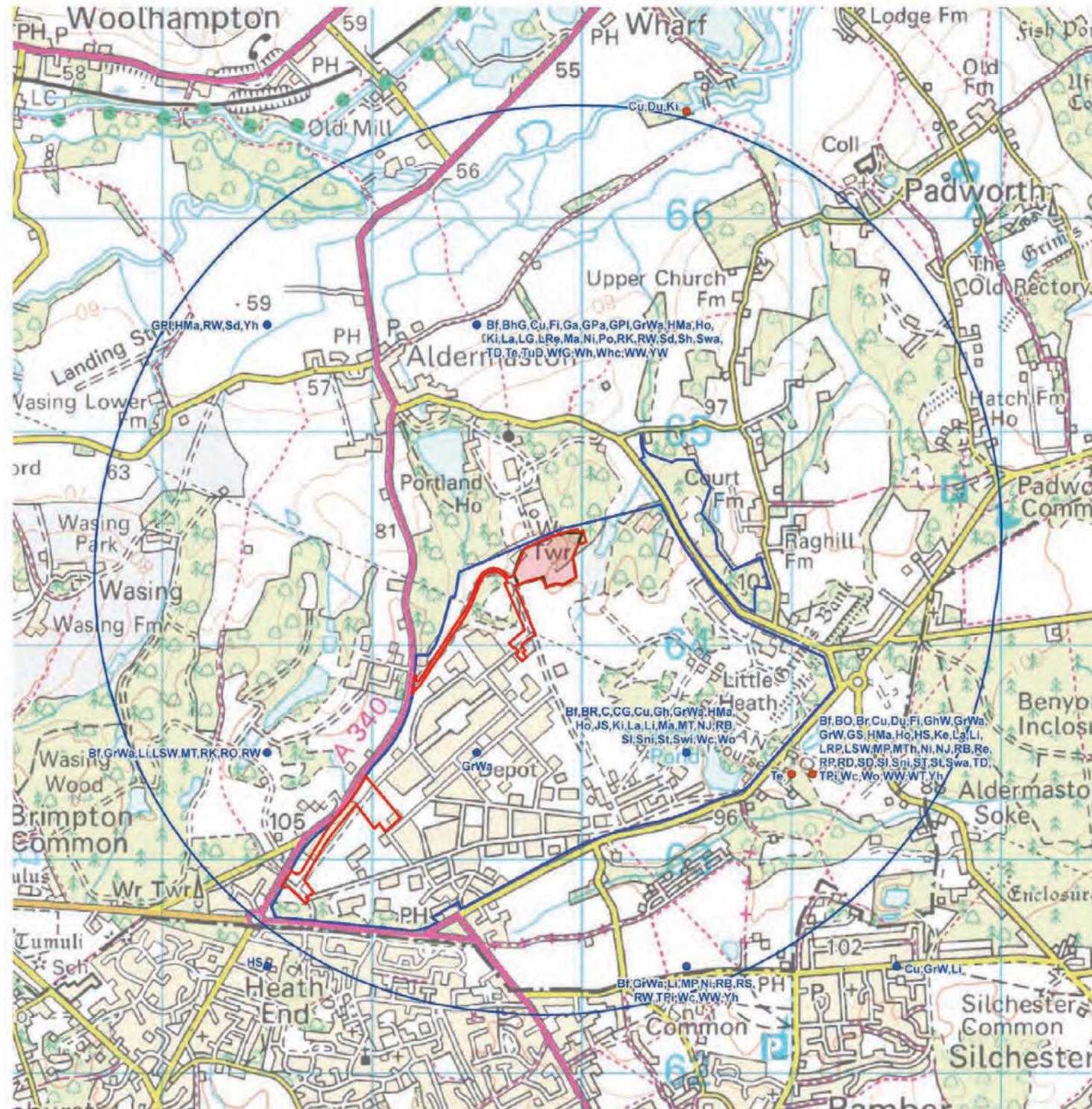
Bat records include 13 records for brown long-eared bats (*Plecotus auritus*), 6 for common pipistrelles (*Pipistrellus pipistrellus*), 1 for serotine bat (*Eptesicus serotinus*), 7 for Natterer's bats, (*Myotis nattereri*) 7 for unidentified Pipistrelles and 5 for unidentified bats. Common pipistrelles have been recorded within 2km of the Hydrus Development Site boundary. The majority of bat records are located south of the AWE Aldermaston Site around Pamber Forest and Silchester Common SSSI and Heath End.

One record of an otter was provided and is located on the River Kennet near Ufton Bridge approximately 4.5km north-east of the Hydrus Development Site. Information provided by the Environment Agency indicates that otters are fairly widespread along the River Kennet.

One record of a badger road casualty was provided for the search area and is located 1.15km north-west of the Hydrus Development Site boundary on the A340.

One record of a harvest mouse was provided for the search area located in Decoy Pit, Pools and Wood SSSI.

Figure 15-3: Protected and Notable Bird Species



KEY



AWE Aldermaston Boundary



Application Site Boundary



Hydrus Development Site Boundary



2km study area

Bird Records



6 figure grid reference



4 figure grid reference

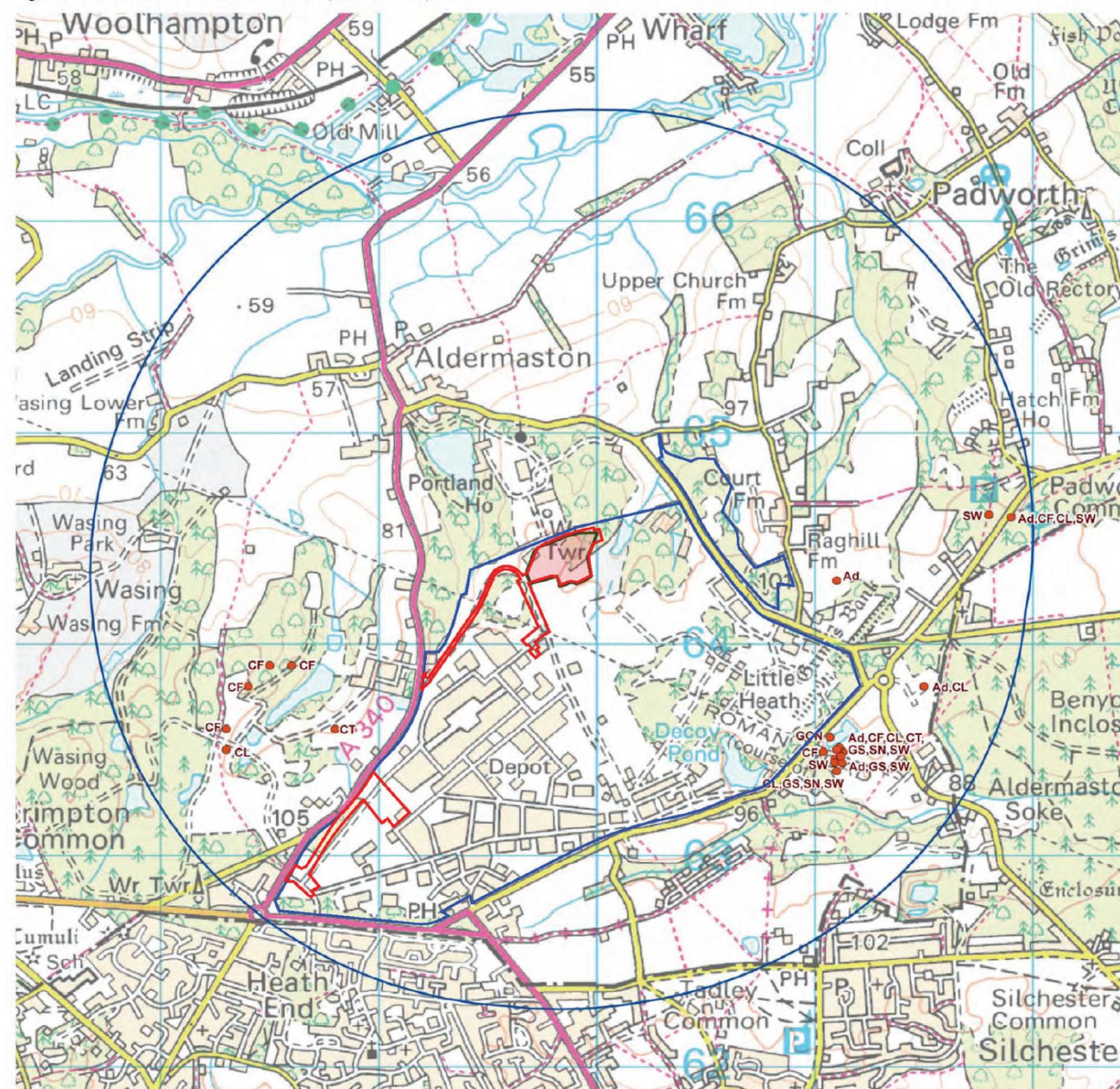
Code	Species	Code	Species
Bf	Bullfinch	MTh	Mistle Thrush
BhG	Black-headed Gull	Ni	Nightingale
BO	Barn Owl	NJ	Night Jar
Br	Brambling	Po	Pochard
BR	Black Redstart	RB	Reed Bunting
C	Curlew	Re	Redshank
CG	Common Gull	RK	Red Kite
Cu	Cuckoo	RO	Ring Ouzel
Du	Dunnock	RP	Ringed Plover
Fi	Fieldfare	RS	Redstart
Ga	Gadwall	RW	Redwing
Gh	Goshawk	SD	Stock Dove
GhW	Grasshopper Warbler	Sd	Shelduck
GPa	Grey Partridge	Sh	Shoveler
GPI	Golden Plover	SI	Skylark
GrW	Green Woodpecker	Sni	Snipe
GrWa	Grey Wagtail	ST	Song Thrush
GS	Green Sandpiper	SI	Starling
HMa	House Martin	Sw a	Swallow
Ho	Hobby	Sw i	Swift
HS	House Sparrow	TD	Turtle Dove
JS	Jack Snipe	Te	Teal
Ke	Kestrel	TPi	Tree Pipit
Ki	Kingfisher	TuD	Tufted Duck
La	Lapwing	Wc	Woodcock
LG	Little Grebe	WFG	White-fronted Goose
Li	Linnet	Wh	Wheatear
LRe	Lesser Redpoll	Whc	Whinchat
LRP	Little Ringed Plover	Wo	Woodlark
LSW	Lesser Spotted Woodpecker	WT	Willow Tit
Ma	Mallard	WW	Willow Warbler
MP	Meadow Pipit	Yh	Yellowhammer
MT	Marsh Tit	YW	Yellow Wagtail



0m

2km

Figure 15-4: Protected and Notable Herpetofauna Species



KEY

- AWE Aldermaston Boundary
- Application Site Boundary
- Hydrus Development Site Boundary
- 2km study area
- Species record

Code	Species
Ad	Adder
CF	Common Frog
CL	Common Lizard
CT	Common Toad
GCN	Great Crested Newt
GS	Grass Snake
SN	Smooth Newt
SW	Slow Worm

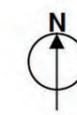


Figure 15-5: Protected and Notable Invertebrate and Flora Species

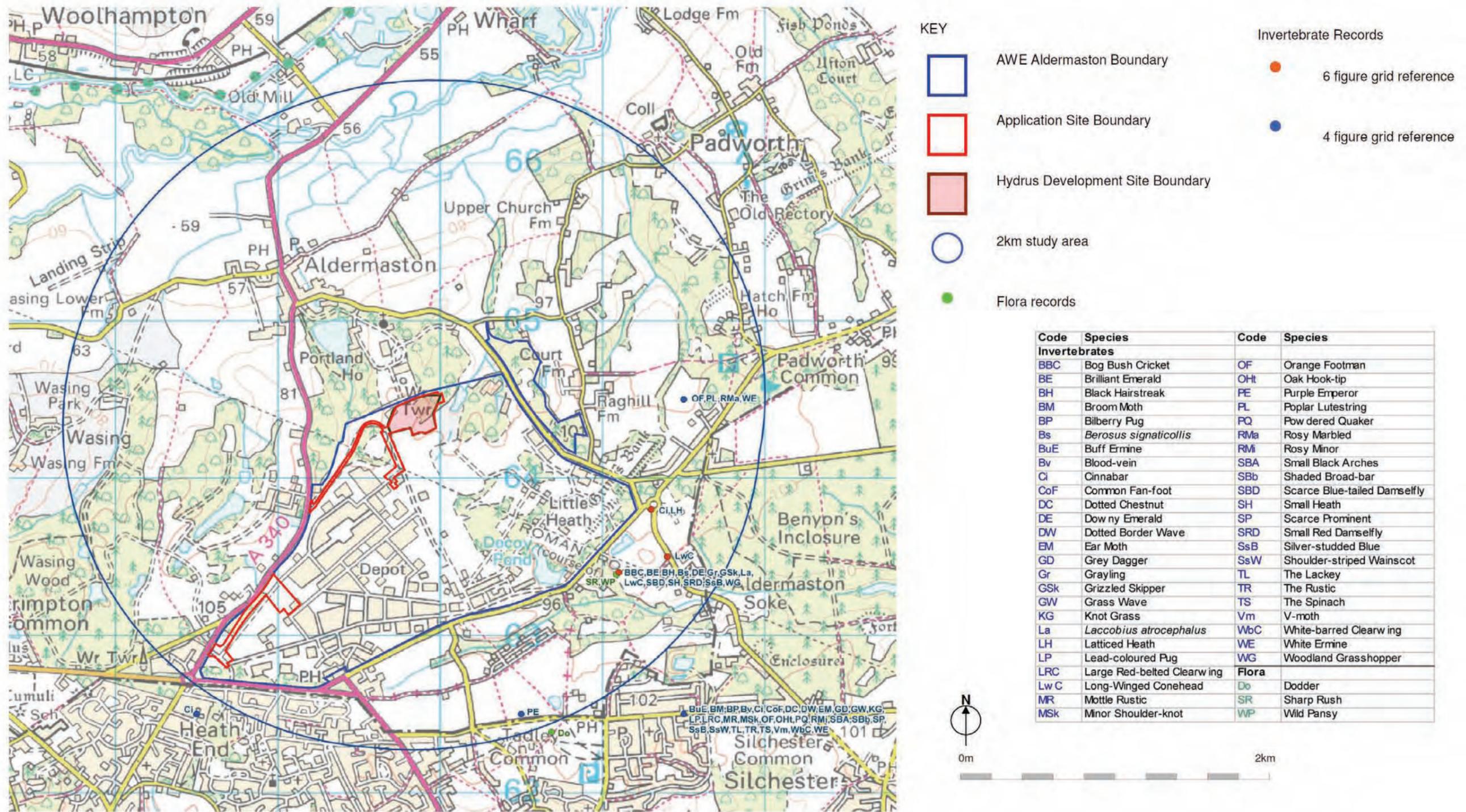
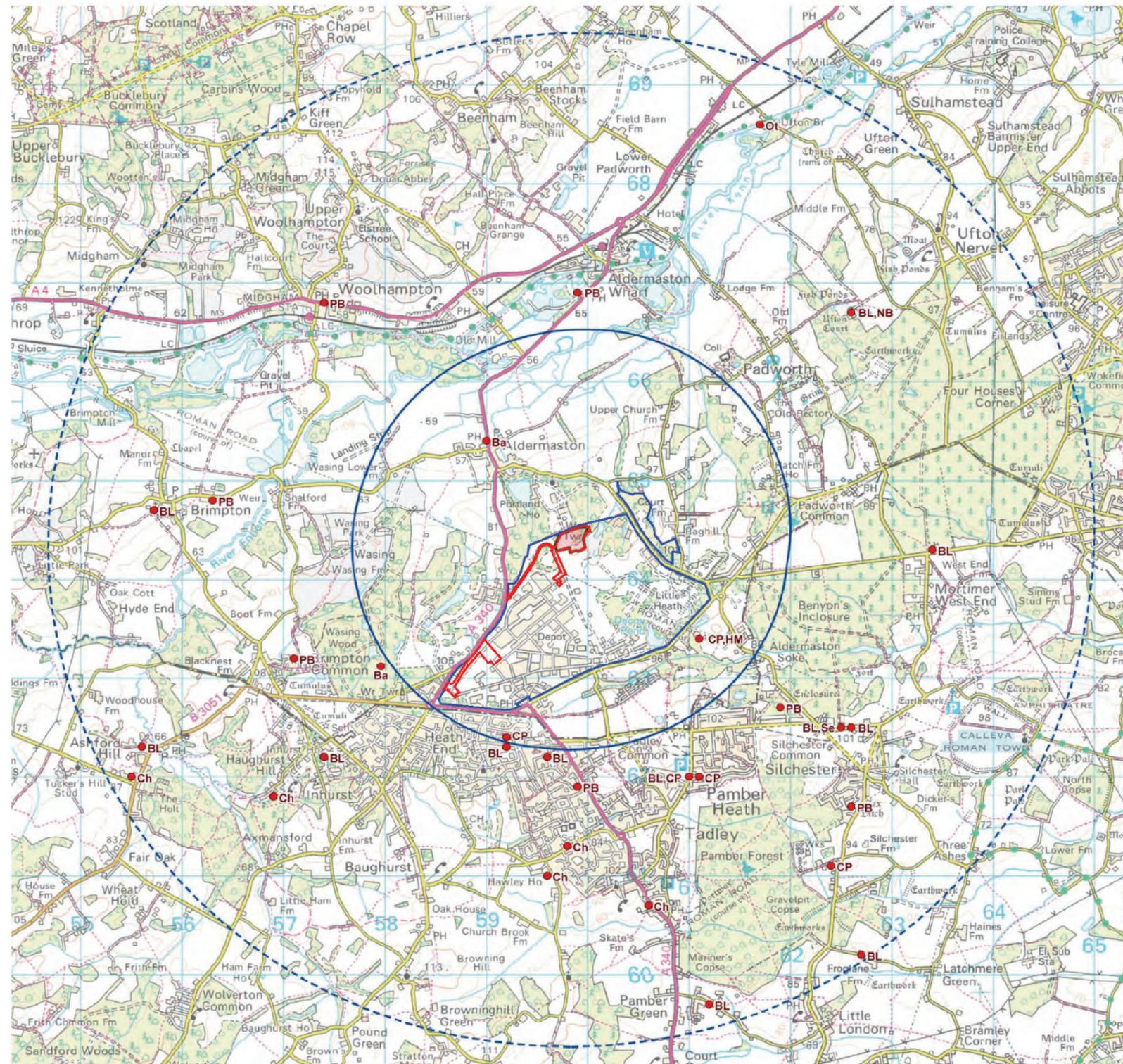


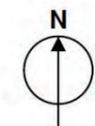
Figure 15-6: Protected and Notable Mammal Species



KEY

-  AWE Aldermaston Boundary
-  Application Site Boundary
-  Hydrus Development Site Boundary
-  2km study area
-  5km study area
-  Species record

Code	Species
Ba	Badger
BL	Brown Long-eared Bat
Ch	<i>Unidentified Bat</i>
CP	<i>Common Pipistrelle</i>
HM	<i>Harvest Mouse</i>
NB	<i>Natterer's Bat</i>
Ot	<i>Otter</i>
PB	<i>Unidentified Pipistrelle</i>
Se	<i>Serotine</i>



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15.4.6 Phase 1 Habitat Survey

15.4.6.1 Application Site Overview

The Hydrus Development Site covers an area of approximately 6.47 hectares. Most of the Hydrus Development Site consists of neutral grassland which in places can be considered flower-rich with patches of acid grassland. This grassland that has developed over aggregate and broken ground is effectively "brownfield" in nature. A small deciduous copse is located in the southeast corner of the Hydrus Development Site with a field layer which is dominated by bramble. There are scattered trees over the remainder of the Hydrus Development Site and a veteran oak is located adjacent to the copse.

The Hydrus Development Site is bordered by areas of acid grassland interspersed with deciduous woodland and parkland trees.

15.4.6.2 Habitats Present within the Application Site

The results of the Extended Phase 1 Habitat Survey are described by habitat below. The Phase 1 Habitat Plan is shown on Figure 15-5 and the associated target notes are provided in Appendix G.5.

A list of plant species recorded is provided in Appendix G.7 which follows the nomenclature of Stace (Ref. 15-26).

15.4.6.3 Broadleaved and Coniferous Scattered Parkland Trees

There are several scattered parkland trees present within the Hydrus Development Site; these include oak, Turkey oak (*Quercus cerris*), ash (*Fraxinus excelsior*), crack willow (*Salix fragilis*), silver birch (*Betula pendula*) and London plane (*Platanus x hispanica*). These trees are scattered across the Hydrus Development Site but form a denser area to the south east of the site, adjacent to the existing copse. One of the trees is a very large, mature veteran oak (*Quercus sp.*) tree (target note 1, Figure 15-7).

The majority of these trees do not have any bat roosting opportunities i.e. no heavy ivy cladding, splits, loose bark or woodpecker holes. However, the mature veteran oak tree is considered to offer high potential for roosting bats and invertebrates. Bird nests from summer 2009 were observed in many of the trees on Hydrus Development Site.

The semi-mature and mature trees are of ecological value due to their age and their opportunities for nesting and foraging birds, and roosting and commuting/foraging habitat for bats, especially the dense area of trees to the south east of the Hydrus Development Site. Due to its age and potential for a variety of wildlife, the veteran oak tree is considered to be of high ecological value.

15.4.6.4 Semi-improved Acid Grassland

The grassland in the west of the Hydrus Development Site, especially that located to the south of the access road, has large amounts of bare ground. The acidic nature of the grassland is confirmed via the presence of a number of small patches of heather (*Calluna vulgaris*) and *Juncus*.

The areas of acid grassland and spoil on the Hydrus Development Site are of value for invertebrates, foraging bats and birds, and herpetofauna.

15.4.6.5 Semi-improved Neutral Grassland

There are large areas of semi-improved neutral grassland within the Hydrus Development Site, largely in-combination with ephemeral vegetation. These areas have colonised around where buildings used to stand and include grasses such as perennial ryegrass (*Lolium perenne*), meadow foxtail (*Alopecurus pratensis*), Yorkshire fog (*Holcus lanatus*), annual meadow grass (*Poa annua*), cocks-foot (*Dactylis glomerata*) and fescue (*Festuca sp.*) with soft rush (*Juncus effuses*), black medick (*Medicago lupulina*), birds foot trefoil (*Lotus corniculata*), dandelion (*Taraxacum officinale*), creeping cinquefoil (*Potentilla reptans*), ribwort plantain (*Plantago lanceolata*), common mouse ear (*Cerastium fontanum*), bristly ox-tongue (*Picris echioides*), cleavers (*Galium aparine*), broad-leaved dock (*Rumex obtusifolius*), curled leaf dock (*Rumex crispus*), forget me not (*Myosotis arvensis*), meadow buttercup (*Ranunculus acris*), creeping buttercup (*Ranunculus repens*), dove's-foot crane's-bill (*Geranium molle*), common daisy (*Bellis perennis*), white clover (*Trifolium repens*), yarrow (*Achillea millefolium*) and occasional lichen species.

This grassland provides potential habitat for reptiles, invertebrates, foraging bats and small mammals.

15.4.6.6 Buildings and Hardstanding

All structures and buildings on the Hydrus Development Site were demolished between January and November 2007. There are some areas of hardstanding within the development boundary in the form of temporary access roads (target note 4 on Figure 15-7), existing access roads and footpaths. Temporary portacabins were also present at the time of survey, associated with the permitted development borehole construction works.

These areas of hardstanding are of no ecological value.

15.4.6.7 Copse

There is a small copse within the south eastern part of the Hydrus Development Site (target note 2 on Figure 15.7). The copse is mainly of oak, elder (*Sambucus nigra*), beech (*Fagus sylvatica*), birch and poplar (*Populus sp.*) trees with a field layer of common nettle (*Urtica dioica*).

Within the copse there are some areas of dead wood and log piles which are of value for invertebrates, small mammals and herpetofauna. The copse is also of value for foraging and commuting bats.

15.4.6.8 Running Wet Ditch

A small running wet ditch runs from the southern boundary towards the copse to the south east of the Hydrus Development Site (target note 2 on Figure 15-7). The ditch itself contains a small amount of running water with grassed embankments and tall ruderals. The running wet ditch is of ecological value due to the potential of the embankments to support reptiles, invertebrates and common small mammals. This ditch is not suitable for water voles due to lack of food sources, connectivity and water quality (see *Technical Appendix G*);

therefore the Hydrus Development Site does not hold the potential to support this species.

15.4.6.9 Tall Ruderals

Ruderal species such as broadleaved dock (*Rumex obtusifolius*) and willowherb (*Chamaenerion angustifolium*) were present along the embankments of the running wet ditch and around the small copse in the south east of the Hydrus Development Site.

This tall ruderal vegetation is of ecological value as it provides areas of inter-linkage around the AWE Aldermaston Site, filling in gaps between woodland, scrub and grassland.

15.4.6.10 Ephemeral/Short Perennial

Several buildings have been demolished within the central section of the Hydrus Development Site, which now comprises short perennial/ephemeral habitat consisting of shallow stony soil with scattered plant species such as black medick, willowherb and dock, typical of derelict urban sites. This bare ground is of ecological value for protected species such as black redstarts (*Phoenicurus ochruros*), and reptiles and provides micro habitats for invertebrates and foraging for birds.

15.4.6.11 Other Habitat

'Other habitat' are habitats that do not fall within the JNCC habitat classification, such as construction laydown areas, bare ground, fly tipping etc., in this case at the Hydrus Development Site they include construction laydown and storage areas and welfare accommodation / offices.

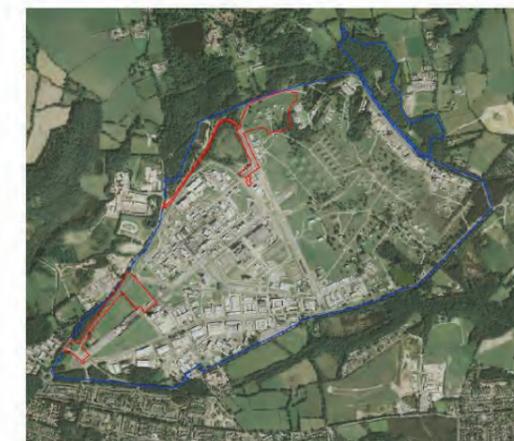
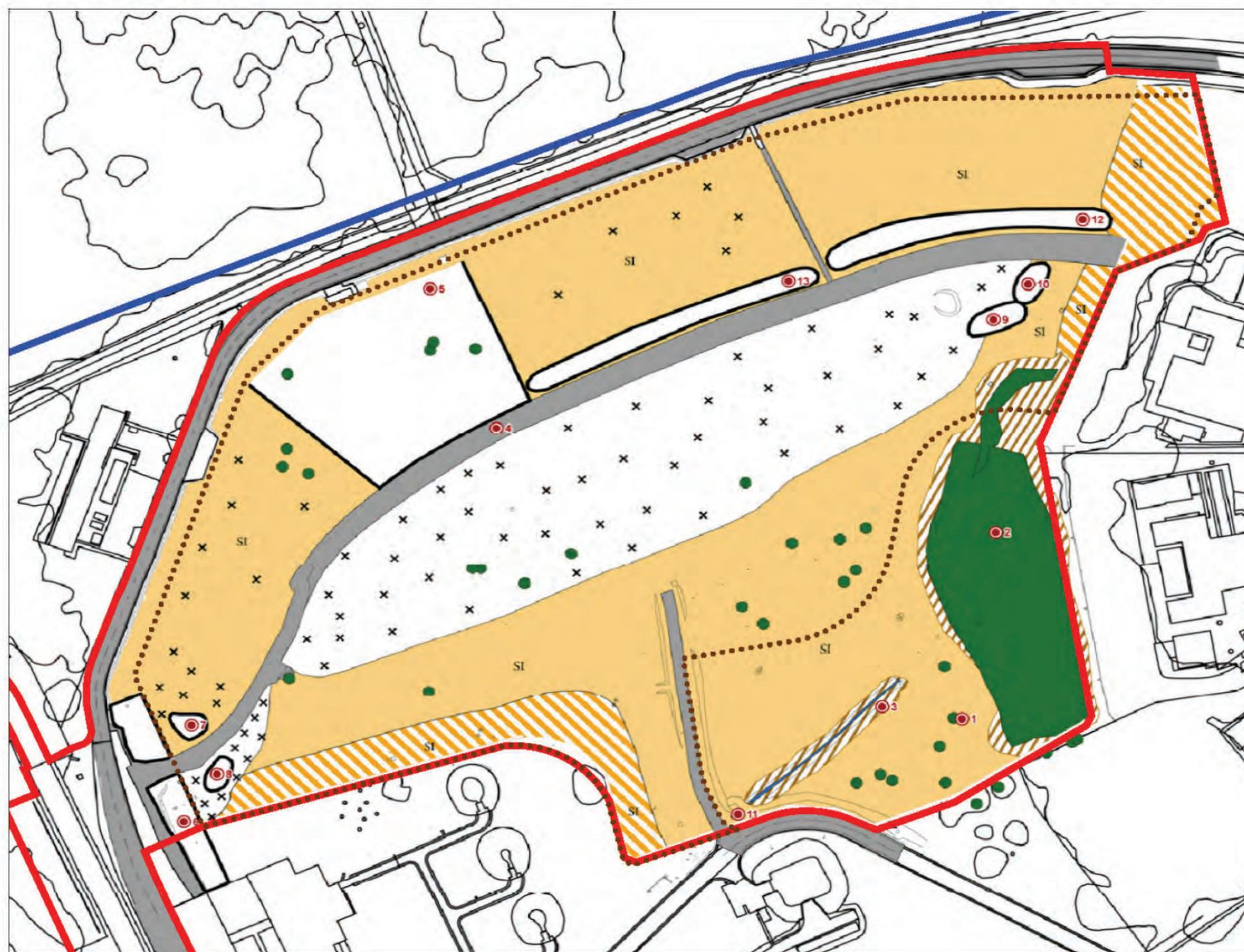
Areas of topsoil have been stripped and piled in storage mounds on the Hydrus Development Site for the temporary access road (target notes 7, 8, 9, 10, 12 and 13 on Figure 15-7). These mounds support semi-improved neutral and acid grassland and provide refuge and foraging areas for birds, small mammals, invertebrates and herpetofauna.

There are two construction laydown areas within the Hydrus Development Site boundary; one at the entrance to the Hydrus Development Site to the west, and one to the north west (target notes 5 and 6 on Figure 15-7). These are temporary areas but are currently active construction enclaves, with portable office buildings and storage facilities.

15.4.6.12 Habitats Beyond the Application Site Boundary

The Proposed Development is surrounded by the remainder of the AWE Aldermaston Site, the majority of which is hardstanding, with some recreational areas and thick screen planting along the main security fence boundary. A large area of acid grassland and heath is present to the south, formed over disused bunkers.

Figure 15-7: Phase 1 Habitat Map



- KEY
- AWE Aldermaston Boundary
 - Hydrus Development Boundary
 - Application Site Boundary
 - Herpetofauna Fence Location
 - Hydrus Development Site Boundary
 - Parkland/scattered broadleaved trees
 - x Ephemeral/short perennial
 - Hardstanding
 - Broadleaved semi-natural woodland
 - SI Semi-improved neutral grassland
 - SI Semi-improved acid grassland
 - Tall ruderals
 - Other habitat
 - Running water
 - 1 Target note



0m

200m



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15.4.7 Potential for Protected or Otherwise Notable Species

A range of ecological field surveys were undertaken on the Hydrus Development Site (as described at 15.3.1.2), which included:

- Bat Activity, Emergence and Dawn Swarm Survey, plus Daytime Tree Checks;
- Reptile Survey in May, June and July;
- Breeding Bird Survey in April;
- Badger Survey; and
- Invertebrate Habitat Assessment.

The reports of these surveys can be found at Appendix G.5. The results are summarised below.

15.4.7.1 Plants and Habitats

No habitats covered by Annex I of the European Habitats Directive were recorded within the field survey study area.

15.4.7.2 Bats

There are no permanent buildings or other standing structures within the Hydrus Development Site. There are portable office buildings within the construction laydown area (CACE) to the south west of the Hydrus Development Site (target note 6 on Figure 15.7). These are unsuitable for bats due to the lack of roosting opportunities i.e. flat roof, wrong material makeup etc.

The majority of the semi-mature to mature trees within the Hydrus Development Site have no bat roosting opportunities i.e. no heavy ivy cladding, splits, loose bark or woodpecker holes. However, the mature veteran oak tree provides roosting opportunities for bats. The grassland, copse, running wet ditch and scattered trees across the Hydrus Development Site provide suitable foraging and commuting habitat for bats.

Evening emergence and dawn swarming surveys

No bats were recorded emerging or returning to the veteran oak tree during the evening emergence or dawn swarming survey. However, high levels of bat activity were recorded around the tree during these surveys.

Tree cavities, including splits and under bark, can be used throughout the year by a variety of species and certain bats are known to move unpredictably between roosts. The bat roost potential of the tree should therefore remain high because of the quantity and variety of features it has for roosting bats.

Evening activity surveys

The Hydrus Development Site was found to provide commuting and foraging habitat for at least two species of bat; common pipistrelle and soprano pipistrelle. Noctule was also recorded within the Hydrus Development Site during emergence surveys.

The south east corner of the Hydrus Development Site was found to have medium bat interest, with the rest of the site being of relatively low bat interest.

The south east corner of the Hydrus Development Site contained a variety of habitats which made it of value to foraging and commuting bats. Prolonged foraging activity was recorded in this area with nine contacts recorded during one survey. All three species of bat recorded on the Hydrus Development Site were found there.

15.4.7.3 Badgers

Badgers are known to be within the AWE Aldermaston Site but no signs were recorded within the Hydrus Development Site boundary.

15.4.7.4 Birds

The scattered trees and copse within the Hydrus Development Site provide suitable nesting habitat for birds. Many nests were recorded within the trees on Hydrus Development Site at the time of the Phase 1 habitat survey in both March and July 2009. The semi-mature and mature trees and copse on site were identified as providing suitable habitat for nesting common bird species and also provide, along with the grassland, an important food source for the birds.

All wild birds and their nests are protected during the breeding season against intentional damage or disturbance of their nests, eggs or young whilst on the nests, under the WCA.

A full breeding bird survey was undertaken across the Hydrus Development Site in April, May and June 2009.

No species that are specially protected under the EC Birds Directive or WCA were identified during the breeding bird survey and no black redstarts (*Phoenicurus ochruros*) were recorded even though suitable habitat was present. However, one species of conservation concern (dunnock, *Prunella modularis*) was recorded breeding on the Hydrus Development Site. This species is listed as a UKBAP Priority Species and is also on the amber list of birds of medium conservation concern.

Three further amber-listed species (willow warbler, *Phylloscopus trochilus*, stock dove, *Columba oenas* and green woodpecker *Picus viridis*) were considered to be breeding in the vicinity of the Hydrus Development Site.

Two skylarks (*Alauda arvensis*) (red-listed species and UKBAP) were flushed from grassland on the Hydrus Development Site in April but were not considered to be breeding on the Hydrus Development Site.

A further ten species of no current conservation concern were regarded as breeding on the Hydrus Development Site.

The grassland was disturbed by construction work associated with the borehole construction permitted development throughout the duration of the breeding bird survey. The copse in the southeast corner of the Hydrus Development Site and the associated veteran oak were the focal point of the breeding bird interest on the Hydrus Development Site. All species considered to be breeding did so in this area. The grassland is suitable for ground-nesting birds such as skylark but, at present, the level of disturbance is precluding breeding.

15.4.7.5 Herpetofauna

A reptile survey was undertaken in May, June and July 2009.

The majority of the grassland on the Hydrus Development Site is not deemed suitable for reptiles due to the regular mowing regime. The reptile survey concentrated on an area of grassland around the woodland copse and small ditch in the south east corner of the Hydrus Development Site which was considered to offer the most favourable habitat for reptiles within the Hydrus Development Site.

The Hydrus Development Site was found to support a low population of slow worms and grass snakes. Slow worms were found around the edge of the copse and along the edge of the ditch. A grass snake (*Natrix natrix*) was located along the edge of the copse. Common toads (*Bufo bufo*) were also recorded using the refugia during the reptile survey.

The Hydrus Development Site does not qualify as a key reptile site under the guidelines in Froglife's Advice Sheet 10 (1999).

A running wet ditch is present on the Hydrus Development Site but there are no ponds. The Hydrus Development Site is located within 500m of the North Ponds which are known to support a medium population of great crested newts (Ref. 15-27).

15.4.7.6 Invertebrates

An Invertebrate Habitat Assessment was undertaken in July 2009. This assessed the overall intrinsic value of the Hydrus Development Site for invertebrates as well as particular features of interest.

Although a full species list was not generated, several species of note were recorded during previous Hydrus Development Site visits and during the habitat assessment. The full survey details can be found at Appendix G.5.

Species that were recorded either during the habitat assessment or incidentally recorded during other ecological surveys include grizzled skipper (*Pyrgus malvae*), common blue (*Polyommatus icarus*), small heath (*Cecononympha pamphilus*), cinnabar moth (*Tyria jacobaeae*) and glow-worm (*Lampyrus noctiluca*). Grizzled skipper is listed as UK Biodiversity Action Plan Priority species, while common blue, small heath and glow-worm have all suffered regional declines. All of these species are indicators of a reasonably diverse invertebrate community.

The Hydrus Development Site has a number of features which are important to invertebrate communities meaning the overall diversity is likely to be high given the size of the site. The grassland itself is structurally diverse, contains abundant bare ground and is locally florally diverse. The veteran oak tree is also a feature of high potential importance to invertebrates due to the presence of dead wood and the natural assemblage oak trees can support. The copse and ditch are less intrinsically valuable than the grassland and the oak tree but provide structural diversity and in the case of the ditch, a small amount of aquatic interest.

15.4.7.7 Invasive weeds

No invasive weeds (Japanese knotweed, *Fallopia japonica*, Himalayan balsam, *Impatiens glandulifera* or giant hogweed, *Heracleum mantegazzianum*) were recorded within the Hydrus Development Site boundary at the time of the Phase 1 survey.

15.4.7.8 Other

There were a number of animal runs throughout the Hydrus Development Site, which appear to have been created by foxes (*Vulpes vulpes*). Fox spraints and a fox itself were recorded during the Phase 1 survey (target note 11 on Figure 15-5). Numerous rabbit burrows are present within the copse to the south east of the Hydrus Development Site. It should be noted that both foxes and rabbits (*Oryctolagus cuniculus*) are protected under The Wild Mammals (Protection) Act 1996 (Ref. 15-28). Under this Act it is an offence to inflict unnecessary suffering to both these species.

15.4.8 Valued Ecological Receptors (VER)

The Valued Ecological Receptors (VER) comprising valued sites, habitats and species which could be affected by the Proposed Development are identified in Table 15-4 below.

The methodology for assigning values to sites, habitats and species is described in section 15.3.2. None of the ecological features identified were considered to be of importance at the County, Regional, National or International level. None of the habitats form part of sites designated as of County importance, and none of the species recorded were at levels approaching 1% of the County populations of those species.

As explained in section 15.3.2, evaluation below County level is based on judgement. In this case, the VERs identified below have been assessed as being of District value on the basis that they are the subject of Biodiversity Action Plans an/or are subject to specific legal protection.

Table 15-4: Summary of Valued Ecological Receptors (VERs)

Valued Ecological Receptor (VER)	Status	Geographical Value
Habitats		
Grassland (VER1)	LBBAP Habitat Action Plan	District
Acid grassland (VER2)	LHBAP Habitat Action Plan	District
Woodland (VER3)	LBBAP & LHBAP Habitat Action Plan	District
Veteran oak tree (VER4)	N/A	District
Species		
Bats (VER5)	Habitat Regulations Schedule 2, Wildlife	District

Valued Ecological Receptor (VER)	Status	Geographical Value
	and Countryside Act Schedule 5, some UK BAP, LHBAP Species Action Plan (Pipistrelle)	
Badgers (VER6)	Protection of Badgers Act 1992	District
Reptiles – slow worms and grass snakes (VER7)	Partial WCA5, UKBAP	District
Amphibians – Great crested newt (VER8)	HREG Schedule 2, Wildlife and Countryside Act Schedule 5, UKBAP, LHBAP Species Action Plan	District
Invertebrates (VER9)	UKBAP (grizzled skipper)	District
Breeding birds (VER10) - skylark, willow warbler, green woodpecker, dunnock, feral pigeon, stock dove, mallard, wood pigeon, pied wagtail, robin, blue tit etc.	WCA1, BCC Red, BCC Amber, UKBAP, LHBAP Species Action Plan (skylark)	District

Key:

European Protected:

Annex 1 – Listed in Annex 1 of the EC Birds Directive

HREG – Listed in Schedule 2 of the Habitat Regulation 1994

UK Protected:

WCA1 – Listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)

WCA5 – Listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)

CROW – Countryside and Rights of Way Act 2000

Other Designations:

UK BAP – Listed as a Priority Species in the UK Biodiversity Action Plan

LBBAP – Listed in the Berkshire Biodiversity Action Plan

LHBAP – Listed in the Hampshire Biodiversity Action Plan

BCC Red – Listed as “red” on the Birds of Conservation Concern List

BCC Amber – Listed as “amber” on the Birds of Conservation Concern List

15.5

Potential Impacts and Mitigation Measures

This section addresses the potential ecological impacts associated with the Proposed Development and the proposed mitigation measures. Table 15-5 details the impacts relating to each of the ecological receptors identified within the Hydrus Development Site.

The impacts of run-off from the Proposed Development has been considered in *Chapter 8: Water Resources*.

15.5.1 Construction Impacts

Construction activities are described in *Chapter 6: Construction Phase*. Potential construction impacts of the Proposed Development on the identified VERs could arise from:

- Direct loss of wildlife habitats through land-take;
- Severance and/or fragmentation where a scheme may create a barrier and divide existing habitats or affect the continuity of wildlife corridors such as hedgerows;
- Disruption of hydrology may affect nearby watercourses;
- Polluted run-off may affect down-stream watercourses;
- Lighting can adversely affect invertebrates and disorientate birds and change bat behaviour; and
- Disturbance of habitats and species (physical or related to increased human activity and/or noise).

Construction works can result in disturbance of sensitive species. Although the works are temporary the potential effects can be significant.

As explained earlier in this chapter, the Proposed Development includes measures to avoid or mitigate such effects so far as practicable. These measures have been taken into account in the following assessment of effects.

Habitats and Species

15.5.1.1 VER1, VER2, VER 3 & VER4: Grassland, Acid Grassland, Woodland & Veteran Oak Tree

The Proposed Development involves the construction of an Operations Building, a Support Building, and an associated Electrical Substation. The Proposed Development involves the removal of some grassland (acid and semi improved) and individual trees. However, the small copse and associated grassed boundaries plus the veteran oak tree would not be affected by the proposals.

The new buildings would be constructed upon the existing habitats on site. The Proposed Development construction would include the creation of a sustainable drainage system (SuDS), compensatory grassland provisions and additional tree planting (See *Chapter 5: The Proposed Development*, *Chapter 8: Water Resources* and *Chapter 13: Landscape and Visual*).

Best practice guidelines would be adhered to during construction, including material storage and handling, siting of construction plant and restricted vehicular

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movements away from the woodland boundaries, retained grassland verges and tree root systems, plus covering of construction materials and operational control. All works on the Hydrus Development Site near trees to be retained will be carried out in-line with British Standard BS 5837: 2005 (Ref. 15-29) and managed during the construction period to ensure they remain safe, i.e. tree protective fencing to BS 5837: 2005 specifications. This will ensure that incidental construction impacts such as machine tracking and laydown of spoil or materials are avoided. The significance of avoiding impacts on tree protective fencing will be included within a toolbox talk to all contractors, prior to commencing work on the Application Site. These best practice guidelines are described further in *Chapter 6: Construction Phase*.

The effect of runoff from the Hydrus Development Site has been considered in *Chapter 8: Water Resources*.

The magnitude of impact on the two types of grassland, veteran oak tree and woodland habitats is assessed as intermediate negative. The significance of the impact is **slight adverse**.

15.5.1.2 VER5: Bats

There are no permanent structures on the Hydrus Development Site and no bat roosts have been identified within any of the trees on the Hydrus Development Site. However, the large veteran oak tree has been assessed as having high potential for roosting bats. The veteran oak tree would not be directly affected by the redevelopment proposals, but may be indirectly affected by construction light, noise and vibration.

Common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus*) and noctule bats (*Nyctalus noctula*) were recorded foraging and commuting across the Hydrus Development Site along the woodland edges, grassed margins and stand alone trees. Whilst the woodland and associated grassed boundary is to be retained, the majority of the grassland and stand alone trees would be lost to the redevelopment. All construction works would be undertaken generally during daylight hours, so there would be minimal impact on these nocturnal animals.

The magnitude of impact on these species is assessed as minor negative. The significance of impact is **slight adverse**.

15.5.1.3 VER6: Badgers

No badger setts have been recorded within the Hydrus Development Site itself or within 30m of the Hydrus Development Site boundary. A Natural England licence for disturbance is not required for the construction phase.

However, badgers have been recorded foraging and commuting within the wider AWE Aldermaston Site. Disturbance during the construction phase would be minimised by the following measures:

- Construction hours to be limited in accordance with the Code of Construction Practice (CoCP); and
- Care will be taken when constructing trenches (>1.5m deep), as these could act as 'pitfall traps'. Trenches will be covered overnight or a means of escape provided.

As badgers frequently construct new setts, a resurvey of the Hydrus Development Site for badgers, particularly within the small copse will be undertaken before site establishment commences.

The magnitude of impact on badgers is assessed as minor negative. The significance of the impact is **slight adverse**.

15.5.1.4 VER7 & VER 8: Reptiles and Amphibians

Slow worms and grass snakes have been recorded along the running wet ditch and copse in the southeast of the Hydrus Development Site within the associated tall grassland and scrub habitat. Common toads have been recorded along the running wet ditch and grassland habitat on the Hydrus Development Site. The Hydrus Development Site is also located within 300m of the North Ponds within AWE Aldermaston. The most recent survey of the North Ponds, conducted by Atkins in 2007, indicates the presence of a medium population of great crested newts. These amphibians could use the field margins and copse edges on the Hydrus Development Site during the summer months and for hibernation through the winter.

Given the limited extent of habitat to be lost and particularly in light of the considerable area of more suitable habitat closer to the AWE North Ponds, it was considered that a European Protected Species (EPS) licence would not be required for the construction period at the Hydrus Development Site. However, in line with current guidance from Natural England, a Method Statement (see Appendix G.5) was produced on behalf of AWE which recommends all reasonable precautions to be taken to minimise impacts on this European Protected Species.

The copse and associated grassed and scrub edges would be retained as part of the redevelopment proposals but some grassland would be lost. The running wet ditch will be retained and protected during construction and operational periods. Amphibians and reptiles present within the Hydrus Development Site boundary would be retained in the locality i.e. within the copse and associated rough grassed boundary and scrub habitat. The following precautionary mitigation measures would be implemented prior to works commencing as part of the Proposed Development.

Herpetofauna exclusion fencing will be erected along the proposed building footprint for the new structures and access road during the construction works to exclude these species from the construction area. The location of the exclusion fence is shown on Figure 15-8 and specification shown at Appendix G.5.

An ecologist will undertake a destructive search of any terrestrial habitat scheduled for removal as part of the clearance or construction works. Any animals found during the fencing installation and associated vegetation removal will be relocated into suitable habitat within the woodland and scrub habitat on the other side of the herpetofauna fencing.

The magnitude of impact on these species in the short term is assessed as minor negative. The significance of the impact is **slight adverse**.

15.5.1.5 VER9: Invertebrates

The Hydrus Development Site has a number of features which support invertebrate communities. The grassland itself is structurally diverse, contains abundant bare ground and is locally florally diverse. The veteran oak tree is also a feature of high potential importance to invertebrates due to the presence of dead wood and the natural assemblage oak trees can support. The copse and ditch are less intrinsically valuable than the grassland and the oak tree but provide structural diversity and in the case of the ditch, a small amount of aquatic interest.

The copse, veteran oak and running wet ditch would be retained as part of the landscape proposals. However, the grassland and bare ground would be lost to the redevelopment.

The magnitude of impact on these species is assessed as minor negative. The significance of the temporary impact is **slight adverse**.

15.5.1.6 VER10: Breeding Birds

The grassland, bare ground, copse and trees on Hydrus Development Site support foraging and nesting birds. Common species of birds have been recorded nesting in the trees and copse. Notable farmland birds recorded using the copse and grassland margins for feeding include skylark, dunnock and willow warbler. The copse and associated grassland edges would be retained as part of the Proposed Development proposals but some grassland margins and bare ground would be lost during the building and road construction. In order to avoid disturbance of nesting birds, vegetation clearance will be undertaken outside of the bird-nesting season where practicable (mid February to mid September inclusive).

The increase in people, traffic and noise in the vicinity of the Hydrus Development Site during the construction period may result in increased disturbance of birds where they utilise nearby features. However, this is likely to be of little significance given that the works would take place within the active AWE Aldermaston Site.

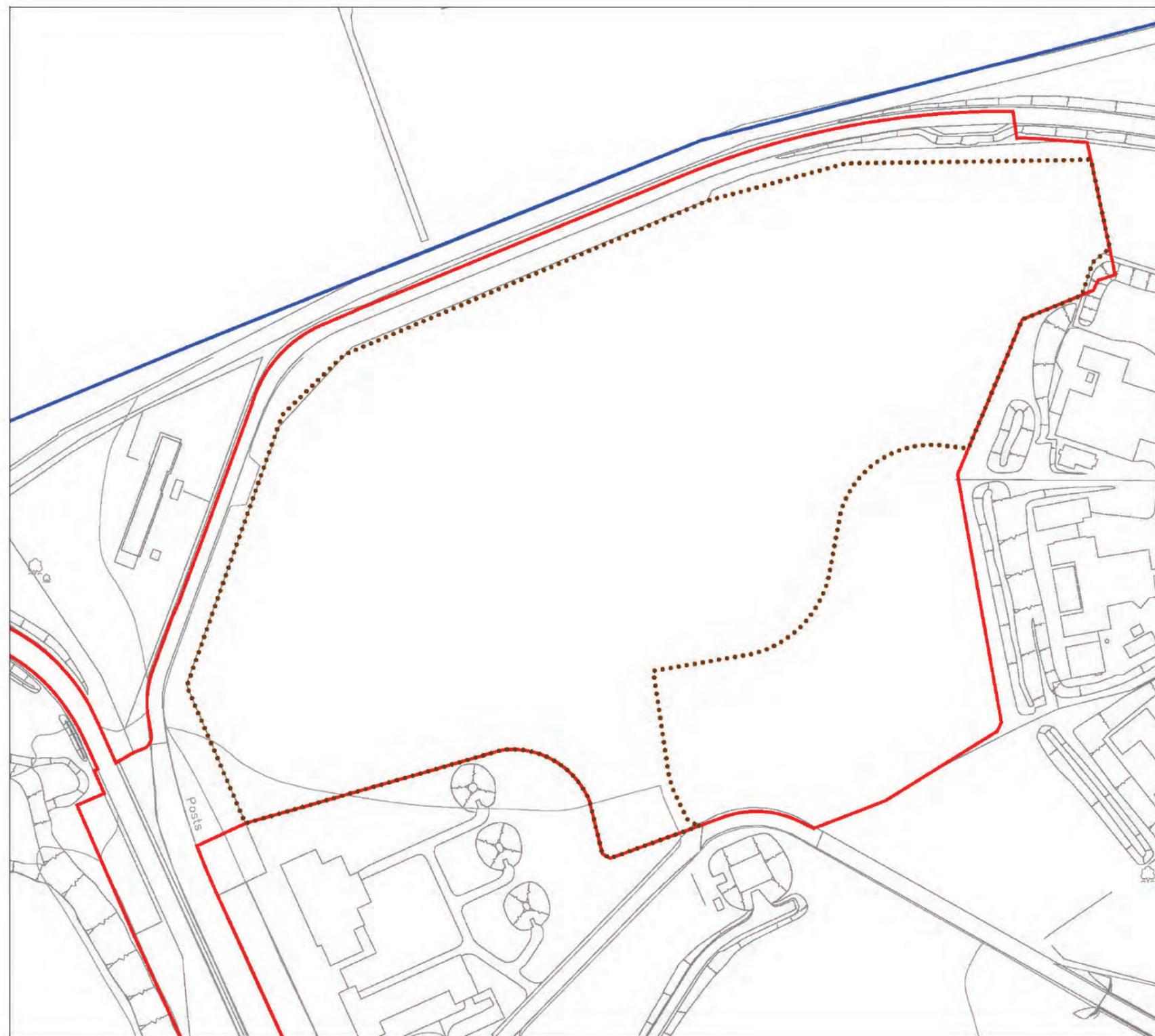
The magnitude of impact on these species during the construction period is considered to be minor negative, and the significance of impact is assessed as **slight adverse**.

15.5.2 Operational Impacts

Potential impacts of the Proposed Development on the identified VERs could arise from:

- Direct loss of wildlife habitats through land-take;
- Severance and/or fragmentation where a scheme may create a barrier and divide existing habitats or affect the continuity of wildlife corridors such as hedgerows;
- Lighting can adversely affect invertebrates and disorientate birds and change bat behaviour; and
- Disturbance of habitats and species (physical or related to increased human activity and/or noise).

Figure 15-8: Herpetofauna Fence Location



KEY



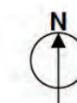
AWE Aldermaston Boundary



Hydrus Development Site Boundary



Fence Location



0m



200m

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Habitats and Species

15.5.2.1 VER1, VER2, VER3 & VER4: Grassland, Acid Grassland, Woodland & Veteran Oak Tree

The majority of the areas of neutral and acid grassland on the Hydrus Development Site would be lost. The landscape proposals for the Hydrus Development Site will include grassed mounds wrapping around the Operations Building, creation of native wildflower meadow / grassland which would form replacement grassland margins and wetland grassland.

The copse, veteran oak tree and associated grassland edges on the Hydrus Development Site provide habitat for invertebrates and two species of reptiles (slow worm and grass snake) and are to be retained within the development. These features are of ecological value and will add maturity to the Proposed Development planting scheme.

New native woodland copses comprising English oak (*Quercus robur*), red oak (*Quercus rubra*), silver birch (*Betula pendula*) and downy birch (*Betula pubescens*) along with semi-mature hedges will also be placed around the Hydrus Development Site (although, tree planting will be limited on existing habitat currently utilised by basking reptiles to limit overshadowing).

The proposals for the Proposed Development will use native planting to provide high quality landscaping and to promote nature conservation by attracting local wildlife. Native planting will also tie in with the existing vegetation on the Hydrus Development Site. Ninety percent of all new planting on the Hydrus Development Site will be native and beneficial to wildlife. The full landscape proposals are described in *Chapter 13: Landscape and Visual*.

The landscape proposals will aim to compensate for any habitat loss but the Hydrus Development Site would lose its structural diversity for wildlife. The magnitude of impact on grassland and acid grassland is considered minor negative and therefore a significance of the impact is **slight adverse**. Whereas, the magnitude of impact on the copse and the veteran oak tree is considered to be negligible, thus the significance of impact is assessed as **negligible**.

15.5.2.2 VER5: Bats

The copse edges and stand alone trees on Hydrus Development Site provide foraging and commuting habitat for bats. The Hydrus Development Site currently experiences moderate levels of background lighting at night due to security requirements, with minimal levels of lighting around the copse and stand alone trees to the south east of the Hydrus Development Site. The species most likely to be affected by any changes in lighting include some birds, bats, moths and insects, i.e. species that are nocturnal.

The proposed lighting has been designed to the specifications set out in the Bat Conservation Trust 'Bats and Lighting in the UK' 2008 guidelines (Ref. 15-30) with column locations and lux levels discussed with an experienced ecologist. Lighting is discussed further in *Chapter 5: The Proposed Development* and *Chapter 13: Landscape and Visual*.

Bats have been recorded foraging and commuting within the Hydrus Development Site. The veteran oak tree has been classed as offering bats high

roosting potential. The new buildings and surrounding access roads will be lit to 20 lux to meet security requirements. The lighting around the rest of the Hydrus Development Site, including the copse, veteran tree and associated grassland, will remain unchanged and will not increase as a result of the additional lighting around the buildings and roads.

Bat boxes will be erected on the semi-mature to mature trees within the Hydrus Development Site. The boxes would be erected in the retained mature trees in suitable areas i.e. unlit for bats. The retention of the copse and associated grassland on site, along with the proposed landscape strategy aims to strengthen existing linear features. Native planting will also tie in with the existing vegetation on the Hydrus Development Site and attract seed eating birds, foraging bats and butterflies.

However, the structural diversity and varied floral community which currently benefit invertebrate species will be lost, thus reducing foraging potential on the Hydrus Development Site for bats.

The magnitude of impact is considered to be minor negative, thus the significance of impact is assessed as **slight adverse**.

15.5.2.3 VER6: Badgers

The following badger mitigation measures have been incorporated into the Proposed Development for the operational phase of the Hydrus Facility.

- An assemblage of fruit- and nut-bearing shrubs (mainly native and where practicable local provenance stock such as English oak, wild cherry *Prunus avium* and hazel *Corylus avellana*) will be planted in appropriate parts of the Hydrus Development Site to which the badgers will still have access, to help mitigate the loss of foraging habitat. Species and cultivars will be selected which fruit at slightly different times of the year, in order that the badgers are supplied with food for the longest period possible;
- Links will be retained along the copse and surrounding woodland with the provision of new grassland, hedgerow and tree planting, thus allowing the badgers to move around the Hydrus Development Site and have access to off-site habitats; and
- Traffic speed restrictions and traffic calming measures are applied throughout the wider AWE Aldermaston Site which already allows badgers to move safely across the site. The speed restriction of 10mph will also be applicable to the Hydrus Development Site.

The magnitude of impact on badgers is assessed as negligible. Thus the significance of the impact is **negligible**.

15.5.2.4 VER7 & VER8: Reptiles and Amphibians

Reptiles and amphibians have been recorded on the Hydrus Development Site and are known to be present within the wider AWE Aldermaston Site. The copse, veteran oak tree, running wet ditch and associated grassland will be retained as part of the landscape proposals but large areas of grassland will be lost to the redevelopment.

A new area of grassland will be created using a wildflower seed mix to the south east of the Operations Building around the detention basin and up to the edge of the copse. A SuDS scheme incorporating swales and a detention basin will enhance the wetland habitat on the Hydrus Development Site. They will be seeded with a wet grassland seed mix.

There will be three types of grassland within the redevelopment; amenity grassland for ease of maintenance around the new building, and areas of species rich meadow grassland and wetland grassland for wildlife enhancement. The amenity grassland will need to be heavily maintained to keep it fit for purpose. However, areas of meadow grassland and wet grassland to be incorporated into the landscape strategy will undergo a reduced mowing regime to allow the grassland to flower and to reduce the risk of harm to herpetofauna during mowing. These areas will be cut once yearly in October, especially around the existing copse and veteran oak tree, plus proposed hedgerows and SuDS detention basin to increase the site's value. This management regime will help maintain and develop the diversity of the grassland.

Tree planting will be limited around the copse and associated grassland and the SuDS features to the south east of the Hydrus Development Site to maintain the existing conditions for the herpetofauna.

One hibernaculum will be created within the copse on the Hydrus Development Site using existing material found within the woodland.

The SuDS will also provide a habitat for grass snakes which are currently utilising the Hydrus Development Site; however it will not retain water long term. The tall grassland and associated grassed embankments will be lost. The magnitude of impact on these species is assessed as minor negative. The significance of the long term impact is **slight adverse**.

15.5.2.5 VER9: Invertebrates

The veteran oak tree, running wet ditch, copse and associated grassland will be retained and incorporated into the landscape proposals, but large areas of grassland and bare ground will be lost to the redevelopment. The creation of the artificial hibernaculum within the copse, the Support Building and Electrical Substation 'green' Sedum roofs, and the wet-grassland planting introduced around the SuDS will provide compensatory habitats for invertebrates currently using the Hydrus Development Site.

Areas surrounding the copse and veteran oak will remain undeveloped and managed as grassland to maintain the invertebrate communities on the Hydrus Development Site. A sympathetic grassland mowing regime involving a yearly cut in October will help maintain and develop the diversity of the new grassland.

However, the structural diversity and varied floral community which currently benefit these species will be lost. The magnitude of impact on these species is assessed as minor negative. Thus the significance of the impact is **slight adverse**.

15.5.2.6 VER10: Breeding Birds

The small copse, individual stand alone trees, bare ground and grassland are used by a number of bird species. The retention of the copse and veteran tree

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on the Hydrus Development Site, along with the creation of new woodland copses, replacement of stand alone trees, creation of wildflower grassland and hedgerow planting will aim to replace nesting habitats on the Hydrus Development Site, provide additional food sources and provide new green corridors, plus linkage on and off site for foraging and nesting birds.

Tree bird boxes will be erected to benefit a range of small bird species. The bird boxes will be positioned around the Hydrus Development Site as compensation for the clearance of suitable bird breeding habitat during site clearance.

The incorporation of an extensive 'green' Sedum roof on the Support Building and Electrical Substation as part of the Proposed Development will also provide foraging habitat for birds including black redstarts which are known to forage and breed within the wider AWE Aldermaston Site.

The magnitude of impact on these species is assessed as negligible. Thus the significance of the impact is **negligible**.

15.6 Ecological Enhancement Measures

Measures to reduce the effects of the Proposed Development and provide new habitat have been included in the design proposals. Mitigation measures have been provided for the protected species that have been recorded within the Hydrus Development Site. Ecological enhancement measures referred to in this chapter will create habitats, provide connectivity and safeguard the longevity of the existing wildlife on the Hydrus Development Site but also attract other species from the surrounding area. Ecological enhancements included as part of the Proposed Development are as follows:

- Creation of semi-mature hornbeam (*Carpinus betulus*) hedging around the Operations and Support Buildings;
- All roof sections of the Support Building and Electrical Substation will incorporate a 'green' Sedum roof; and
- A Sustainable Drainage System (SuDS) scheme has been incorporated into the scheme design and will comprise swales and a detention basin. These are expected to be dry during periods of low flow. Suitable native plant species will be planted to provide habitat enhancement for the running wet ditch and compensation for loss of associated grassland that reptiles and invertebrates currently use on the Hydrus Development Site.

Both mitigation and enhancement measures will be specified within a Construction and Environment Management Plan (CEMP) for the Proposed Development and will be in accordance with the Landscape and Biodiversity Management Plan (LBMP) (see *Chapter 13: Landscape and Visual* of this DEEA).

15.7 Residual Impacts

The significance of any impact has been determined in terms of the importance/value and sensitivity of the habitats and species that would be affected. It should be noted that whilst some residual impacts may be positive, to

adhere to Institute of Ecology and Environmental Management (IEEM) guidelines the assessment always concludes with the highest level of impact.

Therefore whilst ecological enhancements are included as part of the Proposed Development and offer some benefit, in accordance with the IEEM guidelines it must be concluded that the Proposed Development will have a slight adverse effect on the ecology present within the Hydrus Development Site, as this is the highest level of impact overall.

Once the mitigation / enhancement measures have reached maturity there will be an overall benefit to the Hydrus Development Site ecology and biodiversity. This benefit will be secured through the Landscape and Biodiversity Management Plan.

A summary of residual impacts is presented in Table 15-5.

15.8 Cumulative Effects

A number of other developments are planned within the wider AWE Aldermaston Site and the 2km study area and are listed in *Chapter 2: DEEA Methodology*.

A Biodiversity Strategy for AWE was produced in May 2006 (Ref. 15-31) which includes an Ecological Constraints Plan for the AWE Aldermaston Site and identifies habitats and species of biodiversity value. The strategy identifies actions required to maintain and where possible enhance features of value. The AWE Aldermaston Site Framework Plan incorporates a large proportion of the features of biodiversity value that have been identified. The public information leaflet Sites Development Strategy Update 2005 (Ref. 15-32) states that: "*natural habitats will remain protected as havens for wildlife*".

Where there would be unavoidable losses, it has been recommended that new habitats are created and/or other existing features are enhanced to compensate (AWE Biodiversity Strategy). Providing an appropriate level of ecological assessment is carried out for future projects at AWE, and the Biodiversity Strategy is implemented, the cumulative impacts of proposed developments across the AWE Aldermaston Site would be of negligible significance in the medium to long-term.

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Table 15-5: Summary of Residual Impacts

Feature/VER	Value	Potential Impact Characteristics	Mitigation Measures and Enhancement Measures	Residual Impact Significance
HABITATS				
Grassland (VER1)	District	Loss of grassland habitat Damage/destruction of grassland during construction operations	Retention of some areas of acid and rough grassland Best practice guidelines adhered to during construction, including material storage and handling, siting of construction plant and restricted vehicular movements away from the retained grassland areas.	Negligible
Acid grassland (VER2)	District	Loss of grassland habitat Damage/destruction of grassland during construction operations	Grassland will be created through the landscaping proposals using amenity and wildflower seed mixes and maintained appropriately with any bare patches re-seeded as soon as possible	Slight Adverse
Woodland (VER3)	County	Risk of damage to the root systems and canopies of retained trees during construction	The small copse on the Hydrus Development Site provides habitat for invertebrates and two species of reptiles (slow worm and grass snake) and is to be retained within the development. These features are of ecological value and will add maturity to the Proposed Development planting scheme.	Negligible
Veteran oak tree (VER4)	District	due to movement and siting of plant and siting of material storage.	Best practice guidelines adhered to during construction, including material storage and handling, siting of construction plant and restricted vehicular movements away from the woodland boundaries and tree root systems.	Negligible
SPECIES				
Bats (VER5)	District	Impact of construction noise and vibration to potential roosting habitat within the veteran oak tree. Loss of the structural diversity and varied floral community which currently benefit invertebrate species, thus reducing foraging potential for bats. Loss of stand alone trees, thus reducing foraging potential for bats. Increase in lighting across the site which can affect bat behaviour.	Construction works would be generally undertaken during daylight hours in accordance with the CoCP, so there would be minimal impact on nocturnal animals. The retention of the copse, veteran tree and associated grassland on site, along with the proposed landscape strategy to provide additional native trees and species-rich grassland aims to strengthen existing linear features and attract invertebrate species which will benefit foraging bats. The lighting around the areas most frequently used by foraging bats (the copse, veteran tree and associated grassland) will remain unchanged. Bat boxes will be erected on semi-mature to mature trees to provide additional roosting sites. New lighting has been designed to the specifications set out in the Bat Conservation Trust 'Bats and Lighting in the UK' 2008 guidelines with column locations and lux levels discussed with an experienced ecologist.	Negligible
Badgers (VER6)	District	Disturbance to badgers using the site as foraging and commuting habitat.	Disturbance during the construction phase would be minimised by limiting the hours of construction in accordance with the CoCP; and by covering trenches overnight or providing a means of escape so that badgers do not become trapped. As badgers frequently construct new setts, a badger resurvey of the Hydrus Development Site, would be undertaken before site clearance or construction commences.	Negligible
Reptiles (VER7)	District	Loss of grassland and wetland habitat. Injury or death caused by construction activities.	Favourable habitat (the copse, running wet ditch and associated grassland) will be retained. One hibernaculum will be created within the copse on site using existing material found within the woodland site to provide compensatory habitat for reptiles and amphibians. The slow worm and grass snake populations will be retained on Hydrus Development Site and protected during construction and upon completion.	Negligible
Amphibians (VER8)	District	Loss of terrestrial habitat Disturbance, injury or death caused by construction activities.	A Method Statement has been produced which recommends all reasonable precautions to be taken to minimise impacts on great crested newts during the construction period. Herpetofauna exclusion fencing will be erected along the proposed building footprint for the new structures and access road during the construction works to exclude reptiles and amphibians from the construction area. An ecologist will undertake a destructive search of any habitat scheduled for removal as part of the clearance or construction works. Any reptiles or amphibians found during the fencing installation and associated vegetation removal will be relocated into suitable habitat within the woodland and scrub habitat on the other side of the herpetofauna fencing. The SuDS detention basin and swales will increase the wetland habitat on the Proposed Development site. Grassland will be created through the landscaping proposals using amenity and wildflower seed mixes and maintained appropriately. The areas of meadow grassland will undergo a reduced mowing regime to allow the grassland to flower, especially around the existing copse and veteran oak tree, plus proposed hedgerows and SuDS detention basin to increase the value of the site to reptiles and amphibians and to ensure they are not harmed during mowing. Tree planting will be limited around the copse and associated grassland and the SuDS features to the south east of the Proposed Development to maintain the existing conditions for the herpetofauna.	Negligible

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Invertebrates (VER9)	District	<p>Loss of grassland habitat</p> <p>The structural diversity and varied floral community will be lost.</p>	<p>The veteran oak tree, copse, wet ditch and associated grassland will be retained and incorporated into the landscape proposals.</p> <p>The creation of the artificial hibernaculum within the copse, the Sedum roof to the Support Building and Electrical Substation and planting introduced around the SuDS will provide compensatory habitats for invertebrates currently using the Hydrus Development Site.</p> <p>Areas surrounding the copse and veteran oak will remain undeveloped and managed as grassland to maintain the invertebrate communities on site. A sympathetic grassland mowing regime will help maintain and develop the diversity of the new grassland.</p>	Negligible
Breeding birds (VER10)	District	<p>Loss of grassland, bare ground, copse and trees on site which support foraging and nesting birds.</p> <p>Slight increase in disturbance from increase in people, traffic and noise during the construction period.</p>	<p>The copse and associated grassland edges would be retained as part of the Proposed Development.</p> <p>The project would include the creation of native wildflower grassland which would form replacement grassland margins. The landscaping proposals also include the planting of native trees and hedgerows which will provide additional nesting and foraging opportunities for birds.</p> <p>Tree bird boxes will be erected to benefit a range of small bird species. The bird boxes will be positioned around the Proposed Development site as compensation for the clearance of suitable bird breeding habitat during site clearance.</p> <p>The incorporation of a Sedum roof on the Support Building and Electrical Substation as part of the redevelopment proposals will also provide foraging habitat for birds including black redstarts which are known to forage and breed within the wider AWE Aldermaston site.</p>	Negligible

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15.9 References

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- Ref. 15-3 West Berkshire Council (2002). West Berkshire District Local Plan 1991-2006
- Ref. 15-4 The UK Biodiversity Action Plan 1994, HMSO.
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- Ref. 15-22 IUCN Red List Categories and Criteria Version 3.1, IUCN 2001)
- Ref. 15-23 Habitats Directive (European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora, 1992)
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- Ref. 15-32 Defence Estates (2006); The Defence Estate Strategy 2006 – In Trust and On Trust.