RAF Croughton  SATCOM

Preliminary Ecological Appraisal

August 2015

Defence Infrastructure Organisation
RAF Croughton SATCOM

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Defence Infrastructure Organisation
## Issue and revision record

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<th>Date</th>
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Mott MacDonald Ltd was appointed by the Defence Infrastructure Organisation to undertake a Preliminary Ecological Appraisal on the works areas for the proposed SATCOM scheme at RAF Croughton, in Northamptonshire. The proposed development will comprise of the construction of the new SATCOM buildings and associated infrastructure. The demolition of the existing SATCOM buildings will be undertaken as part of a separate commission and is not included within the current scope of works. The aim of the Preliminary Ecological Appraisal was to map the habitats on site, assess the conservation value of features within the zones of influence of the works, and to identify any potential ecological constraints of the proposed works.

There are eleven non-statutory designated Local Wildlife Sites, six Potential Wildlife Sites and three Pocket Parks within 2km of the base. The majority of these sites are highly unlikely to be adversely impacted by the works given their distance from the works areas and nature of the works.

The southern part of RAF Croughton, within which the SATCOM site lies, is a Potential Wildlife Site and part of that habitat will be lost as part of the works. This designation is for sites which have not been surveyed to confirm their status as a Local Wildlife Site.

The areas of the proposed work for SATCOM comprise the following habitat types: improved grassland, amenity grassland, bare ground, species-poor hedgerows. Adjacent habitats are buildings and hard standing.

The habitats within and adjacent to the works area have potential to support breeding birds, over wintering birds and bats. The risk of adversely impacting other protected and notable species is low.

Recommendations are made for consultation with Northamptonshire County Council with respect to the loss of part of the Potential Wildlife Site. Enhancement measures are recommended to increase the nature conservation value of the site, including installation of bird and bat boxes and management of grassland to promote biodiversity.
RAF Croughton SATCOM
Preliminary Ecological Appraisal

1 Introduction

1.1 Background

Mott MacDonald Ltd was appointed by Defence Infrastructure Organisation (DIO) to undertake a Preliminary Ecological Appraisal (PEA) of the proposed working areas for the SATCOM project at RAF Croughton air base. The site is located in Northamptonshire at National Grid Reference SP 56443 32819. The air base covers approximately 260ha and the proposed works cover a total area of approximately 10.5ha within the site.

The proposed development is understood to comprise:
- Construction of a new SATCOM communications and administration buildings and associated car park;
- Construction of associated communication terminals; and
- Connections to existing services.

Demolition of the existing SATCOM building (Building 180) is also planned. However, it is understood that this will be undertaken as part of a separate commission at least 18 months after completion of the new SATCOM facilities.

1.2 Aim and Objectives

The aim of this report is to provide a PEA of the protected and/or notable habitats and species which occur or have the potential to occur on or near the site which may be impacted by the proposed works. The report follows the ‘Guidelines for Preliminary Ecological Appraisal’ (CIEEM, 2013).

The objectives are to:
- Identify any designated sites for nature conservation and habitats on, near and adjacent to the site;
- Identify any notable and/or protected plant or animal species of conservation value, which may occur on or near the site;
- Identify the presence of any invasive plant species on or adjacent to the site;
- Provide a habitat map with target notes of ecological features as identified above;
- Undertake a preliminary assessment of the potential impacts on any ecological receptors of conservation value identified on, near or adjacent to the site; and,
- Recommend further surveys, mitigation and enhancement measures as appropriate.

1.3 Zone of Influence

The current guidance on ecological assessments (IEEM, 2006) recommends that all ecological features that occur within a ‘zone of influence’ (Zol) for a proposed development are investigated. The Zol includes:
- Areas directly within the land take for the proposed development and access;
- Areas which will be temporarily affected during construction;
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The ZoI is variable depending on the ecological receptors affected. For the purposes of this study, the ZoI for habitats is taken as being the footprint of the proposed developments. The ZoI for most protected species and habitats is assessed within 50m of the proposed development. Ponds have been assessed for their potential to support great crested newts *Triturus cristatus* within 500m of the development. Potential for impacts on designated sites has been assessed within 2km of the development.

### 1.4 Assessment of Ecological Value

An assessment of the ecological value for habitats and species within the zone of influence was made, where possible, in accordance with current guidance (IEEM, 2006). These are as follows: international, national, regional, county, district, local and ZoI only.

### 1.5 Legislative and Policy Framework

The construction and operational activities for the proposed works must comply with the International, European and UK nature conservation legislation, and with national and local biodiversity policies. The main pieces of legislation in the UK are the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (as amended). The biodiversity policies which are most relevant are the National Planning Policy Framework (NPPF, 2012), Biodiversity 2020, and the Northamptonshire Biodiversity Action Plan (Northamptonshire BAP).

Under the Natural Environment and Rural Communities (NERC) Act 2006, all public bodies are required to have regard to biodiversity conservation when carrying out their function. Under this act a list of habitats and species that are of principal importance for the conservation of biodiversity in England are published under Section 41.
2 Methods

2.1 Desk Study

A desk study was undertaken of the designated sites for nature conservation, habitats of conservation importance and protected and notable species which occur within 2km of the proposed development area. Data were obtained from the Northamptonshire Biodiversity Records Centre (NBRC) as well as relevant publications, reports and online databases. These included the Multi-Agency Geographic Information for the Countryside (MAGIC), Joint Nature Conservation Committee (JNCC) and the Northamptonshire BAP. Ordnance Survey maps and aerial photographs were reviewed to identify any ponds within 500m of the SATCOM works area.

In addition, a review of previous studies carried out for RAF Croughton was undertaken including a PEA which was produced as part of the planning for the New Medical Dental Clinic (Mott MacDonald, April 2012) and the Integrated Natural and Cultural Resources Management Plan RAF Croughton Baseline Survey report (MWH, July 2011).

2.2 Extended Phase 1 Habitat Survey

A field survey, in the form of an extended Phase 1 Habitat Survey was undertaken by an ecologist from Mott MacDonald on 15 May 2015. All habitats within the proposed development areas were identified and mapped in compliance with the ‘Handbook for Phase 1 habitat survey: a technique for environmental audit’ (Joint Nature Conservation Committee, 2010). Dominant plant species were noted, as were any protected, uncommon or invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

An assessment was also undertaken of the likely presence or absence of protected and notable animal species within the ZoI of the proposed development. This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations. The methodologies and assessment criteria used were based on current published guidance where available. Specific assessment criteria for bats and great crested newts used in this report are given in Appendix A.

2.3 Assessment of Conservation Importance and Likely Impacts

The conservation importance was assessed for each of the main ecological features (designated sites, habitats and species) that occur within the ZoI. The following are some of the criteria that are used in the assessment of the conservation importance: designation of the site; rarity of the species or habitats; presence of Red Data Book (RDB) or endemic species; presence of diverse assemblages of plants or animals; plant communities typical of natural/semi-natural habitats; habitat diversity and connectivity and presence of large populations of animals which are uncommon or threatened in a wider context.

The assessment of conservation importance in this report makes reference to the geographical scale of international, national, regional/county, district/borough, local and site/ZoI only (IEEM, 2006).
As this report is to support a planning application an assessment of the likelihood of adverse impacts as a result of the development has been undertaken, using the scale of certain, very likely, likely, unlikely and very unlikely (based on IEEM 2006). A detailed assessment of the significance of any impacts has not been undertaken as part of the PEA.

2.4 Limitations

Ecological surveys are limited by factors such as time of year, which affect the ability to detect plants and animals. Optimal survey times vary between species and species groups therefore a single survey visit may overlook or under-record certain species. This Preliminary Ecological Appraisal is therefore unlikely to present a full and complete assessment of the biodiversity of the site because it is based on a single site visit.

The site survey was undertaken during May 2015, which is considered to be within the optimal time of year for most species groups. The grassland on parts of the site had recently been cut at the time of the survey meaning that some plant species may not have been apparent or readily identifiable. However, given the highly modified nature of the habitats within the works areas it is considered unlikely that any notable or important species have been overlooked.

Biological records obtained from records centres do not necessarily represent a full and complete species list for a given area and the absence of a species or habitat record does not prove it is not present. Records are not often collected as a result of systematic surveys and therefore geographic, temporal (annual and seasonal) and species coverage is not often representative.
3 Results

3.1 Designated Sites

3.1.1 Statutory designated sites for nature conservation

No statutory designated sites were identified within the proposed working areas for SATCOM or within 2km of the site.

3.1.2 Non-statutory designated sites for nature conservation

No non-statutory designated sites are within the SATCOM working areas.

Five non-statutory designated Local Wildlife Sites (LWS) were identified within 2km of the SATCOM site. Local Wildlife Sites are areas of land which are rich in wildlife and are the equivalent to Sites of Importance for Nature Conservation (SINC). Criteria for selection of this type of site take into account issues such as threats and declines in certain species, national priorities and local distinctiveness. The LWS system is managed, in partnership, by The Wildlife Trust, local authorities, statutory nature conservation agencies, local naturalists and landowners. Local Wildlife Sites were previously known as County Wildlife Site (CWS).

It is not anticipated that there will be any adverse effects on any non-statutory designated sites as a result of the proposed SATCOM development.

Table 3.1: Summary of non-statutory sites for nature conservation

<table>
<thead>
<tr>
<th>Site name</th>
<th>Designation</th>
<th>Minimum distance from base perimeter</th>
<th>Site description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slade Covert</td>
<td>LWS</td>
<td>1.1km east of SATCOM site</td>
<td>Broadleaved semi-natural woodland dominated by sycamore <em>Acer pseudoplatanus</em> and ash <em>Fraxinus excelsior</em> with wych elm <em>Ulmus glabra</em> and English elm <em>Ulmus minor var. vulgaris</em>.</td>
</tr>
<tr>
<td>The Moors</td>
<td>LWS</td>
<td>1.5km north west of SATCOM site</td>
<td>Pond, surrounded by derelict woodland. The pond contains frequent submerged vegetation, very little floating or emergent species include <em>Potamogeton pusillus</em> (unusual in the county), <em>P. natans</em>, <em>Myriophyllum spicatum</em> (a county rarity), <em>Mentha aquatica</em>, <em>Elodea canadensis</em>, <em>Solanum dulcamara</em> and <em>Agrostis stolonifera</em>. The west edge of the pond is heavily shaded, but the east edge is more open. Suitable for newts.</td>
</tr>
<tr>
<td>Croughton Spring Copse</td>
<td>LWS</td>
<td>1.7km north west of SATCOM site</td>
<td>A small patch of woodland on the site of a spring. Much of the central and west parts of the site has been replanted with broadleaved species, mostly oak and sycamore and the site has a fair diversity of ground flora including areas dominated by dogs mercury <em>Mercurialis perennis</em>, as well as more marshy areas.</td>
</tr>
<tr>
<td>Croughton Spinney</td>
<td>LWS</td>
<td>1.8km north of SATCOM site</td>
<td>A small patch of woodland, possibly an ancient remnant, on the Evenly/Croughton border. This is a</td>
</tr>
<tr>
<td>Site name</td>
<td>Designation</td>
<td>Minimum distance from base perimeter</td>
<td>Site description</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------</td>
<td>--------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Old Astwick Village Moat</td>
<td>LWS</td>
<td>1.7m north-east of SATCOM site</td>
<td>The site of the moat in the centre of the ancient village of Astwick. Nearly the entire site is either scrub or heavily shaded. The moat on the south side has some standing water, but most of the moat has swamp or shallower marshy grassland. The small areas of open water are very heavily shaded and largely dystrophic, although some species of aquatic plants are starting to colonize. There is a large badger sett the site and signs of badger activity - tracks and latrines - throughout.</td>
</tr>
</tbody>
</table>

Source: Northamptonshire Biodiversity Records Centre.

In addition to the five LWS, six Potential Wildlife Sites (PWS) were identified within 2km of RAF Croughton. One of these sites (RAF Croughton PWS) covers the majority of the grassland areas within the perimeter road in the south of the base, including the proposed location of the SATCOM development. PWS are sites that are either known or thought to be of higher biodiversity value than the average countryside but have not been confirmed to be of LWS standard by the designating authority (Northamptonshire County Council). It is likely that the area to be affected was designated as a PWS due to the large area of grassland and historical records of botanical interest. The current study found these areas to be relatively species-poor, probably as a result of heavy grazing by sheep and possibly overseeding. However, a full botanical survey has not been undertaken as part of this study and it is unknown whether this area would currently meet the criteria for designation as a LWS.

There are also three Pocket Parks within 2km of the base: Croughton and Croughton Old Allotments to the north-west and Evenley to the north-east. Pocket Parks are “natural areas of countryside that are owned, looked after and cherished by the local community for enjoyment, the protection of wildlife and to provide access to all” (NBRC).

It is anticipated that a significant area of the PWS within the RAF Croughton base would be lost as a result of the proposed SATCOM development.

### 3.2 Habitats

RAF Croughton is situated in a rural area of Northamptonshire and the surrounding land use is mainly arable agriculture.

The base supports two habitats listed on S41 of the NERC Act 2006 as being of principal importance for nature conservation. These are “Hedgerows”, which correspond to Phase 1 habitat species-poor and species-rich hedgerows, and “Rivers” which correspond to Phase 1 habitat flowing water. Of these only...
species-poor hedgerows exist within the ZoI of the SATCOM site and these are described in section 3.2.2 below.

The northern part of the base is mostly built up comprising a variety of buildings with associated hard standing, amenity grassland and scattered trees. The southern parts of the site comprise extensive areas of improved grassland grazed by sheep, around which runs a perimeter road connecting various telecommunications and training facilities. The intensive grazing on these areas means that they have a relatively low diversity of plant species and a significant proportion of species such as perennial rye grass *Lolium perenne* and white clover *Trifolium repens*. A few areas of semi-improved grassland were recorded adjacent to the perimeter road where there is no grazing and the mowing is relatively infrequent. These grassland areas are relatively species rich but unlikely to meet the criteria for habitats listed on S41 of the NERC Act 2006 as being of principal importance for nature conservation, such as Lowland Meadows or Lowland Calcareous Grassland.

The locations of all habitats are shown on the Phase 1 habitat map in Appendix B, with associated Target Notes and photographs in Appendix C. Target Notes are referred to as TN1, TN2 etc. in the following section.

3.2.1 Standing water

One pond was identified within 500m of the proposed working areas for SATCOM from OS mapping and aerial photographs, however no direct access to this pond was made as part of this PEA. This is a large attenuation pond divided into two (TN5) within an area outside the perimeter fence approximately 300m south of the SATCOM site which is understood to have been created during the construction of the A43. Aquatic flora appears to be limited to occasional marginal bulrush *Typha latifolia* and the banks are earth which is vegetated with rough grassland. The area surrounding the pond is planted with young trees and scrub.

This pond is unlikely to meet the criteria for the S41 habitat of principal importance “Ponds” due to the quality of the habitat and species likely to be present.

Adverse impacts on this habitat under the current proposals for SATCOM are considered to be very unlikely.

3.2.2 Hedgerows

There is a section of heavily managed species poor native hedgerow (TN2) comprising hawthorn *Crataegus monogyna* which forms part of the boundaries of some of the grazed areas within the SATCOM site.

All native hedgerows are S41 habitats of principal importance and are of at least district value for nature conservation. In order to be classed as an “important hedgerow” according to the Hedgerows Regulations
1997 there must be a minimum of five woody species within any 30m length. As such the hedgerow within the SATCOM site would not be classed as “important” as it only supports one woody species.

Approximately 200m of species-poor hedgerow would be lost under the current proposals and as such adverse impacts on this habitat under the current proposals for SATCOM are considered to be certain.

### 3.2.3 Improved grassland

The majority of the SATCOM site comprises improved grassland which is currently grazed by sheep (TN1, TN4). Dominant grass species recorded were perennial rye grass, red/sheeps fescue *Festuca rubra/ovina* (could not be identified at time of survey due to grazing), Yorkshire fog *Holcus lanatus*, common bent *Agrostis capillaris* and creeping bent *Agrostis stolonifera* with occasional cocksfoot *Dactylis glomerata*, crested dog’s tail *Cynosurus cristatus* and meadow foxtail *Alopecurus pratensis*. Forb species make up a relatively low percentage of ground cover and mostly comprise white clover and creeping buttercup *Ranunculus repens*, with occasional daisy *Bellis perennis*, common mouse-ear *Cerastium fontanum*, ground ivy *Glechoma hederacea*, black medic *Medicago lupulina*, self-heal *Prunella vulgaris*, chickweed *Stellaria media*, creeping thistle *Cirsium arvense*, dandelion *Taraxacum sp.* and germander speedwell *Veronica chamaedrys*.

The RAF Croughton Integrated Natural and Cultural Resources Management Plan (MHW, 2011) indicate that these grazed areas used to be more species rich, and that previously (or elsewhere in the grazed areas of the site) it may have been classified as poor semi-improved or semi-improved neutral grassland.

This habitat is of value for nature conservation within the site/Zol only. Adverse impacts on this habitat under the current proposals for SATCOM are certain.

### 3.2.4 Amenity grassland

This habitat is prevalent in areas around the existing SATCOM buildings and road verges which are frequently mown. It is mostly dominated by perennial rye grass and annual meadow grass *Poa annua* with some red/sheep’s fescue. Daisy and dandelion were also frequent.

This habitat is of negligible value for nature conservation. Adverse impacts on this habitat under the current proposals for SATCOM are unlikely.

### 3.2.5 Buildings

The existing SATCOM building (Building 180, TN3), adjacent to the new SATCOM site, is a relatively modern multi-storey brick building with pitched, tiled roof. No access was available for an internal inspection at the time of the survey, however it is understood that there is a roof void. Other attached buildings include telecommunications installations of various types, including a spherical structure which was well sealed.
Other buildings within the base include offices, telecommunications facilities and amenity facilities, all of which are relatively modern constructions and are likely to offer few opportunities for roosting bats, although a full assessment of all buildings has not been undertaken as part of this study as no access was available and they were unlikely to be affected.

Buildings and hard standing are of value for nature conservation within the site/ZoI only, however they may support roosting bats and nesting birds. Adverse impacts on this habitat under the current proposals for SATCOM are unlikely. However it is understood that the existing SATCOM building (Building 180) will be demolished 18 - 24 months after completion of the new facilities, as part of a separate commission.

### 3.3 Protected and Notable Plant Species

NBRC returned records of three species listed as Vulnerable on the Vascular Plant Red Data List for Great Britain (JNCC, 2006). These are basil thyme *Clinopodium acinos*, prickly poppy *Papaver argemone* and night-flowering catchfly *Silene noctiflora*. Prickly poppy is also listed as Endangered on the Vascular Plant Red List for England (BSBI, 2014) and basil thyme and night-flowering catchfly are listed as Vulnerable. Two records of basil thyme were from RAF Croughton. There were also records of dwarf spurge *Euphorbia exigua* listed on the Red Data List GB as Near Threatened, from RAF Croughton.

No protected or notable plant species were recorded within the works area for SATCOM. The Red Data Listed species above are mostly found on loose, rocky calcareous substrates and cultivated ground and are unlikely to occur in the heavily grazed, compact soils of the site. However, basil thyme can be found in grassland and short turf and although it was not apparent at the time of the survey its potential presence cannot be excluded.

### 3.4 Invasive Non-native Plant Species

No invasive non-native plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded during the site survey.

### 3.5 Protected and Notable Animal Species

#### 3.5.1 Breeding and Wintering Birds

Incidental observations of buzzard *Buteo buteo*, sparrowhawk *Accipiter nisus*, skylark *Alauda arvensis*, great tit *Parus major*, carrion crow *Corvus corone* and woodpigeon *Columbia palumbus* were made during the site visit. NBRC returned records of a total of 11 species from within 2km of the base.

Table 3.2 below summarises records of bird species of conservation interest returned by NBRC and their conservation status. Species of birds observed on site during the survey are indicated in **bold**.
### Table 3.2: Summary of bird species and their protection within 2km radius of the base perimeter

<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
<th>Most Recent Record</th>
<th>Schedule 1 of WCA</th>
<th>NERC Section 41</th>
<th>Bird of Conservation Concern</th>
<th>Local BAP</th>
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<td>Skylark</td>
<td>Alauda arvensis</td>
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<td></td>
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<tr>
<td>Mallard</td>
<td>Anas platyrhynchos</td>
<td>22/07/1992</td>
<td></td>
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</tr>
<tr>
<td>House Martin</td>
<td>Delichon urbica</td>
<td>14/04/2004</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Yellowhammer</td>
<td>Emberiza citrinella</td>
<td>2001</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Hobby</td>
<td>Falco subbuteo</td>
<td>2001</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Kestrel</td>
<td>Falco tinnunculus</td>
<td>2001</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Swallow</td>
<td>Hirundo rustica</td>
<td>14/04/2004</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Linnet</td>
<td>Linaria cannabina</td>
<td>2001</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Curlew</td>
<td>Numenius arquata</td>
<td>2001</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Dunnoch</td>
<td>Prunella modularis</td>
<td>2001</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Shelduck</td>
<td>Tadorna tadorna</td>
<td>1996</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Source: Northamptonshire Biological records centre; primary data.

In addition to these species, bird surveys carried out by MWH as part of the Integrated Natural and Cultural Resources Management Plan (MHW, 2011) recorded 38 breeding bird species (including seven red listed and seven amber listed BoCC) and 25 wintering bird species (including five red listed and four amber listed BoCC). During the winter bird surveys large flocks of redwing Turdus iliacus and fieldfare Turdus pilaris were recorded feeding on the grassland within the perimeter road.

The species poor hedgerows within the SATCOM site provide limited suitable nesting sites for birds such as chaffinch Fringilla coelebs. Building 180 could also provide nesting sites for birds such as swifts Apus apus and house martin Delichon urbicum.

All wild birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 (as amended). It is an offence to take, damage or destroy the nest of any wild bird while it is in use or being built. In addition species listed on Schedule 1 of the same act are afforded additional protection from disturbance whilst breeding.

Birds are of district value for nature conservation with respect to the proposed development site. There is a risk that breeding birds which nest in hedgerows, may be adversely impacted by the works, unless works are carried out at an appropriate time of year (see Section 4.2.1. below). There is also potential for impacts on wintering birds due to the loss of feeding habitat which will be occupied by SATCOM and other developments which are being built and are proposed on the grassland within the perimeter road.
3.5.2 Bats

There are previous records for five bat species within 2km of RAF Croughton. This includes the following species which may find suitable roosting habitat in the study area; common pipistrelle *Pipistrellus pipistrellus*, brown long-eared bat *Plecotus auritus*, Natterer’s bat *Myotis nattereri*, whiskered bat *Myotis mystacinus* and barbastelle *Barbastella barbastellus*. Many of these records come from Croughton Village, including a number of roost sites. It is likely that noctule *Nyctalus noctula* are also present in the area (Northants Bat Group). Common pipistrelles were recorded flying in and around RAF Croughton during the baseline survey in 2011 and a summer roost of pipistrelles was recorded in a tree on the northern boundary of the base (MWH, 2011) which will not be affected by the SATCOM works.

Building 180 has limited potential to support roosting bats in the roof void if access points are available. However, the highly isolated location of this building and lack of trees, hedgerows or other potential flight lines to directly connect it to potential foraging areas means that it is unlikely to be used as a maternity or hibernation roost, however it may provide temporary roost locations during the summer.

There is suitable foraging and commuting habitat at RAF Croughton, including tree lines, ponds and hedgerows. It is unlikely that foraging and commuting bats will be adversely impacted by the proposed development.

All bat species are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitat and Species Regulations 2010 (as amended). In summary it is an offence to intentionally or deliberately kill, injure, disturb or capture any bats or damage, destroy or obstruct access to any structure used for breeding or resting by them. Seven species are also listed on Section 41 of the NERC Act 2006.

Bats are of district conservation value with respect to the proposed development site. Under the current proposals for SATCOM impacts on bats are considered to be unlikely. However it is understood that the existing SATCOM building (Building 180) will be demolished 18 months after completion of the new facilities, as part of a separate commission. Potential for impacts on bats should be considered prior to demolition.

3.5.3 Otter

No records of otter *Lutra lutra* were returned by NBRC and no suitable habitat for this species was recorded within the SATCOM site. Ockley Brook, on the southern boundary of the base, was not surveyed as part of this PEA however the strip of woodland alongside it suggests that it may be suitable for otter if it is of sufficient size. Otters are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitat and Species Regulations 2010 (as amended). In summary it is an offence to intentionally or deliberately kill, injure, disturb or capture otters or damage, destroy or obstruct access to
any structure used for breeding or resting. Otters are also listed on Section 41 of the NERC Act 2006 and on the Northamptonshire BAP.

Otters are of negligible conservation value with respect to the proposed development site. Adverse effects on otters are considered to be very unlikely under the current proposals for SATCOM as no watercourses will be affected.

### 3.5.4 Water vole

NBRC returned two records of water vole *Arvicola amphibius* from RAF Croughton and the baseline surveys carried out in 2011 (MWH 2011) found signs of water voles latrines on Croughton Brook in the north of the base.

Water vole is fully protected under the Wildlife and Countryside Act 1981 (as amended). In summary it is an offence to intentionally kill, injure or capture a water vole; intentionally or recklessly damage, destroy or obstruct access to any structure which water voles use for shelter or protection; or disturb water vole while they are using such a place. Water voles are also listed on Section 41 of the NERC Act 2006 and on the Northamptonshire BAP. Water voles are of negligible value for nature conservation with respect to the proposed development site.

Adverse effects on water voles are considered to be very unlikely under the current proposals for SATCOM as no ditches or watercourses will be affected.

### 3.5.5 Badger

NBRC returned three previous records for badgers *Meles meles* within 2km of the study site, including two within RAF Croughton. Large active setts were located during the 2011 baseline survey in the scrub south of the perimeter fence (approximately 900m from the development site) and on the footpath to the north of the perimeter fence (MWH, 2011). No field signs or setts were found on site during the PEA survey within the SATCOM site. The areas around the proposed development site and demolition site are generally flat and unsuitable for badger setts but may be used for foraging. There is a known badger sett outside of the RAF base, to the south-west. A culvert under the fence would allow them access to the base for foraging. Therefore, there is potential that badgers may forage on site. If precautions are put in place (see Section 4.2.4. below), there are unlikely to be any adverse impacts on badgers as a result of the works.

Badgers are protected under the Protection of Badgers Act 1992. In summary it is an offence to wilfully kill or injure a badger; damage, destroy or obstruct access to a badger sett; or disturb a badger when it is occupying a sett. Badgers are considered to be of district value for nature conservation with respect to the proposed development site.

Under the current proposals for SATCOM, impacts on badgers are considered to be very unlikely.
3.5.6 **Other mammals**

NBRC returned records of brown hare *Lepus europaeus*, including from within RAF Croughton. This species is listed on S41 of the NERC Act 2006. Grassland within the base provides suitable foraging habitat for brown hare, however impacts on this species under the current proposals for SATCOM are considered to be unlikely due to the lack of suitable cover for breeding.

No records of dormouse *Muscardinus avellanarius* were returned by NBRC and they are scarce in Northamptonshire. The hedgerow within the SATCOM site was species-poor, highly managed and disconnected from other hedgerows or woodland and as such unsuitable for dormouse. No suitable habitat for this species was recorded within the SATCOM works areas and potential for impacts on this species are considered to be negligible.

3.5.7 **Amphibians**

NBRC returned no previous records for amphibians such as great crested newt *Triturus cristatus* from within 2km of RAF Croughton.

The attenuation ponds to the south of the base (TN5) were assessed from adjacent land during the PEA survey and found to have above average (HSI = 0.67) and good suitability (HSI = 0.74) for great crested newts respectively.

Terrestrial habitat within the SATCOM site is generally of low suitability for great crested newts due to the short grazed or cut grass and lack of potential refugia. Given the distance of the SATCOM site from the ponds (300m) and the availability of good terrestrial habitat close to them, it is considered very unlikely that great crested newts are present within the works areas.

Great crested newts are protected under the Wildlife and Countryside Act, 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (as amended). In summary it is illegal to intentionally or deliberately kill, injure, disturb or capture a great crested newt or damage, destroy or obstruct access to any structure used for breeding or resting. Great crested newts are also listed on Section 41 of the NERC Act 2006 as being of principal importance and are considered to be of regional value for nature conservation. Common toad is also listed on S41 of the NERC Act 2006 and is of regional conservation importance.

Under the current proposals for SATCOM, adverse impacts on great crested newts are considered to be very unlikely.

3.5.8 **Widespread reptiles**

NBRC returned one previous record for grass snake *Natrix natrix* within 2km of the base. No reptiles were recorded during the 2011 baseline survey (MWH, 2011) carried out in semi-improved grassland areas in
the north and south of the base. Improved grassland within the SATCOM site is of low suitability for reptiles.

Widespread reptiles including common lizard *Zootoca vivipara*, grass snake, adder *Vipera berus* and slow worm *Anguis fragilis* are afforded partial protection under the Wildlife and Countryside Act 1981 (as amended). In summary it is offence to intentionally kill or injure any of these species. All widespread reptiles are also listed on Section 41 of the NERC Act 2006.

Under the current proposals for SATCOM it is considered very unlikely that reptiles will be adversely affected by the works.

### 3.5.9 White-clawed crayfish

NBRC returned no records of white clawed crayfish *Austropotamobius pallipes* within 2km of RAF Croughton. However, the 2011 baseline report (MWH 2011) reported their presence in deeper parts of Croughton Brook to the west of the main entrance, approximately 1km from the SATCOM site.

White-clawed crayfish is afforded partial protection under the Wildlife and Countryside Act 1981 (as amended). In summary it is an offence to take a white-clawed crayfish. The species is also listed on Annex II of the EC Habitats Directive 1992 which allows for sites where they are present to be designated as Special Areas of Conservation (SAC). White-clawed crayfish is also listed on Section 41 of the NERC Act 2006.

No suitable habitat (watercourses) for this species was recorded within the SATCOM works areas and potential for impacts on this species are considered to be negligible.
4 Interpretation and Recommendations

The results of the PEA identified potential impacts on one non-statutory designated Potential Wildlife Site, one habitat of local conservation value and one habitat which is of conservation value within the site/Zol only. There is potential for impacts on breeding birds under the current proposals.

4.1 Further surveys

Based on the results of the PEA the following surveys are recommended in order to determine the presence/likely absence and/or population status of protected and notable species within the Zol. This information will be used to inform more detailed mitigation and/or potential licensing requirements for protected species should they be adversely affected by the proposed development.

4.1.1 Breeding birds

Any vegetation clearance of suitable nesting habitat such as hedgerows should ideally be carried out outside the breeding season for birds (see section 4.2.3). If vegetation clearance needs to be carried out during the breeding season for birds (March to August inclusive) it will be necessary to carry out a check for active nests not more than 24 hours prior to clearance. If a nest is found it would need to be cordoned off to a suitable distance (minimum 5m, to be determined by an ecologist dependent on species) and remain undisturbed until any chicks have fledged. If a species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) was recorded breeding within or near to the site, additional measures may be needed to ensure it was not disturbed while breeding, including a larger buffer zone and toolbox talks to site staff.

4.1.2 Bats

As there are no direct impacts on the existing SATCOM building (Building 180) as part of the current commission, an assessment of its use by roosting bats is not required. Bat surveys are likely be needed prior to the demolition of Building 180, however as this is being done under a separate commission and not for 18 – 24 months after completion, surveys are not recommended as part of this commission.

4.2 Mitigation

The following mitigation measures must be implemented in order to comply with planning and legislative requirements.

4.2.1 Designated Sites

The proposals for SATCOM would cause the loss of grassland which is within RAF Croughton Potential Wildlife Site. As such Northamptonshire County Council (the designating authority) should be consulted with respect to the proposed works and loss of this habitat.

The grassland in the RAF Croughton Potential Wildlife Site appears to have become less species rich as a result of heavy grazing (see Section 3.2.3 above), and ways of reducing this negative impact and
improving the richness of the grassland should be considered, such as reduction in the intensity of grazing. However, it is understood that due to the secure nature of the site, the scope of habitat improvement is limited by security considerations.

**4.2.2 Habitats**

The length of hedgerow to be removed should be minimised and, if operational constraints allow, new hedgerow should be planted to replace any of this S41 habitat which is lost.

**4.2.3 Breeding Birds**

Any clearance of tall grass, tall herb and ruderal vegetation, scrub, hedgerows and trees should ideally be carried out outside the bird nesting season (March to August inclusive). This is to prevent any potential destruction of nests or eggs, or death/injury to birds.

A suitably experienced ecologist must carry out a bird check 24 hours prior to any vegetation clearance or demolition during the breeding season for birds. If nesting birds are found, a minimum of five metre exclusion zone will need to be established (dependent upon species) and works would not be permitted to proceed within this area until all young in the nest have fledged.

Mitigation for the loss of nesting sites for birds in the hedgerow should take the form of bird boxes installed in suitable vegetation around the base. This should include:

- 4 x open fronted boxes installed in shrubs, suitable for robin *Erithacus rubecula*, wren *Troglodytes troglodytes* etc.

**4.2.4 Bats**

Measures should be taken to avoid adverse effects on bats which may roost in Building 180 during the construction and operation of the new SATCOM building. Low intensity and directional lighting away from potential bat roosts should be used on the site following Bat Conservation Trust Guidelines (*Bats and Lighting in the UK, 2009*). Badger

Any excavations left open overnight should either be covered or constructed with 45° access ramps placed to allow badgers which may be passing through the site to escape.

**4.3 Possible Enhancements**

Under Section 40 of the NERC Act, 2006, all public authorities in England and Wales are required to “have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.” Guidance on the implementation of this legislation in respect to planning is provided in the
National Planning Policy Framework, 2012 which requires that in pursuing sustainable development, net gains in biodiversity are achieved where possible.

The following enhancement measures are therefore recommended in support of any planning applications in order to achieve these requirements.

4.3.1 Biodiversity by design

For the new construction it is important to consider biodiversity as part of the whole package. The following features could be included in the design of buildings or landscaping where operational requirements allow and should be advised to the contractor:

- The incorporation of potential nest sites for birds such as swallows and house martins; and
- Roost space for bats in loft cavities and incorporation of ‘bat bricks’.

4.3.2 Habitats

The following enhancements for habitats are recommended, these can be refined further when the exact areas of habitat affected as part of the current proposal is known.

- Any landscape planting should use native, ideally locally-sourced species and not the ornamental species currently on other parts of the base;
- Any grass re-seeding required should use a species rich mix of native species which is suitable for the local soil conditions;
- There is very little wet habitat on site; it would be beneficial to a wide range of species if a pond or bog area was created; and
- A reduction in the mowing/ grazing regime of some of the grassland areas at the base would permit an increase in plant diversity and potentially increase invertebrates which would benefit breeding and wintering birds and bats.

4.3.3 Breeding birds

Generally enhancements for breeding birds take the form of bird boxes as the majority of the trees on the base offer limited opportunities for hole nesting species. This may include the following:

- 2 x 28 mm holed boxes erected on trees, suitable for blue tit *Cyanistes caerulus*
- 2 x 32 mm holed boxes erected on trees, suitable for great tit *Parus major*

Other measures could include increasing the diversity of habitats at the site, for example by creating additional woodland and hedgerows. Also, changing the management of the amenity grassland would encourage botanical diversity and greater invertebrate prey abundance, for example by reducing mowing and over-seeding with native wildflowers.
4.3.4 Bats

Enhancement measures for bats could include the installation of bat boxes within the existing trees around the base as well as including features such as ‘bat bricks’ within the structure of the new buildings.

Habitat improvement measures would also benefit bats. These could include increasing the amount of native hedgerows and shrubs at the base. The hedgerows should connect where possible with hedgerows which adjoin the site in order to provide foraging corridors within the wider landscape.
5 References


Mott MacDonald (April 2012) RAF Croughton New Medical Dental Clinic, Preliminary Ecological Appraisal.


Appendices

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Appendix A. Summary of Assessment Methods

A.1 Bats

All trees and buildings within the SATCOM working areas with the potential to support roosting and foraging bats were assessed using the ‘Bat Surveys Good Practice Guidelines’ (Hundt, 2012). Trees were categorised using the criteria outlined in Table A.1 and buildings and other structures were assessed using the criteria outlined in Table A.2.

Table A.1: Visual inspection criteria for the suitability of trees for roosting bats.

<table>
<thead>
<tr>
<th>Tree Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known or confirmed roost</td>
<td>-</td>
</tr>
<tr>
<td>Category 1*</td>
<td>Trees with multiple, highly suitable features capable of supporting larger roosts.</td>
</tr>
<tr>
<td>Category 1</td>
<td>Trees with definite bat potential, supporting features than category 1* trees or with potential for use by single bats.</td>
</tr>
<tr>
<td>Category 2</td>
<td>Trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks or crevices being found; or the tree supports some features which may have limited potential to support bats.</td>
</tr>
<tr>
<td>Category 3</td>
<td>Trees with no potential to support bats.</td>
</tr>
</tbody>
</table>

Source: Hundt, 2012

Table A.2 Criteria for bat roost potential assessment of a structure.

<table>
<thead>
<tr>
<th>Bat Roost Potential</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligible</td>
<td>The structure lacks any features suitable for roosting bats.</td>
</tr>
<tr>
<td>Low</td>
<td>The structure may have some interest to roosting bats, e.g. external roosting features such as fascia or soffit boards, but is considered to be sub-optimal to the extent that bats would not be anticipated to use it.</td>
</tr>
<tr>
<td>Moderate</td>
<td>The structure exhibits features suitable for use by roosting bats, such as internal and external cavities well insulated from external weather conditions, but is less than ideal in some way. It may be situated in less than ideal habitat, lacking suitable commuting corridors.</td>
</tr>
<tr>
<td>High</td>
<td>The structure exhibits a number of features suitable for use by roosting bats e.g. numerous roosting opportunities such as dark, enclosed roof voids; the structure has a high degree of connectivity with likely navigation routes; and the building is located within suitable foraging habitat, likely to be noticed by commuting bats.</td>
</tr>
<tr>
<td>Confirmed</td>
<td>Positive signs of bats are recorded within the structure (internally or externally), such as individual bats or bat droppings.</td>
</tr>
</tbody>
</table>

Source: Modified from Hundt, 2012.
A.2 Great crested newts

Habitat Suitability Index assessments are based on Oldham et al, 2000 and ARG UK, 2010. This method categorises 10 variables known to influence the occurrence of great crested newts. An index score of these variables is then calculated in order to assess their likely presence. It should be noted that this method should be regarded as indicative and any recommendations for further surveys are given following precautionary principles unless significant supporting evidence indicates the presence of great crested newts is unlikely.

Table A.3: Habitat Suitability Index categories for the assessment of waterbodies for great crested newts.

<table>
<thead>
<tr>
<th>HSI score</th>
<th>Pond suitability</th>
<th>Likely occurrence of great crested newts</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.5</td>
<td>Poor</td>
<td>3%</td>
</tr>
<tr>
<td>0.5 – 0.59</td>
<td>Below average</td>
<td>20%</td>
</tr>
<tr>
<td>0.6 – 0.69</td>
<td>Average</td>
<td>55%</td>
</tr>
<tr>
<td>0.7 – 0.79</td>
<td>Good</td>
<td>79%</td>
</tr>
<tr>
<td>&gt;0.8</td>
<td>Excellent</td>
<td>93%</td>
</tr>
</tbody>
</table>

Appendix B.  Phase 1 Survey Map
Appendix C. Target Notes

<table>
<thead>
<tr>
<th>Target Note (TN)</th>
<th>Details</th>
<th>Photo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Improved grassland grazed by sheep. Dominant grass species recorded were perennial ryegrass <em>Lolium perenne</em>, red fescue <em>Festuca rubra</em>, Yorkshire fog <em>Holcus lanatus</em> and creeping bent <em>Agrostis stolonifera</em> with frequent cocksfoot <em>Dactylis glomerata</em>, crested dog's tail <em>Cynodon dactylon</em> and meadow foxtail <em>Alopecurus pratensis</em>. Herbaceous species make up a relatively low percentage of ground cover and species recorded included white clover <em>Trifolium repens</em>, daisy <em>Bellis perennis</em>, common mouse-ear <em>Cerastium fontanum</em>, ground ivy <em>Glechoma hederacea</em>, black medic <em>Medicago lupulina</em>, self-heal <em>Prunella vulgaris</em>, creeping buttercup <em>Ranunculus repens</em>, chickweed <em>Stellaria media</em> and occasional creeping thistle <em>Cirsium arvense</em>, dandelion <em>Taraxacum Agg.</em> and germander speedwell <em>Veronica chamaedrys</em>.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Highly managed species-poor native hedgerow comprising hawthorn <em>Crataegus monogyna</em></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Building 180 (existing SATCOM building). Three storey brick building with pitched, tiled roof. Modern structure and appears mostly well sealed with few roosting opportunities for bats. Low potential for roosting bats.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Relatively low intensity grazing by cattle on improved grassland dominated by false oat grass <em>Arrhenatherum elatius</em>.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Attenuation pond which is understood to have been created as part of the construction of the A43. Large waterbody (approximately 200m x 50m) which is fed from the south-west by Ockley Brook. Aquatic flora appears to be limited to occasional marginal bulrush <em>Typha latifolia</em>. Banks are earth which is vegetated with managed grassland. Area surrounding the pond is planted with young trees and scrub including hawthorn <em>Crataegus monogyna</em>, Scots pine <em>Pinus sylvestris</em>, hazel <em>Corylus avellana</em>, horse chestnut <em>Aesculus hippocastanum</em>, holly <em>Ilex aquifolium</em> and alder <em>Alnus glutinosus</em>.</td>
<td></td>
</tr>
</tbody>
</table>