Land at Teversham Road, Fulbourn

Ecological Impact Assessment

January 2017

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Document Issue Log

Version / Issue	Comment	Date	Author	Checked by	Approved by
1	Final Draft	12/01/2017	IEL	TNO	TNO
2					

Third Party Disclaimer

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1. Introduction

1.1. An application is to be made for Land at Teversham Road, Fulbourn involving outline planning permission for a high quality residential development of up to 110 homes, with areas of landscaping and public open space, one new access point and associated infrastructure works.

1.2. An initial application was refused by South Cambridgeshire District Council (SCDC) in 2015 partly on the basis that the site was considered to be of potential importance for nature conservation and that the outline planning application did not provide sufficient information about how the ecological interests of the site would be protected and enhanced.

1.3. The Applicant reviewed the reasons for refusal and considered further how the ecological interests of the site can be integrated into the proposed development and managed in the long-term. The Applicant submitted an appeal which was heard at inquiry in September 2016.

1.4. With regards to ecology within the Appeal Decision published in November 2016, the Inspector concluded that *"…subject to the satisfactory implementation of an agreed Landscape and Biodiversity Management Plan, which could be secured by condition, the proposed development would not have an unacceptably harmful impact on areas of ecological or nature conservation interest".*

1.5. The Inspector found no conflicts with either the adopted LDF Policy NE/6, nor did he consider that the appeal to be at odds with paragraphs 109 and 118 of the National Planning Policy Framework (NPPF) which, in summary, require the planning system to conserve and enhance biodiversity, minimising impacts and providing net gains where possible. The Appeal was however dismissed on other (non-ecological) matters.

1.6. This Report supports a further planning application for the Land at Teversham Road site. It describes the ecological interests of the site, provides an Ecological Impact Assessment (EcIA) undertaken in accordance with the guidelines published by the Chartered Institute of Ecology and Environmental Management (CIEEM 2016) and describes the measures proposed to mitigate potential impacts and further enhance the site. The report is structured as follows:

- Summary of the proposed Land at Teversham Road development;
- Policy and legislation context;
- Ecological baseline;
- Determining the importance of ecological features;
- Impact assessment;
- Proposed mitigation and enhancement measures; and
- Conclusions.

1.7. The aims of the report are therefore to:

i) Identify and describe all potentially significant ecological effects associated with the proposed development;

ii) To set out the mitigation measures required to ensure compliance with nature conservation legislation;

iii) To address any potentially significant ecological effects;

iv) To identify how mitigation and enhancement measures will/could be secured;

v) To provide an assessment of the significance of any residual effects; and

vi) To set out the requirements for post-construction monitoring.

2. Summary of the proposed development Site

2.1. The Site extends over approximately 6.85 ha. And lies in the north of Fulbourn village approximately centred on Ordnance Survey grid reference 551315, 256609, between Teversham Road in the west and Cox's Drove in the east. Figure 1 provides an overview of the indicative site layout of the proposed development.

2.2. The Site is divided into a western section and an eastern section by a watercourse a chalk stream (referred to here as the 'award drain') which runs northwards. The watercourse is fed by a spring or springs. A ditch is present along the western boundary and the southern boundary of the western section of the site.

2.3. The Site is underlain by the West Melbury Marly Chalk Formation which comprises part of the East Anglian Chalk aquifer and is classified as a Principal Aquifer (a strategically important underground waterbody). The Site is not covered by any statutory environmental designations, but Green Belt land lies immediately to the north of the railway line, and the site abuts (and includes some land within) the Fulbourn Conservation Area to the south.

2.4. The proposal seeks to develop the Site for up to 110 dwellings, with 30% of these to be affordable units. This would result in a gross residential density of 16 dwellings per hectare (dph) over the site as a whole. However, the illustrative layout plan indicates that about 3.55 ha of the site would remain as open space, to include the chalk stream, floodwater management areas, a sustainable drainage system (SuDS), children's play areas, and the pumping station garden. Overall this would result in a net density of about 33 dph within the developed parts of the site. No built form would occur within the conservation area.

2.5. The sole vehicular access would be from Teversham Road, with an emergency access also proposed onto Cox's Drove. In addition, a pedestrian access is proposed from Cow Lane, through the pumping station garden, and a further pedestrian access is suggested to link with the informal path through Poorwell Water, although doubt was expressed at the inquiry whether this would be acceptable to the Parish Council.

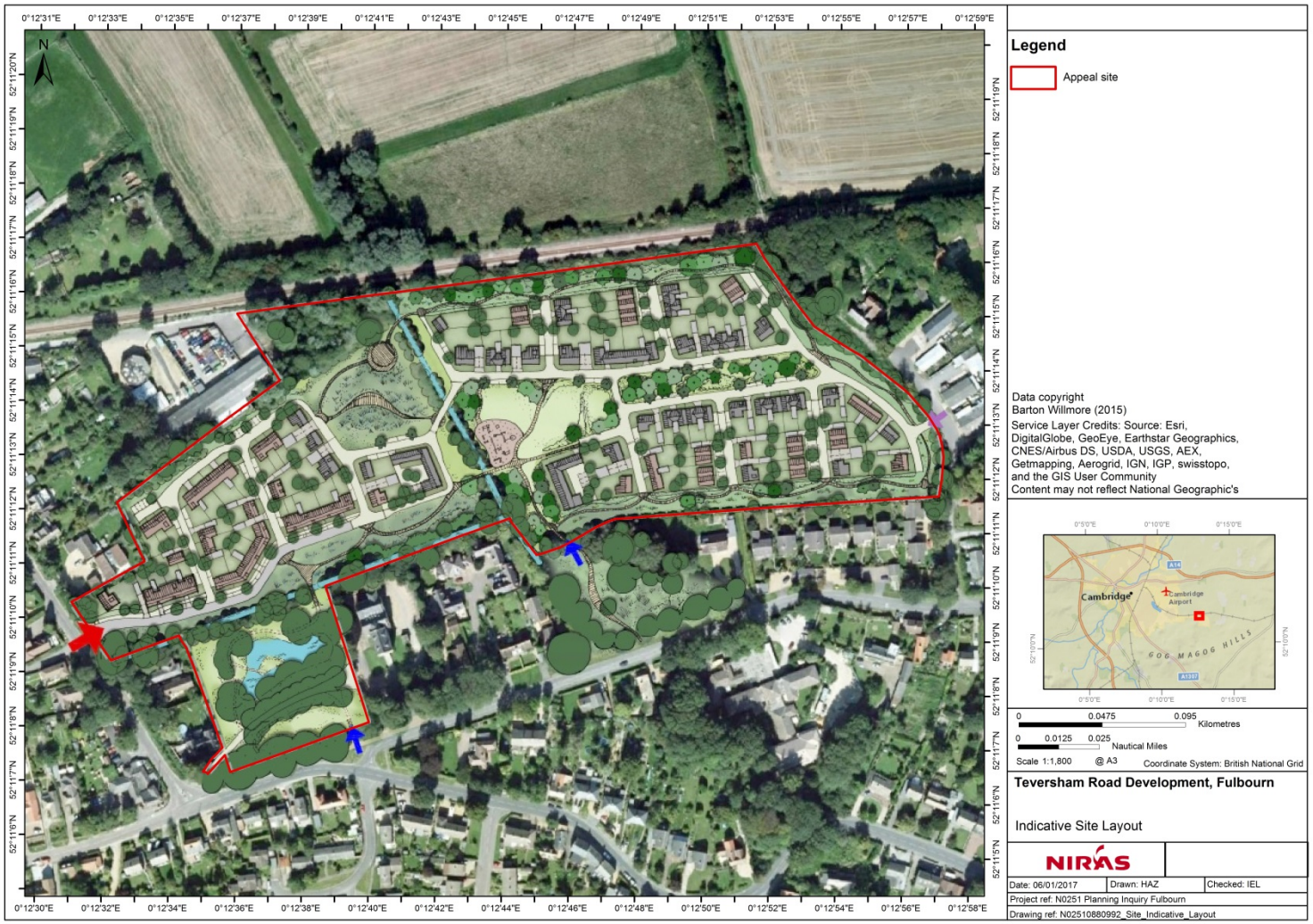

Figure 1 : Indicative layout of the proposed development at Land at Teversham Road, Fulbourn.

3. Policy and legislation context

National planning policy

3.1. The National Planning Policy Framework (NPPF), published in 2012, and the Planning Practice Guidance (PPG) initially published in 2014, are material considerations in this application. One of the overall aims of the NPPF is that the planning system should aim to conserve and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible. National policy regarding ecology and biodiversity is contained within Paragraphs 109 to 125 of NPPF. Guidance on the implementation of the policy is provided within the Planning Practice Guidance (PPG) Natural Environment: Biodiversity and Ecosystems.

3.2. Paragraphs 109 to 125 of the NPPF outline the procedures by which a Local Planning Authority should take account of flood risk at the allocation and application stages and discusses key requirements which should be met.

3.3. Of particular relevance to The Appeal Site are that it should be safe from flooding, that it should minimise impacts on biodiversity, provide net gains in biodiversity where possible and contribute to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures. Specifically, paragraph 118 reads as follows (edited for relevance to the Site):

When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- *if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
- *opportunities to incorporate biodiversity in and around developments should be encouraged; and*
- *planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss.*

3.4. On 6 March 2014 the Department for Communities and Local Government (DCLG) launched the National Planning Practice Guidance as a web-based resource. Section 11 sets out guidance on "Conserving and enhancing the natural environment" and Paragraph 109 explains that:

- The planning system should contribute to and enhance the natural and local environment by:

- Protecting and enhancing valued landscapes, geological conservation interests and soils;
- Recognising the wider benefits of ecosystem services;
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and
- Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Local planning policy

3.5. The Development Plan comprises the South Cambridgeshire District Council's Local Development Framework (LDF) Core Strategy Development Plan Document (DPD), and the LDF Development Control Policies DPD.

3.6. There are a number of policies within DPD and Area Action Plans which relate to biodiversity. The supporting text of the Development Control Policies Policy NE/6 states that further guidance on Priority Species and Habitats, sites and the achievement of biodiversity targets will be set out in the Biodiversity Strategy. The Biodiversity Strategy was produced in 2006 and adopted as Council policy.

3.7. LDF policy NE/6 Biodiversity part 2 states that:

The District Council will refuse development that would have an adverse significant impact on the population or conservation status of protected species or priority species or habitat unless the impact can be adequately mitigated or compensated for by measures secured by planning conditions or obligations.

3.8. A full excerpt of LDF policy NE/6 is provided in Appendix 1 of this Report.

Legislation

Protected sites

3.9. Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, known as the "Habitats Directive", was adopted in 1992. The Directive is the means by which the European Union (EU) meets its obligations under the Council Decision 82/72/EEC of 3 December 1981 concerning the conclusion of the Convention on the conservation of European wildlife and natural habitats (Bern Convention). The Habitats Directive requires EU Member States to maintain or restore natural habitats and wild species listed in the Annexes to the Directive to a favourable conservation status.

3.10. The Habitats Regulations transpose the requirements of the Habitats Directive into national law. SACs

are designated in recognition of their value as best representatives of the range and variety within the EU of habitats and (non-bird) species listed on Annexes I and II to the Habitats Directive.

3.11. Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended) (Birds Directive) provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. Mechanisms for the achievement of the objectives of the Directive are set by each Member State (in the UK delivery is via several different statutes).

3.12. SPAs are designated under the Birds Directive due to their value as areas of the most important habitat for rare and vulnerable birds (listed on Annex I of the Directive), and for regularly occurring migratory bird species within the European Union.

3.13. Although not a European site designation, Ramsar sites were originally designated to protect sites of importance as waterfowl habitat, and were later broadened to include all aspects of wetland conservation and sustainable use.

3.14. Sites of Special Scientific Interest (SSSIs) are designated to protect the best examples of the UK's flora, fauna, or geological or physiographical features. The designation may extend into intertidal areas out to the jurisdictional limit of local authorities, generally Mean Low Water in England. SSSIs are notified under the Wildlife and Countryside Act 1981 (as amended).National Nature Reserves (NNR) are established to conserve and enhance landscapes. They promote public enjoyment and consider the social and economic well-being of those living within them.

3.15. Local Reserves (often referred to as LNR's) are local authority designations under the National Parks and Access to the Countryside Act 1949. They are designated in consultation with relevant statutory nature conservation agencies and are managed for nature.

The Habitats and Species Regulations (2010)

3.16. The Habitats Regulations make it an offence to deliberately disturb EPS (listed under the Habitats Directive). Under the Habitats Regulations, places of shelter are fully protected, and it is an offence to damage or destroy a breeding site or resting place of such an animal, whether deliberately or not. It is also an offence to disturb in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species; and to disturb in a manner or circumstances which are likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young. Any activity which is likely to affect these species requires prior consultation with the relevant statutory nature conservation organisation. In England, this means that Natural England should be consulted.

3.17. A licence from Natural England may be required in case of potential disturbance of EPSs or damage or destruction of a resting site as a result of work activities. Under Regulation 53(2)(e) of the Habitats Regulations, licences may be granted for:

- Preserving public health, public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment.

3.18. Under Regulation 53(9), in order for a licence to be successful, two tests must be satisfied:

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

The Wildlife and Countryside Act 1981 (as amended)

3.19. The Wildlife and Countryside Act (WCA) 1981 (as amended) ("WCA 1981") provides protection to species and habitats. Section 9 provides protection to certain animal species listed in Schedule 5.

3.20. For those species fully protected under Section 9 it is an offence to intentionally kill, injure or take animals listed in Schedule 5. It is also an offence to intentionally or recklessly damage, destroy or obstruct access to any place used by animals listed in Schedule 5 for shelter or protection, and to disturb such an animal while it is occupying a structure or place which it uses for shelter or protection. Any works, which may potentially cause disturbance to these species, requires prior consultation with Natural England.

3.21. It is an offence to: intentionally kill, injure or take any wild bird; take, damage or destroy the nest of a wild bird included in Schedule ZA1; take, damage or destroy the nest of any wild bird while that nest is in use or being built; or take or destroy an egg of any wild bird. It is also an offence to intentionally or recklessly disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or to disturb dependent young of such a bird.

3.22. Section 13 provides protection to wild plants. It is an offence to intentionally pick, uproot or destroy any wild plant included in Schedule 8. It is also an offence to sell, offer or expose for sale, or possess or transport for the purpose of sale, any live or dead wild plant included in Schedule 8.

3.23. It is also an offence under Section 14 to allow certain invasive species (listed in Schedule 9) such as Japanese knotweed (*Fallopia japonica*) and giant hogweed (*Heracleum mantegazzanium*) to grow in the wild.

3.24. Part II of the WCA 1981 makes it an offence to damage any sites designated as SSSI. Any works which may potentially damage these sites requires prior consultation with Natural England.

Natural Environment and Rural Communities Act 2006

3.25. The Natural Environment and Rural Communities Act 2006 (NERC Act) provides that Natural England's general purpose is to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.

3.26. Section 41 of the NERC Act required the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The Section 41 list provides guidance to decision-makers, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 2006, to have regard to biodiversity conservation in England when carrying out their function.

Environmental Impact Assessment Regulations

3.27. The process of Environmental Impact Assessment is governed by the Town and Country Planning (Environmental Impact Assessment) Regulations 2011(as amended).

3.28. The regulations only apply to certain types of development and/or projects. South Cambridgeshire District Council has screened the proposal in accordance with the Environmental Impact Assessment (EIA) Regulations and has come to the view that it is not EIA development as it would not be likely to have significant effects on the environment by virtue of such factors as its nature, size and location.

Cambridgeshire County Wildlife Site Criteria

3.29. In addition to the Biodiversity SPD implemented by the Council, reference is made in this EcIA to the Cambridgeshire Criteria for County Wildlife Site (CWS) published by Cambridgeshire & Peterborough County Wildlife Sites Panel (2014). This document sets out a series of criteria in order to select CWS's within the County.

4. Methodology

Scope of the assessment

4.1. This EcIA considers the full suite of ecological features that may have relevance to impacts from the proposed development namely: protected/designate sites, habitats and species of principal importance for conservation of biodiversity, protected species and those species deemed to be important at a regional or local level.

4.2. A Phase 1 habitat and protected species scoping survey for the Site was undertaken in 2014 (MKA Ecology 2014) which included a desk study for ecological feature of relevance. A data search was conducted for the site and a 2 km buffer area with both Cambridgeshire and Peterborough Biological Records Centre (CPBRC) and the Multi-agency Geographic Information for the Countryside (MAGIC www.magic.gov.uk) consulted.

4.3. Consultation was undertaken with Natural England and the Council regarding the scope of ecological assessment work for the first application of the development. Natural England in October 2014 stated that they had no objection with regards to impacts protect sites, while noting that Fulbourn Fen and Great Wilbraham Common Sites of Special Scientific Interest (SSSI) are in close proximity. Natural England concluded that the application would not damage or destroy the interest features for which these sites have been notified. Natural England therefore advised the Council that these SSSIs do not represent a constraint in determining this application. Natural England also drew the Applicant's attention to their Standing Advice on protected species.

4.4. South Cambridgeshire District Council have been consulted extensively through the original application for the development and through the subsequent Appeal process. Despite the Council's objection to the original application on ecological grounds they confirmed that the suite of surveys undertaken was welcomed (Mungovan 2014).

Field survey

4.5. The Site has been subject to substantial recent ecological survey since 2014. The following reports are referred to in this report to characterise the baseline ecological conditions:

- Phase 1 Habitat and protected Species Scoping[1] (MKA Ecology 2014a)
- Bat Roost Survey (MKA Ecology 2014b)
- Breeding Bird Survey (MKA Ecology 2014c and updated in NIRAS 2017)
- Reptile Survey (MKA Ecology 2014d)
- Water Vole and Otter Survey[2] (MKA Ecology 2014e)
- Great Crested Newt Survey (MKA Ecology 2015a)
- Assessment of species of Botanical Interest (MKA Ecology 2015b)
- Ecological Management Concepts (NIRAS 2016[3])
- Targeted Botanical Survey (The Wildlife Trust BCN 2016)

Phase 1 habitat and protected species scoping survey

4.6. The Phase 1 Habitat Survey was completed by MKA Ecology on 6 June 2014. The habitat at the site was surveyed using the standardised Joint Nature Conservation Committee (JNCC) Phase 1 classification and mapping methodology (JNCC, 2010). Data were recorded onto field maps and then transferred onto a Geographic Information System (GIS) following the JNCC Colour Mapping Pallet for ArcGIS. Dominant plant species were observed and recorded within each habitat type. The plant species nomenclature follows that of Stace (2010).

4.7. The protected species scoping survey completed in parallel targeted the likely or potential presence of the following species / species groups:

- Reptiles: adder *Vipera berus*, common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix natrix.*.
- Amphibians: great crested newt (GCN) *Triturus cristatus*.
- Mammals: badger *Meles meles*, bats (all species), water vole *Arvicola amphibius*, brown hare *Lepus europaeus*, Otter *Lutra lutra*.
- Birds: all species, with special reference to species listed under Schedule 1 of the Wildlife and Countryside Act (1981) as amended, UK BAP (UKBAP) Priority Species[4] and Red and Amber list Birds of Conservation Concern (BoCC3; Eaton *et al*., 2009[5]).

4.8. Within its recommendations the Phase 1 habitat and protected species scoping report detailed the requirement for further survey for reptiles, breeding birds, bats, badger, water vole and otter. No further survey for badger was deemed necessary within the site boundary (MKA Ecology 2014a).

[1] Now commonly referred to as a Preliminary Ecological Appraisal (PEA) – see CIEEM (2013).
[2] Although not detailed on the front cover this report also includes a survey for badger.
[3] NIRAS (2016) includes results of updated botanical survey.
[4] Now superseded by the list of species of principal importance under the NERC Act (2006).
[5] Now updated as Birds of Conservation Concern 4 (Eaton *et al.,* 2015)

Bat roost survey

4.9. During the preliminary ecological assessment at the site a total of three trees were identified with the potential to support roosting bats. Trees 1 and 2 were considered to have moderate potential to support roosting bats and Tree 3 was considered to have a low potential to support roosting bats. Nocturnal survey effort followed the best-practice Guidelines developed by the Bat Conservation Trust (BCT, 2012[6]) which recommend that two nocturnal surveys are completed at features with moderate potential to support roosting bats and that a single nocturnal survey is completed at features with a low potential to support roosting bats.

4.10. A dusk emergence survey and a dawn re-entry survey were undertaken at Trees 1 and 2 while a single dawn re-entry survey was completed at Tree 3 (both in June 2014).

4.11. Any bats emerging from or re-entering the trees were recorded and the time and species noted. All bat activity observed on site was recorded and flight-lines were mapped. The start and finish time of the emergence/re-entry surveys were recorded, as was the date, wind direction and force, temperature, precipitation and cloud cover for each survey. A map of the habitat to be surveyed was drawn in order to show any bat emergence locations.

4.12. The emergence survey began 15 minutes before sunset and continued for approximately two hours after sunset. The re-entry surveys started approximately two hours before sunrise and finished at sunrise. Surveyors used broadband bat detectors (BatBox Duet). Edirol digital recorders were used to collect bat call data which was later analysed using BatSound software. Identification of bat calls was undertaken using the parameters set out by Russ (2012).

Breeding bird survey

4.13. A breeding bird survey was conducted with the survey area defined as the area enclosed within the site boundary. Five visits were undertaken between 21 May and 30 June 2014.

4.14. For territorial and semi-colonial species, the method used in this survey was based on the British Trust for Ornithology's (BTO) reduced-effort Common Bird Census (CBC) territory mapping technique (Marchant 1983; Bibby *et al.* 1992). The territory mapping method allows the distribution of bird territories across the survey area to be determined and from this, a count of the number of breeding pairs for each species can be derived.

4.15. Visits were undertaken early in the morning, between 05:00 – 09:30. The whole survey area was covered in each visit, using suitable optical equipment (binoculars) to observe bird behaviour. The species, number, location and any breeding activity were recorded on a map using standard BTO codes. The route taken was alternated on each visit to ensure that different parts of the Application Site were visited during different stages of the morning (MKA Ecology 2014c).

4.16. Analysis of the data collected has been revisited in NIRAS (2017). The records of birds made on each visit were collated to determine the approximate location and numbers of breeding pairs for territorial and semi-colonial species and to give an indicative total for the survey area as a whole for non-territorial and non-breeding species. The territorial analysis was based on a standard technique (Marchant 1983; Bibby *et al.* 1992) where most critically at least two registrations of breeding

[6] Now superseded by BCT (2016)

behaviour are required to determine a territory cluster when 8 or fewer surveys visits are undertaken (as in this case). It is also required that at least two registrations from a territory cluster must be recorded at least 10 days apart. However, a single record of a nest with eggs or young can be counted as a cluster even in the event of adult birds not being record at the appropriate qualifying level (Bibby *et al.,* 1992).

Reptile survey

4.17. A presence / absence survey for reptiles was undertaken in accordance with survey guidance from Froglife (1999) and with the JNCC guidelines (JNCC, 2004). The survey involved the placement of 125 artificial refugia in arrays of five mats spread evenly across all habitats considered suitable for reptiles (MKA Ecology 2014d).

4.18. The refugia were composed of approximately 0.5m² sheets of corrugated metal and roof felt. Reptiles often use ground objects as a place to shelter from predation or disturbance and for absorbing heat. They are exothermic, which is to say that they gain their body heat from the sun. Reptiles within the immediate vicinity are attracted to refugia in order to gain heat at appropriate times of day, because of the materials ability to absorb heat and provide a warmer micro-habitat than the surrounding vegetation.

4.19. Seven survey visits were carried out over seven separate days in suitable weather conditions in May and June 2014. Visits were timed to the period of the day when reptiles are most likely to be seeking a means of gaining additional heat, i.e. early morning, late afternoon, post-showers and cooler times of day. Different species and even sexes of animals have differing behavioural patterns and preferences in terms of using such refugia and basking out in the open, therefore a varied approach to visit times is generally beneficial in ensuring a thorough survey.

Badger, water vole and otter survey

4.20. The Badger, Otter and Water Vole surveys were all completed during a site visit on 27 May 2014 (MKA Ecology 2014e). For badger a walkover survey of the Application Site and surrounding 30m was conducted. All field signs of Badger activity were recorded on to a base map.

4.21. If present, the following field signs were recorded:

- Faeces: Badgers characteristically deposit faeces in small pits, individually known as dung pits, and collectively a latrine which are often located at the boundaries of territories; and next to active setts.
- Setts: these can be single isolated outlier earths or a series of earths which can number over a hundred.
- Paths and tracks with Badger footprints.
- Sightings, road fatalities and hair on fences.

4.22. If present, Sett entrances were categorised using the following criteria:

- Well used holes (with one or more of the following features: well-worn entrance; freshly excavated soil; bedding material).

- Partially used holes (leaves or twigs in entrance and/or mosses and other plants growing in or around entrance).

- Disused holes (partially or completely blocked, with considerable amount of re-excavation needed before use).

4.23. Each sett or hole, if found, was then classified as being one of the following:

- Main Setts: These usually have a large number of holes with large spoil heaps, and the sett generally looks well used. They usually have well used paths to and from the sett and between sett entrances. Normally the breeding sett is in continual use all year round.

- Annexe Setts: These are always close to a main sett and are usually connected to the main sett by one or more obvious, well-worn paths. They consist of several holes, but are not necessarily in use all the time, even if the main sett is very active.

- Subsidiary Setts: Often these have only a few holes and are usually at least 50 m from a main sett, and do not have an obvious path connecting them with another sett. They are not continuously active.

- Outlier Setts: These usually only have one or two holes, often have little spoil outside the hole, have no obvious path connecting them with another sett, and are only used sporadically (Natural England, 2007).

4.24. The water vole survey methods follow those recommended in the Water Vole Survey Handbook (Strachan & Moorhouse, 2006[7]). The banks of the ditches and the pond were searched for signs of water vole activity.

4.25. The banks of the waterways were searched for evidence of:

- Latrines: piles of water vole droppings used in territory marking;

- Burrows: oval shaped holes in the bank, usually at the waters edge and sometimes with a cropped 'lawn' of grass;

- Feeding stations: piles of small pieces of vegetation; and

- Footprints.

4.26. Signs of otter were also searched for whilst undertaking the water vole survey. Particular attention was paid to prominent places, such as logs or gravel bars, and bridges where otters are likely to leave spraints (faeces used in marking territories).

4.27. The banks of the waterways were searched for the following evidence of otter activity:

- Resting places including holts, laying-up sites and grooming hollows;

- Spraints and 'tar' spots;

- Feeding remains including fish bones, amphibian remains etc.; and

[7] Superseded by the third edition published in 2011 (Strachan, Moorhouse and Gelling 2011).

- Footprints and tracks.

Great crested newt survey

4.28. As surveys were undertaken early in the survey season window for great crested newt, a requirement was imposed by the LPA to confirm the activity of newt populations in the area to validate any negative results obtained at the target ponds at the site. To achieve this, three 'control' ponds with known populations of great crested newt were selected and surveyed in the area (MKA Ecology 2015a)

4.29. Surveys of all ponds (both target and control) were carried out by a licensed surveyor using the standard methodology and recommendations outlined under the Great Crested Newt Mitigation Guidelines (English Nature, 2001); with the exception of the recommendations for timing (i.e. at least half of the survey visits should be undertaken between mid-April and mid-May).

4.30. Four survey visits between 9th and 16th March 2014 of the target ponds (Ponds A and B) were scheduled in order to establish the presence or absence of great crested newt at the proposed development site. Control ponds were only surveyed until great crested newt activity was confirmed.

4.31. At least three of the three of following four survey techniques were used at each site:

- Bottle trapping: This involved the placement of modified two litre soft drink bottles attached to bamboo canes at two metre intervals along the pond edge (the trapped air bubble method was used). All traps were set at dusk or immediately before dusk and were collected as soon as possible the following morning (well within the 17 hours specified by Natural England). Where ponds were lined (e.g. Pond A and C), a floating bottle trap design was used, anchored to the banks of the pond with string.

- Torching: This involved walking the perimeter of the pond (access permitting) during nocturnal hours looking for great crested newt in the water using a high powered torch.

- Egg searching: Emergent vegetation was checked for evidence of deposited newt eggs and identifying the species of any eggs found.

- Netting: A hand net was used to sweep the pond, where access along the bank permitted.

Ecological Management Concepts

4.32. To understand opportunities for habitat retention, replacement, enhancement and translocation, detailed surveys of species of botanical importance were undertaken.

4.33. Two survey visits were undertaken in 2016 with the first in late May when the grass sward was low with a key aim of determining the distribution of the adder's tongue fern across the site. A second survey visit was conducted in early July 2016 to update the existing data with regards to other strong indicator species (for neutral grassland), as well as to derive an overall species list for the site. The locations of key plant species were mapped using a hand held Geographical Positioning System (GPS) unit and notes made on their abundance (NIRAS 2016).

Targeted Botanical Survey (The Wildlife Trust BCN 2016)

4.34. A botanical survey commissioned by the Council was undertaken in July 2016 (concurrently with the NIRAS second survey visit) by The Wildlife Trust BCN. A report on this survey (The Wildlife Trust BCN 2016) was submitted as evidence by both the Council and The Wildlife Trust for the Land at Teversham Road appeal in September 2016.

4.35. The survey focused on the identification of locally notable plant species and grassland indicator species. The locations of key plant species or communities were mapped using a hand held GPS unit and notes made on their abundance (NIRAS 2016).

Ecological Impact Assessment (EcIA)

4.36. This EcIA provides an assessment of the significance of impacts on ecological features by following a framework based on CIEEM (2016). The first two stages involve:

i. Establish the baseline ecology of the Land at Teversham Road site. This is based on the suite of ecological surveys completed between 2014 and 2016 supported by records attained from CPERC and others.

ii. Determine the importance of ecological features. CIEEM present a geographical frame of reference to determine value or importance:

- International or European
- National
- Regional
- County
- Local

4.37. Key considerations when assessing the ecological importance of a site are whether it is designated, the habitats which it provides and/or whether legally protected species are to be found there.

4.38. Habitat types of European (International) conservation importance are listed on Annex I of the Habitats Directive. Habitat types that are considered priorities for conservation in England and Wales are listed as habitats of principal importance under sections 41/42 of the NERC Act (2006).

4.39. Species of European (International) conservation importance are listed on Annexes II, IV and V of the Habitats Directive and Annex I of the Birds Directive. Species that are considered to be priorities for conservation in England and Wales are listed as species of principal importance under sections 41/42 of the NERC Act (2006). Specific species have legal protection under Annex IV of the EC Habitats Directive71 and the appropriate national regulations. In the UK other species are protected under Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended). Further species specific guidance is sought to establish importance of features present (e.g. Birds of Conservation Concern 4; Eaton *et al.*, 2015).

4.40. Following the determination of value, three further stages are followed to ultimately determine the residual significance of potential effects on ecological features:

i. The magnitude of the impacts is assessed according to the timing frequency, extent, duration and reversibility of the impact. Definitions for levels of magnitude include the following of

relevance:

- High - notable impacts on the feature / population, which would have a sufficient effect to alter the nature of the feature in the short to long term and affect its long-term viability. For example, more than 20% habitat loss or damage.

- Medium - impacts that are detectable in short and long-term, but which should not alter the long-term viability of the feature / population. For example, between 10 - 20% habitat loss or damage.

- Low - impacts that are sometimes perceptible in short and long-term, but which will not alter the long-term viability of the feature / population. For example, between <10% habitat loss or damage.

ii. Following the identification of receptor value and magnitude of the effect, the significance of the impact is often considered using a matrix approach (SNH 2013). Assess the significance of impacts. Impacts on ecological features are characterised by several characteristics including whether they are positive or negative, their extent, magnitude, duration, timing, frequency and reversibility. CIEEM (2016) provides definitions for evaluating the significance of effects on habitats or species:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.

- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

iii. Consideration of mitigation and enhancement measures. Extensive proposals for mitigation and enhancement measures have previously been made by the Applicant as part of the Appeal process for the proposed development. These are detailed in NIRAS (2016) and this EcIA will draw upon these proposals to determine the residual significance of any impacts.

Constraints

4.41. The surveys of the target ponds were undertaken early in the survey season for Great Crested Newt, and therefore did not adhere to the guidelines which state that at least half of the survey visits should be undertaken between mid-April and mid-May. The use of control ponds to confirm Great Crested Newt activity early in the season was proposed in agreement with the South Cambridgeshire County Ecology Officer to mitigate for this guidance deviation (MKA Ecology 2015a).

4.42. The results taken from bat survey detector recordings are biased towards bats that use louder echolocation calls. Therefore quiet bats, such as Brown Long-eared Bat, may be under-recorded due to the limited recording range of the equipment. This was not considered to present a significant constraint as surveyors were vigilant to ensure that visual cues indicating the presence of quiet species were recorded (MKA Ecology 2014b).

4.43. During the survey for badger, some sections of the hedgerows could not be accessed directly due to dense vegetation, however, when badger setts are present in areas of dense vegetation there are obvious paths through the vegetation which allow the setts to be detected indirectly. Therefore this

was not considered to have had a significant adverse impact on the results of the survey (MKA Ecology 2014e). Access to the railway embankment to the north of the site was not available and therefore was not included in the survey area. However the southern edge of the railway embankment was largely heavily vegetated and therefore any Badger setts present would have been identified by the presence of Badger paths. Furthermore, any Badger setts present on the northern edge of the railway embankment would be separated from the site by the railway line. Therefore, the lack of access to the railway embankment was not considered to have had a significant adverse impact on the results of the survey.

4.44. The optimal period for undertaking Badger surveys is during the winter months when vegetation is low and field signs can be easily observed. However, this survey was undertaken during the summer months. In order to eliminate this constraint surveyors were vigilant to search all areas, where feasible, and to search for any tracks within the vegetation which may indicate the presence of Badger (MKA Ecology 2014e).

5. Ecological baseline

Designated sites

5.1. The Site is not designated as a statutory site under international or European legislation (e.g. Special Area of Conservation). It is not designated under national legislation (e.g. SSSIs) and it is well established that the proposal will have no effect on any nationally protected site.

5.2. Natural England noted that Fulbourn Fen and Great Wilbraham Common Sites of Special Scientific Interest (SSSI) are in relatively close proximity to the Land at Teversham Road site. Natural England concluded however that the application would not damage or destroy the interest features for which these sites have been notified. Natural England therefore advised the Council that these SSSI's do not represent a constraint in determining the application.

5.3. In addition, the site is not locally designated as a site of conservation interest (e.g. County Wildlife Site) nor is it adjacent any areas with such a designation.

Habitats and botanical species

5.4. The Site comprises two fields which total an area approximately 6.85 hectares. The land is dominated by semi-improved neutral grassland with variations in the assemblage due to a varied history of land-use and management, as well as variation in soil moisture content.

5.5. The fields are bisected by a ditch which channels a stream rising from a spring to the south flowing north to Teversham Fen.

5.6. The fields are bounded by unmanaged hedgerows with mature and semi-mature hedgerow trees. The existing site habitats of mature hedgerows, small woodland blocks and the stream provide infrastructure features and connectivity to the wider landscape that would be retained.

5.7. The two fields have been unmanaged for a period of time resulting in a complex mosaic within the grassland assemblage with two distinct areas. The first area encompasses the west field and the majority of the east field which are dominated by false oat grass (*Arrenhantherum elatius*) in both fields with field horsetail (*Equisetum arvense*) attaining local dominance in the west field. This assemblage resembles the National Vegetation Classification MG1 *A.elatius* community which is

characteristic of circumneutral soils where a lack of management has allowed the gradual nutrient enrichment of the soil. The sward on site is relatively species rich.

5.8. The second area describes a broad swathe on the eastern side of the east field with an assemblage dominated by tall grasses and ruderals, indicating a different management regime with a stronger ruderal component including dominant nettle and creeping thistle (*Cirsium arvense*), spear thistle (*C. vulgare*), false oat grass, hogweed (*Heracleum sphondylium*) and frequent cow parsley (*Anthriscus sylvestris*).

5.9. No habitats of European conservation importance (i.e. Annex I of the Habitats Directive) are present (NIRAS 2016; The Wildlife Trust BCN 2016). It has been contended previously by both the Council and the Wildlife Trust that site is at least in part of a Priority Habitat under the NERC Act (2006) by virtue of being lowland meadow. The grassland on the site is identified by multiple sources as being semi-improved (MKA Ecology 2014a; NIRAS 2016, The Wildlife Trust BCN 2016) whereas the definition of lowland meadow Priority Habitat however involves unimproved pasture[8] .

5.10. The suite of ecological surveys were undertaken between 2014 and 2015 by MKA Ecology (e.g. MKA Ecology 2014a; MKA Ecology 2015b) which identified the presence of four grassland species listed as strong indicators in the CWS Section 2 Grasslands[9]. Under Section 2 (c) the criteria for designation as a CWS includes sites supporting three or more strong neutral grassland indicator species. The four species were:

- adder's tongue fern (*Ophioglossum vulgatum*);
- early marsh orchid (*Dactylorhiza incarnate*);
- common spotted orchid (*D. fuchsia*); and
- yellow rattle (*Rhinanthus minor*).

5.11. The status of the above identified strong indicator species was updated in 2016 (NIRAS 2016).

5.12. *Adder's tongue fern* - the distribution of adder's tongue fern was found to be more extensive than previously identified with a frequent distribution in both the west and east fields. The distribution appeared to be closely related to the surface moisture content of the soil (Figure 2).

5.13. *Common spotted orchid* - no flowering spikes of common spotted orchid were recorded in 2016.

5.14. *Early marsh orchid* - the location of the patch of early marsh orchid in the east field differed slightly from location described in previous surveys undertaken by MKA Ecology in 2014, but a strong colony was found with 67 flowering spikes counted. One flowering spike was also found in the marsh area of the west field (Figure 3).

5.15. *Yellow rattle* – this species was found to have a scattered presence through the west field (Figure 3).

[8] http://jncc.defra.gov.uk/page-5706

[9] Cambridgeshire & Peterborough County Wildlife Sites Panel (2014)

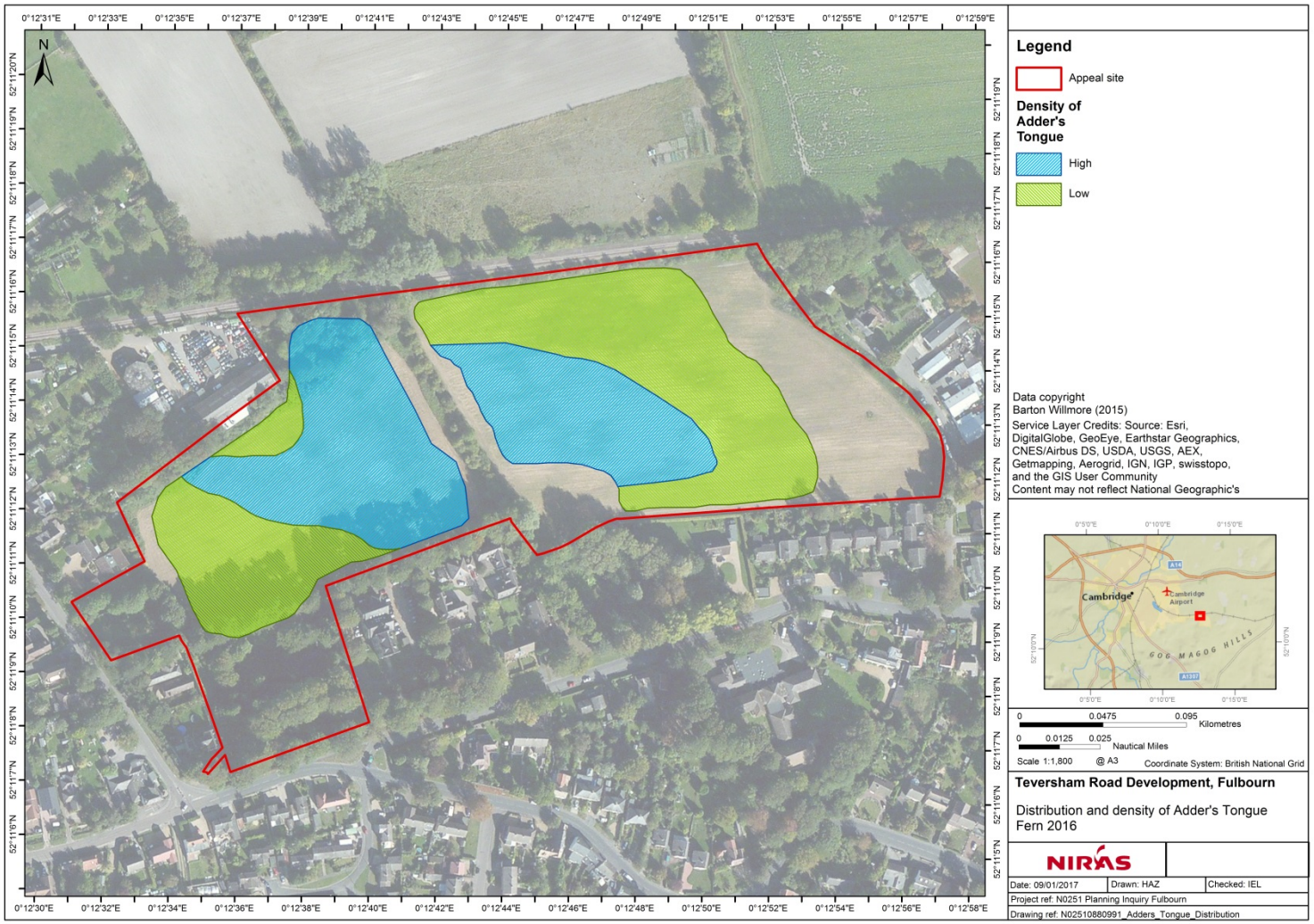

Figure 2: Distribution of adder's tongue fern at Land at Teversham Road 2016

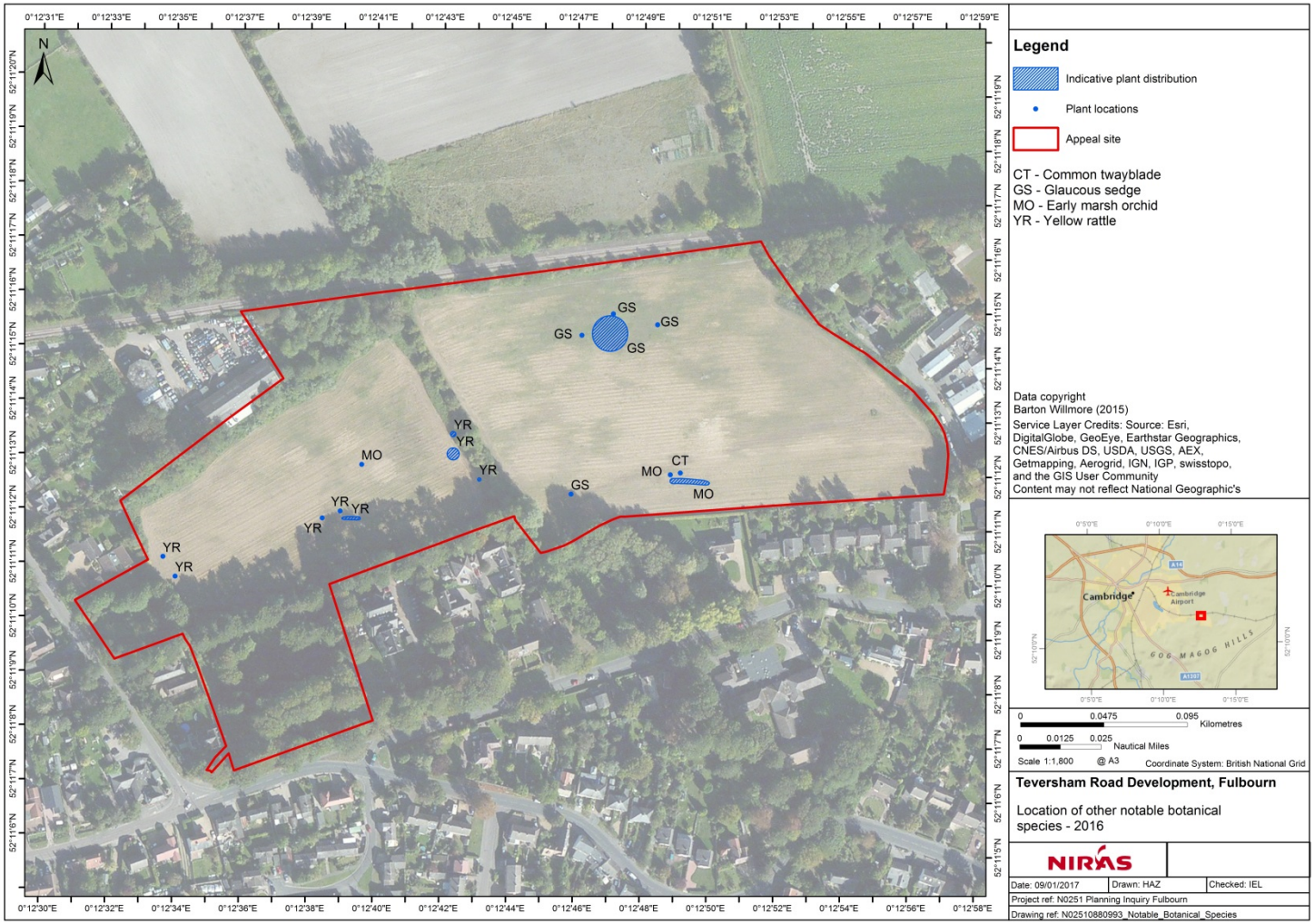

Figure 3: Distribution of other strong indicator species for neutral grassland at Land at Teversham Road 2016

5.16. The following additional strong indicator species were also identified in 2016:

5.17. *Glaucous sedge* - an extensive patch of glaucous sedge (*Carex flacca*) was identified in the location where common spotted orchid spikes were previously recorded (Figure 3).

5.18. *Common Twayblade* - common twayblade (*Neottia ovata*) is a species had species not previously been recorded before the 2016 surveys - two flowering spikes of were recorded in the east field in close proximity to the early marsh orchid location (Figure 3).

5.19. Bee orchid is identified here only as a grassland species, rather than a grassland indicator (following its status in Cambridgeshire & Peterborough County Wildlife Sites Panel (2014)), contra its deemed status in evidence given by the Council and The Wildlife Trust during the September 2016 appeal.

5.20. The findings of NIRAS (2016) in terms of the botanical baseline present at the Land at Teversham Road site do, in general however, concur with those presented in The Wildlife Trust BCN (2016). A notable exception is the distribution of glaucous sedge; while the primary data mapping (Map 6) in The Wildlife Trust BCN (2016) matches that of NIRAS (2016), paragraph 4.2 of the former appears to erroneously suggest that this species was 'locally frequent' in the western field of the site.

Species

Breeding birds

5.21. MKA Ecology (2014c) previously reported on the results of the 2014 breeding bird surveys. These data have been reanalysed by NIRAS (2017) in order to identify the importance of the assemblage according to the criteria detailed below:

- Annex 1 of the EU Birds Directive (2009/147/EC);
- Schedule 1 of the Wildlife and Countryside Act (1981, amended 1985);
- Species of Principal Importance for Conservation (NERC Act 2006);and
- Birds of Conservation Concern 4 (BoCC) Red and Amber Lists (Eaton *et al*., 2015).

5.22. A total of thirty-five species were recorded during the breeding bird surveys within the survey area, three of which were only recorded in flight over the site. Twelve of the thirty-five species were considered to be breeding. Three species that were only recorded in flight over the site (mute swan, little egret and turtle dove), with no evidence of site usage, are not taken forward in evaluating the breeding bird assemblage.

5.23. Eight of the thirty-two species recorded using the survey area meet the criteria for conservation concern. Two species only meet the criteria for conservation concern were considered to be breeding (song thrush and dunnock with two and one territories respectively). The location of the territories of these two species were closely associated with woodland edge habitat on the site boundary (Figure 4).

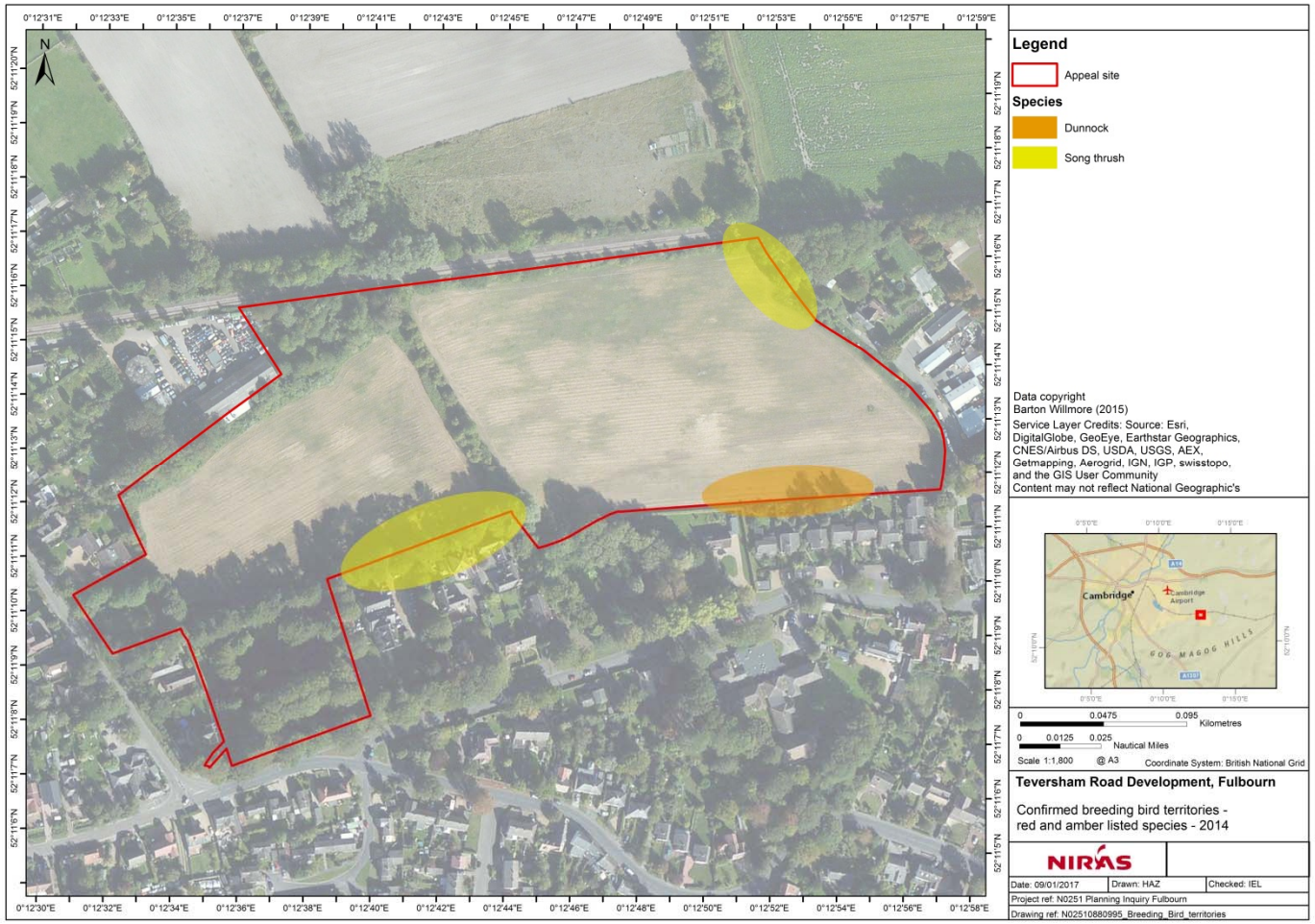

Figure 4 : Territories of bird species of conservation interest at Land at Teversham Road 2014.

Reptiles

5.24. Twenty-four records of common lizard were made across the site with a maximum of count of eight Common Lizards recorded during a single visit. Furthermore, grass snake was recorded on four occasions at the site, with no more than one being observed on any visit. Common Lizard were recorded at nine of the 25 survey locations and were recorded in both the western and eastern fields. They were most frequently recorded on the southern site boundary. Grass Snake were recorded in three of the 25 locations, and only in the eastern field (MKA Ecology 2014d).

5.25. Following the guidance suggested by the Herpetofauna Groups of Britain and Ireland (HGBI; 1998) populations of reptiles can be classified as "small, medium or large" based on the number of reptiles per hectare recorded on site, which gives an indication on the amount of translocation effort required to remove them lawfully.

5.26. The reptile survey recorded a density of approximately two common lizard per hectare at Land off Land at Teversham Road, Fulbourn. The site can therefore be said to support a small population of common lizard (<20/ha). A peak count of eight common lizard would also correspond to a small population. Furthermore, the site can be said to support a small population of grass snake (<2/ha).

Great crested newt

5.27. Two waterbodies associated with the Land at Teversham Road site were surveyed by MKA Ecology (2015a). Pond A referred to the ornamental pond within the Pump House Garden (referred to as Area G within NIRAS 2016). Pond B is 50m outside of the proposed development site boundary within Poorwell Water.

5.28. Pond A was man-made and concrete-lined. It was located in the south of the site surrounded by poor semi-improved grassland and mixed plantation woodland. Species present within this pond included dominant duckweed and yellow iris *Iris pseudacorus*, along with frequent rosebay willowherb *Chamerion angustifolium* along the pond margins. (MKA Ecology 2015a).

5.29. Pond B was located approximately 50m south of the site boundary, adjacent to Cow Lane. It was heavily silted, containing only shallow water, with dominant common reed *Phragmites australis*. It was surrounded by poor semi-improved grassland with occasional willow *Salix* sp. trees, including one large specimen in the pond itself (MKA Ecology 2015a).

5.30. No great crested newt were found during the surveys undertaken at Ponds A and B at the Land at Teversham Road site. Furthermore, no other amphibian species were recorded at either site (MKA Ecology 2015a).

5.31. Pond A was found to contain low numbers of large predatory diving beetles, and Pond B was found to contain low numbers of small fish (including stickleback, minnow and gudgeon). All of these will predate on the larvae of great crested newt, though populations can survive with their presence.

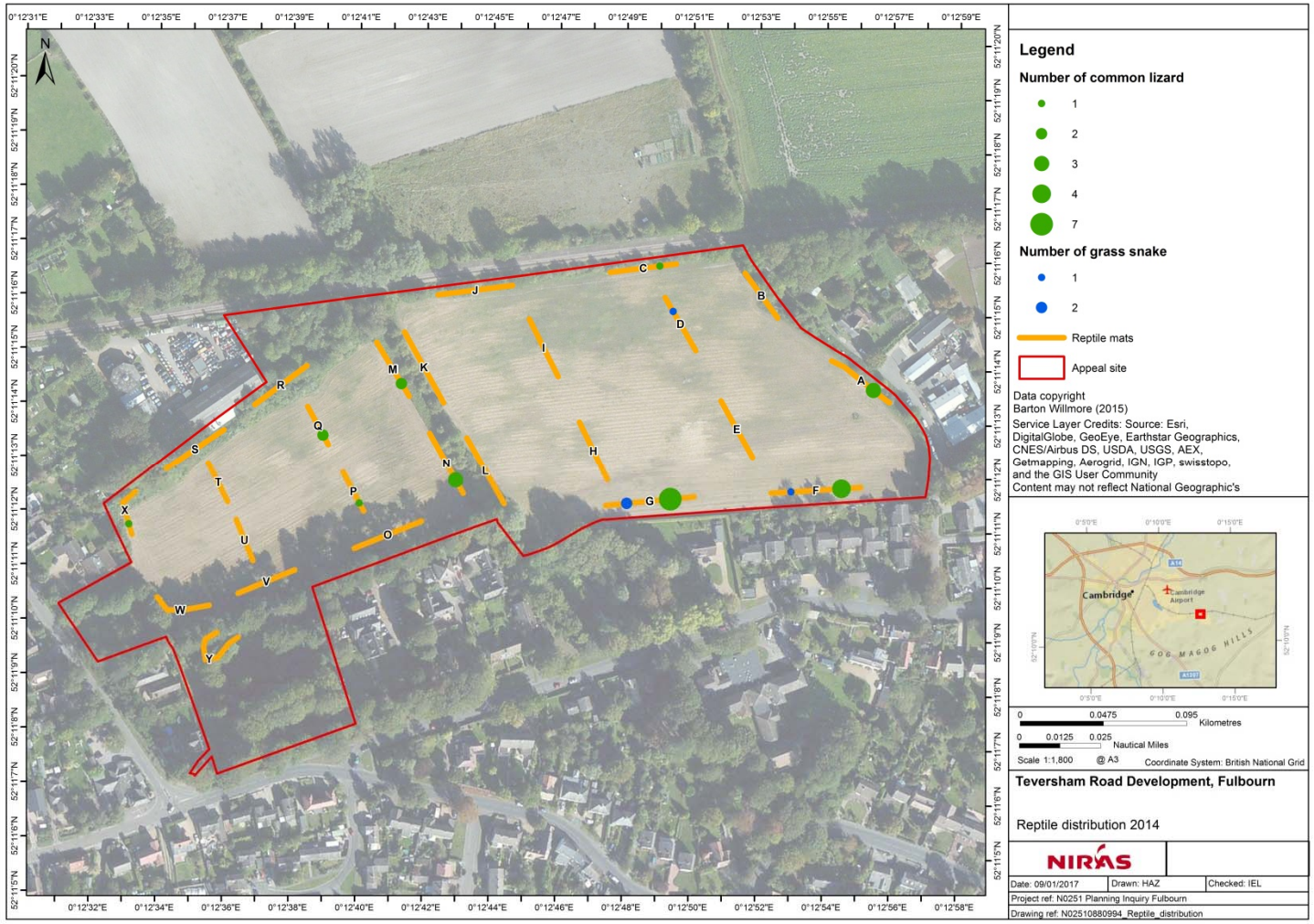

Figure 5: Reptile species distribution and abundance at Land at Teversham Road 2014

Water vole

5.32. Two main ditches were present onsite with one running north to south along the middle of the site and (the award drain – referred to as Ditch 1 in MKA Ecology 2014e)) and one running west from the central ditch along parts of the southern boundary. Both ditches were approximately two to three metres wide and around 50 – 60cm deep at the time of the survey with a significant silt layer up to half the depth of the channel in places.

5.33. No water voles were recorded at the site or any field signs indicating their presence. The banks of the award drain were either heavily covered in ivy and bramble scrub with no grass/graminoid species present or bare earth in the heavily shaded areas. The banks of the second ditch were almost exclusively man made concrete slabs.

5.34. Some burrows were recorded on the banks of the award drain, however these burrows were approximately 3cm in diameter and therefore were considered to be used by another small mammal species and not water vole (MKA Ecology 2014e).

Otter

5.35. No otters were recorded at the site or any field signs indicating their presence. In addition, there are no major water courses in close proximity to the site which may provide high quality habitat for the species. Little Wilbraham River is the closest water course and this is situated approximately 2km to the north-east of the site (MKA Ecology 2014e).

5.36. The absence of major water courses and high quality otter habitat within the vicinity of the site reduces the likelihood of the species occurring at the Land at Teversham Road site.

Badger

5.37. No Badgers were recorded at the site or any field signs indicating their presence (MKA Ecology 2014e).

5.38. The general topography of the site is very flat with no earth banks or other features that would be suitable for sett building. However, some areas such as the ditch banks and rail embankments were present. Some mammal tracks were present onsite through the vegetation, however, these were considered to have been created by Rabbits or Muntjac and not Badger due to the presence of droppings and footprints (MKA Ecology 2014e).

Bats

5.39. No bat roosts were recorded art any of the three trees surveyed and therefore it is considered unlikely that there will be impacts on roosting bats as a result of the development (MKA Ecology 2014b).

5.40. During the survey the following bat species were recorded:

- Serotine;
- common pipistrelle;
- soprano pipistrelle;

- *Pipistrellus* sp.; and
- *Myotis* sp..

5.41. MKA Ecology (2014b) concluded that there is a moderate diversity of species recorded at the Land at Teversham Road site with some scarcer species recorded (noctule, serotine and *Myotis sp.*). However the activity levels of these species was considered to be low. Activity was particularly low for the scarcer species such as Serotine (one pass) and *Myotis sp*. (two passes). Activity of the common species (common and soprano pipistrelles) was also low for a rural site. Of some regarding common pipistrelle was the identification of a strong commuting route along the central hedgerow and award drain (running north to south) which bisects the site. Approximately 30 minutes before dawn on 17 June 2014 five common pipistrelle were observed commuting south along this feature.

6. Determining the importance of ecological features

6.1. Table 1 provides a summary of the deemed importance (in reference to the geographical framework promoted by CIEEM 2016) of ecological features at the Land at Teversham Road site.

Designated sites

6.2. As established by Natural England, the proposed development will not directly or indirectly impact any designated site. Such sites are therefore not considered further in this EcIA.

Habitats

6.3. No habitats of European Importance present nor are any UK Priority Habitats present at Land at Teversham Road.

6.4. According to Cambs & Peterborough CWS Panel (2014) the relevant criterion for neutral grassland CWS designation is that sites must support "*frequent numbers of ...: three or more strong neutral grassland indicator species*." Mungovan (2016) provided a framework on establishing frequency as part of the Councils evidence for the Land at Teversham Road appeal using what is known as the DAFOR scale. It is stated that "frequently" means across 40-60% of the site. On this basis, adder's tongue can be regarded as frequently occurring across the site (see Figure 2) as a whole, none of the other species occur in such a fashion (see Figure 3). In fact, the other species would not even be "occasionally" found on the appeal site using the appropriate scale (Mungovan 2016).

6.5. The CWS criterion 2c requires the frequent occurrence of three or more strong indicator species to be supported, which as established above, the Land at Teversham Road site does not meet.

6.6. CWS criterion 2e requires 50 grassland species to be supported in order to qualify for selection. Neither the surveys by NIRAS (2016) or The Wildlife Trust BCN (2016) recorded a suite of species that meets this criterion. The Site is therefore considered not to meet any criterion presented in this EcIA of County level importance or above.

6.7. Habitats are concluded to be of **Local** importance by virtue of constituting, in parts, of a complex grassland mosaic with a relatively rich species assemblage. The site is however colonised by field horsetail, false oat grass and increasingly by invasive scrub.

Table 1 : Summary of importance of ecological features at the Land at Teversham Road Site.

Ecological feature	Covering legislation and guidance	Land at Teversham Road occurrence	Level of importance
Designated sites	•Habitats Directive 92/43/EEC (SACs); •Birds Directive 2009/147/EC (SPAs); •Wildlife and Countryside Act 1981 (SSSIs); •National Parks and Access to the Countryside Act 1949 (LNRs);	•No designated sites overlap with site boundary •No designated sites outside of boundary would be influenced by development	None
Habitats	•Habitats Directive (Annex I - habitats of European conservation importance) •NERC Act (2006) (Priority Habitats) •Cambs & Peterborough CWS Panel. 2014 (CWS Criteria)	•No habitats of European Importance present •No UK Priority Habitats present •Habitats present do not meet Cambridgeshire CWS criteria	Local
Botanical species	•Red Data List of vascular plants in Great Britain (JNCC, 2005) •Cambs & Peterborough CWS Panel. 2014 (County status)	•The Site supports no plants that are specifically protected nor any that are categorised as Nationally Rare, Nationally Scarce or included on the Red Data List of vascular plants (JNCC, 2005). •The site supports one strong indicator species of neutral grassland in Cambridgeshire in some frequency: adder's tongue fern • The site supports infrequent early marsh orchid, common twayblade, yellow rattle and, glaucous sedge which are also strong indicator species for neutral grassland.	Local
Breeding birds	•Birds Directive 2009/147/EC (Annex 1) •Wildlife and Countryside Act 1981 (Schedule 1) •NERC Act (2006) (Priority Species) •Eaton *et al.* (2015) (BoCC4)	•The site supports no breeding species listed on either Annex 1 of the EU Birds Directive or Schedule 1 of the WCA (1981). •The site supports just two Red listed Priority species in low breeding numbers (max. 2 territories).	None

Reptiles	•Wildlife and Countryside Act 1981 (Schedule 5) •NERC Act (2006) (all reptiles are Priority Species)	•The site supports a restricted distribution of a low population of common lizard. • The site supports a restricted distribution of a low population of grass snake.	Local
Great crested newt	•Habitats Directive 92/43/EEC •Habitats Regulations (2010). Great crested newts are an EPS and as such any development works which could affect them may require a licence from Natural England to comply with the Habitats Regulations. •Wildlife and Countryside Act 1981 (Schedule 5) •NERC Act (2006) (Species of Principal Importance) •Cambs & Peterborough CWS Panel. 2014 (County status)	•Not present during site survey	None
Water vole	•Wildlife and Countryside Act 1981 (Schedule 5) •NERC Act (2006) (Species of Principal Importance)	•Not present during site survey	None
Otter	•Habitats Directive 92/43/EEC (Otter is listed on Annexes II and IV). •Habitats Regulations (2010). •Wildlife and Countryside Act 1981 (Schedule 5) •NERC Act (2006) (Species of Principal Importance)	•Not present during site survey	None
Badger	•Badgers are protected under the Protection of Badgers Act 1992.	•Not present during site survey	None
Bats	•All bat species are listed in Annex II of the Habitats Directive. • Wildlife and Countryside Act 1981 (Schedule 5 – all bat species) •Noctule, soprano pipistrelle and brown long-eared bats are NERC Act (2006) Species of Principal Importance.	•No bat roosts present during site survey. •Limited foraging/commuting activity by widespread species noted including pipistrelle commuting route along award drain.	None (roosts) Local (foraging/commuting)

Plant species

6.8. The Site supports no plants that are specifically protected nor any that are categorised as Nationally Rare, Nationally Scarce or included on the Red Data List of vascular plants (JNCC, 2005).

6.9. The site does support one strong indicator species (adder's tongue fern) of neutral grassland in Cambridgeshire in some frequency with five other string indicator species being infrequently (early marsh orchid, common twayblade, yellow rattle and, glaucous sedge). The majority of these species are relatively uncommon in Cambridgeshire (The Wildlife Trust BCN 2016).

6.10. The Wildlife Trust BCN (2016) utilise additional criteria by summarising the relative restriction of a species to designated sites in the County. It is however highlighted that none of the species identified are anything other than widespread on a national or regional basis and designations of other sites will rely on other factors to support their status. The Land at Teversham Road site is located in a district with very high levels of versatile agricultural land and it is clearly evident that arable farming predominates to the exclusion of pasture or indeed neutral grassland. That grassland species of interest are more usually found on sites managed for their ecological value is therefore not considered to be of any relevance to determining the underlying value of the ecological interest of the application site.

6.11. Considering the presence of several locally uncommon plants, the Land at Teversham Road site is concluded to be of **Local** importance for botanical species.

Breeding birds

6.12. A breeding bird survey of the Site has determined that no species listed on Annex 1 of the EU Birds Directive or Schedule 1 of the WCA (1981) are present on site. Just two species of any conservation value were found to be breeding on site (song thrush and dunnock). Both of these species although Red Listed are widespread and common throughout the UK and occur in most woodland edge habitats including gardens. The breeding bird assemblage at the Site is clearly unexceptional and is demonstrated to be of no particular value above and beyond any adjacent areas. It is considered that the assemblage does not meet any criteria of being of Local importance.

6.13. Breeding birds are therefore not considered further within the impact assessment of this Report. As detailed in Section 3, all birds and their nests are protected under the WCA (1981 as amended). Therefore, these species are nevertheless discussed further within the mitigation and monitoring sections of this report.

Reptiles

6.14. Low populations of both common lizard and grass snake were recorded at the Land at Teversham Road site during survey. Both species are widespread both nationally and within Cambridgeshire although they Species of Principal Importance for Conservation (SPIC) under the NERC Act (2006). Section 41 of the Act places a legal obligation on developers to ensure that the conservation status of all SPIC (including UK BAP species) found on a site is maintained and, where possible, enhanced.

6.15. The considering the distribution and abundance nationally and locally of the two reptile species and their low populations present at the Site, grass snake and common lizard assessed as being of **Local** importance.

Great crested newt

6.16. No great crested newts were found to be present at the Land at Teversham Road sit. This species is therefore not considered further in this EcIA.

Water vole

6.17. No water voles were found to be present at the Land at Teversham Road sit. This species is therefore not considered further in this EcIA.

Otter

6.18. No otters were found to be present at the Land at Teversham Road sit. This species is therefore not considered further in this EcIA.

Badger

6.19. No badgers were found to be present at the Land at Teversham Road sit. This species is therefore not considered further in this EcIA.

Bats

6.20. No bat roosts were found to be present with in the Land at Teversham Road site and this issue is not considered further in this EcIA.

6.21. During survey a moderate diversity of species recorded at the Land at Teversham Road site with some scarcer species recorded (noctule, serotine and *Myotis sp.*). However the activity levels of these species was considered to be low (MKA Ecology 2014b). A strong commuting route for Common Pipistrelle was identified along the central hedgerow and award drain (running north to south) which bisects the site. This species is abundant both nationally and locally. On this basis the Site's value for commuting and foraging bats is assessed as being at most of **Local** importance.

7. Impact assessment

7.1. The following features of Local importance have been carried forward for impact assessment:

- Habitats / plant species;
- Reptiles; and
- Foraging / commuting bats.

7.2. This sections discusses and characterises the likely impacts on each of these features as a result of the development in the absence of any scheme implementing mitigation or enhancements for biodiversity. This section includes reference to best practice measures such as habitat retention when determining impact significance.

Habitats / plant species

7.3. The proposal for development of 110 dwellings and associated infrastructure would, in the absence of mitigation and/or management, inevitably result in the loss of a sizeable extent of the grassland habitats on site and a reduction in population of the locally uncommon plant species. Potential impacts are therefore defined as being of habitat loss / reduction in distribution through the construction phase of the development. In addition, for retained habitats and species potential impacts through disturbance / damage and other indirect impacts in the operational phase are also considered.

7.4. Although the current proposals for the Site's layout are purely indicative (Figure 1), it is considered that the more frequent species such as adder's tongue fern and also yellow rattle are likely to maintain populations on site. Species with more restricted distributions are at a greater risk.

7.5. Areas supporting the only stands of early marsh orchid and common twayblade will be retained through the flexibility of the outline planning proposals and an area of high density adders tongue will be retained (see Section 8 for full details of retention schemes). Therefore, the magnitude of impacts on locally uncommon plant species features will vary between Low (early march orchid, common twayblade, yellow rattle) and High (adder's tongue, glaucous sedge).

7.6. When assessing. Impacts of construction period ground clearance / disturbance and assuming a High level of magnitude on features of Local value (i.e. adder's tongue fern) an impact of **Moderate** significance results. When assuming a Low level of magnitude on features of Local value (all other locally uncommon plant species) results an impact of **Negligible** or **Minor** significance.

7.7. Potential impacts through disturbance / damage and other indirect impacts in the operational phase are considered to be minimal and result in impacts of **Negligible** magnitude and significance. Further consideration of maintaining a grassland plant community on Site are discussed in Section 8.

Reptiles

7.8. Low populations of both common lizard and grass snake were recorded at the Land at Teversham Road site during survey. On this basis the site is considered to be of Local importance for reptiles. Loss of grassland habitat will occur as part of the development, however notable areas within which reptiles occur are to be retained within the indicative layout proposals (Figure 1; Figure 5). These areas include habitat bordering the Award Drain which support common lizard and the southern boundary of the eastern field which supports both species.

7.9. Potential impacts are as being of habitat loss / reduction in distribution in addition to direct mortality through the construction phase of the development. In addition, potential impacts through disturbance and indirect effects in the operational phase are also considered.

7.10. Without mitigation, the development has the potential to remove a small proportion of the existing identified habitats where reptiles occur. Potential impacts are as being of habitat loss / reduction in distribution through the construction phase of the development. In addition, for retained habitats and species potential impacts through disturbance in the operational phase are also considered.

7.11. Both common lizard and grass snake were associated with boundary features on the Site (Figure 5), strongly suggesting that combined with retaining other grassland on site (estimated to account for up to 1.8 ha, Barton Willmore 2017) it is anticipated that the viability of reptile populations would not

likely be affected. It is therefore considered that any deemed effects from the construction phase of the development would be of **Low** magnitude over the long term. Considering that the reptile features are considered to be of Local importance it would results in an impact of **Negligible** or **Minor** significance. Disturbance to reptiles in the operational phase of the development may potentially occur through increased human presence and increased habitat fragmentation. There is however currently relatively extensive disturbance to the site and minor increase in access to grassland habitat is not anticipated to result in an observable negative impact on reptile populations.

Bats

7.12. Potential impacts to bat species are limited to operational phase effects on the identified 'strong' commuting route of common pipistrelle that follows the Award Drain (MKA Ecology 2014b). Other considerations include the low level of foraging activity noted over habitats by species such as serotine and noctule.

7.13. Light falling on a bat roost exit point, regardless of species, will at least delay bats from emerging, which shortens the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed (Bat Conservation Trust 2014). Although no roosts are present at the Land at Teversham Road site, artificial light can also impact foraging areas. The Award Drain, is considered to be a commuting route although if also used for foraging, impacts of at most a minor magnitude would be expected on common pipistrelle. This species is considered to have low sensitive to light disturbance (Stone 2013) and is common and widespread in urban areas through the UK. It is concluded that an impact on a feature of Local importance such as a common pipistrelle commuting route would result in **Negligible** or **Minor** significance on this basis.

7.14. With regards to foraging habitat for other species of bats, all areas of broadleaved woodland, hedgerows and the award drain are to be retained within the indicative design layout. In addition up to 1.8 ha of grassland will be retained. It is considered that there would be a negligible impact on the low level of foraging activity identified which therefore results in an impact of **Negligible** significance.

Summary of impact significance

7.15. Table 2 presents a summary of the significance of impacts as a result of the proposed development prior to the consideration of mitigation. Only impacts on adder's tongue fern (through a moderate reduction in distribution due to construction phase habitat loss) are considered to be above Negligible significance.

Table 2: Summary of the significance of potential impacts on ecological features at the Land at Teversham Road Site

Ecological feature	Potential Impact	Phase	Impact significance
Habitats / plant features	Habitat loss / reduction in distribution	Construction	Moderate (adder's tongue fern) Negligible (all other species)
	Disturbance / indirect impacts	Operation	Negligible
Reptiles	habitat loss / reduction in distribution/ direct mortality	Construction	Negligible or Minor
	Disturbance / indirect impacts	Operation	Negligible
Bats	Disturbance	Construction	Negligible or Minor
	Disturbance	Operation	Negligible

8. Proposed mitigation and ecological enhancement measures

8.38. Only impacts on adder's tongue fern in the construction phase through habitat loss are considered to be significant in EIA terms. However, despite these findings the Applicant has previously presented a detailed overview of habitat management options that can be implemented to provide both mitigation where necessary and a suite of ecological enhancements (NIRAS 2016).

8.39. NIRAS (2016) delineated the Land at Teversham Road site in to nine areas (A – I as presented in Figure 6) within which there is an opportunity for habitat management and enhancement.

8.40. As well as taking the landscape structure and potential impacts on ecological features (as determined in Section 7) into consideration, the proposals for retention, enhancement and creation have been designed to correlate with the known surface water regime of the site and the requirements to create a comprehensive Sustainable Urban Drainage Systems (SUDS) scheme to manage surface water runoff from the proposals.

8.41. Each of the nine areas are summarised below and detail provided in relation to the existing habitat and, the commitment made for habitat management as part of the planning application for the development. Ultimately, These proposals will be captured and fully realised in both a Biodiversity Management Plan (BMP) and a Mitigation Scheme for the development (see Section 9).

Area A (Award Drain)

Existing habitat

8.42. This chalk stream drains northwards through the centre of the site, creating a water based corridor linking through the network of off-site linear field drainage ditches to Caudle Ditch which in turn drains towards Teversham Fen. The stream has become significantly over-shaded by tree and shrub growth, which limits light penetration and restricts the development of stream vegetation. One consequence of its current status is that it is expected to support a limited aquatic faunal assemblage.

Proposed management

8.43. The stream will be retained in the drainage design and the landscaping plan for the site. There is, in addition, an opportunity to enhance the physical features of the stream by selective silt removal and to enhance the growth and development of the riparian and aquatic vegetation through selective removal and thinning of trees and shrubs and possible planting of aquatic plants suitable for flowing water.

8.44. Management of the stream corridor is proposed to be on a five year cycle with minimum disturbance. Overhanging marginal shrubs would be cut back to maintain an open water surface over much of the stream length with pockets of shade retained. Where possible, management of the stream would include the provision of substrate ledges that would provide further habitat enhancement. The watercourse is an Award Drain and subject to maintenance by South Cambridgeshire District Council.

Area B (northern boundary)

Existing habitat

8.45. The northern boundary of Area B comprises a mature hedgerow linking to an on-site copse at the western end and an offsite copse at the east end. The hedge Area B, is not species rich as assessed against the conservation criteria of the Hedgerow Regulations being dominated by hawthorn *Crataegus monogyna*. It also contains seven trees of three species ranging from semi-mature to early mature ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus* and walnut *Juglans regia*. Area B contains lower density stands of adder's tongue measuring approximately 850 m^2.

Proposed Management

8.46. The hedgerow and trees will be retained. A buffer strip along the boundary provides the potential space for further enhancement through structural planting of native trees and shrubs to improve the species diversity and density of the hedgerow linked to a marginal grassland strip. Proposals would take into account Network Rail requirements on the planting of trees adjacent to rail lines.

8.47. Network Rail (2015) provides guidelines on which species can be planted >5m and >10m away from the rail line. Species that could be planted at >5m include hawthorn, blackthorn *Prunus spinosa* and hazel *Corylus avellana*. Species that could be planted at >10m include Beech Fagus sylvatica, common oak *Quercus robur* and rowan *Sorbus aucuparia*. The mosaic of habitats along the margin would therefore be similar to the current mosaic and enhancements would increase the nesting and foraging opportunities for birds and foraging opportunities for bats.

8.48. Where Adder's Tongue exists (in low density) these areas will either be retained in the buffer strip or removed-retained.

Area C (northern woodland)

Existing habitat

8.49. The small copse, Area C, provides a node within the linear connectivity of the hedgerows in the landscape. The copse is an area of semi-natural, broad-leaved woodland with a canopy layer of ash and birch *Betula* sp., a shrub layer of hawthorn and elder *Sambucus nigra* and a ground flora dominated by rank ruderals such as ivy *Hedera helix* and common nettle Urtica *dioica*.

8.50. The surveys in 2016 (NIRAS 2016) found that adder's tongue occurred widely in the ground flora with an approximate extent of 1170 m2 of high density occurring. The presence of this species in this area was not reported previously.

Proposed Management

8.51. The woodland and ground flora where adder's tongue occurs in high density will be retained. There is further scope for enhancement by virtue of developing the vertical structure, species diversity and quality of the woodland edge. Given the current risk to ash trees, recommendations for planting would include additional canopy trees such as lime *Tilia* sp. with a variety of understorey trees and a diverse shrub layer within the woodland and along the margins of species tolerant of the alkaline to neutral soils. Improvement of the woodland structure and diversity, strengthened by long term management, would enhance the resource for invertebrates and local fauna in the long term.

8.52. There is notable scope within the woodland of Area C to provide a series of bat and bird boxes (in this small area c.5 of each are likely to be sufficient). Bird boxes are likely to attract common species such as great/blue tits although common starling (Red Listed) may also utilise nest boxes in such circumstances.

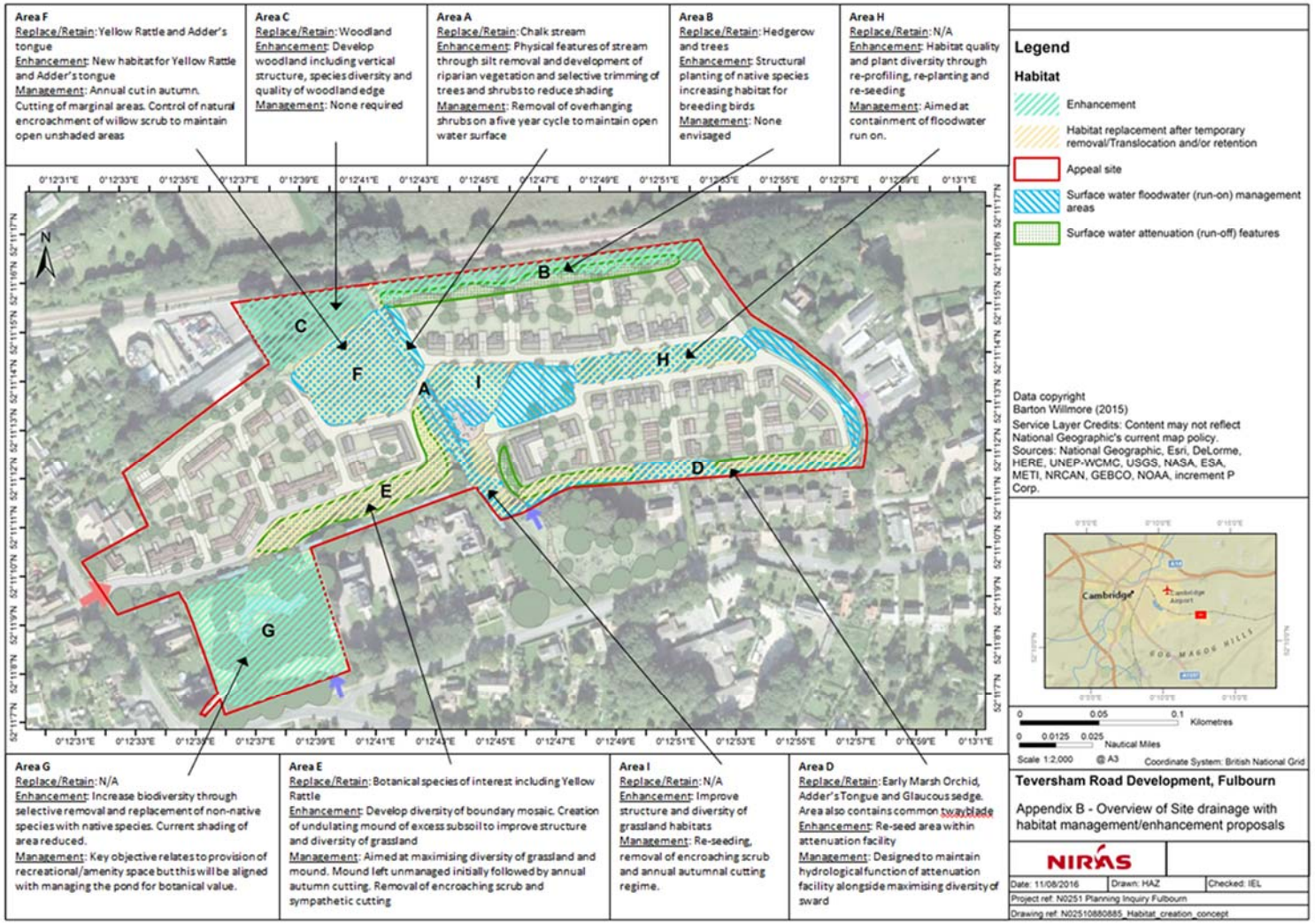

Figure 6: Overview of habitat management and enhancement proposals

Area D (southern boundary, eastern field)

Existing habitat

8.53. The vegetation of this perimeter area currently comprises the boundary edge of the semi-improved grassland defined by a managed hedgerow with occasional trees. A portion of this area is adjacent to and overlaps with a core area of early marsh orchid. Adder's Tongue is also present in low density and Common Twayblade also occurs. Other species of interest are shown in Figure 1.2 with a small stand of Hairy Sedge immediately to the east of the Early March Orchid colony. The presence of these species indicates a higher soil moisture content in this area.

Proposed Management

8.54. The area containing the colony of Early Marsh Orchid will be retained as indicated in Figure 6. The middle of the attenuation basin will no longer be part of the basin, and will be left alone in order to avoid disturbing the Orchids. Maintaining current hydrology in this area will be a focus of management protocols. This retention will also serve to retain the only areas where common twayblade has been recorded and other associate species in this area (adder's Tongue in low density and other species such as hairy sedge).

8.55. Elsewhere in Area D where loss of key plant occurs (limited to low density area of adder's tongue), the turves would be removed and retained within the site boundaries, where possible. Within the attenuation facility itself there is an opportunity to seed with a wetland seed mix containing approximately 24 varieties of native indigenous herbaceous plants and grasses suitable for wet alkaline soils. This would increase the biodiversity interest along the southern boundary.

8.56. The management regime would be designed to maintain the hydrological function of the attenuation facility alongside maximising the diversity of the sward and the retention of the early marsh orchid colony.

Area E (western field)

Existing habitat

8.57. Area E is the section of the western field adjacent to the southern boundary, currently comprised of semi-improved under-managed grassland and defined by the offsite boundary trees and shrubs. Substantial coverage of adder's tongue occurred in this area in 2016, with approximately 1020 m^2 of higher density areas. Also present in 2016 were other species of botanical interest including yellow rattle (strong indicator species) and bee orchid.

Proposed Management

8.58. Management will focus on developing the diversity of boundary mosaic with creation of undulating mound of excess subsoil to improve structure and diversity of grassland. Areas of high density adder's tongue will be removed and replaced.

8.59. Although bee orchid is not considered to be a species of notable conservation value, simple measures are proposed to maintain its presence in Area E. An undulating mound of the material can be created

alongside the southern boundary of the field adjacent to the area supporting the existing population. The mound can be created with a range of aspects, gradients and micro-topographic features providing microhabitats for the orchid. The mound would be offset from the site boundary to reduce the shading effect from the semi-mature and mature offsite trees. This provides an opportunity to improve the structure and diversity of grassland habitats through appropriate management, including removal of encroaching scrub and sympathetic cutting. Disturbed ground resulting from the creation of the mound can either be allowed to regenerate naturally or can be seeded with a diverse meadow mix.

8.60. Yellow rattle can also be sown on the new banks with a greater proportion of seed sown on the north side of the bund. This plant is an annual with no persistent seed bank in the soil, parasitizing the roots of grasses and herbaceous plants and occurs on shallow lime rich soils. The distribution of this species in a sward tends to vary year on year as the balance between the host plants and the yellow rattle changes. Consideration would be given to providing sufficient area to accommodate natural fluctuations although it is expected that enhancement of this species distribution can be achieved based on the infrequent stands present on the Land at Teversham Road Site in 2016.

8.61. The management of the grassland and the mound would be aimed at maximizing species diversity. Initially the mound may be left unmanaged as the canopy structure of a new grassland develops through the natural succession stages of the basal and semi-basal layers and finally the leaf layer. All arisings would be removed to ensure that the nutrient levels of the soil are lowered; these arising's have the potential to left on site as part of reptile mitigation.

Area F (western field)

Existing habitat

8.62. Area F is section of the western field currently comprised of under-managed semi-improved grassland. The absence of site management is leading to Willow scrub encroachment. The area contains patches within which Adder's Tongue is relatively abundant with over 2500 m^2 of high density habitat. This area is proposed to be set aside for the management of potential surface flood water (run-on).

Proposed Management

8.63. The management of potential surface flood water is likely to require current ground levels in Area F to be slightly reduced. It is however considered that a high density of adder's tongue can be maintained within the Area. Consideration has also been given to the potential for creating areas at the margins with a steady high soil moisture content that would support adder's tongue and re-sown yellow rattle.

8.64. The area of currently covered by high density Adder's Tongue is of over 70% of Area F. The aim of management in this area would be to:

i. Retain/replace, enhance and create new habitat for high density adder's tongue in order to maintain current levels or to widen distribution. Enhance Area F for yellow rattle in drier areas with up to 30% of Area F is available for enhancement works.

ii. Management of the translocation area would be annual cuts in spring and autumn with all arisings removed.

iii. The site design indicates that the area could also accommodate public use, through a system

of boardwalks above the vegetation. Use of the paths and access from the walkways can be controlled by constructing the boardwalks within 1m high fencing.

iv. Management of the marginal areas would be determined by the seed mix used. A meadow mix would be cut annually in autumn and all arisings removed; a pond edge mix would be cut on a three year cycle and all arisings removed.

v. Natural encroachment by willow scrub would be controlled to maintain the grassland mosaic.

Area G (southern landscaped area)

Existing habitat

8.65. Area G within the Pump House Garden currently includes a small pond surrounded by plantation mixed woodland and species poor semi-improved grassland. The grassland is largely shaded by surrounding areas of woodland and assessed to be of poorer quality than that in neighbouring fields. The pond is man made with a concrete lining and also provides little ecological value. Species present within this pond included dominant duckweed *Lemnaceae* agg. and yellow iris *Iris pseudacorus*, along with frequent rosebay willowherb *Chamerion angustifolium* along the pond margins.

Proposed Management

8.66. The key management objective for this area relates to the provision of recreational/amenity space, but there is considerable scope to enhance the biodiversity of this area through the selective removal and replacement of non-native species and enhancement using native varieties. There is notable scope within this area to provide mitigation and habitat enhancements for reptiles, particularly grass snake.

Area H (eastern field)

Existing habitat

8.67. Area H lies within the developed area. The current grassland has limited existing value (Figure 1.2) and there is evidence of encroaching scrub. This area is located within the development proposals and sited along a potential area of surface water flooding, the area would be landscaped to provide both visual amenity and public open space through a design that incorporates natural features and more ornamental planting.

Proposed Management

8.68. If unmanaged further scrub encroachment is expected. Management of this area would be aimed at the containment of surface water run-off and amenity, but there is also an opportunity to enhance the habitat quality and plant diversity. This can be achieved through re-profiling, re-planting and re-seeding with a suitable mixture of native trees, shrubs, herbs integrated with ornamental shrubs and trees that attract wildlife. Ongoing sympathetic management on the natural grassland areas would be as elsewhere on the site, aimed at maximising species diversity.

Area I (eastern field)

Existing habitat

8.69. Area I is a section of the eastern field currently comprised of semi-improved grassland. The absence of site management is leading to scrub (willow) encroachment but this area contains a section that formerly contained core concentration of common spotted orchid found in 2014, although this species was not present in 2016. A patch of glaucous sedge was located in 2016 in approximately the same locality as the orchids were found in 2014, this patch partly overlaps into Area I.

Proposed Management

8.70. The area would need to fulfil a number of functions, primarily to accommodate surface water floodwater (run-on) but also to provide public amenity space which would both take precedence over habitat development depending on the final design. Where public access can be controlled or minimised the potential for developing receptor sites for translocated turves and maintaining areas containing glaucous sedge.

8.71. Both Area H and Area I would deliver areas of open space within the development that would link to the existing boundary habitats and the stream corridor and would provide wildlife habitat within the urban landscape which bring nature into the development.

Summary of proposed ecological enhancement measures

8.72. Four main components are proposed that will provide notable enhancements for biodiversity which should be considered in parallel to mitigation measures.

i. The award drain will be removed of shading, managed and maintained to the benefit of ecology. It is recognised that this has the potential to be valuable asset and given that this feature is a Priority Habitat (NERC Act 2006 habitats of principal importance), the enhancement can be accorded a significant biodiversity benefit;

ii. The landscaping scheme as detailed above will deliver substantial additional boundary planning and provide for the management of the existing community. This will be a significant benefit to the breeding bird population of the site when supplemented with nest boxes and a more diverse flora on the site itself. This is likely to include birds which are of conservation concern.

iii. The existing reptile and grass snake population can be readily accommodated within the scheme with a variety of areas of open space on the site being suitable for them. Enhancement of the ornamental pond in the pump house garden would be suitable habitat for the grass snake population and large areas of the site, including Area F would be suitable for the low population of lizards with the addition of reptile hibernacula. Coupled with the pond improvements which will increase amphibian numbers (the principal food of grass snake) and the increased invertebrate population which will result from the increased diversity of flora which the site's managed ecological resource can deliver, there is a significant potential for enhancement;

iv. Bat and bird boxes throughout the scheme will enhance species diversity and provide opportunities for protected species and species of concern which do not presently use the site. No bats currently use the site for roosting while specific bird box designs can be incorporated to attract Red Listed species such as swift, starling and house sparrow.

Habitat translocation as a management tool

8.73. The overlap between the locations of the patches of adder's tongue, and other less frequent species within the development layout has meant that retention in situ is unlikely and, in order to retain the diversity within the site boundaries, translocation of these patches has to be considered. These three species are found in damp grassland habitats and there is potential for translocation to Areas F and I, with a potential for additional patches in Areas B and H.

8.74. Habitat translocation can deliver new biodiversity value and conserve ecological resources when used with pragmatic safeguards and as a method of where loss of habitat will occur as part of a development (Anderson and Groutage, 2003; Box and Stanhope, 2010). While translocations have previously been regarded as a mechanism of 'last resort' there is growing understanding that translocations can benefit the species being moved, improve the overall habitat function of the site involved (Hollingsworth & Gaywood, 2015). Translocation is now seen as an important component for rebuilding biodiversity that can work in tandem with habitat creation, restoration and enhancement (Box, 2013). The benefits of translocation over otherwise inevitable loss and stresses its advantages in establishing new habitats.

8.75. Translocation would consider:

- the physical environment,
- use of appropriate machinery;
- correct time of year; and
- the after care and management.

8.76. A translocation method statement will be prepared following a botanical survey to update the knowledge of the distribution of the plants and a soil assessment to determine the suitability of the proposed receptor sites (Box, 2013).

8.77. Results at translocation sites vary considerably. Notable failures from other sites have been attributed to the translocation techniques, climate change and the disturbance caused by the physical movement.

8.78. For this site the overall composition of the sward is not as critical as the provision of soil conditions suitable for the selected plants. It is therefore important that the work is undertaken under controlled conditions with experienced machinery operators following a specific method statement and supported by an immediate aftercare programme, particularly of watering to flush out released ions. On-going management would be designed to control aggressive and competitive grasses within the sward.

8.79. The only frequent species of local interest which will require translocation for some of its population is Adder's Tongue which is widely distributed across the site, showing that, if there are groundwater variations across the site, it is insensitive to them. All other relevant species, including glaucous sedge and (in the event that it re-appears) common spotted orchid are relatively undemanding in terms of soil conditions and there is more than sufficient flexibility within the scheme to ensure that they are provided with what they most need.

Summary of residual significance of potential impacts from the development

8.80. Whilst the development foot print will result in the loss of some of the existing grassland habitats on the site, this EcIA has demonstrated that what is locally important can be retained and that it is supplemented by a wealth of mitigation measures to provide overall enhancement in terms of the

site's net biodiversity. It is to be achieved by a combination of layout, design, landscaping and enhancement measures. Firstly, the layout and design of the scheme will allow for the retention of three of the key indicator species in situ and numerous opportunities for allowing for the fourth, yellow rattle, to be sown. In particular, the principal concentration of the early marsh orchid and the only common twayblade plants will remain in situ. Adder's tongue is also present in the area to be retained and it will also be retained in Area F and C, which together provide a substantial area of retained habitat.

8.81. In addition to the considerations of mitigation and enhancements focussing on grassland habitat, it is important to note that the site is colonised by field horsetail and false oat grass and increasingly by invasive scrub. Its ecological value to be likely to be subject to decline and there is no likelihood of that changing. It is also highlighted that the site is a time part of regional waterbody and no element of the development will make a material change to ground water levels. There is no connectively between the surface water management proposals and the groundwater and therefore no conceivable effect (Cannon Consulting Engineers, 2017).

8.82. Within the context detailed above, a finding of **Negligible** significance on all habitats and plant species (in all phases of the proposed development) after consideration of mitigation is entirely appropriate. It is also considered that there is potential for a positive impact on grassland species by securing their status on site, which is currently under threat from scrub encroachment and domination from species such as field horsetail.

8.83. The reptile species present on the site are commonly encountered and mitigation is most effectively and economically achieved by retaining appropriate areas of suitable reptile habitat in situ. The size of the Land at Teversham Road Site and the extent of land to be retained free of development coupled with the low population of the two species present allows for the development design to provide for this. It is evident that the pond in the pump house garden would be suitable habitat for the grass snake population and large areas of the site, including Area F would be suitable for the low population of lizards.

8.84. A reptile mitigation strategy will be prepared for the site, detailing the methodology to be used to undertake a translocation of the small populations of both species, and the location and management of receptor areas. The mitigation strategy will take the form of a component of the agreed Scheme and will therefore align with biodiversity management and drainage plans.

8.85. Within this context, a finding of **Negligible** significance on reptile species (in all phases of the proposed development) after consideration of mitigation is entirely appropriate.

8.86. A Negligible or Minor impact significance on commuting common pipistrelle bats is predicted in the absence of any mitigation. Whilst this level of impact is demonstrably not significant in EIA terms, it is considered that habitat management of the award drain would increase the level of invertebrate interest present and therefore a foraging resource for bat species. Coupled with the consideration the commuting would be unaffected by any lighting in this area and with the provision of bat boxes in boundary woodland areas, it is entirely plausible that a **Minor positive** impact on common pipistrelle would be the residual result.

9. Proposed monitoring and management plans

9.1. Monitoring of mitigation and in particular translocations over the long term is essential to enable a successful outcome and apply remedial actions should they be found to be required (Box, 2013).

9.2. A Biodiversity Management Plan (BMP) will include full details of the landscape and ecological management objectives for the site, including, the following key aspects:

i. An audit of proposed retained areas (including early marsh orchid) and an assessment of the existing site habitats to be retained, lost and created.

ii. Management and protection measures for all retained habitats and species to prevent damage during construction.

iii. A habitat restoration scheme for the award drain.

iv. Management of the surrounding tree belts and hedgerows, particularly with regard retaining the award drain commuting flight corridor for bats.

v. Management of ponds

vi. Reptile mitigation strategy including the location of retained reptile habitat, specific enhancements for reptile (including hibernaculum) and means of protecting reptiles from harm during the course of the development.

vii. Monitoring of notable species, with reporting provided to the LPA at appropriate intervals (typically years 1, 2, 5 and 10 post construction could be applied).

9.3. In association with the BMP a scheme of mitigation and translocation would be produced. Key aspects of the Scheme would include:

i. Botanical surveys to be undertaken (if 2016 surveys are required to be updated) in order to determine the distribution and densities of important grassland species.

ii. The Scheme's aims and objectives.

iii. Evaluation of the ecological and geological requirements of the important grassland species.

iv. Selection of suitable receptor sites following adequate site investigation.

v. Method statement for the grassland removal.

vi. Location of works and/or measures required to successfully implement the translocation.

vii. Full details of long-term management and ownership of the receptor sites.

viii. Persons responsible for the implementation of the Scheme.

ix. Timing of the Scheme's implementation.

x. Measures for the monitoring of the Scheme.

9.4. It is considered that a 10 year span post-construction is appropriate for monitoring (Box and Stanhope 2013). Monitoring is not required on annual basis (Anderson 2003) and therefore applying years 1, 2 , 5 and 10 in line with the BMP.

10. Conclusion

10.1. The proposed development at Land at Teversham Road is considered to result in no loss of any species of local importance and an overall net gain in biodiversity including, importantly, a significant gain to a habitat of Priority Habitat status and there is no policy reason, local or national outline planning permission could not be granted.

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12. Appendices

Appendix 1: SCDC Development Plan Document policy NE/6 Biodiversity

1. New development should aim to maintain, enhance, restore or add to biodiversity. Opportunities should be taken to achieve positive gain through the form and design of development. Where appropriate, measures may include creating, enhancing and managing wildlife habitats and natural landscape. The built environment should be viewed as an opportunity to fully integrate biodiversity within new development through innovation. Priority for habitat creation should be given to sites which assist in achieving targets in the Biodiversity Action Plans (BAPs).

2. The District Council will refuse development that would have an adverse significant impact on the population or conservation status of protected species or priority species or habitat unless the impact can be adequately mitigated or compensated for by measures secured by planning conditions or obligations.

3. Where there are grounds to believe that a proposal may affect a protected species or priority species or habitat, applicants will be expected to provide an adequate level of survey information to establish the extent of the potential impact together with possible alternatives to the development, mitigation schemes and / or compensation measures.

4. New development will have regard to the impact, either direct or indirect, of a proposal on people's opportunity to enjoy and experience nature on a site together with opportunities to improve public access to nature in addition to understanding local environmental characteristics.

5. Previously developed land will not be considered to be devoid of biodiversity. The re-use of such sites must be undertaken carefully with regard to existing features of biodiversity interest. Development proposals will be expected to include measures that maintain and enhance important features whilst incorporating them within any development of the site.

6. Exceptionally, where the economic or social benefits of a proposal outweigh harm to an important site or species, the approach will be first to avoid or minimise the harm, then to seek mitigation of the impact, and finally to secure appropriate compensation for any residual impact in order to ensure no net loss of biodiversity. Planning conditions and obligations will be used as appropriate to secure this.

7. Planning permission will not be granted for development which would have an unacceptable adverse impact on the biodiversity of the Natural Areas.